

Clippard

Miniature Pneumatics

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

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See Page 356.

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Mailing Address & Phone

Clippard Instrument Laboratory, Inc.
7390 Colerain Avenue
Cincinnati, Ohio 45239
513-521-4261 • Fax: 513-521-4464

Clippard Europe S.A. (Sales Office)
Parc Scientifique Einstein
Rue du Bosquet 6
BE-1348 Louvain-la-Neuve, Belgium
+32 10 45 21 34
Fax: +32 10 45 25 26

Contact Us by e-mail

sales@clippard.com

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The Clippard Advantage

Clippard Instrument Laboratory provides thousands of standard and special pneumatic products to design engineers and manufacturers around the world. Clippard has a unique advantage by providing standard and custom products, and value-added assemblies based on the most successful miniature pneumatic line in the world.

Clippard is well-known as a quality manufacturer. However, there is much more to the story. True craftsmanship used in the Minimatic® line is not limited by a numbers standard. Customers have long recognized the partnership they have with the Clippard organization, and have grown to appreciate the high standards self-imposed in the manufacture and testing of each valve and cylinder. Every employee at Clippard is devoted and empowered to provide you with the best product available.



CNC Swiss Turning Centers

Quality People

delivering the highest

Quality Products!



Cincinnati, Ohio



Fairfield, Ohio



Brussels, Belgium

"Pioneers of miniature pneumatic valves, cylinders and fittings"

William L. Clippard, Jr. founded Clippard Instrument Laboratory in 1941. The initial product line consisted of electrical test equipment, magnetic windings and radio frequency coils. The first miniature fluid power devices designed and built by Clippard were for use in the manufacturer of his own equipment.

In the early 1950's, Mr. Clippard introduced Minimatic components as a new product line. His first spring-return, rolled-construction air cylinder had a 3/8" bore and a 1/2" stroke.

He also created the now standard #10-32 threaded ports, and introduced this new size cylinder and valve port to the market. As #10-32 fittings gained acceptance, they also became the standard to miniature valves. More component types and sizes were added as new markets developed around these popular products.

The need for miniature pneumatics was so widespread that the Minimatic line rapidly became Clippard's primary product line, and remains so today.



Today, the company is managed by William L. Clippard, III, President and Robert L. Clippard, Vice President, and has grown to include over 5,000 standard products. The company's headquarters are located in Cincinnati, Ohio with manufacturing facilities in Fairfield, Ohio as well, and a sales office in Brussels, Belgium.

new products



Engineering product design and customer solutions with a team approach



Stepper-Controlled Proportional Valve
(Pages 192 & 193)



High Flow Electronic Valves
(Page 178)



Proportional Valve Driver
(Page 191)



Pilot-Operated Check Valves
(Page 150)



Exhaust Mufflers
(Pages 164 & 312)



Analytical Series Electronic Valves
(Page 173)

flexibility

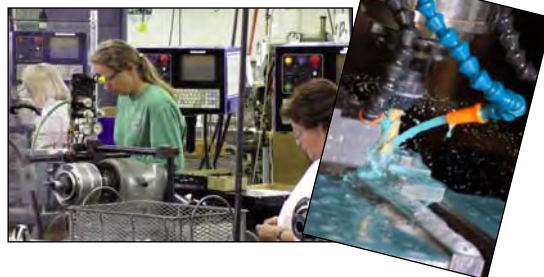


24/7 automated precision CNCs are set-up and operated by a highly-trained staff



innovation

A variety of capabilities and flexibility allow us to respond to your needs



knowledge



Unparalleled assembly experience stemming from years of producing thousands of standard and custom pneumatic products



craftsmanship

100% testing, KanBan Inventory Systems, and a world-class distribution network



experience



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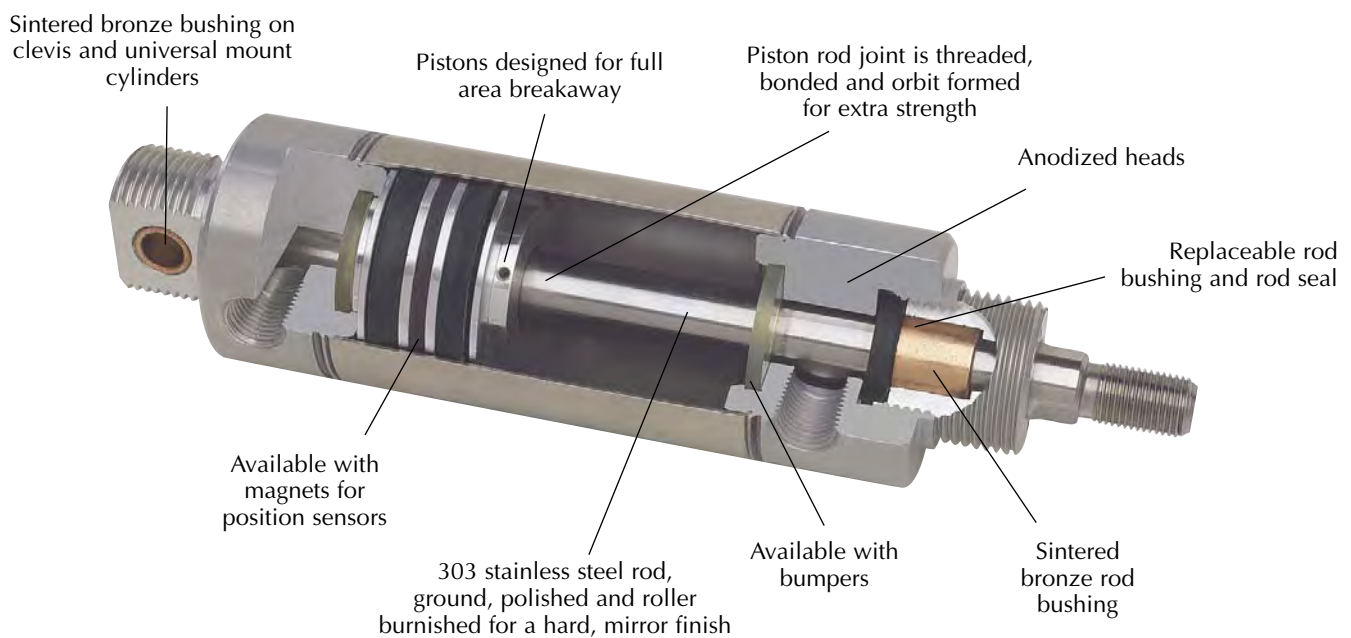




STAINLESS STEEL CYLINDER CONSTRUCTION

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, bonded and orbit formed to pistons
- Replaceable 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



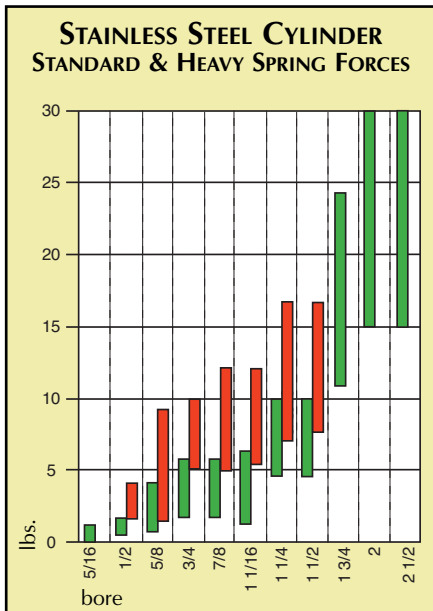
NUMBERING SYSTEM

Stroke
In inches & fractions of an inch

□	□	□	-	□	-	□	-	□
Mounting Type		Rod Type		Bore				Options
S - Stud U - Universal C - Clevis F - Front Block E - End Stud T - Trunnion		D - Double Ended Rod R - Rotating Rod N - Non-Rotating Rod H - Hollow Rod		5/32" - page 7 1/4" - page 7 05 - 5/16" 08 - 1/2" NEW! 09 - 9/16" 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"		B - Bumpers V - Fluorocarbon Seals C - Cushions M - Magnetic Piston for Position Sensors F - Cushion Front End R - Cushion Rear End W - Rod Wiper S - Side Ported H - Heavy Spring P - Rotated Ports N - No Threads
	Cylinder Type							
	D - Double Acting S - Single Acting R - Reverse Acting F - Front Spring Bias B - Back Spring Bias							

Not all combinations are available - consult factory

SPECIFICATIONS

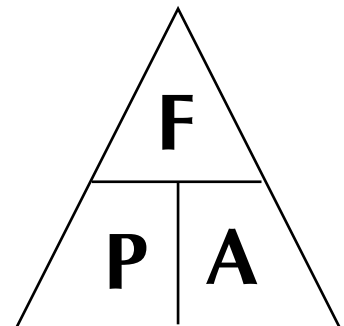


Bore Size	5/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1-1/16"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"
Force Factor - Extend (Area)	0.07	0.19	0.25	0.31	0.44	0.60	0.88	1.2	1.7	2.4	3.1	4.9	7.0
Rod Size	1/8"	3/16"	3/16"	3/16"	1/4"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	5/8"	3/4"
Rod Area	0.01	0.03	0.03	0.03	0.05	0.05	0.08	0.11	0.15	0.20	0.31	0.31	0.44
Force Factor - Retract (Area)	0.06	0.16	0.22	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.

F - Force or load in pounds	$F = P \times A$
P - Pressure	$P = F / A$
A - Area of cylinder (square inches)	$A = F / P$

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



Standard Spring Forces (lbs)

Bore	5/16"	1/2"	9/16"	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	1.7	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	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"	9/16"	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	N/A	3.3	5.0	5.0	5.5	8.5	8.5	N/A	N/A	N/A
Compressed	N/A	4.0	N/A	9.0	10.0	10.0	13.0	17.0	17.0	N/A	N/A	N/A



STAINLESS STEEL CYLINDER

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 -M

Clippard stainless steel pneumatic cylinders that are equipped with an internal magnet can be used with the Reed Switch and GMR Sensor. By accurately sensing the magnetic field of the piston when it passes beneath the sensor, the position of the rod piston is determined, and the feedback signal is created. 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 adder.

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.

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.

Private Label Option

Call Clippard for further information about private label options.

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

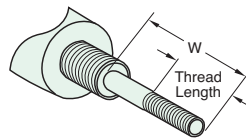
Bumpers -B

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.

Rod Extensions



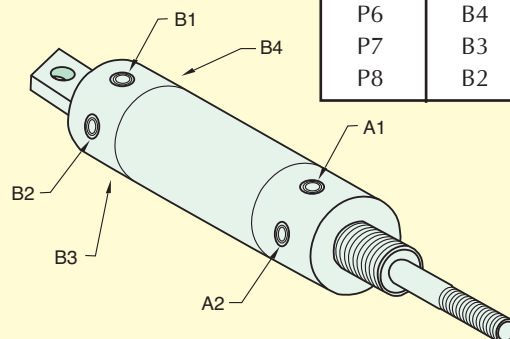
If a special rod extension is required, please refer to the drawing at left. For a special rod extension on single- or double-acting cylinders, indicate desired "W" when rod is at rest

(retracted) with no pressure to either port. For reverse acting cylinders, indicate "W" when rod is at rest (extended) with no pressure to either port.

W = _____ Thread Length = _____

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	9/16"	09	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 Cylinder" request form.





STAINLESS STEEL ACCESSORIES

POSITION SENSORS

Clippard stainless steel pneumatic cylinders that are equipped with an internal magnet can be used with the Reed Switch and GMR Sensor. By accurately sensing the magnetic field of the piston when it passes beneath the sensor, the position of the rod piston is determined, and the feedback signal is created. 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 adder.

GMR (Giant Magneto Resistive) Sensor

Clippard's GMR sensor is a solid-state device that is made up of alternating layers of conductive magnetic and non-magnetic materials. When a magnetic field is applied, there is a large drop in resistance. This decrease produces a signal that can be used to determine the location of the piston.

Some of the benefits of GMR technology include small size, high durability, high sensitivity, high response time, low power consumption and low cost. These benefits make this sensor a clear choice for piston location in pneumatic system control.



A 1/2" minimum stroke is required when multiple sensors are used.



A 1/2" minimum stroke is required when multiple sensors are used.

Reed Switch

Clippard's Reed Switch is a Single Pole, Single Throw (SPST) Normally-Open electronic switch. 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 the location of the piston.

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.

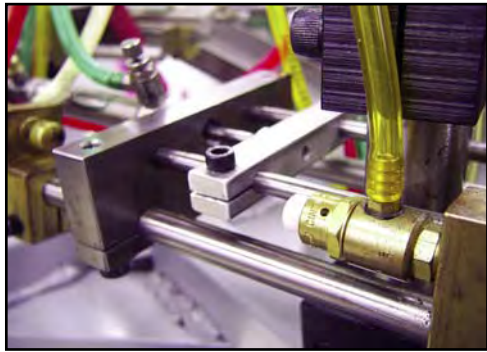


CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**



5/32" BORE STAINLESS STEEL CYLINDER & ACCESSORIES



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](#).



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 161 and 162](#).



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 141 through 144](#).



NEW Pilot-Operated Check Valves

These valves provide control functions with cylinders and with other control circuits. See [page 150](#) for a complete range of Pilot-Operated Check Valves.

SM-2

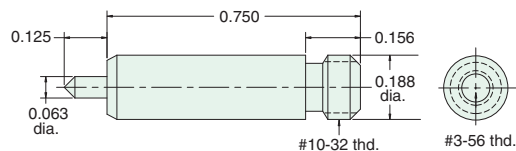
Single Acting



Bore: 5/32" **Available Stroke Length:** 1/4"
Mount: Rear Thread **Materials:** Stainless steel body, piston & rod, Buna-N U-cup, Beryllium copper spring
Type: Spring Return

Did you know...

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



SM-3-□

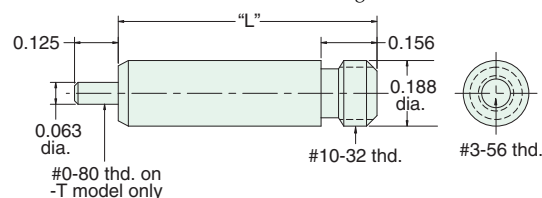
Single Acting



Model	SM-3-1	SM-3-2	SM-3-3	SM-3-4	Materials: Stainless steel tube and rod, brass piston, Buna-N U-cup
Stroke	1/4"	1/2"	3/4"	1"	
Length "L"	0.740	1.171	1.593	2.000	

Bore: 5/32" **Mount:** Rear Thread **Type:** Spring Return

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



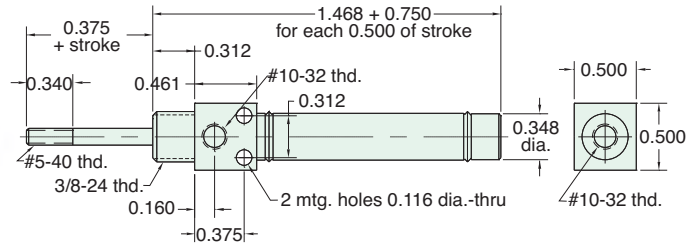
5/16" BORE STAINLESS STEEL CYLINDER



SRR-05-□-□

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 1 lbs. **Spring At Rest:** 0.5 lbs.
Options: B, V, N **Maximum Stroke:** 17" For B option add 0.250

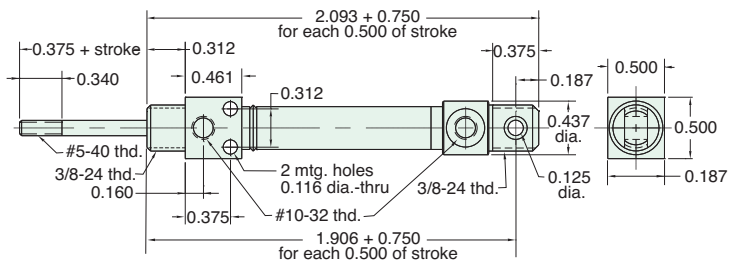


Nuts included, but not shown on drawing

URR-05-□-□

Reverse Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 1 lbs. **Spring At Rest:** 0.5 lbs.
Options: B, V, P2, P3, P4, P5, P6, P7, P8, N **Maximum Stroke:** 17" For B option add 0.250

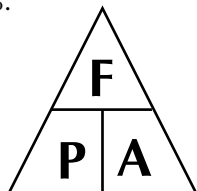


Nuts included, but not shown on drawing

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"	9/16"	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	0.25	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"	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	0.03	0.05	0.05	0.08	0.11	0.15	0.20	0.20	0.31	0.44
Force Factor - Retract (area)	0.06	0.16	0.22	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	4.9	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	4.4	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	12.4	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	11.00	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	19.8	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	17.6	22.6	31.27	44.07	64.26	87.17	124.0	176.29	232.29	367.46	524.66

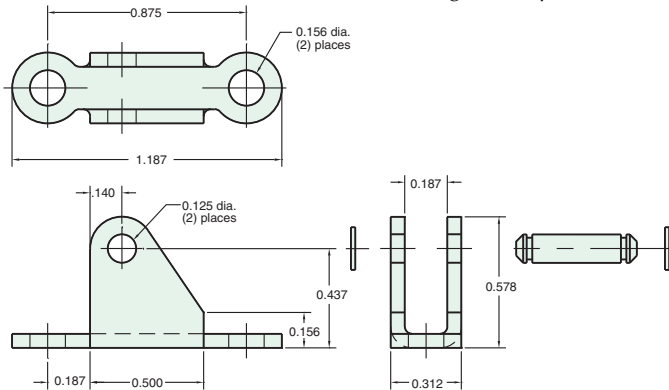


5/16" BORE ACCESSORIES



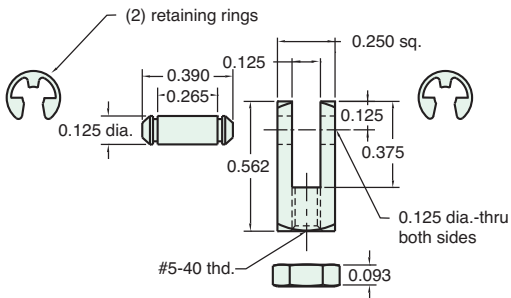
CB-0595

Clevis Bracket
Material: Steel, bright zinc plated



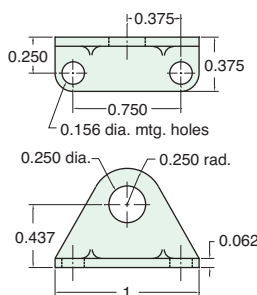
RC-0581

Rod Clevis
Material: Steel, electroless nickel plate



FB-0591

Foot Bracket
Material: Steel, bright zinc plated



MOUNTING NUTS

Stud Nut

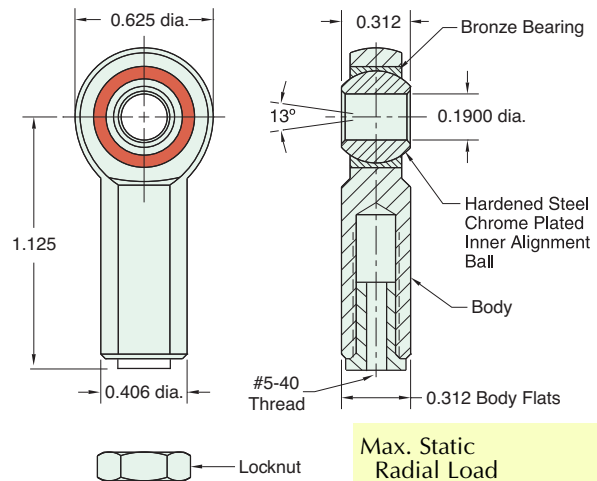
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N04-28A	7/16"	5/32"	1/4-28
N04-28B	3/8"	1/8"	1/4-28
N06-24A	9/16"	7/32"	3/8-24
N06-24B	1/2"	3/32"	3/8-24

Rod Nut

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

RE-0585

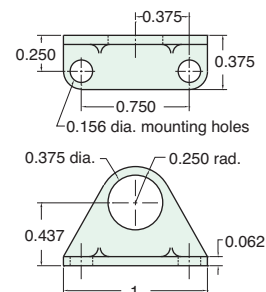
Rod End
Material: Steel, bright zinc plated body



Max. Static Radial Load (rod end only): 1,624 lbs.
Fits Rod Thread Size: #5-40

FB-0592

Foot Bracket
Material: Steel, bright zinc plated



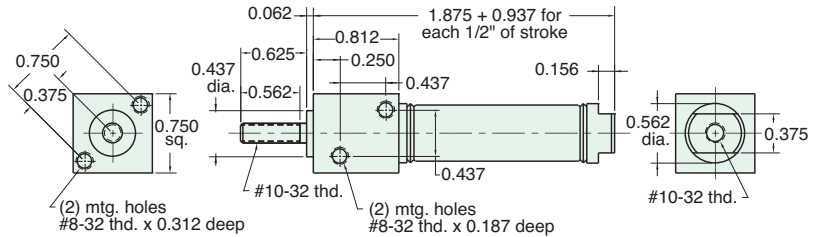
1/2" BORE STAINLESS STEEL CYLINDER



FSR-08-□-□

Single Acting

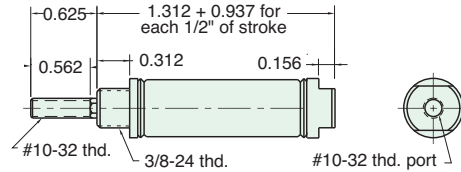
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 2 lbs. **Spring At Rest:** 0.9 lbs.
Options: M, B, H, V, S, N, W **Maximum Stroke:** 23"
 For B option add 0.375
 For M option add 0.312
 For S option add 0.187



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: M, B, H, V, S, N **Maximum Stroke:** 23"
 For B option add 0.500
 For M option add 0.312
 For S option add 0.187

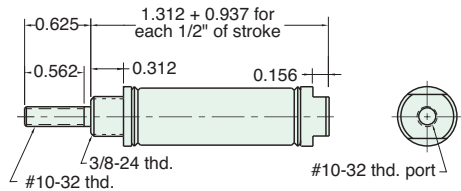


Nuts included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 23"
 For B option add 0.500
 For M option add 0.312
 For S option add 0.187

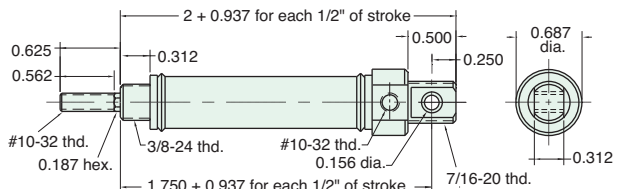


Nuts included, but not shown on drawing

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: M, B, H, V, P6, N **Maximum Stroke:** 23"
 For B option add 0.500
 For M option add 0.312



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



1/2" BORE STAINLESS STEEL CYLINDER

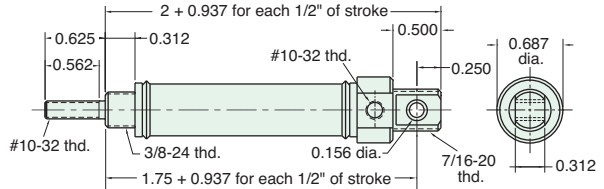
USR-08-□-□

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: M, B, H, V, P6, N, W **Maximum Stroke:** 23"

For B option add 0.500
For M option add 0.312



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

FDR-08-□-□

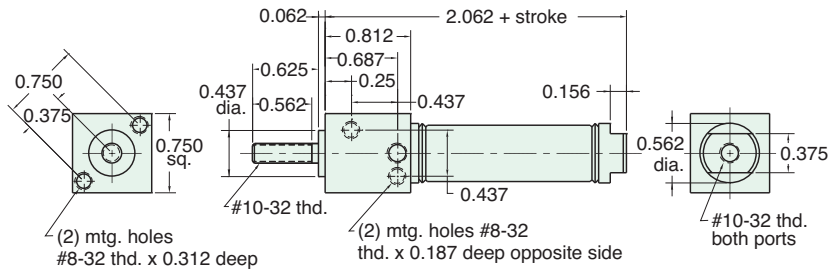
Double Acting



Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: M, B, V, P6, P7, P8, S, N, W

For B option add 0.500
For M option add 0.312

For S option add 0.187



SDR-08-□-□

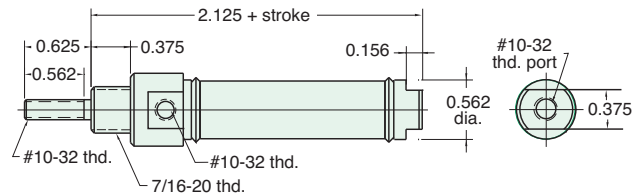
Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: M, B, V, P6, P7, P8, S, N, W

For B option add 0.500
For M option add 0.312

For S option add 0.187



Nut included, but not shown on drawing

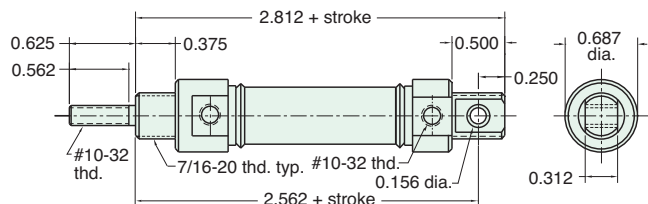
UDR-08-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 42"
Options: M, B, V, P2, P3, P4, P5, P6, P7, P8, N, W

For B option add 0.500
For M option add 0.312



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

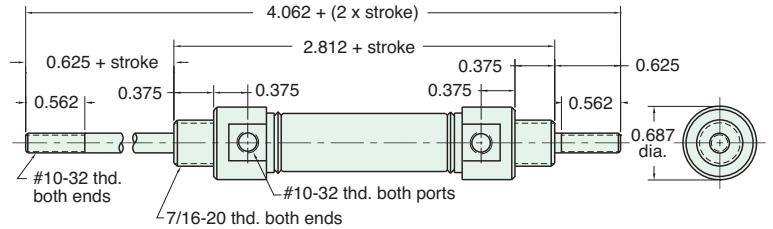
1/2" BORE STAINLESS STEEL CYLINDER



SDD-08-□-□

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Double Rod **Maximum Stroke:** 20" For B option add 0.500
Options: M, B, V, P6, P7, P8, N, W For M option add 0.312

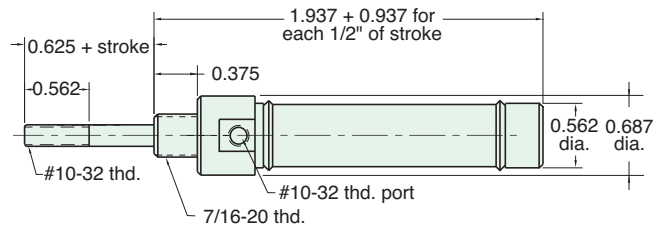


Nuts included, but not shown on drawing

SRR-08-□-□

Reverse 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: M, B, H, V, N, W **Maximum Stroke:** 15" For B option add 0.500
 For M option add 0.312

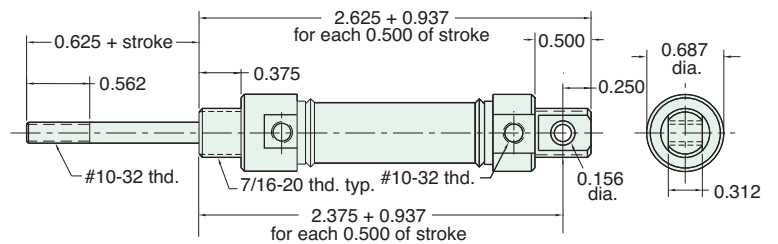


Nut included, but not shown on drawing

URR-08-□-□

Reverse 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: M, B, H, V, P2, P3, P4, P5, P6, P7, P8, N, W **Maximum Stroke:** 15" For B option add 0.500
 For M option add 0.312



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

Did you know that all Clippard Cylinders are 100% tested.



1/2" BORE ACCESSORIES



MOUNTING NUTS

Stud Nut

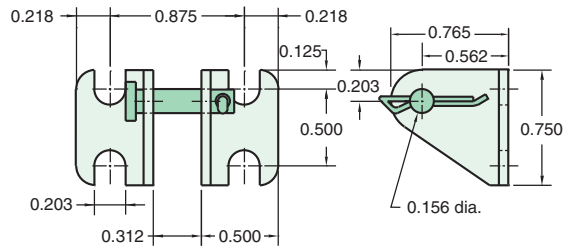
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N06-24A</u>	9/16"	7/32"	3/8-24
<u>N06-24B</u>	1/2"	3/32"	3/8-24
<u>N07-20</u>	11/16"	1/4"	7/16-20

Rod Nut

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

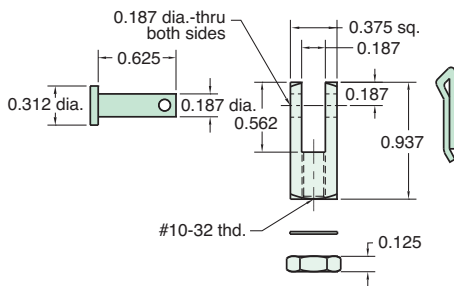
CB-0895

Clevis Bracket
Material: Steel, bright zinc plated



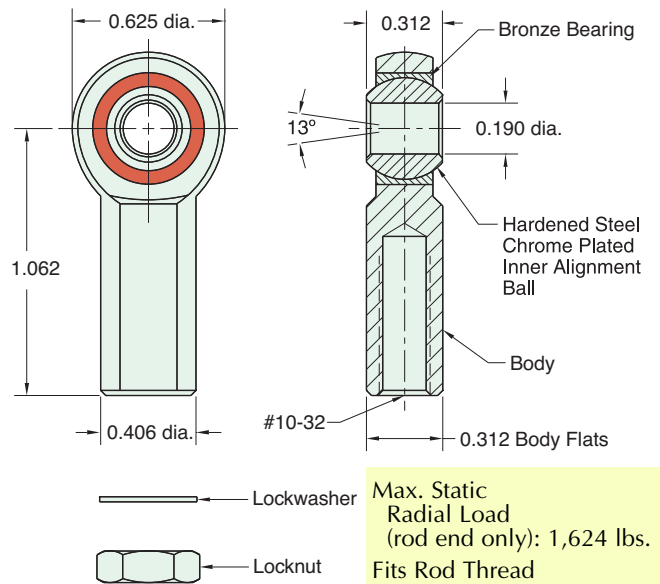
RC-0881

Rod Clevis
Material: Steel, electroless nickel plate



RE-0885

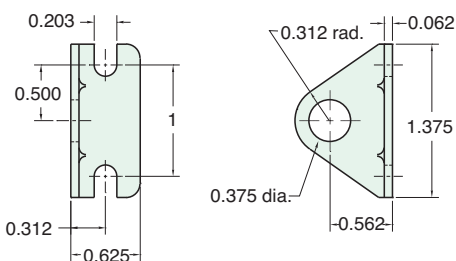
Rod End
Material: Steel, bright zinc plated body



Max. Static Radial Load (rod end only): 1,624 lbs.
Fits Rod Thread Size: #10-32

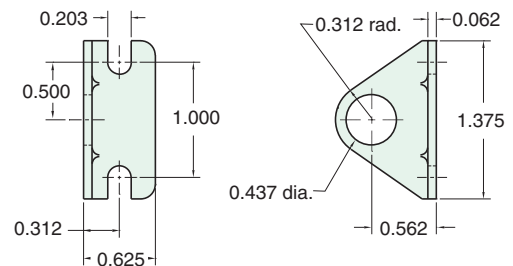
FB-0891

Foot Bracket
Material: Steel, bright zinc plated



FB-0892

Foot Bracket
Material: Steel, bright zinc plated



NEW! 9/16" BORE STAINLESS STEEL CYLINDER

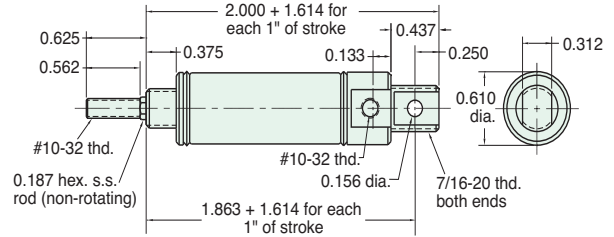


USN-09-□-□

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:** 1.7 lbs.
Options: B, V, P6, N, M, MB **Maximum Stroke:** 23" For B option add 0.063
 For M or MB option add 0.125



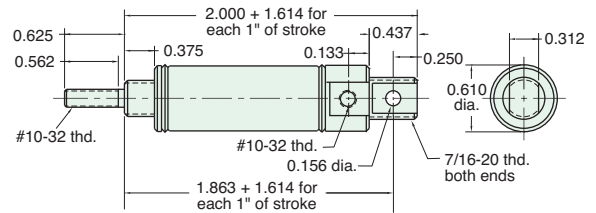
Furnished without nut(s). See Chart on [Page 17](#).

USR-09-□-□

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:** 1.7 lbs.
Options: B, V, P6, N, M, MB **Maximum Stroke:** 23" For B option add 0.063
 For M or MB option add 0.125



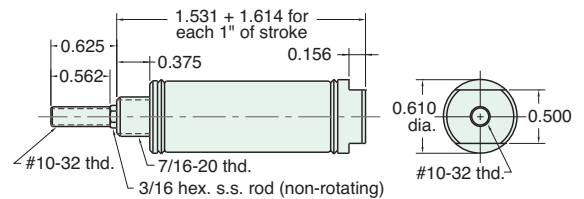
Furnished without nut(s). See Chart on [Page 17](#).

SSN-09-□-□

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:** 1.7 lbs.
Options: B, V, N, M, MB **Maximum Stroke:** 23" For B option add 0.063
 For M or MB option add 0.125



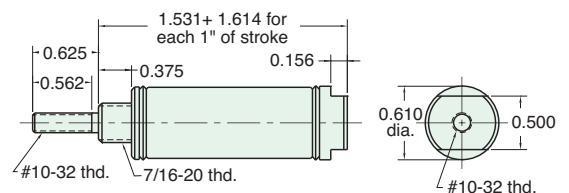
Nut included, but not shown on drawing

SSR-09-□-□

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:** 1.7 lbs.
Options: B, V, N, M, MB **Maximum Stroke:** 23" For B option add 0.063
 For M or MB option add 0.125



Nut included, but not shown on drawing

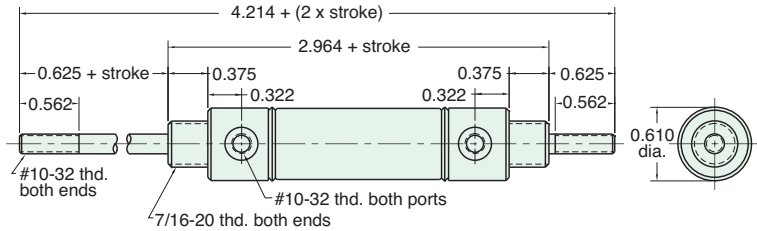


NEW! 9/16" BORE STAINLESS STEEL CYLINDER

SDD-09-□-□

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Double Rod **Maximum Stroke:** 20"
Options: B, V, P6, P7, P8, N, M, MB For B option add 0.125

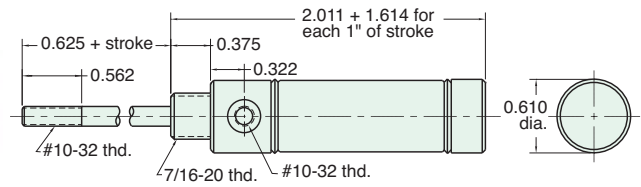


Nuts included, but not shown on drawing

SRR-09-□-□

Reverse 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:** 1.7 lbs.
Options: B, V, N, M, MB **Maximum Stroke:** 15"
For B option add 0.563
For M or MB option add 0.125

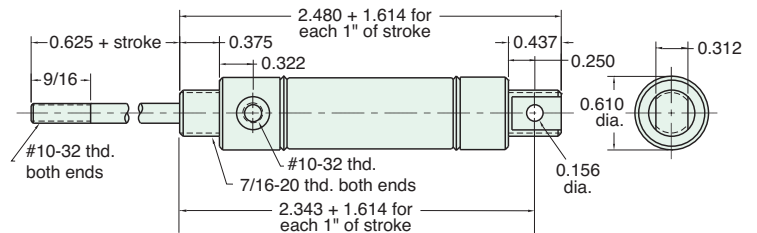


Nut included, but not shown on drawing

URR-09-□-□

Reverse 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:** 1.7 lbs.
Options: B, V, P2, N, M, MB **Maximum Stroke:** 14"
For B option add 0.063
For M or MB option add 0.125

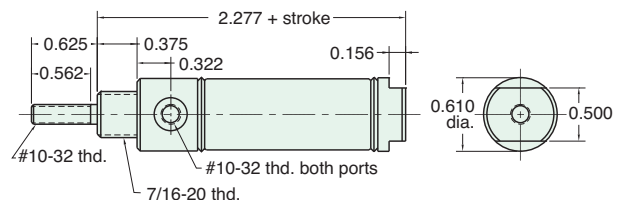


Furnished without nut(s). See Chart on Page 17.

SDR-09-□-□

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: B, V, P6, P7, P8, N, M, MB For B option add 0.125



Nut included, but not shown on drawing

NEW! 9/16" BORE STAINLESS STEEL CYLINDER



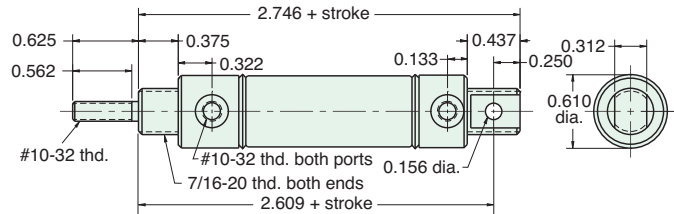
UDR-09-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: B, V, P2, P3, P4, P5, P6, P7, P8, N, M, MB

For B option add 0.125



Furnished without nut(s). See Chart below.



MOUNTING NUTS

Stud Nut

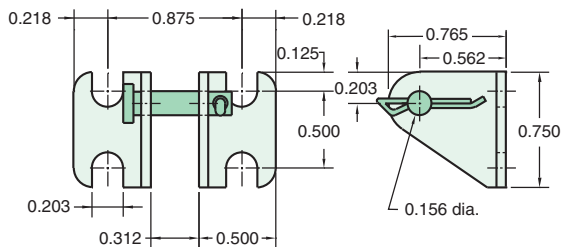
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N07-20	11/16"	1/4"	7/16-20

Rod Nut

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

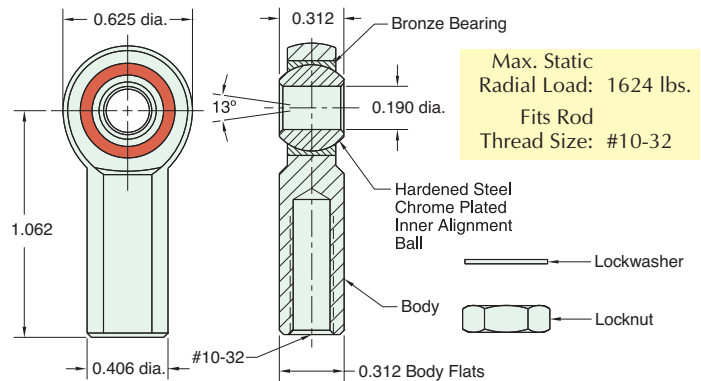
CB-0895

Clevis Bracket
Material: Steel, bright zinc plated



RE-0885

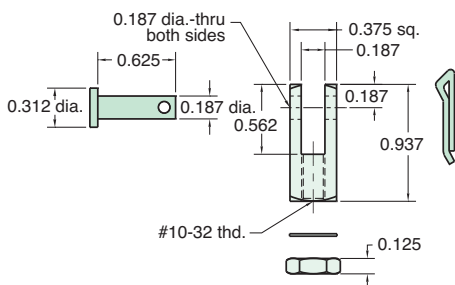
Rod End
Material: Steel, bright zinc plated body



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

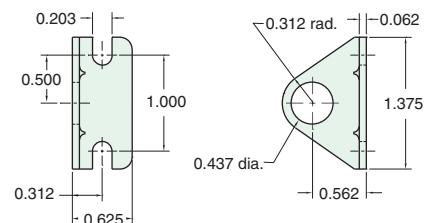
RC-0881

Rod Clevis
Material: Steel, electroless nickel plate



FB-0892

Foot Bracket
Material: Steel, bright zinc plated



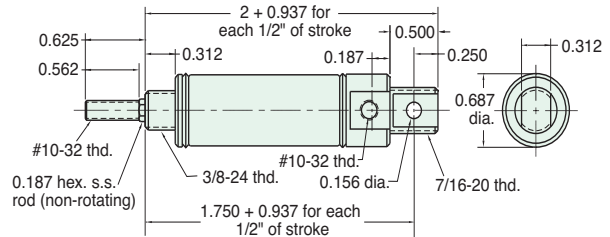


5/8" BORE STAINLESS STEEL CYLINDER

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: M, B, H, V, P6, N **Maximum Stroke:** 23" For B option add 0.500
For M option add 0.312

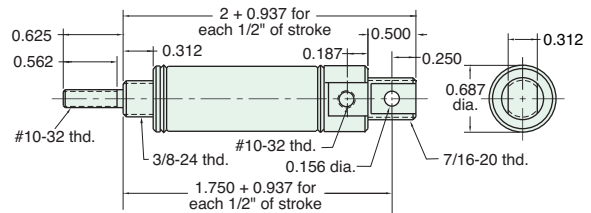


Furnished without nut(s). See Chart on Page 21.

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: M, B, H, V, P6, N, W **Maximum Stroke:** 23" For B option add 0.500
For M option add 0.312

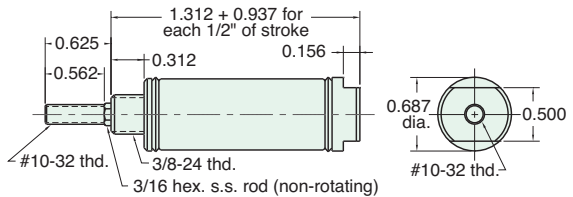


Furnished without nut(s). See Chart on Page 21.

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: M, B, H, V, S, N **Maximum Stroke:** 23" For B option add 0.500
For M option add 0.312

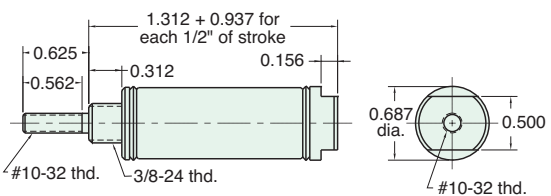


Nut included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 23" For B option add 0.500
For M option add 0.312



Nut included, but not shown on drawing

5/8" BORE STAINLESS STEEL CYLINDER

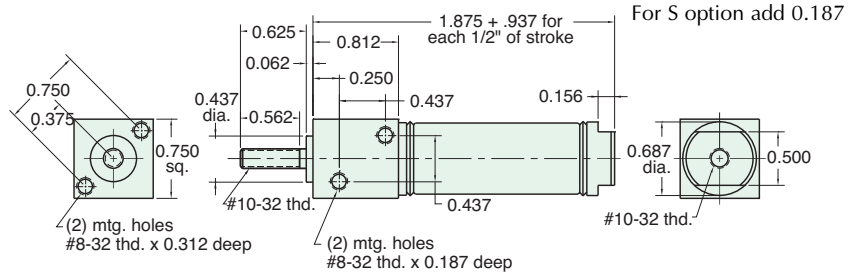


FSR-10-□-□

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. For B option add 0.375
Options: M, B, H, V, S, N, W **Maximum Stroke:** 13" For M option add 0.312

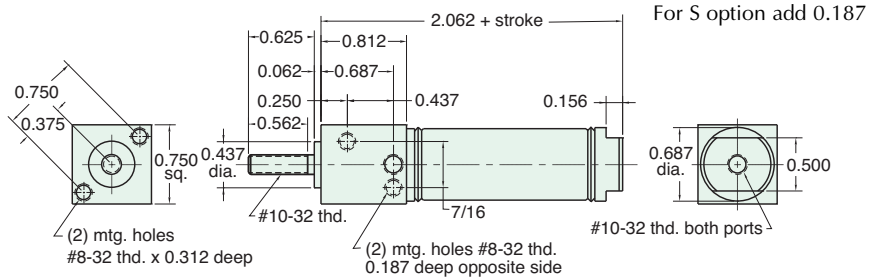


FDR-10-□-□

Double Acting



Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: M, B, V, P6, P7, P8, S, N, W For B option add 0.500
 For M option add 0.312

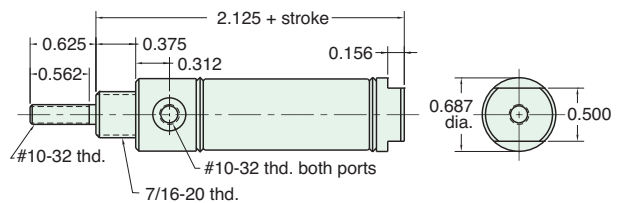


SDR-10-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: M, B, V, P6, P7, P8, S, N, W For B option add 0.500
 For M option add 0.312



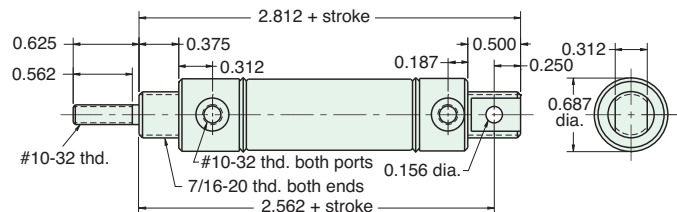
Nut included, but not shown on drawing

UDR-10-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Maximum Stroke:** 43"
Options: M, B, V, P2, P3, P4, P5, P6, P7, P8, N, W For B option add 0.500
 For M option add 0.312



Furnished without nut(s). See Chart on Page 21.

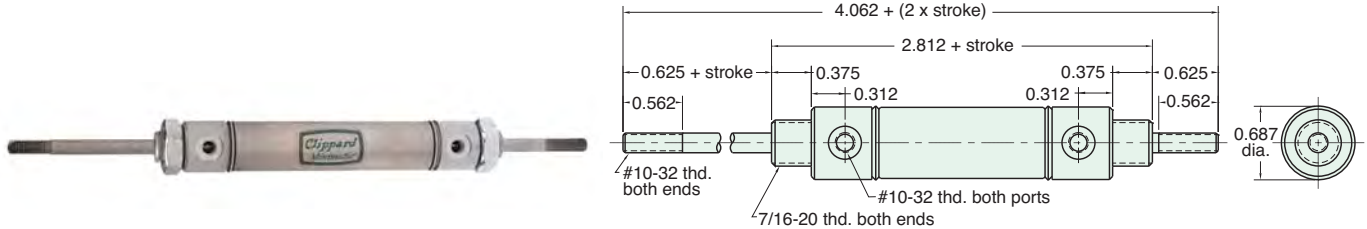


5/8" BORE STAINLESS STEEL CYLINDER

SDD-10-□-□

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Double Rod **Maximum Stroke:** 20"
Options: M, B, V, P6, P7, P8, N, W For B option add 0.500
For M option add 0.312

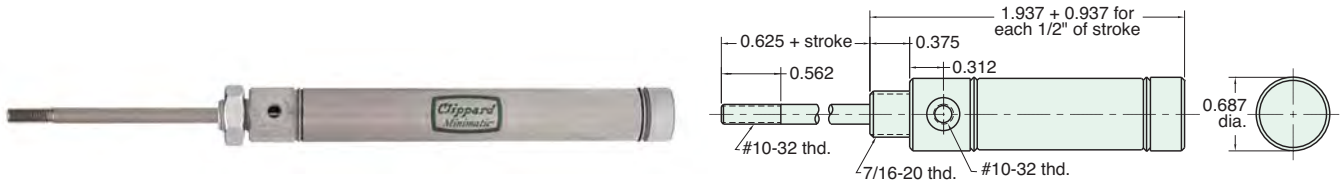


Nuts included, but not shown on drawing

SRR-10-□-□

Reverse 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: M, B, H, V, N, W **Maximum Stroke:** 15"
For B option add 0.500
For M option add 0.312

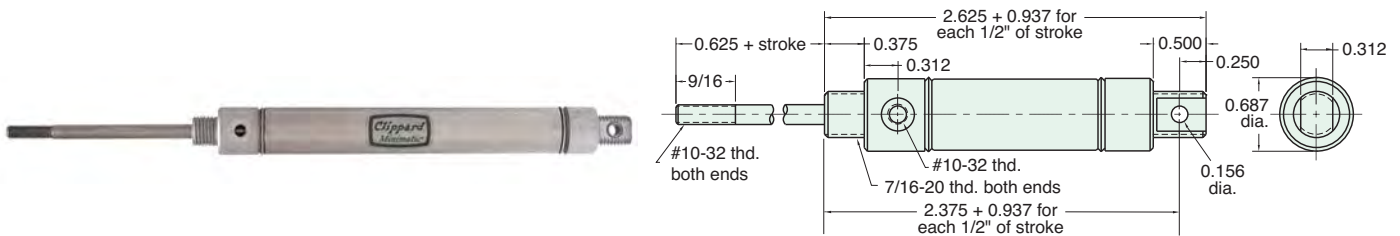


Nut included, but not shown on drawing

URR-10-□-□

Reverse 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: M, B, H, V, P2, N, W **Maximum Stroke:** 14"
For B option add 0.375
For M option add 0.312



Furnished without nut(s). See Chart on Page 21.

For harsh environments, refer to [pages 64 through 69](#) for Clippard's Corrosion-Resistant Stainless Steel 5/8" cylinders.



MOUNTING NUTS

Stud Nut

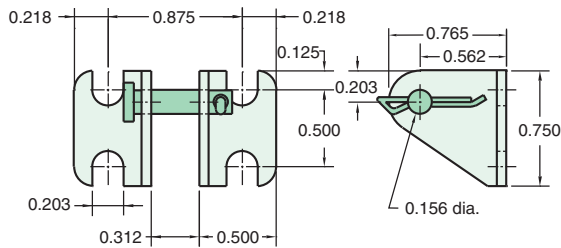
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N06-24A	9/16"	7/32"	3/8-24
N06-24B	1/2"	3/32"	3/8-24
N07-20	11/16"	1/4"	7/16-20

Rod Nut

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

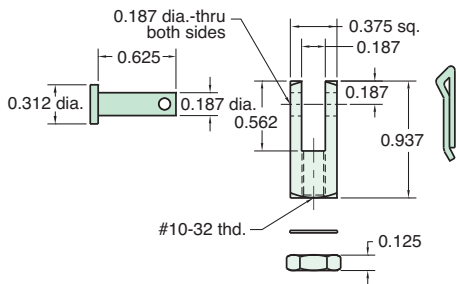
CB-0895

Clevis Bracket
Material: Steel, bright zinc plated



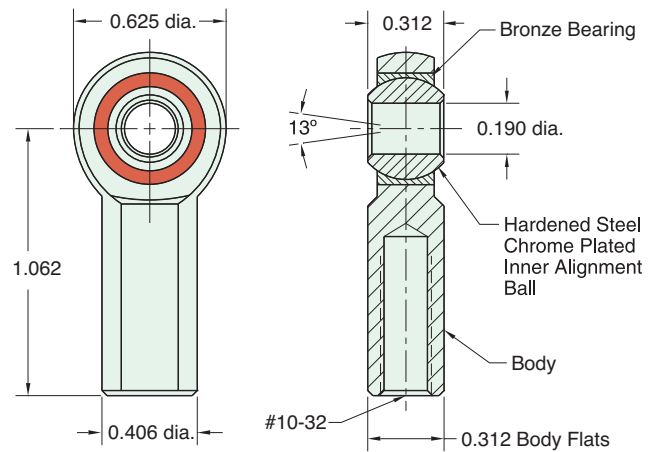
RC-0881

Rod Clevis
Material: Steel, electroless nickel plate



RE-0885

Rod End
Material: Steel, bright zinc plated body



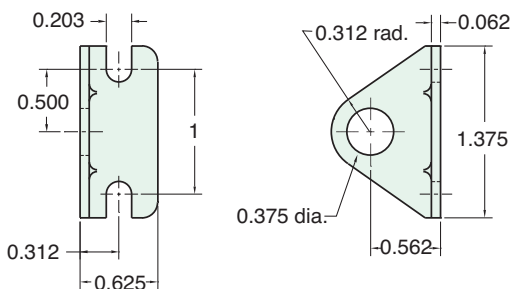
Lockwasher

Locknut

Max. Static Radial Load (rod end only): 1,624 lbs.
Fits Rod Thread Size: #10-32

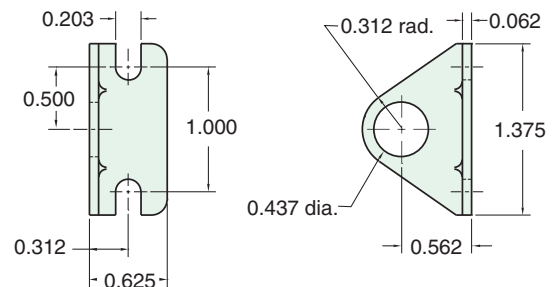
FB-0891

Foot Bracket
Material: Steel, bright zinc plated



FB-0892

Foot Bracket
Material: Steel, bright zinc plated



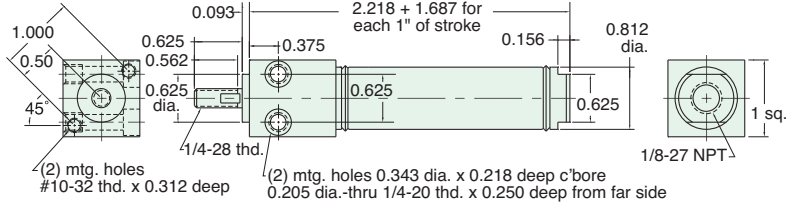


3/4" BORE STAINLESS STEEL CYLINDER

FSR-12-□-□

Single Acting

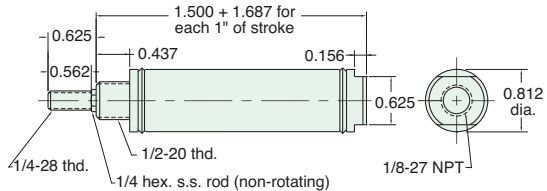
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: M, B, H, V, S, N, W **Maximum Stroke:** 25" For B option add 0.375
For M option add 0.125
For S option add 0.437



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: M, B, H, V, S, N **Maximum Stroke:** 26" For B option add 0.500
For M option add 0.125
For S option add 0.437

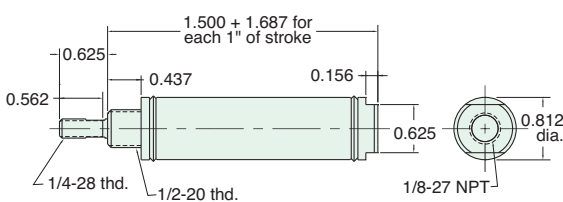


Nut included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 26" For B option add 0.500
For M option add 0.125
For S option add 0.437

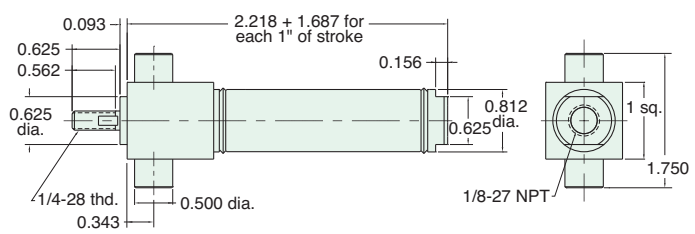


Nut included, but not shown on drawing

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: M, B, H, V, S, N **Maximum Stroke:** 25" For B option add 0.500
For M option add 0.125
For S option add 0.437



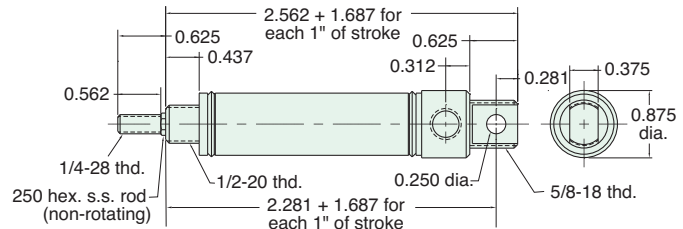
3/4" BORE STAINLESS STEEL CYLINDER



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: M, B, H, V, P6, N **Maximum Stroke:** 25" For B option add 0.500
 For M option add 0.125

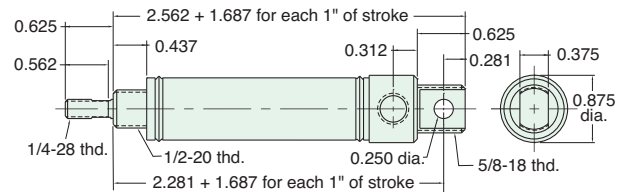


Furnished without nut(s). See Chart on Page 27.

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: M, B, H, V, P6, N, W **Maximum Stroke:** 25" For B option add 0.500
 For M option add 0.125

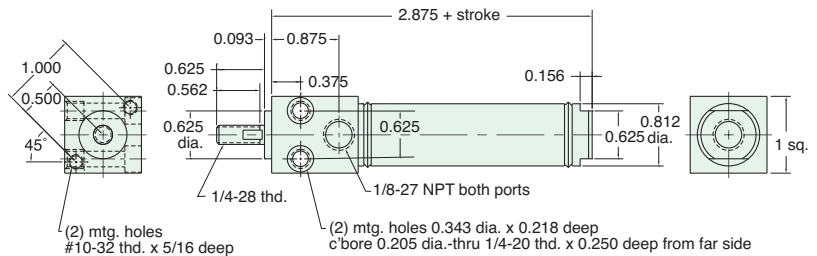


Furnished without nut(s). See Chart on Page 27.

FDR-12-□-□

Double Acting

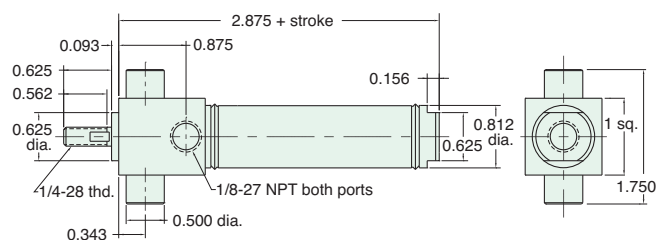
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42" For B option add 0.500
Options: M, B, W, V, P6, P7, P8, S, N For S option add 0.437



TDR-12-□-□

Double Acting

Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42" For B option add 0.500
Options: M, B, W, V, S, N, P6, P7, P8 For S option add 0.437





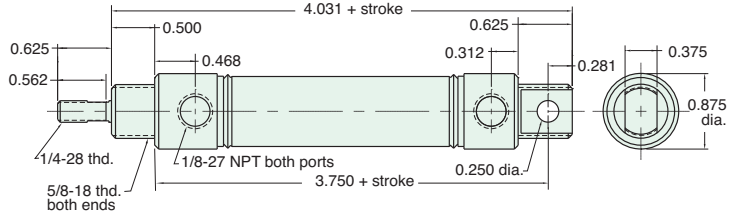
3/4" BORE STAINLESS STEEL CYLINDER

UDR-12-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Rotating rod **Maximum Stroke:** 41"
Options: C, F, R, B, W, V, P2, P3, P4, P5, P6, P7, P8, M, N For B option add 0.500



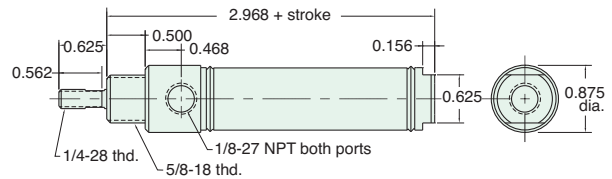
Furnished without nut(s). See Chart on Page 27.

SDR-12-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42"
Options: C, F, R, B, W, V, P6, P7, P8, S, M, N For B option add 0.500
For C, F, R & S options add 0.437



For harsh environments, refer to pages 64 through 69 for Clippard's Corrosion-Resistant Stainless Steel 3/4" cylinders.

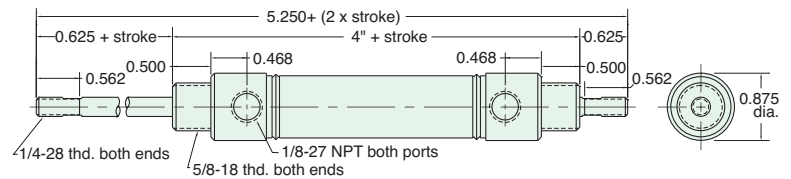
Nuts included, but not shown on drawing
C, F, & R options use side ported rear head

SDD-12-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Rod **Maximum Stroke:** 20"
Options: C, F, B, W, V, P6, P7, P8, M, N For B option add 0.500



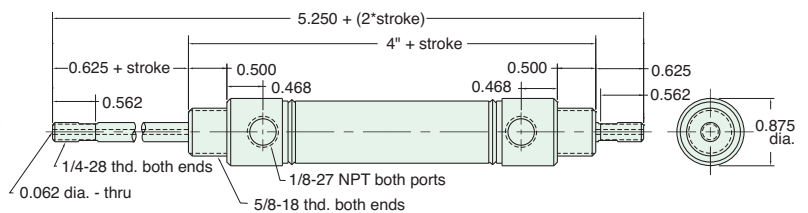
Nuts included, but not shown on drawing

SDH-12-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Hollow Rod **Maximum Stroke:** 20"
Options: B, W, V, P6, P7, P8, M, N For B option add 0.500



Nuts included, but not shown on drawing

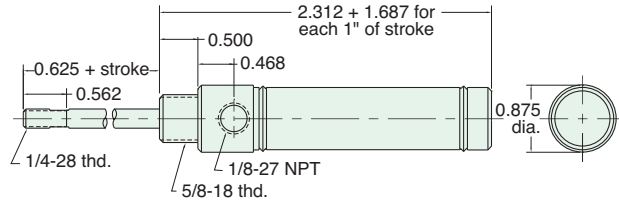
3/4" BORE STAINLESS STEEL CYLINDER



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: M, B, H, W, V, N **Maximum Stroke:** 16" For B option add 0.375
 For M option add 0.125

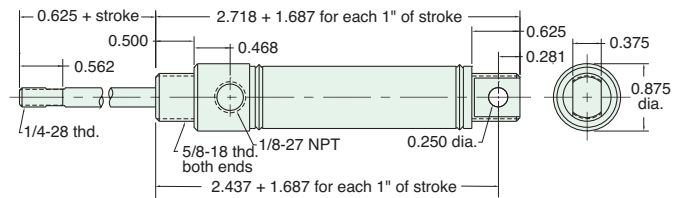


Nut included, but not shown on drawing

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: M, B, H, W, V, P2, N, W **Maximum Stroke:** 15" For B option add 0.500
 For M option add 0.125

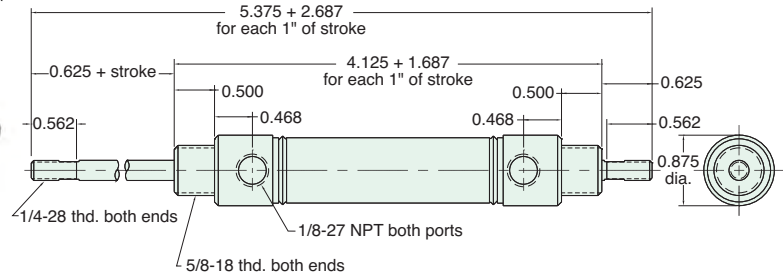


Furnished without nut(s). See Chart on Page 27.

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: M, B, H, W, V, P6, P7, P8, N **Maximum Stroke:** 15" For B option add 0.375

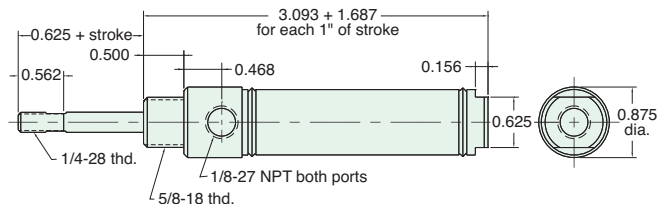


Nuts included, but not shown on drawing

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: M, B, H, W, V, P6, P7, P8, S, N **Maximum Stroke:** 15" For B option add 0.375
 For S option add 0.437



Nut included, but not shown on drawing



MOUNTING NUTS

Stud Nut

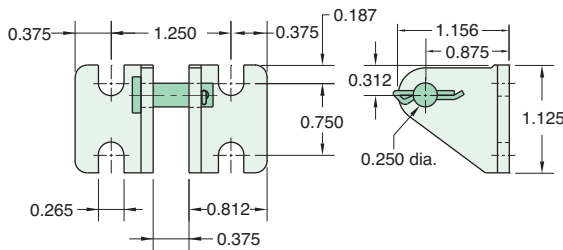
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N08-20</u>	3/4"	5/16"	1/2-20
<u>N10-18</u>	15/16"	3/8"	5/8-18

Rod Nut

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

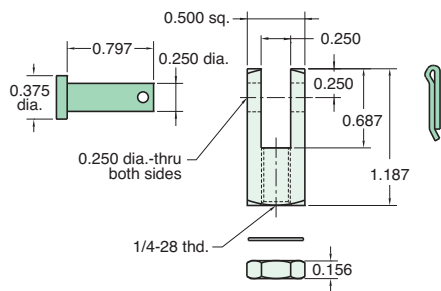
CB-1795

Clevis Bracket
Material: Steel, bright zinc plated



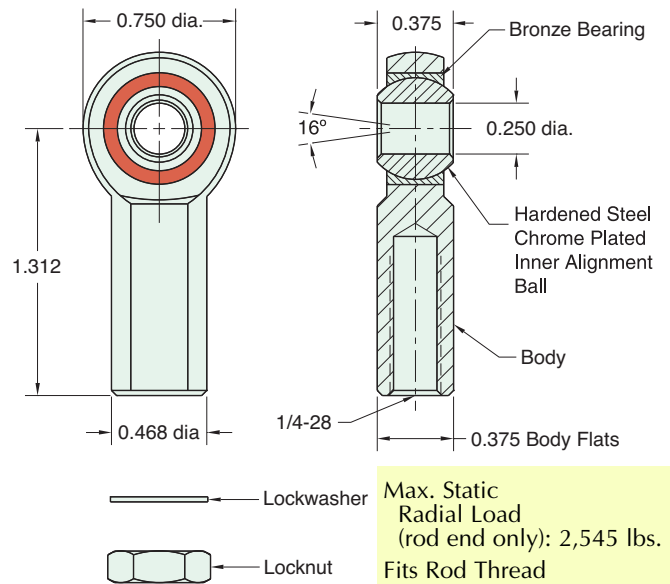
RC-1281

Rod Clevis
Material: Steel, electroless nickel plate



RE-1285

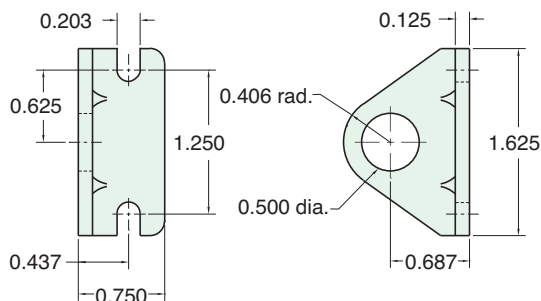
Rod End
Material: Steel, bright zinc plated body



Max. Static Radial Load (rod end only): 2,545 lbs.
Fits Rod Thread Size: 1/4-28

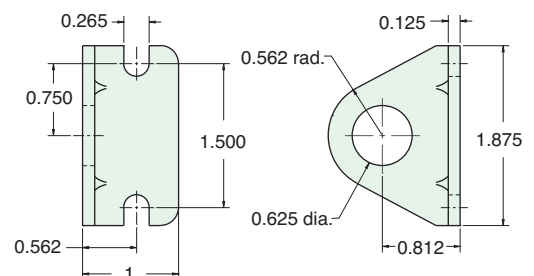
FB-1291

Foot Bracket
Material: Steel, bright zinc plated



FB-1791

Foot Bracket
Material: Steel, bright zinc plated





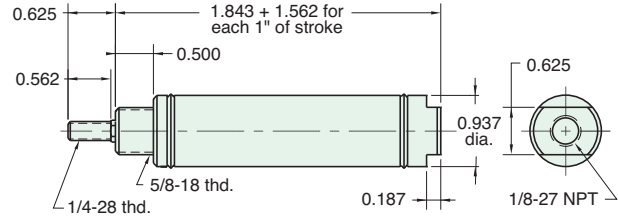
7/8" BORE STAINLESS STEEL CYLINDER

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: M, H, V, S, N **Maximum Stroke:** 27"
Bumpers are standard
For M option add 0.125
For S option add 0.281



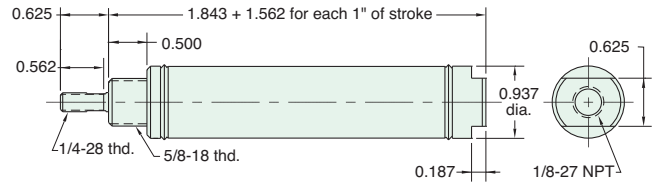
Nut included, but not shown on drawing

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: M, H, V, S, N, W **Maximum Stroke:** 27"
Bumpers are standard
For M option add 0.125
For S option add 0.281



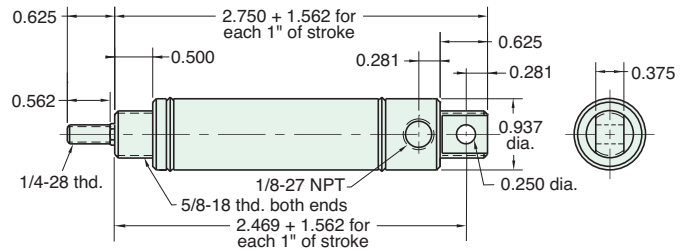
Nut included, but not shown on drawing

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: M, H, V, P6, N **Maximum Stroke:** 27"
Bumpers are standard
For M option add 0.125



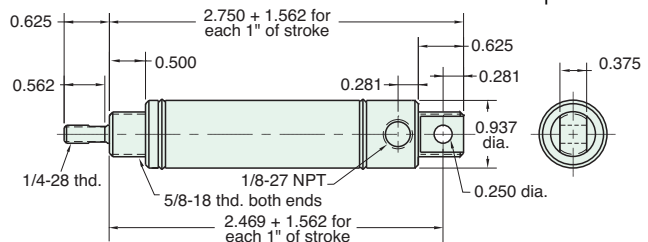
Furnished without nut(s). See Chart on Page 31.

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: M, H, V, W, P6, N **Maximum Stroke:** 27"
Bumpers are standard
For M option add 0.125



Furnished without nut(s). See Chart on Page 31.

7/8" BORE STAINLESS STEEL CYLINDER



SDR-14-□-□

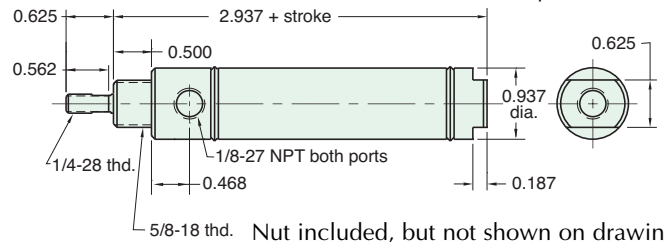
Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42"
Options: C, F, R, M, W, V, P6, P7, P8, S, N

Bumpers are standard
 For M option add 0.125

For C, F, R and S option add 0.281
 For CM, FM, RM and SM option add 0.593



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

UDR-14-□-□

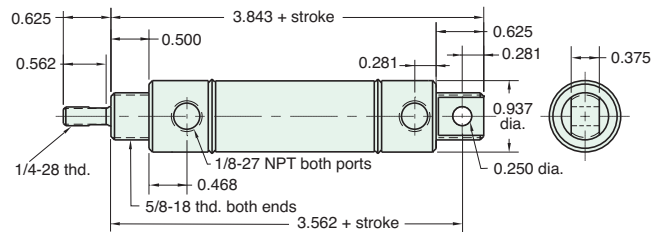
Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 41"
Options: C, F, R, M, W, V, P2, P3, P4, P5, P6, P7, P8, N

Bumpers are standard
 For M option add 0.125

For CM, FM and RM option add 0.312



Furnished without nut(s). See Chart on Page 31.

SDD-14-□-□

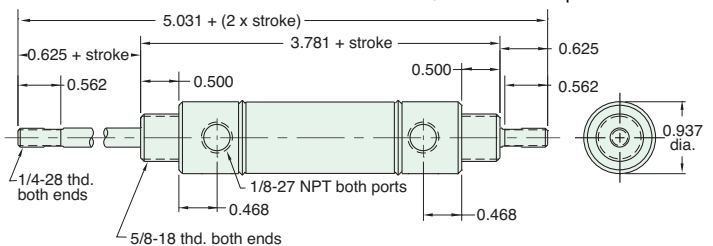
Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Rod **Maximum Stroke:** 20"
Options: C, F, M, W, V, P6, P7, P8, N

Bumpers are standard
 For M option add 0.125

For CM, FM and RM option add 0.312



Nuts included, but not shown on drawing

SDH-14-□-□

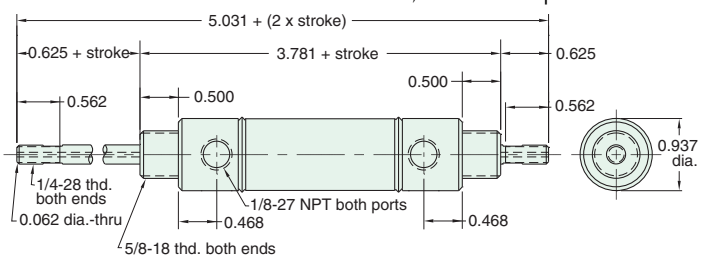
Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Hollow Rod **Maximum Stroke:** 20"
Options: C, F, M, W, V, P6, P7, P8, N

Bumpers are standard
 For M option add 0.125

For CM, FM and RM option add 0.312



Nuts included, but not shown on drawing



7/8" BORE STAINLESS STEEL CYLINDER

SRR-14-□-□

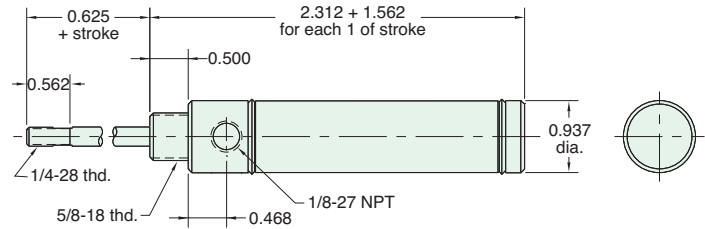
Reverse Acting

Mount: Stud
Type: Rotating Rod
Options: M, H, W, V, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 6 lbs. Spring At Rest: 3 lbs.
Maximum Stroke: 16"

Bumpers are standard

For M option add 0.125



Nut included, but not shown on drawing

URR-14-□-□

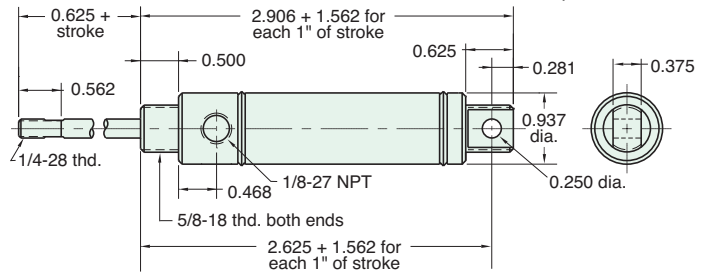
Reverse Acting

Mount: Universal
Type: Rotating Rod
Options: M, H, W, V, P2, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 6 lbs. Spring At Rest: 3 lbs.
Maximum Stroke: 16"

Bumpers are standard

For M option add 0.125



Furnished without nut(s). See Chart on Page 31.

7/8" bore cylinders are also available in heavy-duty brass. See pages 92 and 93.

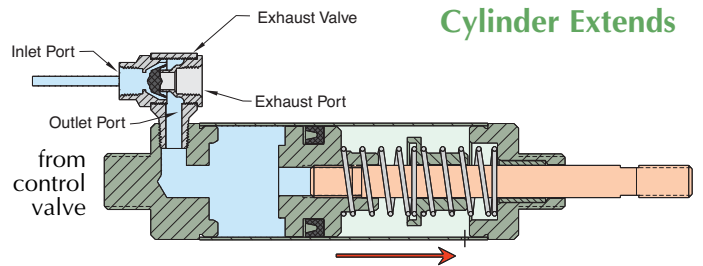
I-Series Exhaust Valve

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.

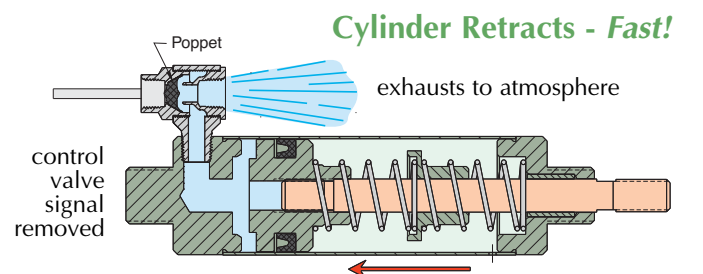
The pressurized air pushes against the piston and extends the rod, compressing the spring, until full rod extension is achieved.

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!



MOUNTING NUTS

Stud Nut

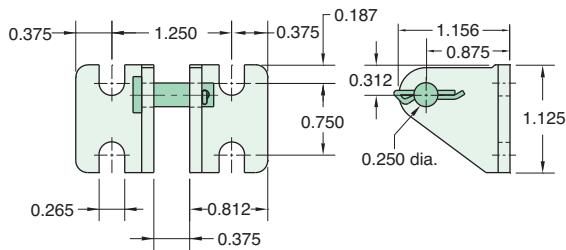
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N10-18</u>	15/16"	3/8"	5/8-18

Rod Nut

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

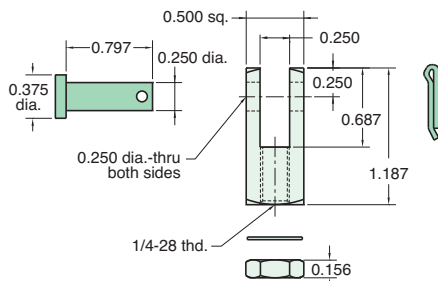
CB-1795

Clevis Bracket
Material: Steel, bright zinc plated



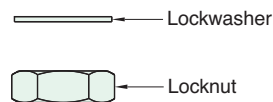
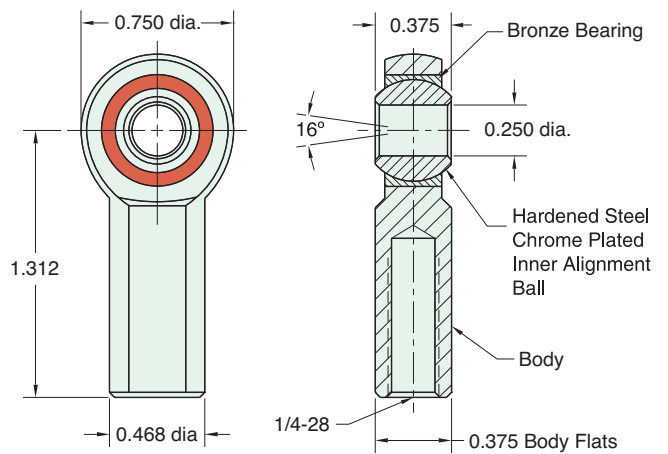
RC-1281

Rod Clevis
Material: Steel, electroless nickel plate



RE-1285

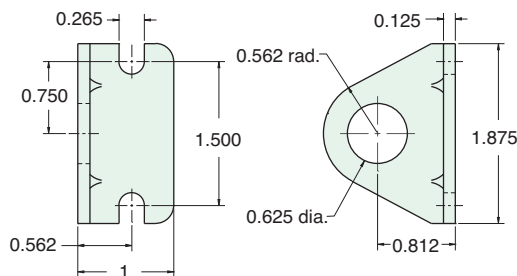
Rod End
Material: Steel, bright zinc plated body



Max. Static Radial Load (rod end only): 2,545 lbs.
Fits Rod Thread Size: 1/4-28

FB-1791

Foot Bracket
Material: Steel, bright zinc plated



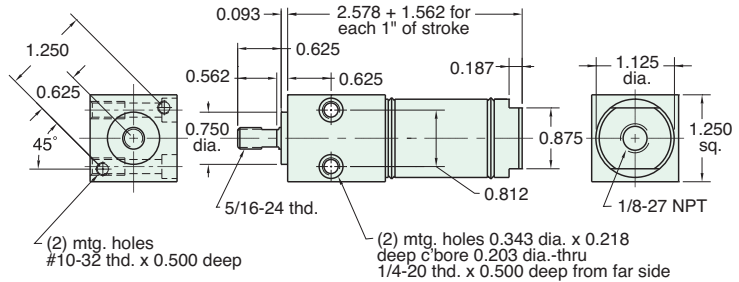


1 1/16" BORE STAINLESS STEEL CYLINDER

FSR-17-□-□

Single Acting

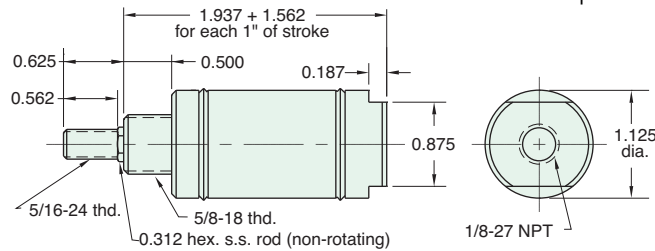
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: M, B, H, V, S, N, W **Maximum Stroke:** 27" For M option add 0.125
 For S option add 0.250



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: M, B, H, V, S, N **Maximum Stroke:** 27" For M option add 0.125
 For S option add 0.250

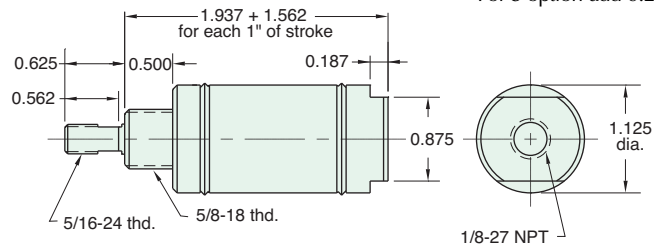


Nut included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 27" For M option add 0.125
 For S option add 0.250

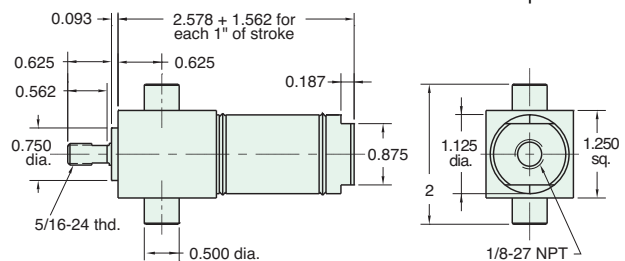


Nut included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 26" For M option add 0.125
 For S option add 0.250



1 1/16" BORE STAINLESS STEEL CYLINDER

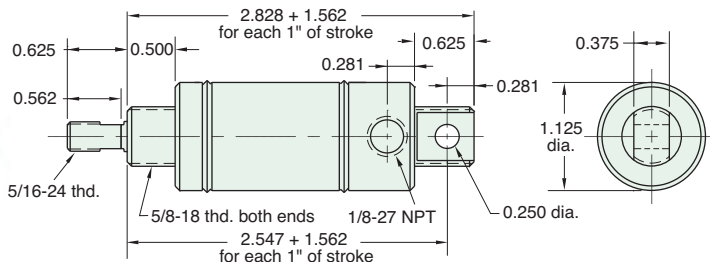


USN-17-□-□

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: M, B, H, V, P6, N **Maximum Stroke:** 27" For M option add 0.125



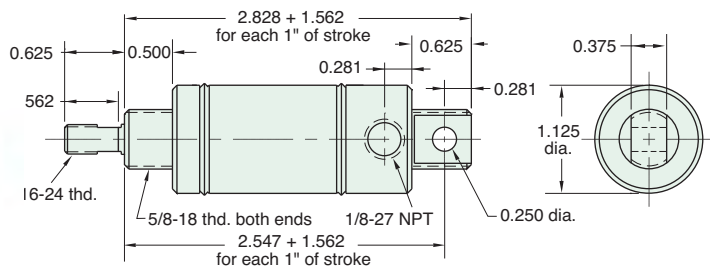
Furnished without nut(s). See Chart on Page 37

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: M, B, H, V, P6, N, W **Maximum Stroke:** 27" For M option add 0.125



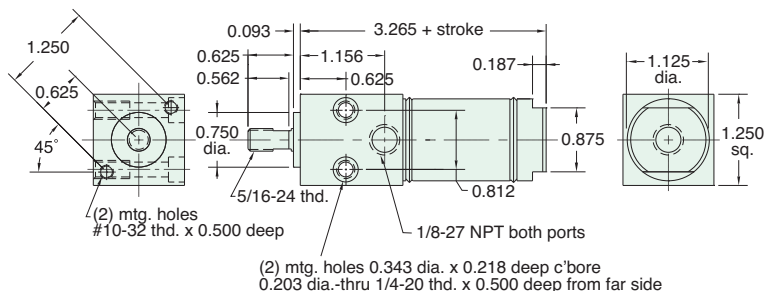
Furnished without nut(s). See Chart on Page 37.

FDR-17-□-□

Double Acting



Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42"
Options: M, B, W, V, P6, P7, P8, S, N For S option add 0.250

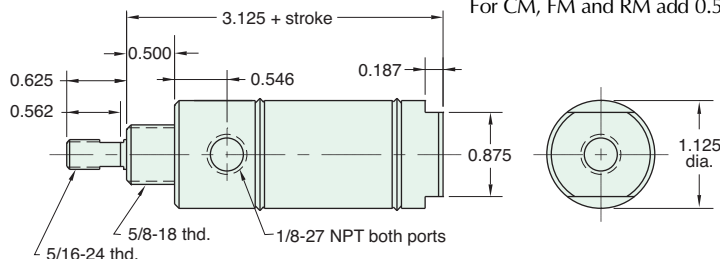


SDR-17-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42"
Options: C, F, R, M, B, W, V, P6, P7, P8, S, N For C, F, R or S option add 0.250
 For CM, FM and RM add 0.562



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



1 1/16" BORE STAINLESS STEEL CYLINDER

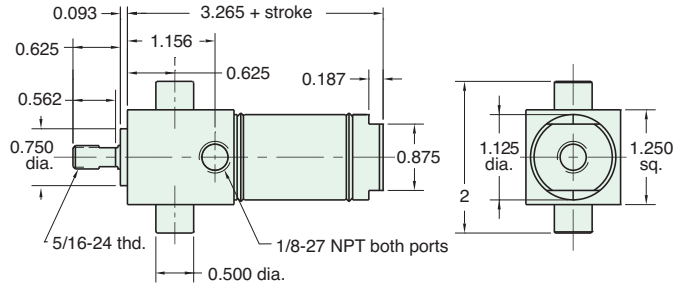
TDR-17-□-□

Double Acting



Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 42"
Options: M, B, W, V, S, N, P6, P7, P8

For S option add 0.250



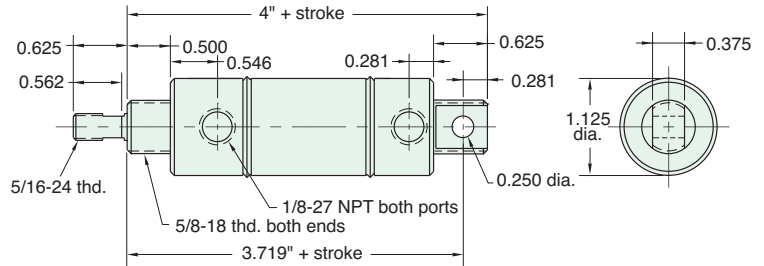
UDR-17-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 41"
Options: C, F, R, M, B, W, V, P2, P3, P4, P5, P6, P7, P8, N

For CM, FM and RM add 0.312



Furnished without nut(s). See Chart on Page 37.

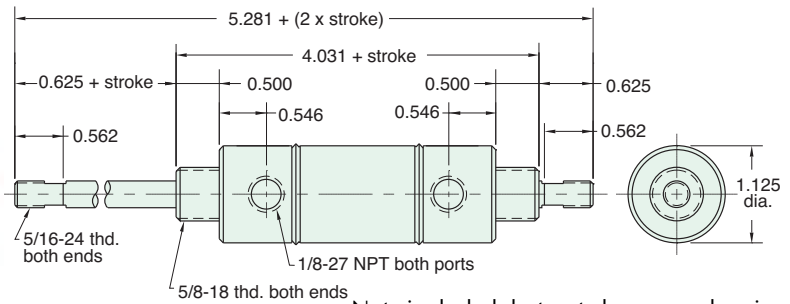
SDD-17-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Rod **Maximum Stroke:** 20"
Options: C, F, M, B, W, V, P6, P7, P8, N

For CM, FM and RM add 0.312



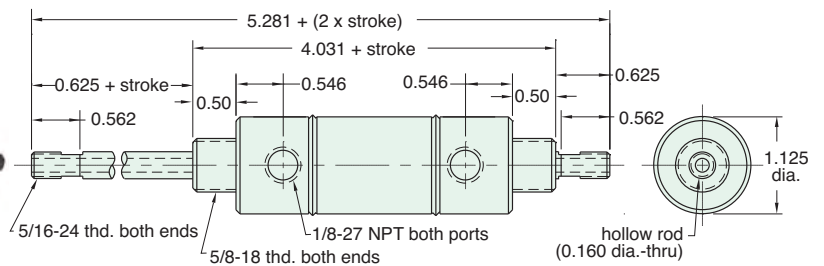
Nuts included, but not shown on drawing

SDH-17-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Hollow Rod **Maximum Stroke:** 20"
Options: M, B, W, V, P6, P7, P8, N



Nuts included, but not shown on drawing

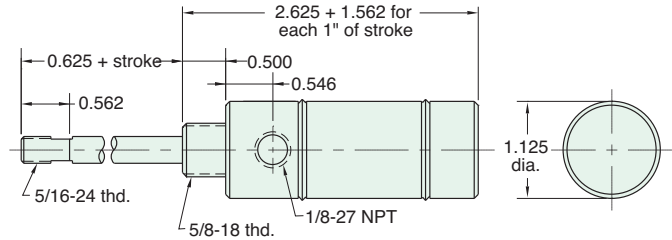
1 1/16" BORE STAINLESS STEEL CYLINDER



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: M, B, H, W, V, N **Maximum Stroke:** 16" For M option add 0.125

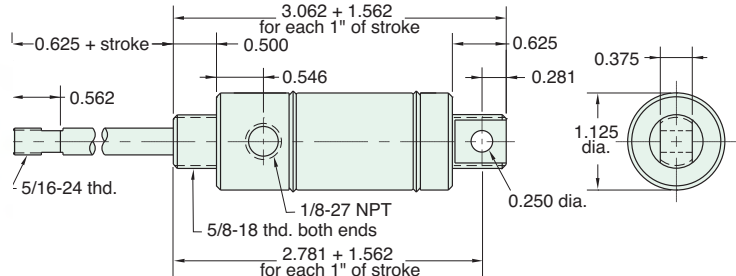


Nuts included, but not shown on drawing

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: M, B, H, W, V, P2, N **Maximum Stroke:** 16" For M option add 0.125

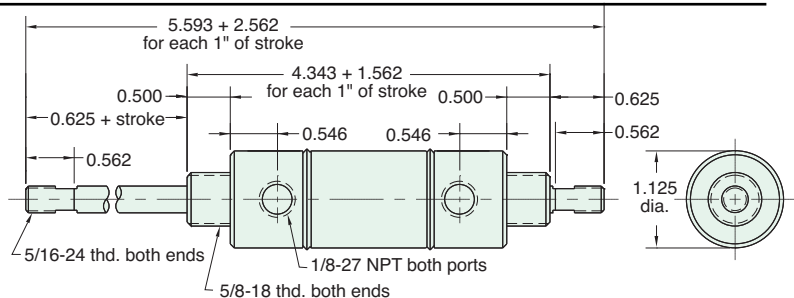


Furnished without nut(s). See Chart on Page 37.

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: M, B, H, W, V, P6, P7, P8, N **Maximum Stroke:** 15"

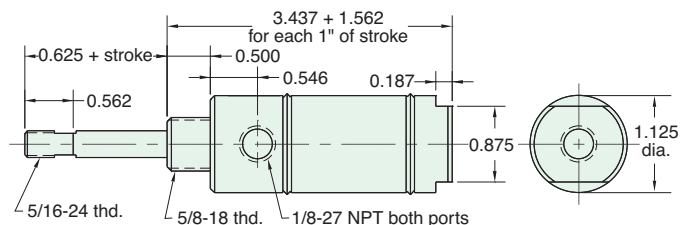


Nuts included, but not shown on drawing

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: M, B, H, W, V, P6, P7, P8, S, N **Maximum Stroke:** 16" For S option add 0.250



Nut included, but not shown on drawing



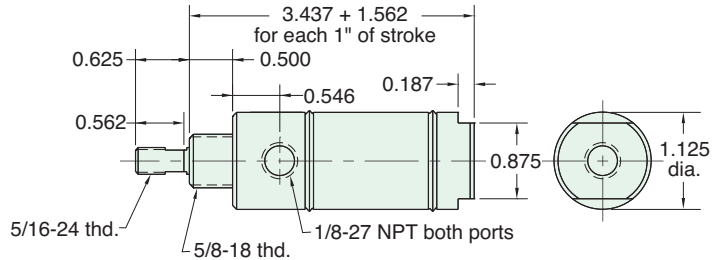
1 1/16" BORE STAINLESS STEEL CYLINDER

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: M, B, H, W, V, P6, P7, P8, S, N **Maximum Stroke:** 26" For S option add 0.250



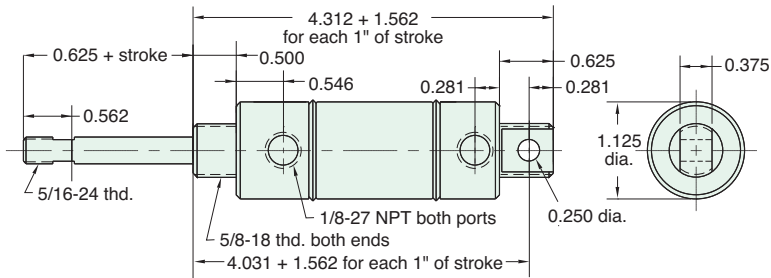
Nut included, but not shown on drawing

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: M, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N **Maximum Stroke:** 16"



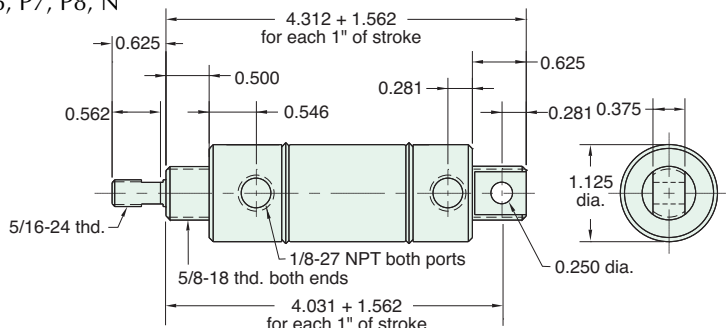
Furnished without nut(s). See Chart on Page 37.

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: M, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N **Maximum Stroke:** 26"



Furnished without nut(s). See Chart on Page 37.

For harsh environments, refer to [page 67](#) for Clippard's Corrosion-Resistant Stainless Steel 1/16" cylinders.



MOUNTING NUTS

Stud Nut

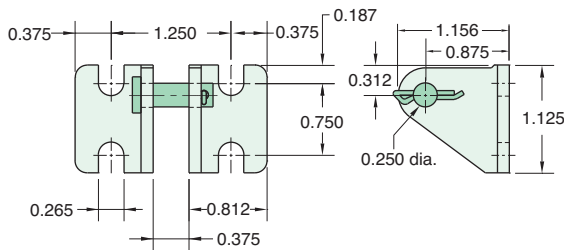
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N10-18</u>	15/16"	3/8"	5/8-18

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N05-24</u>	1/2"	3/16"	5/16-24

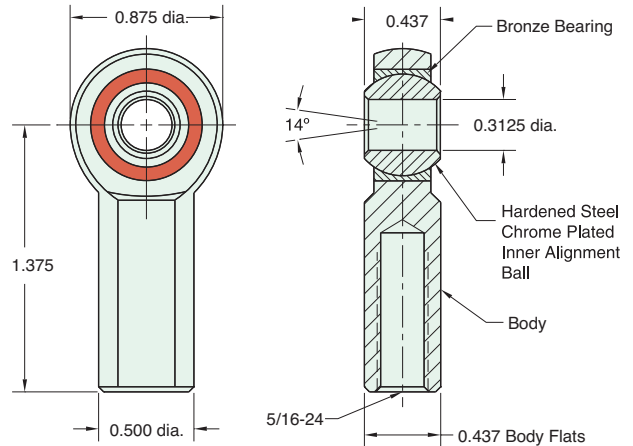
CB-1795

Clevis Bracket
Material: Steel, bright zinc plated



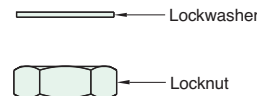
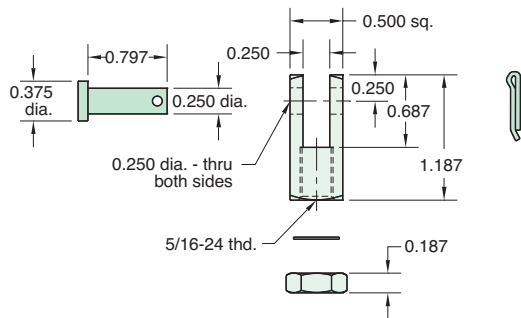
RE-1785

Rod End
Material: Steel, bright zinc plated body



RC-1781

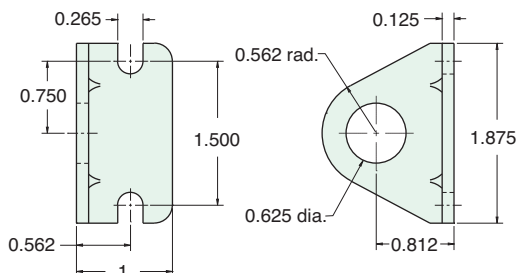
Rod Clevis
Material: Steel, electroless nickel plate



Max. Static Radial Load (rod end only): 3,200 lbs.
Fits Rod Thread Size: 5/16-24

FB-1791

Foot Bracket
Material: Steel, bright zinc plated



1 1/4" BORE STAINLESS STEEL CYLINDER



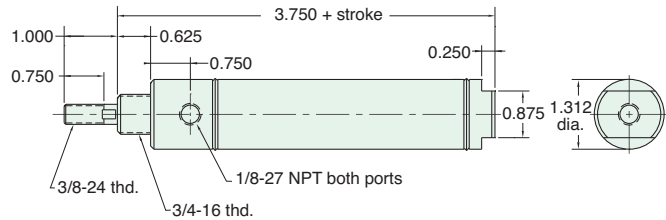
Note: The 1 1/4" bore is also available with a 7/16-20 threaded rod. Order -LR option.

SDR-20-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 41"
Options: C, F, R, M, B, W, V, P6, P7, P8, S, N For C, F, R and S option add 0.312
 For CM, FM, RM and SM options add 0.625



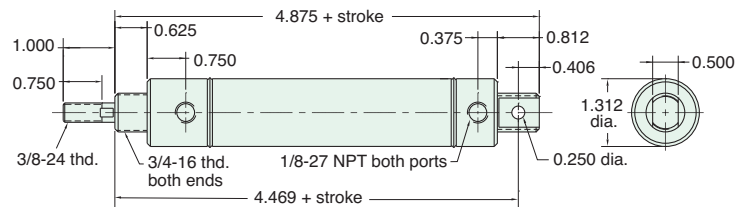
Nut included, but not shown on drawing
 C, F, & R options use side ported rear head

UDR-20-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 40"
Options: C, F, R, M, B, W, V, P2, P3, P4, P5, P6, P7, P8, N For CM, FM and RM options add 0.312



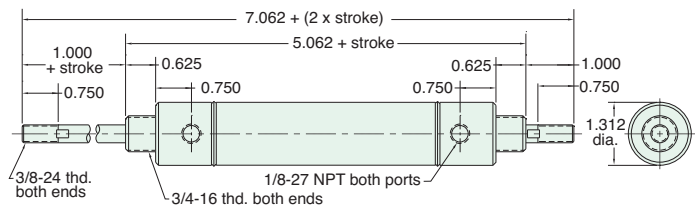
Furnished without nut(s). See Chart on Page 41.

SDD-20-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Rod **Maximum Stroke:** 19"
Options: C, F, M, B, W, V, P6, P7, P8, N For CM and FM options add 0.312



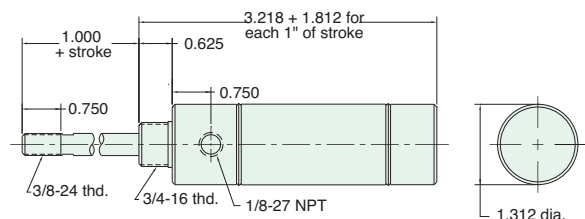
Nuts included, but not shown on drawing

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: M, B, H, W, V, N **Maximum Stroke:** 14" For M option add 0.125



Nuts included, but not shown on drawing



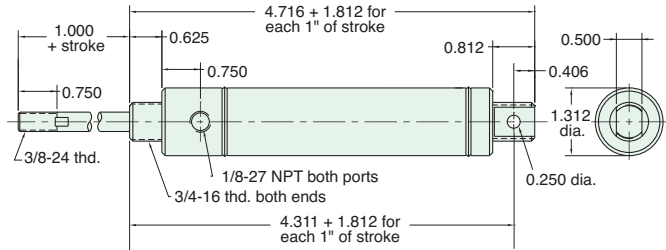
1 1/4" BORE STAINLESS STEEL CYLINDER

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

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: M, B, H, W, V, P2, N **Maximum Stroke:** 14" For M option add 0.125



Furnished without nut(s). See Chart on Page 41.

For harsh environments, refer to [page 68](#) for Clippard's Corrosion-Resistant Stainless Steel 1 1/4" cylinders.



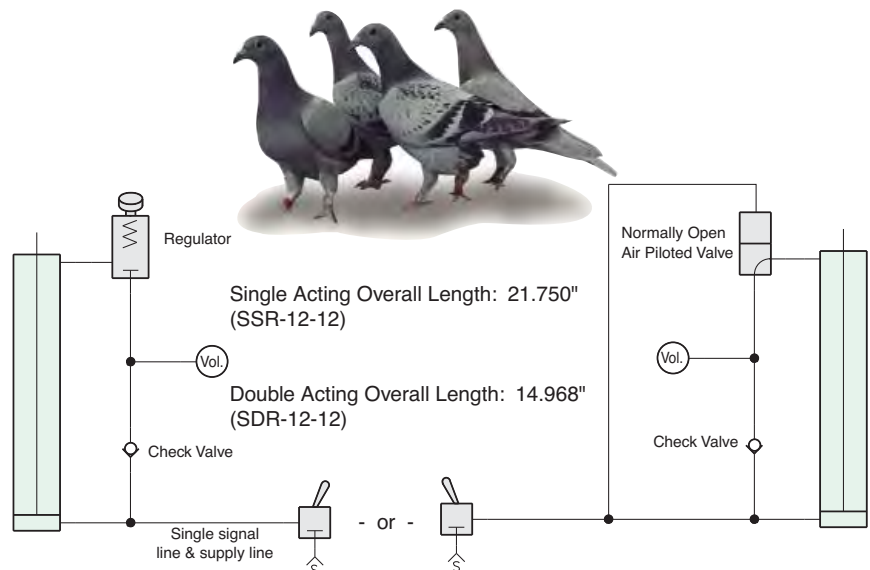
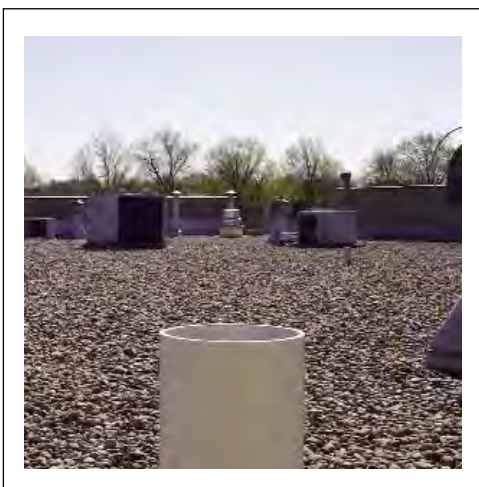
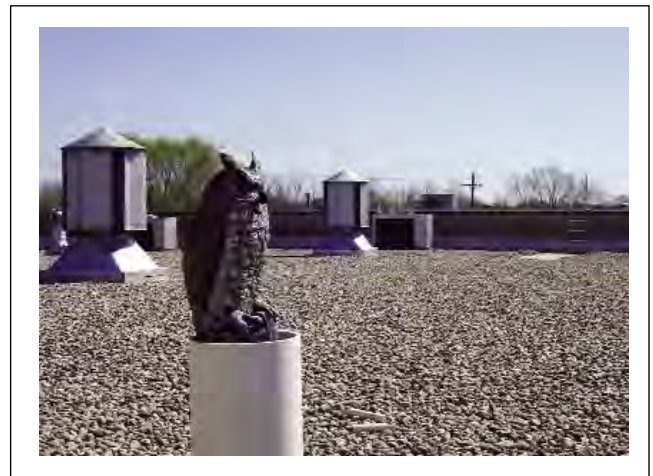
APPLICATION STORY

ap-ply-ca-tion \ap-l ə-ˈkâ-sh ən 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" 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.





MOUNTING NUTS

Stud Nut

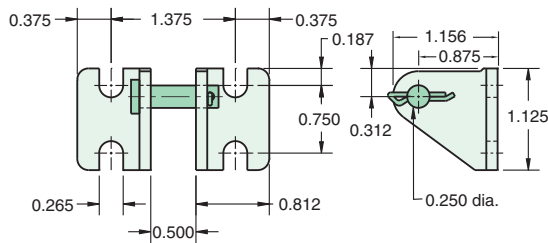
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N12-16</u>	1 3/32"	27/64"	3/4-16

Rod Nut

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

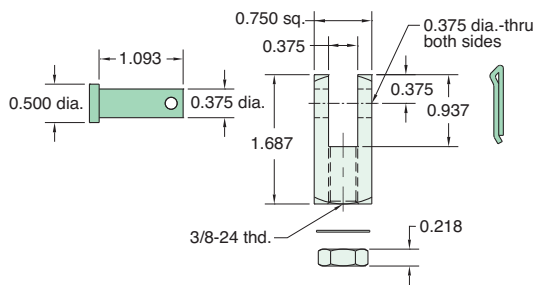
CB-2095

Clevis Bracket
Material: Steel, bright zinc plated



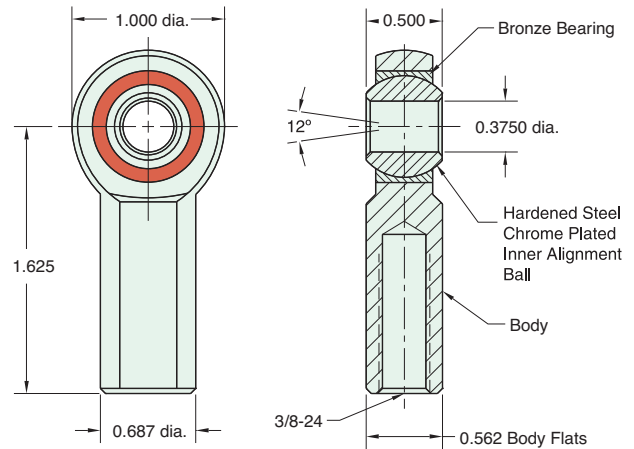
RC-2081

Rod Clevis
Material: Steel, electroless nickel plate



RE-2085

Rod End
Material: Steel, bright zinc plated body



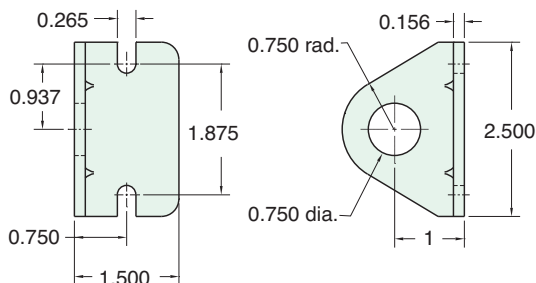
Lockwasher

Locknut

Max. Static Radial Load (rod end only): 3,950 lbs.
Fits Rod Thread Size: 3/8-24

FB-2491

Foot Bracket
Material: Steel, bright zinc plated





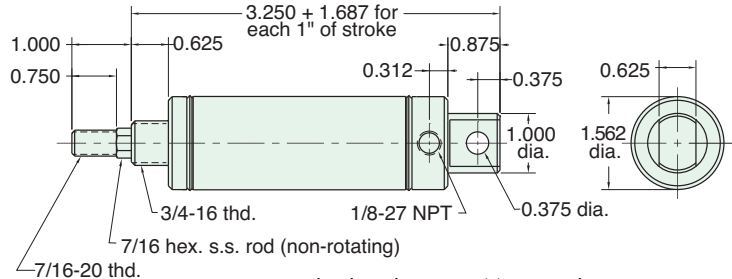
1 1/2" BORE STAINLESS STEEL CYLINDER

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: M, B, H, V, P6, N **Maximum Stroke:** 24" For M option add 0.125



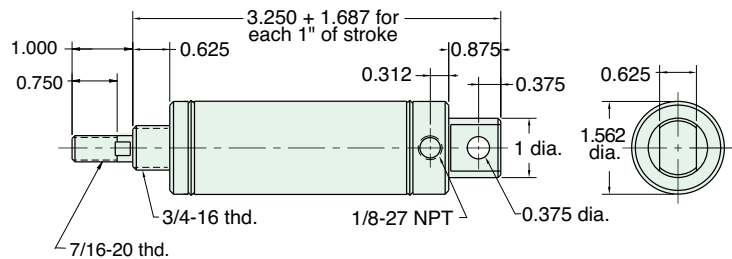
Furnished without nut(s). See Chart on Page 49.

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: M, B, H, V, P6, N, W **Maximum Stroke:** 24" For M option add 0.125



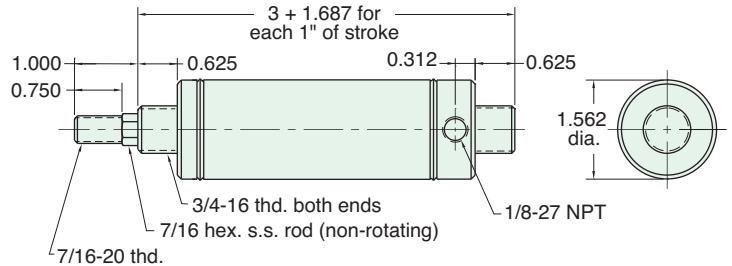
Furnished without nut(s). See Chart on Page 49.

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: M, B, H, V, N **Maximum Stroke:** 24" For M option add 0.125



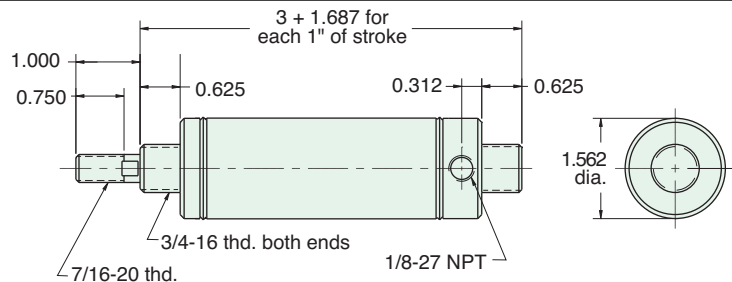
Nuts included, but not shown on drawing

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: M, B, H, V, N, W **Maximum Stroke:** 15" For M option add 0.125



Nut included, but not shown on drawing

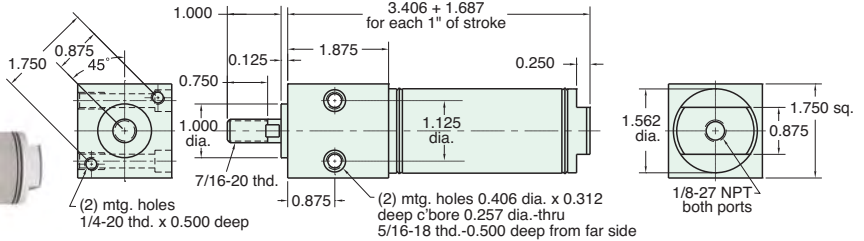
1 1/2" BORE STAINLESS STEEL CYLINDER



FSR-24-□-□

Single Acting

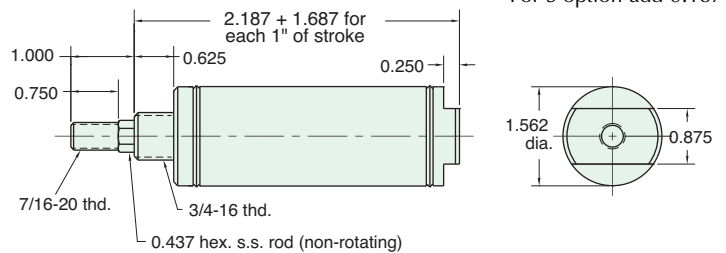
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: M, B, H, V, S, N, W **Maximum Stroke:** 24" For M option add 0.125
 For S option add 0.187



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: M, B, H, V, S, N **Maximum Stroke:** 24" For M option add 0.125
 For S option add 0.187

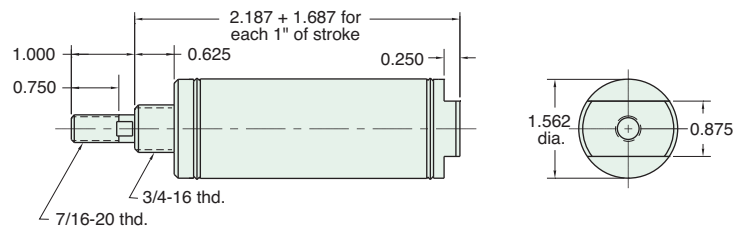


Nut included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 24" For M option add 0.125
 For S option add 0.187

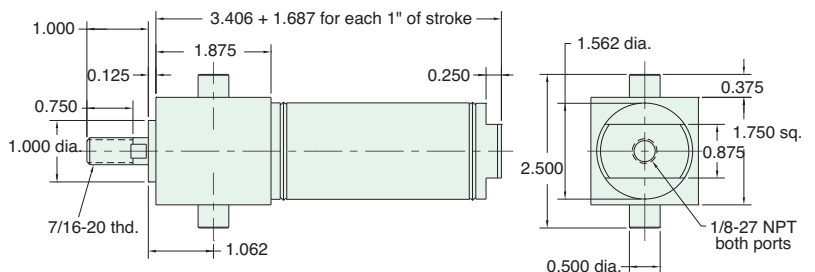


Nut included, but not shown on drawing

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: M, B, H, V, S, N, W **Maximum Stroke:** 23" For M option add 0.125
 For S option add 0.187





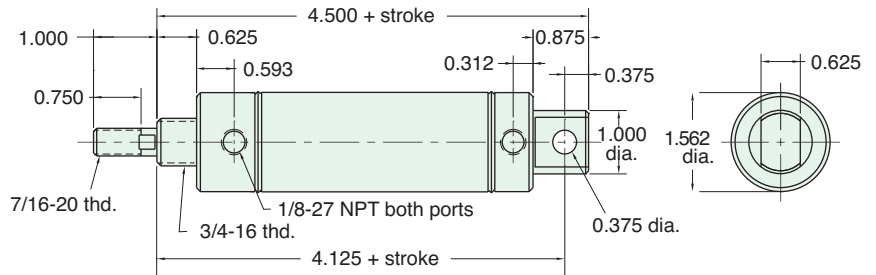
1 1/2" BORE STAINLESS STEEL CYLINDER

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 **Maximum Stroke:** 39"
Options: C, F, R, M, B, W, V, P2, P3, P4, P5, P6, P7, P8, N



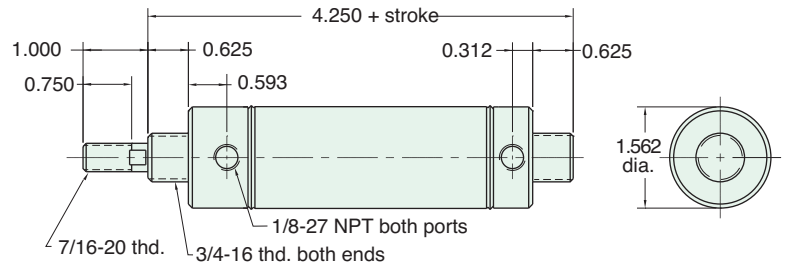
Furnished without nut(s). See Chart on Page 49.

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 **Maximum Stroke:** 39"
Options: C, F, R, M, B, W, V, P6, P7, P8, N



Nuts included, but not shown on drawing

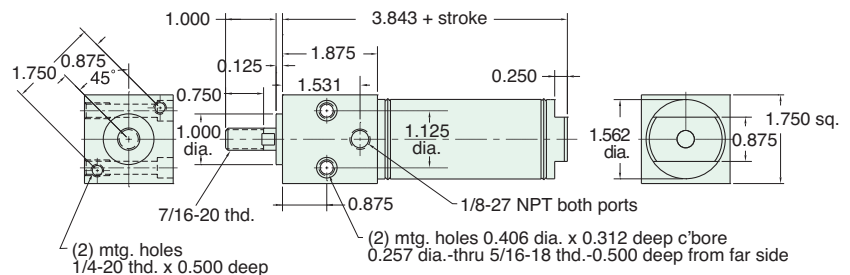
FDR-24-□-□

Double Acting



Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 40"
Options: M, B, W, V, P6, P7, P8, S, N

For S option add 0.187



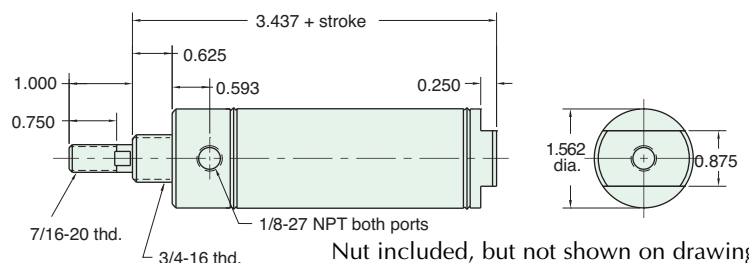
SDR-24-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 40"
Options: C, F, R, M, B, W, V, P6, P7, P8, S, N

C, F, R and S option add 0.187



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

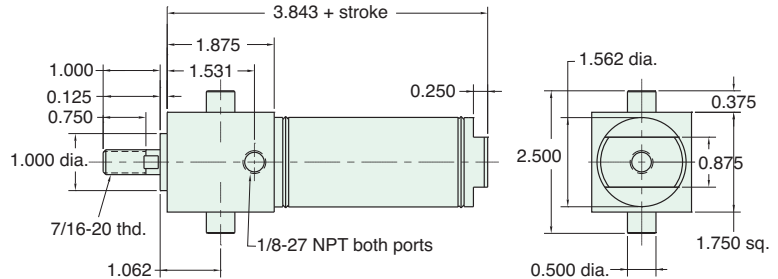
1 1/2" BORE STAINLESS STEEL CYLINDER



TDR-24-□-□

Double Acting

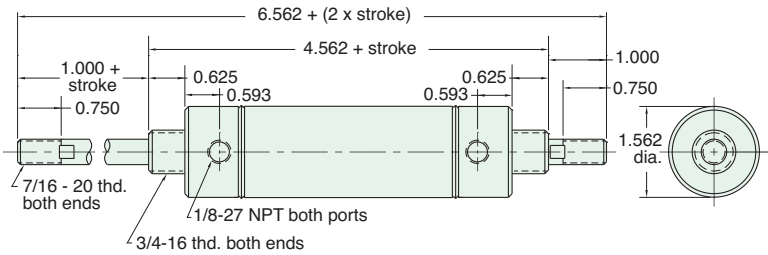
Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 40"
Options: M, B, W, V, S, N
 For S option add 0.187
 P6, P7, P8



SDD-24-□-□

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod **Maximum Stroke:** 19"
Options: C, F, M, B, W, V, P6, P7, P8, N

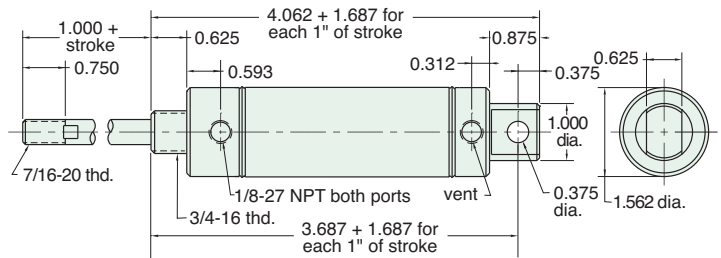


Nuts included, but not shown on drawing

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: M, B, H, W, V, P2, **Maximum Stroke:** 14"
 P3, P4, P5, P6, P7, P8, N

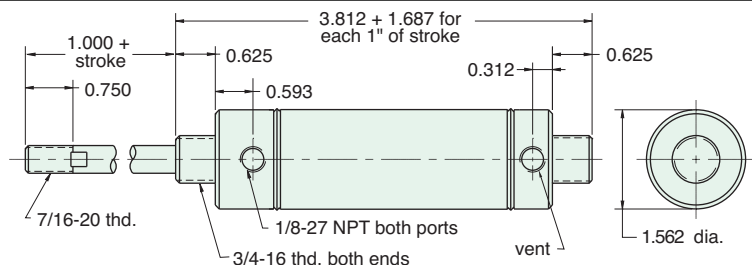


Furnished without nut(s). See Chart on Page 49.

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: M, B, H, W, V, N **Maximum Stroke:** 14"



Nuts included, but not shown on drawing

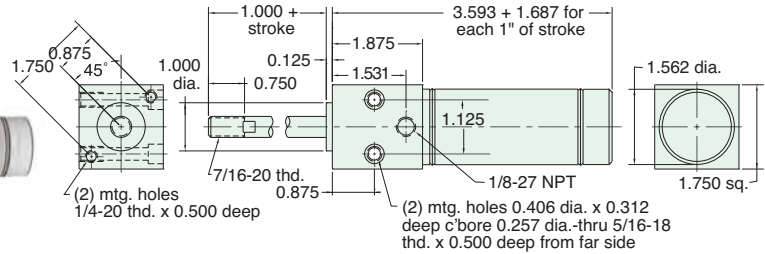


1 1/2" BORE STAINLESS STEEL CYLINDER

FRR-24-□-□

Reverse Acting

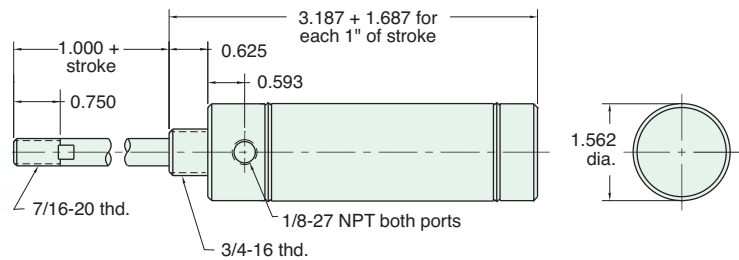
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: M, B, H, W, V, N **Maximum Stroke:** 15"



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: M, B, H, W, V, N **Maximum Stroke:** 15"

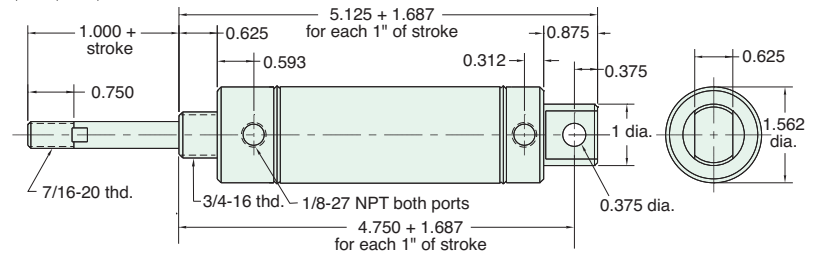


Nut included, but not shown on drawing

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: M, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N **Maximum Stroke:** 14"

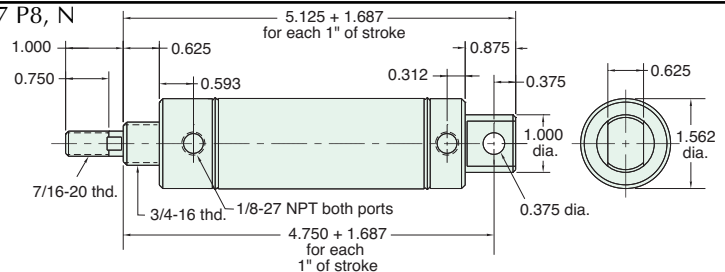


Furnished without nut(s). See Chart on Page 49.

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: M, B, H, W, V, P2, P3, P4, P5, P6, P7 P8, N **Maximum Stroke:** 23"



Furnished without nut(s). See Chart on Page 49.

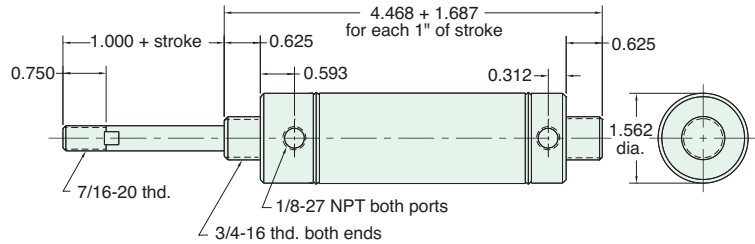
1 1/2" BORE STAINLESS STEEL CYLINDER



EBR-24-□-□

Double Acting, Rear Spring Bias

Mount: End
Type: Rotating Rod
Options: M, B, H, W, V, P6, P7, P8, N
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Maximum Stroke: 14"

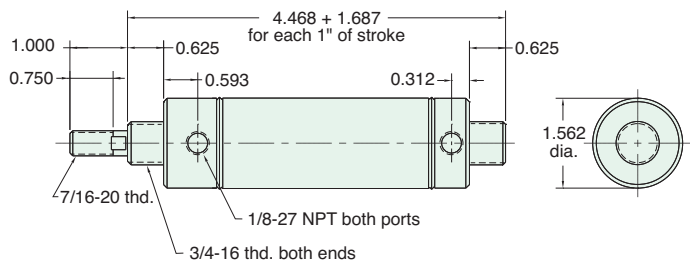


Nuts included, but not shown on drawing

EFR-24-□-□

Double Acting, Front Spring Bias

Mount: End
Type: Rotating Rod
Options: M, B, H, W, V, P6, P7, P8, N
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Maximum Stroke: 23"

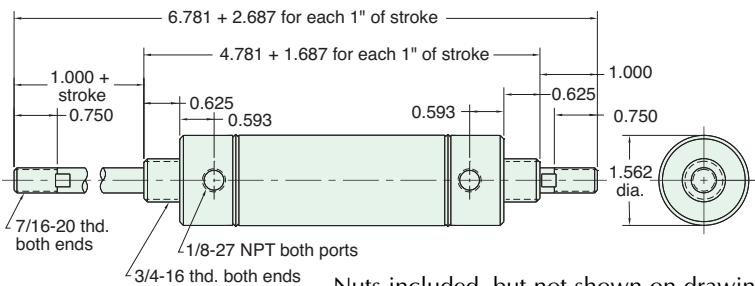


Nuts included, but not shown on drawing

SFD-24-□-□

Double Acting, Front Spring Bias

Mount: Stud
Type: Double Rod
Options: M, B, H, W, V, P6, P7, P8, N
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Maximum Stroke: 14"

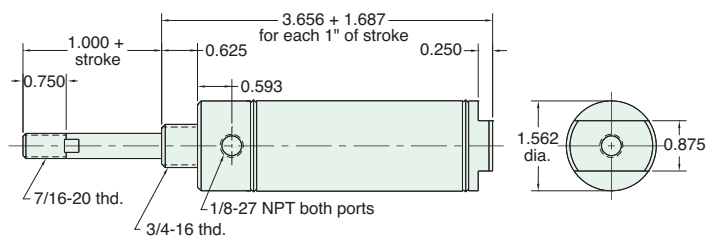


Nuts included, but not shown on drawing

SBR-24-□-□

Double Acting, Rear Spring Bias

Mount: Stud
Type: Rotating Rod
Options: M, B, H, W, V, P6, P7, P8, S, N
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Maximum Stroke: 15" For S option add 0.187



Nuts included, but not shown on drawing

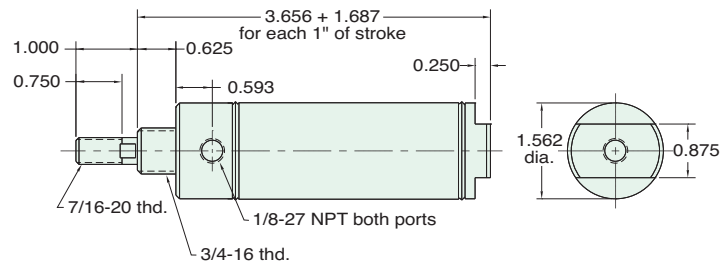


1 1/2" BORE STAINLESS STEEL CYLINDER

SFR-24-□-□

Double Acting, Front Spring Bias

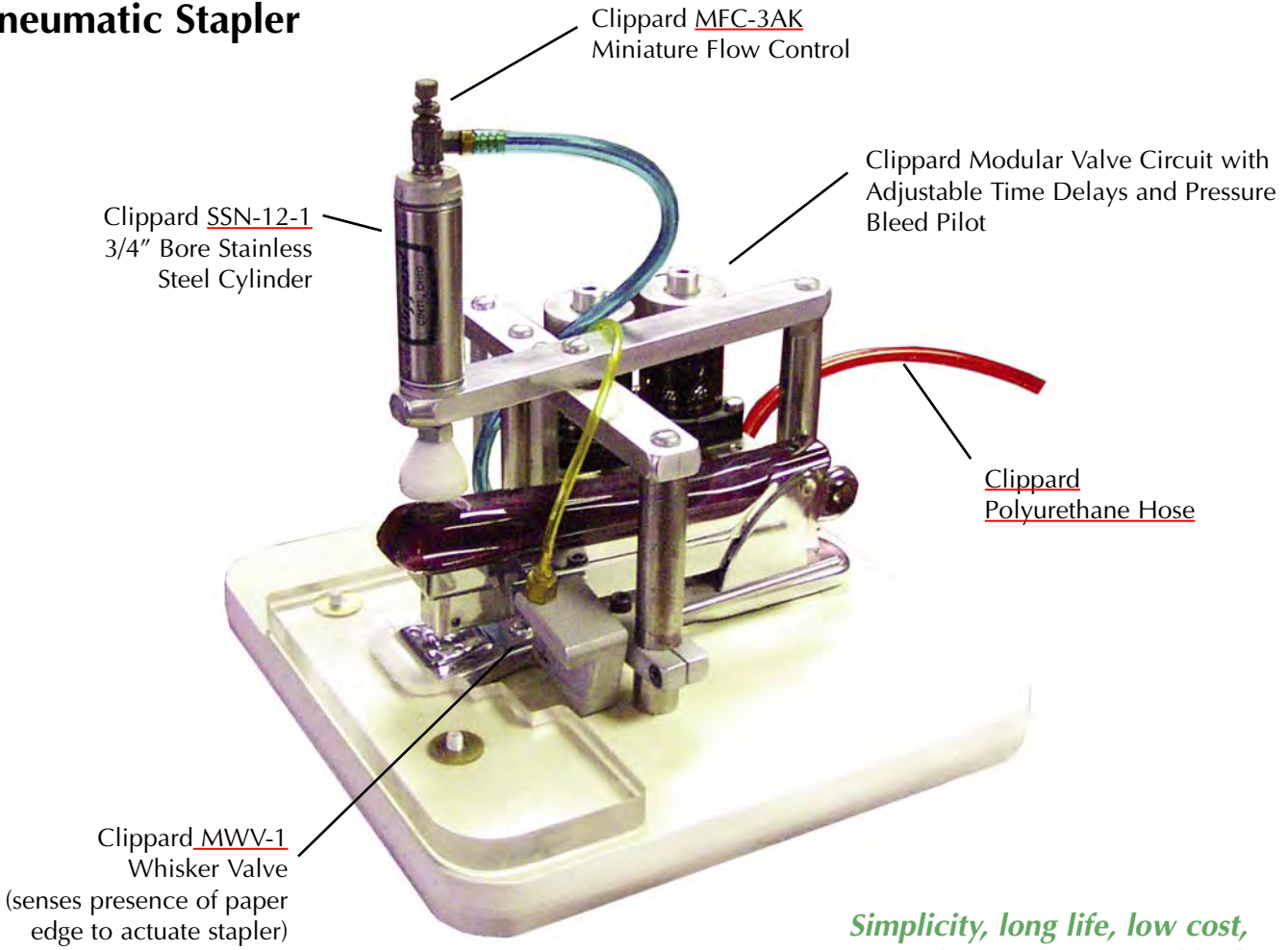
Mount: Stud	Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod	Spring Compressed: 10 lbs. Spring At Rest: 4 1/2 lbs.
Options: M, B, H, W, V, P6, P7, P8, S, N	Maximum Stroke: 23" For S option add 0.187



Nut included, but not shown on drawing

For harsh environments, refer to [page 69](#) for Clippard's Corrosion-Resistant Stainless Steel 1 1/2" cylinders.

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

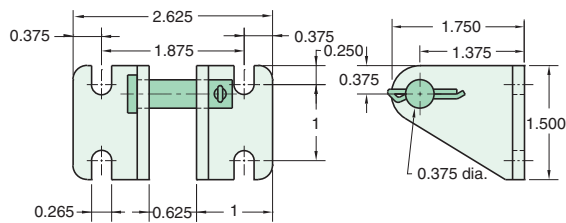
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N12-16</u>	1 3/32"	27/64"	3/4-16

Rod Nut

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

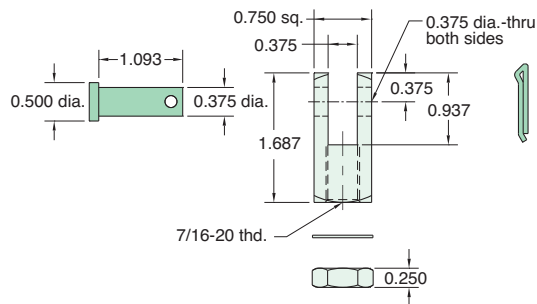
CB-2495

Clevis Bracket
Material: Steel, bright zinc plated



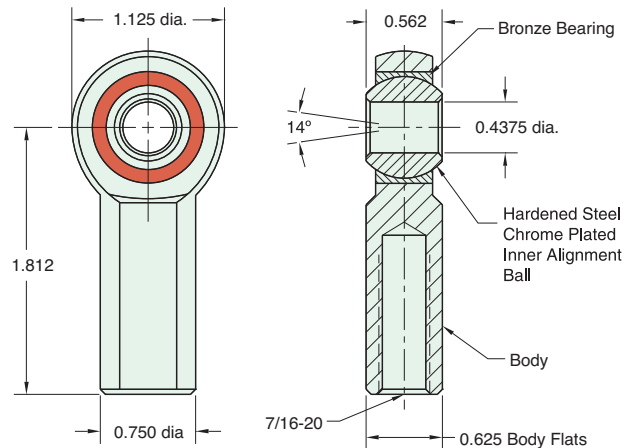
RC-2481

Rod Clevis
Material: Steel, electroless nickel plate



RE-2485

Rod End
Material: Steel, bright zinc plated body



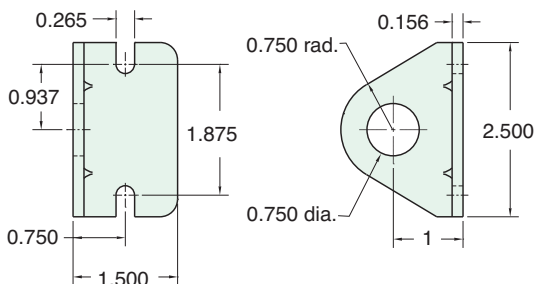
Lockwasher

Locknut

Max. Static Radial Load (rod end only): 4,300 lbs.
Fits Rod Thread Size: 7/16-20

FB-2491

Foot Bracket
Material: Steel, bright zinc plated





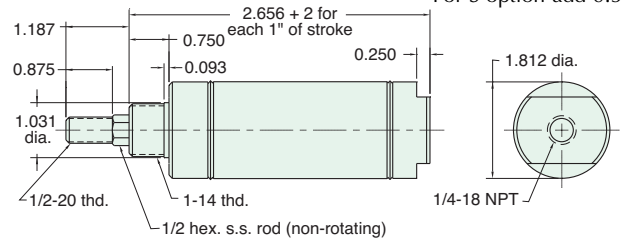
1 3/4" BORE STAINLESS STEEL CYLINDER

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: M, V, S, N **Maximum Stroke:** 20" **Bumpers are standard**
For M option add 0.125
For S option add 0.562



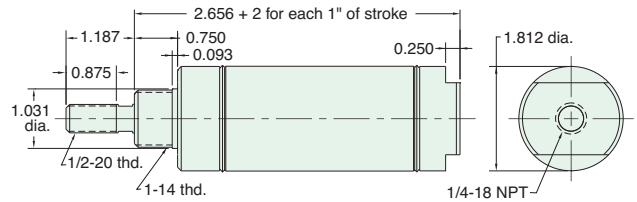
Nut included, but not shown on drawing

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: M, V, S, N, W **Maximum Stroke:** 20" **Bumpers are standard**
For M option add 0.125
For S option add 0.562



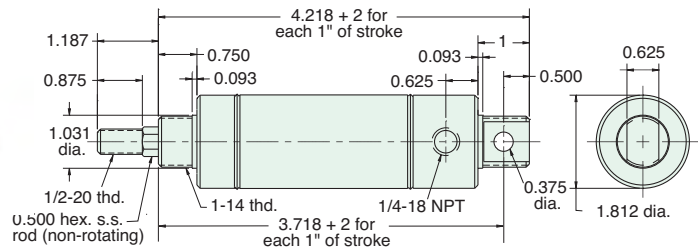
Nut included, but not shown on drawing

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: M, V, P6, N **Bumpers are standard.** For M option add 0.125



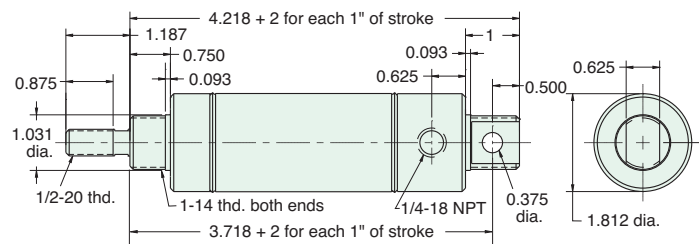
Furnished without nut(s). See Chart on Page 53.

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: M, V, P6, N, W **Bumpers are standard.** For M option add 0.125



Furnished without nut(s). See Chart on Page 53.

1 3/4" BORE STAINLESS STEEL CYLINDER



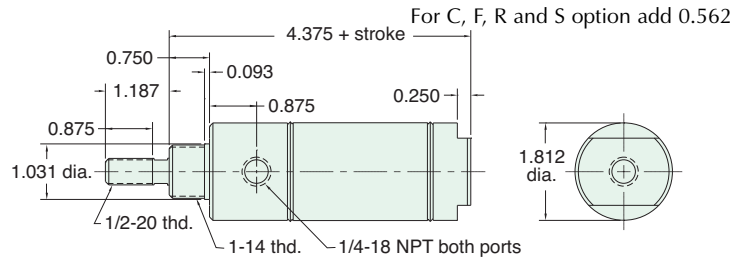
SDR-28-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 39"
Options: C, F, R, M, W, V, P6, P7, P8, S, N

Bumpers are standard



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

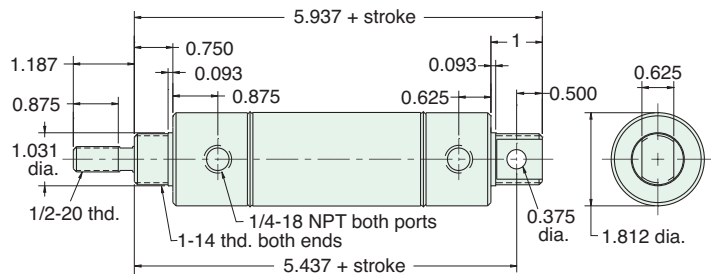
UDR-28-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 37"
Options: C, F, R, M, W, V, P2, P3, P4, P5, P6, P7, P8, N

Bumpers are standard



Furnished without nut(s). See Chart on Page 53.

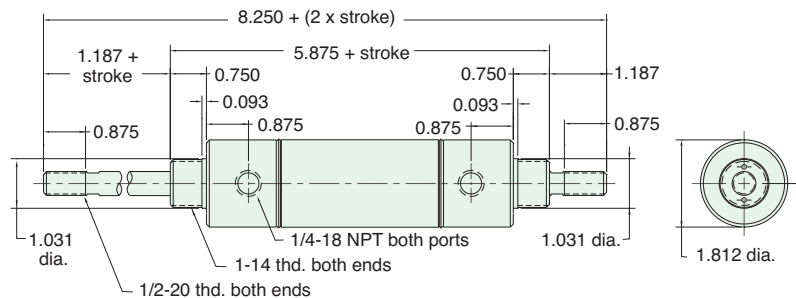
SDD-28-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod **Maximum Stroke:** 18"
Options: C, F, M, W, V, P6, P7, P8, N

Bumpers are standard



Nuts included, but not shown on drawing

SRR-28-□-□

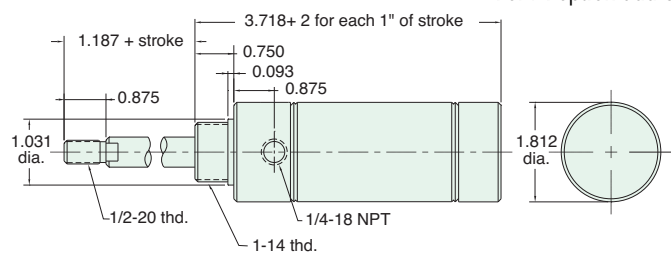
Reverse Acting



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: M, W, V, N **Maximum Stroke:** 13"

Bumpers are standard

For M option add 0.125



Nut included, but not shown on drawing

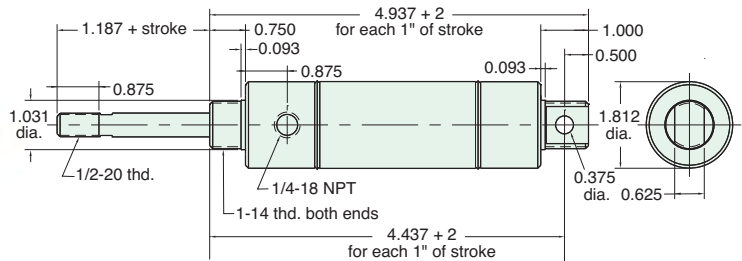


1 3/4" BORE STAINLESS STEEL CYLINDER

URR-28-□-□

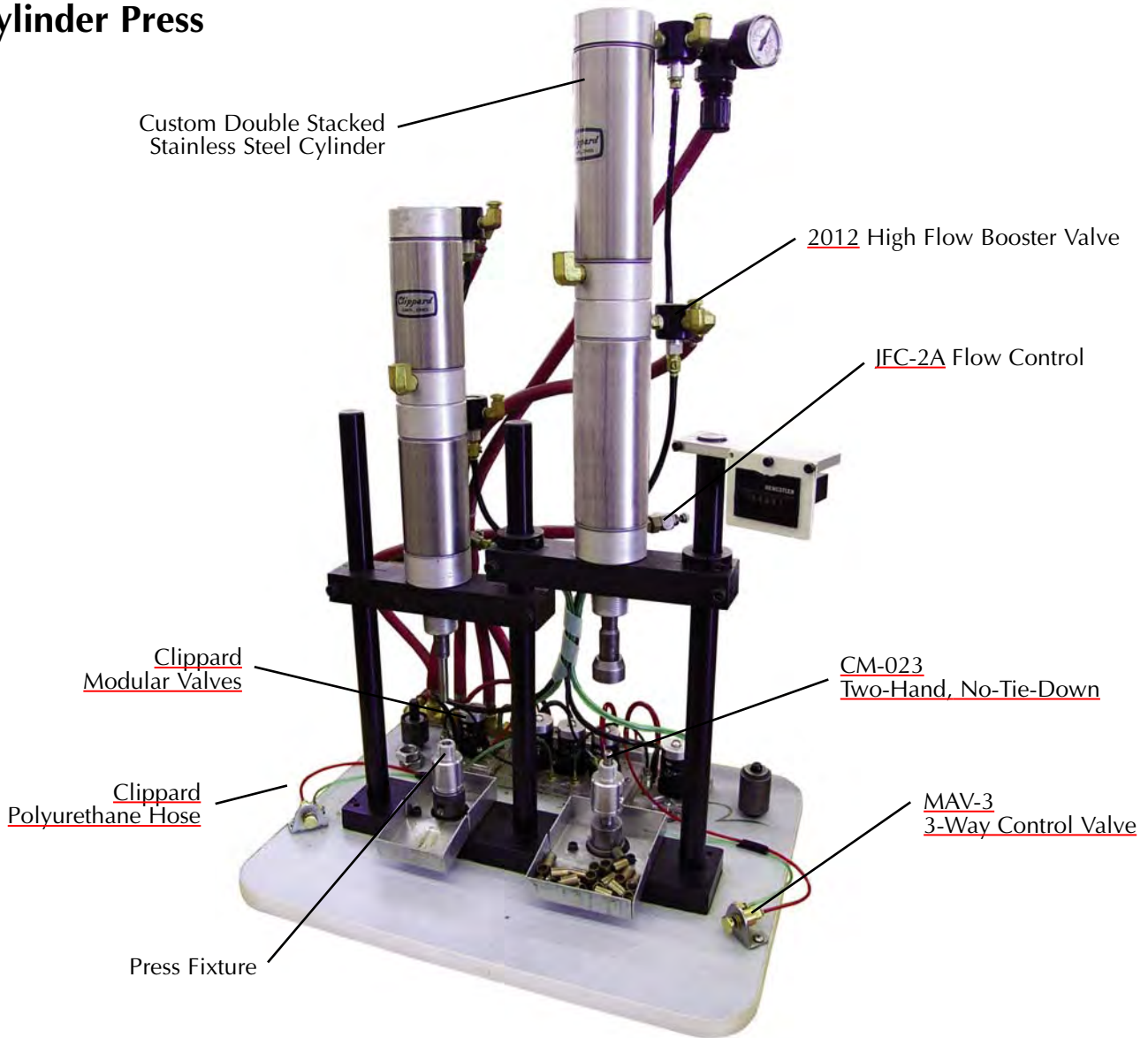
Reverse Acting

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: M, W, V, P2, N **Maximum Stroke:** 12" **Bumpers are standard**
For M option add 0.125



Furnished without nut(s). See Chart on [Page 53](#).

Dual Double Stacked Cylinder Press





MOUNTING NUTS

Stud Nut

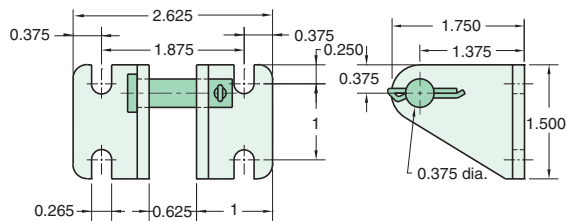
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N16-14	1 1/2"	35/64"	1-14

Rod Nut

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

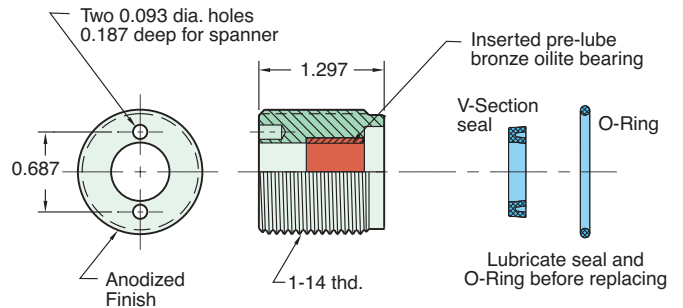
CB-2495

Clevis Bracket
Material: Steel, bright zinc plated



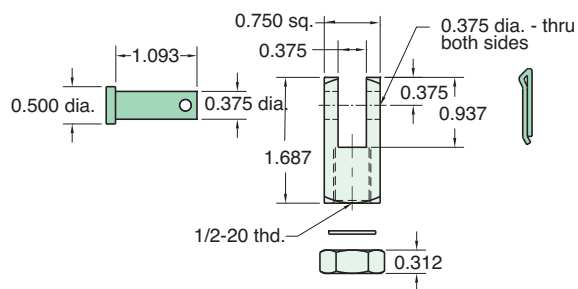
RK-2899

Replaceable Rod Seal
Material: Aluminum body



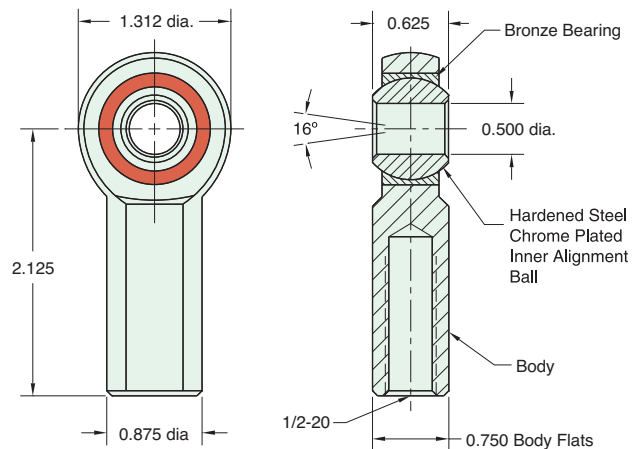
RC-3281

Rod Clevis
Material: Steel, electroless nickel plate



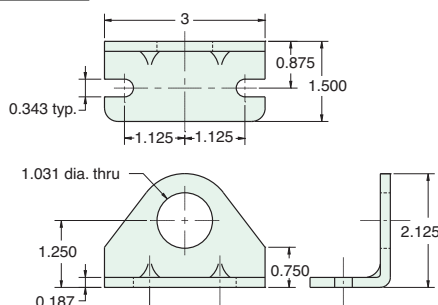
RE-3285

Rod End
Material: Steel, bright zinc plated body



FB-2891

Foot Bracket
Material: Steel, bright zinc plated



Lockwasher

Locknut

Max. Static Radial Load (rod end only): 6,700 lbs.
Fits Rod Thread Size: 1/2-20



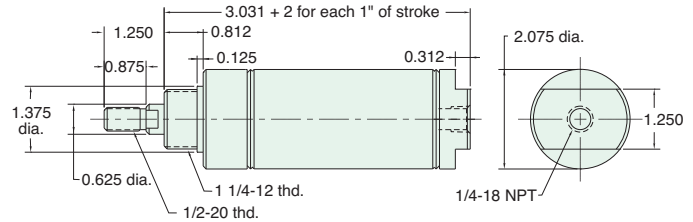
2" BORE STAINLESS STEEL CYLINDER

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: M, B, V, S, N, W **Maximum Stroke:** 20" For M option add 0.125
For S option add 0.375



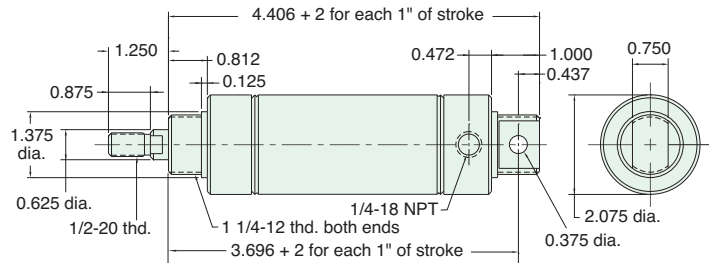
Nut included, but not shown on drawing

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: M, B, V, N, P6, W **Maximum Stroke:** 19" For M option add 0.125



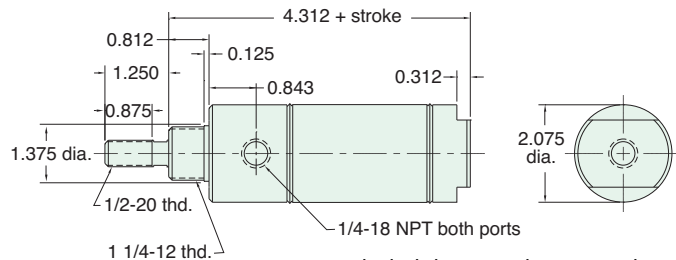
Furnished without nut(s). See Chart on [Page 57](#).

SDR-32-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 39"
Options: C, F, R, M, B, W, V, P6, P7, P8, S, N For C, F, R and S options add 0.375



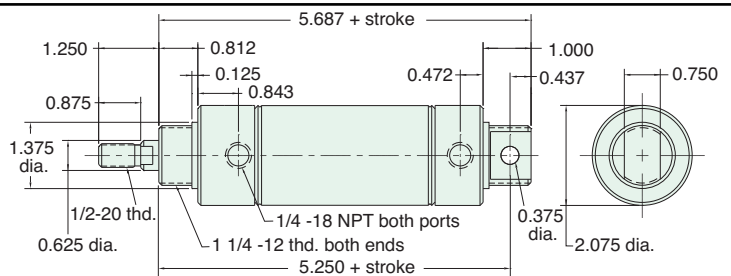
Nut included, but not shown on drawing
C, F, & R options use side ported rear head

UDR-32-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6", 7", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 38"
Options: C, F, R, M, B, W, V, P2, P3, P4, P5, P6, P7, P8, N



Furnished without nut(s). See Chart on [Page 57](#).

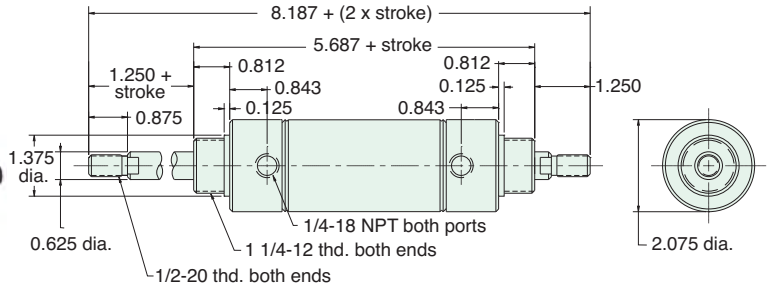
2" BORE STAINLESS STEEL CYLINDER



SDD-32-□-□

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod **Maximum Stroke:** 18"
Options: C, F, M, B, W, V, P6, P7, P8, N

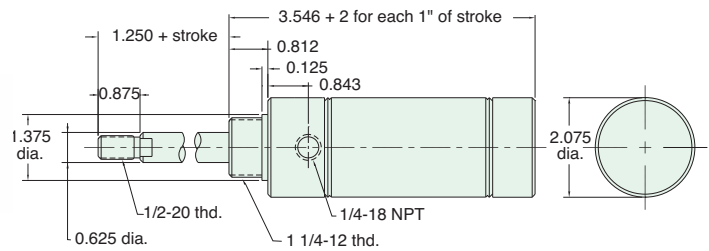


Nuts included, but not shown on drawing

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: M, B, W, V, N **Maximum Stroke:** 12" For M option add 0.125

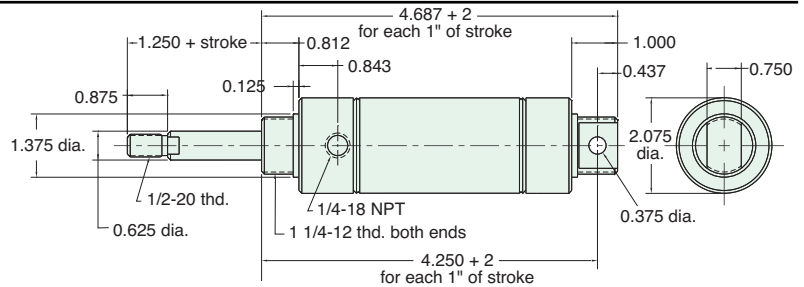


Nut included, but not shown on drawing

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: M, B, W, V, P2, N **Maximum Stroke:** 13" For M option add 0.125

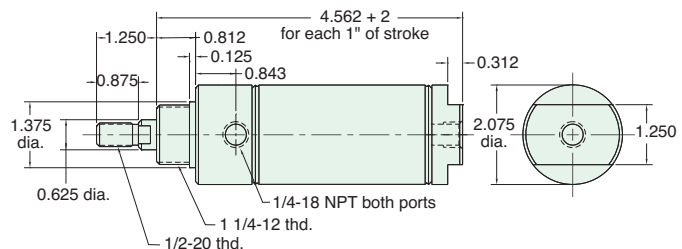


Furnished without nut(s). See Chart on Page 57.

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: M, B, W, V, P6, P7, P8, S, N For S option add 0.375



Nut included, but not shown on drawing



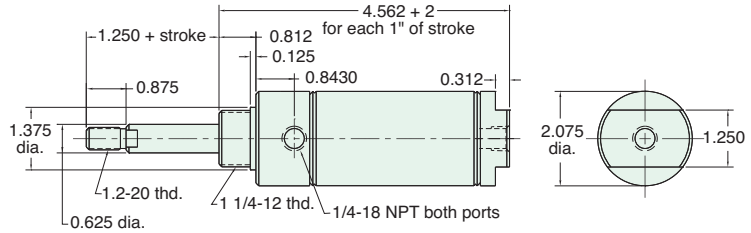
2" BORE STAINLESS STEEL CYLINDER

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: M, B, W, V, P6, P7, P8, S, N For S option add 0.375



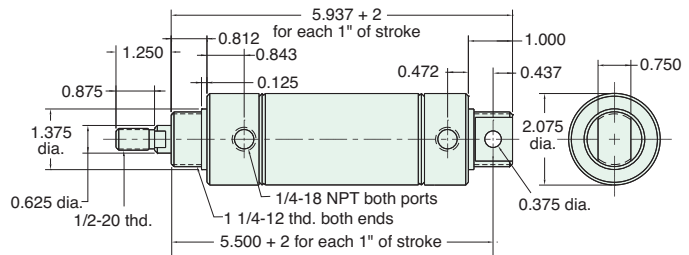
Nut included, but not shown on drawing

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: M, B, W, V, P2, P3, P4, P5, P6, P7, P8, N



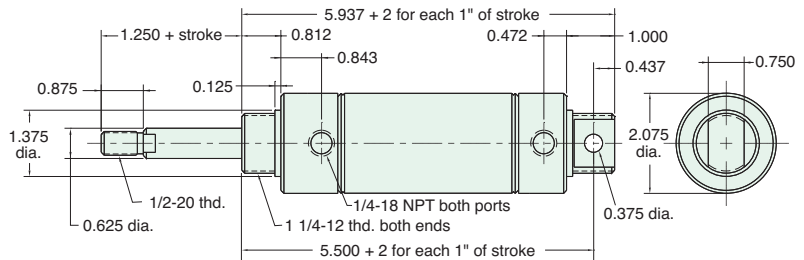
Furnished without nut(s). See Chart on Page 57.

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: M, B, W, V, P2, P3, P4, P5, P6, P7, P8, N



Furnished without nut(s). See Chart on Page 57.

CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**

Custom Cylinders

"Twice the force in half the size" was the goal for one custom cylinder. Multiple cylinder positions, or multiplied force can be achieved with this design.





MOUNTING NUTS

Stud Nut

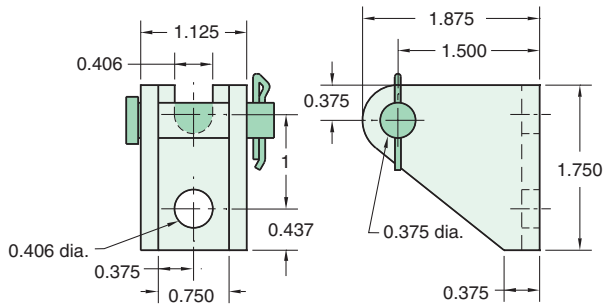
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N20-12	1 3/4"	7/16"	1 1/4-12

Rod Nut

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

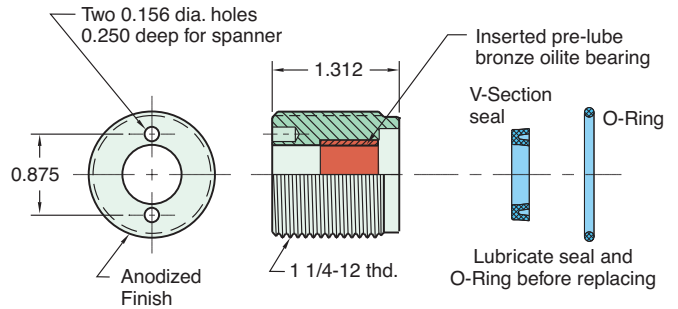
CB-3295

Clevis Bracket
Material: Steel, bright zinc plated



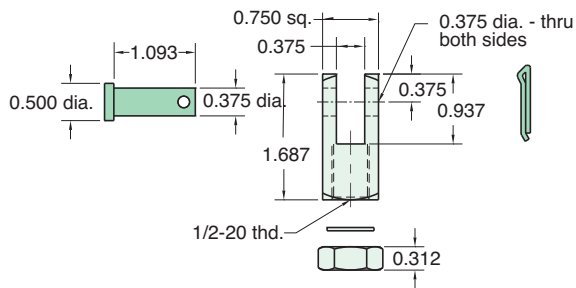
RK-3299

Replaceable Rod Seal
Material: Aluminum body



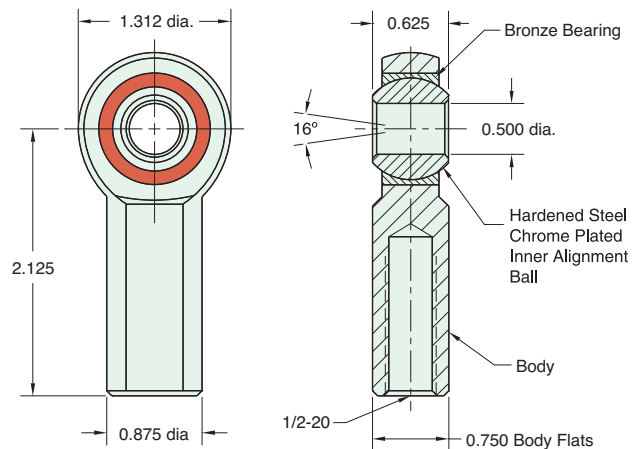
RC-3281

Rod Clevis
Material: Steel, electroless nickel plate



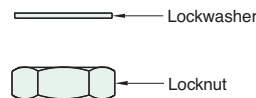
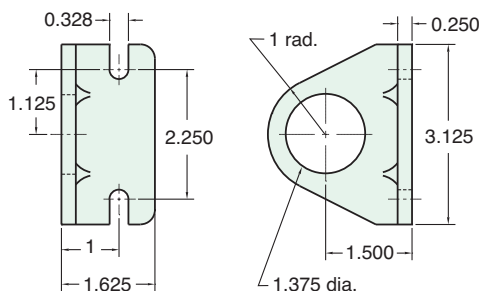
RE-3285

Rod End
Material: Steel, bright zinc plated body



FB-3291

Foot Bracket
Material: Steel, bright zinc plated



Max. Static Radial Load (rod end only): 6,700 lbs.
Fits Rod Thread Size: 1/2-20



2 1/2" BORE STAINLESS STEEL CYLINDER

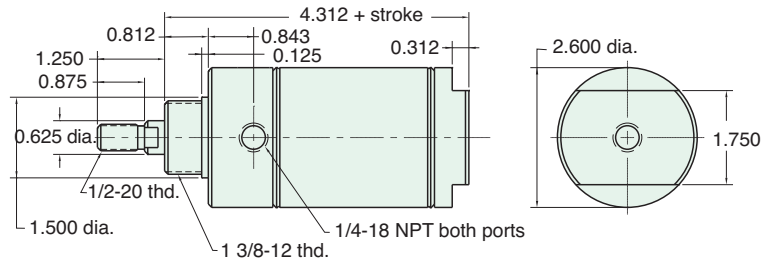
SDR-40-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 39"
Options: C, F, R, M, W, V, P6, P7, P8, S, N

Bumpers are standard
For M option add 0.312
For C, F, R and S option add 0.375



Nut included, but not shown on drawing

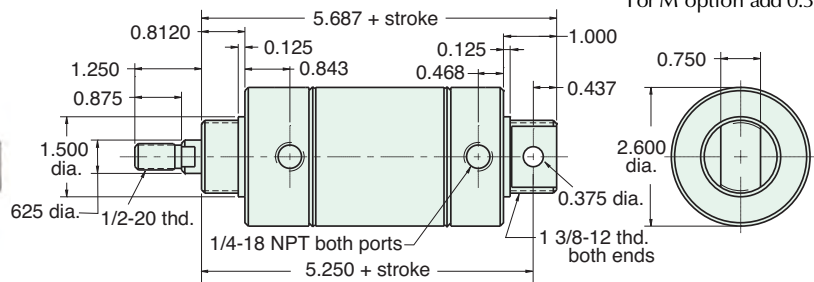
UDR-40-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 7", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 38"
Options: C, F, R, M, W, V, P2, P3, P4, P5, P6, P7, P8, N

Bumpers are standard
For M option add 0.312



Furnished without nut(s). See Chart on Page 59.

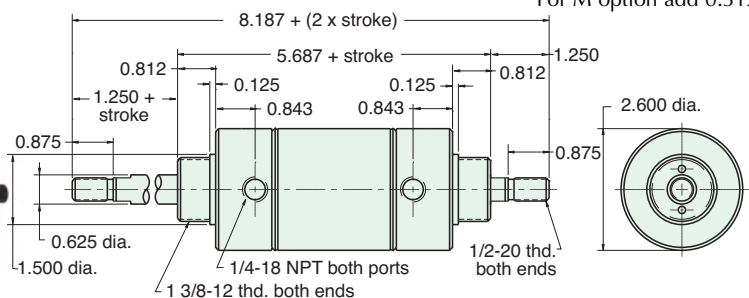
SDD-40-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod **Maximum Stroke:** 18"
Options: C, F, M, W, V, P6, P7, P8, N

Bumpers are standard
For M option add 0.312



Nut included, but not shown on drawing

Did you know that all Clippard Cylinders are 100% tested.



MOUNTING NUTS

Stud Nut

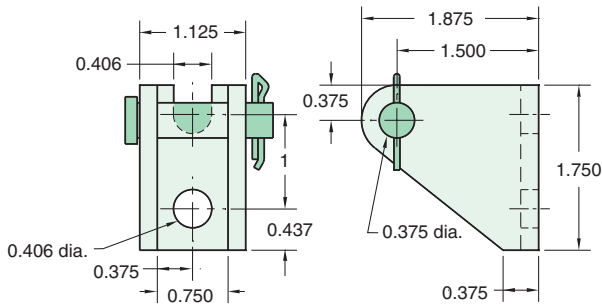
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N22-12	1 7/8"	1/2"	1 3/8-12

Rod Nut

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

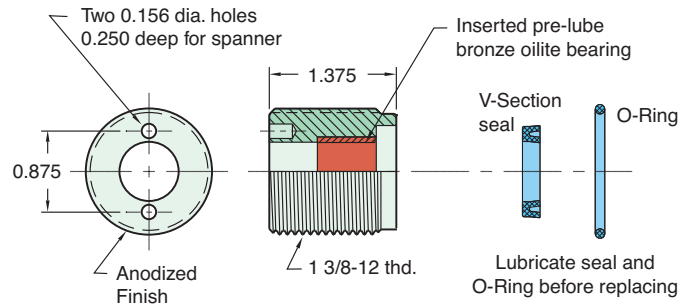
CB-3295

Clevis Bracket
Material: Steel, bright zinc plated



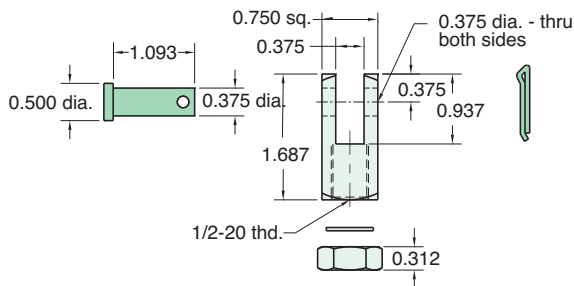
RK-4099

Replaceable Rod Seal
Material: Aluminum body



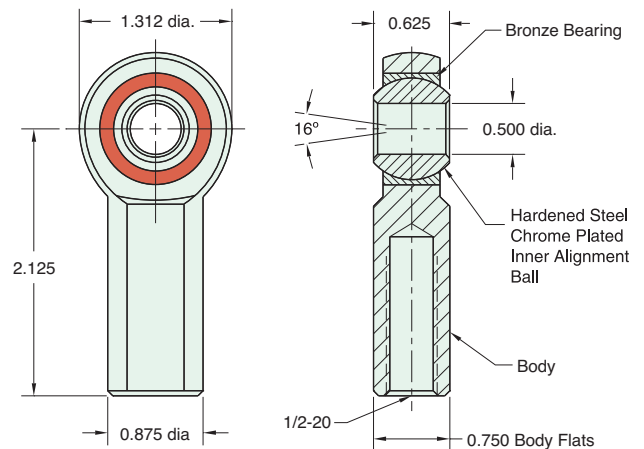
RC-3281

Rod Clevis
Material: Steel, electroless nickel plate



RE-3285

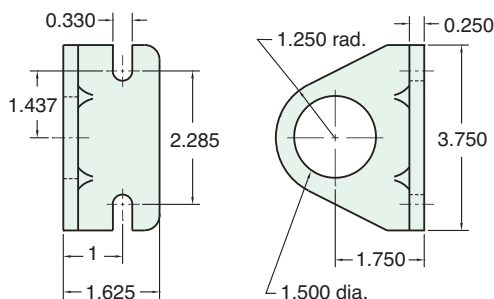
Rod End
Material: Steel, bright zinc plated body



Max. Static Radial Load (rod end only): 6,700 lbs.
Fits Rod Thread Size: 1/2-20

FB-4091

Foot Bracket
Material: Steel, bright zinc plated





3" BORE STAINLESS STEEL CYLINDER

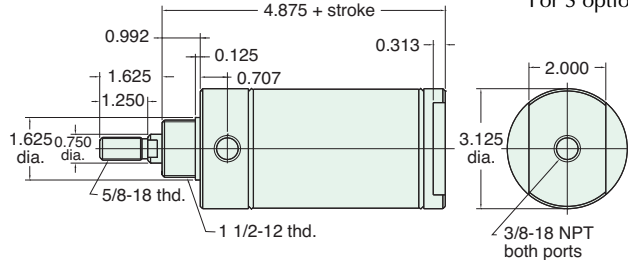
SDR-48-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Rotating Rod **Maximum Stroke:** 34"
Options: M, W, V, P6, P7, P8, S, N

Bumpers are standard
No additional length for bumpers
For S option add 0.437



Nut included, but not shown on drawing

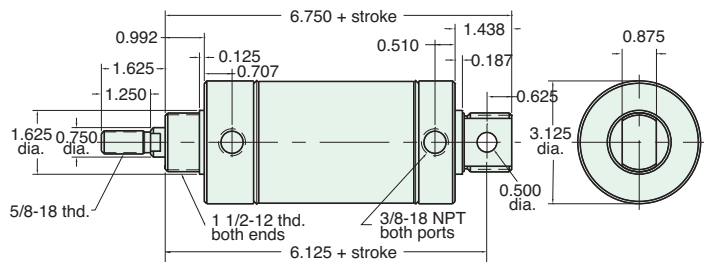
UDR-48-□-□

Double Acting



Mount: Universal **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 7", 8", 10", 12"
Type: Rotating Rod **Maximum Stroke:** 32"
Options: M, W, V, P2, P3, P4, P5, P6, P7, P8, N

Bumpers are standard
No additional length for bumpers



Furnished without nut(s). See Chart on Page 61.

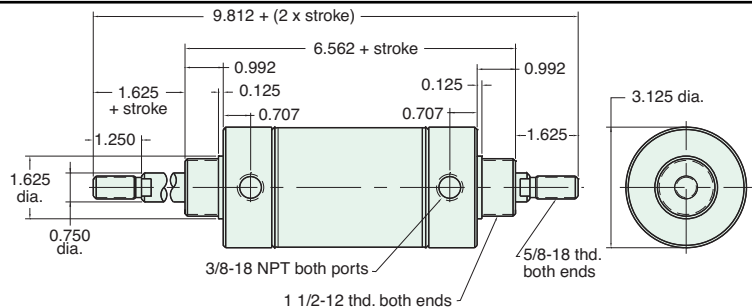
SDD-48-□-□

Double Acting



Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod **Maximum Stroke:** 15"
Options: M, W, V, P6, P7, P8, N

Bumpers are standard
No additional length for bumpers



Nuts included, but not shown on drawing

Did you know...

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





MOUNTING NUTS

Stud Nut

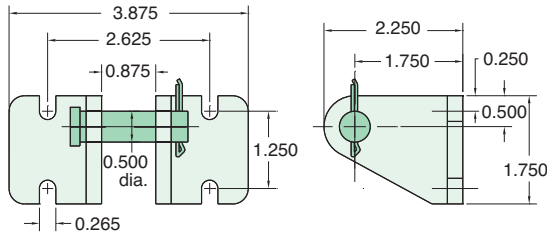
Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N24-12</u>	2 1/4"	1/2"	1 1/2-12

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
<u>N10-18</u>	15/16"	3/8"	5/8-18

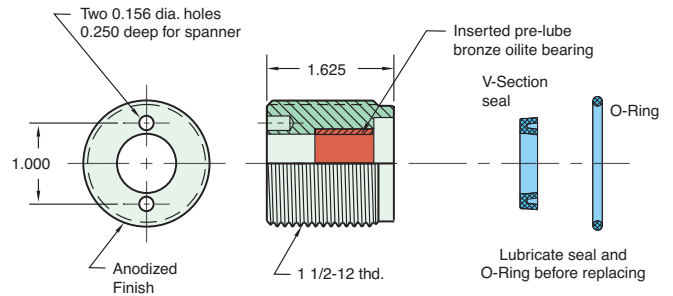
CB-4895

Clevis Bracket
Material: Steel, bright zinc plated



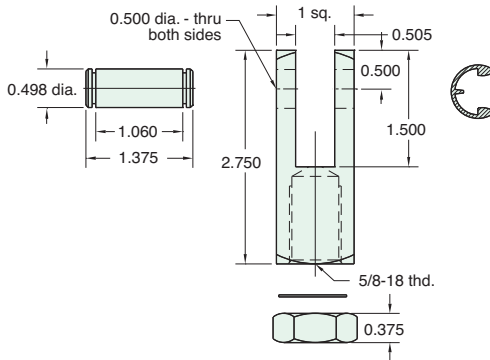
RK-4899

Replaceable Rod Seal
Material: aluminum body



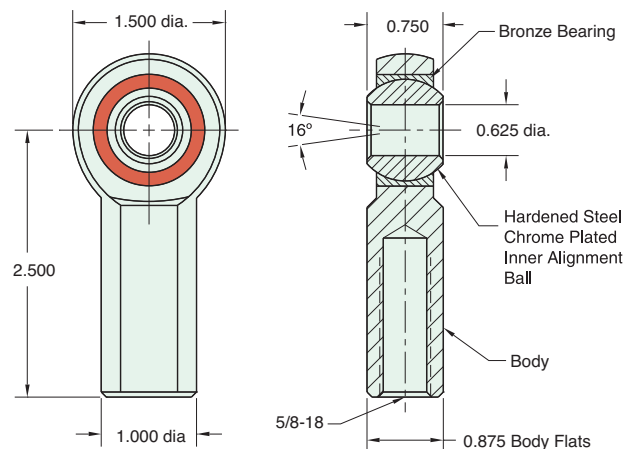
RC-4881

Rod Clevis
Material: Steel, electroless nickel plate



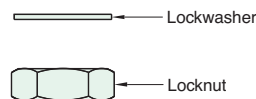
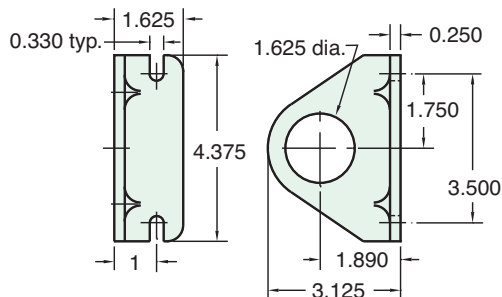
RE-4885

Rod End
Material: Steel, bright zinc plated body



FB-4891

Foot Bracket
Material: Steel, bright zinc plated



Max. Static Radial Load (rod end only): 7,400 lbs.
Fits Rod Thread Size: 5/8-18



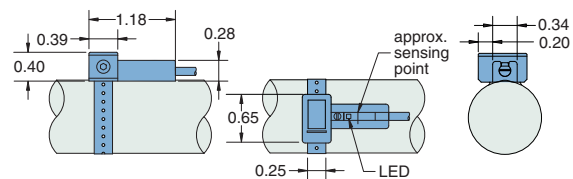
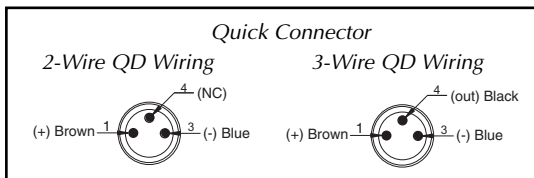
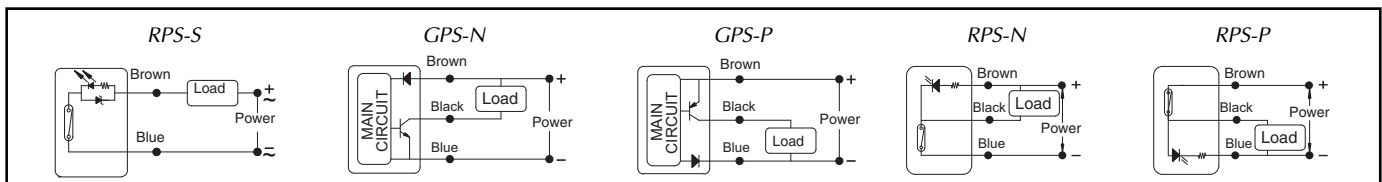
POSITION SENSORS

Magnetic Piston -M

Clippard stainless steel pneumatic cylinders that are equipped with an internal magnet that can be used with the Reed Switch and GMR Sensor. By accurately sensing the magnetic field of the piston when it passes beneath the sensor, the position of the rod piston is determined, and the feedback signal is created. Use of this option may add to the overall length of the cylinder. See specific cylinder listings for availability and details of the overall length adder.



Characteristic/Type	RPS-S	GPS-N	GPS-P	RPS-N	RPS-P
Switching Logic	SPST Normally-Open	Solid State Output, Normally-Open	Solid State Output, Normally-Open	SPST Normally-Open	SPST Normally-Open
Sensor Type	Reed Switch	NPN Current Sinking	PNP Current Sourcing	Reed Switch NPN	Reed Switch PNP
Operating Voltage	RPS-S3: 5 to 120 VAC RPS-S8Q: 5 to 60 VAC/DC	5 to 28 VDC	5 to 28 VDC	5 to 30 VDC	5 to 30 VDC
Switching Current	100 mA max.	200 mA max.	200 mA max.	250 mA max.	250 mA max.
Switching Rating	10 W max.	6 W max.	6 W max.	10 W max.	10 W max.
Current Consumption	-	7.5 mA max. @ 24 V (Switch Active)	7.5 mA max. @ 24 V (Switch Active)	10 mA max. @ 24 V (Switch Active)	10 mA max. @ 24 V (Switch Active)
Voltage Drop	2.5 V max. @ 40 mA DC	0.5 V max. @ 200 mA (Resistive Load)	0.5 V max. @ 200 mA (Resistive Load)	0.5 V max. @ 550 mA (Resistive Load)	0.5 V max. @ 550 mA (Resistive Load)
Leakage Current	-	0.01 mA max.	0.01 mA max.	-	-
Indicator	Red LED	Red LED	Green LED	Red LED	Green LED
Cable	2.8\$, 2C, Oil-Resistant PVC	2.8\$, 3C, Oil-Resistant PVC	2.8\$, 3C, Oil-Resistant PVC	2.8\$, 3C, Oil-Resistant PVC	2.8\$, 3C, Oil-Resistant PVC
Sensitivity	60 G	40 ~ 750 G	40 ~ 750 G	60 G	60 G
Max. Switching Frequency	200 Hz	5,000 Hz	5,000 Hz	1,000 Hz	1,000 Hz
Temperature Range	14 to 158°F (-10 to 70°C)	14 to 158°F (-10 to 70°C)	14 to 158°F (-10 to 70°C)	14 to 158°F (-10 to 70°C)	14 to 158°F (-10 to 70°C)
Shock	30 G	50 G	50 G	30 G	30 G
Vibration	9 G	9 G	9 G	9 G	9 G
Enclosure Classification	IP 67 (NEMA 6)	IP 67 (NEMA 6)	IP 67 (NEMA 6)	IP 67 (NEMA 6)	IP 67 (NEMA 6)
Protection Circuit	-	Power Source Reverse Polarity; Surge Suppression	Power Source Reverse Polarity; Surge Suppression	-	-



Mounting Bracket

Clippard's Universal Mounting Bracket is designed to be used with both the Solid State (GMR)

Sensor and the Reed Switch. The Universal Bracket can be used on any Clippard stainless steel cylinder where the -M option is available. Comes complete with 5/64" hex wrench.

Order No.
UC-0848 Mounting Bracket

Reed Switch Order No.

- [RPS-P3](#) Sourcing Switch with 3 m Wire Leads
- [RPS-P8Q](#) Sourcing Switch with 8 mm Male QC 6" Pigtail
- [RPS-N3](#) Sinking Switch with 3 m Wire Leads
- [RPS-N8Q](#) Sinking Switch with 8 mm Male QC 6" Pigtail
- [RPS-S3](#) Simple Switch (2-Wire) with 3 m Wire Leads
- [RPS-S8Q](#) Simple Switch (2-Wire) with 8 mm Male QC 6" Pigtail
- [CPS-C8Q5](#) Mating Cable Assembly, 8 mm Female QC with 5 m Leads

GMR Switch Order No.

- [GPS-P3](#) Sourcing Switch with 3 m Wire Leads
- [GPS-P8Q](#) Sourcing Switch with 8 mm Male QC 6" Pigtail
- [GPS-N3](#) Sinking Switch with 3 m Wire Leads
- [GPS-N8Q](#) Sinking Switch with 8 mm Male QC 6" Pigtail
- [CPS-C8Q5](#) Mating Cable Assembly, 8 mm Female QC with 5 m Leads

AVT-□-□

[AVT-12-1](#)

[AVT-17-2](#)
[AVT-17-3](#)

[AVT-24-4](#)
[AVT-24-6](#)

[AVT-24-8](#)
[AVT-24-10](#)

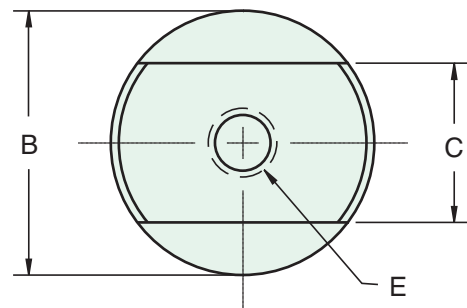
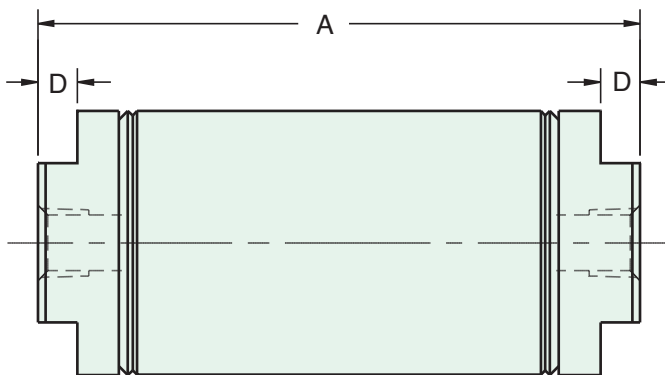
[AVT-32-12](#)
[AVT-32-14](#)

[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



CORROSION-RESISTANT CYLINDER

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 to 180°F, and have a pressure rating of 150 psig (air). A variety of mounting styles are available.

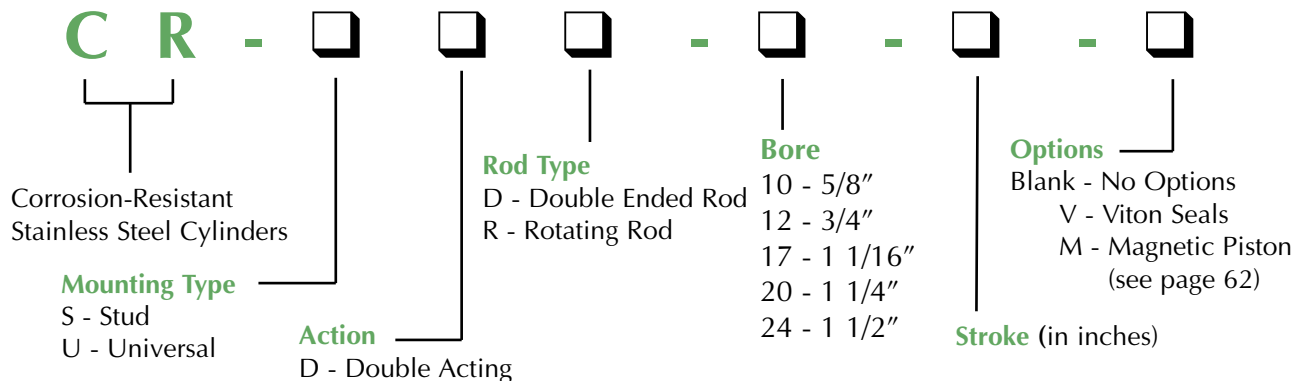
Delrin® is a registered trademark of E.I. DuPont Co.



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

NUMBERING SYSTEM



5/8" BORE CORROSION-RESISTANT CYLINDER



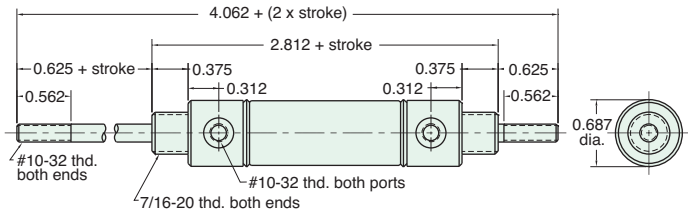
CR-SDD-10-□-□

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 M option add 0.312



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

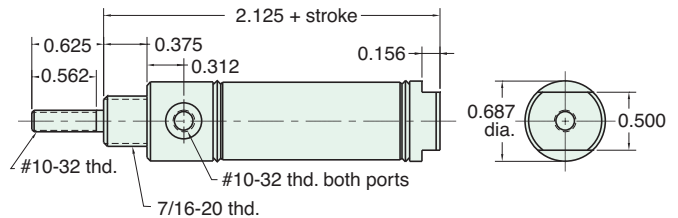
CR-SDR-10-□-□

Double Acting

Mount: Stud
Type: Rotating Rod

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Options: M, V, N

For M option add 0.312



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

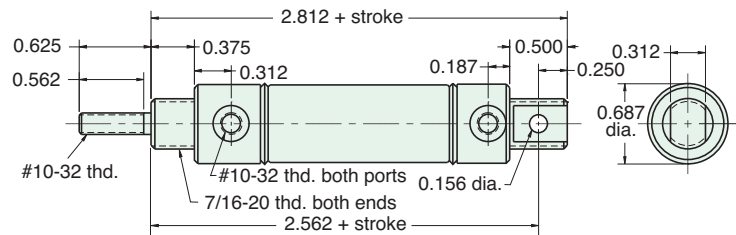
CR-UDR-10-□-□

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 M option add 0.312



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

Stainless Steel Mounting

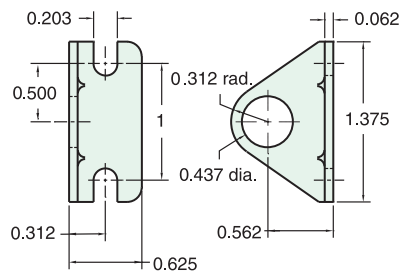
Foot Bracket

Model Number: [FB-0892-SS](#)

Nut

Model Number: [N07-20-SS](#)

Max. Torque in lbs.: 4.0





3/4" BORE CORROSION-RESISTANT CYLINDER

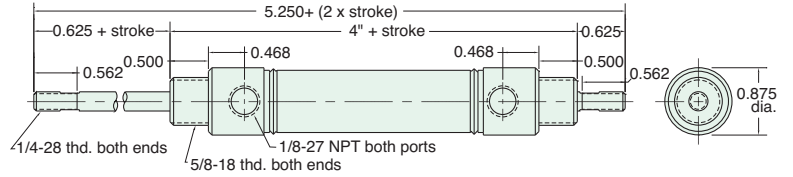
CR-SDD-12-□-□

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

Double Acting



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

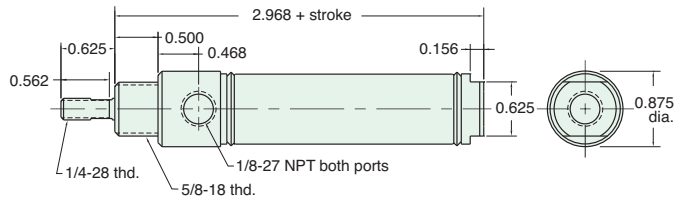
CR-SDR-12-□-□

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

Double Acting



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

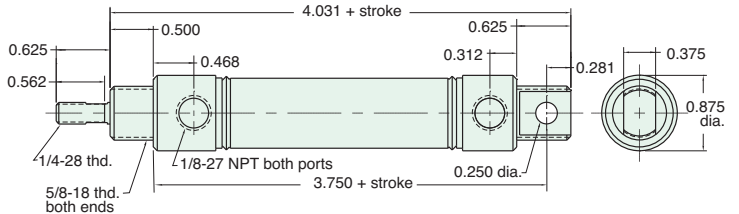
CR-UDR-12-□-□

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

Double Acting



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

Stainless Steel Mounting

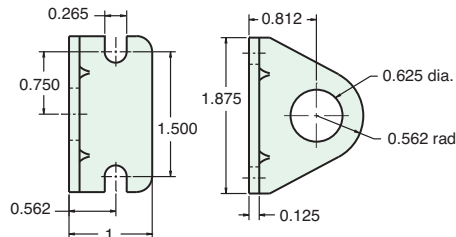
Foot Bracket

Model Number: [FB-1791-SS](#)

Nut

Model Number: [N10-18-SS](#)

Max. Torque in lbs.: 12



1 1/16" BORE CORROSION-RESISTANT CYLINDER



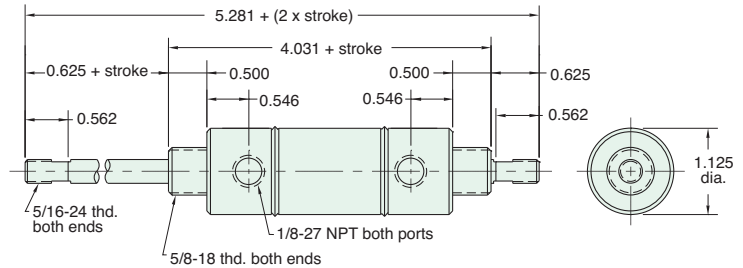
CR-SDD-17-□-□

Double Acting



Mount: Stud
Type: Double Rod

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



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

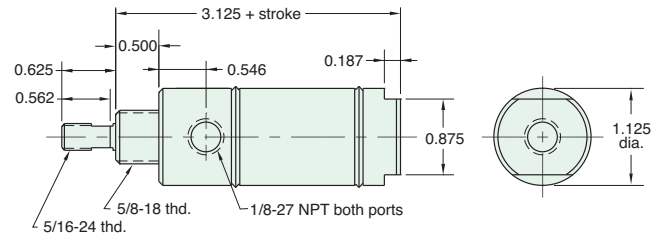
CR-SDR-17-□-□

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



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

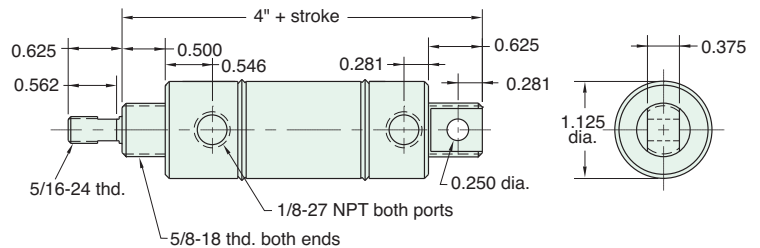
CR-UDR-17-□-□

Double Acting



Mount: Universal
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

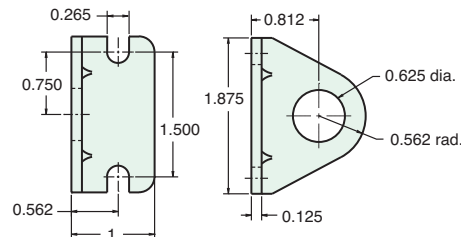


Furnished without nut(s). Order Part No. [N10-18-SS.](#)

Stainless Steel Mounting

Foot Bracket
Model Number: [FB-1791-SS](#)

Nut
Model Number: [N10-18-SS](#)
Max. Torque in lbs.: 12





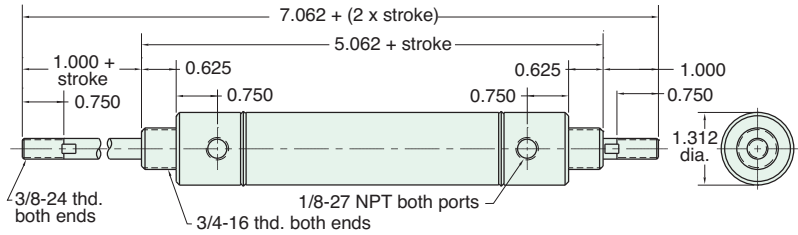
1 1/4" BORE CORROSION-RESISTANT CYLINDER

CR-SDD-20-□-□

Mount: Stud
Type: Double Rod

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

Double Acting



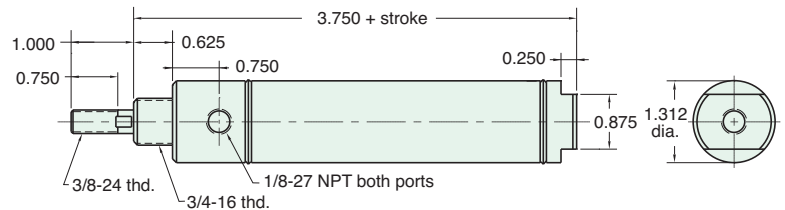
Furnished without nut(s). Order Part No. [N12-16-SS.](#)

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

Double Acting



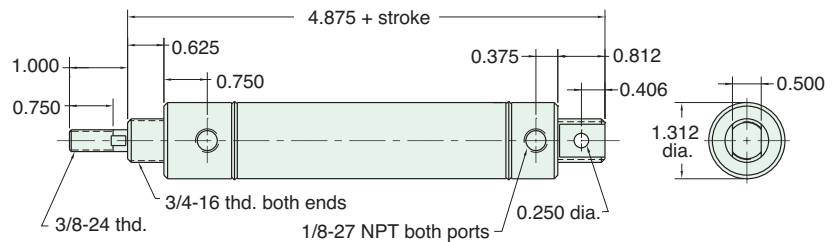
Furnished without nut(s). Order Part No. [N12-16-SS.](#)

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

Double Acting

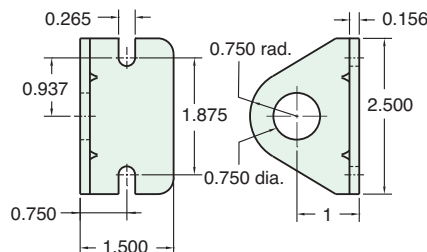


Furnished without nut(s). Order Part No. [N12-16-SS.](#)

Stainless Steel Mounting

Foot Bracket
Model Number: [FB-2491-SS](#)

Nut
Model Number: [N12-16-SS](#)
Max. Torque in lbs.: 20



1 1/2" BORE CORROSION-RESISTANT CYLINDER

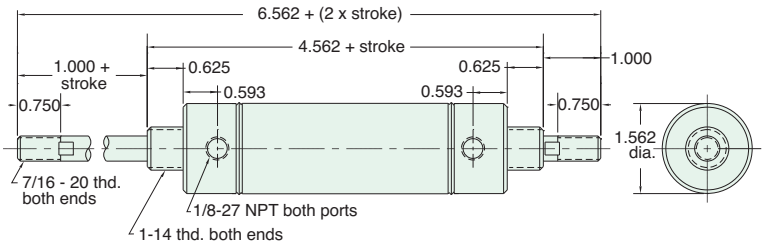


CR-SDD-24-□-□

Mount: Stud
Type: Double Rod

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

Double Acting



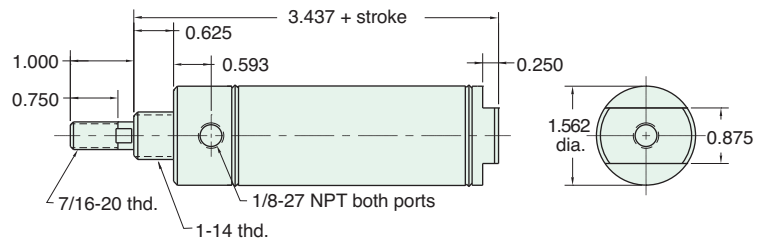
Furnished without nut(s). Order Part No. [N16-14-SS.](#)

CR-SDR-24-□-□

Mount: Stud
Type: Rotating Rod

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

Double Acting



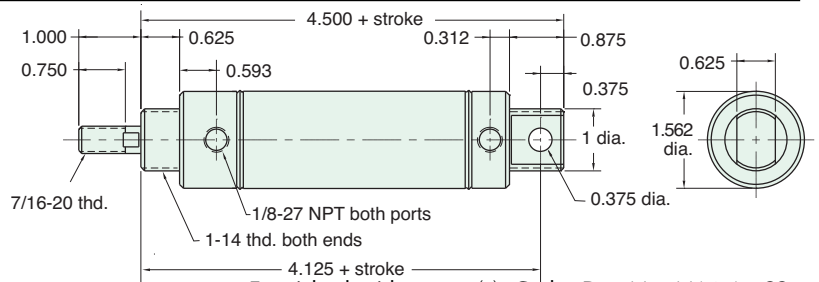
Furnished without nut(s). Order Part No. [N16-14-SS.](#)

CR-UDR-24-□-□

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

Double Acting

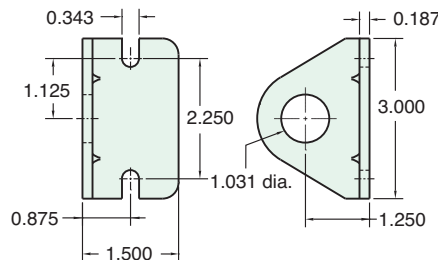


Furnished without nut(s). Order Part No. [N16-14-SS.](#)

Stainless Steel Mounting

Foot Bracket
Model Number: [FB-2891-SS](#)

Nut
Model Number: [N16-14-SS](#)
Max. Torque in lbs.: 30





AIR FORCE ONE® COMPACT CYLINDER



Clippard Instrument Laboratory, Inc. Air Force One compact cylinders are available in double acting, spring return, spring extend and double rod models. GMR 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.

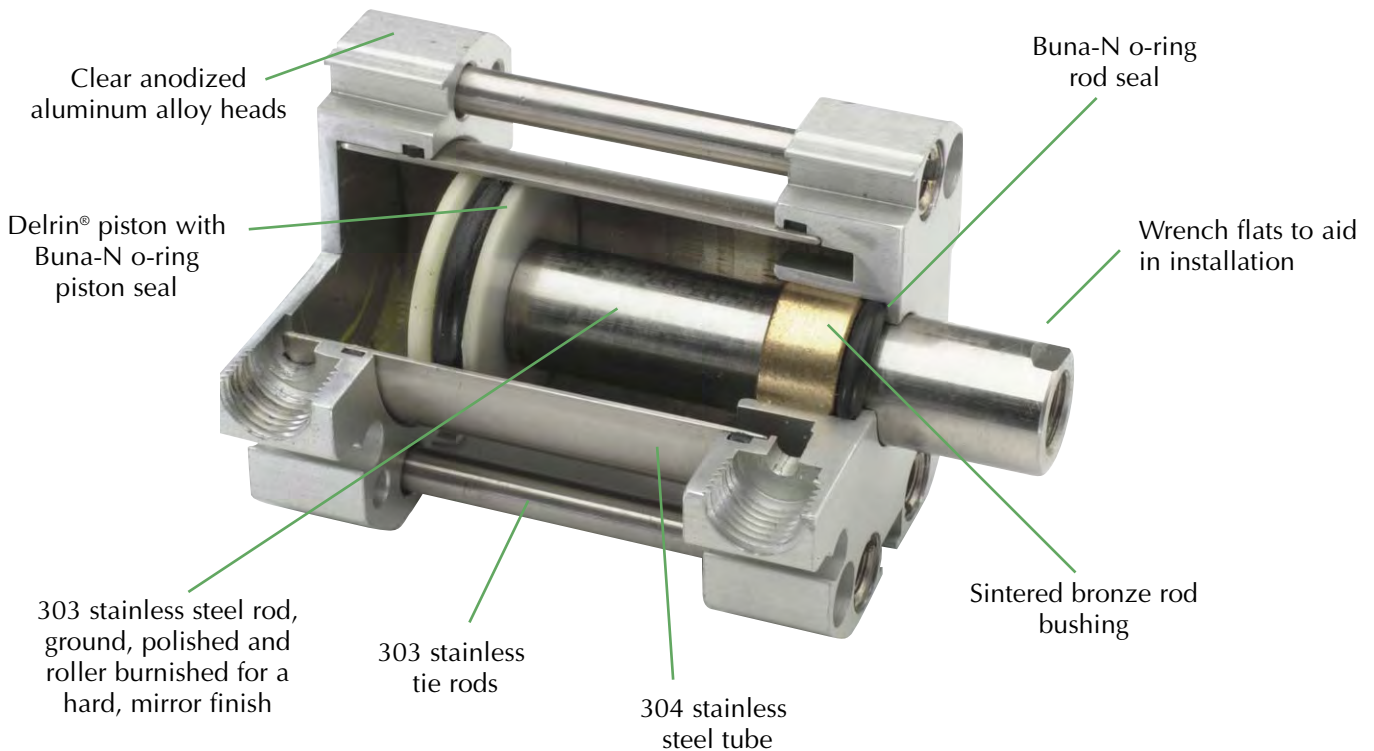
The various mounting configurations available in the AFO cylinders assure freedom to interchange with most cylinders on the market. This means most systems can be upgraded to include quality AFO cylinders.

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 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 - □ □ □ - □ - □ - □

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

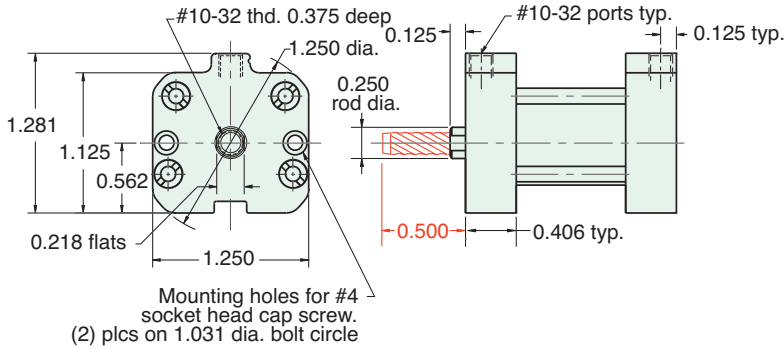
Options

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



5/8" BORE AFO COMPACT CYLINDER

AF - □□□ - 10 - □

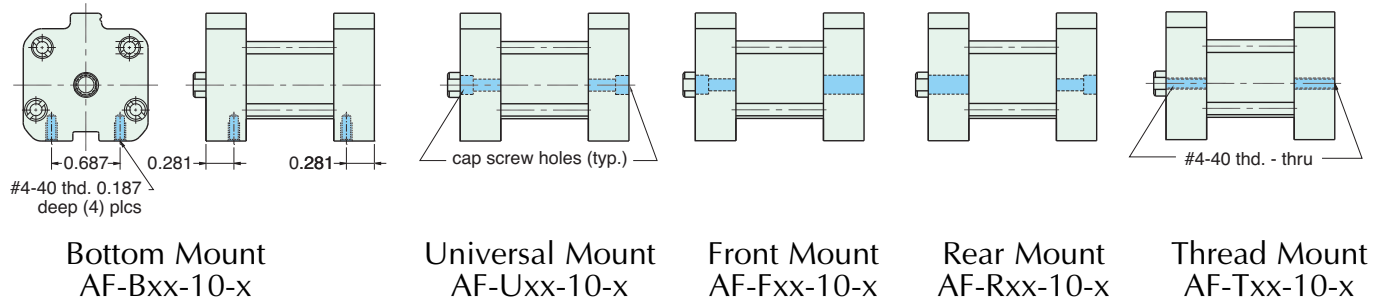


For rod with male thread option, add -T to the end of the part number after Stroke

See page 71 for Air Force One numbering system

MOUNTING STYLES

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

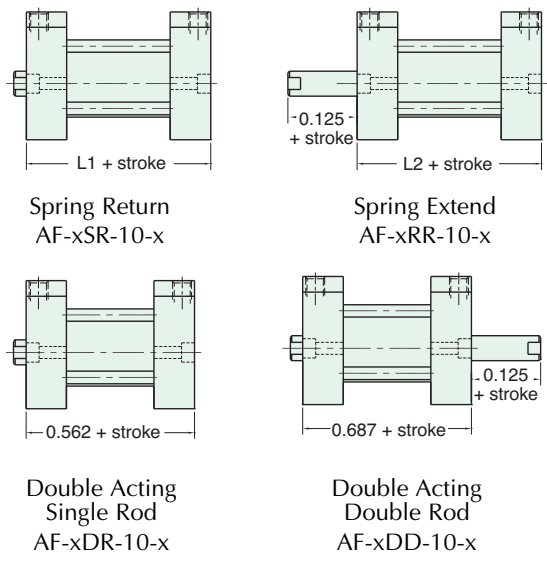


CYLINDER LENGTHS

"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"

Add 7/8" for Magnetic Piston

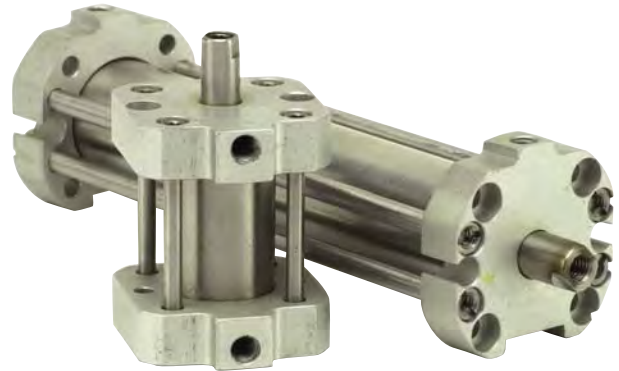
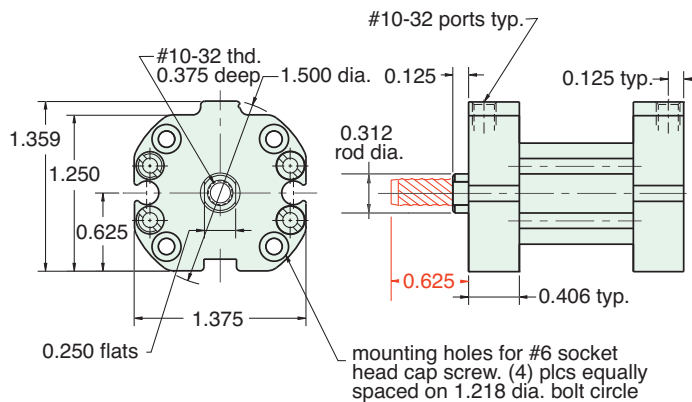


Spring Forces	
Spring Return	
Compressed	At Rest
5.75 lbs.	1.5 lbs.
Spring Extend	
Compressed	At Rest
5.75 lbs.	1.5 lbs.

3/4" BORE AFO COMPACT CYLINDER



AF - □□□ - 1 2 - □

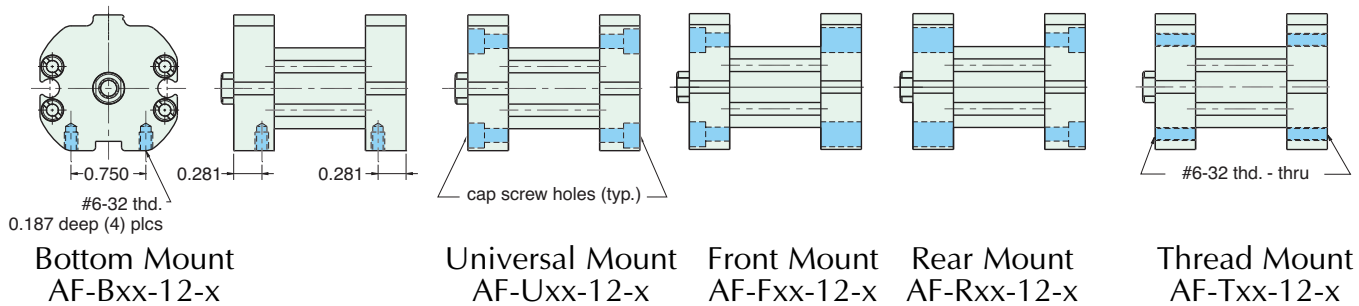


For rod with male thread option, add -T to the end of the part number after Stroke

See [page 71](#) 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

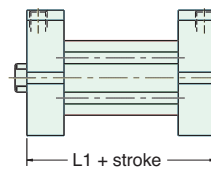
Thread Mount
AF-Txx-12-x

CYLINDER LENGTHS

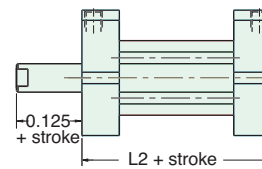
"L"	Stroke	Spring Return	Spring Extend
L1	1/4" - 1"	13/16"	
L1	1 1/8" - 2"	1 3/8"	
L1	2 1/8" - 3"	1 15/16"	
L1	3 1/8" - 4"	2 1/2"	
L2	1/4" - 1"		1 1/16"
L2	1 1/8" - 2"		1 5/8"
L2	2 1/8" - 3"		2 3/16"
L2	3 1/8" - 4"		2 3/4"

Overall length of body is stroke plus "L"

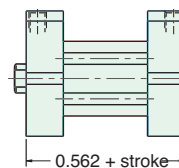
Add 7/8" for Magnetic Piston



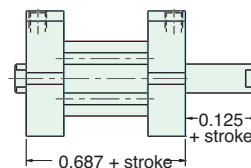
Spring Return
AF-xSR-12-x



Spring Extend
AF-xRR-12-x



Double Acting
Single Rod
AF-xDR-12-x



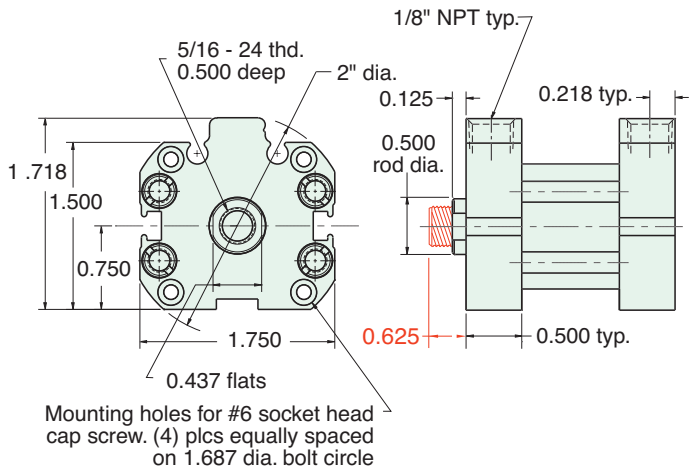
Double Acting
Double Rod
AF-xDD-12-x

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



1 1/16" BORE AFO COMPACT CYLINDER

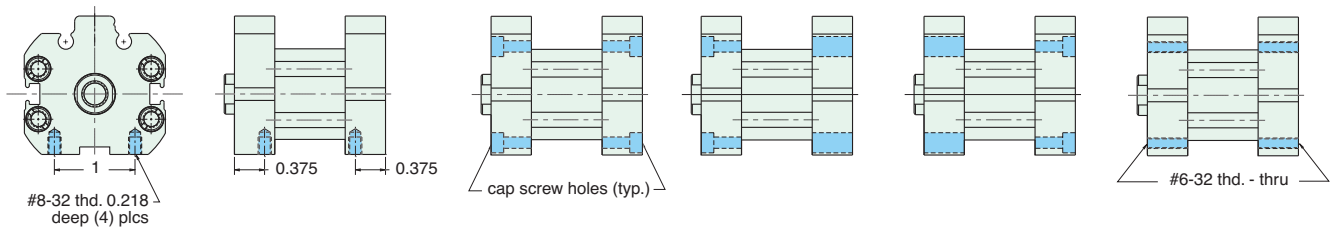
AF - □□□ - 17 - □



For rod with male thread option, add -T to the end of the part number after Stroke
 See [page 71](#) 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

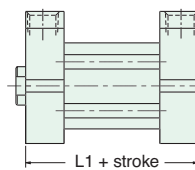
Thread Mount
AF-Txx-17-x

CYLINDER LENGTHS

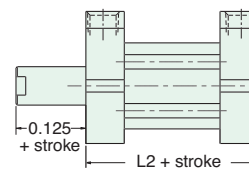
"L"	Stroke	Spring Return	Spring Extend
L1	1/4" - 1"	7/8"	
L1	1 1/8" - 2"	1 1/2"	
L1	2 1/8" - 3"	2 1/8"	
L1	3 1/8" - 4"	2 3/4"	
L2	1/4" - 1"		1 3/8"
L2	1 1/8" - 2"		2"
L2	2 1/8" - 3"		2 5/8"
L2	3 1/8" - 4"		3 1/4"

Overall length of body is stroke plus "L"

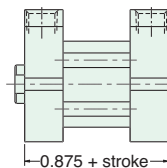
Add 7/8" for Magnetic Piston



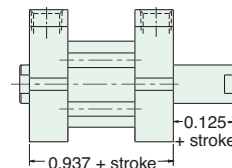
Spring Return
AF-xSR-17-x



Spring Extend
AF-xRR-17-x



Double Acting
Single Rod
AF-xDR-17-x



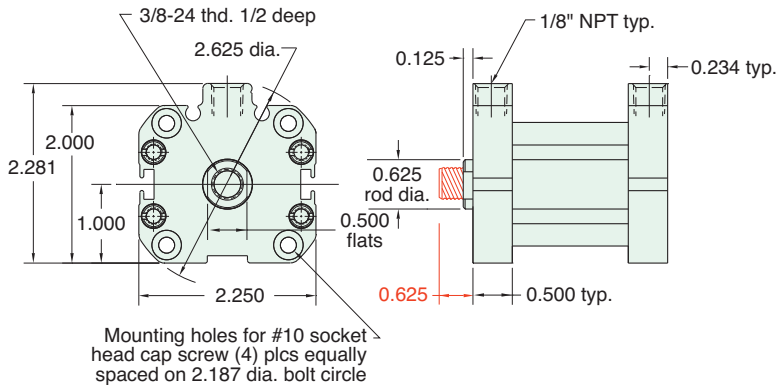
Double Acting
Double Rod
AF-xDD-17-x

Spring Forces	
Spring Return	
Compressed	At Rest
11.5 lbs.	5.5 lbs.
Spring Extend	
Compressed	At Rest
11.5 lbs.	5.5 lbs.

1 1/2" BORE AFO COMPACT CYLINDER



AF - □□□ - 24 - □

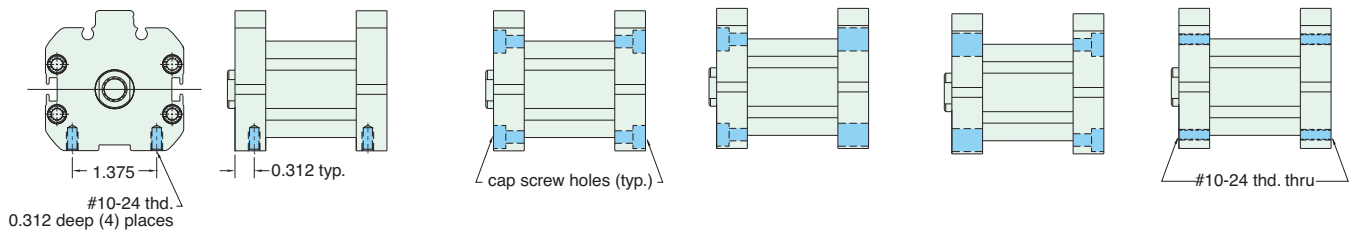


For rod with male thread option, add -T to the end of the part number after Stroke

See [page 71](#) 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

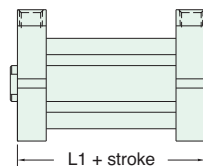
Thread Mount
AF-Txx-24-x

CYLINDER LENGTHS

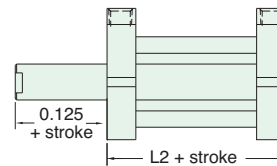
"L"	Stroke	Spring Return	Spring Extend
L1	1/4" - 1"	7/8"	
L1	1 1/8" - 2"	1 1/2"	
L1	2 1/8" - 3"	2 1/8"	
L1	3 1/8" - 4"	2 3/4"	
L2	1/4" - 1"		1 3/8"
L2	1 1/8" - 2"		2"
L2	2 1/8" - 3"		2 5/8"
L2	3 1/8" - 4"		3 1/4"

Overall length of body is stroke plus "L"

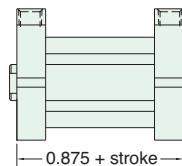
Add 7/8" for Magnetic Piston



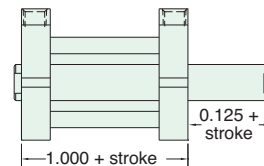
Spring Return
AF-xSR-24-x



Spring Extend
AF-xRR-24-x



Double Acting
Single Rod
AF-xDR-24-x



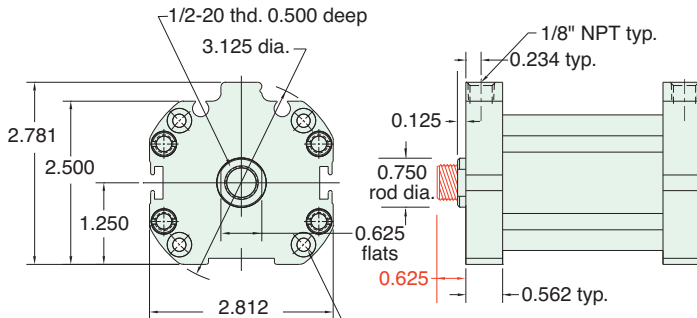
Double Acting
Double Rod
AF-xDD-24-x

Spring Forces	
Spring Return	
Compressed	At Rest
13 lbs.	7.5 lbs.
Spring Extend	
Compressed	At Rest
13 lbs.	7.5 lbs.

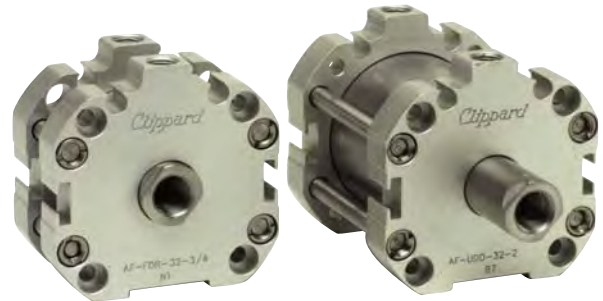


2" BORE AFO COMPACT CYLINDER

AF - □□□ - 3 2 - □



Mounting holes for #10 socket head cap screw (4) plcs equally spaced on 2.687 dia. bolt circle

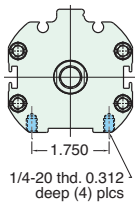


For rod with male thread option, add -T to the end of the part number after Stroke

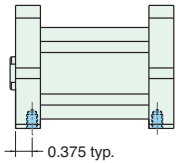
See page 71 for Air Force One numbering system

MOUNTING STYLES

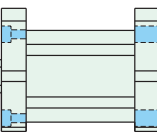
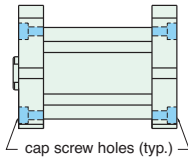
Five mounting styles give you versatility and fast, easy installation.



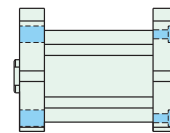
Bottom Mount
AF-Bxx-32-x



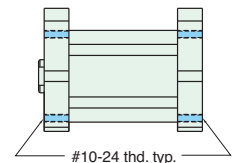
Universal Mount
AF-Uxx-32-x



Front Mount
AF-Fxx-32-x



Rear Mount
AF-Rxx-32-x

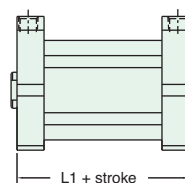


Thread Mount
AF-Txx-32-x

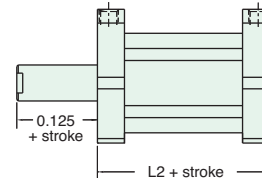
CYLINDER LENGTHS

"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"

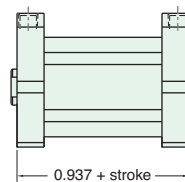
Overall length of body is stroke plus "L"
Add 7/8" for Magnetic Piston



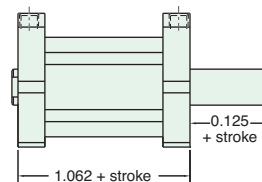
Spring Return
AF-xSR-32-x



Spring Extend
AF-xRR-32-x



Double Acting
Single Rod
AF-xDR-32-x



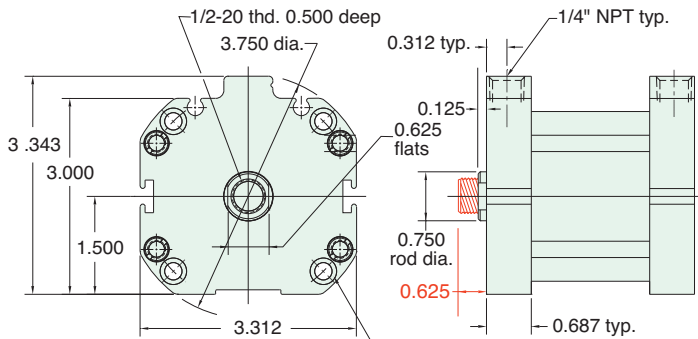
Double Acting
Double Rod
AF-xDD-32-x

Spring Forces	
Spring Return	
Compressed	At Rest
13 lbs.	7.5 lbs.
Spring Extend	
Compressed	At Rest
13 lbs.	7.5 lbs.

2 1/2" BORE AFO COMPACT CYLINDER



AF - □□□ - 40 - □



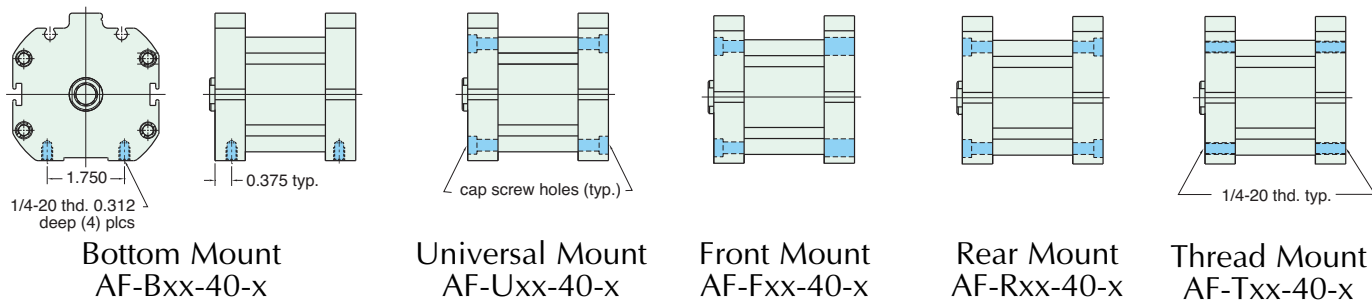
Mounting holes for 0.250 socket head cap screw (4) plcs equally spaced on 3.250 dia. bolt circle



For rod with male thread option, add -T to the end of the part number after Stroke
See [page 71](#) for Air Force One numbering system

MOUNTING STYLES

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

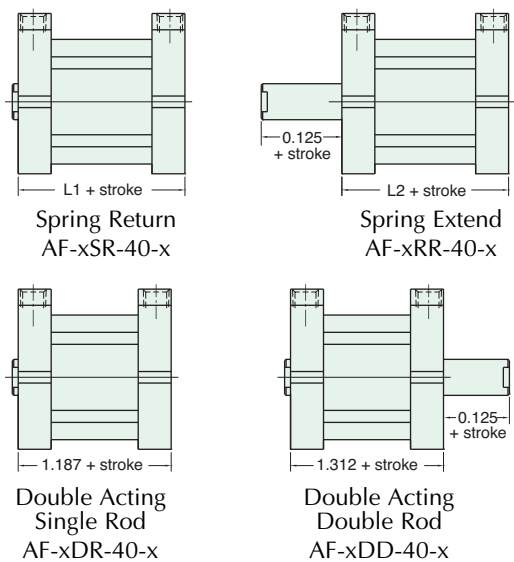


CYLINDER LENGTHS

"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"

Add 7/8" for Magnetic Piston



Spring Forces	
Spring Return	
Compressed	At Rest
25 lbs.	18.5 lbs.
Spring Extend	
Compressed	At Rest
25 lbs.	18.5 lbs.



AFO COMPACT CYLINDER GMR SENSORS

AIR FORCE ONE® GMR SENSORS NUMBERING SYSTEM

A F H S - □ □

AFHS
Air
Force
GMR
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 0.875 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 GMR sensors.

Magnetic Piston

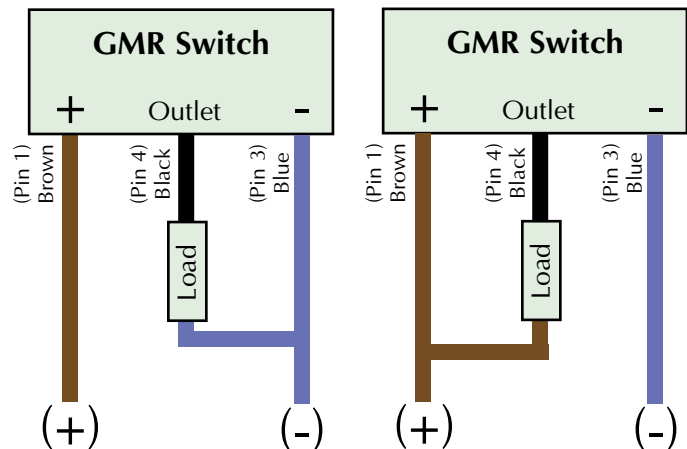
A specialized magnet is attached to the piston that will actuate the Clippard GMR sensors. This allows one or more of these dependable electronic sensor/switches to accurately determine the position of the cylinder rod. To order cylinders with magnetic pistons, specify model numbers that end with -M. GMR 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 to 175°F
LED Indicator	

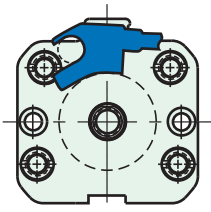
Sourcing PNP

Sinking NPN

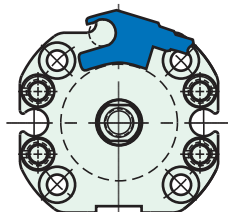


MAGNETIC PISTON & GMR SENSORS

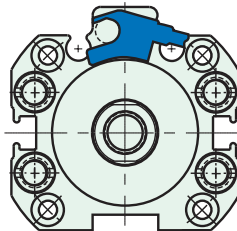
When ordered with the M option, an extra rod is added to the AFO for mounting and positioning the switch.



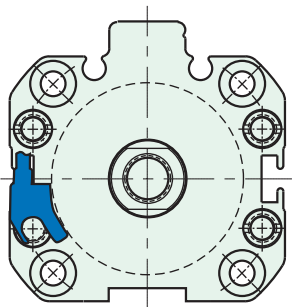
5/8" Bore



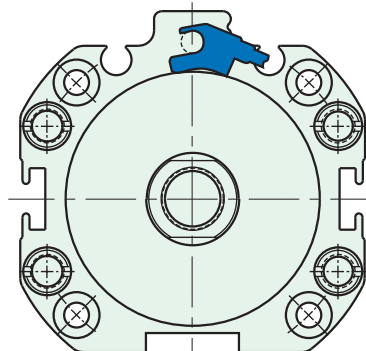
3/4" Bore



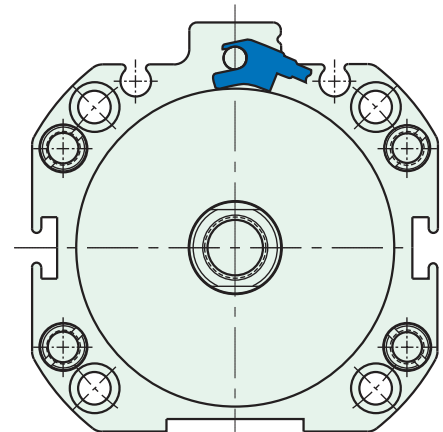
1 1/16" Bore



1 1/2" Bore



2" Bore



2 1/2" Bore

GMR SENSORS

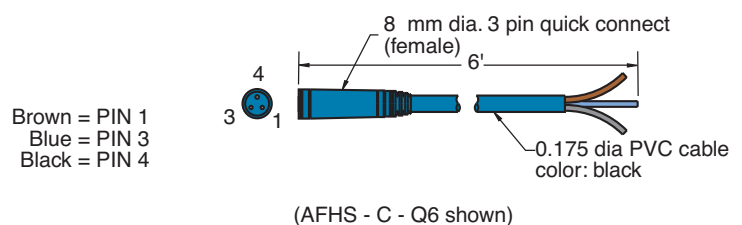
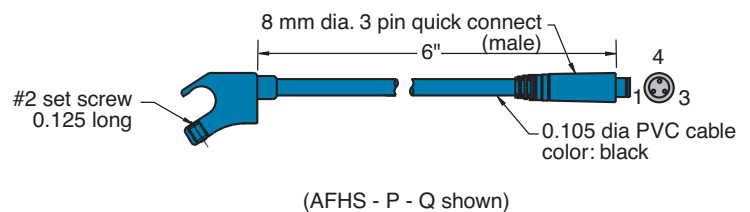
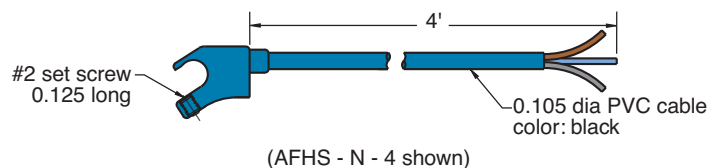
Position Sensing Switch

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

Locating GMR Sensors on Cylinders

Cylinders ordered with magnetic pistons come with an additional attached rod* on which the GMR 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 GMR Switch in place.

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

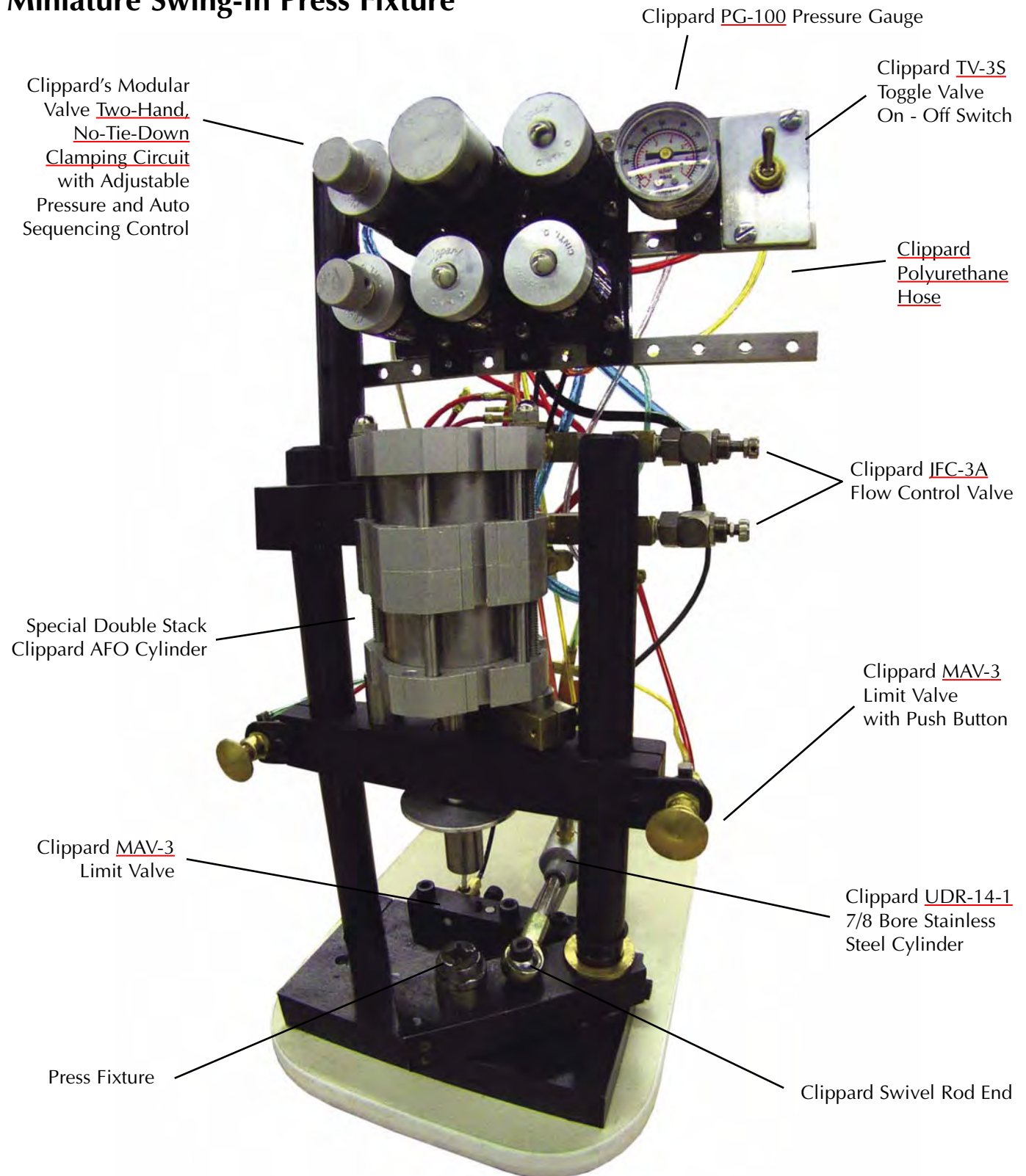


Brown = PIN 1
Blue = PIN 3
Black = PIN 4



SWING-IN PRESS APPLICATION

Miniature Swing-In Press Fixture





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 (7/8" 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".

- 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 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

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

1949

Did you know that 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	<u>83</u>	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	<u>83</u>	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	<u>84</u>	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	<u>85</u>	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	<u>84</u>	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	<u>86</u>	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	<u>86</u>	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	<u>86</u>	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	<u>88</u>	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	<u>89</u> **	Air & Hyd.	0.20	250 psig-Air 1000 psig-Hyd.*	T- Ring	Vee Ring	1/4"	Thd.	1/16" NPT	Threaded	
7/8" Bore Spring Return	<u>90</u>	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	<u>91</u> **	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	<u>90</u>	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.

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 to 230°F

*Consult factory for hydraulic applications

SUB-MINIATURE MINIMATIC® CYLINDER



SM-2

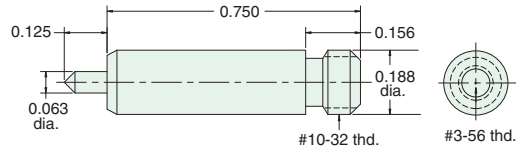
Single Acting



Did you know...

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

Bore: 5/32"
Mount: Rear Thread
Type: Spring Return
Available Stroke Length: 1/4"
Materials: Stainless steel body, piston & rod, Buna-N U-cup, Beryllium copper spring



SM-3-□

Single Acting

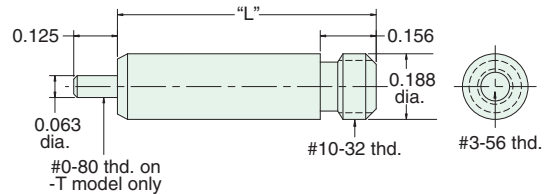


Bore: 5/32"
Mount: Rear Thread
Type: Spring Return

Model	SM-3-1	SM-3-2	SM-3-3	SM-3-4
Stroke	1/4"	1/2"	3/4"	1"
Length "L"	0.740	1.171	1.593	2.000

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

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

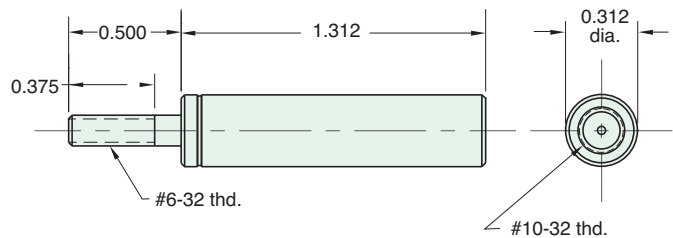


SM-6

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



Nut included, but not shown on drawing

CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**

Special Configurations

This Clippard produced the first rolled-construction cylinder in 1949. Since then, we have produced thousands of special configurations from cartridge designs to low break-away **miniature cylinders**.



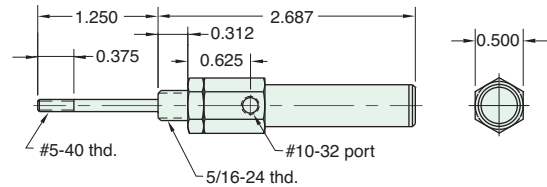


3/8" BORE BRASS MINIMATIC® CYLINDER

3SS-AR-1/2

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

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



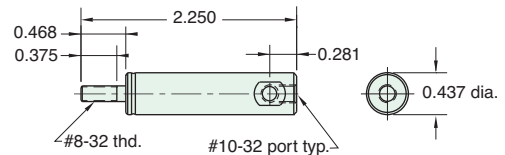
Rod nut included, but not shown on drawing

3PS-1/2

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

Brass Rod - non-rotating

First Cylinder - 1949



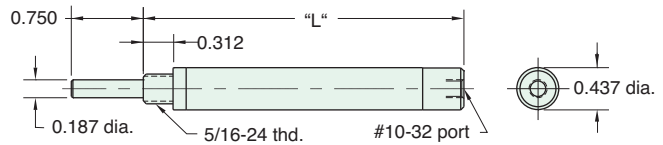
Rod nut included, but not shown on drawing

3SS-□

Mount: Stud **Stroke** | 1/2" | 1" | 2" | 3"
Type: Single Acting
 Spring Return **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

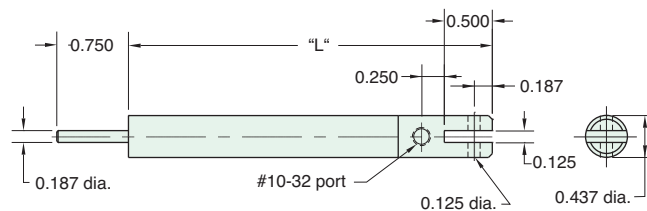


3CS-□

Mount: Clevis **Stroke** | 1/2" | 1" | 2" | 3"
Type: Single Acting
 Spring Return **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



3/8" BORE BRASS MINIMATIC® CYLINDER

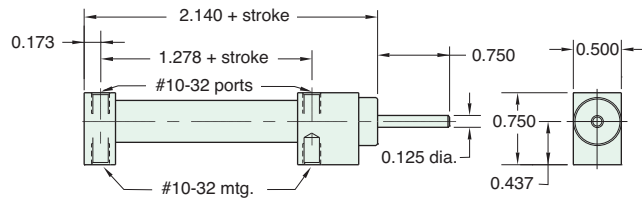


3BDS-□

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

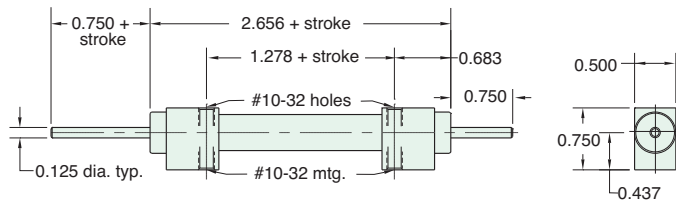


3BDD-□

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

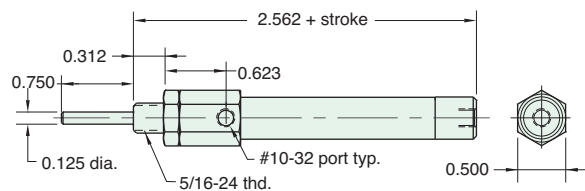


3SD-□

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



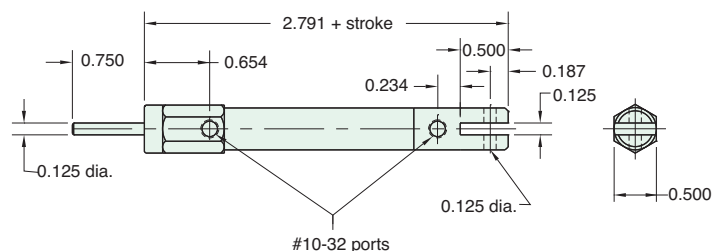
Nut included, but not shown on drawing

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

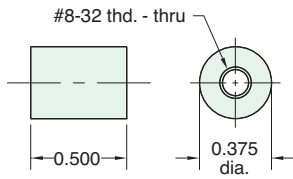




3/8" BORE MOUNTING BRACKETS

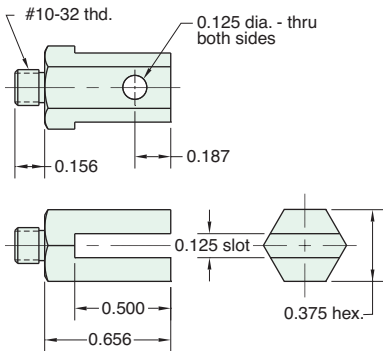
11767

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



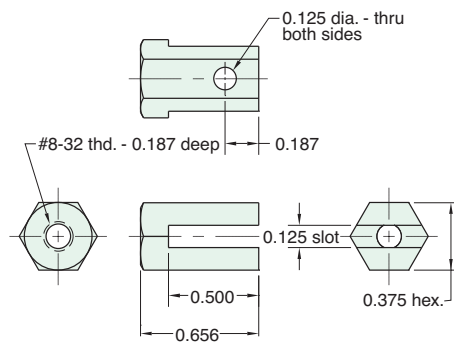
11996

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



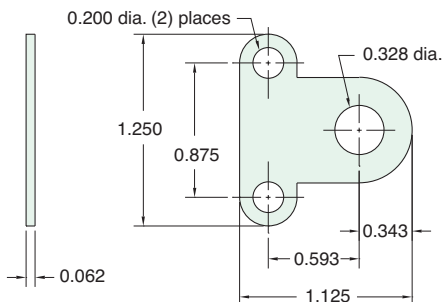
11997

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



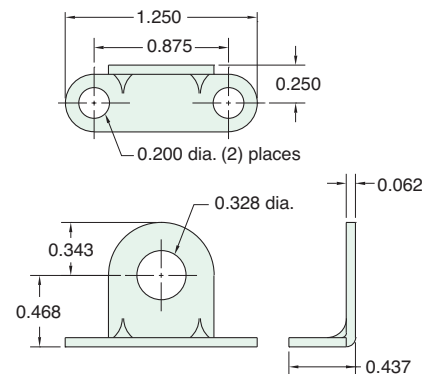
11917-2

Mounting Bracket (flat)



11918-2

Mounting Bracket (angled)



9/16" BORE BRASS MINIMATIC® CYLINDER



9PS-3/4

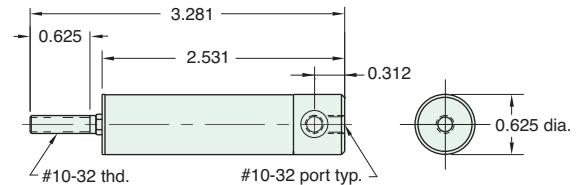
Mount: Body

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



Rod nut included, but not shown on drawing

9BS-□

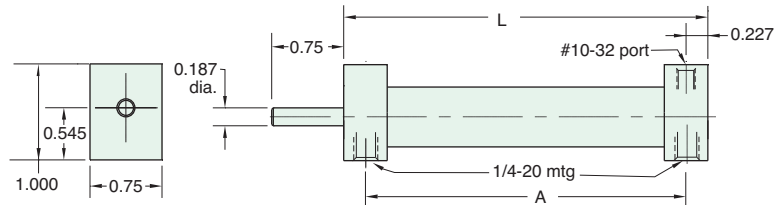
Mount: Block

Type: Single Acting
Spring Return

Stroke Length "L"	3/4"	1 1/2"	2 1/4"	3"
"A"	2.750	4.218	5.593	6.937
	2.298	3.764	5.139	6.483

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-□

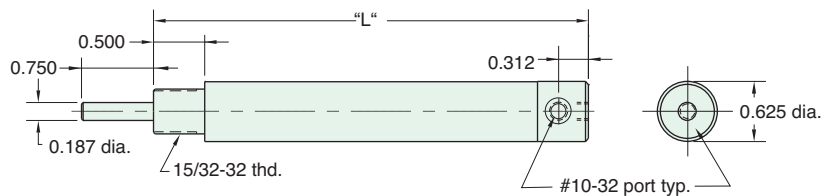
Mount: Stud

Type: Single Acting
Spring Return

Stroke Length "L"	3/4"	1 1/2"	2 1/4"	3"
	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-□

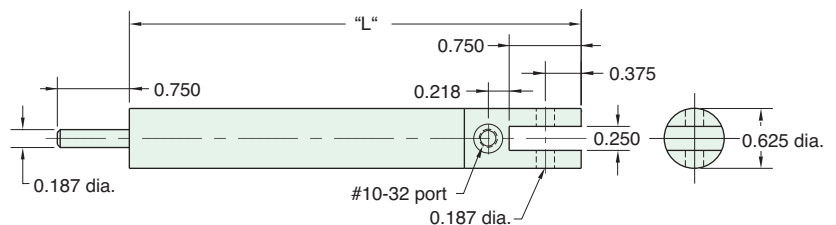
Mount: Clevis

Type: Single Acting
Spring Return

Stroke Length "L"	3/4"	1 1/2"	2 1/4"	3"
	3.343	4.703	6.062	7.421

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





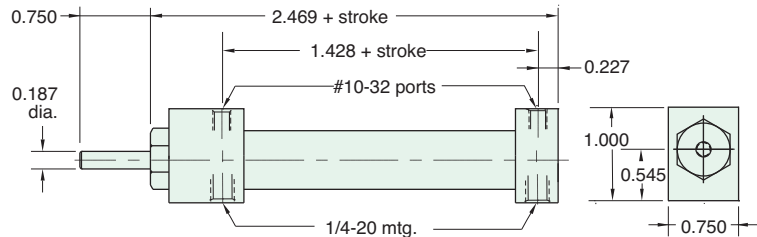
9/16" BORE BRASS MINIMATIC® CYLINDER

9BDS-□

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 #10-32 x 1/2" rod thread

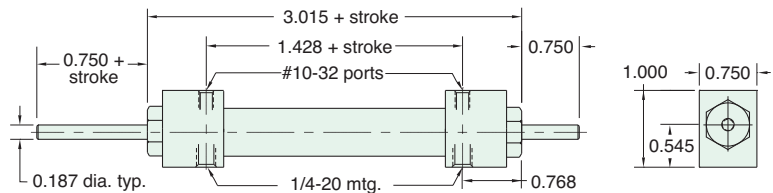


9BDD-□

Mount: Block **Available Stroke Lengths:** 1", 2", 3", 4", 5", 6"
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 #10-32 x 1/2" rod thread

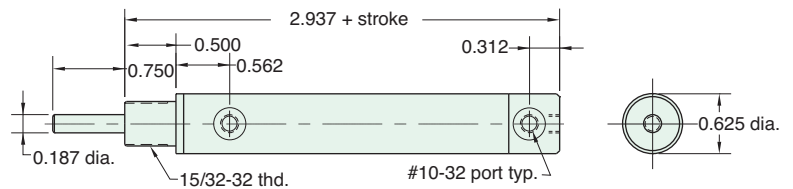


9SD-□

Mount: Stud **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 #10-32 x 1/2" rod thread



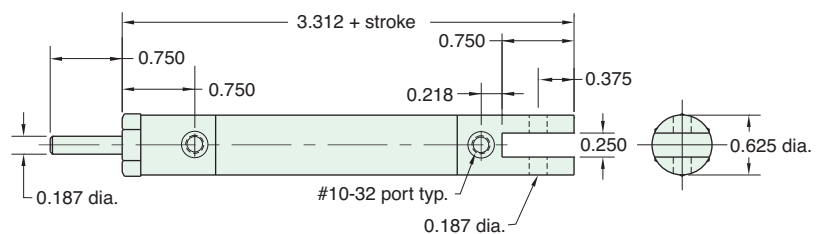
Nut included, but not shown on drawing

9CD-□

Mount: Clevis **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 #10-32 x 1/2" rod thread



9/16" BORE BRASS HEAVY DUTY CYLINDER

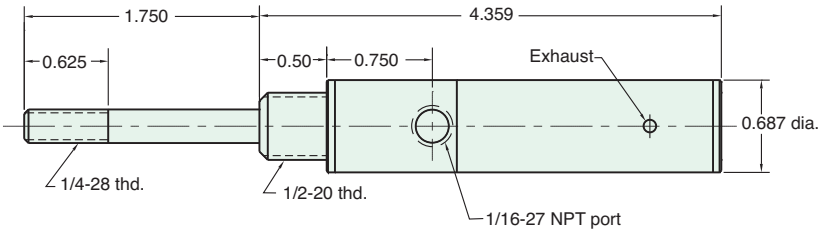


9SS-AR-1

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

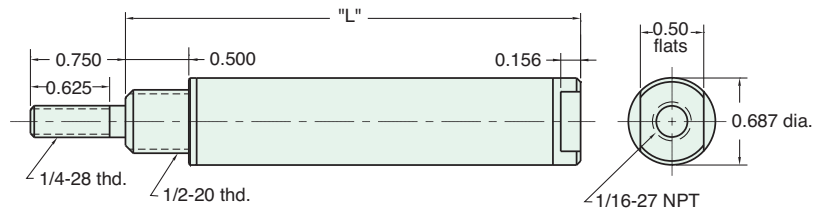
H9S-□S

Mount: Stud
Type: Single Acting
 Spring Return

Stroke Length "L"	1"	2"	3"
	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

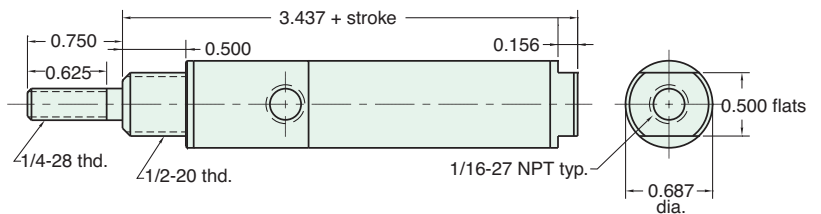
H9S-□D

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

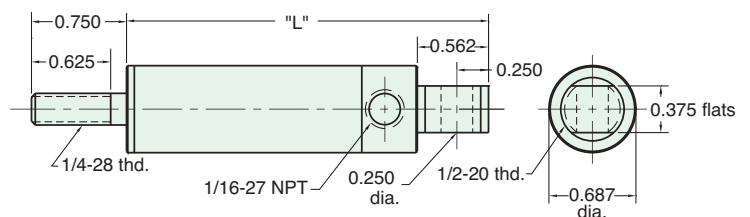
H9C-□S

Mount: Clevis
Type: Single Acting
 Spring Return

Stroke Length "L"	1"	2"	3"
	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

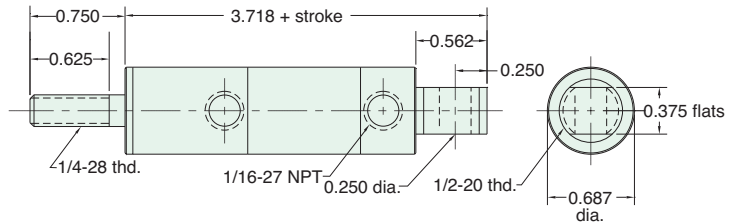
Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

H9C-□D

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

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

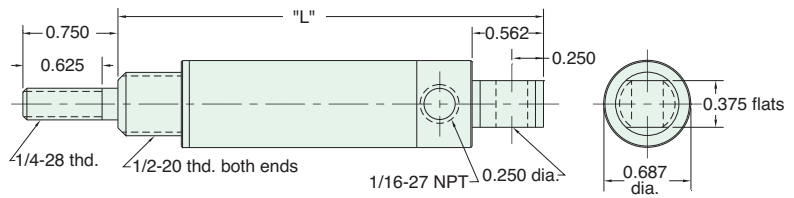
H9U-□S

Mount: Universal Type: Single Acting Spring Return

Stroke Length "L"	1"	2"	3"
	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



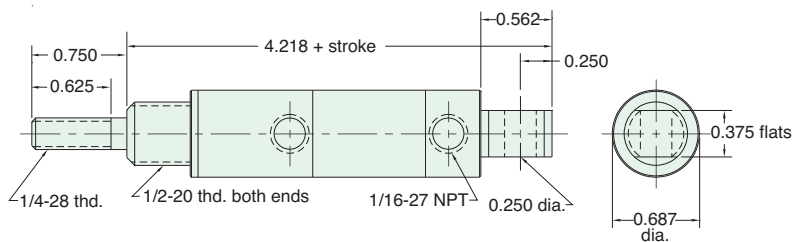
Nuts included, but not shown on drawing

H9U-□D

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

To order: Indicate stroke in box □

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



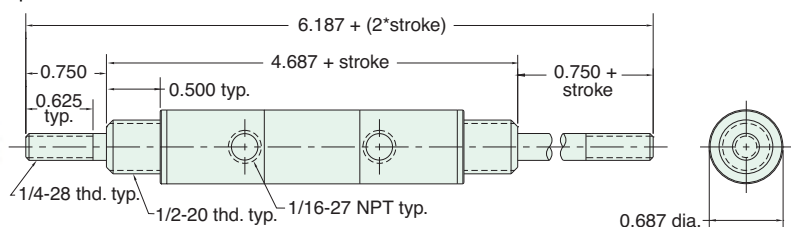
Nuts included, but not shown on drawing

H9D-□D

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

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

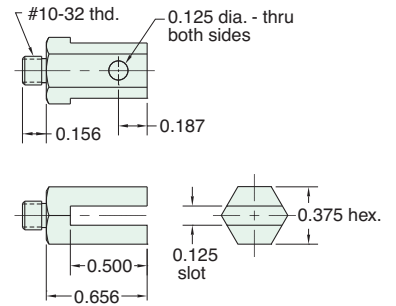
9/16" BORE MOUNTING BRACKETS



11996

Male Clevis

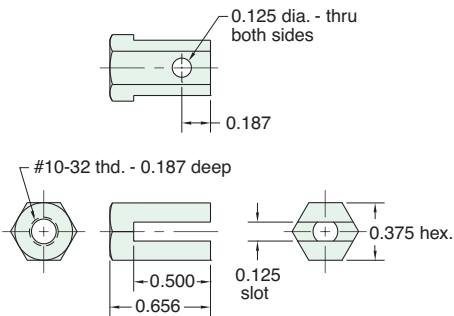
Mounts in rear of cylinder tapped #10-32



15009

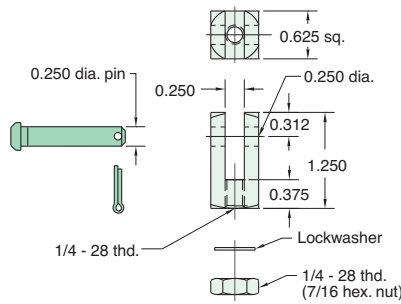
Female Clevis

For use with cylinders having #10-32 threaded shaft



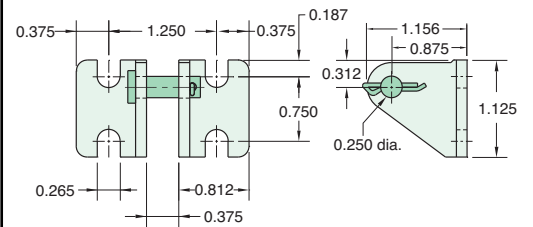
15015

Rod Clevis Assembly



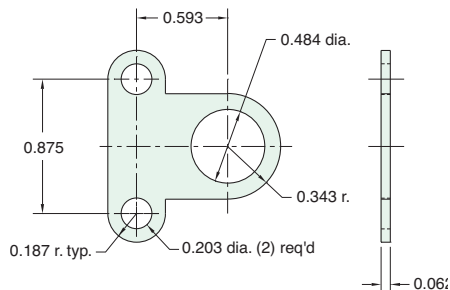
CB-1795

Clevis Bracket
Material: Steel,
bright zinc plated



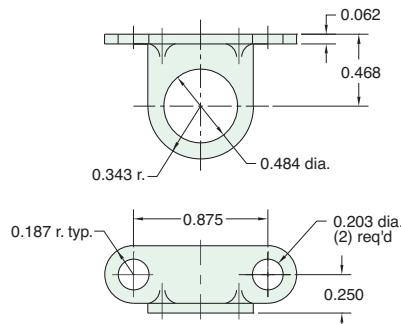
11917-1

Mounting
Bracket (flat)



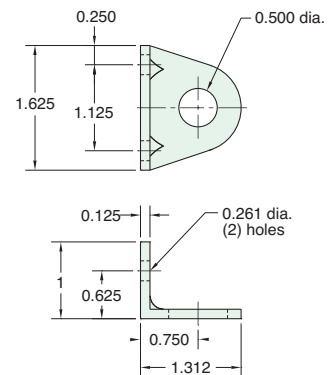
11918-1

Mounting
Bracket (angled)



15018-2

Foot Bracket
(angled)





7/8" BORE BRASS HEAVY DUTY CYLINDER

Consult factory for hydraulic applications

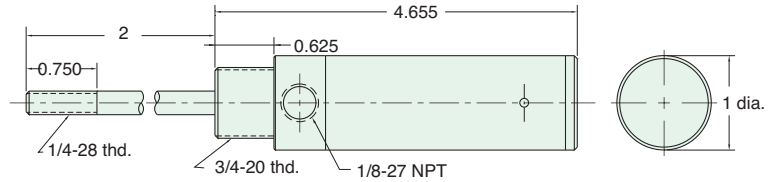
7SS-AR-1

Mount: Stud

Available Stroke Lengths: 1"

Type: Single Acting
Spring Extended

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



Nut included, but not shown on drawing

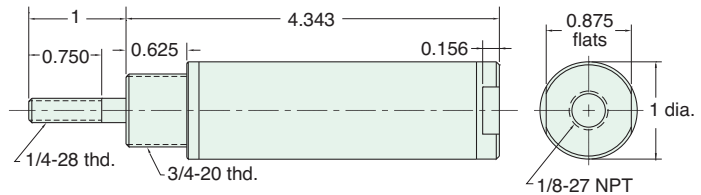
7SS-1

Mount: Stud

Available Stroke Lengths: 1"

Type: Single Acting
Spring Return

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



Nut included, but not shown on drawing

7SD-□

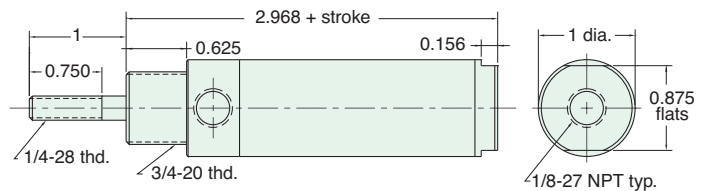
Mount: Stud

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

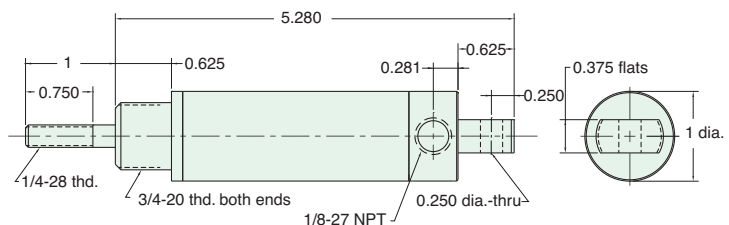
7S-1

Mount: Universal

Available Stroke Lengths: 1"

Type: Single Acting
Spring Return

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

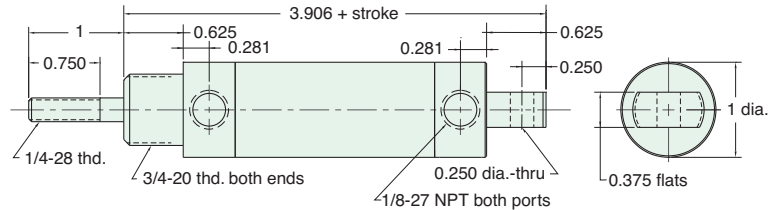
Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1,000 psig.



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



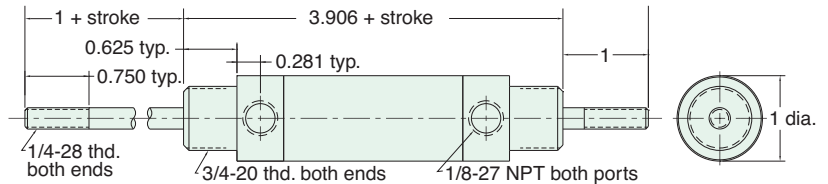
Nut included, but not shown on drawing



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.

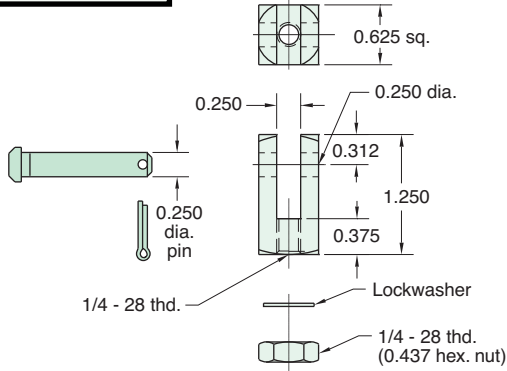




7/8" BORE MOUNTING BRACKETS

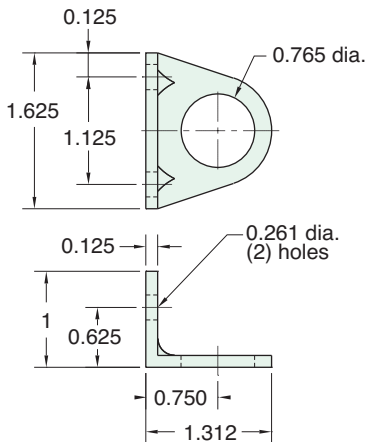
15015

Rod Clevis Assembly



15018-1

Foot Mounting Bracket



CUSTOMer
solutions

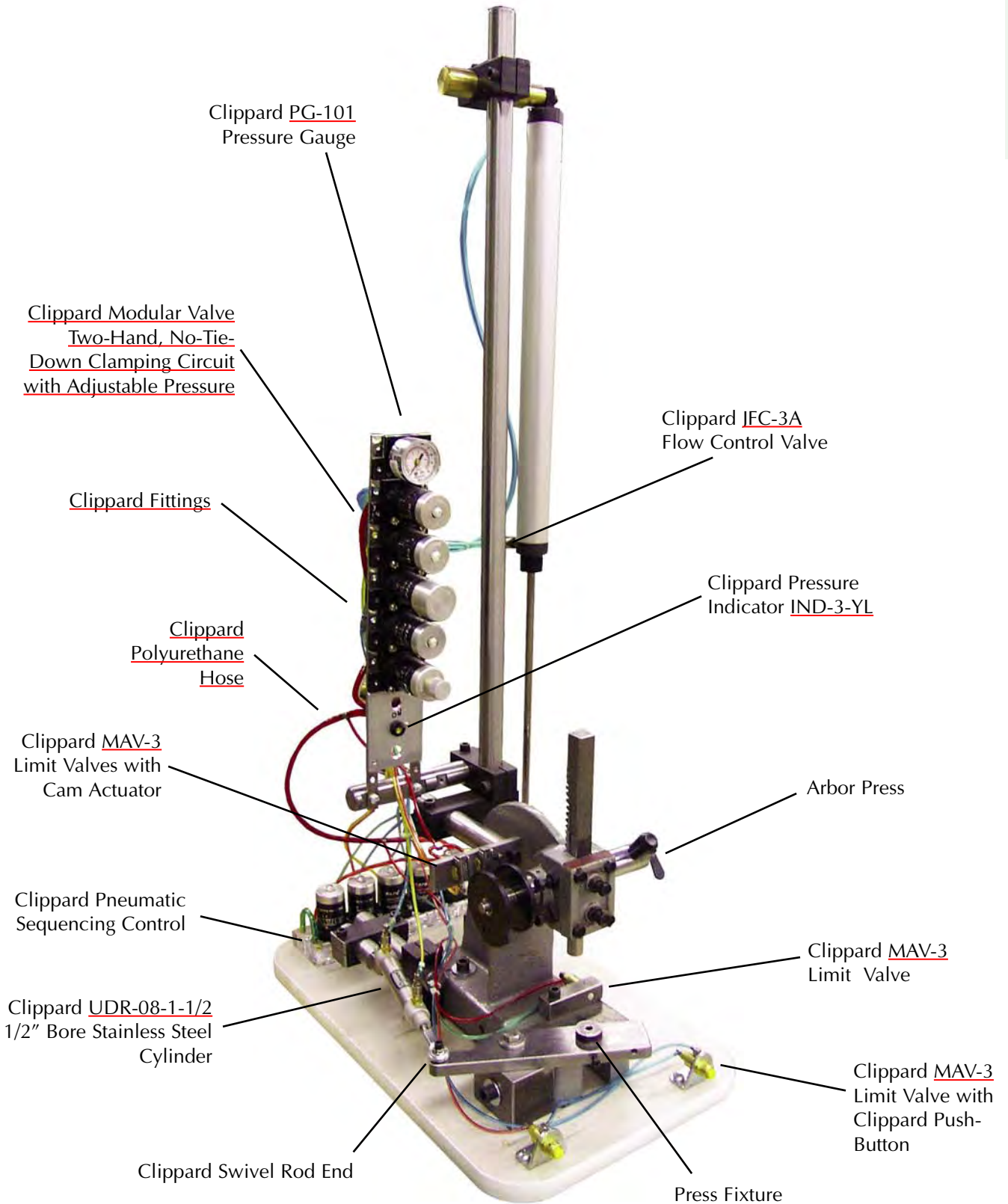
If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. Let us know YOUR Need, and we will help to find YOUR Solution!

Special Cylinders

Clippard produced the first rolled-construction cylinder in 1949. Since then, we have produced thousands of special configurations from cartridge designs to low break-away miniature cylinders.



Miniature Swing-In Automated Arbor Press





DIRECTIONAL CONTROL VALVES

CONTROL VALVE SELECTION CHARTS 97 - 103

2-WAY VALVES 104 - 108

3-WAY VALVES 109 - 117

PALM BUTTON VALVES 117

VALVE MOUNTING BRACKETS 117

4-WAY VALVES 118 - 124

VALVE ACTUATORS 127 - 130

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PRESSURE ACTUATED SWITCHES 145

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HEAVY-DUTY LIMIT VALVES 154

SENSORS 155 - 156

SPECIAL FUNCTION VALVES 157 - 159

PNEUMATIC COUNTER 160

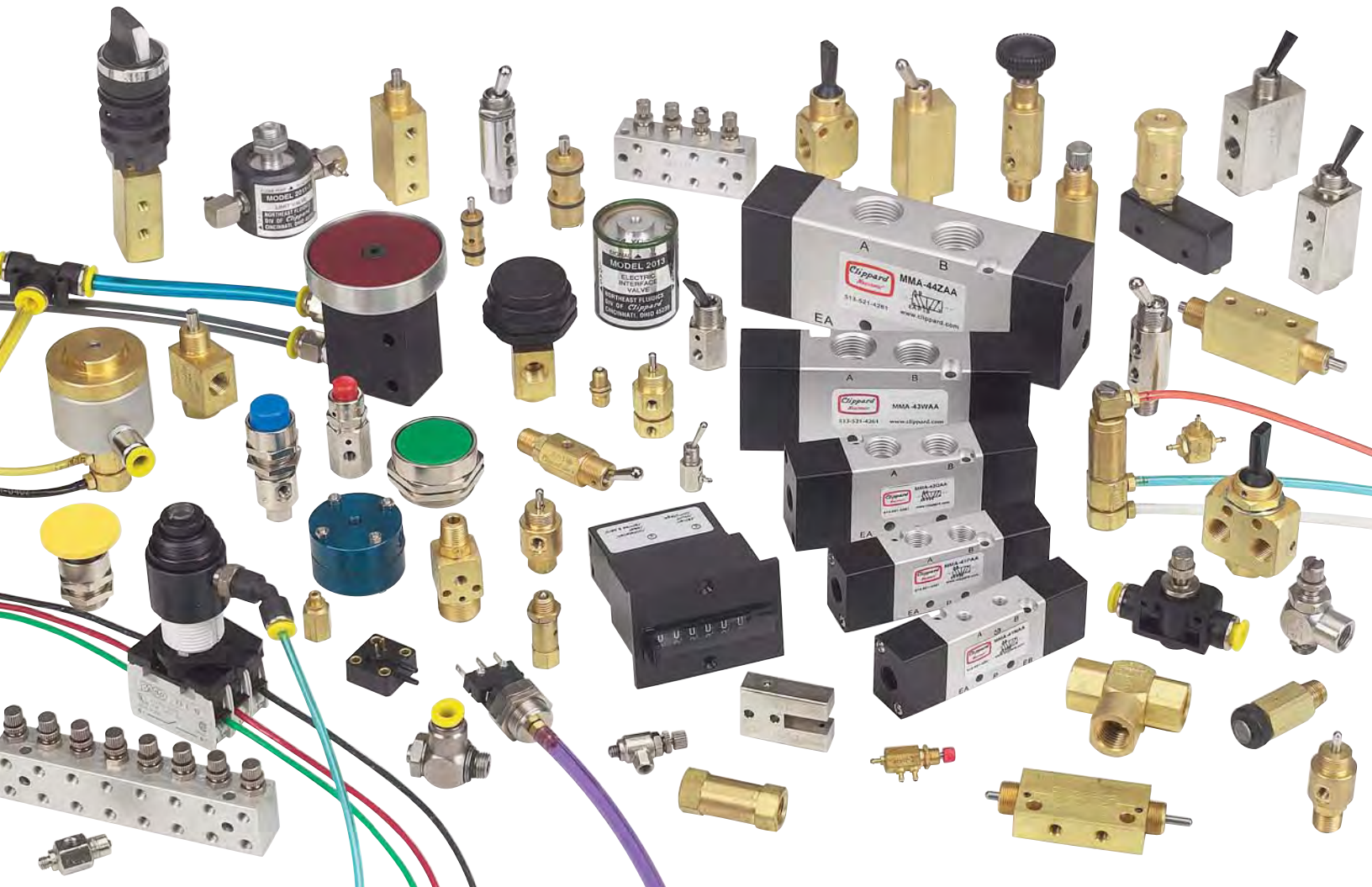
EXHAUST VALVES 161 - 162

NEEDLE VALVES 163 - 164

NEW! MUFFLERS 164

PRESSURE REGULATORS 165

SLEEVE VALVES 166

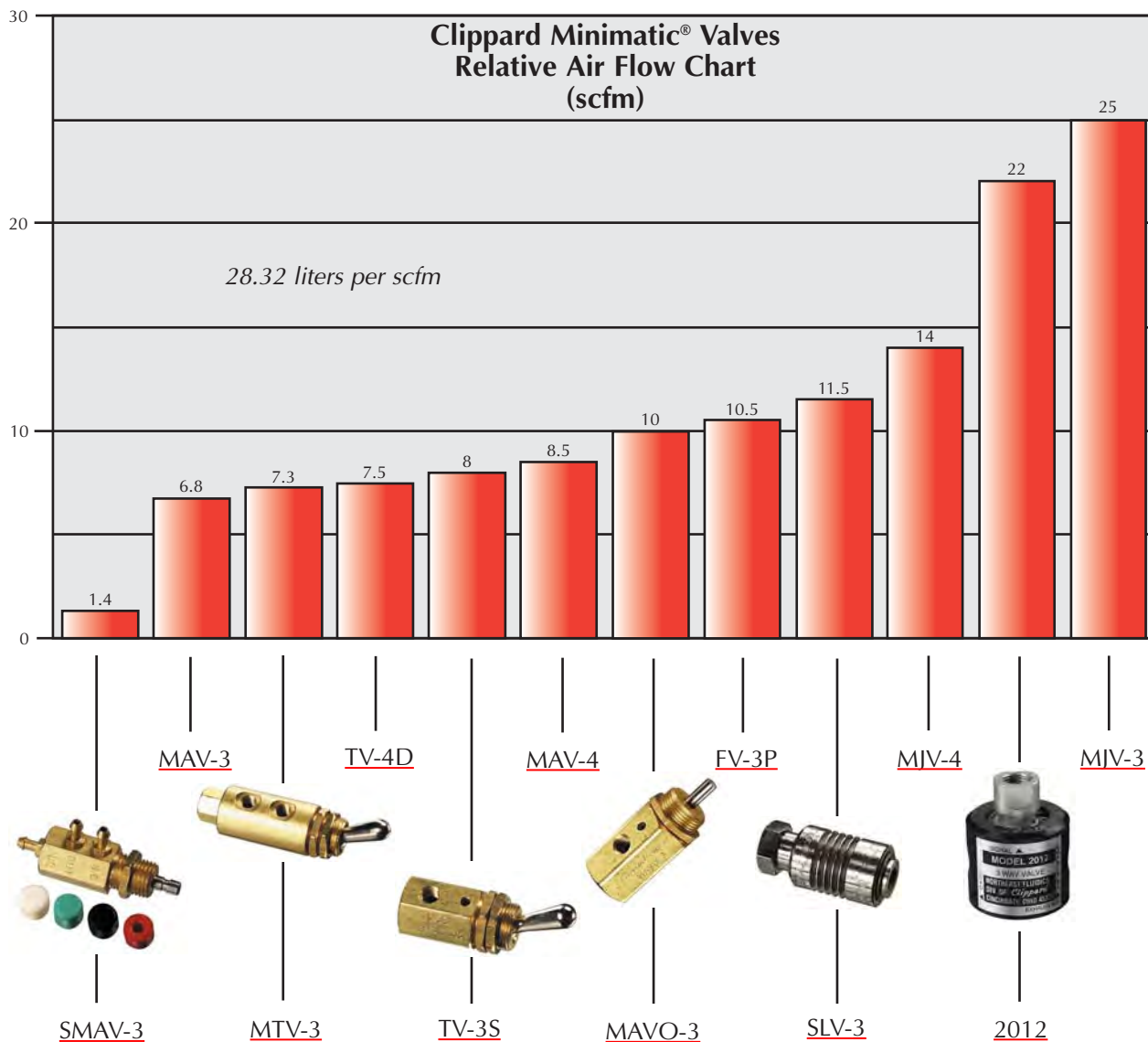




Every air system is unique . . . and Clippard has the air valve you need. Clippard control valves are available in poppet or spool design; 2-, 3-, or 4-way functions, in sizes from #3-56 and #10-32 (M5) through 1/8" NPT (G1/8) ports; and for pressures to 300 psig/21 bar. They are available with solenoid,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





SELECTION CHARTS

2-Way Toggle, Stem & Air-Piloted Valves

Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Derated	Metal Toggle	Plastic Toggle	Page No.
			Inlet	Outlet	Exhaust						
MTV-2	Poppet	7.3 scfm	#10-32	#10-32	-	▲	D	▲		106	
MTV-2-M5	Poppet	175 l/min	M5	M5	-	▲	D	▲		106	
MTV-2P	Poppet	7.3 scfm	1/8" NPT	#10-32	-	▲	D	▲		106	
TV-2S	Spool	8 scfm	#10-32	#10-32	-	▲	D	▲		106	
TV-2S-M5	Spool	190 l/min	M5	M5	-	▲	D	▲		106	
TV-2SF	Spool	8 scfm	#10-32	#10-32	-	▲	D		▲	106	
TV-2SF-M5	Spool	190 l/min	M5	M5	-	▲	D		▲	106	
TV-2SP	Spool	8 scfm	1/8" NPT	#10-32	-	▲	D	▲		106	
TV-2SFP	Spool	8 scfm	1/8" NPT	#10-32	-	▲	D		▲	106	
TV-2M	Poppet	8 scfm	#10-32	#10-32	-	▲	M	▲		106	
TV-2M-M5	Poppet	190 l/min	M5	M5	-	▲	M	▲		106	
TV-2MF	Poppet	8 scfm	#10-32	#10-32	-	▲	M		▲	106	
TV-2MF-M5	Poppet	190 l/min	M5	M5	-	▲	M		▲	106	
TV-2MP	Poppet	6.8 scfm	1/8" NPT	#10-32	-	▲	M	▲		107	
TV-2MFP	Poppet	6.8 scfm	1/8" NPT	#10-32	-	▲	M		▲	107	
TVO-2M	Spool	8 scfm	#10-32	#10-32	-	▲	M	▲		107	
TVO-2M-M5	Spool	190 l/min	M5	M5	-	▲	M	▲		107	
TVO-2MF	Spool	8 scfm	#10-32	#10-32	-	▲	M		▲	107	
TVO-2MF-M5	Spool	190 l/min	M5	M5	-	▲	M		▲	107	
TVO-2MP	Spool	6.8 scfm	1/8" NPT	#10-32	-	▲	M	▲		107	
TVO-2MFP	Spool	6.8 scfm	1/8" NPT	#10-32	-	▲	M		▲	107	
MAV-2	Poppet	6.8 scfm	#10-32	#10-32	-		▲			104	
MAV-2-M5	Poppet	170 l/min	M5	M5	-		▲			104	
MAV-2P	Poppet	6.8 scfm	1/8" NPT	#10-32	-		▲			104	
MAV-2C	Poppet	6 scfm	-	-	-		▲			104	
MIV-2C	Poppet	22 scfm	-	-	-		▲			105	
MAV-2R	Poppet	6.8 scfm	#10-32	#10-32	-		▲			104	
MAV-2R-M5	Poppet	170 l/min	M5	M5	-		▲			104	
MAVO-2	Spool	10 scfm	#10-32	#10-32	-	▲				104	
MAVO-2-M5	Spool	245 l/min	M5	M5	-	▲				104	
MAVO-2P	Spool	10 scfm	1/8" NPT	#10-32	-	▲				105	
MAVO-2C	Spool	10 scfm	-	-	-	▲				104	
MIV-2	Poppet	25 scfm	1/8" NPT	1/8" NPT	-		▲			105	
MIV-2-MG	Poppet	708 l/min	G1/8	G1/8	-		▲			105	
MIVO-2	Spool	12 scfm	1/8" NPT	1/8" NPT	-	▲				105	
MJVO-2-MG	Spool	600 l/min	G1/8	G1/8	-	▲				105	
MIVO-2C	Spool	15 scfm	-	-	-	▲				105	
PAV-2	Poppet	6.8 scfm	1/8" NPT	#10-32	-		▲			108	
PAV-2P	Poppet	6.8 scfm	1/8" NPT	1/8" NPT	-		▲			108	
PAVO-2	Spool	11.6 scfm	#10-32	#10-32	-	▲				108	
PAVO-2P	Spool	11.6 scfm	#10-32	1/8" NPT	-	▲				108	



3-Way Toggle Valves

Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Metal Toggle	Plastic Toggle	Page No.
			Inlet	Outlet	Exhaust						
MTV-3	Poppet	7 scfm	#10-32	#10-32	#10-32		▲	D	▲		111
MTV-3-M5	Poppet	175 l/min	M5	M5	M5		▲	D	▲		111
MTV-3P	Poppet	7 scfm	1/8" NPT	#10-32	#10-32		▲	D	▲		111
MITV-3	Poppet	25 scfm	1/8" NPT	1/8" NPT	1/8" NPT		▲	D	▲		112
MITV-3-MG	Poppet	600 l/min	G1/8	G1/8	G1/8		▲	D	▲		112
FTV-3	Spool	10 scfm	#10-32	#10-32	#10-32		▲	D	▲		113
FTV-3-M5	Spool	240 l/min	M5	M5	M5		▲	D	▲		113
FTV-3F	Spool	10 scfm	#10-32	#10-32	#10-32		▲	D		▲	113
FTV-3F-M5	Spool	130 l/min	M5	M5	M5		▲	D		▲	113
FTV-3P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT		▲	D	▲		113
FTV-3-MG	Spool	250 l/min	G1/8	G1/8	G1/8		▲	D	▲		113
FTV-3FP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT		▲	D		▲	113
FTV-3F-MG	Spool	250 l/min	G1/8	G1/8	G1/8		▲	D		▲	113
TV-3S	Spool	8 scfm	#10-32	#10-32	hole in body		▲	D	▲		111
TV-3S-M5	Spool	190 l/min	M5	M5	hole in body		▲	D	▲		111
TV-3SF	Spool	8 scfm	#10-32	#10-32	hole in body		▲	D		▲	111
TV-3SF-M5	Spool	190 l/min	M5	M5	hole in body		▲	D		▲	111
TV-3SP	Spool	8 scfm	1/8" NPT	#10-32	hole in body		▲	D	▲		111
TV-3SFP	Spool	8 scfm	1/8" NPT	#10-32	hole in body		▲	D		▲	111
TV-3M	Poppet	6.8 scfm	#10-32	#10-32	hole in body		▲	M	▲		111
TV-3M-M5	Poppet	170 l/min	M5	M5	hole in body		▲	M	▲		111
TV-3MF	Poppet	6.8 scfm	#10-32	#10-32	hole in body		▲	M		▲	111
TV-3MF-M5	Poppet	170 l/min	M5	M5	hole in body		▲	M		▲	111
TV-3MP	Poppet	6.8 scfm	1/8" NPT	#10-32	hole in body		▲	M	▲		112
TV-3MFP	Poppet	6.8 scfm	1/8" NPT	#10-32	hole in body		▲	M		▲	112
TVO-3M	Spool	6.8 scfm	#10-32	#10-32	hole in body	▲		M	▲		112
TVO-3M-M5	Spool	170 l/min	M5	M5	hole in body	▲		M	▲		112
TVO-3MF	Spool	6.8 scfm	#10-32	#10-32	hole in body	▲		M		▲	112
TVO-3MF-M5	Spool	170 l/min	M5	M5	hole in body	▲		M		▲	112
TVO-3MP	Spool	6.8 scfm	1/8" NPT	#10-32	hole in body	▲		M	▲		112
TVO-3MFP	Spool	6.8 scfm	1/8" NPT	#10-32	hole in body	▲		M		▲	112
SMTV-3	Spool	1.4 scfm	#3-56*	#3-56*	hole in body	▲	▲	D	▲		113

Toggle Valves

* With hose barbs uninstalled



SELECTION CHARTS

3-Way Stem Valves

Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Metal Toggle	Plastic Toggle	Page No.
			Inlet	Outlet	Exhaust						
FV-3	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲				110
FV-3-M5	Spool	240 l/min	M5	M5	M5	▲	▲				110
FV-3-MG	Spool	240 l/min	G1/8	G1/8	G1/8	▲	▲				110
FV-3D	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲				110
FV-3D-M5	Spool	240 l/min	M5	M5	M5	▲	▲				110
FV-3DP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲				110
FV-3DP-MG	Spool	240 l/min	G1/8	G1/8	G1/8	▲	▲				110
FV-3P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲				110
MAV-3	Poppet	6.8 scfm	#10-32	#10-32	through stem		▲				109
MAV-3-M5	Poppet	170 l/min	M5	M5	through stem		▲				109
MAV-3P	Poppet	6.8 scfm	1/8" NPT	#10-32	through stem		▲				109
MAV-3C	Poppet	6 scfm	Cartridge	Cartridge	through stem		▲				109
MAV-3R	Poppet	6.8 scfm	#10-32	#10-32	through stem		▲				109
MAV-3R-M5	Poppet	193 l/min	M5	M5	through stem		▲				109
MAVO-3	Spool	10 scfm	#10-32	#10-32	holes in body	▲					109
MAVO-3-M5	Spool	245 l/min	M5	M5	holes in body	▲					109
MAVO-3P	Spool	10 scfm	#10-32	#10-32	holes in body	▲					109
MAVO-3C	Spool	10 scfm	Cartridge	Cartridge	holes in body	▲					109
MJV-3	Poppet	25 scfm	1/8" NPT	1/8" NPT	through stem		▲				110
MJV-3-MG	Poppet	708 l/min	G1/8	G1/8	through stem		▲				110
MJV-3C	Poppet	22 scfm	Cartridge	Cartridge	through stem		▲				110
MJVO-3	Spool	12 scfm	1/8" NPT	1/8" NPT	holes in body	▲					109
MJVO-3-MG	Spool	600 l/min	G1/8	G1/8	holes in body	▲					109
MJVO-3C	Spool	15 scfm	Cartridge	Cartridge	holes in body	▲					110
SMAV-3	Spool	1.4 scfm	#3-56	#3-56	#3-56	▲	▲				113
PAV-3	Poppet	6.8 scfm	#10-32	#10-32	holes in body		▲				114
PAV-3P	Poppet	6.8 scfm	#10-32	1/8" NPT	holes in body		▲				114
PAVO-3	Spool	11.6 scfm	#10-32	#10-32	holes in body	▲					114
PAVO-3P	Spool	11.6 scfm	#10-32	1/8" NPT	holes in body	▲					114

Stem Valves



4-Way Toggle & Stem Valves

	Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Metal Toggle	Plastic Toggle	Page No.
				Inlet	Outlet	Exhaust						
Toggle Valves	TV-4D(M)	Spool	7.5 scfm	#10-32	#10-32	holes in body		▲	D	▲	▲	121
	TV-4D-M5	Spool	180 l/min	M5	M5	holes in body		▲	D	▲	▲	121
	TV-4M(M)	Spool	7.5 scfm	#10-32	#10-32	holes in body		▲	D	▲	▲	121
	TV-4DM(M)	Spool	7.5 scfm	#10-32	#10-32	holes in body		▲	D	▲	▲	121
	TV-4DP(M)	Spool	7.5 scfm	1/8" NPT	1/8" NPT	holes in body		▲	D	▲	▲	121
	TV-4MP(M)	Spool	7.5 scfm	1/8" NPT	1/8" NPT	holes in body		▲	D	▲	▲	121
	TV-4DMP(M)	Spool	7.5 scfm	1/8" NPT	1/8" NPT	holes in body		▲	D	▲	▲	121
	MTV-4	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲	D	▲		120
	MTV-4-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲	D	▲		120
	MTV-4F	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲	D		▲	120
	MTV-4F-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲	D		▲	120
	MJTV-4	Spool	10.5 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲	D	▲		120
	MJTV-4-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲	D	▲		120
	MJTV-4F	Spool	10.5 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲	D		▲	120
	MJTV-4F-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲	D		▲	120
	MTV-5	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲	D	▲		120
	MTV-5-M5	Spool	240 l/min	M5	M5	M5	▲	▲	D	▲		120
	MTV-5F	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲	D		▲	120
	MTV-5F-M5	Spool	240 l/min	M5	M5	M5	▲	▲	D		▲	120
	MJTV-5	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲	D	▲		120
MJTV-5-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲	D	▲		120	
MJTV-5F	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲	D		▲	120	
MJTV-5F-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲	D		▲	120	
Stem Valves	MAV-4	Spool	8.5 scfm	#10-32	#10-32	holes in body	▲	▲				118
	MAV-4-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				118
	MAV-4D	Spool	8.5 scfm	#10-32	#10-32	holes in body	▲	▲				118
	MAV-4D-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				118
	MJV-4	Spool	14 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲				118
	MJV-4-MG	Spool	396 l/min	G1/8	G1/8	holes in body	▲	▲				118
	MJV-4D	Spool	14 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲				118
	MJV-4D-MG	Spool	396 l/min	G1/8	G1/8	holes in body	▲	▲				118
	FV-4	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲				118
	FV-4-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				118
	FV-4-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲				118
	FV-4P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲				118
	FV-4D	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲				118
	FV-4D-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				118



4-Way Stem Valves Cont'd.

	Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Metal Toggle	Plastic Toggle	Page No.
				Inlet	Outlet	Exhaust						
Stem Valves	FV-4DP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲				118
	FV-4D-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲				118
	FV-5	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲				119
	FV-5-M5	Spool	240 l/min	M5	M5	#10-32	▲	▲				119
	FV-5P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲				119
	FV-5-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲				119
	FV-5D	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲				119
	FV-5D-M5	Spool	240 l/min	M5	M5	M5	▲	▲				119
	FV-5DP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲				119
	FV-5D-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲				119

Options

-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. Consult factory for availability.

CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**

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.

Maximatic® 3- & 4-Way Valves

3-Way Valves

Series No.	Inlet	Ports Outlet	Exhaust	Function	Cv	Flow @ 100 psig	Page
MMA-31NAS	#10-32	#10-32	#10-32	3/2	0.58	27 scfm	115
MMA-31PAS	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.67	31 scfm	115
MMA-32QAS	1/4" NPT	1/4" NPT	1/8" NPT	3/2	0.89	49 scfm	115
MMA-33WAS	3/8" NPT	3/8" NPT	1/4" NPT	3/2	1.68	93 scfm	115
MMA-34ZAS	1/2" NPT	1/2" NPT	1/2" NPT	3/2	2.79	171 scfm	115
MMA-31NAA	#10-32	#10-32	#10-32	3/2	0.58	27 scfm	115
MMA-31PAA	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.67	31 scfm	115
MMA-32QAA	1/4" NPT	1/4" NPT	1/8" NPT	3/2	0.89	49 scfm	115
MMA-33WAA	3/8" NPT	3/8" NPT	1/4" NPT	3/2	1.68	93 scfm	115
MMA-34ZAA	1/2" NPT	1/2" NPT	1/2" NPT	3/2	2.79	171 scfm	115

4-Way Valves

Series No.	Inlet	Ports Outlet	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-WAY STEM VALVES



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” position elec-

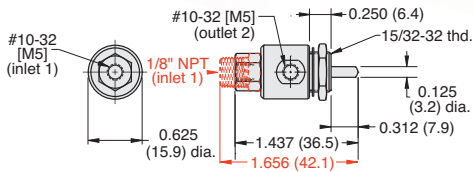
tricity flows from supply to the light, and in the “off” position the electrical current flow is stopped. 2-way stem valves may have a poppet or spool, and, by depressing the stem, a Normally-Closed (NC) valve is opened and a Normally-Open (NO) valve is closed. A variety of actuators may be attached 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

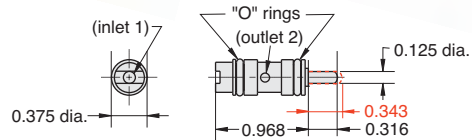
Force For Full Stem Travel: 24 oz. nominal

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 Cartridge Valves



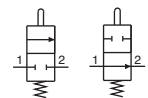
Input Pressure: 300 psig

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

Force For Full Stem Travel: 24 oz. nominal

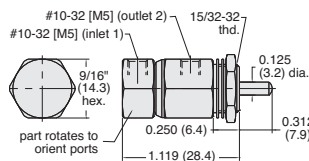
Mounting: Inserts into a 3/8" bore (0.375" ±0.001")

Note: See page 105 for mounting details



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

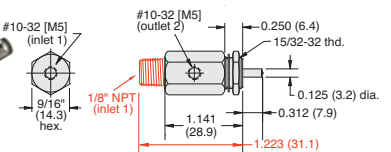
Force For Full Stem Travel: 24 oz. nominal

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

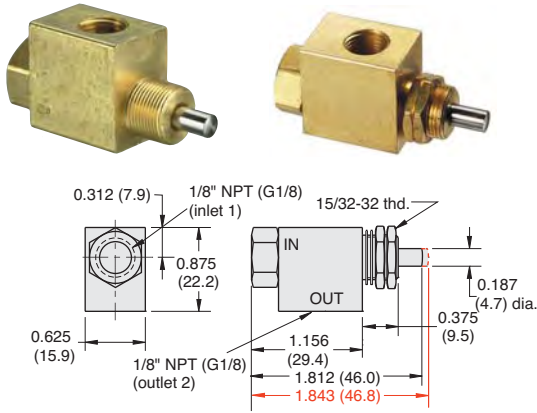
Force For Full Stem Travel: 32 oz. nominal

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



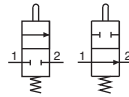
Part No.	Description
MAVO-2	2-Way Normally-Open Spool Valve, #10-32
MAVO-2-M5	2-Way Normally-Open Spool Valve, M5
MAVO-2P	2-Way Normally-Open Spool Valve, 1/8" NPT

J-Series Miniature 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

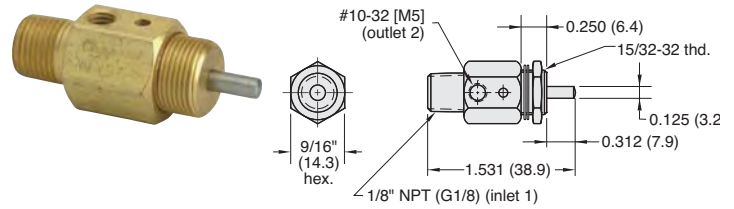


Force For Full Stem Travel: MJV-2/MJV-2-MG - 38 oz. nominal
MJVO-2/MJVO-2-MG - 36 oz. nominal

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

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.

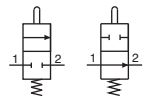
Air Flow: 11 scfm @ 50 psig; 22 scfm @ 100 psig

Force For Full Stem Travel: 24 oz. nominal

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

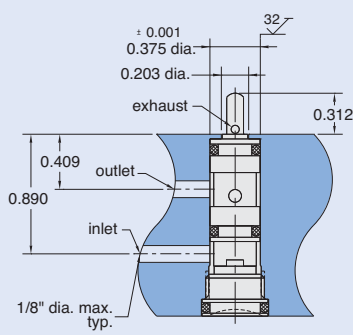
Note: See below for mounting details

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

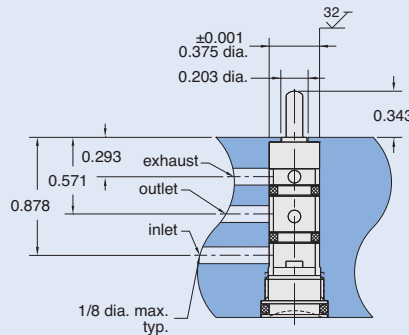


Cartridge Valve Mounting

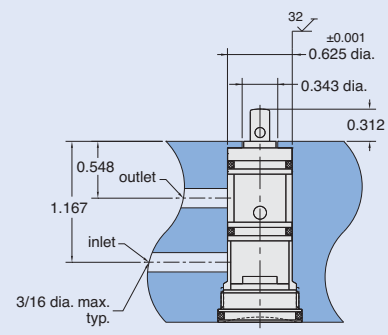
Clippard miniature cartridge valves offer the user flexibility in the application of 2-way and 3-way Normally-Open or Normally-Closed valves. Two sizes are provided: to fit either a 0.375" diameter bore or 0.625" diameter bore. They are used in Clippard heavy-duty limit switches and are suitable for 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



2-WAY TOGGLE VALVES



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.

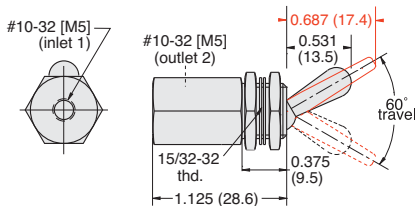
Medium: Air, Water or Oil

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

Force For Full Stem Travel: 12 oz. nominal

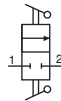
Mounting: 15/32-32 thread. Nuts and lockwashers furnished.

2 Position Spool Valves



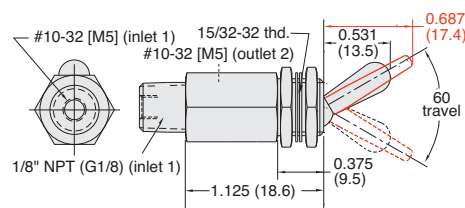
Input Pressure: 150 psig/10 bar max.

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



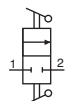
Part No.	Description
TV-2S	2 Position Spool Valve, NP Steel Toggle, #10-32
TV-2S-M5	2 Position Spool Valve, NP Steel Toggle, M5
TV-2SF	2 Position Spool Valve, Plastic Toggle, #10-32
TV-2SF-M5	2 Position Spool Valve, Plastic Toggle, M5

2 Pos. Spool Valves with 1/8" NPT Inlet



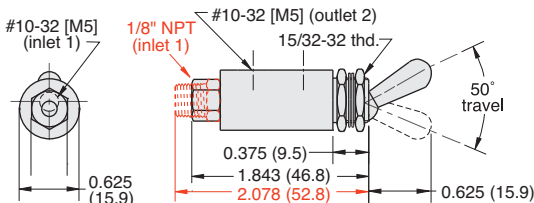
Input Pressure: 150 psig max.

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



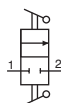
Part No.	Description
TV-2SP	2 Position Spool Valve, NP Steel Toggle, 1/8" NPT
TV-2SFP	2 Position Spool Valve, Plastic Toggle, 1/8" NPT

2 Position Poppet Valves



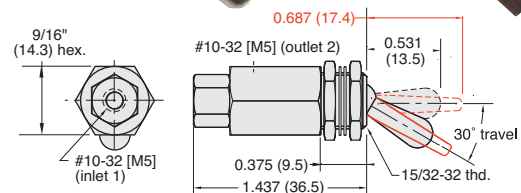
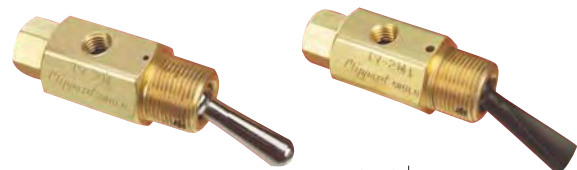
Input Pressure: 150 psig/10 bar max.

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



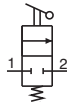
Part No.	Description
MTV-2	2 Position Poppet Valve, NP Brass Toggle, #10-32
MTV-2-M5	2 Position Poppet Valve, NP Brass Toggle, M5
MTV-2P	2 Position Poppet Valve, NP Brass Toggle, 1/8" NPT

2 Pos. 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

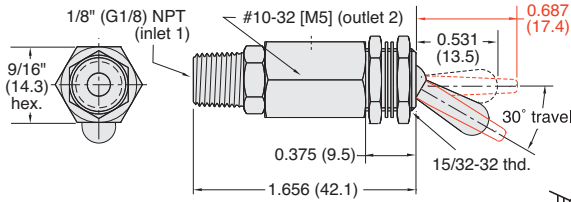


Part No.	Description
TV-2M	2 Position N.C. Poppet Valve, NP Steel Toggle, #10-32
TV-2M-M5	2 Position N.C. Poppet Valve, NP Steel Toggle, M5
TV-2MF	2 Position N.C. Poppet Valve, Plastic Toggle, #10-32
TV-2MF-M5	2 Position N.C. Poppet Valve, Plastic Toggle, M5

2-WAY TOGGLE VALVES

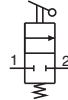


2 Pos. N.C. Poppet w/Momentary Actuation



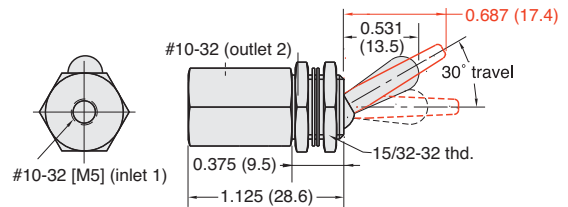
Input Pressure: 150 psig max.

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



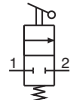
Part No.	Description
TV-2MP	2 Position Poppet Valve, NP Steel Toggle, 1/8" NPT
TV-2MFP	2 Position Poppet Valve, Plastic Toggle, 1/8" NPT

2 Pos. N.O. Spool w/Momentary Actuation



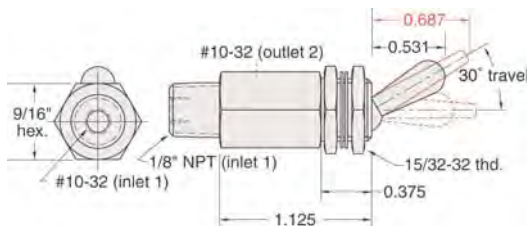
Input Pressure: 150 psig/10 bar max

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



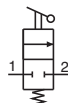
Part No.	Description
TVO-2M	2 Position N.O. Spool Valve, NP Steel Toggle, #10-32
TVO-2M-M5	2 Position N.O. Spool Valve, NP Steel Toggle, M5
TVO-2MF	2 Position N.O. Spool Valve, Plastic Toggle, #10-32
TVO-2MF-M5	2 Position N.O. Spool Valve, Plastic Toggle, M5

2 Pos. N.O. Spool 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 Spool Valve, NP Steel Toggle
TVO-2MFP	2 Position Spool Valve, Plastic Toggle

CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**



Specials!

Clippard has been and still is a pioneer in miniature pneumatics. This cartridge 2-way valve is small and packs a lot of flow into a very tight package. If you don't see what you need in this section, just call us!



2-WAY AIR-PILOTED VALVES

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 (N.C.) valve is opened and a Normally-Open (N.O.) 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

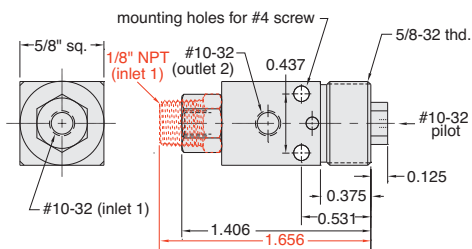
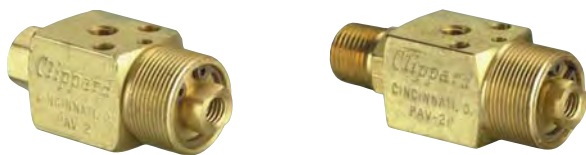
Stem Travel: 1/8" (3.2)

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.

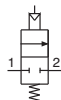
Foot Bracket: FB-1791

Air-Piloted N.C. Poppet Valves



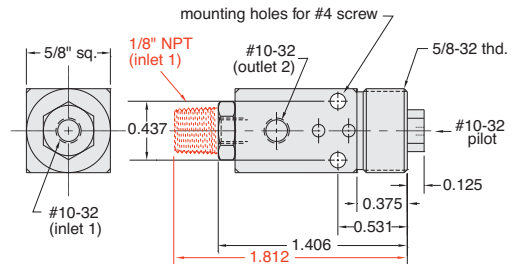
Input Pressure: 300 psig max.

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



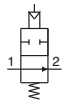
Part No.	Description
PAV-2	Normally-Closed Poppet Valve, #10-32
PAV-2P	Normally-Closed Poppet Valve, 1/8" NPT

Air-Piloted N.O. Spool Valves



Input Pressure: 150 psig max.

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

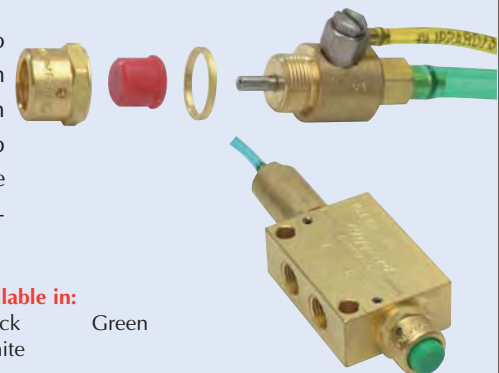


Part No.	Description
PAVO-2	Normally-Open Spool Valve, #10-32
PAVO-2P	Normally-Open Spool Valve, 1/8" NPT

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 131 for more information.



Button Housing Available in:

- Black Chrome
- Electroless
- Brass
- Nickel Plated

Button Colors Available in:

- Yellow
- Black
- Red
- White
- Green



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

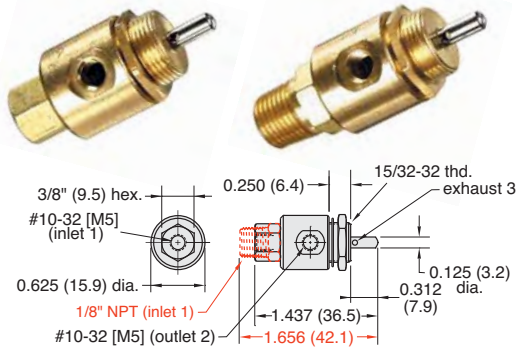
blocking the exhaust. Releasing the stem closes the inlet and opens the outlet to an exhaust port which vents the outlet to atmosphere. 3-way stem valves may have a poppet or spool and be Normally-Closed (N.C.) or Normally-Open (N.O.).

Medium: Air

Stem Travel: 1/8" (3.2)

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

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

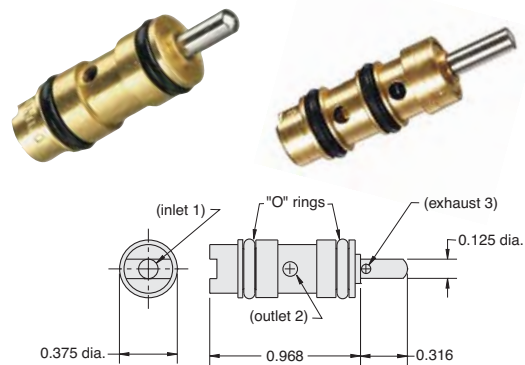
Force For Full Stem Travel: 24 oz. nominal

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



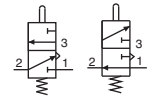
Input Pressure: 300 psig

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

Force For Full Stem Travel: 24 oz. nominal

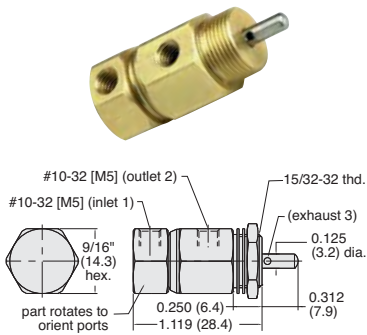
Mounting: Inserts into a 3/8" bore (0.375" 0.001")

Note: See page 105 for mounting details



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

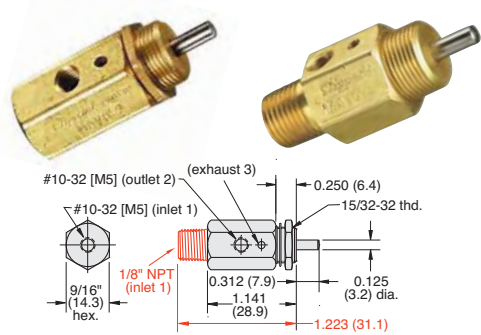
Force For Full Stem Travel: 24 oz. nominal

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.

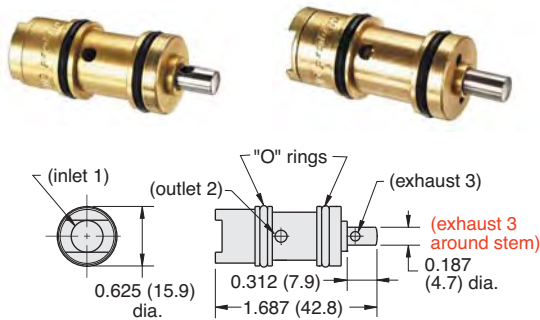


Part No.	Description
MAVO-3	Normally-Open Spool Valve, #10-32
MAVO-3-M5	Normally-Open Spool Valve, M5
MAVO-3P	Normally-Open Spool Valve, 1/8" NPT



3-WAY STEM VALVES

J-Series Poppet Cartridge Valves



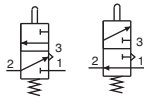
Input Pressure: 300 psig

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

Force For Full Stem Travel: 38 oz. nominal

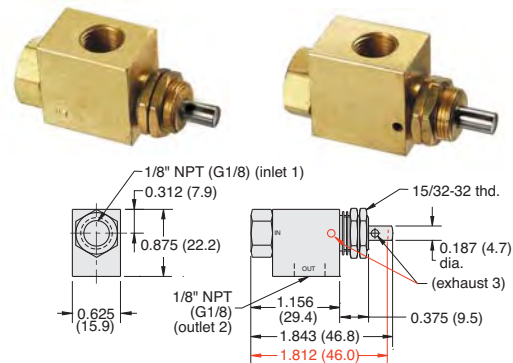
Mounting: Inserts into a 5/8" bore (0.625" ±0.001")

Note: See [page 105](#) for mounting details



Part No.	Description
MIV-3C	3-Way Normally-Closed Poppet Cartridge Valve
MIVO-3C	3-Way Normally-Open Poppet Cartridge Valve

J-Series 3-Way Poppet Valves

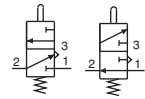


Input Pressure: MJV-3/MJV-3-MG - 300 psig/21 bar max.
MJVO-3/MJVO-3-MG - 150 psig/10 bar max.

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

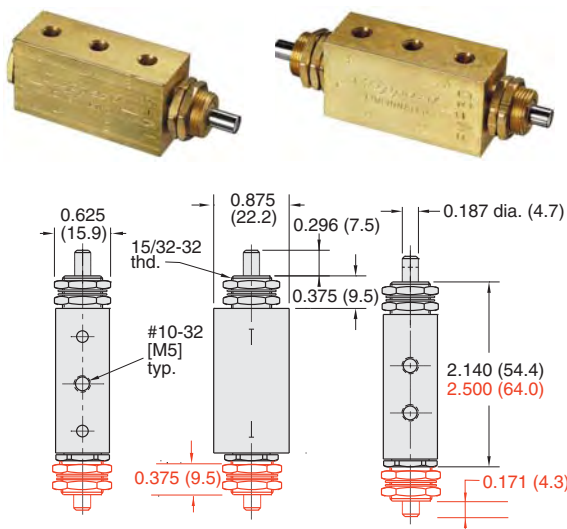
Force For Full Stem Travel: 38 oz. nominal

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



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

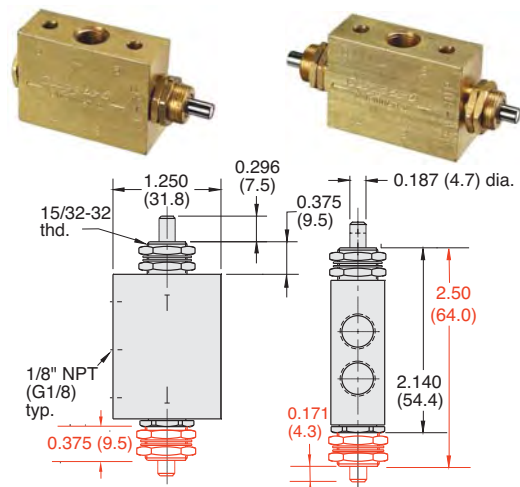
Force For Full Stem Travel: FV-3 & FV-3-M5 - 4 1/2 pounds nominal.
FV-3D & FV-3D-M5 - 1 1/2 pounds nominal

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 TOGGLE VALVES



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.

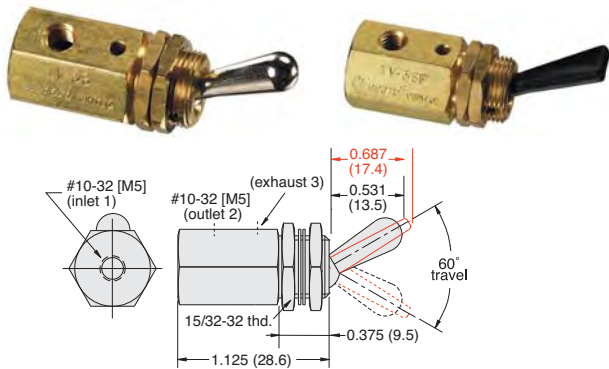
Medium: Air

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

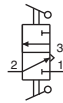
2 Position Spool Valves



Input Pressure: 150 psig/10 bar max.

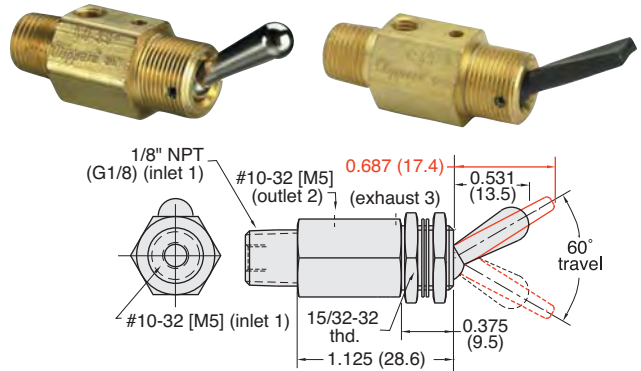
Air Flow: 4.5 scfm @ 50 psig; 8.0 scfm @ 100 psig;
190 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



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

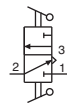
2 Pos. Spool Valve with 1/8" NPT Inlet



Input Pressure: 150 psig/10 bar max.

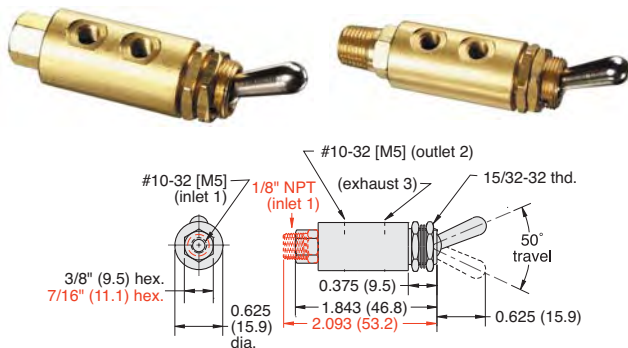
Air Flow: 4.5 scfm @ 50 psig; 8.0 scfm @ 100 psig;
190 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



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

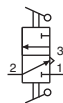
2 Position Poppet Valves



Input Pressure: 150 psig/10 bar max.

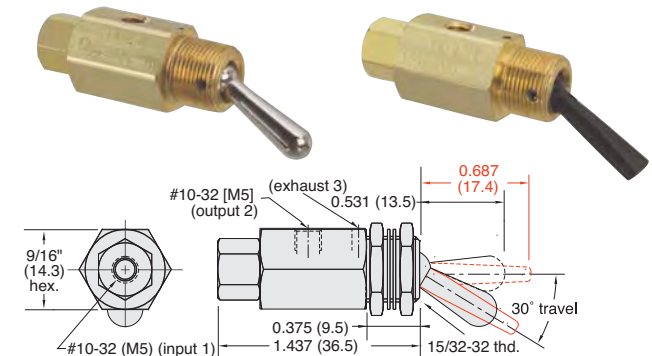
Air Flow: 4.0 scfm @ 50 psig; 6.8 scfm @ 100 psig;
175 l/min @ 6 bar

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

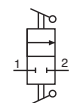
2 Pos. N.C. Poppet with Momentary Actuation



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

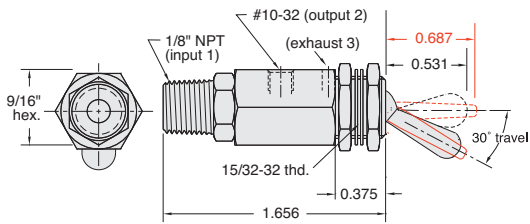
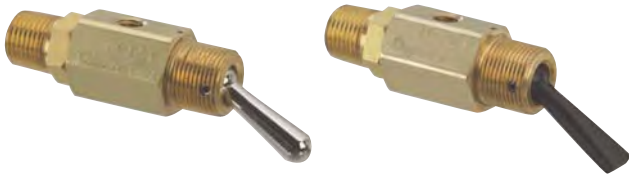


Part No.	Description
TV-3M	2 Position Poppet Valve, NP Steel Toggle, #10-32
TV-3M-M5	2 Position Poppet Valve, NP Steel Toggle, M5
TV-3MF	2 Position Poppet Valve, Plastic Toggle, #10-32
TV-3MF-M5	2 Position Poppet Valve, Plastic Toggle, M5



3-WAY TOGGLE VALVES

2 Pos. N.C. Poppet w/Momentary Actuation



Input Pressure: 300 psig max.

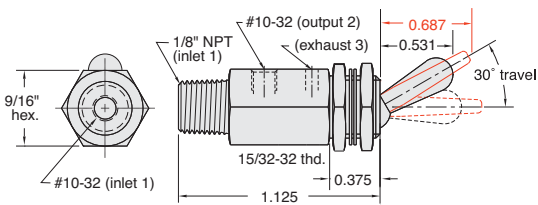
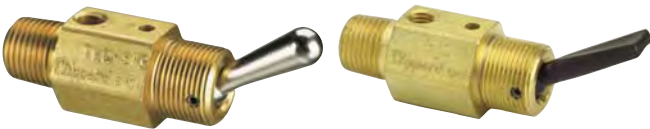
Air Flow: 4.0 scfm @ 50 psig; 6.8 scfm @ 100 psig

Force For Full Stem Travel: 12 oz. nominal



Part No.	Description
TV-3MP	2 Position Poppet Valve, NP Steel Toggle
TV-3MFP	2 Position Poppet Valve, Plastic Toggle

2 Pos. N.O. Poppet w/Momentary Actuation



Input Pressure: 150 psig max.

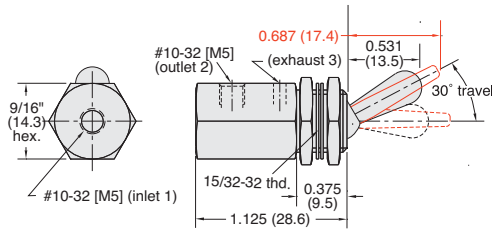
Air Flow: 4.0 scfm @ 50 psig; 6.8 scfm @ 100 psig

Force For Full Stem Travel: 12 oz. nominal



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

2 Pos. N.O. Poppet w/Momentary Actuation



Input Pressure: 150 psig/10 bar max.

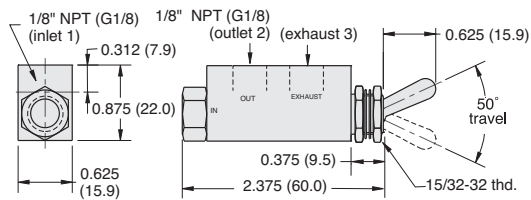
Air Flow: 4.0 scfm @ 50 psig; 6.8 scfm @ 100 psig;
170 lpm @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



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

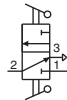
2 Position Poppet Valves



Input Pressure: 300 psig/21 bar max.

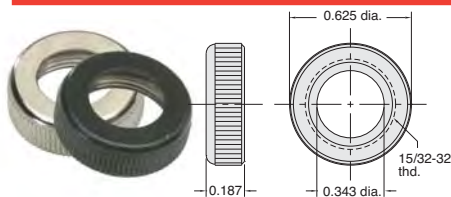
Air Flow: 14 scfm @ 50 psig; 25 scfm @ 100 psig;
600 l/min @ 6 bar

Force For Full Stem Travel: 16 oz. nominal



Part No.	Description
MITV-3	2 Position Poppet Valve, 1/8\"/>
MITV-3-MG	2 Position Poppet Valve, G1/8

15/32 Panel Mounting Nut



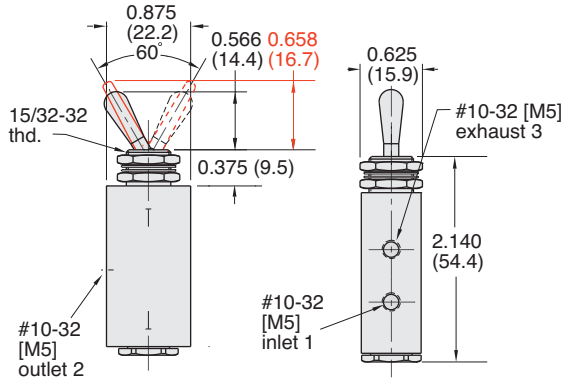
Brass with black or bright nickel finish

Part No.	
11406-1	Black
11406-2	Bright

3-WAY TOGGLE & STEM VALVES



2 Position Spool Valves

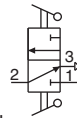


Input Pressure: 150 psig/10 bar max.

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

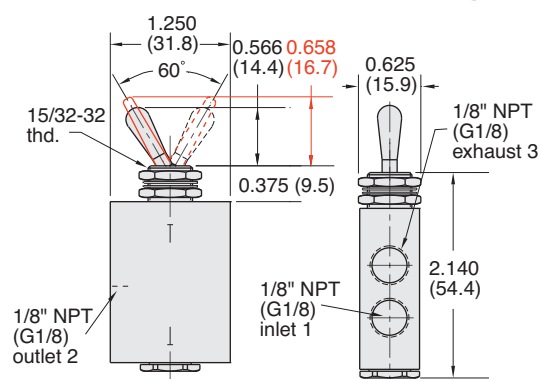
Force For Full Stem Travel: 16 oz. nominal

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



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

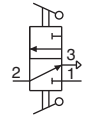


Input Pressure: Vacuum to 150 psig/10 bar max.

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

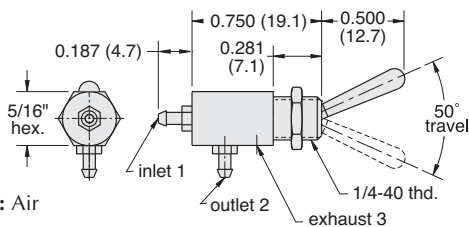
Force For Full Stem Travel: 16 oz. nominal

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



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

Sub-Miniature Spool Valve



Medium: Air

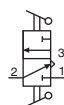
Input Pressure: 100 psig max.

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

Air Flow: 1.4 scfm @ 100 psig

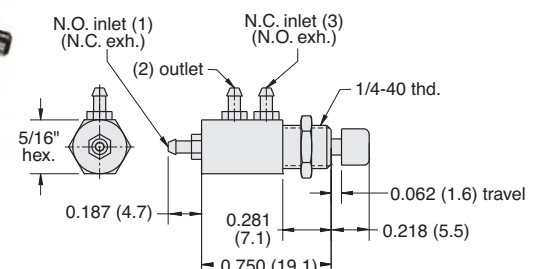
Force For Full Stem Travel: 24 oz. nominal

Spool Material: Delrin®



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

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



Medium: Air

Stem Travel: 1/16"

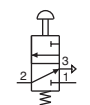
Input Pressure: 100 psig max.

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 AIR-PILOTED & LIMIT VALVES



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 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 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

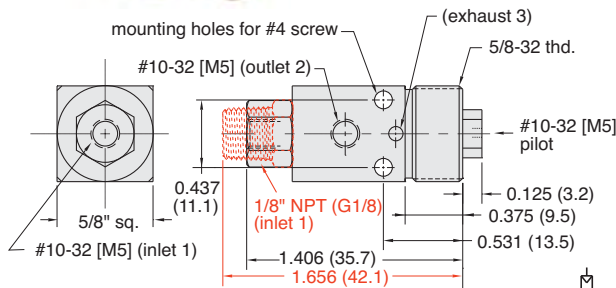
Materials: Brass body, Buna-N seals, stainless steel stem and spring

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 N.C. Poppet Valves

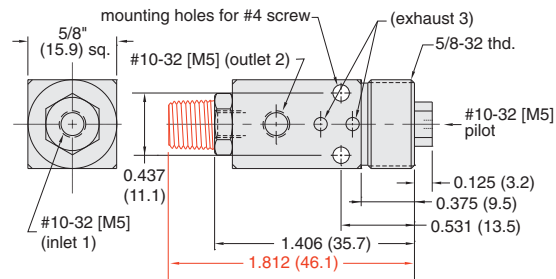


Input Pressure: 300 psig max.

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 N.O. Spool Valves

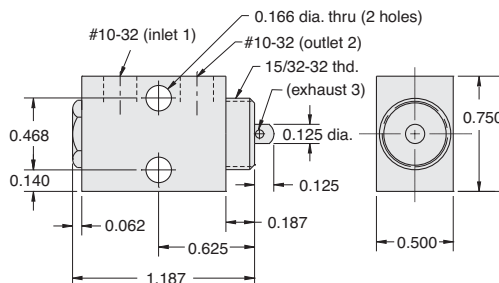


Input Pressure: 150 psig max.

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

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

Miniature Limit Valve



Stem Travel: 1/8" (3.2)

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

MAXIMATIC® 3-WAY AIR PILOT VALVES



2-Position Spring Return & Air Pilot 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.

Type: Spool

Medium: Air (40 micron filtration) or Inert Gas

Operating Range: Single Air Pilot: 20 to 125 psig; Double Air Pilot: 0 to 125 psig.

Pilot Pressure: See chart

Maximum Pressure: 125 psig

Number of Ports: 3

Materials: Aluminum, Stainless Steel, Thermoplastic

Mounting: Body Ported, Manifold Mount

Temperature Range: 32 to 150°F (0 to 65°C)

Seals: Buna-N

Minimum Pilot Pressure

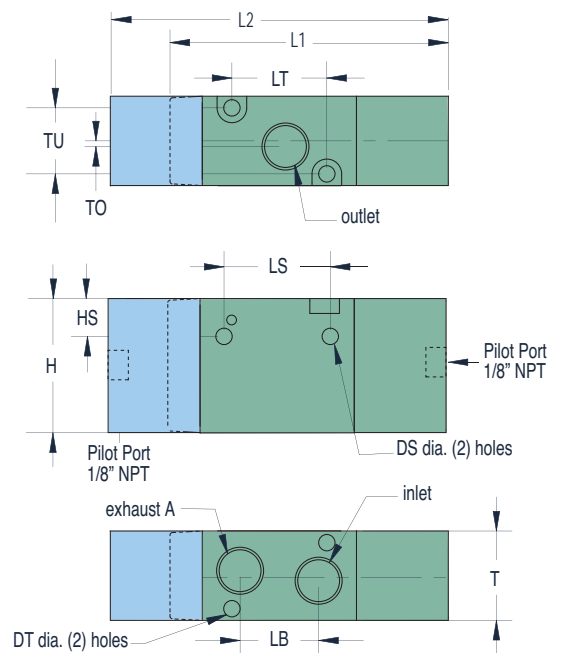
	Single Pilot		Double Pilot	
Operating Pressure (psig)	20	80	20	80
Pilot Pressure (psig)	20	35	5	8

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)	0.65 (16.5)	1.06 (26.9)	1.34 (34.0)

Maximatic®

Port	Cv	Flow Rate	
		@ 50 psig	@ 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

Conforms to ISO 19973-2 test standards



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	1/4" NPT	0.89/49
MMA-33WAS		MMA-33WAA		3/8" NPT	3/8" NPT	3/8" 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



MANUALLY-OPERATED 3-WAY AIR VALVES

Push/Pull Valves



Push/Pull spool valves are 3-way configurations. The Detent version maintains spool position by friction, while the Momentary spring returns to the home position.

Operating Pressure: 0 to 115 psig

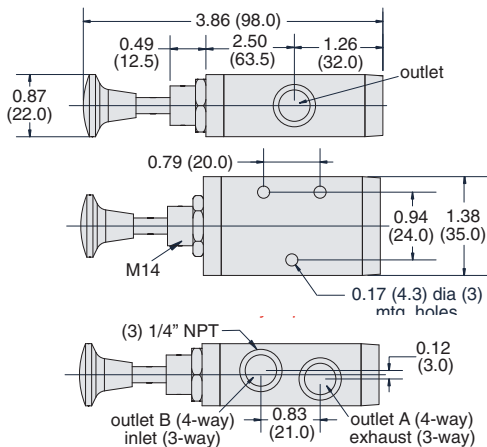
Cv: 0.89

Ports: 1/4" NPT, 1/8" NPT exhaust

Operating Temperature: 32 to 140°F (0 to 60°C)

Mounting: Panel or base mount

Part No.	Description
<u>MMV-P3QD</u>	3-Way, 3 Port Detented Push/Pull Valve



Lever Valves



Lever valves are 3-way spool valves with 1/4" NPT ports. They have either a Detented or Momentary manual operation.

Operating Pressure: 0 to 150 psig

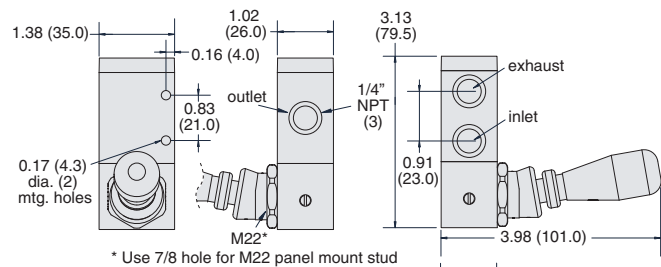
Cv: Detented: 1.0; Momentary: 0.89

Port Size: 1/4" NPT

Operating Temperature: 32 to 140°F (0 to 60°C)

Mounting: Panel or base mount

Part No.	Description
<u>MMV-L3QD</u>	3-Way, 2-Position Detented Valve
<u>MMV-L3QM</u>	3-Way, 2-Position Momentary Valve



Foot Pedal Valves

Foot Pedal Valve is a 3-way valve with 1/4" NPT ports with a low-profile flat pedal.

Operating Pressure: 0 to 150 psig

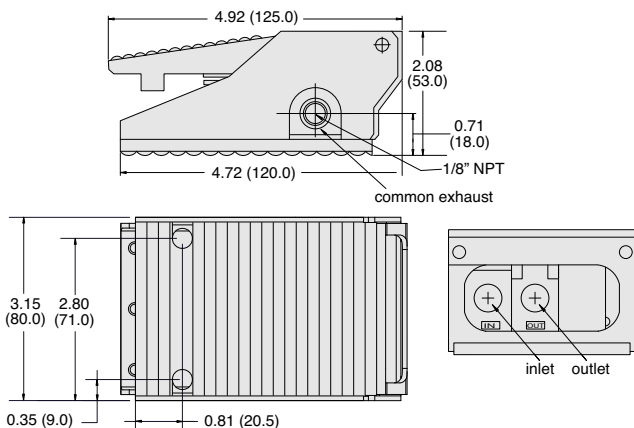
Cv: 1.4

Ports: 1/4" NPT

Mounting: Base mount

Operating Temperature: 32 to 140°F (0 to 60°C)

Part No.	Description
<u>MMV-F3QM-F</u>	3-Way Valve with Flat Pedal

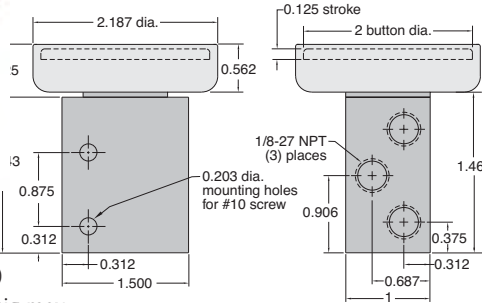




3-Way Poppet Palm Button Valves



3-Way Poppet (MAV-3C) Normally-Closed - Bubble Tight Poppet Cartridge Valve (- replaceable cartridge)



Medium: Air

Stem Travel: 1/8" (3.2)

Input Pressure: 100 psig max.

Air Flow: 3.5 scfm @ 150 psig; 6.0 scfm @ 100 psig

Force to Actuate: 1.75 lb. manual

Ports: 1/8" NPT - exhaust may be muffled or piped away but NOT restricted

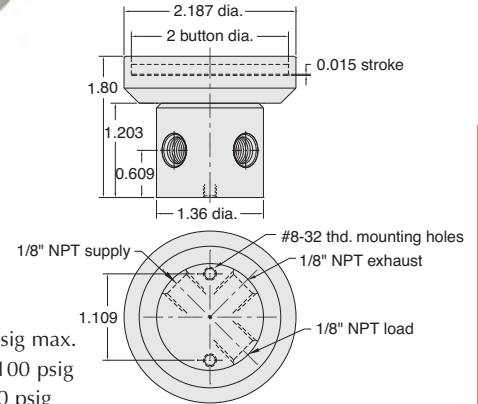
Mounting: Mounting holes provided; optional Bracket Kit #12959 provides additional mounting versatility; valve available with anodized color buttons

Part No.	Description
PB-1-RD	3-Way Poppet Poppet Valve, Red
PB-1-GN	3-Way Poppet Poppet Valve, Green
PB-1-BK	3-Way Poppet Poppet 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 valve opening



Medium: Air

Input Pressure: 100 psig max.

Air Flow: 22 scfm @ 100 psig

Bleed: 0.1 scfm @ 100 psig

Force to Actuate: 1 oz. manual

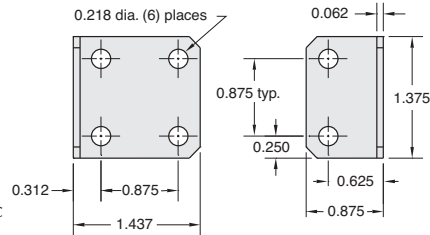
Mounting: Mounting holes provided; optional Bracket Kit #2010-50 provides additional mounting versatility; valve available with anodized color buttons

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



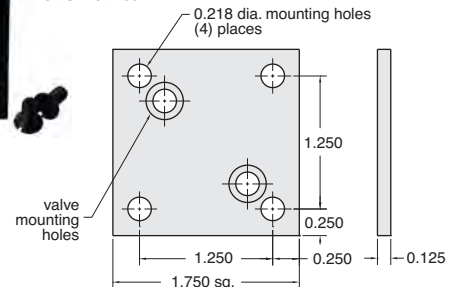
Mounting: Six 7/32" dia. holes on 1/8" centers for attaching valves to bracket
Construction: Stamped from 1/8" thick steel, zinc plated

Part No.	Description
12959	90° Mounting Bracket Kit

Mounting Bracket



Bracket to mount 2010, 2011-1, 2012 and 2013 valves



Black anodized finish, two mounting screws furnished

Part No.	Description
2010-050	Mounting Bracket Kit



4-WAY STEM VALVES

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

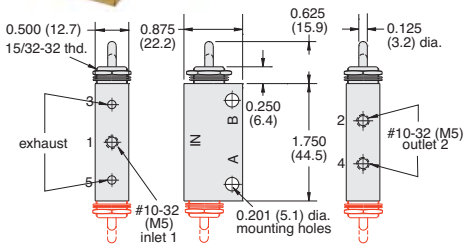
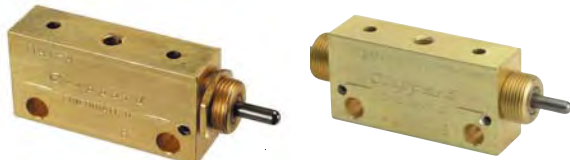
Stem Travel: 1/8" (3.2)

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.

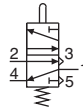
Miniature 4-Way Spool Valves



Air Flow: 5.0 scfm @ 50 psig; 8.5 scfm @ 100 psig; 240 l/min @ 6 bar

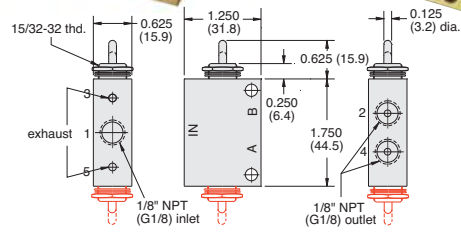
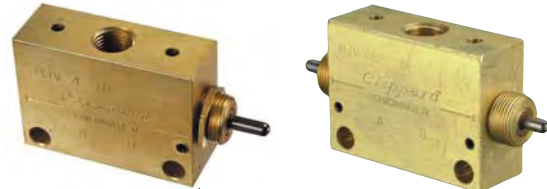
Force For Full Stem Travel: MAV-4 - 38 oz. nominal; MAV-4D - 12 oz. nominal

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

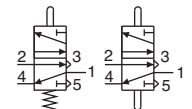
J-Series 4-Way Spool Valves



Air Flow: 8.0 scfm @ 50 psig; 14.0 scfm @ 100 psig; 390 l/min @ 6 bar

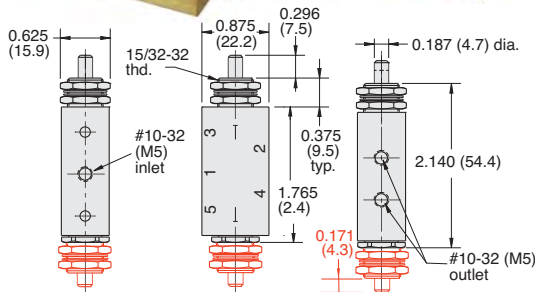
Force For Full Stem Travel: MJV-4 - 38 oz. nominal; MJV-4D - 12 oz. nominal

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

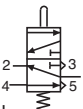
FV-Series 4-Way Spool Valves



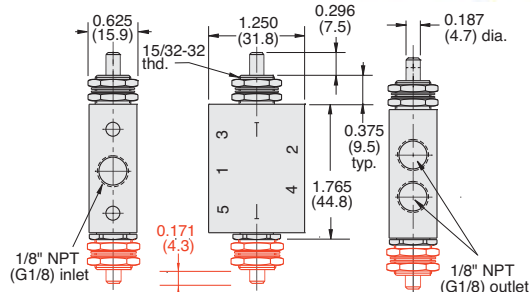
Air Flow: 6.0 scfm @ 50 psig; 10 scfm @ 100 psig; 240 l/min @ 6 bar

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



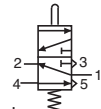
FV-Series 4-Way Spool Valves



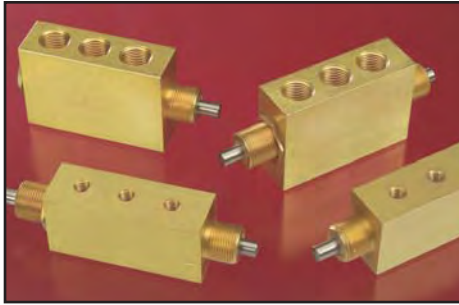
Air Flow: 6.5 scfm @ 50 psig; 10 scfm @ 100 psig; 250 l/min @ 6 bar

Force For Full Stem Travel: FV-4P & FV-4-MG - 4 1/2 lb. nominal; FV-4D & 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

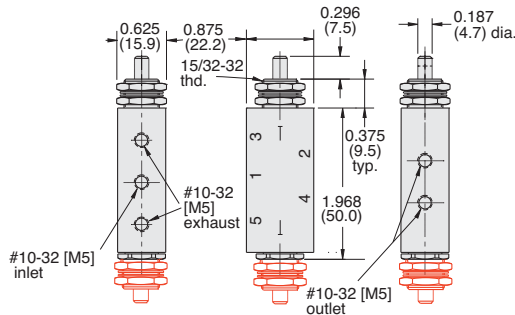
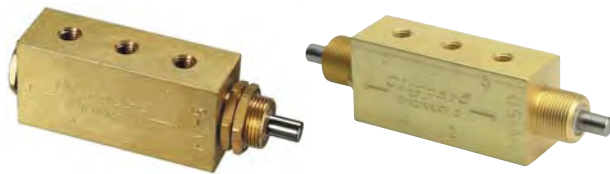


4-Way Fully-Ported Stem Valves

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.

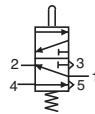
4-Way Fully-Ported Valves



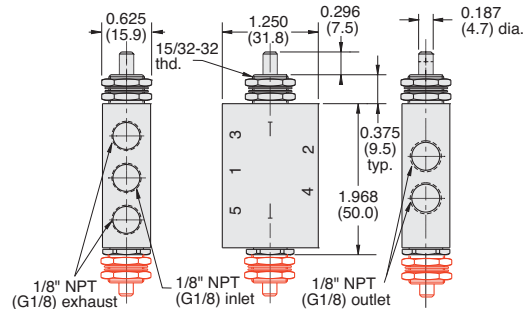
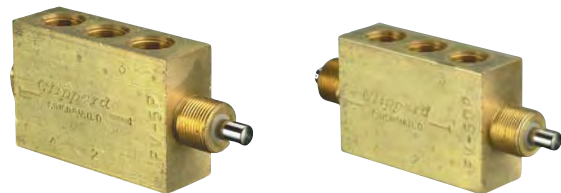
Medium: Air or Oil

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



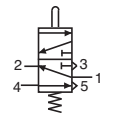
4-Way Fully-Ported Valves



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

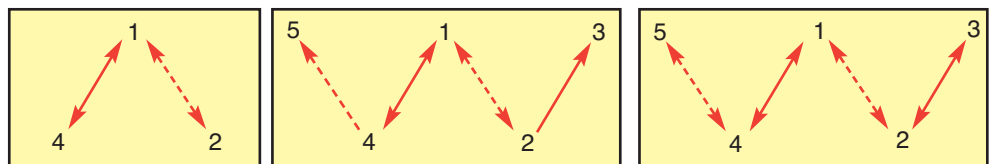


Part No.	Description
FV-5	Plunger Actuated Spring Return Valve, #10-32
FV-5-M5	Plunger Actuated Spring Return Valve, M5
FV-5D	2 Position Double Plunger Valve, #10-32
FV-5D-M5	2 Position Double Plunger Valve, M5

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.





4-WAY TOGGLE VALVES

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.

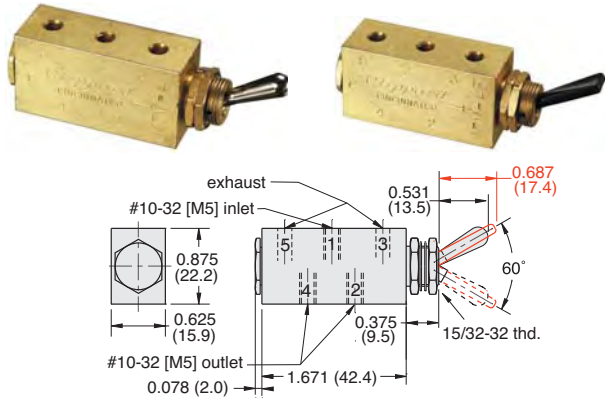
Medium: Air

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.

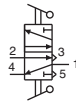
2 Position Spool Valves



Input Pressure: 150 psig/10 bar max.

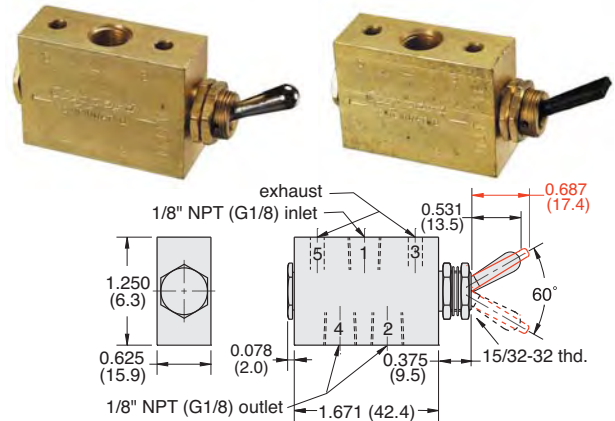
Air Flow: 6 scfm @ 50 psig; 10 scfm @ 100 psig;
240 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



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

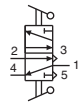
J-Series 2 Position Spool Valves



Input Pressure: 150 psig/10 bar max.

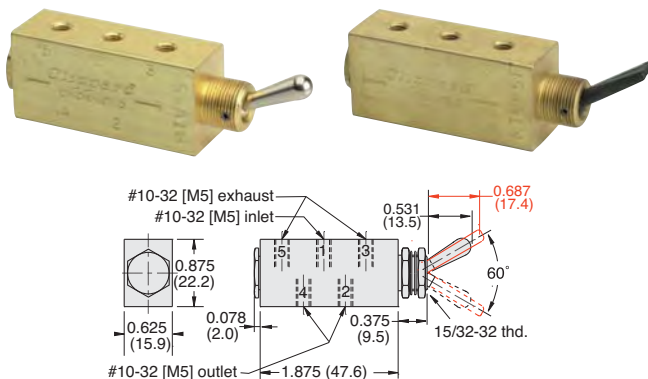
Air Flow: 6.5 scfm @ 50 psig; 10.5 scfm @ 100 psig;
250 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



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

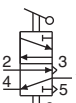
2 Position Fully-Ported Spool Valves



Input Pressure: 150 psig/10 bar max.

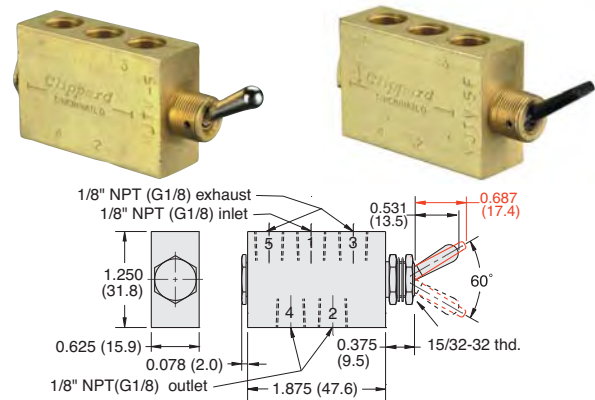
Air Flow: 6 scfm @ 50 psig; 10 scfm @ 100 psig;
240 l/min @ 6 bar

Force For Full Stem Travel: 16 oz. nominal



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

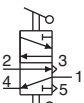
J-Series 2 Position Fully-Ported Spool



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
MITV-5	2 Position Spool Valve, NP Steel Toggle, 1/8" NPT
MITV-5-MG	2 Position Spool Valve, NP Steel Toggle, G1/8
MITV-5F	2 Position Spool Valve, Plastic Toggle, 1/8" NPT
MITV-5F-MG	2 Position Spool Valve, Plastic Toggle, G1/8

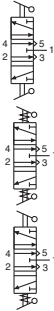
4-WAY TOGGLE VALVES



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 or ENP brass, and seals of Buna-N rubber.



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

Medium: Air

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

Input Pressure: 150 psig/10 bar max.

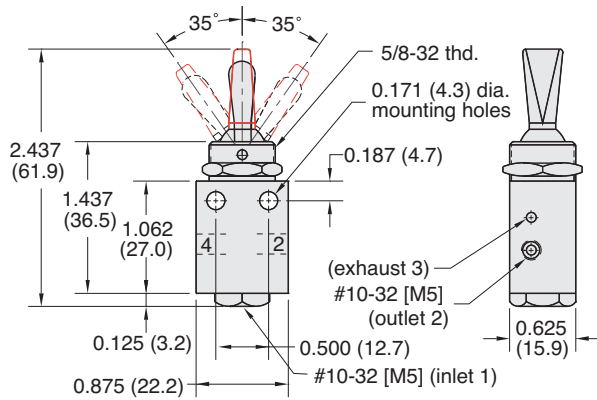
Air Flow: 4.5 scfm @ 50 psig; 7.5 scfm @ 100 psig;
180 l/min @ 6 bar

Force For Full Stem Travel: 8 oz. nominal

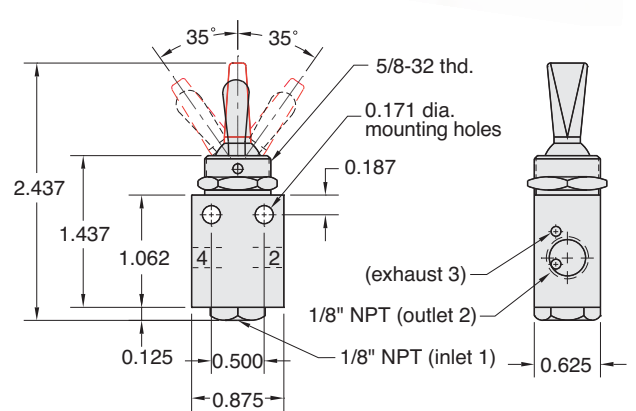
Toggle: Plastic or ENP Brass

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

3 Position Toggle Valves, #10-32



3 Position Toggle Valves, 1/8" NPT



Part No.	Description
TV-4D	Plastic Toggle Valve, Detented/Detented
TV-4M	Plastic Toggle Valve, Momentary/Momentary
TV-4DM	Plastic Toggle Valve, Detented/Momentary
TV-4D-H	ENP Brass Toggle Valve, Detented/Detented
TV-4M-H	ENP Brass Toggle Valve, Momentary/Momentary
TV-4DM-H	ENP Brass Toggle Valve, Detented/Momentary

Part No.	Description
TV-4DP	Plastic Toggle Valve, Detented/Detented
TV-4MP	Plastic Toggle Valve, Momentary/Momentary
TV-4DMP	Plastic Toggle Valve, Detented/Momentary
TV-4DP-H	ENP Brass Toggle Valve, Detented/Detented
TV-4MP-H	ENP Brass Toggle Valve, Momentary/Momentary
TV-4DMP-H	ENP Brass Toggle Valve, Detented/Momentary



FILL & BLEED TOGGLE VALVES

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.

Medium: Air

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

Input Pressure: 120 psig max.

Air Flow:

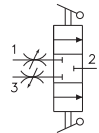
Adjustable	Full-Flow (-F)
3.0 scfm @ 50 psig	4.5 scfm @ 50 psig
5.0 scfm @ 100 psig	7.5 scfm @ 100 psig

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

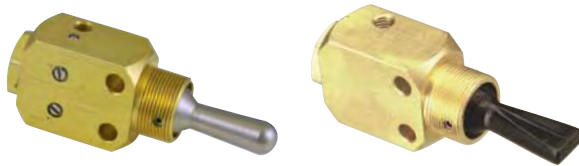
Force For Full Stem Travel: 8 oz. nominal

Toggle: Plastic or ENP Brass

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

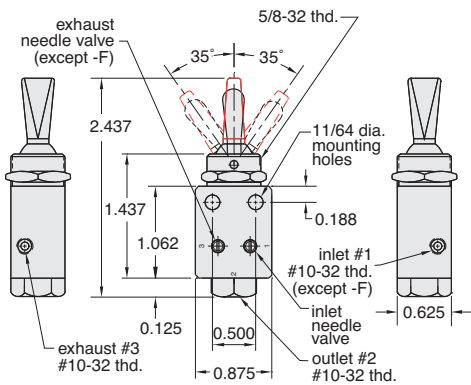


3 Position Fill & Bleed Valves, #10-32

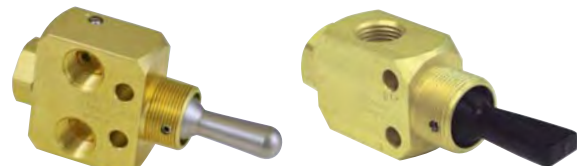


Adjustable
(NP Brass Toggle shown)

Full-Flow
(Plastic Toggle shown)

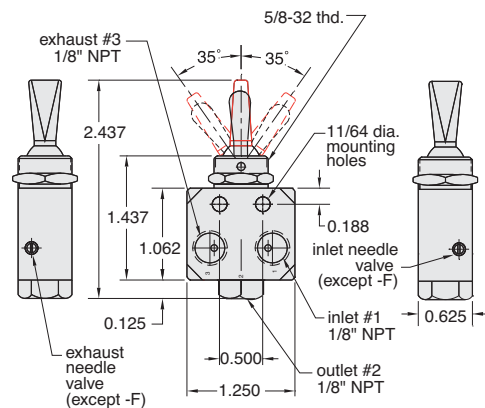


3 Position Fill & Bleed Valves, 1/8" NPT



Adjustable
(NP Brass Toggle shown)

Full-Flow
(Plastic Toggle shown)



Part No.	Description
FBV-3D	Adj. Valve, Detented/Detented, Plastic Toggle
FBV-3DF	Full-Flow Valve, Detented/Detented, Plastic Toggle
FBV-3M	Adj. Valve, Momentary/Momentary, Plastic Toggle
FBV-3MF	Full-Flow Valve, Momentary/Momentary, Plastic Toggle
FBV-3DM	Adj. Valve, Detented/Momentary, Plastic Toggle
FBV-3DMF	Full-Flow Valve, Detented/Momentary, Plastic Toggle
FBV-3D-H	Adj. Valve, Detented/Detented, ENP Brass Toggle
FBV-3DF-H	Full-Flow, Detented/Detented, ENP Brass Toggle
FBV-3M-H	Adj. Valve, Momentary/Momentary, ENP Brass Toggle
FBV-3MF-H	Full-Flow, Momentary/Momentary, ENP Brass Toggle
FBV-3DM-H	Adj. Valve, Detented/Momentary, ENP Brass Toggle
FBV-3DMF-H	Full-Flow, Detented/Momentary, ENP Brass Toggle

Part No.	Description
FBV-3DP	Adjustable Valve, Detented/Detented, Plastic Toggle
FBV-3DPF	Full-Flow Valve, Detented/Detented, Plastic Toggle
FBV-3MP	Adjustable Valve, Momentary/Momentary, Plastic Toggle
FBV-3MPF	Full-Flow Valve, Momentary/Momentary, Plastic Toggle
FBV-3DMP	Adjustable Valve, Detented/Momentary, Plastic Toggle
FBV-3DMPF	Full-Flow Valve, Detented/Momentary, Plastic Toggle
FBV-3DP-H	Adjustable Valve, Detented/Detented, ENP Brass Toggle
FBV-3DPF-H	Full-Flow Valve, Detented/Detented, ENP Brass Toggle
FBV-3MP-H	Adjustable Valve, Momentary/Momentary, ENP Brass Toggle
FBV-3MPF-H	Full-Flow Valve, Momentary/Momentary, ENP Brass Toggle
FBV-3DM-H	Adjustable Valve, Detented/Momentary, ENP Brass Toggle
FBV-3DMPF-H	Full-Flow Valve, Detented/Momentary, ENP Brass Toggle

MAXIMATIC® 4-WAY AIR PILOT VALVES



2-Position Spring Return & Air Pilot 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.

Type: Spool

Medium: Air (40 micron filtration) or Inert Gas

Operating Range: Single Air Pilot: 20 to 125 psig, Double Air Pilot: 0 to 125 psig. Refer to Minimum Pilot Pressure Chart below.

Pilot Pressure: See chart **Maximum Pressure:** 125 psig

Number of Ports: 5 **Mounting:** Body Ported, Manifold

Materials: Aluminum, Stainless Steel, Thermoplastic

Seals: Buna-N

Minimum Pilot Pressure

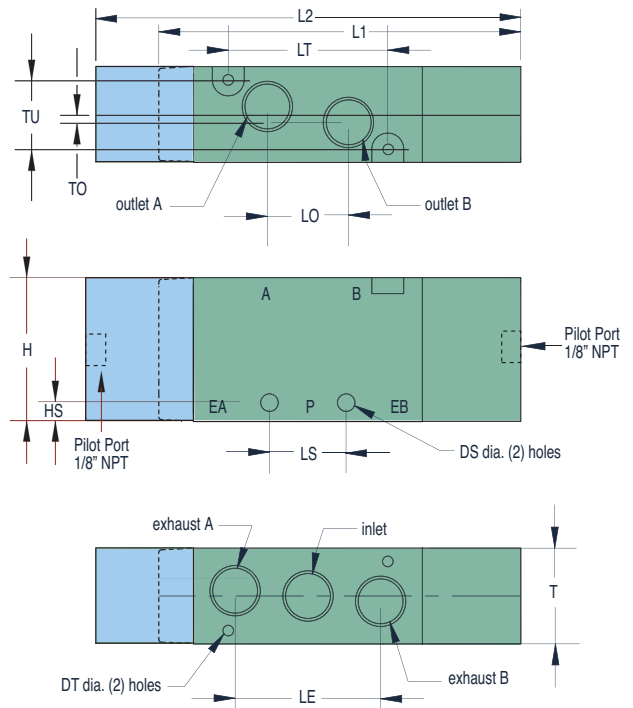
	Single Pilot	Double Pilot	Three Position
Operating Pressure (psig)	20 80	20 80	20 80
Pilot Pressure (psig)	20 35	5 8	20* 20*

* 30 on MMA-41 Series

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)

Port	Cv	Flow Rate	
		@ 50 psig	@ 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

Conforms to ISO 19973-2 test standards



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



MAXIMATIC® 4-WAY AIR PILOT VALVES

3-Position Spring Centered Double Air Pilot 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.

MAXIMUM
Value. \leftarrow
 \rightarrow Performance.

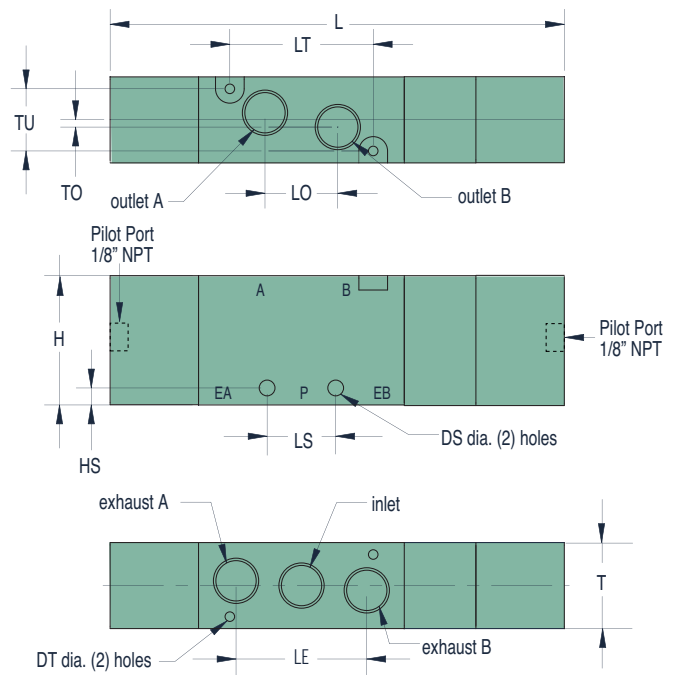
Operating Range: 0 to 125 psig


Pilot Pressure: See previous page

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)
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)





Exhaust Mufflers
For quiet system operation, see pages 164 and 312 for standard and speed control mufflers.



Closed Center	Pressure Center	Exhaust Center	Inlet	Outlet	Exhaust	Cv/scfm*
<u>MMA-41NAAC</u>	<u>MMA-41NAAP</u>	<u>MMA-41NAAE</u>	#10-32	#10-32	#10-32	0.50/23
<u>MMA-41PAAC</u>	<u>MMA-41PAAP</u>	<u>MMA-41PAAE</u>	1/8" NPT	1/8" NPT	1/8" NPT	0.50/23
<u>MMA-42QAAC</u>	<u>MMA-42QAAP</u>	<u>MMA-42QAEE</u>	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
<u>MMA-43WAAC</u>	<u>MMA-43WAAP</u>	<u>MMA-43WAAE</u>	3/8" NPT	3/8" NPT	1/4" NPT	1.00/72
<u>MMA-44ZAAC</u>	<u>MMA-44ZAAP</u>	<u>MMA-44ZAAE</u>	1/2" NPT	1/2" NPT	1/2" NPT	1.68/93

* scfm based on flow @ 100 psig

MANUALLY-OPERATED 4-WAY AIR VALVES



Push/Pull Valves



Push/Pull spool valves 4-way configurations. The Detent version maintains spool position by friction, while the Momentary spring returns to the home position.

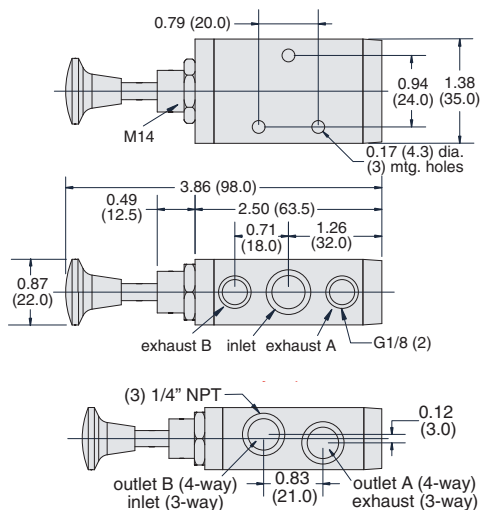
Operating Pressure: 0 to 115 psig **Cv:** 0.89

Ports: 1/4" NPT, 1/8" NPT exhaust

Operating Temperature: 32 to 140°F (0 to 60°C)

Mounting: Panel or base mount

Part No.	Description
<u>MMV-P4QD</u>	4-Way, 5 Port Detented Push/Pull Valve
<u>MMV-P4QM</u>	4-Way, 5 Port Momentary Push/Pull Valve



Lever Valves

Lever valves are 4-way spool valves with 1/4" NPT ports. They have either a Detented or Momentary manual operation.

Operating Pressure: 0 to 150 psig

Cv: Detented: 1.0
Momentary: 0.89

Port Size: 1/4" NPT

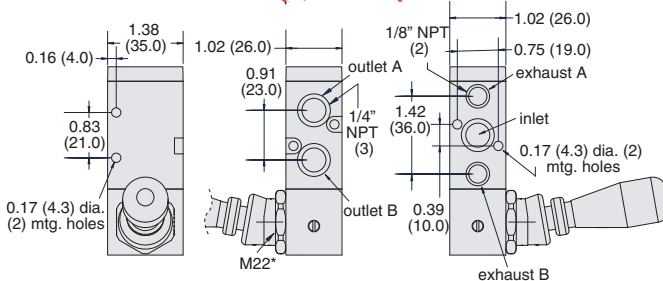
Operating Temperature: 32 to 140°F (0 to 60°C)

Mounting: Panel or base mount

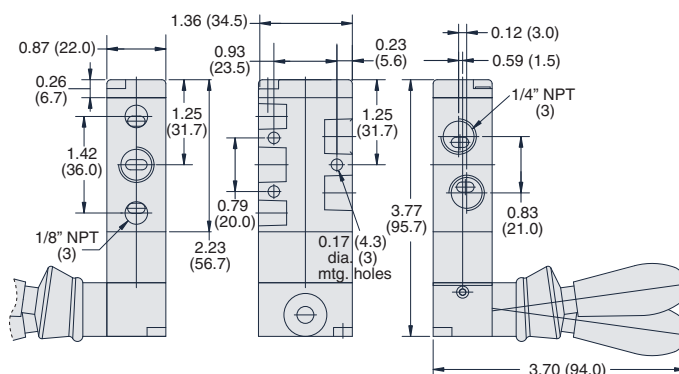


Part No.	Description
<u>MMV-L4QD</u>	4-Way, 2-Position Detented Valve
<u>MMV-L4QM</u>	4-Way, 2-Position Momentary Valve
<u>MMV-L4QD-C</u>	4-Way, 3-Position Detented Valve, Closed Center

MMV-L4QD/MMV-L4QM



MMV-L4QM-C



Did you know...

Clippard Instrument Laboratory, Inc. began as a manufacturer of radio coils and test instruments in 1941.



MANUALLY-OPERATED 4-WAY AIR VALVES

Rotary Valves



Rotary Valves are 4-way valves with 1/4" NPT ports. They are manually-operated 3-position closed center valves.

Operating Pressure: 0 to 150 psig

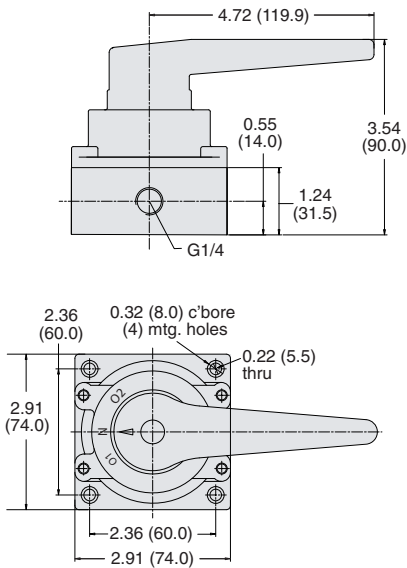
Port Size: 1/4" NPT

Cv: 1.68

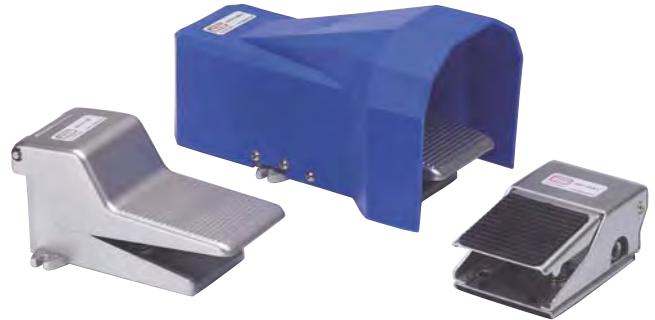
Mounting: Base mount

Operating Temperature: 32 to 140°F (0 to 60°C)

Part No.	Description
<u>MMV-R4QN-C</u>	4-Way, 3-Position Non-Detented Rotary Valve
<u>MMV-R4QD-C</u>	4-Way, 3-Position Detented Rotary Valve



Foot Pedal Valves



Foot Pedal Valves are 4-way valves with 1/4" NPT ports. Two versions are offered; either a low-profile flat pedal or standard pedal with or without guard.

Operating Pressure: 0 to 150 psig

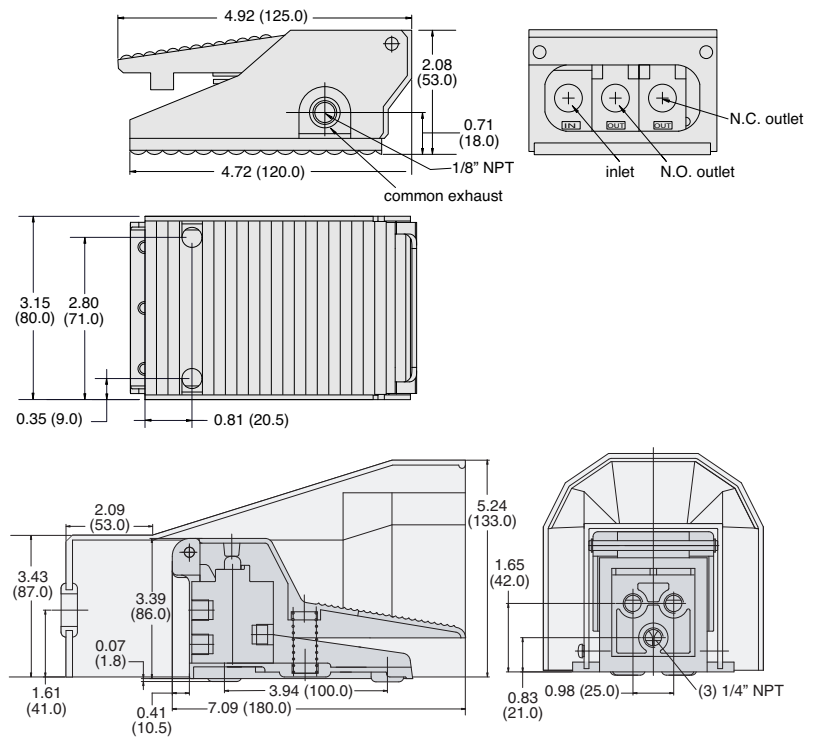
Cv: 1.4

Ports: 1/4" NPT

Mounting: Base mount

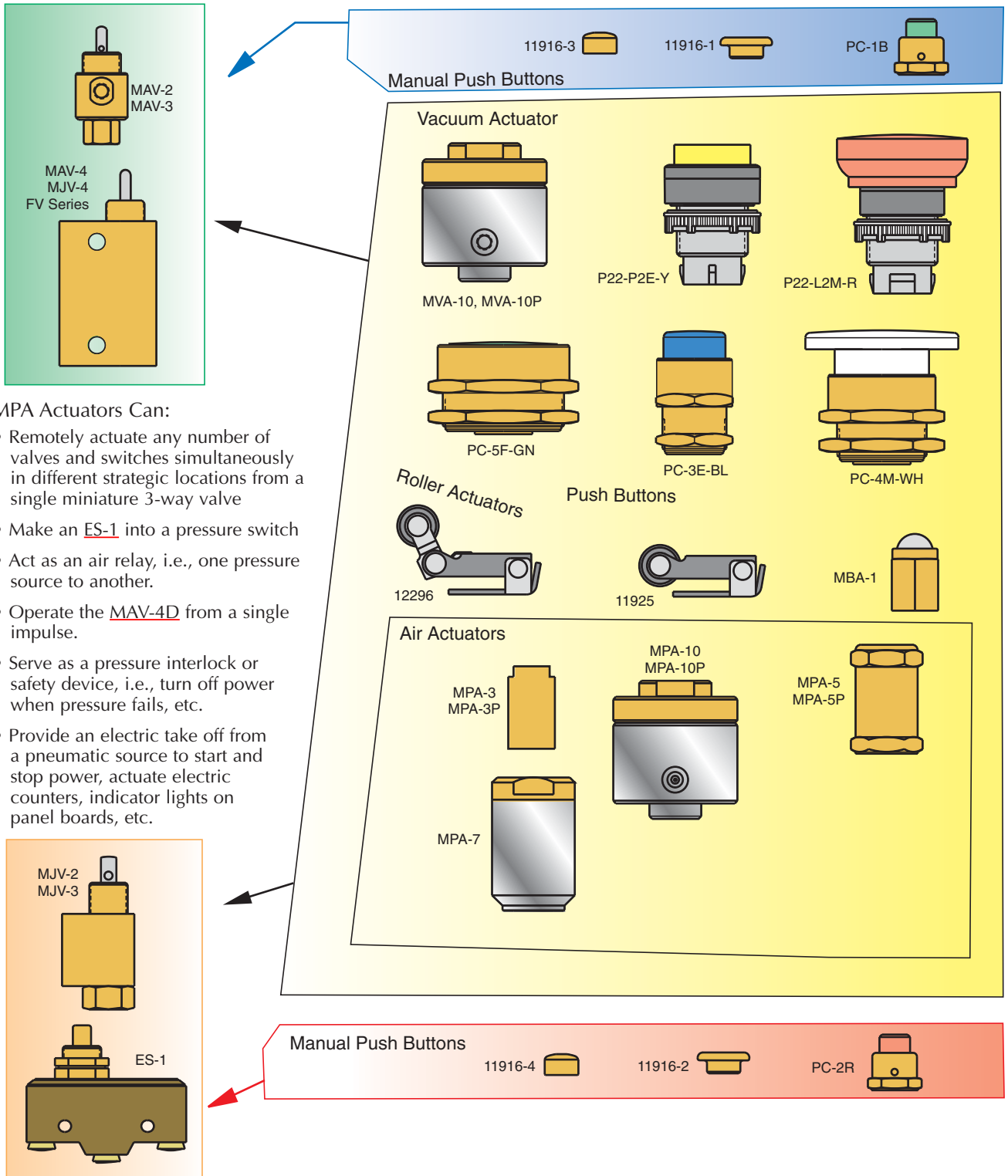
Operating Temperature: 32 to 140°F (0 to 60°C)

Part No.	Description
<u>MMV-F4QM-F</u>	4-Way Valve with Flat Pedal
<u>MMV-F4QM</u>	4-Way Valve with Standard Pedal
<u>MMV-F4QM-G</u>	4-Way Valve with Plastic Foot Guard



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.

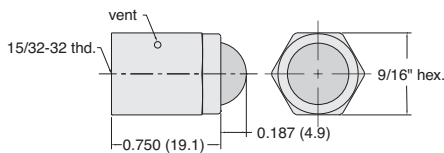


VALVE ACTUATORS

Ball Cam Actuator



Ball Cam Actuator permits the valves and electrical switch to be operated by mechanical movement depressing the ball from any direction



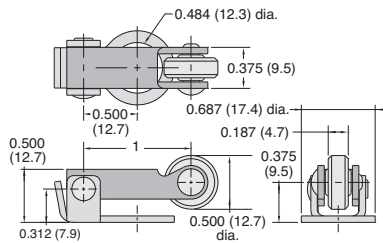
Construction: Body - brass
Ball - stainless steel retained in housing

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
<u>MBA-1</u>	Ball Cam Actuator

Roller Cam Actuator



Construction: Stainless steel with nylon roller

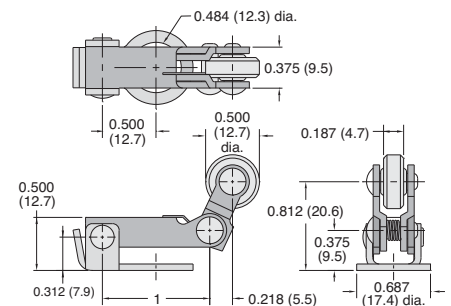
Temperature Range: 32 to 230°F

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
<u>11925</u>	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
<u>12296</u>	Roller, Double-Pivoted One-Way Cam Follower Actuator

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.

CUSTOMer solutions



A valve used in dental applications features ports located straight out of the back for ease-of-assembly in a tight space. It also incorporates a special toggle to match the customers' aesthetic requirements.

Use any combination of Clippard's electronic valves to actuate any Clippard control valve with an external supply.



In system subassemblies, manifold-mounted components are desirable for an integrator. In this design, Clippard utilizes the miniature regulator series and an air-piloted 2-way valve mounted on a manifold adjacent to our electronic valve.



For more information, visit www.clippard.com/customsolutions

MINIMUM PRESSURE REQUIRED (psig)*													
Clippard Valve	Pressure (psig)					Vacuum (" Hg)	Clippard Valve	Pressure (psig)					Vacuum (" 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	n/a	n/a		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								

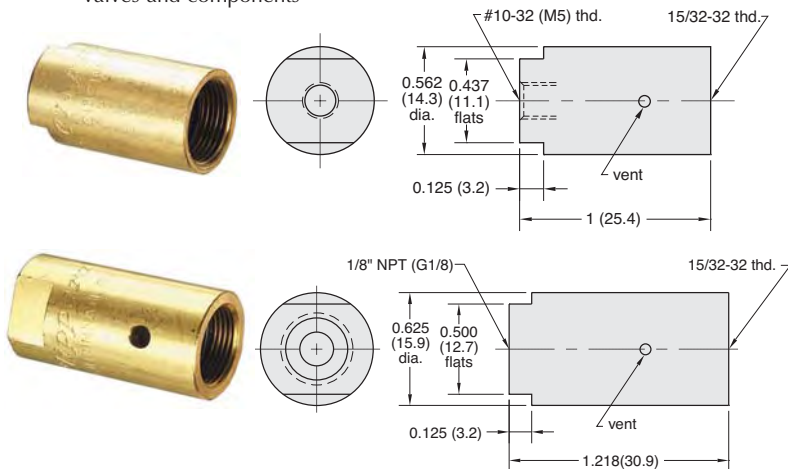
*with 100 psig to valve inlet

Single Acting Air Pilot Actuators

Input Pressure: 250 psig/17 bar max.

Construction: Body - brass; Springs - stainless steel; Seals - Buna-N rubber; Piston - Delrin®

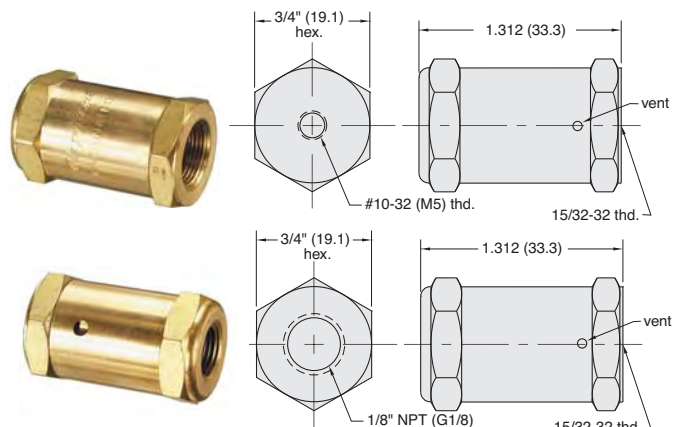
Mounting: #15/32-32 female thread to mount to Clippard miniature valves and components



Bore Size: 0.375 (9.5)

Force Factor: 0.1

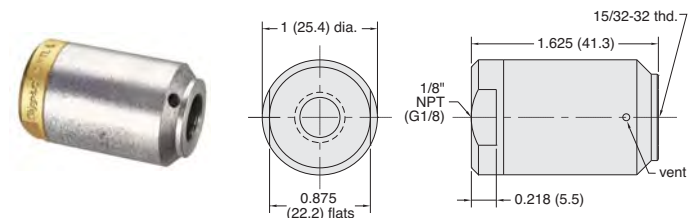
Part No.	Description
<u>MPA-3</u>	Single Acting, Spring Return Actuator, #10-32
<u>MPA-3-M5</u>	Single Acting, Spring Return Actuator, M5
<u>MPA-3P</u>	Single Acting, Spring Return Actuator, 1/8" NPT
<u>MPA-3-MG</u>	Single Acting, Spring Return Actuator, G1/8



Bore Size: 0.625 (15.9)

Force Factor: 0.3

Part No.	Description
<u>MPA-5</u>	Single Acting, Spring Return Actuator, #10-32
<u>MPA-5-M5</u>	Single Acting, Spring Return Actuator, M5 Metric
<u>MPA-5P</u>	Single Acting, Spring Return Actuator, 1/8" NPT
<u>MPA-5-MG</u>	Single Acting, Spring Return Actuator, G1/8



Bore Size: 0.875" (22.2) dia.

Force Factor: 0.6

Part No.	Description
<u>MPA-7</u>	Single Acting, Spring Return Actuator, 1/8" NPT
<u>MPA-7-MG</u>	Single Acting, Spring Return Actuator, G1/8

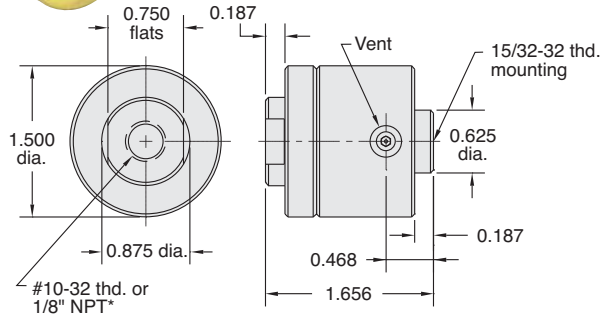


VALVE ACTUATORS

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

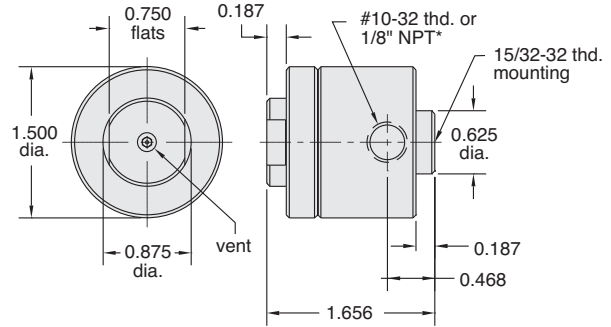
Force Factor: 1.2

Part No.	Description
<u>MPA-10</u>	Single Acting, Spring Return Actuator, #10-32
<u>MPA-10P</u>	Single Acting, Spring Return Actuator, 1/8" NPT

Vacuum Actuators



Single Acting Spring Return Vacuum Actuator



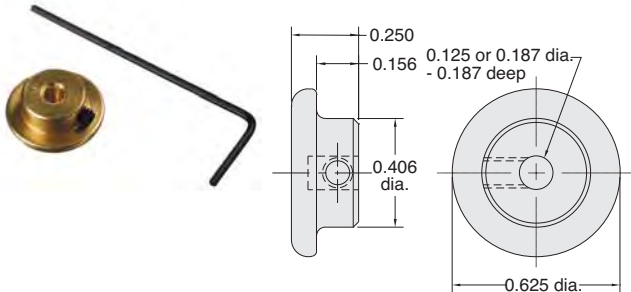
Input Pressure: 30 in. Hg

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
<u>MVA-10</u>	Single Acting, Spring Vacuum Actuator, #10-32
<u>MVA-10P</u>	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 over-travel of valve stem by providing a positive stop

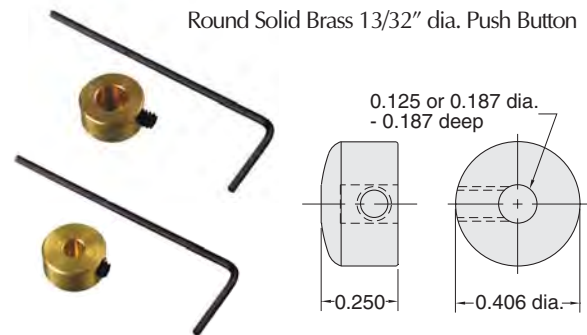
Mounting: 1/8" or 3/16" dia. mounting hole fits valve stems; locks in place by set screw (Allen wrench furnished)

Note: Individually packaged or bulk quantities available

Part No.	Description
<u>11916-1</u>	5/8" Brass Push Button, 1/8" Stem
<u>11916-2</u>	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 over-travel 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

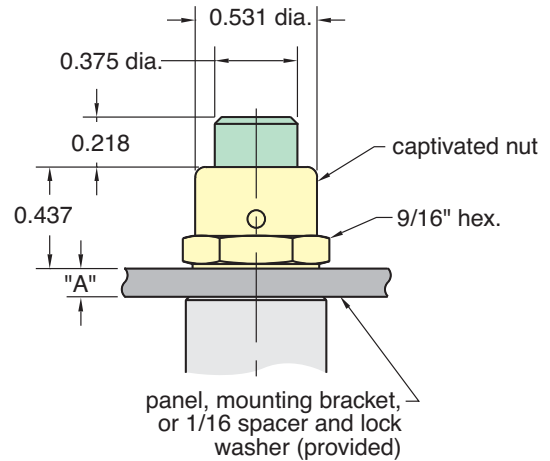
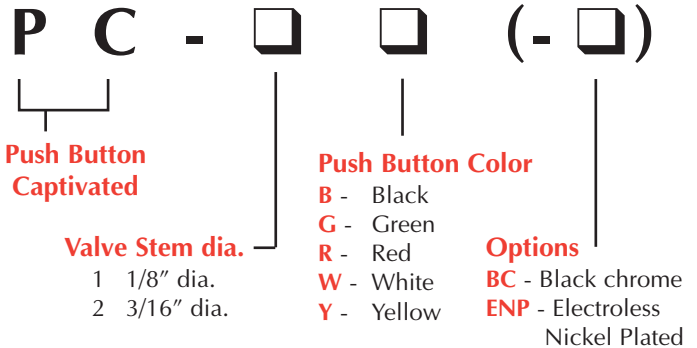
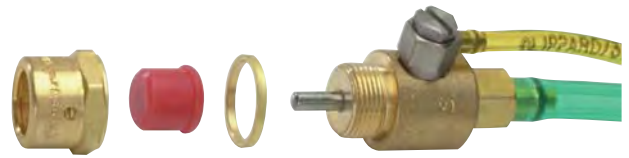
Part No.	Description
<u>11916-3</u>	13/32" Brass Push Button, 1/8" Stem
<u>11916-4</u>	13/32" Brass Push Button, 3/16" Stem

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 -ENP 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 over-travel 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.



Spacing Required for Proper Actuation of Push Button

Valve	"A" Dim.
MAV-2, MAV-3 MAVO-2, MAVO-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"

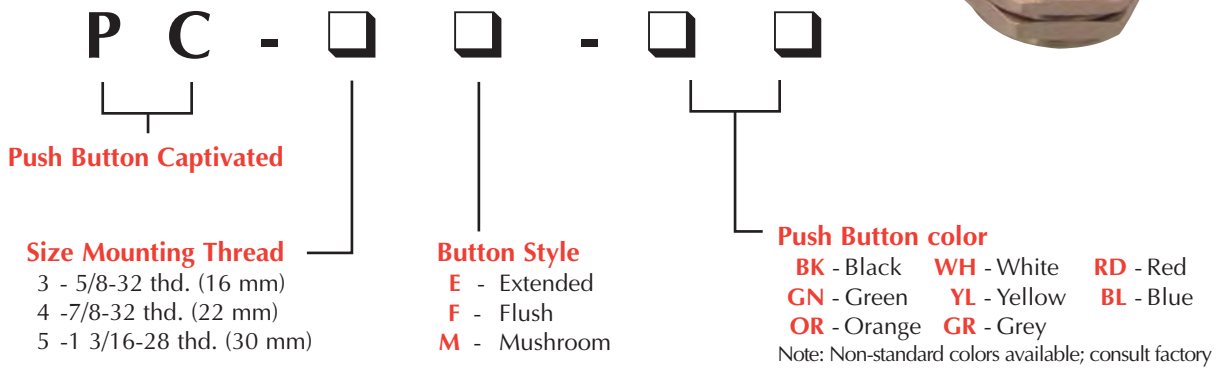


PUSH BUTTON ACTUATORS

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 over-travel or side load to the valve assuring superior performance and long life.



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

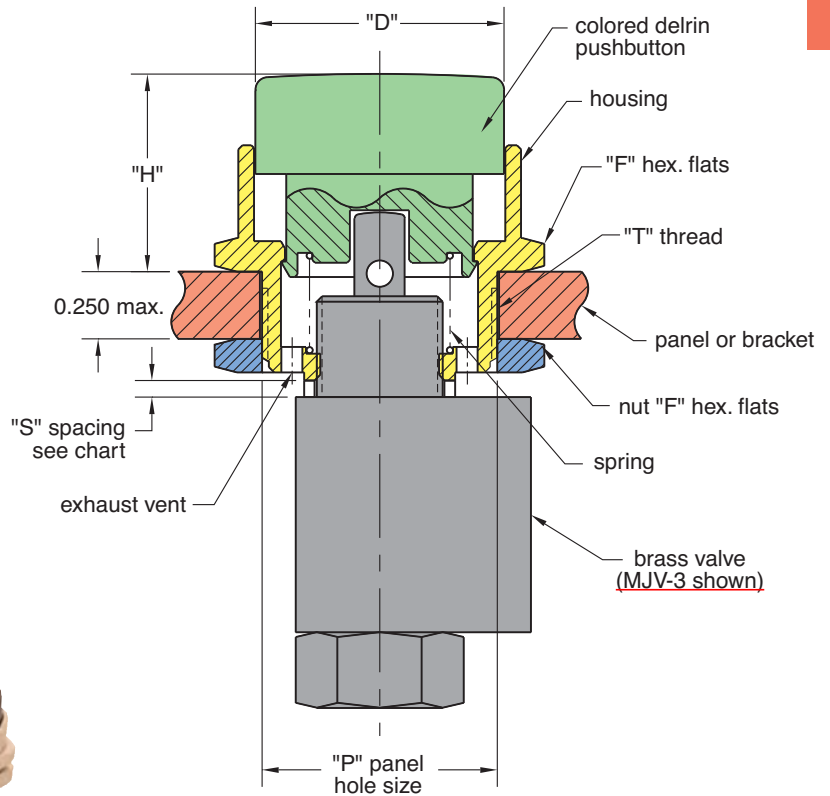
- Assembles directly to the valve; no adapters required
- Ideal for mounting on panels or brackets, up to 1/4" thick panel
- Self-contained assembly; no loose parts
- Stainless steel spring returns button to extended position with no added load to the valve stem
- Three sizes: 16 mm (5/8" dia.), 22 mm (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
- Electroless nickel plated brass housing and nut, molded Delrin® button and stainless steel spring for long life and corrosion resistance
- Protects the valve from over-travel 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" Panel Hole ^{+1/32} / ₀	"F" Hex Flats
5/8-32 (16 mm) mtg. thd.	PC-3E-□□	0.625"	0.734"			
	PC-3F-□□	0.625"	0.500"	5/8-32	5/8" dia.	3/4"
	PC-3M-□□	1.165"	0.906"			
7/8-32 (22 mm) mtg. thd.	PC-4E-□□	0.925"	0.734"			
	PC-4F-□□	0.925"	0.500"	7/8-32	7/8" dia.	1-1/16"
	PC-4M-□□	1.500"	0.906"			
1 3/16-28 (30 mm) mtg. thd.	PC-5E-□□	1.165"	0.734"			
	PC-5F-□□	1.165"	0.500"	1 3/16-28	1-3/16" dia.	1-5/16"
	PC-5M-□□	1.500"	0.906"			



SPACING "S" REQUIRED FOR PROPER VALVE ACTUATION					
Valve series	MAV-2 MAV-3	MAVO-2 MAVO-3	MAV-4 MJV-4	MAV-4D 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"



CONTROL VALVE & ACTUATOR ASSEMBLIES

Minimatic® Actuators

Clippard's line of 22 mm and 30 mm actuators may be coupled with a variety of Clippard control valves with a simple adapter system providing a single assembly of a panel-mounted actuator and air valve.

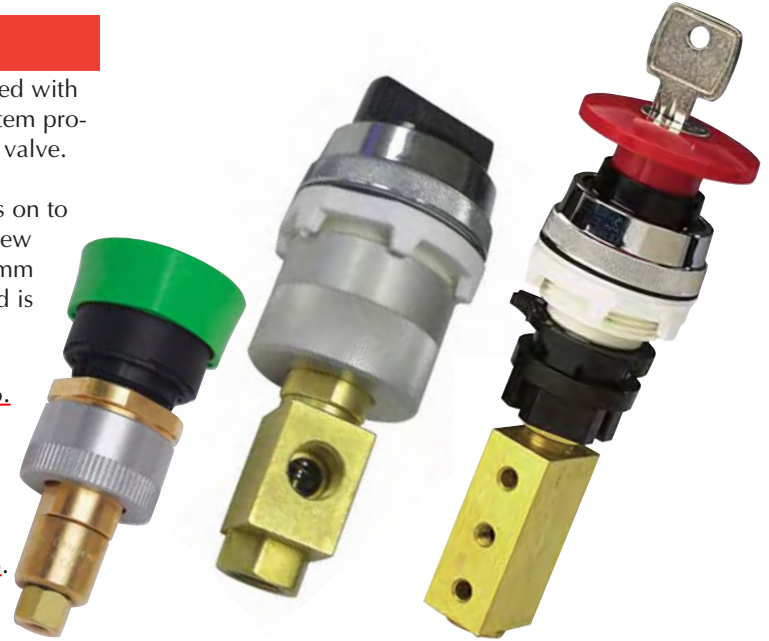
The PB-22 and PB-30 have an aluminum housing that threads on to the actuator, and integral brass sleeve. The PB-22-X fits the new 22 mm series actuators (P22-XXX), and the PB-30 fits the 30 mm series of actuators (PL-XXX). The PB-85 is made of plastic, and is compatible with 30 mm actuators only.

Step #1. Select **Actuator** on [pages 135 through 136](#).

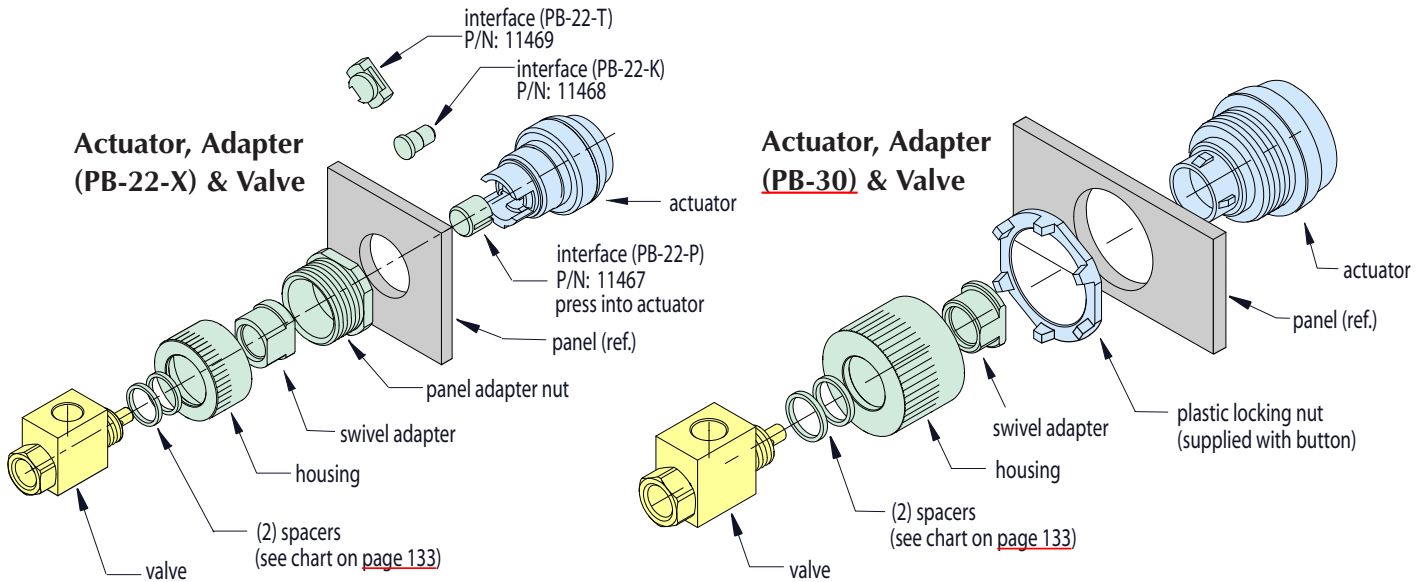
Step #2. Determine spacing requirements using the chart on [page 135](#).

Step #3. Determine **Adapter** on [pages 135 and 136](#).

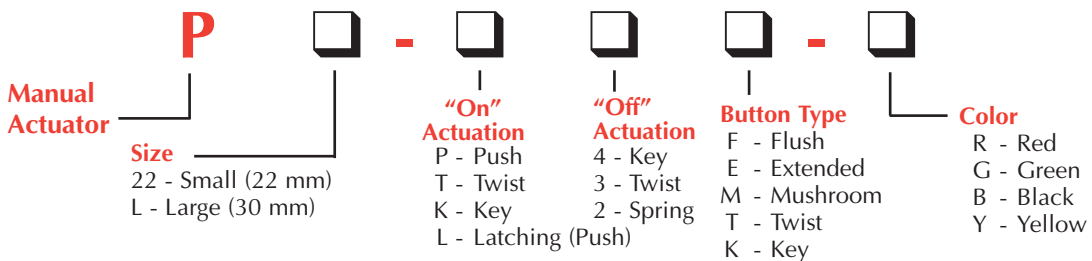
Step #4. Add **Accessories** on [page 137](#).



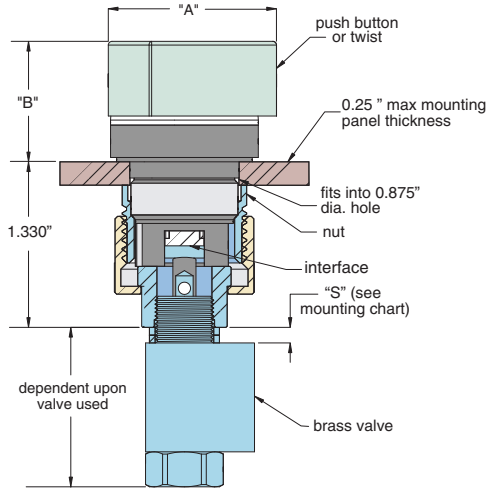
PB-22-X Adapter (22 mm) PB-30 Adapter (30 mm) PB-85 Adapter (30 mm)



Actuator Ordering Guide



Size 22 mm Actuators



PB-22-X Adapter			
Actuator	Adapter	"A"	"B"
P22-P2F-	PB-22-P	1.200"	0.450"
P22-P2E-	PB-22-P	1.200"	0.650"
P22-P2M-	PB-22-P	1.600"	0.850"
P22-L3M-	PB-22-K	1.450"	1.000"
P22-L4M-	PB-22-K	1.450"	1.200"
P22-T2T-	PB-22-T	1.200"	0.925"
P22-T3T-	PB-22-T	1.200"	0.925"
P22-T3K-	PB-22-T	1.200"	1.000"
P22-K3K-	PB-22-T	1.200"	1.000"

Mounting Chart for Clippard Valves

The following chart gives the necessary spacing required between the shoulder of the valve and the base of the adapter. Two 1/16" spacers are furnished with each adapter.

Spacer Requirements

Valves	"S"
MAV-2, -2P, -2R, -3R, -3, -3P	None
MAVO-2, -3	
MJV-2, -3	1/8"
MJVO-2, -3	
MAV-4, -4D	None
MJV-4, -4D	
ES-1	None
FV-3, -3P, -3D, -3DP	
FV-4, -4P, -4D, -4DP	1/8"
FV-5, -5P, -5D, -5DP	



Flush Push Button. Manual Push "In". Spring Return.

Part No.	Description
P22-P2F-R	Red
P22-P2F-G	Green
P22-P2F-B	Black
P22-P2F-Y	Yellow



Extended Push Button. Manual Push "In". Spring Return.

Part No.	Description
P22-P2E-R	Red
P22-P2E-G	Green
P22-P2E-B	Black
P22-P2E-Y	Yellow



Automatic Push/Turn Mushroom. Manual push "In". Latches "In". Turn clockwise to unlatch. Spring return.

Part No.	Description
P22-L3M-R	Red
P22-L3M-G	Green
P22-L3M-B	Black



Maintained Twist 90°. Turn clockwise to latch "In". Turn counterclockwise to release. Black only.

Part No.	Description
P22-T3T-B	Black



Spring Return Twist 45°. Turn clockwise and hold for "In". Release for spring return. Black only.

Part No.	Description
P22-T2T-B	Black



Manual Push Mushroom. Manual Push "In". Spring Return.

Part No.	Description
P22-P2M-R	Red
P22-P2M-G	Green
P22-P2M-B	Black



Key Twist 90° Maintained.

(P22-T3K-B) Turn key clockwise to latch "In". Turn key counterclockwise to release. Key with-drawable in both positions. Black only.

P22-K3K-B same as P22-T3K-B except key is withdrawable in "Out" position only.

Part No.	Description
P22-T3K-B	Black
P22-K3K-B	Black



Push Key Mushroom. Manual push "In".

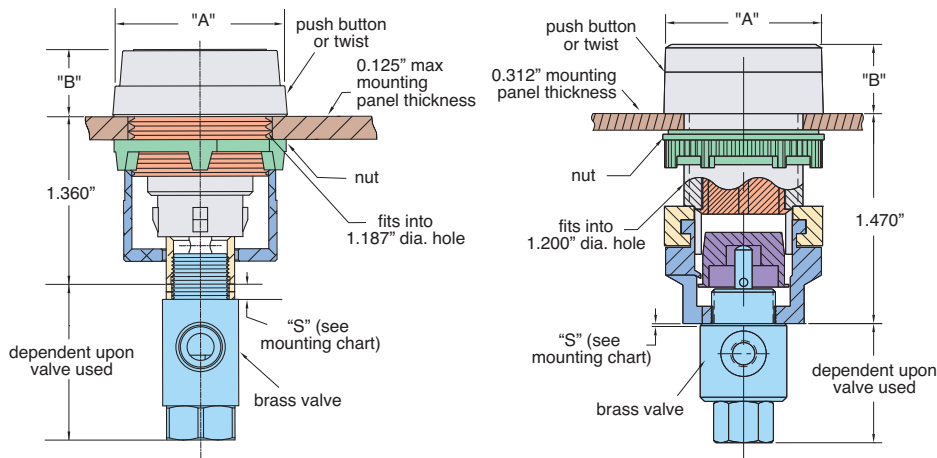
Automatic latches "In". Turn key clockwise to release. Spring return. Key withdrawable "Out" position only. Red only.

Part No.	Description
P22-L4M-R	Red



CONTROL VALVE & ACTUATOR ASSEMBLIES

Size 30 mm Actuators



PB-30 Aluminum Adapter		
Actuator	"A"	"B"
PL-P2F-	1.440"	0.580"
PL-P2E-	1.440"	0.880"
PL-P2M-	1.560"	1.050"
PL-L3M-	1.560"	1.050"
PL-P4K-	1.440"	1.400"
PL-L4M-	1.580"	1.300"
PL-T2T-	1.440"	1.070"
PL-T3T-	1.440"	1.070"
PL-T3K-	1.440"	1.200"
PL-K3K-	1.440"	1.200"

PB-85 Plastic Adapter		
Actuator	"A"	"B"
PL-P2F-	1.440"	0.550"
PL-P2E-	1.440"	0.960"
PL-P2M-	1.575"	1.043"
PL-L3M-	1.575"	1.043"
PL-P4K-	1.440"	2.280"
PL-L4M-	1.575"	2.280"
PL-T2T-	1.440"	1.403"
PL-T3T-	1.440"	1.043"
PL-T3K-	1.440"	2.280"
PL-K3K-	1.440"	2.280"

Part No.	Description
PB-30	Aluminum Adapter
PB-85	Plastic Adapter



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



Maintained Twist 90°. Turn clockwise to latch "In". Turn counterclockwise to release. Black only.

Part No.	Description
PL-T3T-B	Black



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



Push Key Mushroom. Manual push "In". Automatic latches "In". Turn key clockwise to release. Spring return. Key withdrawable "Out" position only.

Part No.	Description
PL-L4M-R	Red



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



Manual Push Mushroom. Manual push "In". Spring return.

Part No.	Description
PL-P2M-R	Red
PL-P2M-G	Green
PL-P2M-B	Black



Spring Return Twist 45°. Turn clockwise and hold for "In". Release for spring return. Black only.

Part No.	Description
PL-T2T-B	Black



Push Key Push Button. Manual push "In". Spring return. Turn key counterclockwise to lock "Out"; clockwise to unlock. Key withdrawable locked or unlocked. Black only.

Part No.	Description
PL-P4K-B	Black



Key Twist 90° Maintained. (PL-T3K-B) Turn key clockwise to latch "In". Turn key counterclockwise to release. Key withdrawable in both positions. Black only.

PL-K3K-B same as PL-T3K-B except key is withdrawable in "Out" position only.

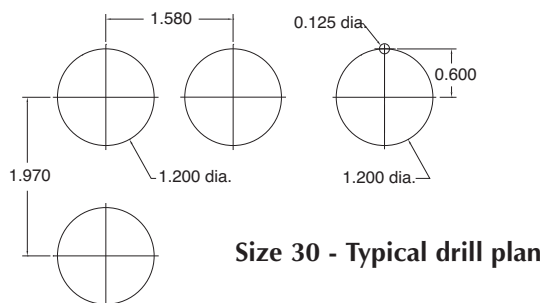
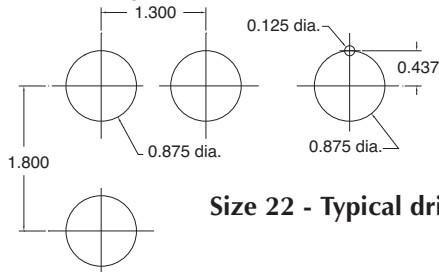
Part No.	Description
PL-T3K-B	Black
PL-K3K-B	Black

Legend Plates

Legend Text	22 Size Part #	30 Size Part #
Blank	P22-01	PL-01
Start	P22-02	PL-02
Stop (red)	P22-03	PL-03
Forward	P22-04	PL-04
Reverse	P22-05	PL-05
Fast	P22-06	PL-06
Slow	P22-07	PL-07
On	P22-08	PL-08
Off (red)	P22-09	PL-09
Reset	P22-10	PL-10
Raise	P22-11	PL-11
Lower	P22-12	PL-12
Emergency Stop (red)	P22-13	PL-13
Run / Jog	P22-31	PL-31
Auto / Hand	P22-32	PL-32
Forward / Reverse	P22-33	PL-33
Fast / Slow	P22-34	PL-34
Open / Close	P22-35	PL-35
Up / Down	P22-36	PL-36
Off / On	P22-37	PL-37

Mounting Clippard Manual Actuators

These drill plans are for units fitted with optional anti-rotation ring



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 30 mm size manual actuators.

Part No.	Description
PB-60	Mounting Wrench



Replacement Interface

Part No.	Description
11468	PB-22-K Interface
11467	PB-22-P Interface
11469	PB-22-T Interface



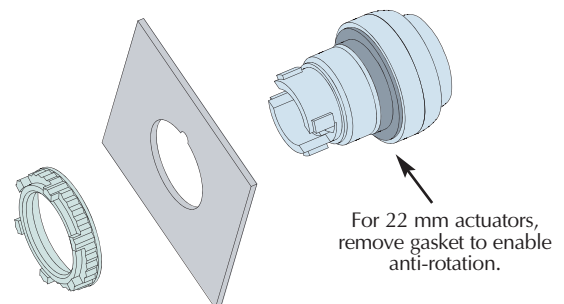
Replacement 30 mm Anti-Rotation Ring

Holds 30 mm adapter in one position. Included with all 30 mm twist manual actuators.

Part No.	Description
PL-50	Anti-Rotation Ring, 30 mm



22 mm Anti-Rotation Feature



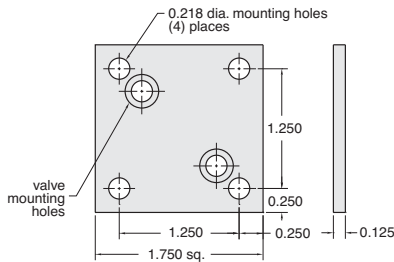


VALVE MOUNTING BRACKETS & ACCESSORIES

Flat Bracket



Flat bracket designed to mount 2010, 2011-1, 2012 and 2013 valves



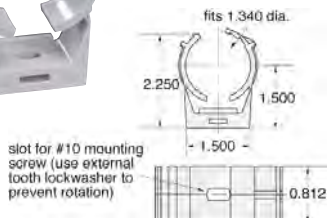
Construction: Black anodized finish, two mounting screws furnished.

Part No.	Description
2010-050	Flat Bracket

Bracket for Action Relays



Mounting bracket for 3200-A snap action relays.

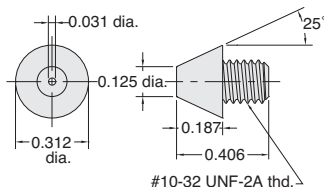


Part No.	Description
3200-006	Snap Action Relay Bracket

Rubber Nozzles



#10-32 rubber nozzles for replacement 2011-1 limit valves. #10-32 thread, five to a package

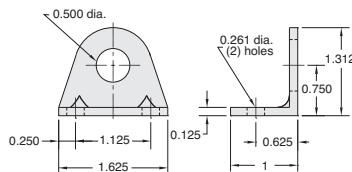


Part No.	Description
2011-012	Rubber Nozzles

Metal Foot Bracket



90° angle, metal foot bracket for Clippard miniature valves



Mounting: 1/2" dia. hole for valve; two 0.261" dia. holes for attaching bracket

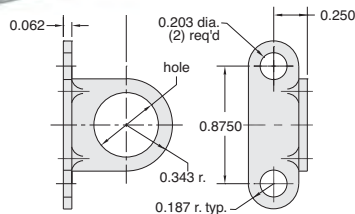
Construction: Stamped from 1/8" thick steel, zinc plated

Part No.	Description
15018-2	Foot Mounting Bracket

Metal Foot Bracket



90° angle, metal foot bracket for Clippard miniature valves



Mounting: 31/64" dia. mounting hole for valve; two 13/64" dia. mounting holes for attaching bracket

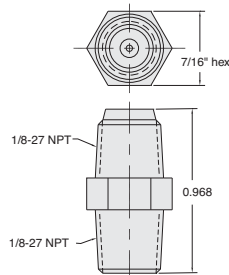
Construction: Stamped from 1/16" thick steel, zinc plated

Part No.	Description
11918-1	Bracket, 0.484" Hole
11918-2	Bracket, 0.328" Hole

1/8" NPT Filter



1/8" NPT hex nipple with 40 micron filter / strainer, can be used as a muffler

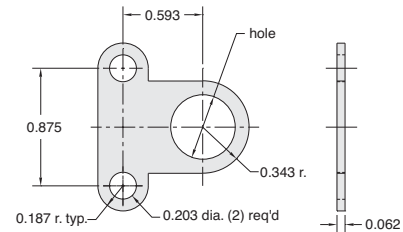


Part No.	Description
9002-01	1/8" NPT Filter

Flat Metal Bracket



Flat metal bracket, for mounting Clippard miniature valves



Mounting: 31/64" dia. mounting hole for valve; two 13/64" dia. mounting holes for attaching bracket

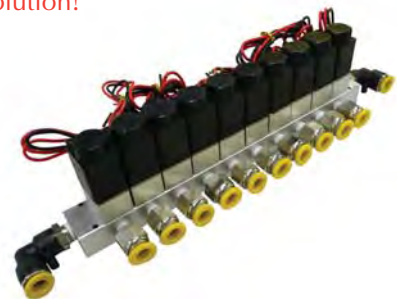
Construction: Stamped from 1/16" thick steel, zinc plated

Part No.	Description
11917-1	Metal Bracket, 0.484 Hole
11917-2	Metal Bracket, 0.328 Hole

See Page 314 for a complete offering of In-Line Manifolds

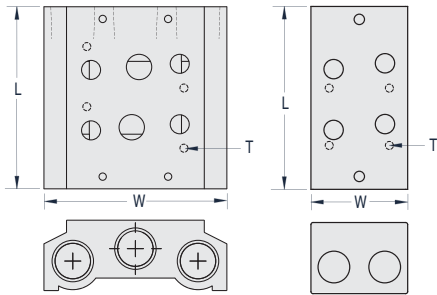
CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**



For more information, visit www.clippard.com/customsolutions

Parallel Bar Manifolds



4-Way Manifold

3-Way Manifold



Valve Series	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

[27041-33](#) Hardware Kit for MMA-33 Series Valves

[27041-32](#) Hardware Kit for MMA-32 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

[27041-43](#) Hardware Kit for MMA-43 Series Valves

[27041-42](#) Hardware Kit for MMA-42 Series Valves

[27041-44](#) Hardware Kit for MMA-44 Series Valves

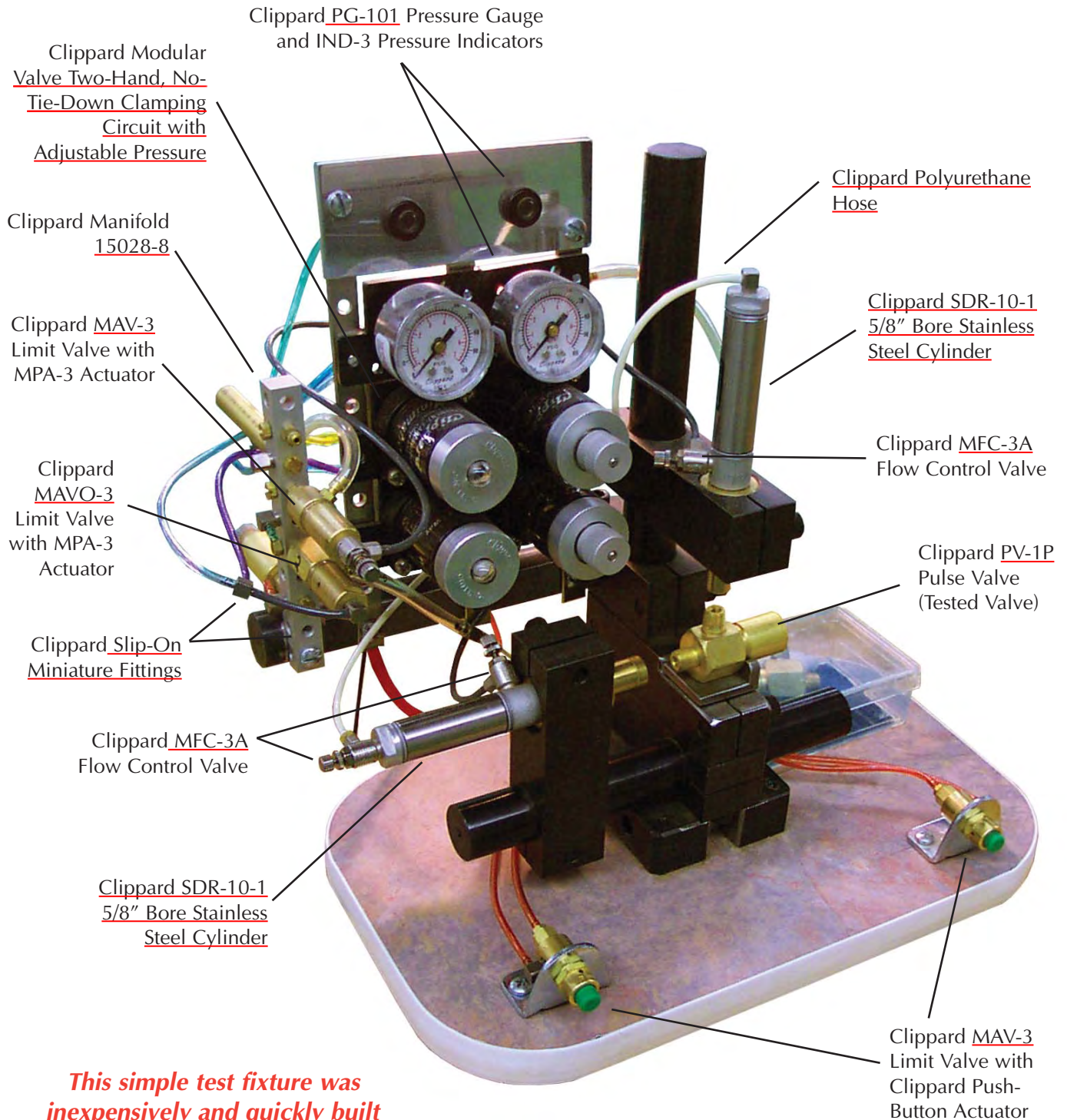
Rebuild Kits

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

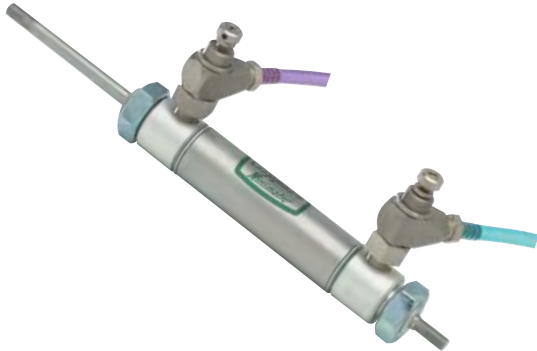


Pneumatic Pulse Valve Leak Tester



This simple test fixture was inexpensively and quickly built using standard Clippard products.

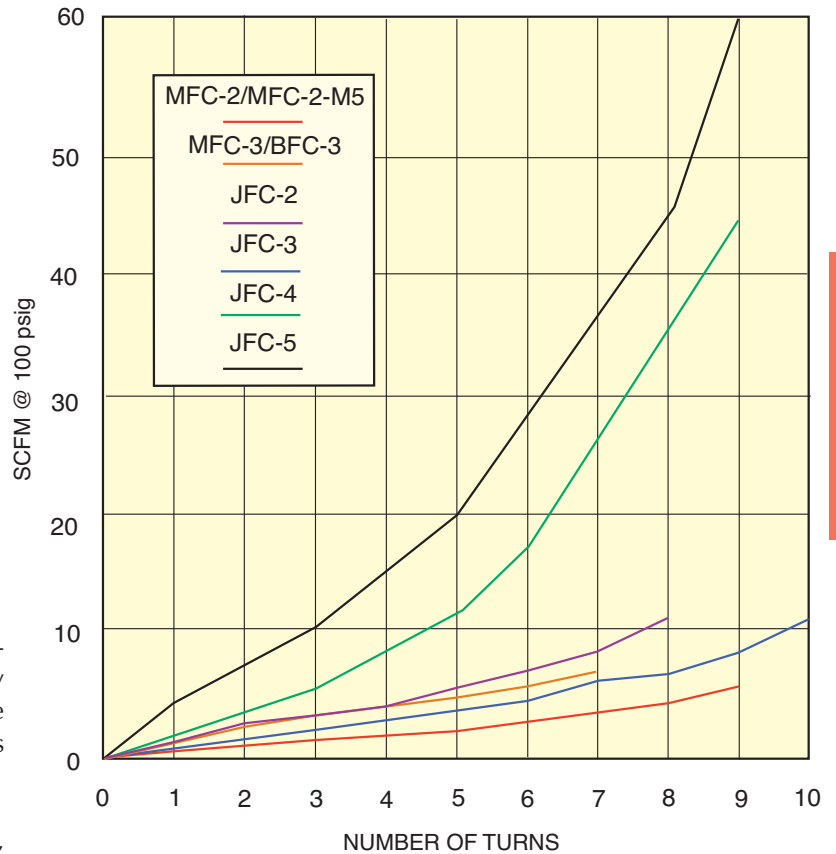
Flow Controls Flow vs. Needle Turns



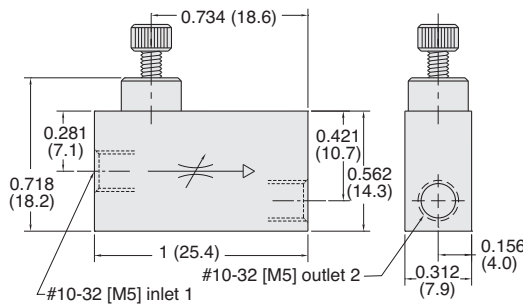
Clippard offers five models of adjustable flow controls with #10-32 through 3/8" NPT ports. They feature a combination needle and check valve that controls flow in one direction and allows free flow in the opposite direction.

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: In-line

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



FLOW CONTROL VALVES

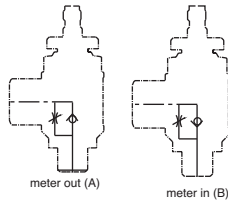
Input Pressure: 150 psig max.

Mounting: Directly into #10-32 port

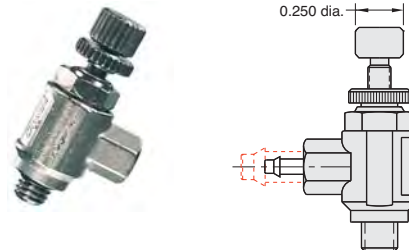
Ports: Rotating input port allows 360° positioning #10-32 port

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

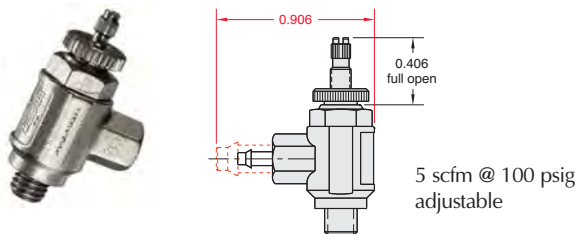


#10-32 Valves, Knurled Knob



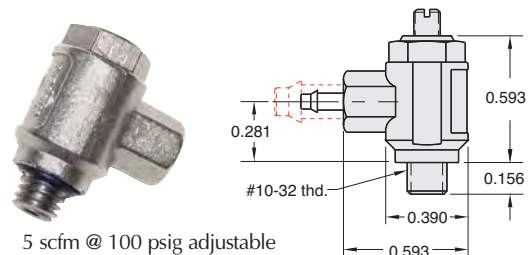
Part No.	Description
MFC-3AK	Meter Out Control Valve, #10-32 Female Side Port
MFC-3AK1	Meter Out Control Valve, 1/16" Barb Side Port
MFC-3AK2	Meter Out Control Valve, 1/8" Barb Side Port
MFC-3BK	Meter In Control Valve, #10-32 Female Side Port
MFC-3BK1	Meter In Control Valve, 1/16" Barb Side Port
MFC-3BK2	Meter In Control Valve, 1/8" Barb Side Port

#10-32 Valves, Screwdriver Slot



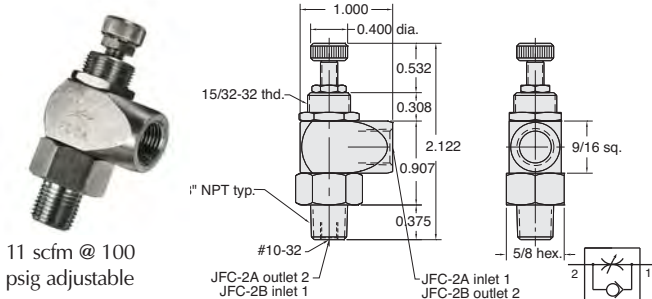
Part No.	Description
MFC-3A	Meter Out Control Valve, #10-32 Female Side Port
MFC-3A1	Meter Out Control Valve, 1/16" Barb Side Port
MFC-3A2	Meter Out Control Valve, 1/8" Barb Side Port
MFC-3B	Meter In Control Valve, #10-32 Female Side Port
MFC-3B1	Meter In Control Valve, 1/16" Barb Side Port
MFC-3B2	Meter In Control Valve, 1/8" Barb Side Port

#10-32 Valves, Recessed Needle



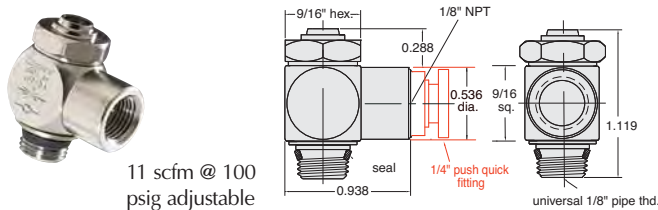
Part No.	Description
MFC-3AR	Meter Out Control Valve, #10-32 Female Side Port
MFC-3AR1	Meter Out Control Valve, 1/16" Barb Side Port
MFC-3AR2	Meter Out Control Valve, 1/8" Barb Side Port
MFC-3BR	Meter In Control Valve, #10-32 Female Side Port
MFC-3BR1	Meter In Control Valve, 1/16" Barb Side Port
MFC-3BR2	Meter In Control Valve, 1/8" Barb Side Port

1/8" NPT Control Valves, Knurled Knob



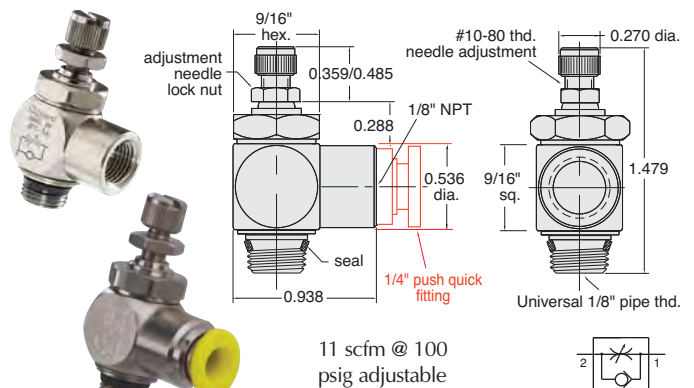
Part No.	Description
JFC-2A	Meter Out Control Valve, 1/8" NPT
JFC-2B	Meter In Control Valve, 1/8" NPT

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-3ARP08	Meter Out Control Valve, 1/4" Push-Quick Fitting
JFC-3BRP08	Meter In Control Valve, 1/4" Push-Quick Fitting

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



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 in-line.

Ports: Rotating input port allows 360° positioning 1/8" NPT

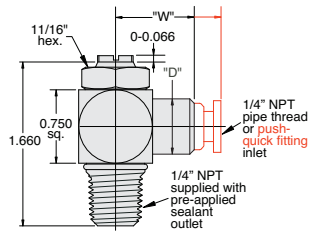
Adjustment: Recessed slotted needle or knurled knob

Part #	"D"	"W"
JFC-4K & JFC-4R	0.710"	0.875"
JFC-4K-P08 & JFC-4R-P08	0.562"	1.062"
JFC-4K-P12 & JFC-4R-P12	0.710"	1.250"
JFC-5K & JFC-5R	0.827"	1.125"
JFC-5K-P12 & JFC-5R-P12	0.750"	1.375"

1/4" NPT Valves, Recessed Needle



(JFC-4R shown)

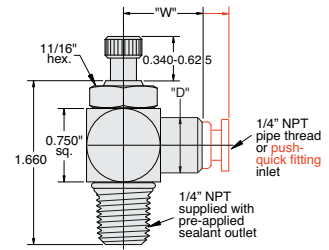


Part No.	Description
JFC-4R	Meter Out Control Valve, 1/4" NPT
JFC-4R-P08	Meter Out Control Valve, 1/4" Push-Quick Fitting
JFC-4R-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

1/4" NPT Valves, Adjusting Knob



(JFC-4K shown)

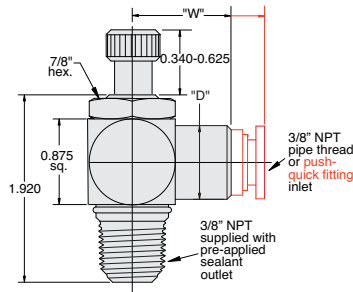


Part No.	Description
JFC-4K	Meter Out Control Valve, 1/4" NPT
JFC-4K-P08	Meter Out Control Valve, 1/4" Push-Quick Fitting
JFC-4K-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

3/8" NPT Valves, Adjusting Knob



(JFC-5K-P12 shown)

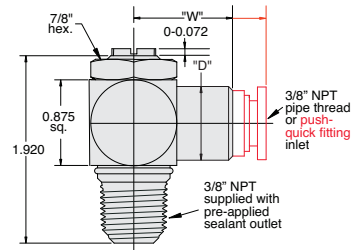


Part No.	Description
JFC-5K	Meter Out Control Valve, 3/8" NPT
JFC-5K-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

3/8" NPT Valves, Recessed Needle



(JFC-5R-P12 shown)



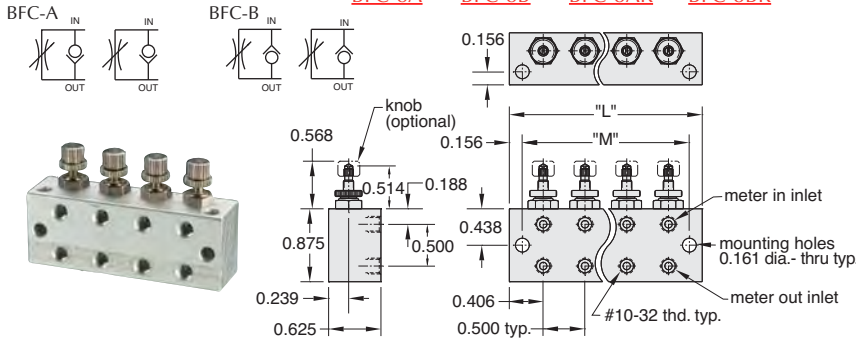
Part No.	Description
JFC-5R	Meter Out Control Valve, 3/8" NPT
JFC-5R-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting



MANIFOLD FLOW CONTROLS

Block Flow Controls

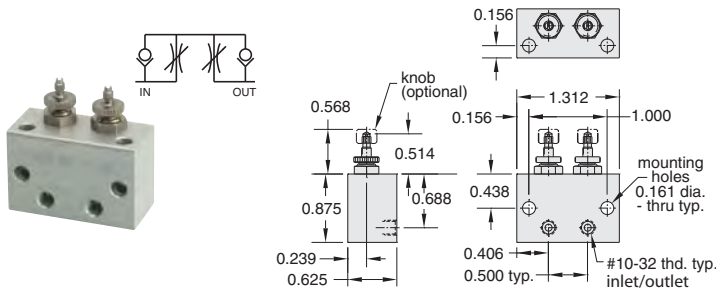
- [BFC-2A](#)
- [BFC-2B](#)
- [BFC-2AK](#)
- [BFC-2BK](#)
- [BFC-4A](#)
- [BFC-4B](#)
- [BFC-4AK](#)
- [BFC-4BK](#)
- [BFC-6A](#)
- [BFC-6B](#)
- [BFC-6AK](#)
- [BFC-6BK](#)
- [BFC-8A](#)
- [BFC-8B](#)
- [BFC-8AK](#)
- [BFC-8BK](#)



Block Flow Controls

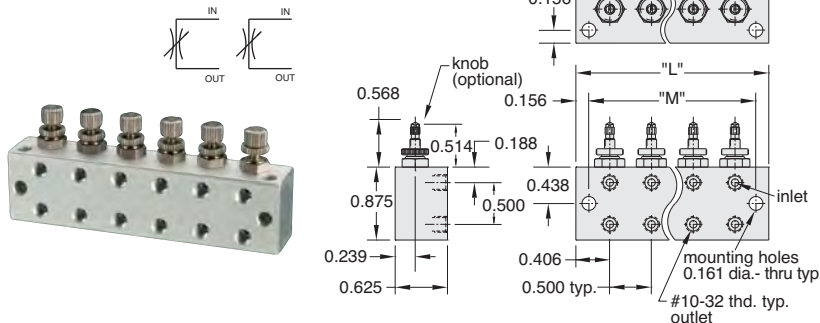
- [BFC-2C](#)
- [BFC-2CK](#)

Two valves common meter in and meter out.



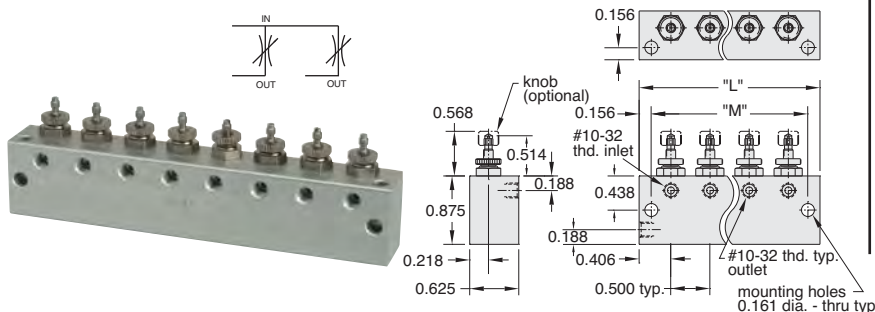
Block Needle Valves

- [BNV-2N](#)
- [BNV-4N](#)
- [BNV-6N](#)
- [BNV-8N](#)
- [BNV-2NK](#)
- [BNV-4NK](#)
- [BNV-6NK](#)
- [BNV-8NK](#)



Block Needle Manifolds

- [BNM-2N](#)
- [BNM-4N](#)
- [BNM-6N](#)
- [BNM-8N](#)
- [BNM-2NK](#)
- [BNM-4NK](#)
- [BNM-6NK](#)
- [BNM-8NK](#)



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



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"

PRESSURE ACTUATED SWITCHES



Medium: Air
Inlet Pressure: 5 to 150 psig; 0.3 to 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 pressures listed are nominal values only. For applications where a tight tolerance for actuation or deactuation is needed, please contact Clippard.

- 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

Nominal Actuation Pressure*

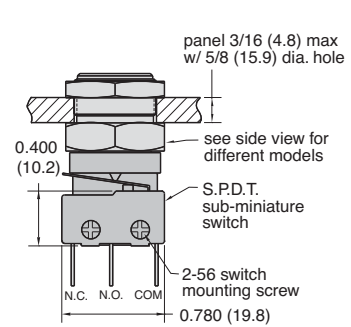
06 6 psig/0.4 bar
20 20 psig/1.4 bar
40 41 psig/ 2.8 bar
65 65 psig/4.5 bar
MN Manual

Inlet Port:

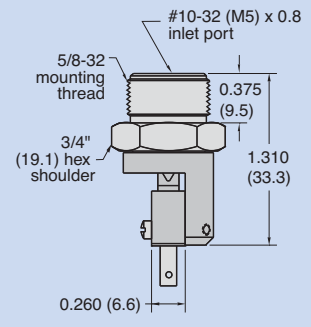
Blank #10-32 thd
F 1/8" NPT female
P 1/8" NPT male
M5 M5 x 0.8 thd

*Actuation pressure is nominal only. For applications where accuracy is critical, please contact Clippard.

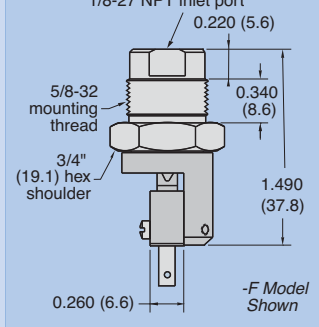
SAS Model



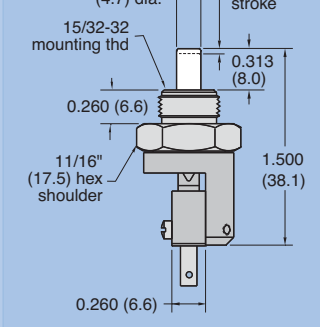
STD. & -M5



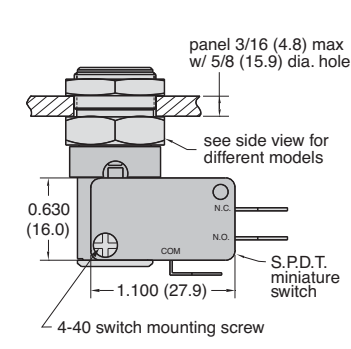
-F & -P



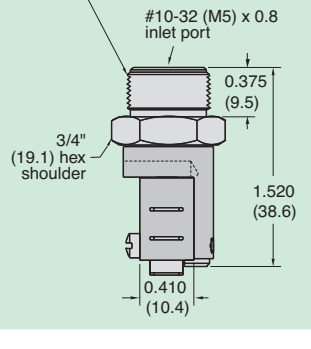
-MN



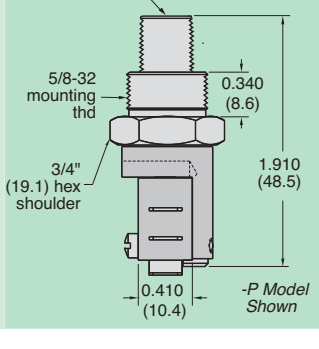
MAS Model



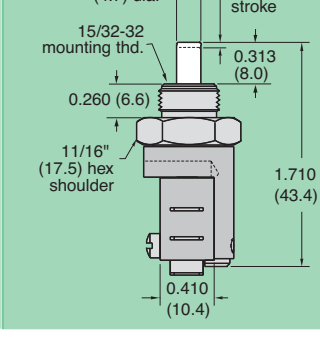
STD. & -M5



-F & -P



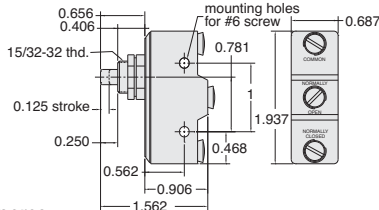
-MN





ELECTRIC & PNEUMATIC SWITCHES

Single Pole Electrical Switch



Stem Travel: 1/8" (3.2)

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

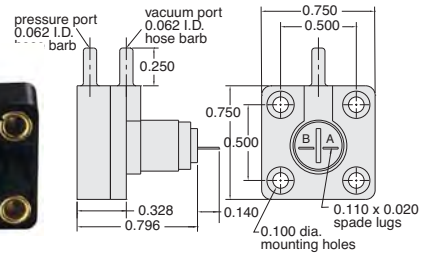


Mounting: #15/32-32 thread; nut and lockwashers furnished, also two 0.140" dia. mounting holes in body

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

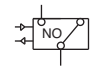
Switching Speed: 125 Hz, Normally-Open

Actuating Pressure: 3" H₂O 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

CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. Let us know YOUR Need, and we will help to find YOUR Solution!



Needle valves are common in controlling the flow of fluids and gases. This special needle valve uses a "D" stem for adapting to standard panel knobs. It also incorporates a special left-handed thread to provide a more intuitive clockwise movement to increase flow of the back for ease-of-assembly in a tight space. It also incorporates a special toggle to match the customers' aesthetic requirements.

A **combination assembly** using a toggle or push button operator and Clippard's pressure-actuated electrical switches provides a simultaneous air and electrical output.



This air-piloted valve is designed for a **water application** where limited space is available.



Alternate materials, seals and/or lubrication for specific applications are common (and welcomed) requests at Clippard. Stainless steel, aluminum, plastic or brass. All available, just ask!

For more information, visit www.clippard.com/customsolutions



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 Zytel 80G33 poppet.

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

Medium: Air or Hydraulic

Input Pressure: 300 psig/21 bar max. (MJCV Series: 1,000 psig hydraulic max.)

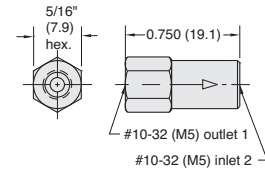
Pressure To Open: Cracks at approx. 1/2 psig

Mounting: Direct or in-line

Flow Direction: Arrow on valve body indicates direction of flow

Temperature Range: 32° to 230°F

Note: Not intended for pressure relief



Medium: Air

Input Pressure: 100 psig/21 bar max.

Air Flow: 1 scfm @ 50 psig;
28 l/min @ 3.5 bar

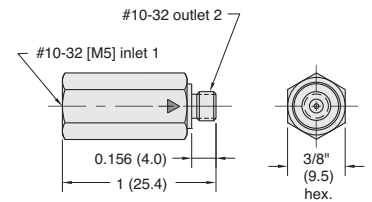
Pressure To Crack: 1 psig

Pressure To Fully Open: 2.5

Part No.

MCV-2

MCV-2-M5



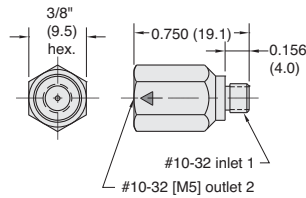
Part No.

MCV-1AB

MCV-1AB-M5



Air Flow: 6.5 scfm @ 50 psig; 11.5 scfm @ 100 psig; 280 l/min @ 6 bar



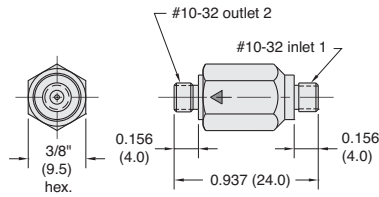
Part No.

MCV-1

MCV-1-M5



Air Flow: 6.5 scfm @ 50 psig; 11.5 scfm @ 100 psig; 280 l/min @ 6 bar

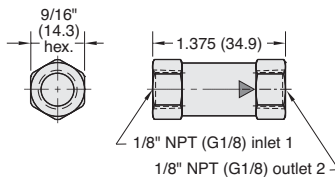


Part No.

MCV-1AA



Air Flow: 6.5 scfm @ 50 psig; 11.5 scfm @ 100 psig; 280 l/min @ 6 bar



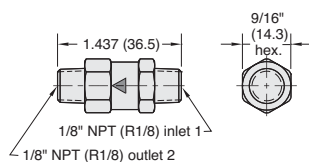
Part No.

MICV-1

MICV-1-MG



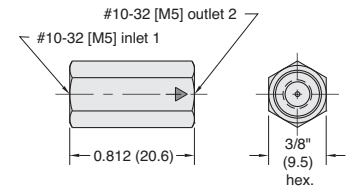
Air Flow: 20 scfm @ 50 psig; 36 scfm @ 100 psig; 580 l/min @ 6 bar



Part No.

MICV-1AA

MICV-1AA-MR



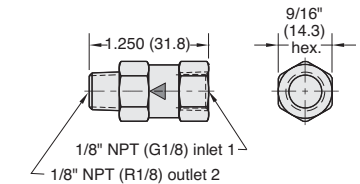
Part No.

MCV-1BB

MCV-1BB-M5



Air Flow: 6.5 scfm @ 50 psig; 11.5 scfm @ 100 psig; 280 l/min @ 6 bar



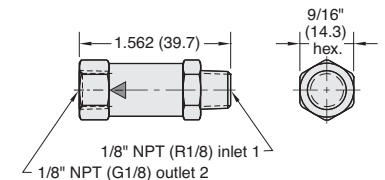
Part No.

MICV-1AB

MICV-1AB-MR



Air Flow: 20 scfm @ 50 psig; 36 scfm @ 100 psig; 580 l/min @ 6 bar



Part No.

MICV-1BA

MICV-1BA-MG



Air Flow: 20 scfm @ 50 psig; 36 scfm @ 100 psig; 580 l/min @ 6 bar



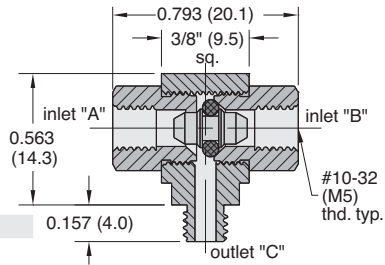
#10-32 SHUTTLE VALVES

Shuttle Valves

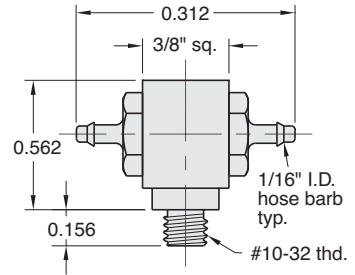
There are three models of shuttle valves offered by Clippard. These valves feature a shuttle that allows flow from one inlet to the outlet while blocking the other inlet. They may be mounted directly to valves and cylinders or in-line using the hose barbs on the MSV models.

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 in-line
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

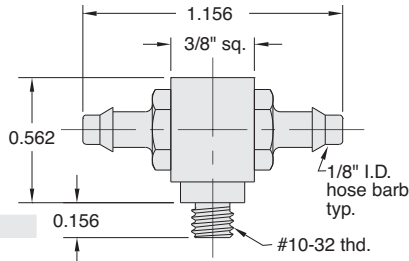
Note: Shuttle valves should not be used as a pressure selector



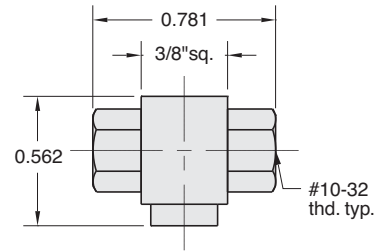
Part No.
 MSV-1
 MSV-1-M5



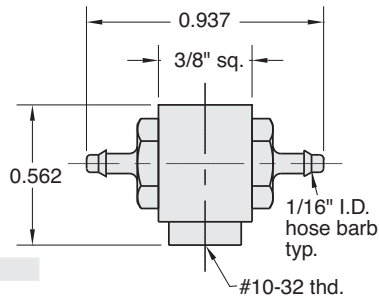
Part No.
 MSV-1M22



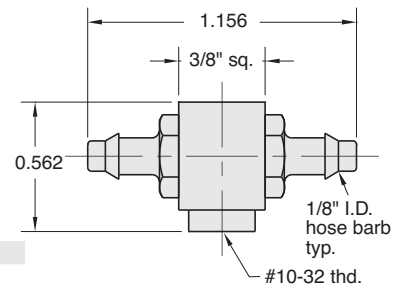
Part No.
 MSV-1M44



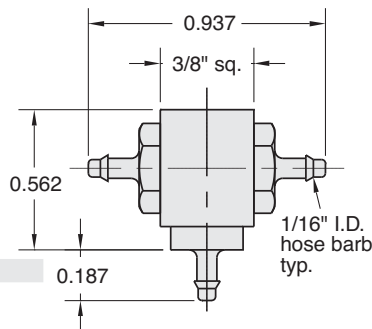
Part No.
 MSV-1FFF



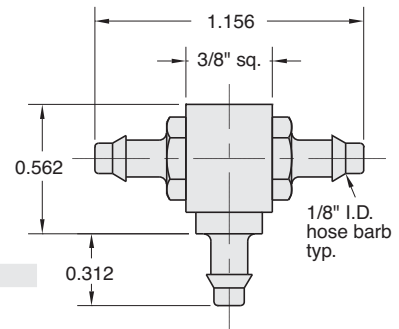
Part No.
 MSV-1F22



Part No.
 MSV-1F44



Part No.
 MSV-1222

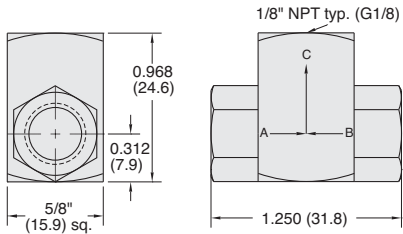


Part No.
 MSV-1444

Poppet Type Shuttle Valves



Brass body, Delrin Poppet,
Buna-N seal



Medium: Air, Water or Oil

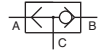
Input Pressure: 300 psig/21 bar - air; 1,000 psig/70 bar - hydraulic

Air Flow: 14 scfm @ 50 psig; 26 scfm @ 100 psig; 630 l/min @ 6 bar

Mounting: Direct or in-line

Operation: Flow from "A" to "C" or "B" to "C"

Pressure to Shift: 1/2 psig approx.



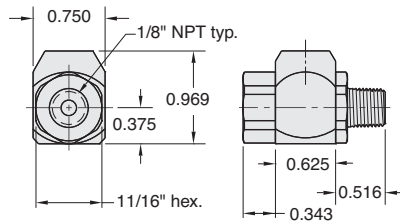
Note: Shuttle valves should not be used as a pressure selector

Part No.	Description
<u>MJSV-1</u>	Poppet Shuttle Valve, 1/8" NPT
<u>MJSV-1-MG</u>	Poppet Shuttle Valve, G1/8

J-Series Shuttle Valves



Part No.
ISV-2FPE



Poppet type shuttle
(double check) valve.
Brass body, stainless
steel shuttle, Buna-N
seal

Medium: Air, Water or Oil

Input Pressure: 300 psig max.

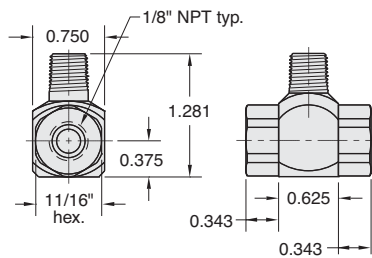
Air Flow: 30 scfm @ 50 psig
50 scfm @ 100 psig

Mounting: Direct or in-line

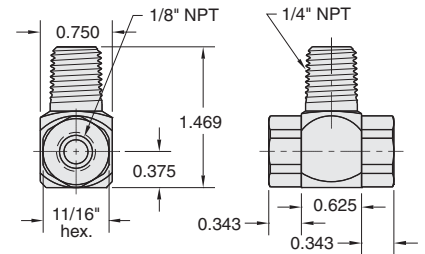
Pressure to Shift: 1 psig approx.



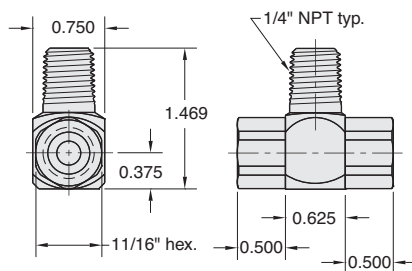
Part No.
ISV-2PFE



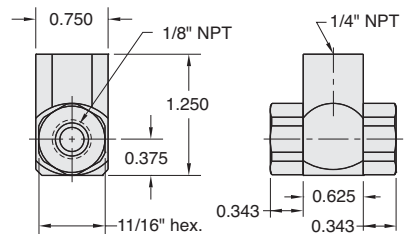
Part No.
ISV-2WFF



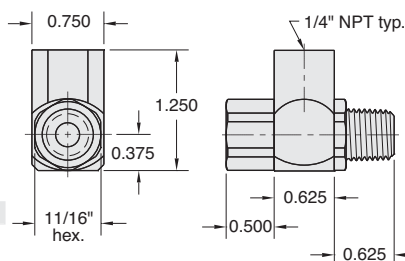
Part No.
ISV-2WYY



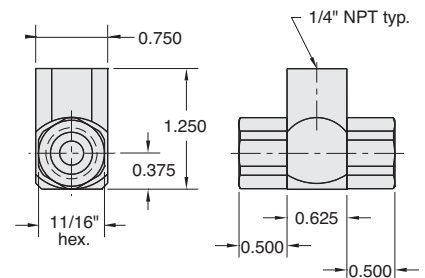
Part No.
ISV-2YFF



Part No.
ISV-2YYY



Part No.
ISV-2YYY





NEW! PILOT-OPERATED CHECK VALVES

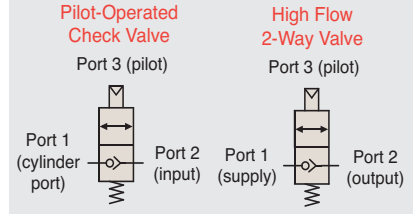


Pilot-Operated Check Valves work as standard check valves, but can be opened with an air pilot signal to permit free flow in the normally “checked” direction. The Clippard Pilot-Operated Check Valve provides the user with a reliable method to check flow in one direction, with the ability to remotely signal a free flow through the valve. Ideal for any circuit that requires this useful function—all in one valve that is easy to connect!

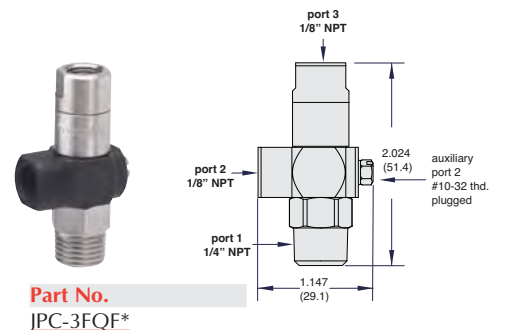
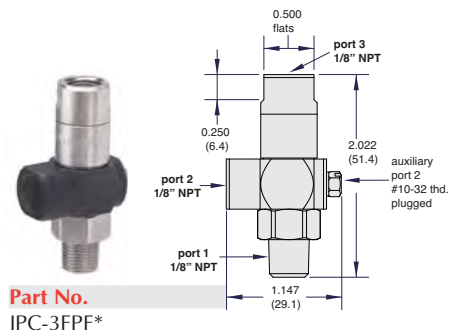
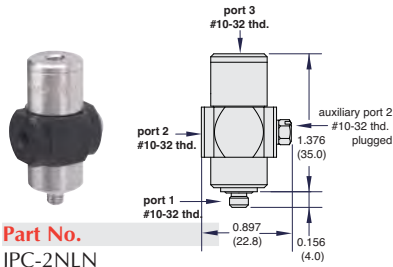
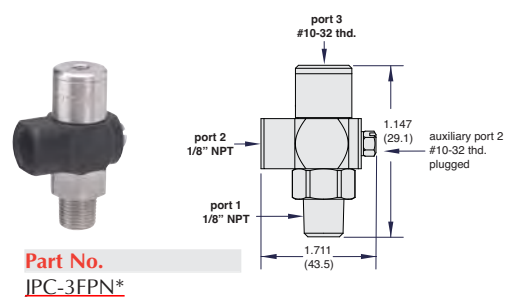
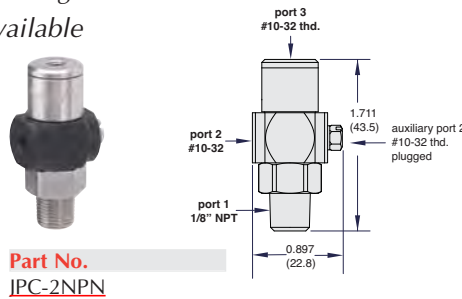
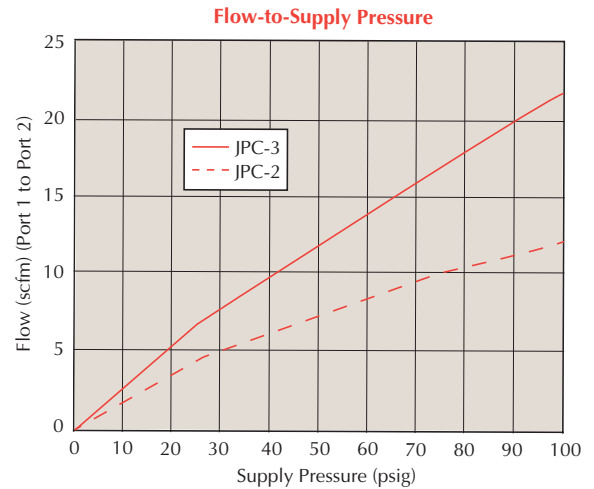
Medium: Air, Water or Oil
Pressure Range: 0 to 300 psig; 0 to 21 bar (see chart below)
Temperature Range: 32 to 230°F (0 to 110°C)
Materials: ENP brass, anodized aluminum, stainless steel, Buna-N seals

For specialty options such as various seal materials, manual override, or specific pilot to supply ratios, please consult factory.

Function/Porting Options



- High flow valve means low pressure drop
- Uses Clippard's superior poppet design
- Variety of port configurations available
- “Auxiliary” port allows ease of plumbing
- Side port (port 2) rotates for ease of positioning



* Also available in corrosion-resistant materials. Add “CR-” to the beginning of the Part No.

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 to 150 psig/20 bar max.

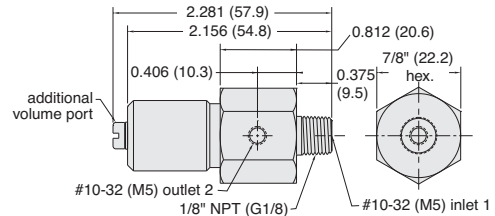
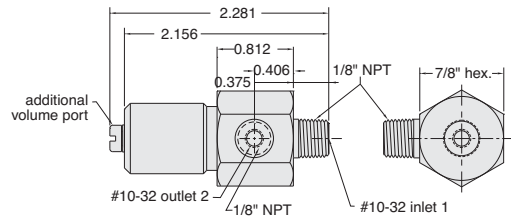
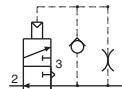
Mounting: 1/8" NPT (G1/8) thread; nut furnished

Volume Chamber: #10-32 (M5)

Operation: Converts a continuous supply of inlet air into a pulse of approximately 100 milliseconds

Response: 300 cycles per minute; time delay may be increased by adding standard Clippard volume chambers not to exceed 3 cu. in.

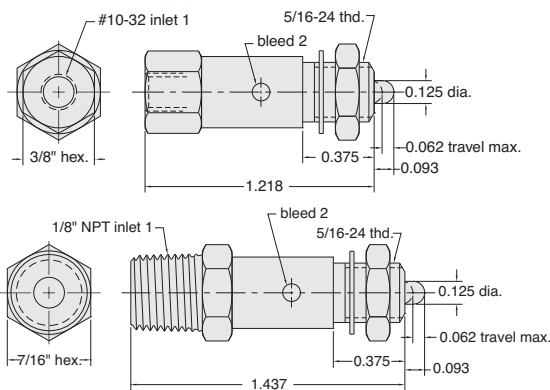
Construction: Body - ENP brass, Seals - Buna-N rubber, Spring - stainless steel, Poppet - Delrin®



Part No.	Description
<u>PV-1</u>	Pulse Valve, #10-32
<u>PV-1-M5</u>	Pulse Valve, M5 Metric
<u>PV-1P</u>	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

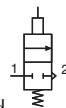
Stem Travel: 1/16" max. (will open and close in as little as 0.005")

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

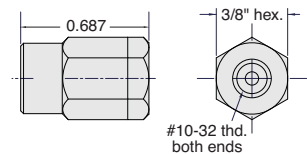


Part No.	Description
<u>MPS-2</u>	Poppet Valve with Pilot Sensor, #10-32
<u>MPS-2P</u>	Poppet Valve with Pilot Sensor, 1/8" NPT

In-Line Fixed Orifice Air Chokes



Each choke is calibrated for precise flow



Medium: Air

Material: Brass

Working Range: 0 to 300 psig max.

Part No.	Description
<u>MAC-A</u>	Air Choke, 0.0135" Hole, Yellow Disk
<u>MAC-B</u>	Air Choke, 0.010" Hole, Green Disk
<u>MAC-C</u>	Air Choke, 0.0075" Hole, Blue Disk
<u>MAC-D</u>	Air Choke, 0.006" Hole, Red Disk

Additional Valve Specifications

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

Temperature Range: 32 to 230°F (0 to 110°C)

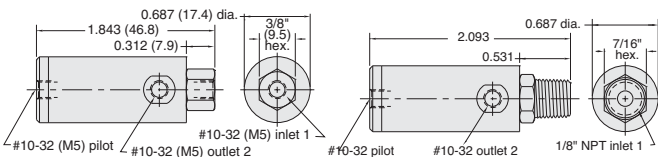
Options: Consult the factory concerning the price and availability of the following standard options:

- ENP** - Electroless Nickel Plating
- M5** - M5 x 0.8 threaded ports
- MG** - G1/8 ports
- E** - EPDM Seals
- V** - Viton Seals



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

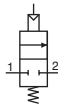
Input Pressure: 100 psig/10 bar max.

Pilot Pressure: 25 psig min.

Flow: 74 cu. in. H₂O per min. @ 80 psig

Drawback: 0.07 cu. in. (1.2 ml)

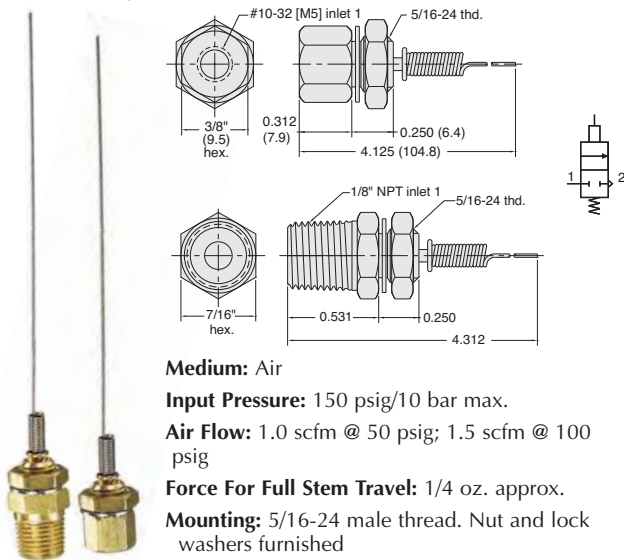
Mounting: Mounts in-line



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.

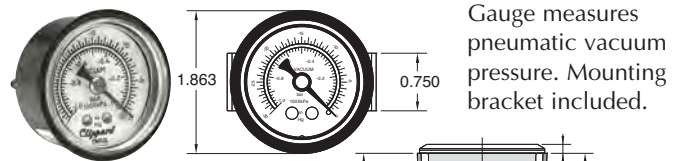
Mounting: 5/16-24 male thread. Nut and lock washers furnished

Bleed: To atmosphere around whisker stem

Whisker: Stainless steel, approx. 3" (76.2) length. Replacement Part No. 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

Vacuum Gauge



Gauge measures pneumatic vacuum pressure. Mounting bracket included.

Range: Scale reading from 0 to 30" Hg. and 0 to -1 bar

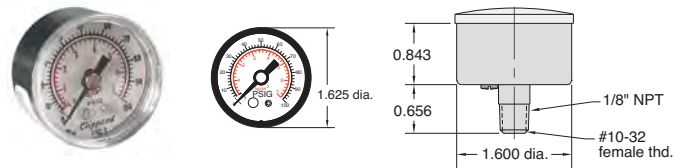
Construction: Nickel-plated steel case. Plastic face. Dial shows two ranges; Hg in black. Bars in red. Built-in pressure snubber.

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 Gauges



Gauge measures pneumatic system pressure. Stud mounted.

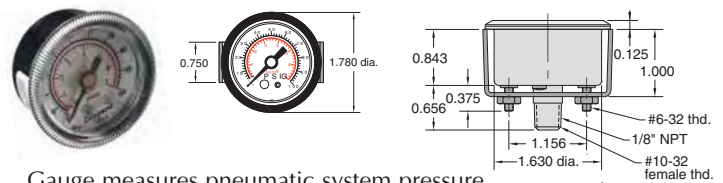
Range: Scale reading from 0 to 100 psig and 0 to 6.9 bar

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



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

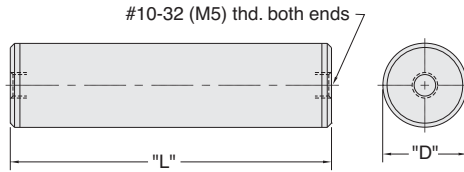
Mounting: With zinc plated steel bracket supplied

Part No.	Description
PG-100	Pressure Gauge

In-Line Volume Chamber



Used for providing a time delay in pneumatic circuits



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.

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

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

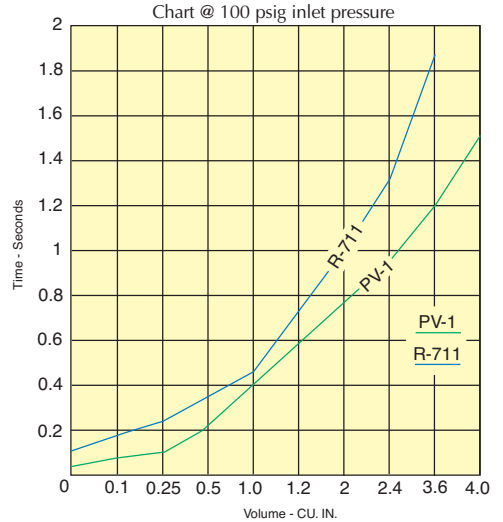
Volume	Time in Seconds	
	PV-1	R-711
0	0.042	0.117
0.1	0.074	0.180
0.25	0.124	0.245
0.5	0.210	0.350
1.0	0.390	0.450
1.2	0.580	0.700
2.0	0.760	1.000
2.4	0.950	1.300
3.6	1.200	1.900
4.0	1.500	N.R.

Medium: Air only

Material: Brass

Input Pressure: 150 psig/10 bar max.

Mounting: Direct or in-line; Mounting clamp with MAT-20 and MAT-4.0



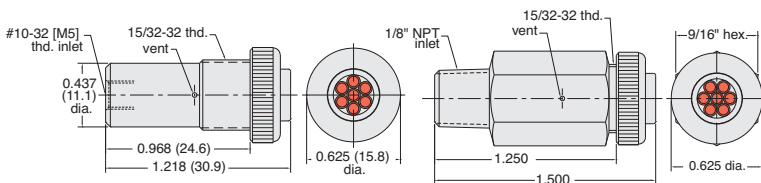
Part No.	Description
MAT-(size)	In-Line Volume Chamber, #10-32
MAT-(size)-M5	In-Line Volume Chamber, M5

Specify Size per Chart

R-821 volume charts are shown in the Modular Section of this catalog.

Multi-Pin Air Indicator

Plunger type (when extended 7-pin color display signals "on")



Medium: Air Only

Input Pressure: 150 psig/1 to 10 bar max.

Minimum Actuation Pressure: 15 psig approx.

Response: Approx. 10 milliseconds @ 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

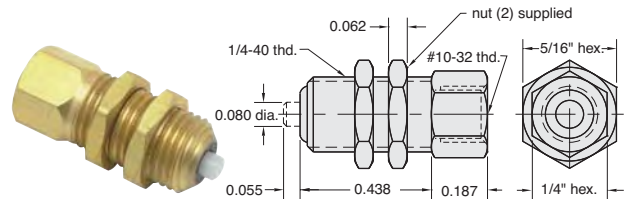
Maximum Panel Thickness: 3/16" (4.8)

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

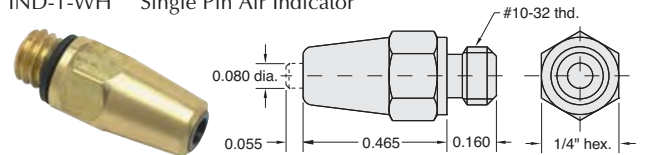
GN-Green, WH-White, RD-Red, YL-Yellow

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 milliseconds @ 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 #10-32 port

Maximum Panel Thickness: 3/16"



HEAVY-DUTY LIMIT VALVES

Heavy-Duty Limit Valves



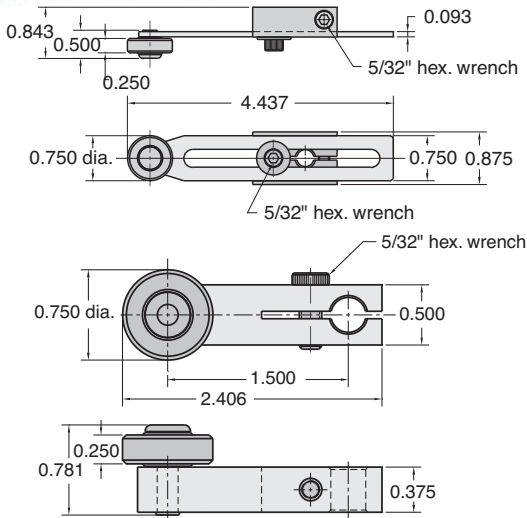
These valves feature rugged construction to withstand heavy use. A zinc alloy die cast actuator head with a hardened steel shaft in a bronze bearing is mated to a solid aluminum valve body. Inside is

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.



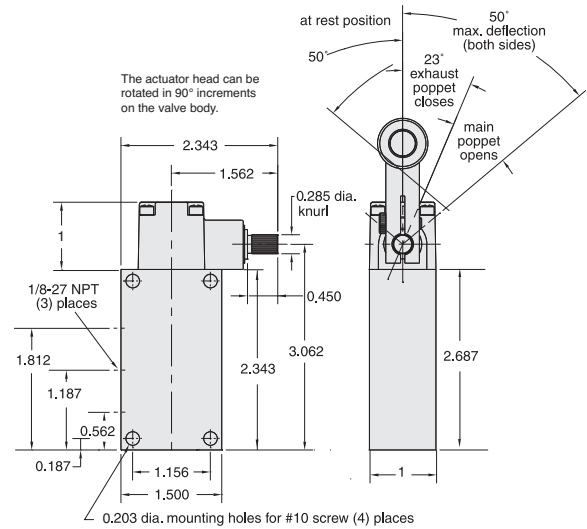
Arm: Aluminum base with steel extendable arm (AR-L only)

Roller: Hardened steel

Adjustment: AR-L only - 1.0" to 3.5"

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.

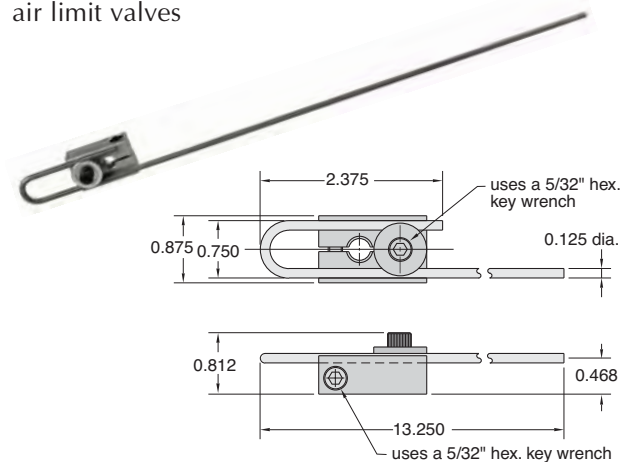
Actuation Range: 0 to 23° Off, 23 to 50° On, Maximum travel 50°

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" long retained by screw clamp; the rod may be shortened and/or bent to desired shape

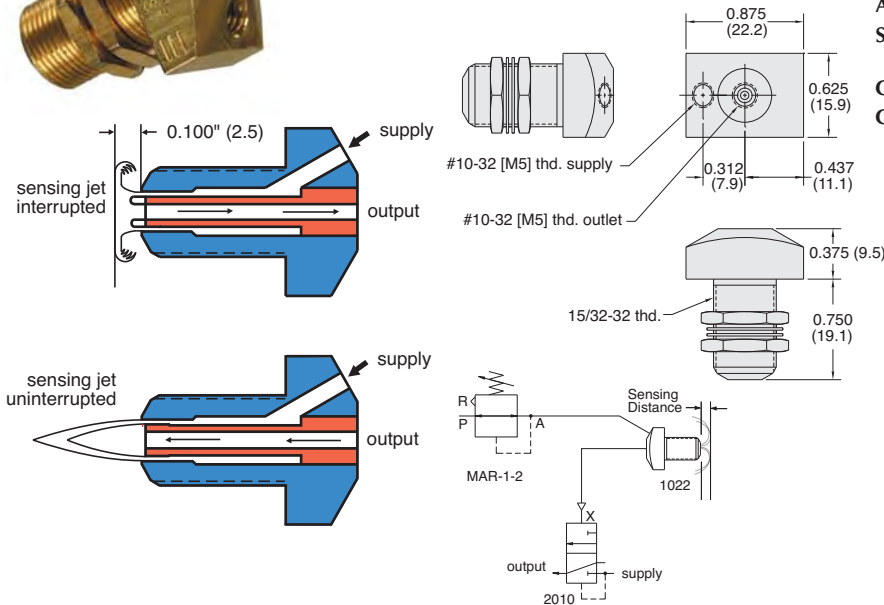
Mounting: Slotted aluminum mounting clamp may be positioned on limit valve shaft in any direction within a 360° circle

Part No.	Description
AR-M	Rod Actuator Arm

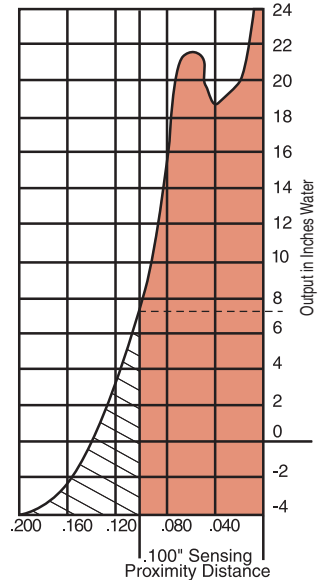
Non-Contact Air Proximity Switch



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



Medium: Air
Input Pressure: 4 to 10 psig/0.3 to 0.7 bar
Nominal Proximity Distance: 0.100"
Output Signal at 4 psig supply: Normal: -2" H₂O
 actuated: 7 1/2" H₂O
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

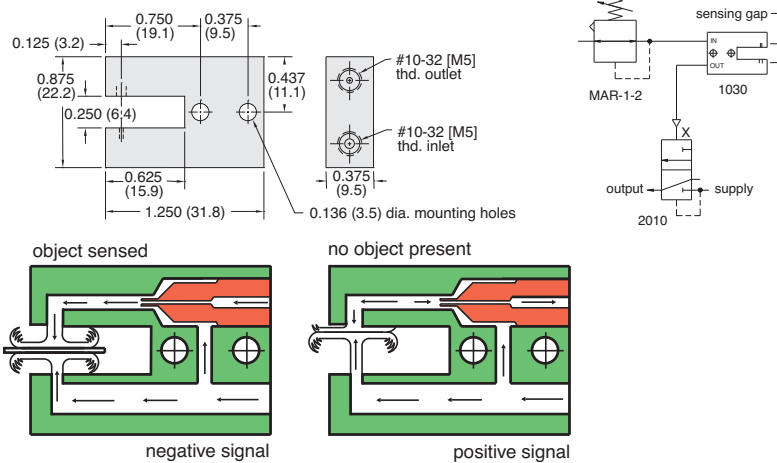


Part No.	Description
1022	Non-Contact Air Limit Switch, #10-32
1022-M5	Non-Contact Air Limit Switch, M5

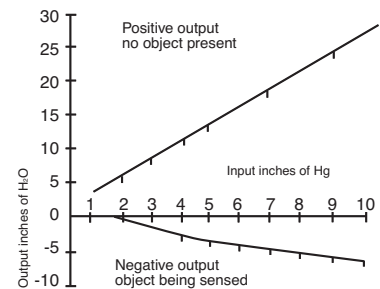
Non-Contact Gap Sensor



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



Medium: Air
Input Pressure: 0.5 to 5 psig
Output: -3" to 26" H₂O @ 4 psig
Frequency Response: 1,000 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



Part No.	Description
1030	Non-Contact Positive Pressure Sensor, #10-32
1030-M5	Non-Contact Positive Pressure Sensor, M5

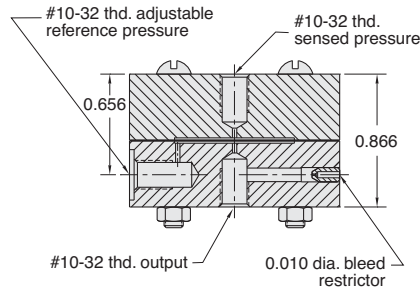
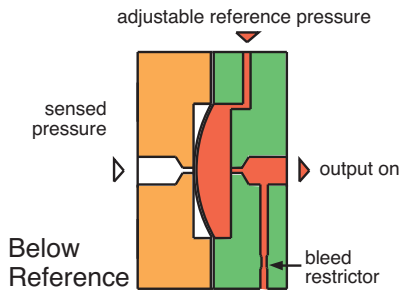
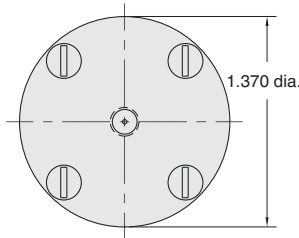


PRESSURE SENSORS

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 to 150 psig max.

Air Flow: 0.029" orifice

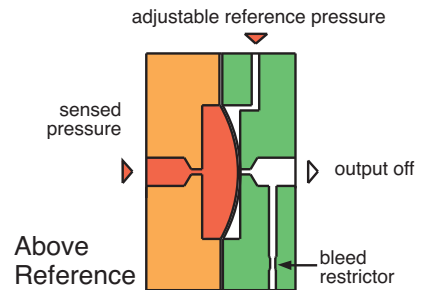
Response Time: 5 milliseconds

Differential Sensitivity: 2%

Frequency Response: 60 Hz

Materials: Anodized aluminum body, Buna-N diaphragms

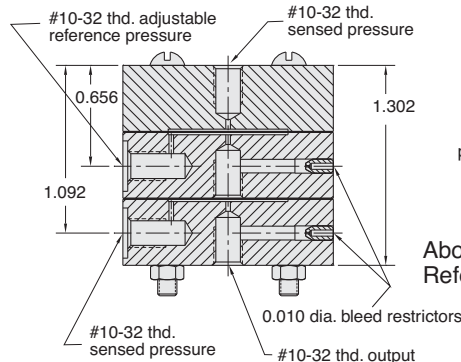
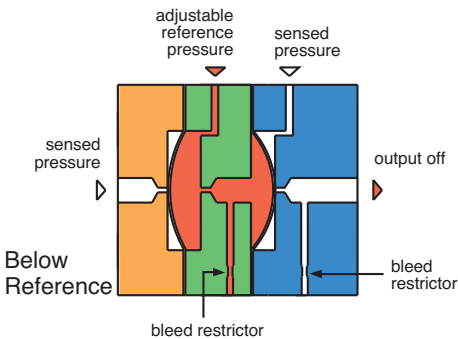
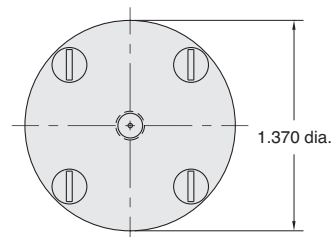
Part No.	Description
1043	Single Stage Pressure Repeater



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 to 150 psig max.

Air Flow: 0.029" orifice

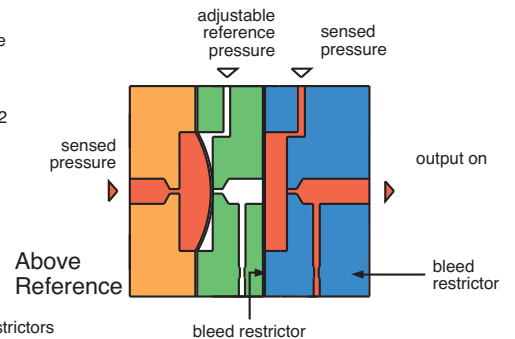
Response Time: 5 milliseconds

Differential Sensitivity: 2%

Frequency Response: 60 Hz

Materials: Anodized aluminum body, Buna-N diaphragms

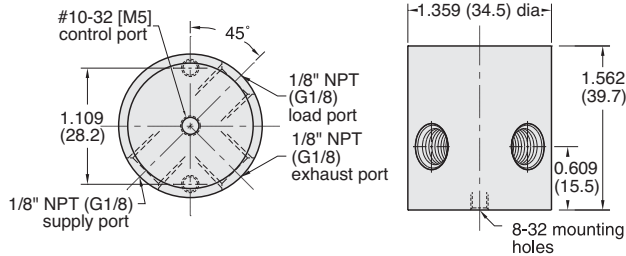
Part No.	Description
1044	Two Stage Pressure Repeater



3-Way Normally-Closed Amplifier Valves

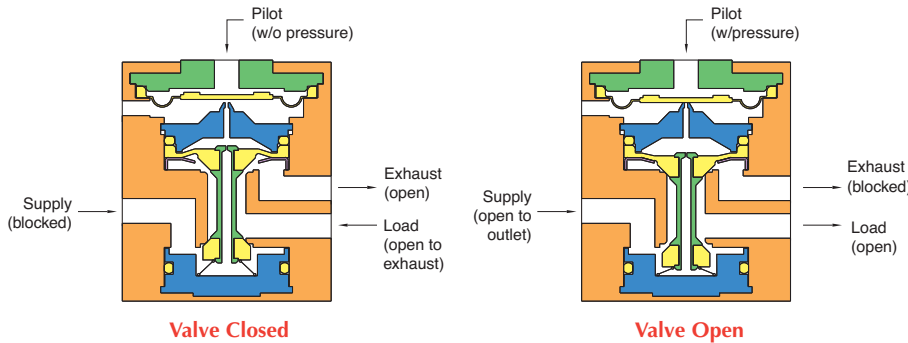


3-Way Valve Normally-Closed Interface amplifies very low pressure air-jet sensing signals to working power levels



Top View

Side View



Valve Closed

Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 30 to 100 psig / 2 to 7 bar max.

Air Flow: 22 scfm @ 100 psig; 530 l/min @ 6 bar

Pilot Pressure: 4" H₂O @ 100 psig

Maximum Allowable Pilot Pressure: 5 psig

Response Time: 10 milliseconds dead headed

Operating Speed: 50 Hz

Bleed: 0.1 scfm @ 100 psig

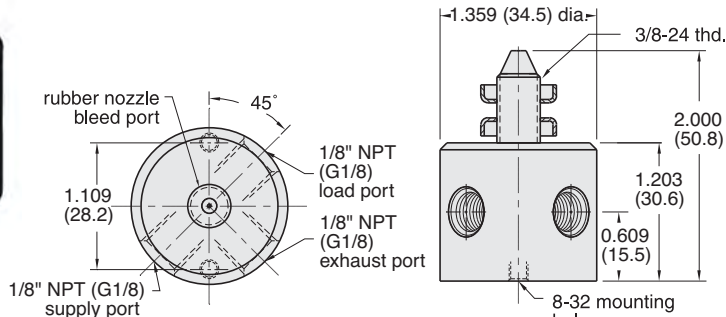
Ports: Load - 1/8" NPT (G1/8) female
Supply - 1/8" NPT (G1/8) female
Exhaust - 1/8" NPT (G1/8) female
Control - #10-32 (M5) female

Part No.	Description
2010	Normally-Closed Interface, 1/8" NPT
2010-MG	Normally-Closed Interface, G1/8

3-Way Bleed Pressure Piloted Limit Valves

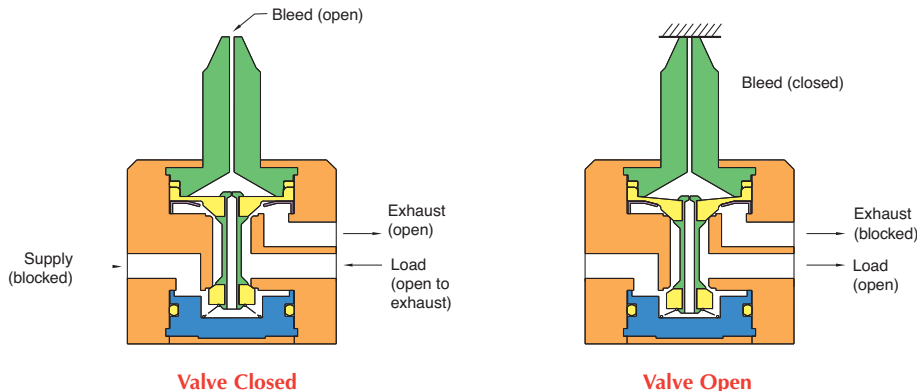


3-Way Bleed Pressure Piloted Limit Valve; blocking of the sensing port causes rapid valve opening



Top View

Side View



Valve Closed

Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 30 to 100 psig / 2 to 7 bar max.

Air Flow: 22 scfm @ 100 psig; 530 l/min @ 6 bar

Bleed: 0.1 scfm @ 100 psig

Response Time: 15 milliseconds

Ports: 1/8" NPT (G1/8)

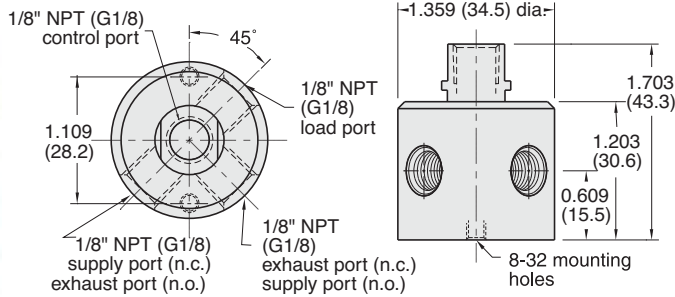
Note: Supplied with threaded bulkhead mount and integral rubber nozzle for direct actuation by mechanical closure. By removing rubber nozzle and inserting a #10-32 fitting and length of hose, 2011-1 can be converted to a remote sensing valve.

Part No.	Description
2011-1	Piloted Limit Valve, 1/8" NPT
2011-1-MG	Piloted Limit Valve, G1/8



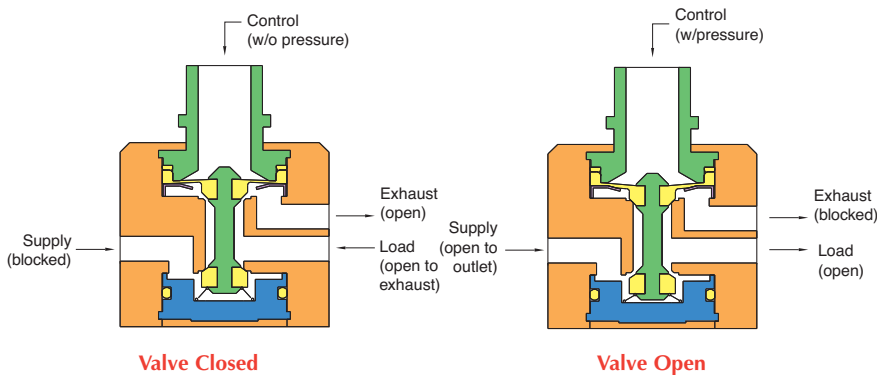
SPECIAL PILOTED 3-WAY VALVES

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 to 100 psig/7 bar max.

Air Flow: 22 scfm @ 100 psig;
530 l/min @ 6 bar

Minimum Pilot Pressure:
 N.O. - 90% of supply pressure
 N.C. - 60% of supply pressure

Response Time: 15 milliseconds after pilot pressure reaches switch point

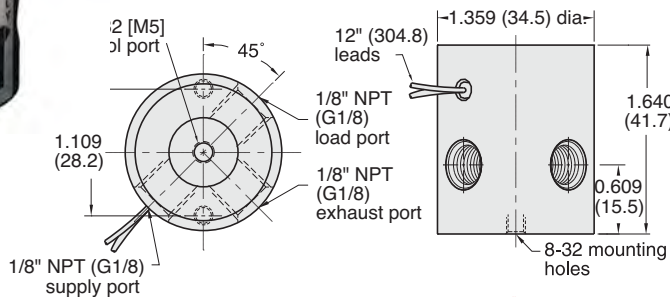
Operating Speed: 1,100 CPM

Part No.	Description
<u>2012</u>	Piloted Valve, 1/8" NPT
<u>2012-MG</u>	Piloted Valve, G1/8
<u>2012-VAC</u>	Valve for Vacuum Operation (requires positive pressure pilot signal)
<u>2012-G</u>	Valve for Liquid Adhesives (silicone diaphragm and seals), 1/8" NPT
<u>2012-G-MG</u>	Valve for Liquid Adhesives (silicone diaphragm and seals), G1/8

3-Way N.O. or N.C. Electronically Piloted Valves

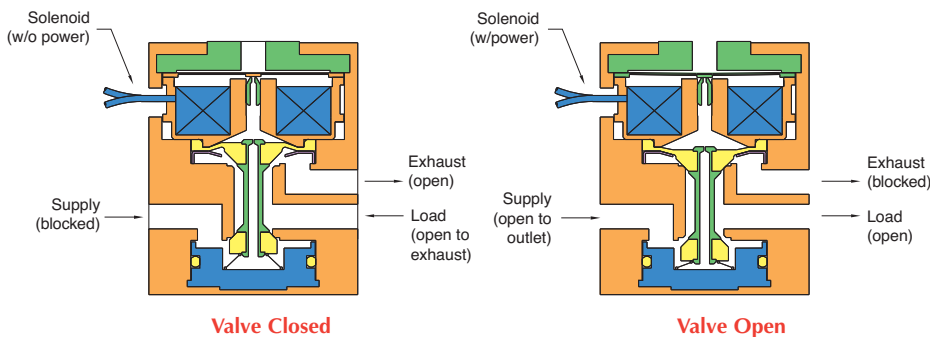


3-Way Normally-Closed Electronic Valve with low-power DC solenoid can be directly converted to high pressure pneumatic power without electronic amplification.



Top View

Side View



Valve Closed

Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 30 to 100 psig/2 to 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 milliseconds

Leads: 28 gauge stranded PVC 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
<u>2013-6</u>	Valve, 6 Volts DC, 1/8" NPT
<u>2013-12</u>	Valve, 12 Volts DC, 1/8" NPT
<u>2013-24</u>	Valve, 24 Volts DC, 1/8" NPT
<u>2013-6-MG</u>	Valve, 6 Volts DC, G1/8
<u>2013-12-MG</u>	Valve, 12 Volts DC, G1/8
<u>2013-24-MG</u>	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 to 100 psig; 2.7 to 7 bar max.

Air Flow: 22 scfm @ 100 psig; 620 l/min @ 6 bar

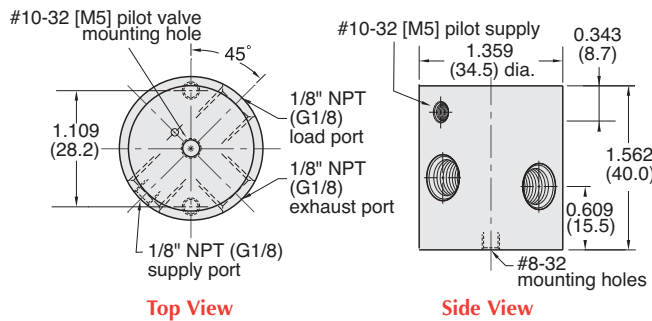
Pilot Pressure: 60% of supply pressure, minimum

Response Time: Approx. 20 milliseconds

Mounting: Mounting holes provided

Materials: Anodized aluminum, stainless steel

Part No.	Description
<u>2020</u>	Piloted Valve, 1/8" NPT
<u>2020-MG</u>	Piloted Valve, G1/8
<u>2021</u>	Piloted Valve, 1/8" NPT
<u>2021-MG</u>	Piloted Valve, G1/8

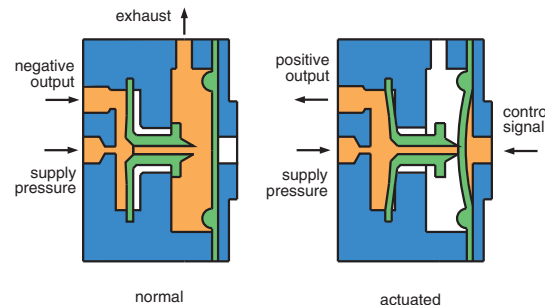
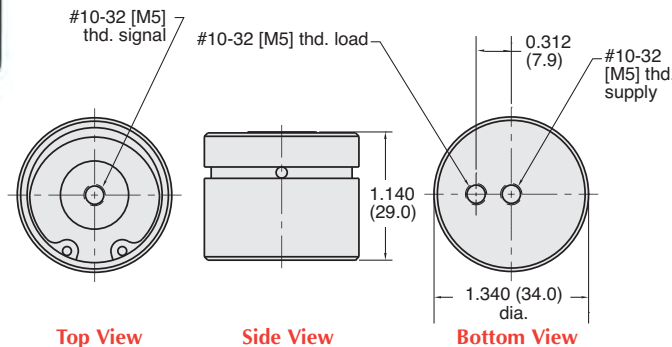


2020 shown with ET Pilot Valve and external pilot supply

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.



Medium: Air

Input Pressure: 3 to 100 psig; 0.2 to 7 bar max.

Minimum Pilot Pressure: 1.5" H₂O psig

Maximum Pilot Pressure: 1 psig (28" H₂O")

Air Flow: 0.18 scfm @ 100 psig; 5 l/min @ 6 bar

Bleed Orifice Diameter: 0.010"

Part No.	Description
<u>3200-A</u>	Amplifying Valve, #10-32
<u>3200-A-M5</u>	Amplifying Valve, M5



PNEUMATIC COUNTER

6-Digit Pneumatic Totalizing Counter



The PT-1SM 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 may be reset manually by 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 many other purposes. The PT-1SM is designed for surface mounting.

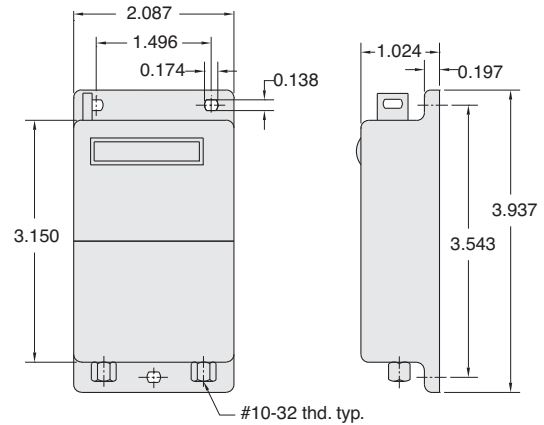
Display: 6 figures, numerals 0.080" to 0.160"

Medium: Filtered compressed air containing no oil

Reset: Manual push button and pneumatic spring return

Input Pressure: 30 to 120 psig

Mounting: Surface mount

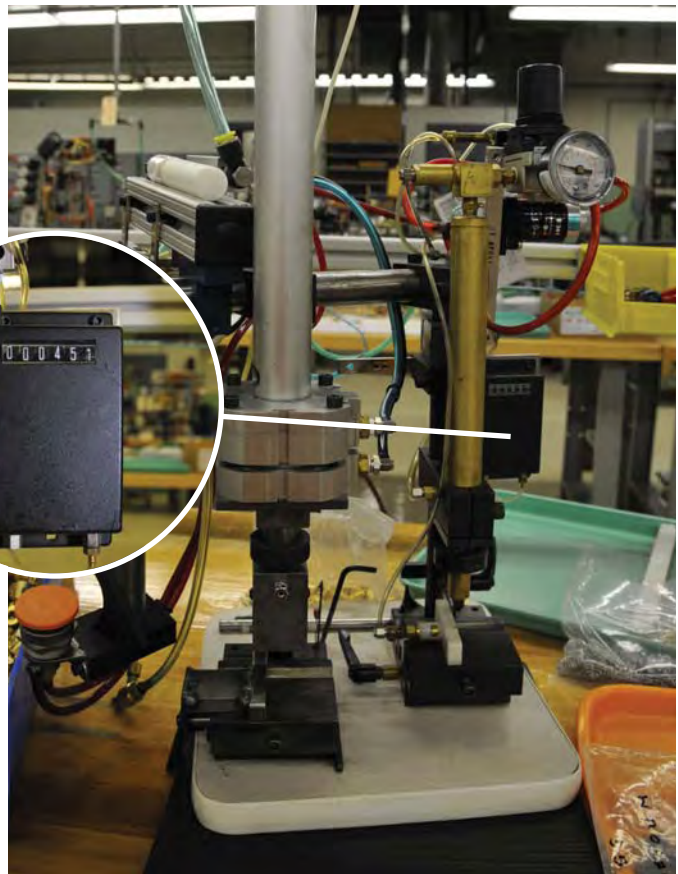


Part No.	Description
PT-1SM	6-Digit Pneumatic Totalizing Counter

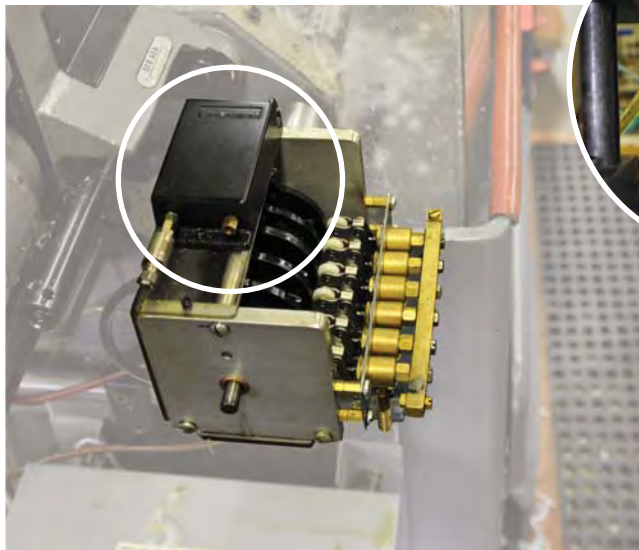
Pneumatic Counter Solutions

Pneumatic counters are used in a variety of pneumatic applications including filling machines, cut counting, stamping, multi-spindle operations and more. They count pulses generated by cylinders, push buttons, pedals, and other actuation devices.

Clippard's 6-digit totalizing counter can be found in many places throughout their manufacturing operations.



Date Stamping Operation



4-Spindle Turret Operation

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.

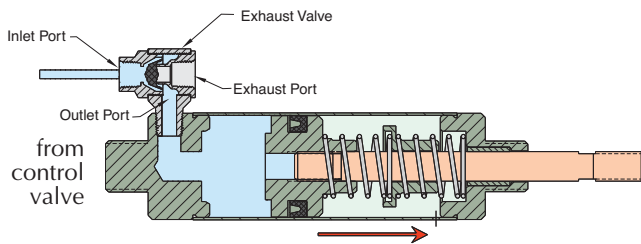
Supply air from a control valve is directed into the inlet port of the exhaust valve. The Buna-N poppet seals the exhaust port and allows air to flow from the outlet port of the valve into the cylinder.

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

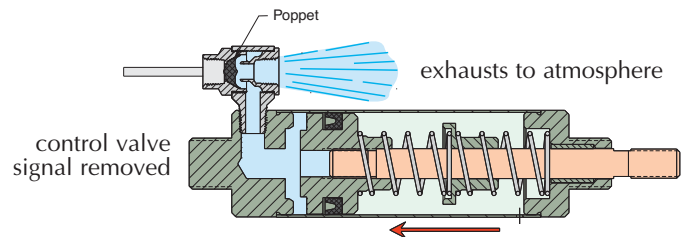
When the control valve exhausts air from the exhaust valve inlet port, the Buna-N poppet shifts to seal the inlet port and open the exhaust port to the cylinder. The pressurized air is allowed to exhaust directly through the exhaust valve to atmosphere.

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.

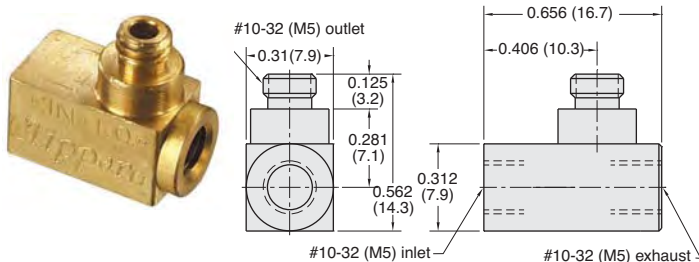
Cylinder Extends



Cylinder Retracts - Fast!



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 to 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"

Packaging Solutions

A leader in miniature pneumatics, Clippard provides the packaging industry a variety of products and solutions. We understand the needs of this industry, and are prepared to serve you with our expanding product lines and expertise in applications.

- Conveying applications
- Case erectors
- Process solutions
- Bottle/container filling
- Palletizing
- Controls for a variety of applications

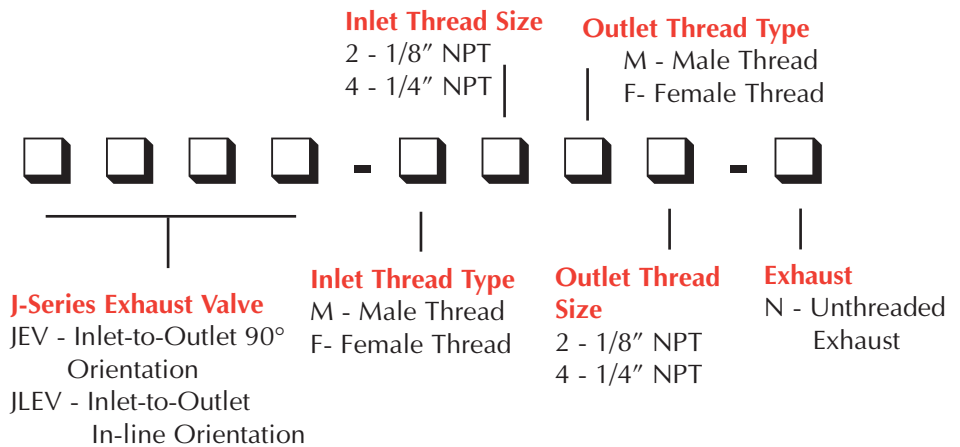




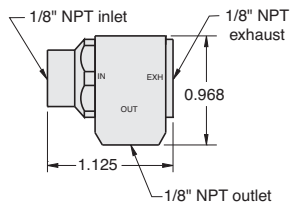
EXHAUST VALVES

J-Series Exhaust Valves

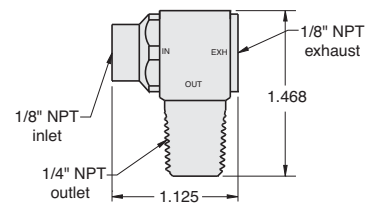
Clippard's J-Series Exhaust Valve offers a variety of design features and provides fast response times and high flow with 1/8" and 1/4" NPT ports. This compact poppet type valve is constructed of brass and is 100% tested to assure the highest quality. The JEV's primary function is to increase cylinder 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.



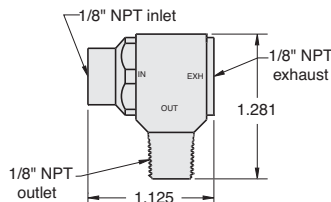
Part No.
JEV-F2F2



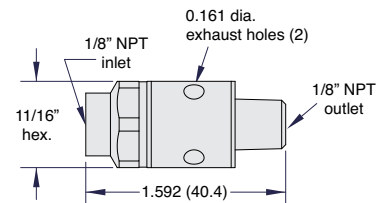
Part No.
JEV-F2M4



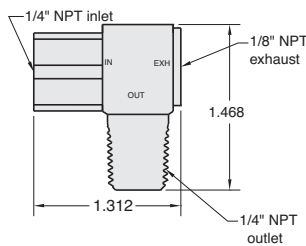
Part No.
JEV-F2M2



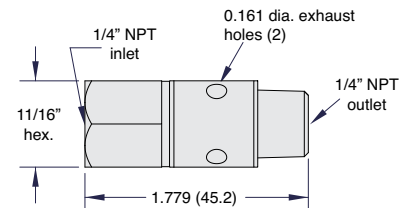
Part No.
JLEV-F2M2-N



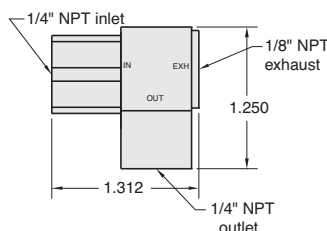
Part No.
JEV-F4M4



Part No.
JLEV-F4M4-N

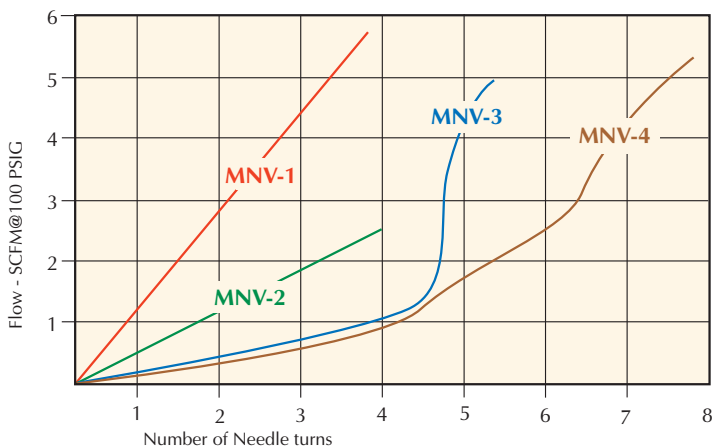
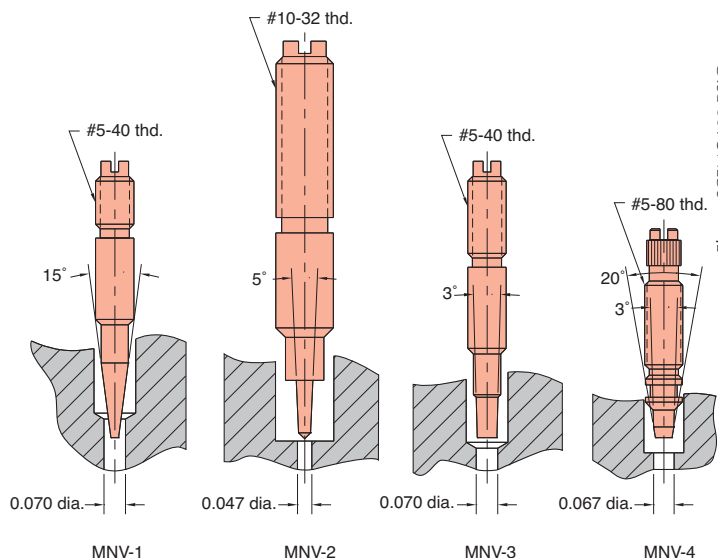


Part No.
JEV-F4F4



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



Adjustable control needle valves restrict flow in both directions. There are 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, in-line 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).

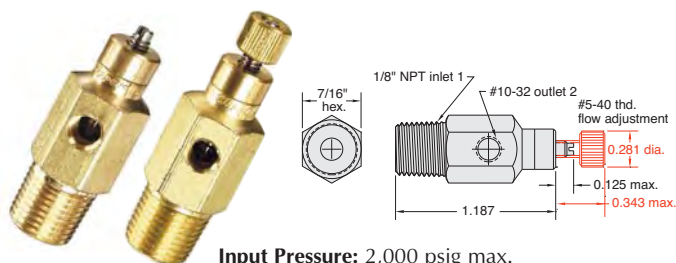
15° Needle Valves, #10-32



Input Pressure: 2,000 psig max.
Air Flow: 3 scfm @ 50 psig; 6 scfm @ 100 psig

Part No.	Description
<u>MNV-1</u>	Needle Valve, #10-32, Screwdriver Slot
<u>MNV-1K</u>	Needle Valve, #10-32, Knurled Knob

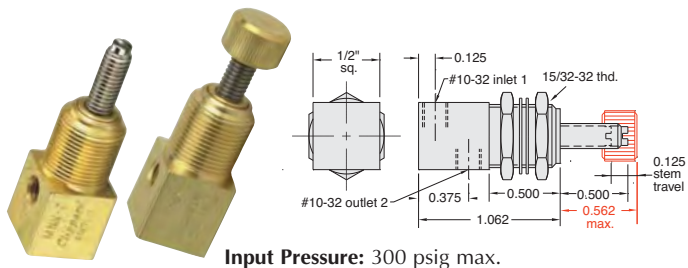
15° Needle Valves, 1/8" NPT



Input Pressure: 2,000 psig max.
Air Flow: 3 scfm @ 50 psig; 6 scfm @ 100 psig

Part No.	Description
<u>MNV-1P</u>	Needle Valve, 1/8" NPT, Screwdriver Slot
<u>MNV-1KP</u>	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
<u>MNV-2</u>	Needle Valve, #10-32, Screwdriver Slot
<u>MNV-2K</u>	Needle Valve, #10-32, Knurled Knob

3° Needle Valves, #10-32



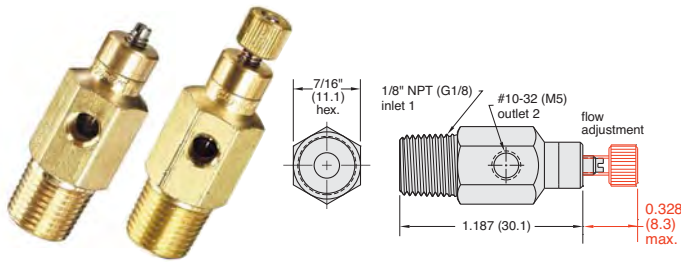
Input Pressure: 2,000 psig/40 bar max.
Air Flow: 2.5 scfm @ 50 psig; 5 scfm @ 100 psig; 120 l/min @ 6 bar

Part No.	Description
<u>MNV-3</u>	Needle Valve, #10-32, Screwdriver Slot
<u>MNV-3-M5</u>	Needle Valve, M5, Screwdriver Slot
<u>MNV-3K</u>	Needle Valve, #10-32, Knurled Knob
<u>MNV-3K-M5</u>	Needle Valve, M5, Knurled Knob



NEEDLE VALVES & MUFFLERS

3° Needle Valves, 1/8" NPT

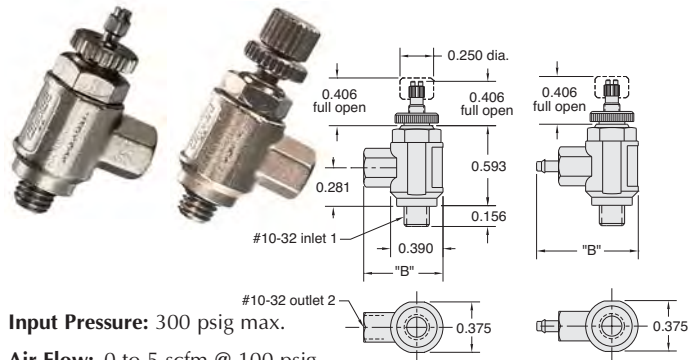


Input Pressure: 2,000 psig/40 bar max.

Air Flow: 2.5 scfm @ 50 psig; 5 scfm @ 100 psig; 120 l/min @ 6 bar

Part No.	Description
<u>MNV-3P</u>	Needle Valve, #10-32, Screwdriver Slot
<u>MNV-3P-M5</u>	Needle Valve, M5, Screwdriver Slot
<u>MNV-3KP</u>	Needle Valve, #10-32, Knurled Knob
<u>MNV-3KP-M5</u>	Needle Valve, M5, Knurled Knob

3° Needle Valves, #10-32

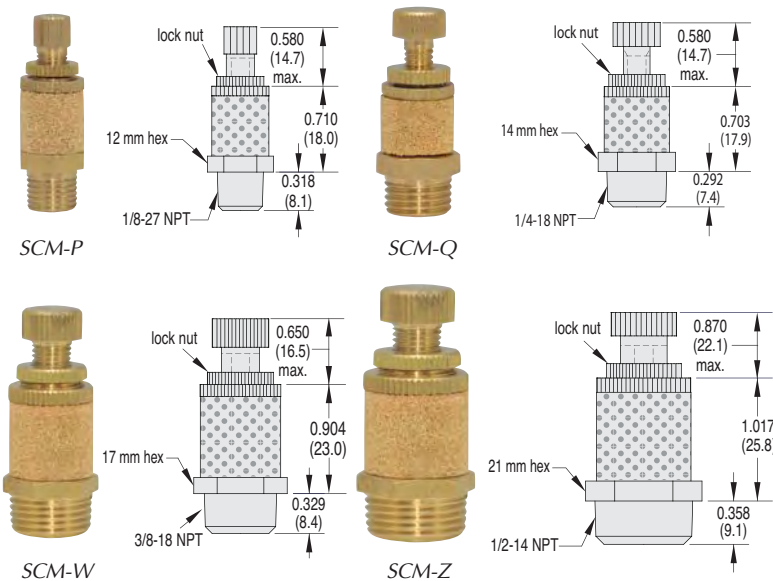


Input Pressure: 300 psig max.

Air Flow: 0 to 5 scfm @ 100 psig

Part No.	Female Part	"B"	Adjustment
<u>MNV-4</u>	#10-32	0.593	Knurled locking nut standard; screwdriver slot; knurled locking nut standard; clockwise adjustment of either provides less flow
<u>MNV-41</u>	1/16 Barb . . .	0.750	
<u>MNV-42</u>	1/8 Barb . . .	0.906	
<u>MNV-4K</u>	#10-32	0.593	Knurled knob; clockwise adjustment of either provides less flow
<u>MNV-4K1</u>	1/16 Barb . . .	0.750	
<u>MNV-4K2</u>	1/8 Barb . . .	0.906	

NEW! Speed Control Mufflers



Knurled knob length based on minimum thread engagement.

Material: Solid brass body; sintered bronze muffler (40 micron)

Part No.	Description
<u>SCM-P</u>	Muffler, 1/8-27 NPT
<u>SCM-Q</u>	Muffler, 1/4-18 NPT
<u>SCM-W</u>	Muffler, 3/8-18 NPT
<u>SCM-Z</u>	Muffler, 1/2-14 NPT



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.

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.

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 event.

Medium: Air

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

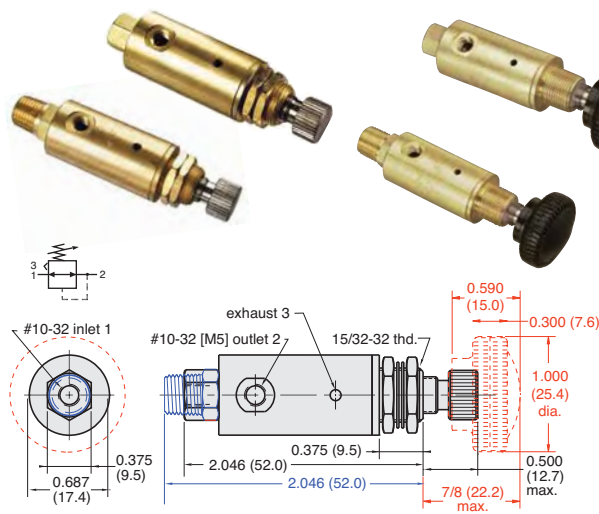
Air Flow: 3 scfm @ 50 psig; 5 scfm @ 100 psig; 120 l/min. @ 6 bar

Input Pressure: 300 psig/21 bar max.

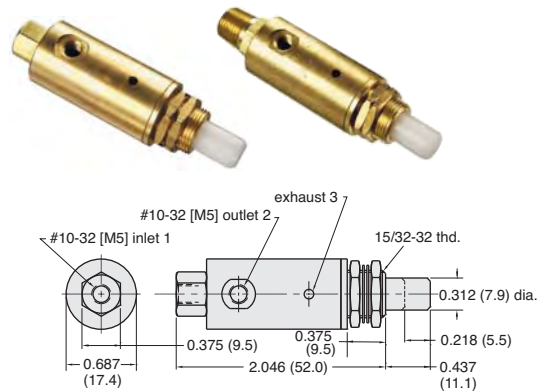
Mounting: #15/32-32 thread. Nuts and lockwashers furnished

Adjustment: By means of a knob with micro-adjustment (40 pitch thd.)

Adjustable Pressure Regulators



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	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

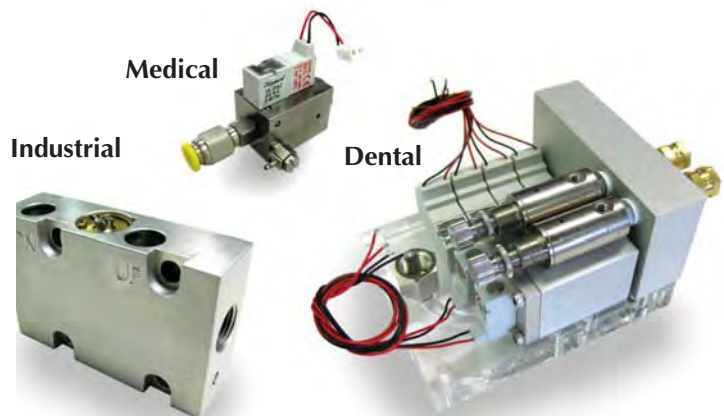
Range (psig/bar)*	#10-32	1/8" NPT	M5
0-20/1.4	MAR-1C-2	MAR-1CP-2	MAR-1C-2-M5
0-30/2.1	MAR-1C-3	MAR-1CP-3	MAR-1C-3-M5
0-40/2.8	MAR-1C-4	MAR-1CP-4	MAR-1C-4-M5
0-50/3.4	MAR-1C-5	MAR-1CP-5	MAR-1C-5-M5
0-60/4.1	MAR-1C-6	MAR-1CP-6	MAR-1C-6-M5
0-70/4.8	MAR-1C-7	MAR-1CP-7	MAR-1C-7-M5
0-100/6.9	MAR-1C	MAR-1CP	MAR-1C-M5

* Outlet pressure is based on 7/32" stem travel. If stem is depressed further, the outlet pressure will increase.

MAR Series Regulators

Special Configurations & Assemblies

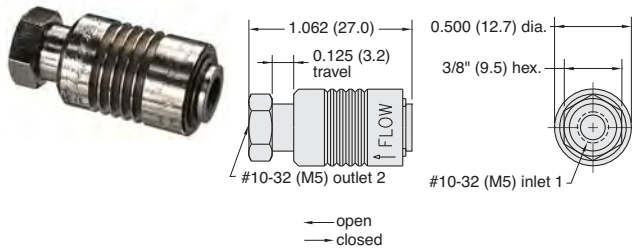
- Robust
- Compact
- Reliable
- Multiple Medias
- Manifold Mount
- Cartridge Style
- Preset to Pressure
- Pre-Assembled & Tested





SLEEVE VALVES

2 Position 2-Way or 3-Way Sleeve Valves



Medium: Air

Mounting: In-line or direct to fitting

Stem Travel: 1/8" (3.2)

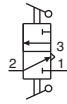
Material: Electroless nickel plated

Input Pressure: 150 psig/10 bar max. brass

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.

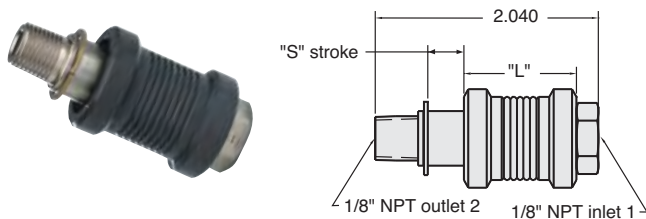
The JSLV-2 and JSLV-3 valves feature a smooth opening stroke during which inlet air is directed to the outlet. During the closing stroke, in the opposite direction of travel, the outlet is closed from the inlet and in the JSLV-3 version, the outlet is then exhausted to atmosphere without the inlet ever being connected to exhaust.

Medium: Air, Water or Oil

Force to Actuate: Approx. 8 lbs

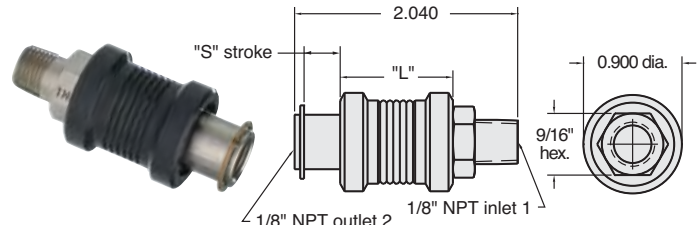
Input Pressure: 150 psig max.

Mounting: In-line or direct to fitting



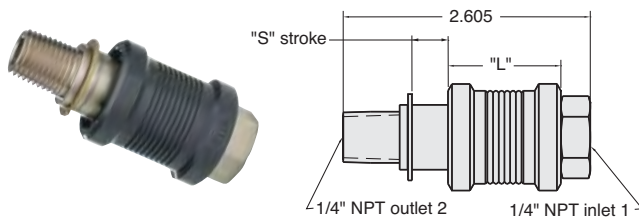
Air Flow: 1/8" NPT: 43 scfm @ 100 psig

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"



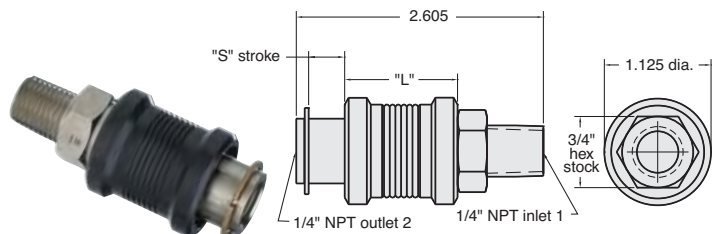
Air Flow: 1/8" NPT: 43 scfm @ 100 psig

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"



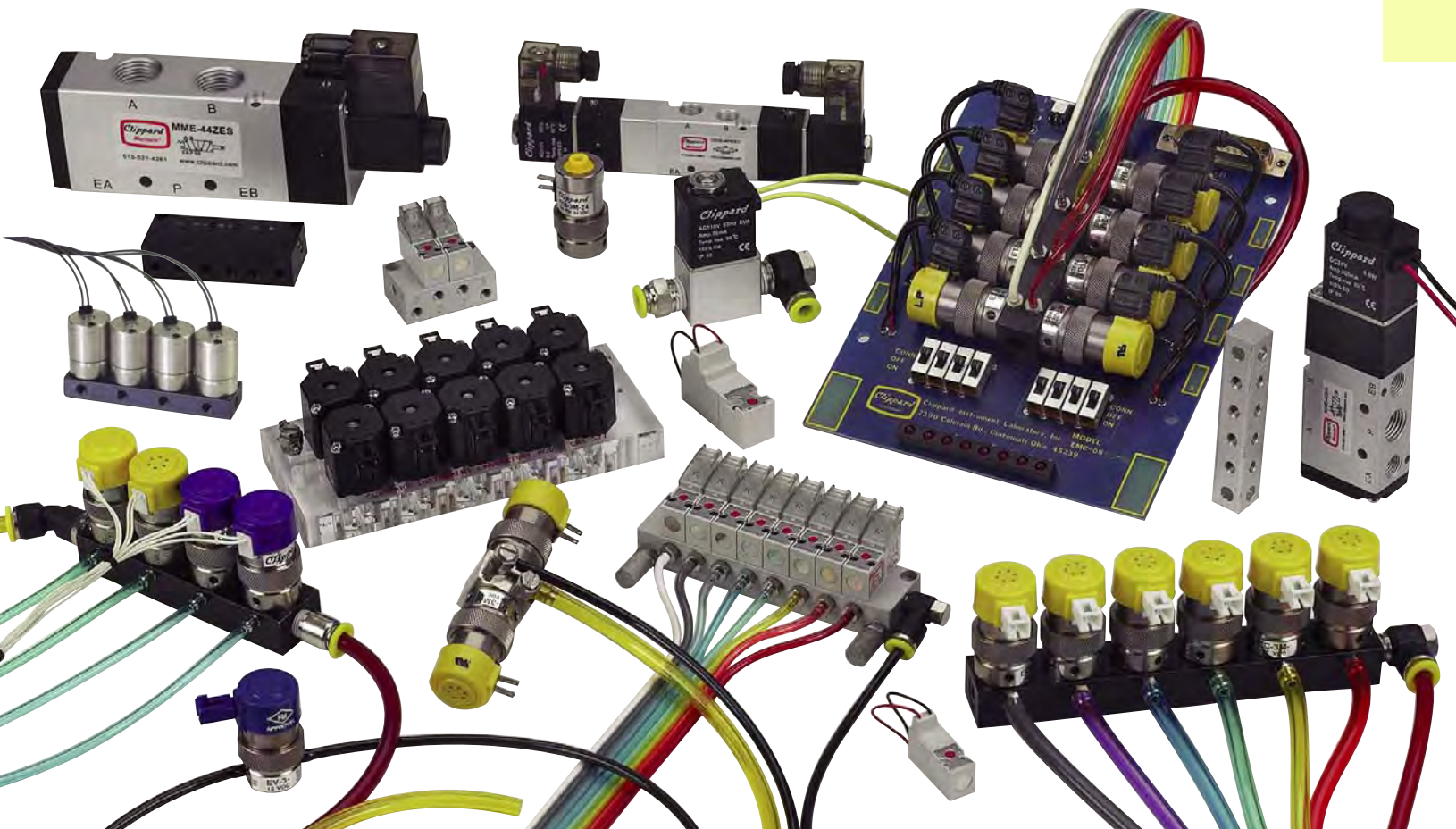
Air Flow: 1/4" NPT: 70 scfm @ 100 psig

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"

ELECTRONIC VALVES



<u>MOUSE VALVE SERIES (EV, ET, EC, EW SERIES)</u>	<u>169 - 182</u>
<u>OXYGEN CLEAN, NEW! ANALYTICAL & CORROSION-RESISTANT SERIES VALVES</u>	<u>173 - 180</u>
<u>INTRINSICALLY SAFE VALVES</u>	<u>182</u>
<u>ELECTRONIC VALVE ACCESSORIES</u>	<u>183 - 185</u>
<u>ELECTRONIC MANIFOLD CARDS</u>	<u>186 - 187</u>
<u>EVP SERIES PROPORTIONAL CONTROL VALVES</u>	<u>188 - 190</u>
NEW! <u>PROPORTIONAL VALVE DRIVER</u>	<u>191</u>
NEW! <u>STEPPER-CONTROLLED PROPORTIONAL VALVE</u>	<u>192 - 193</u>
<u>EM SERIES STUD MOUNTED VALVES</u>	<u>194 - 195</u>
<u>ES, ESO SERIES COMPACT VALVES</u>	<u>196 - 200</u>
EXPANDED! <u>10 MM & 15 MM MINIATURE VALVES</u>	<u>201 - 214</u>
<u>MAXIMATIC® SOLENOID VALVES</u>	<u>215 - 225</u>





ELECTRONIC VALVES OVERVIEW

Mouse Valve Series



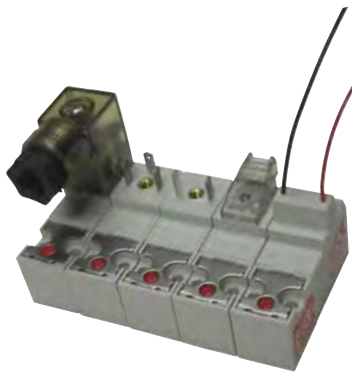
- Industry standard for leak-free operation
- Fast response
- Low power
- 1,000,000,000+ cycle life
- Low heat rise
- Quiet operation

Proportional Valve Series



- Direct-operated
 - Low hysteresis
- EVP Series***
- Fast response
 - High cycle life
- SCPV Series***
- High flow
 - Stepper-controlled
 - Excellent linearity

10 & 15 mm Valve Series



- 2- or 3-way operation
- Detachable coil and connector for orientation options
- Variety of electrical circuit features
- Manifold options available

Maximatic® Valve Series



- General purpose, 2-, 3- and 4-way configurations
- Maximum Value, Maximum Performance
- Direct- and pilot-operated
- Manifold or in-line mounting
- NAMUR style
- Same-day shipping for most models

Custom Electronic Valves

With years of engineering and technical experience, Clippard continues to be a leader in manufacturing special products for a broad spectrum of industries.



Not your every day 10 or 15 mm valves!

Specially-designed high-flow 2-way valves that can pass twice as much gas or liquid flow than other valves.



Integrated Solutions

How else can we make it easy? This application requires special pressure decay testing and the assembly of customer-specified fittings, connector and special labeling.



Custom Ports & Connectors

The application requires a special connection to a gas canister. The valve is tested for response time and flow rate, which delivers a consistent amount of gas each cycle.

Clippard “Mouse” Series Electronic Valves

- **Functional Simplicity—One Moving Part!**
- **1,000,000,000+ Cycle Life**
- **Fast Response**
- **Low Heat Rise**
- **Quiet Operation**
- **Industry Standard for Leak-Free Operation**
- **Low Power**



EV Series

2- and 3-way manifold and in-line mounting. Normally-Closed and fully-ported versions.

See Pages 171 - 179.



Proportional Control Series

Proportional control provides variable output flow. 2-way only.

See Pages 188 - 190.



Corrosion-Resistant Series

Enhanced plating and some stainless steel components add to the life of this valve used with mildly corrosive media, such as moisture in air or gases.

See Pages 171 - 179.



Intrinsically Safe Series

Low power and suited for Intrinsically Safe barriers.

See Page 182.



Oxygen Clean EV Series

Specially-cleaned valves for analytical or Oxygen use.

See Pages 171 - 179.



EM Series

The smallest valve in this series, for applications requiring high-density valve population.

See Pages 194 - 195.



NEW! Analytical EV Series

Specially-cleaned valves for special needs of the analytical industry.

See Pages 171 - 179.



ES Series

Alternate mounting with same compact design and reliability.

See Pages 196 - 200.



ECN, EVN, ETN Series

Normally-Open, manifold mount to allow Normally-Closed and Normally-Open valves on the same manifold.

See Page 181.



ELECTRONIC MOUSE VALVE SERIES



2020/2021 High Flow 3-Way Valves

Piloted by a Clippard EC, EV, ET or EW manifold mount electronic valve, the 2020/2021 produces outputs up to 22 scfm at 100 psig. Combines low wattage, long life and cool running of the "E" series valves with quick response and high flow of Fluidamp type valves.

[See Page 183.](#)



EVB Booster Series

Electronic Valve Boosters amplify the flow capacity of EC, EV and ET type valves by over eight

times. Manifold style electronic valves mount onto booster body, which, in turn, mounts on Clippard manifolds.

[See Page 183.](#)



2013 Series Electronic Fluidamp

Low-power DC solenoid solid state output signals can be

directly converted to high pressure pneumatic power without amplification.

[See Page 183.](#)

Manifolds



Pilot Manifold

Clippard's 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.

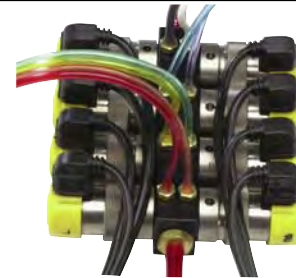
[See Page 185.](#)



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.

[See Page 185.](#)



Multi-Valve Manifolds

Multi-valve manifolds are available 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.

[See Page 185.](#)

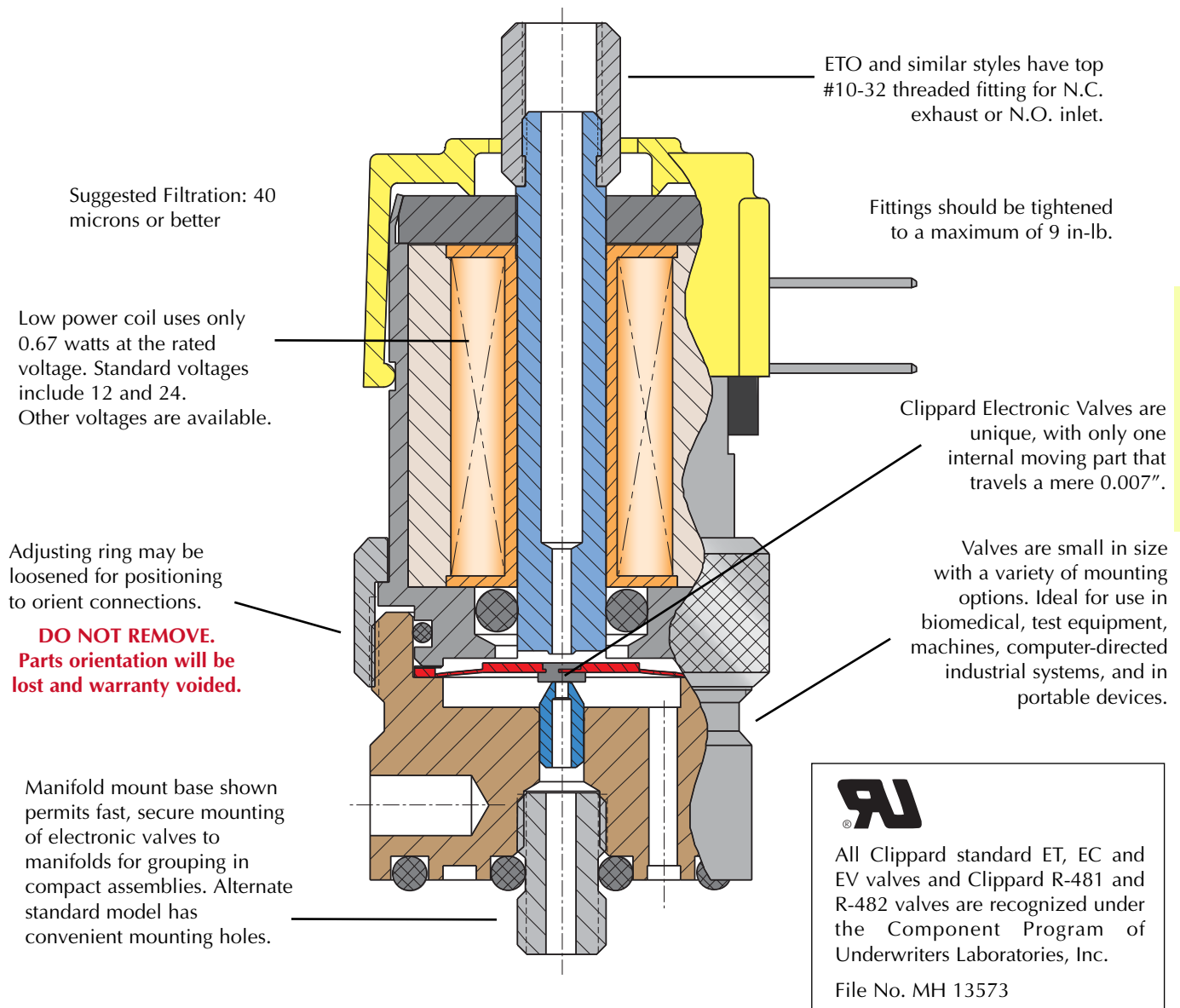
Assembly Services

Call Clippard for assistance with your application, assembly and testing. Clippard can provide full tested sub-assemblies for your application or device. For more information call Clippard today.



Clippard's Unique Electronic "Mouse" Valves

Clippard's Electronic Valves are quiet and quick! 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.



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. The valves' small size makes them well suited to a wide range of applications in biomedical, environmental test equipment, textile machines, packaging machinery, computerized industrial automation, and portable systems.



THE MOUSE VALVE SERIES

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 to 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.



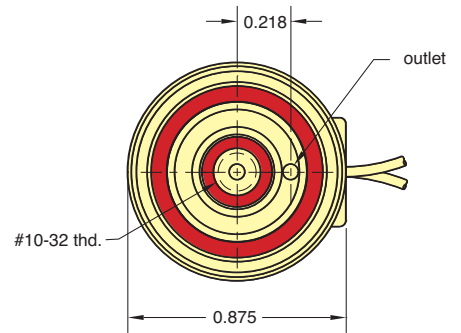
Quick Connect

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 Mounting

The complete line of EC, EV, ET and EW 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.



CUSTOM SOLUTIONS

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. Let us know YOUR need, and we will help to find YOUR Solution!

CUSTOMer solutions



Clippard's Electronic Valves are incredibly flexible from a production standpoint. Just let us know what you need.

- Custom Voltage
- Custom Flow Rate
- Custom Max Pressure/ Vacuum

Tight Assemblies Cartridge design is desirable for integrating valves into compact assemblies. This EVP proportional valve is calibrated to meet the customers flow range and maintain “zero” leak rate, and is incorporated into the OEM’s manifold.



Clippard Integrated Solutions offer optimized pneumatic system design to increase performance, reduce cost, and make your job easier.



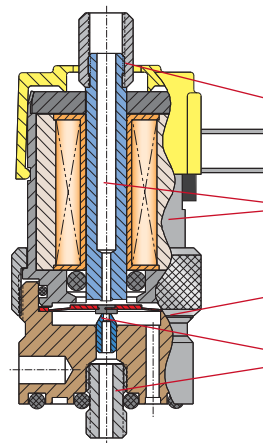
MOUSE VALVE SERIES DESCRIPTIONS



Standard Series

2- and 3-way manifold and in-line mounting. Normally-Closed and fully-ported versions.

Higher Flow 2-Way Version. The standard series also includes an option that provides higher flow for 2-way, Normally-Closed applications. Although manifold mounting is accomplished in the same fashion, the inlet is the annular port, and the outlet becomes the center port, through the convenient stud mount of the valve.

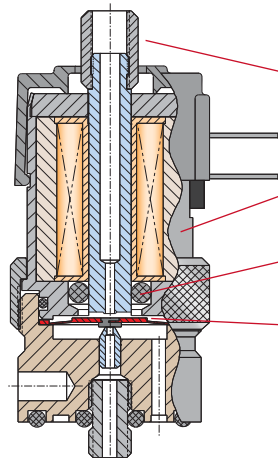


- Nickel-plated brass fitting
- Electroless nickel-plated steel housing and core
- Buna-N seals standard
- Electroless nickel-plated brass body
- Stainless steel stud and nozzle
- (Manifold style valve shown)



Corrosion-Resistant "CR-" Series

Clippard's Corrosion-Resistant Series (CR-) incorporates materials and construction that provides enhanced protection for valves used with mildly corrosive media such as moisture in air or gases. Where stainless steel is not possible, plating is incorporated to add life to wear components. A nickel-plated brass valve body is standard, but stainless steel may be substituted.



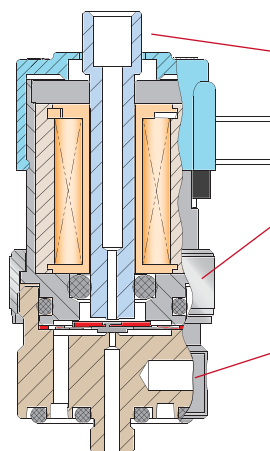
- Nickel-plated brass fitting
- Stainless steel housing and core
- Buna-N seals standard
- Electroless nickel-plated Spider



NEW! Analytical "A-" Series

Clippard's Electronic Analytical Valve (A-) series combines the proven features of the "Mouse" series with the specific needs of the analytical industry, and for applications where cleanliness is especially important. Special materials, manufacturing and assembly processes make this valve perfectly suited for applications where internal cleanliness, bubble-tight operation, and long life are imperative.

For more information, visit clippard.com/analytical



- Integral fitting
- No anaerobic sealant used
- Larger cross section O-ring improves sealing
- Cleaned per Clippard Standard ES-3.43
- One-piece base eliminates many leak points



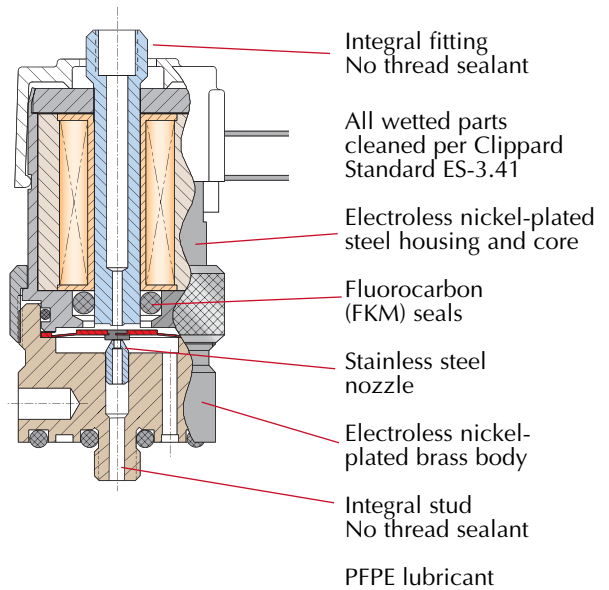
MOUSE VALVE SERIES DESCRIPTIONS



Oxygen Clean "O-" Series

All EV, ET, EC and EW series electronic valves with the "O-" part number option are available manufactured and assembled for use in Oxygen-enriched environments for applications that are extremely sensitive to contamination.

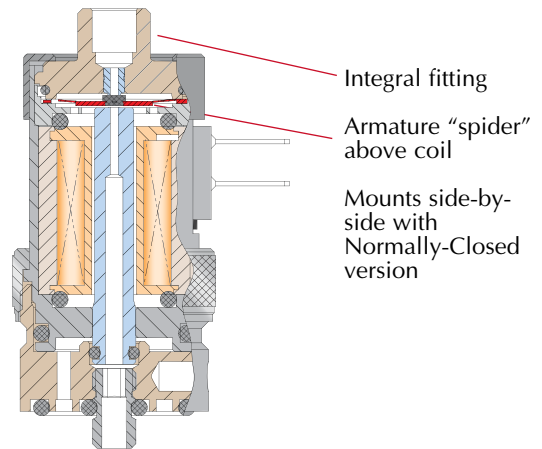
- Valves are ultrasonically cleaned, assembled, inspected and tested in an enclosed controlled area with a state-of-the-art positive pressure HEPA filtration system
- Both organic and inorganic contaminants such as particulate matter and Hydrocarbon oils are removed
- No organic sealants, adhesives or lubricants are used in the manufacturing process
- Component parts are lubricated with Oxygen-compatible PFPE (perfluoropoly ether) grease, only as needed for assembly
- Individual testing and inspection is accomplished utilizing compressed Nitrogen and ultra-violet light



For more information on the process, visit www.clippard.com/oxygen

ECN, EVN, ETN Mouse Valves

Normally-Open, manifold mount to allow Normally-Closed and Normally-Open valves on the same manifold. See [page 181](#) for ordering information.

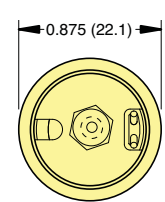
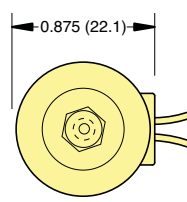
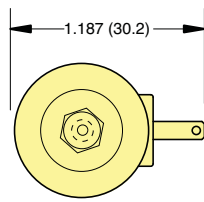
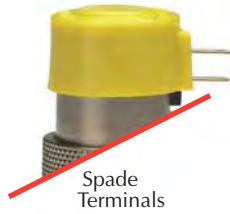
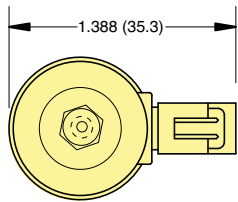


Custom EV Valves

Don't see it here? Call us! Many people shy away from asking for customized products and fear increased price and lead times. Clippard's electronic valve production consist of nealy 50% customized product. From the simple tweaks to complex challenges, Clippard is your partner for finding the right solution to your needs.

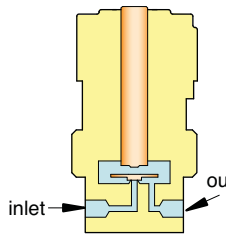


Electrical Connection Options

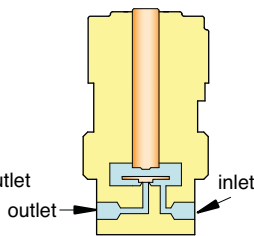


Valve Types

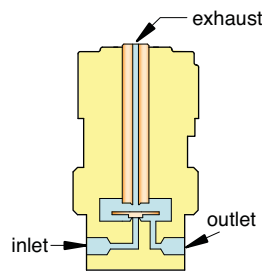
In-Line Mount



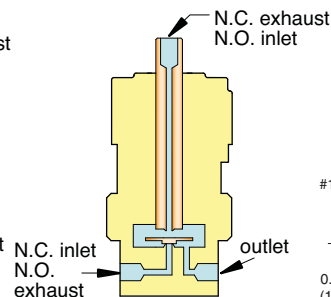
2-Way Normally-Closed In-Line Mount



2-Way Normally-Closed High Flow In-Line Mount

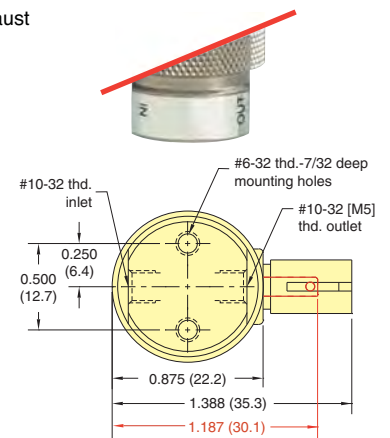


3-Way Normally-Closed In-Line Mount

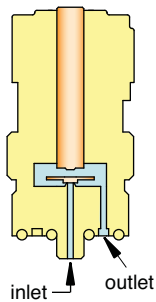


3-Way Fully-Ported In-Line Mount

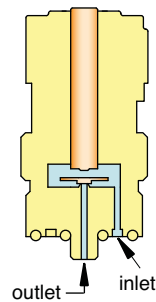
Mounting Options



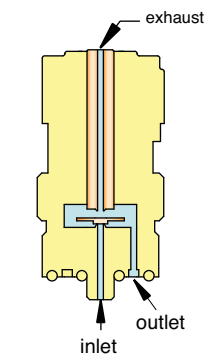
Manifold Mount



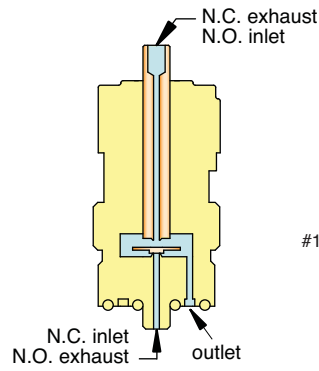
2-Way Normally-Closed Manifold Mount



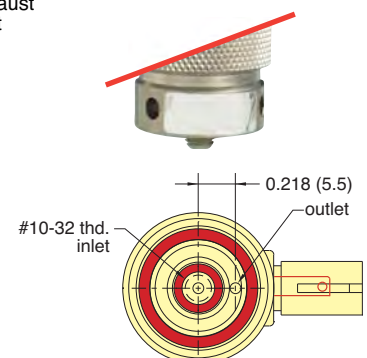
2-Way Normally-Closed High Flow Manifold Mount



3-Way Normally-Closed Manifold Mount



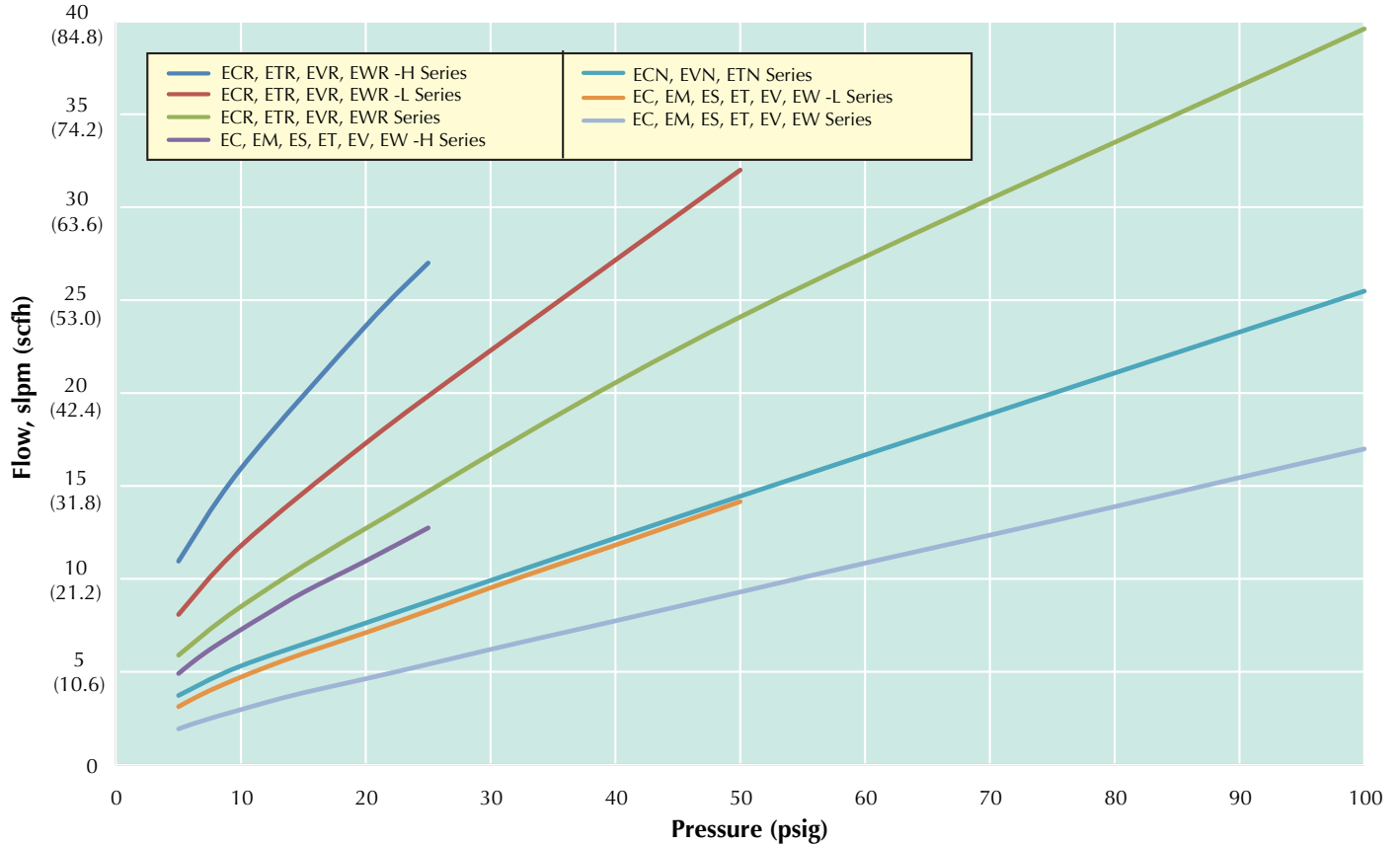
3-Way Fully-Ported Manifold Mount





GAS FLOW & ELECTRICAL SPECIFICATIONS

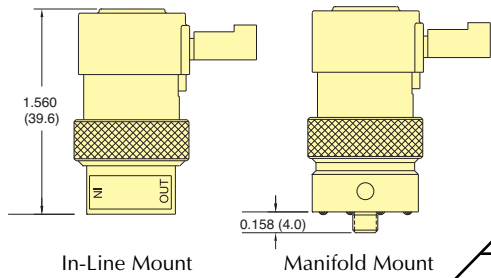
Typical Air Flow



Electrical Specifications

Series	Nominal			Power (watts)	Working Range (cont. duty)
	Voltage	Current (amps)	Resistance (ohms)		
- Standard	6	0.11	54	0.67	90 to 150% of rated voltage
- Oxygen Clean	12	0.055	218		
- Analytical	24	0.028	864		
- Corrosion-Resistant	12	0.098	122	1.2	90 to 110% of rated voltage
	24	0.049	486		
- EM Series	12	0.083	144	1.0	90 to 120% of rated voltage
- ES Series	24	0.042	576		

2-WAY NORMALLY-CLOSED VALVES, IN-LINE & MANIFOLD MOUNT



		Pressure Range		Voltage		Part No.	
		Vac. to 105 psig +		Vac. to 50 psig		Vac. to 25 psig	
		12 VDC		24 VDC		Part No.	
		In-Line Mount		Manifold Mount		Part No.	
		•	•	•	•	* EC-2-12	* EC-2M-12
		•	•	•	•	* EC-2-24	* EC-2M-24
		•	•	•	•	* EC-2-12-L	* EC-2M-12-L
		•	•	•	•	* EC-2-24-L	* EC-2M-24-L
		•	•	•	•	* EC-2-12-H	* EC-2M-12-H
•	•	•	•	* EC-2-24-H	* EC-2M-24-H		
		•	•	•	•	* ET-2-12	* ET-2M-12
		•	•	•	•	* ET-2-24	* ET-2M-24
		•	•	•	•	* ET-2-12-L	* ET-2M-12-L
		•	•	•	•	* ET-2-24-L	* ET-2M-24-L
		•	•	•	•	* ET-2-12-H	* ET-2M-12-H
•	•	•	•	* ET-2-24-H	* ET-2M-24-H		
		•	•	•	•	* EV-2-12	* EV-2M-12
		•	•	•	•	* EV-2-24	* EV-2M-24
		•	•	•	•	* EV-2-12-L	* EV-2M-12-L
		•	•	•	•	* EV-2-24-L	* EV-2M-24-L
		•	•	•	•	* EV-2-12-H	* EV-2M-12-H
•	•	•	•	* EV-2-24-H	* EV-2M-24-H		
		•	•	•	•	* EW-2-12	* EW-2M-12
		•	•	•	•	* EW-2-24	* EW-2M-24
		•	•	•	•	* EW-2-12-L	* EW-2M-12-L
		•	•	•	•	* EW-2-24-L	* EW-2M-24-L
		•	•	•	•	* EW-2-12-H	* EW-2M-12-H
•	•	•	•	* EW-2-24-H	* EW-2M-24-H		

Medium: Clean, dry air (40 micron filter)

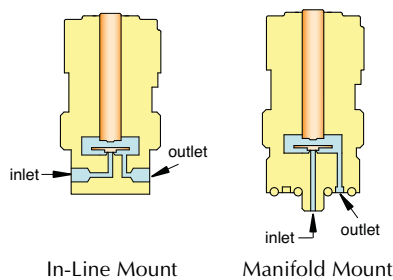
Power Consumption: 0.67 watt (CR Series: 1.2 watt)

Temperature Range: 32 to 180°F (0 to 82°C).
CR Series: 32 to 150°F (0 to 64°C)

Response: 5 to 10 milliseconds (nominal)

Operating Range: 90 to 150% of rated voltage (CR Series: ±10%)

Ports: #10-32 (M5 optional), in-line only



Valve Series (*)	Standard	Non-Standard
Standard	(blank)	
Oxygen Clean	O-	See Pages 173 & 174 for further information
Analytical Series**	A-	
Corrosion-Resistant	CR-	
(not std. on "EW")		
Options (add to end of Part No.)		
FKM Seals	-V	
EPR Seals		-E
Silicone Seals		-S
Diode		-D
Metric Ports (in-line)	-M5	

Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig <i>+ call for special configurations</i>	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

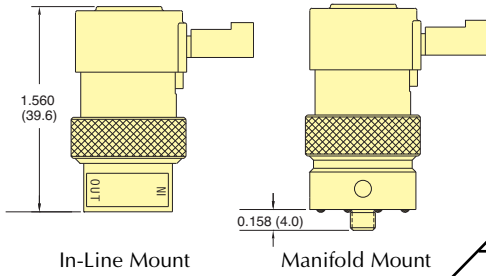
Example Part No's:
ET-2M-12-V
CR-ET-2-12

See [Page 175](#) for mounting options

** Available on manifold mount valves only



NEW! 2-WAY NORMALLY-CLOSED HIGH FLOW VALVES, IN-LINE & MANIFOLD MOUNT



Part No.

		Pressure Range			Voltage		In-Line Mount	Manifold Mount
		Vac. to 105 psig +	Vac. to 50 psig	Vac. to 25 psig	12 VDC	24 VDC		
 1.388 (35.3)	 0.025" Pin Connector	•			•		* ECR-2-12	* ECR-2M-12
		•			•		* ECR-2-24	* ECR-2M-24
			•		•		* ECR-2-12-L	* ECR-2M-12-L
			•		•		* ECR-2-24-L	* ECR-2M-24-L
			•		•		* ECR-2-12-H	* ECR-2M-12-H
	•		•		* ECR-2-24-H	* ECR-2M-24-H		
 1.187 (30.2)	 Spade Terminals	•			•		* ETR-2-12	* ETR-2M-12
		•			•		* ETR-2-24	* ETR-2M-24
			•		•		* ETR-2-12-L	* ETR-2M-12-L
			•		•		* ETR-2-24-L	* ETR-2M-24-L
			•		•		* ETR-2-12-H	* ETR-2M-12-H
	•		•		* ETR-2-24-H	* ETR-2M-24-H		
 0.875 (22.1)	 Wire Leads Side (Radial)	•			•		* EVR-2-12	* EVR-2M-12
		•			•		* EVR-2-24	* EVR-2M-24
			•		•		* EVR-2-12-L	* EVR-2M-12-L
			•		•		* EVR-2-24-L	* EVR-2M-24-L
			•		•		* EVR-2-12-H	* EVR-2M-12-H
	•		•		* EVR-2-24-H	* EVR-2M-24-H		
 0.875 (22.1)	 Wire Leads Top (Axial)	•			•		* EWR-2-12	* EWR-2M-12
		•			•		* EWR-2-24	* EWR-2M-24
			•		•		* EWR-2-12-L	* EWR-2M-12-L
			•		•		* EWR-2-24-L	* EWR-2M-24-L
			•		•		* EWR-2-12-H	* EWR-2M-12-H
	•		•		* EWR-2-24-H	* EWR-2M-24-H		

Medium: Clean, dry air (40 micron filter)

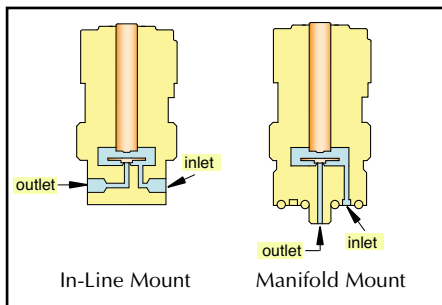
Power Consumption: 1.2 watt

Temperature Range: 32 to 150°F (0 to 66°C)

Response: 10 milliseconds (nominal)

Operating Range: ±10% of rated voltage

Ports: #10-32 (M5 optional), in-line only



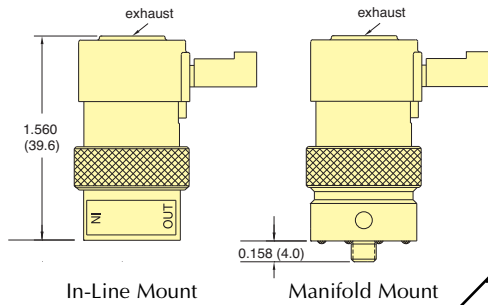
Valve Series (*)	Standard	Non-Standard
Standard	(blank)	See Pages 173 & 174 for further information
Oxygen Clean	O-	
Analytical Series**	A-	
Options (add to end of Part No.)		
FKM Seals	-V	
EPR Seals		-E
Silicone Seals		-S
Diode		-D
Metric Ports (in-line)	-M5	

See Page 175 for mounting options

** Available on manifold mount valves only

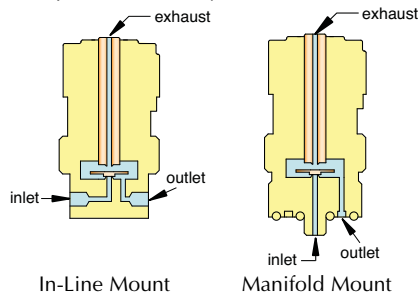
Pressure Range	Suffix	Air Flow
28" Hg Vac. to 100 psig <i>+call for special configurations</i>	(blank)	1.4 scfm @ 100 psig (39 l/min @ 7 bar)
28" Hg Vac. to 50 psig	-L	1.1 scfm @ 50 psig (32 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	-H	0.95 scfm @ 25 psig (27 l/min @ 1.8 bar)

3-WAY NORMALLY-CLOSED VALVES, IN-LINE & MANIFOLD



		Pressure Range			Voltage		Part No.	
		Vac. to 105 psig +			Vac. to 50 psig		Vac. to 25 psig	
					12 VDC		24 VDC	
							In-Line Mount	
							Manifold Mount	
 0.025" Pin Connector		•			•		<u>*EC-3-12</u>	<u>*EC-3M-12</u>
		•			•	•	<u>*EC-3-24</u>	<u>*EC-3M-24</u>
			•			•	<u>*EC-3-12-L</u>	<u>*EC-3M-12-L</u>
			•			•	<u>*EC-3-24-L</u>	<u>*EC-3M-24-L</u>
				•		•	<u>*EC-3-12-H</u>	<u>*EC-3M-12-H</u>
			•			•	<u>*EC-3-24-H</u>	<u>*EC-3M-24-H</u>
 Spade Terminals		•			•		<u>*ET-3-12</u>	<u>*ET-3M-12</u>
		•			•	•	<u>*ET-3-24</u>	<u>*ET-3M-24</u>
			•			•	<u>*ET-3-12-L</u>	<u>*ET-3M-12-L</u>
			•			•	<u>*ET-3-24-L</u>	<u>*ET-3M-24-L</u>
				•		•	<u>*ET-3-12-H</u>	<u>*ET-3M-12-H</u>
			•			•	<u>*ET-3-24-H</u>	<u>*ET-3M-24-H</u>
 Wire Leads Side (Radial)		•			•		<u>*EV-3-12</u>	<u>*EV-3M-12</u>
		•			•	•	<u>*EV-3-24</u>	<u>*EV-3M-24</u>
			•			•	<u>*EV-3-12-L</u>	<u>*EV-3M-12-L</u>
			•			•	<u>*EV-3-24-L</u>	<u>*EV-3M-24-L</u>
				•		•	<u>*EV-3-12-H</u>	<u>*EV-3M-12-H</u>
			•			•	<u>*EV-3-24-H</u>	<u>*EV-3M-24-H</u>
 Wire Leads Top (Axial)		•			•		<u>*EW-3-12</u>	<u>*EW-3M-12</u>
		•			•	•	<u>*EW-3-24</u>	<u>*EW-3M-24</u>
			•			•	<u>*EW-3-12-L</u>	<u>*EW-3M-12-L</u>
			•			•	<u>*EW-3-24-L</u>	<u>*EW-3M-24-L</u>
				•		•	<u>*EW-3-12-H</u>	<u>*EW-3M-12-H</u>
			•			•	<u>*EW-3-24-H</u>	<u>*EW-3M-24-H</u>

- Medium:** Clean, dry air (40 micron filter)
- Power Consumption:** 0.67 watt (CR Series: 1.2 watt)
- Temperature Range:** 32 to 180°F (0 to 82°C), CR Series: 32 to 150°F (0 to 64°C)
- Response:** 5 to 10 milliseconds (nominal)
- Operating Range:** 90 to 150% of rated voltage (CR Series: ±10%)
- Ports:** #10-32 (M5 optional), in-line only



Valve Series (*)	Standard	Non-Standard
Standard	(blank)	
Oxygen Clean	O-	See Pages 173 & 174 for further information
Analytical Series**	A-	
Corrosion-Resistant (not std. on "EW")	CR-	
Options (add to end of Part No.)		
FKM Seals	-V	
EPR Seals		-E
Silicone Seals		-S
Diode		-D
Metric Ports (in-line)	-M5	

Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig <i>*call for special configurations</i>	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

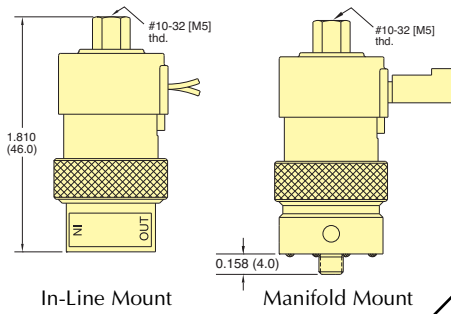
Example Part No's:
ET-3-12-S
O-EW-3-24

See Page 175 for mounting options

** Available on manifold mount valves only



3-WAY FULLY-PORTED VALVES, IN-LINE & MANIFOLD



Part No.

		Pressure Range		Voltage		In-Line Mount	Manifold Mount
		Vac. to 105 psig +	Vac. to 50 psig	Vac. to 25 psig	12 VDC	24 VDC	
 0.025" Pin Connector		•	•	•	•	* ECO-3-12	* ECO-3M-12
		•	•	•	•	* ECO-3-24	* ECO-3M-24
 Spade Terminals		•	•	•	•	* ECO-3-12-L	* ECO-3M-12-L
		•	•	•	•	* ECO-3-24-L	* ECO-3M-24-L
 Wire Leads Side (Radial)		•	•	•	•	* ECO-3-12-H	* ECO-3M-12-H
		•	•	•	•	* ECO-3-24-H	* ECO-3M-24-H
 Wire Leads Top (Axial)		•	•	•	•	* ETO-3-12	* ETO-3M-12
		•	•	•	•	* ETO-3-24	* ETO-3M-24
 Wire Leads Side (Radial)		•	•	•	•	* ETO-3-12-L	* ETO-3M-12-L
		•	•	•	•	* ETO-3-24-L	* ETO-3M-24-L
 Wire Leads Top (Axial)		•	•	•	•	* ETO-3-12-H	* ETO-3M-12-H
		•	•	•	•	* ETO-3-24-H	* ETO-3M-24-H
 Wire Leads Top (Axial)		•	•	•	•	* EVO-3-12	* EVO-3M-12
		•	•	•	•	* EVO-3-24	* EVO-3M-24
 Wire Leads Side (Radial)		•	•	•	•	* EVO-3-12-L	* EVO-3M-12-L
		•	•	•	•	* EVO-3-24-L	* EVO-3M-24-L
 Wire Leads Top (Axial)		•	•	•	•	* EVO-3-12-H	* EVO-3M-12-H
		•	•	•	•	* EVO-3-24-H	* EVO-3M-24-H
 Wire Leads Top (Axial)		•	•	•	•	* EWO-3-12	* EWO-3M-12
		•	•	•	•	* EWO-3-24	* EWO-3M-24
 Wire Leads Side (Radial)		•	•	•	•	* EWO-3-12-L	* EWO-3M-12-L
		•	•	•	•	* EWO-3-24-L	* EWO-3M-24-L
 Wire Leads Top (Axial)		•	•	•	•	* EWO-3-12-H	* EWO-3M-12-H
		•	•	•	•	* EWO-3-24-H	* EWO-3M-24-H

Medium: Clean, dry air (40 micron filter)

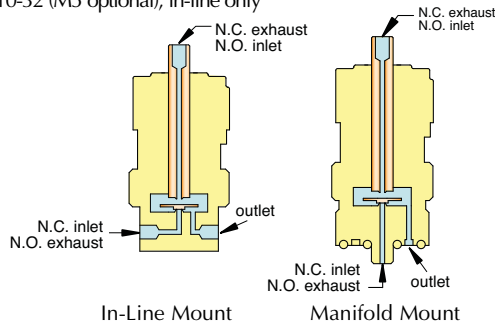
Power Consumption: 0.67 watt (CR Series: 1.2 watt)

Temperature Range: 32 to 180°F (0 to 82°C)
CR Series: 32 to 150°F (0 to 64°C)

Response: 5 to 10 milliseconds (nominal)

Operating Range: 90 to 150% of rated voltage (CR Series: ±10%)

Ports: #10-32 (M5 optional), in-line only



Valve Series (*)	Standard	Non-Standard
Standard	(blank)	
Oxygen Clean	O-	See Pages 173 & 174 for further information
Analytical Series**	A-	
Corrosion-Resistant (not std. on "EWO")	CR-	
Options (add to end of Part No.)		
FKM Seals	-V	
EPR Seals		-E
Silicone Seals		-S
Diode		-D
Metric Ports (in-line)	-M5	

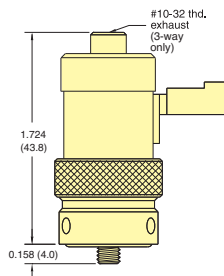
Example Part No's:
ETO-3M-24-D
CR-EVO-3-12

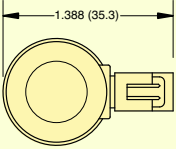

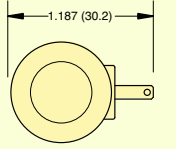

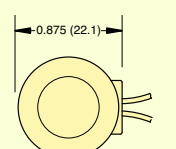

See [Page 175](#) for mounting options

** Available on manifold mount valves only

Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig <i>+ call for special configurations</i>	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

2-WAY & 3-WAY NORMALLY-OPEN VALVES, MANIFOLD



		Voltage		2-Way	3-Way
		12 VDC	24 VDC		
 0.025" Pin Connector		•		<u>ECN-2M-12</u>	* <u>ECN-3M-12</u>
			•	<u>ECN-2M-24</u>	* <u>ECN-3M-24</u>
 Spade Terminals		•		<u>ETN-2M-12</u>	* <u>ETN-3M-12</u>
			•	<u>ETN-2M-24</u>	* <u>ETN-3M-24</u>
 Wire Leads Side (Radial)		•		<u>EVN-2M-12</u>	* <u>EVN-3M-12</u>
			•	<u>EVN-2M-24</u>	* <u>EVN-3M-24</u>

Medium: Clean, dry air (40 micron filter)

Power Consumption: 0.67 watt

Temperature Range: 32 to 180°F (0 to 82°C)

Response: 5 to 10 milliseconds (nominal)

Operating Range: 90 to 150% of rated voltage

Voltage: 12 VDC or 24 VDC. Other voltages available upon request.

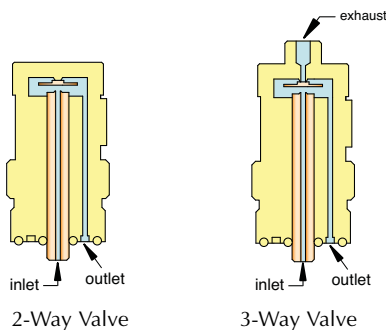
Ports: #10-32 (M5 optional)

Options	Standard	Non-Standard
(add to end of Part No.)		
FKM Seals	-V	
EPR Seals		-E
Silicone Seals		-S
Diode		-D
Metric Ports	-M5	

Example Part No's:
EVN-2M-12-V
ETN-3M-24-M5

See Page 175 for mounting options

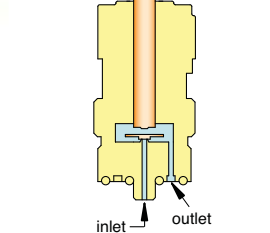
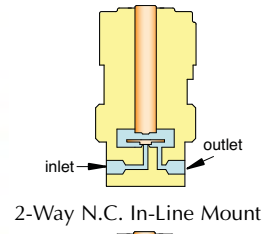
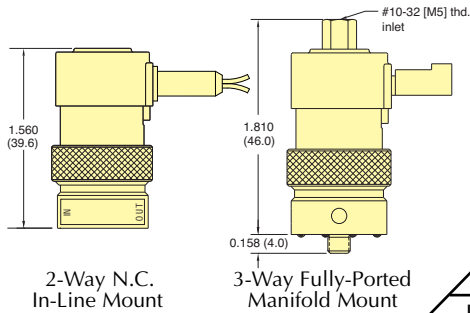
Pressure Range	Air Flow
28" Hg Vac. to 105 psig	0.9 scfm @ 100 psig
[†] call for special configurations	(25 l/min @ 7 bar)



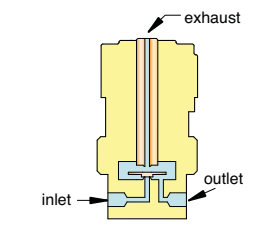


2- & 3-WAY INTRINSICALLY SAFE VALVES

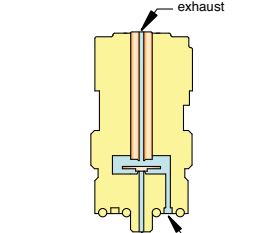
2-WAY INTRINSICALLY SAFE NORMALLY-CLOSED VALVES, IN-LINE & MANIFOLD MOUNT



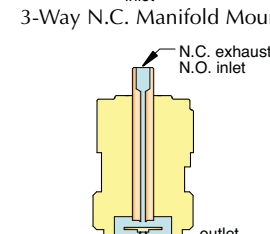
2-Way N.C. Manifold Mount



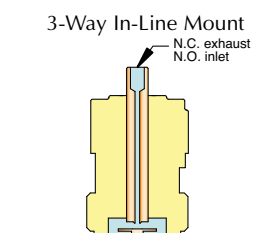
3-Way N.C. In-Line Mount



3-Way N.C. Manifold Mount



3-Way In-Line Mount



3-Way Manifold Mount

Pressure Range	In-Line Mount	Manifold Mount	Part No.	
			In-Line Mount	Manifold Mount
• Vac. to 105 psig + • Vac. to 50 psig • Vac. to 25 psig	•	•	EI-2-15.5	EI-2M-15.5
	•	•	EI-2-15.5-L	EI-2M-15.5-L
	•	•	EI-2-15.5-H	EI-2M-15.5-H
•	•	•	EI-2-15.5-C	EI-2M-15.5-C
	•	•	EI-2-15.5-LC	EI-2M-15.5-LC
	•	•	EI-2-15.5-HC	EI-2M-15.5-HC

3-WAY INTRINSICALLY SAFE NORMALLY-CLOSED VALVES, IN-LINE & MANIFOLD MOUNT

•	•	•	EI-3-15.5	EI-3M-15.5
	•	•	EI-3-15.5-L	EI-3M-15.5-L
	•	•	EI-3-15.5-H	EI-3M-15.5-H
•	•	•	EI-3-15.5-C	EI-3M-15.5-C
	•	•	EI-3-15.5-LC	EI-3M-15.5-LC
	•	•	EI-3-15.5-HC	EI-3M-15.5-HC

3-WAY INTRINSICALLY SAFE FULLY-PORTED VALVES, IN-LINE & MANIFOLD MOUNT

•	•	•	EIO-3-15.5	EIO-3M-15.5
	•	•	EIO-3-15.5-L	EIO-3M-15.5-L
	•	•	EIO-3-15.5-H	EIO-3M-15.5-H
•	•	•	EIO-3-15.5-C	EIO-3M-15.5-C
	•	•	EIO-3-15.5-LC	EIO-3M-15.5-LC
	•	•	EIO-3-15.5-HC	EIO-3M-15.5-HC

Medium: Clean, dry air (40 micron filter)

Power Consumption: 0.67 watt (CR Series: 1.2 watt)

Temperature Range: 32 to 180°F (0 to 82°C)

Response: 5 to 10 milliseconds (nominal)

Operating Range: 90 to 150% of rated voltage

Voltage: 15.5 VDC

Ports: #10-32 and manifold mount

See [Page 175](#) for mounting options

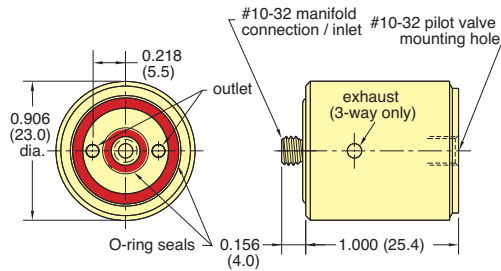
Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig *call for special configurations	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

See www.clippard.com/intrinsicallysafe for more information

EV, ET, EC, EW SERIES HIGHER FLOW VALVES



EC, EV, ET & EW PILOTED 2-WAY & 3-WAY NORMALLY-CLOSED, PRESSURE PILOTED VALVES, MANIFOLD MOUNT



Medium: Air

Materials: Nickel-plated brass, acetal, stainless steel and Buna-N

Response: 20 milliseconds @ 20 psig;
13 milliseconds @ 100 psig nominal

Ports: Inlet and outlet through manifold

Material: Nickel-plated brass, acetal, stainless steel and Buna-N

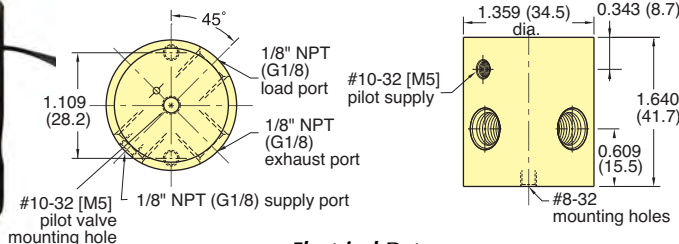
Note: Use only Normally-Closed 3-Way Pilot valves in conjunction with EVB-2/EVB-3

Part No.

- EVB-2 2-Way Valve Booster
- EVB-3 3-Way Valve Booster

Input Pressure	Air Flow
20 to 150 psig	6.1 scfm @ 100 psig (176 l/min @ 7 bar)

ELECTRONIC INTERFACE 3-WAY NORMALLY-CLOSED VALVE



Medium: Air

Filtration: 10 micron

Ports: 1/8" NPT female

Switching Speed: 10 milliseconds

Bleed Flow: 0.10 scfm @ 100 psig

Frequency Response: 50 Hz @ 100 psig;
70 Hz @ 30 psig

Part No.

- 2013-6 Interface Valve, 6 VDC
- 2013-12 Interface Valve, 12 VDC
- 2013-24 Interface Valve, 24 VDC

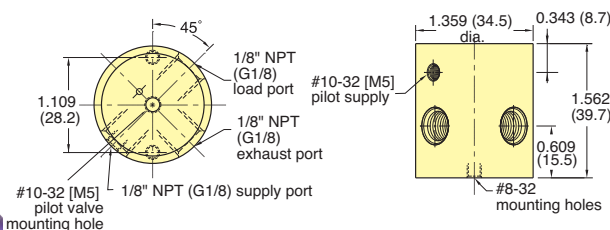
Continuous Overload: 350% @ 25°C ambient; 250% @ 50°C ambient

Power Consumption: Less than 0.50 watts @ rated voltage (80 ma. @ 6 VDC, 40 ma. @ 12 VDC 20 ma. @ 24VDC)

Leads: 28 gauge stranded PVC insulated

Input Pressure	Air Flow
30 to 100 psig <i>call for special configurations</i>	22 scfm @ 100 psig (634 l/min @ 7 bar)

3-WAY NORMALLY-CLOSED, PRESSURE PILOTED VALVES



Medium: Air

Pilot Pressure: (2020) 60% of supply pressure, minimum

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 to the end of the Part No. for metric version

Designed to be piloted by a Clippard EC, EV and ET manifold mount electronic valve (not included). 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 pilot port.

Part No.

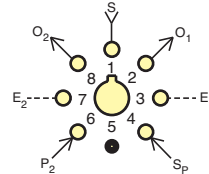
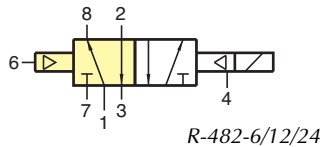
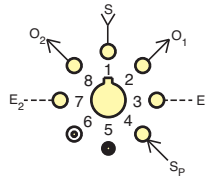
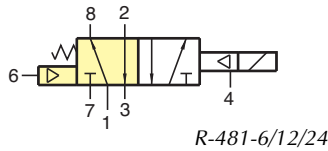
- 2020 External Piloted Valve with #10-32 Port
- 2021 Internal Piloted Valve

Input Pressure	Air Flow
30 to 100 psig <i>call for special configurations</i>	30 scfm @ 100 psig (2.1 l/min @ 7 bar)



ET PILOTED 4-WAY VALVES & CONNECTORS

4-WAY PILOTED VALVES



Type: 4-way combination electronic and modular spool type interface valve. Fully-ported ET-3 & R-401 (R-481)/R-402 (R-482) hybrid

Medium: Air, water, or oil; pilot - air only

Mounting: Uses Octoport base and two captivated screws

Ports: Valve has patented Octoport system

Note: Supply pressure must be applied to both ports 1 and 4. Minimum pressure on port 4 should be 40 psig.

Part No.

- R-481-12 ET-3/R-401, 12 VDC
- R-481-24 ET-3/R-401, 24 VDC
- R-482-12 ET-3/R-402, 12 VDC
- R-482-24 ET-3/R-402, 24 VDC

Input Pressure	Air Flow
Pilot: 40 psig min.	9 scfm @ 100 psig
Working: 0 to 150 psig	(255 l/min @ 7 bar)

For more information please see [Page 270](#) in the Modular Valve section of this catalog.

ET VALVE CONNECTORS

Black molded lug connectors are available for easy push-on connection ET-C48 is 48" in length, ET-C120 is 120" in length.



Insulated crimp-on spade lug connectors are available for wiring up leads to connect an electronic circuit to ET style valves. Accepts #22, #24, or #26 wire.



Part No.

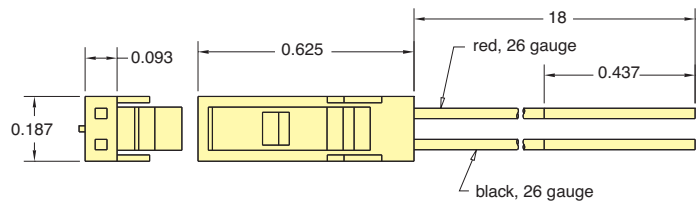
- ET-C48 48" Connector
- ET-C120 120" Connector

Part No.

- 3831 Spade Lug Connector

EC & EI VALVE CONNECTORS

TE Connectivity #5-103956-1 with 18" or 120" wire leads for EC/ECO and EI/EIO valves.



Part No.

- C2-RB18 18" Connector
- C2-RB120 120" Connector



CUSTOM PORTS & CONNECTORS

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs.

This application requires a special connection to a MAPP gas canister. The valve is tested for response time and flow rate, which delivers a consistent amount of gas each cycle.

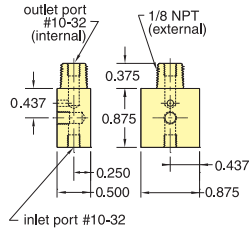
CUSTOMer
solutions



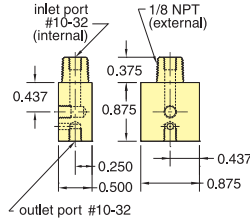
Specialized Manifolds

Material: ENP brass
Option: Add -MR for metric version

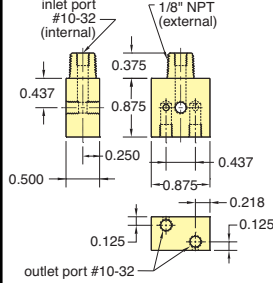
15490-1 Standard
O-15490-1 Oxygen Clean
 #10-32 [M5] Inlet
 1/8" NPT (R1/8) Outlet



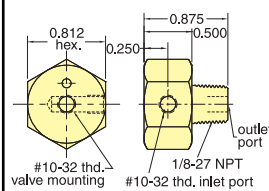
15490-2 Standard
O-15490-2 Oxygen Clean
 1/8" NPT (R1/8) Inlet
 #10-32 [M5] Outlet



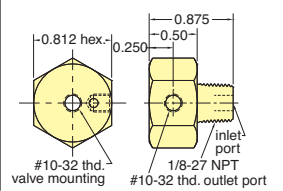
Dual Outlet
15490-3 Standard
O-15490-3 Oxygen Clean
 1/8" NPT (R1/8) Inlet
 #10-32 [M5] Outlet



15491-1 Standard
O-15491-1 Oxygen Clean
 #10-32 [M5] Inlet
 1/8" NPT (R1/8) Outlet



15491-2 Standard
O-15491-2 Oxygen Clean
 1/8" NPT (R1/8) Inlet
 #10-32 [M5] Outlet



Use: Mount EV, ET, EC, and EW valves to any 1/8" NPT supply port

Oxygen Clean Manifolds

Multi-station manifolds are available for use with Clippard's Oxygen Clean series electronic valves. These manifolds offer either single-sided or double-side mounting in Oxygen-compatible ENP brass material.

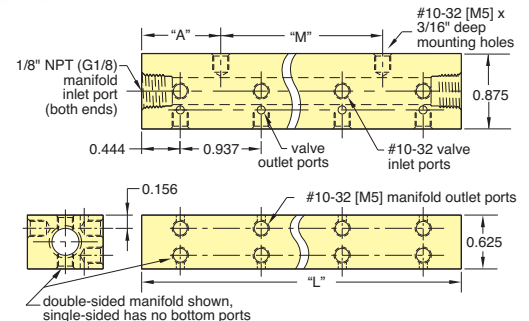
The Oxygen series products are manufactured and assembled for applications in Oxygen-enriched environments which are extremely sensitive to contamination. Each manifold is cleaned according to [Clippard Specification #ES-3.41](#), and double bagged in heat-sealed polyethylene bags.



- Input Ports:** In-line 1/8" NPT (G1/8 optional)
- Outlet Ports:** #10-32 (M5 optional)
- Mounting:** #10-32 tapped holes (M5 optional)
- Materials:** ENP Brass
- Option:** Add -M5 for Metric version

Single-Sided		Double-Sided		"A"	Length "L"	Mtg. "M"
Part No.	Stations	Part No.	Stations			
O-15581-2*	2	O-15582-8*	8	0.444	1.826	0.937
O-15581-4*	4	O-15582-8*	8	0.913	3.702	1.875
O-15581-6*	6	O-15582-12*	12	0.913	5.577	3.750

* Add -M5 for metric version (G1/8 inlet)

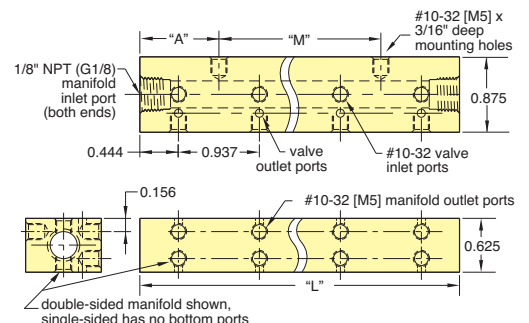


Multi-Valve Manifolds

Construction: Black anodized aluminum
Option: Add -M5 for Metric version



Single-Sided		Double-Sided		"A"	Length "L"	Mtg. "M"
Part No.	Stations	Part No.	Stations			
15481-2	2	15482-8	8	0.444	1.826	0.937
15481-4	4	15482-8	8	0.913	3.702	1.875
15481-6	6	15482-12	12	0.913	5.577	3.750





ELECTRONIC MANIFOLD CARD

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.

Reverse Polarity Protection

Circuit using diodes and capacitor provides input voltage protection against reverse polarity.

Resistor-Diode-LED Circuit

Individual circuit to each valve provides protection against shut-off spikes. LED is illuminated when 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.

Power Selector Switch

Two-position selector switch enables choice of power input source (25-pin connector or auxiliary).

25-Pin Connector

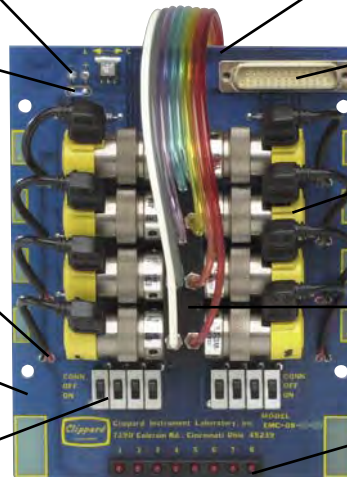
Clippard Electronic Valves

Clippard Valve Manifold

Compact, efficient mounting of the valves is by Clippard multi-valve manifolds.

LED Bank

Illuminated LED signals that the valve is actuated.



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:

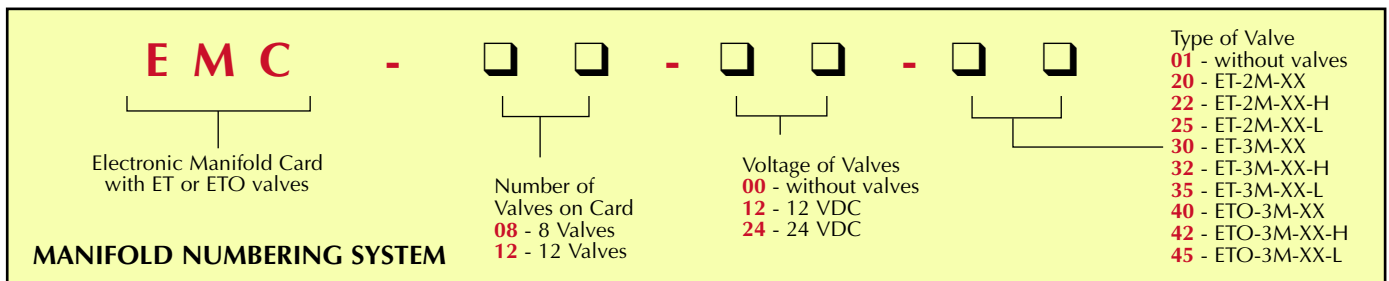
- 8 or 12 Clippard ET interface valves
- Manifold mount for single air supply
- Circuit board fully wired
- Instant plug-in with 25-pin connector
- Resistor, diode, LED and switch for each valve
- Auxiliary power supply connection

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!

Convenience in interfacing electronics and pneumatics . . . completely assembled, manifolded valve cards.

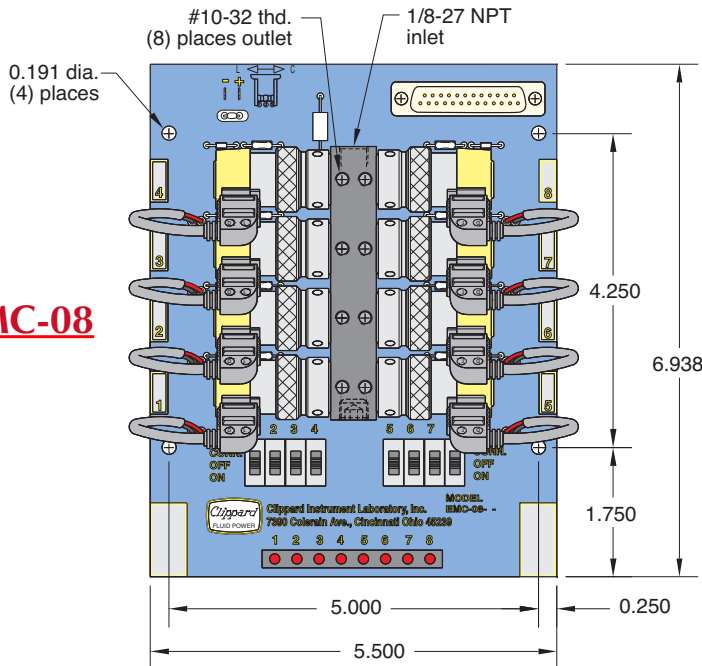
Features

- Fast, easy to mount
- Pre-assembled; all valves mounted
- 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

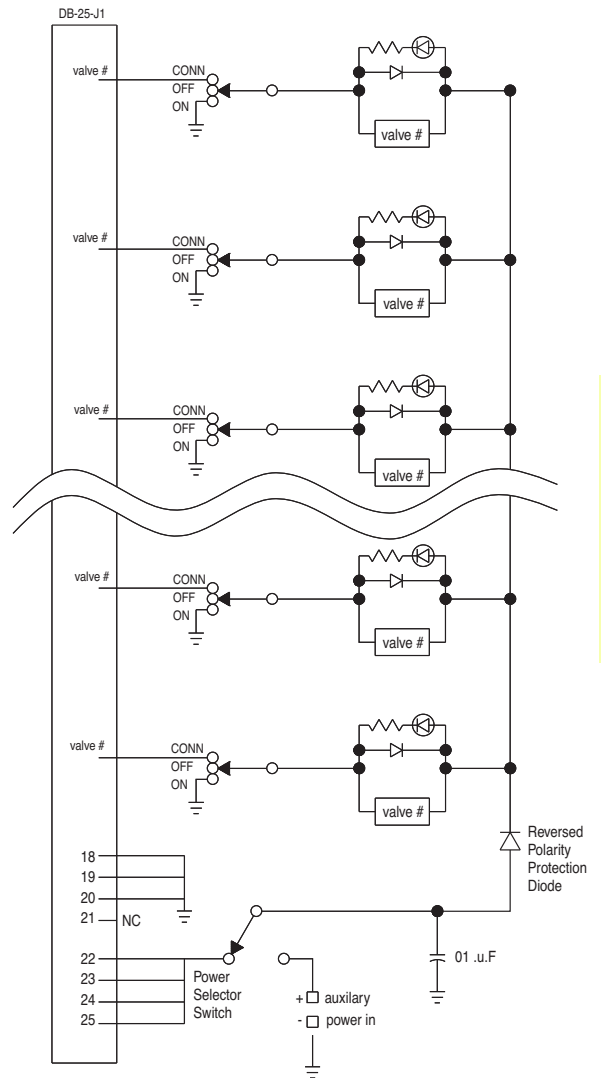
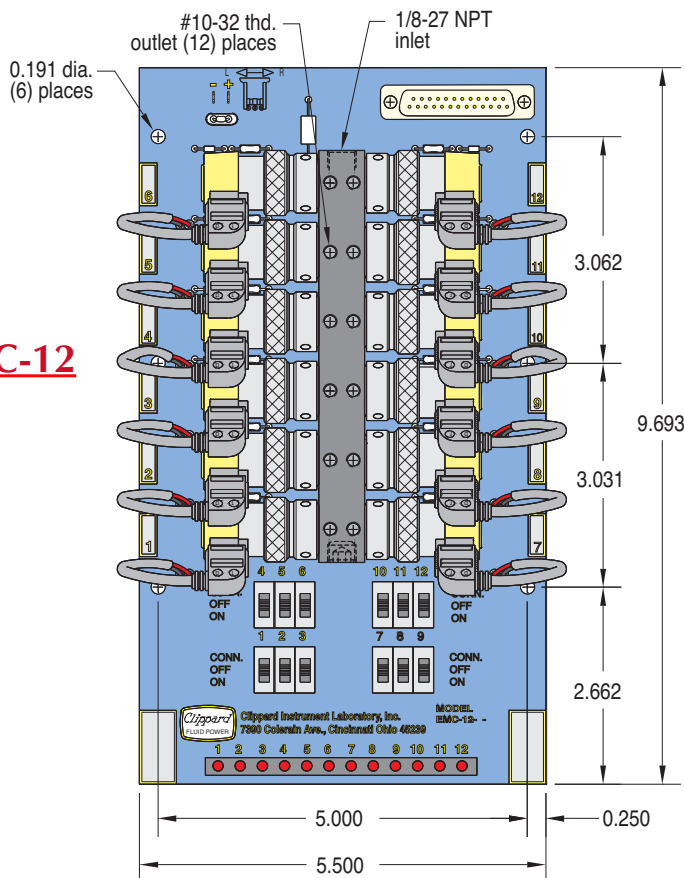


EMC-08-00-01 and EMC-12-00-01 are part numbers for cards without any valves, and without manifold. Manifold mounting hardware is included. Manifolds may be ordered separately, if desired. Part numbers are: 15482-8 and 15482-12.

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.



EVP SERIES PROPORTIONAL CONTROL VALVES

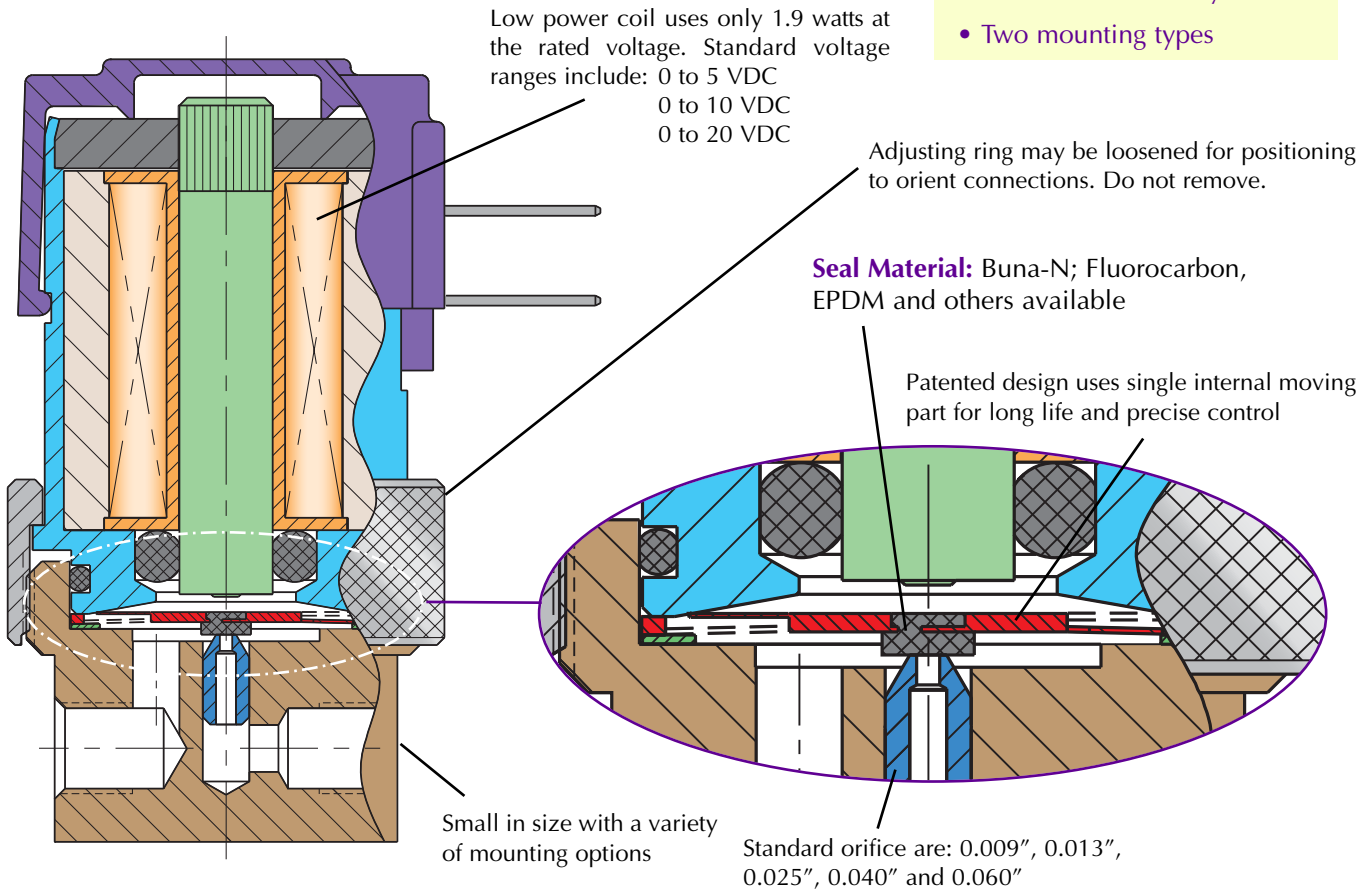
The EVP series Proportional Control Valves combine the features of the existing EV series valve - long life, low power, and Clippard's reputation for high quality components - with the additional capability for proportional control.

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

- Flow proportional to input current
- Fast response
- Long life
- Small package
- Single moving part - low friction and wear
- Five orifice sizes
- Three connection styles
- Two mounting types



Designed For:

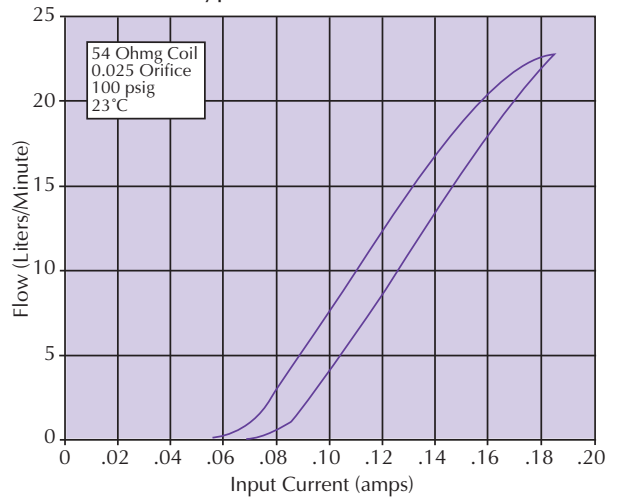
- Analytical Instruments
- Blood pressure monitoring
- Precise pressure control
- Patient Simulators
- Automotive
- Gas Controllers
- Mass Flow Control
- Gas Chromatography
- Respirators / Ventilators and many more...

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.

Typical Performance



Type: 2-Way, Proportional

Medium: Air, Inert Gases

Temperature Range: 32 to 120°F (0 to 49°C)

Power Consumption: 1.9 watts at 23°C, 2.3 watts max

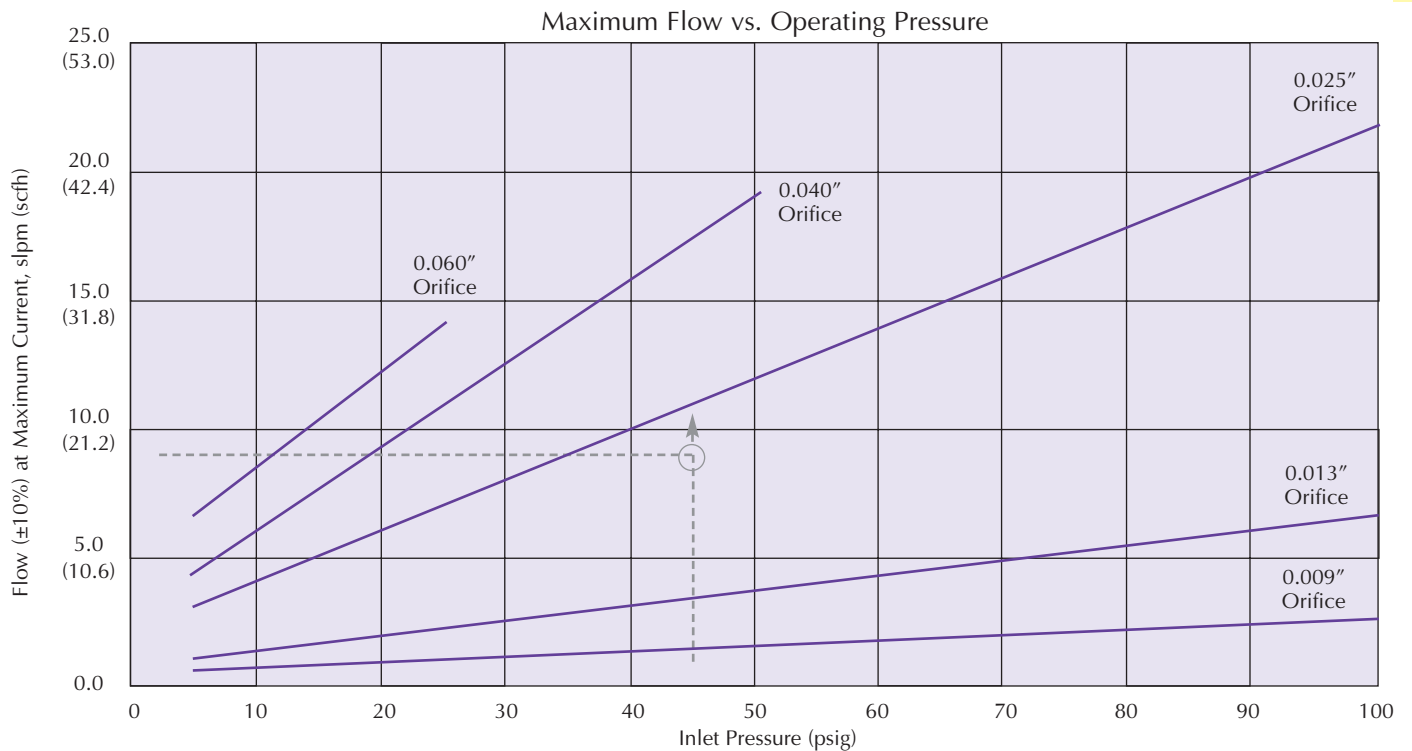
Mounting: In-line or Manifold (see [page 185](#) for manifolds)

Ports: #10-32 Female (In-line)

#10-32 Male Stud (Manifold)

Seal Material: Buna-N; Fluorocarbon and EPDM
Others available.

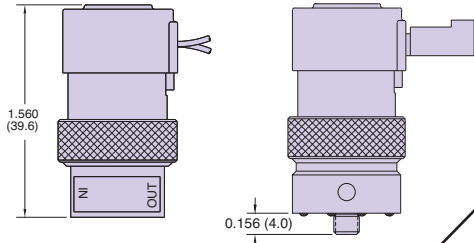
Maximum Hysteresis: 10% of full current



To determine the correct orifice required, locate the colored line immediately above the flow/pressure intersection
Example: 9 slpm required at 45 psig inlet. This example leads to a "-2545" valve (0.025" nozzle, 45 psig).



2-WAY PROPORTIONAL VALVES, IN-LINE & MANIFOLD MOUNT



		Voltage			Base Part No.		Operating Range & Orifice
		5 VDC	10 VDC	20 VDC	In-Line Mount	Manifold Mount	
	<p>0.025" Pin Connector</p>	•			<u>EC-P-05-*</u>	<u>EC-PM-05-*</u>	<p>* Complete Part Number with the number derived after choosing the desired Maximum Operating Range and Orifice size below.</p>
		•	•		<u>EC-P-10-*</u>	<u>EC-PM-10-*</u>	
			•		<u>EC-P-20-*</u>	<u>EC-PM-20-*</u>	
	<p>Spade Terminals</p>	•			<u>ET-P-05-*</u>	<u>ET-PM-05-*</u>	
		•	•		<u>ET-P-10-*</u>	<u>ET-PM-10-*</u>	
			•		<u>ET-P-20-*</u>	<u>ET-PM-20-*</u>	
	<p>Wire Leads Side (Radial)</p>	•			<u>EV-P-05-*</u>	<u>EV-PM-05-*</u>	
		•	•		<u>EV-P-10-*</u>	<u>EV-PM-10-*</u>	
			•		<u>EV-P-20-*</u>	<u>EV-PM-20-*</u>	

Base Part No. plus [] [] - [] [] []

See Page 189 for flow chart/selection

Orifice Options:

- 09 - 0.009" dia.
- 13 - 0.013" dia.
- 25 - 0.025" dia.
- 40 - 0.040" dia.
- 60 - 0.060" dia.

Maximum Pressure (specify Operating Pressure):

- [] - 5 to 100 psig
- [] - 5 to 50 psig
- [] - 5 to 25 psig

Options: Blank - none, E - EPDM seals, V - FKM seals

Ports: Blank - #10-32, M5 - Metric

* Consult factory for availability of non-standard voltages and other options

Sample part number: EC-P-10-2585

Medium: Clean, dry air or inert gases

Power Consumption: 1.9 watts at 73°F, 2.3 watts max

Temperature Range: 32 to 120°F (0 to 49°C)

Ports: #10-32 Female (in-line); manifold (see page 185 for manifold options)

Nominal Voltage Range @ 73°F (VDC)	Input Current Range (amps)	Coil Resistance @ 73°F (ohms)	Max. Voltage Required (VDC)
0 to 5	0 to 0.370	13.5	6.2
0 to 10	0 to 0.185	54	12.4
0 to 20	0 to 0.092	218	24.8

Do not exceed input current range.

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 5 psig, please consult factory.

NEW! EVPD PROPORTIONAL VALVE DRIVER



Plug-and-Play Control for Proportional Valves

The New EVPD Proportional Valve Driver fast-tracks valve-control applications. This product is ideal for laboratories and OEM product development, and can be customized to fit OEM applications including control parameters. The EVPD produces driver current for Clippard's EVP series valves proportional to input control signals.

Power Requirement: 7 to 28 VDC @ 5 Watt (see chart)

Input Impedance: 200 kΩ

Command Set-Point Signal Type: Selectable: 0 to 5 VDC, 0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, PWM @ ≥2 kHz duty cycle

Adjustments: Minimum Drive Current, Maximum Drive Current, Command Deadband

LED Indicators: Power; Activity Status & Faults

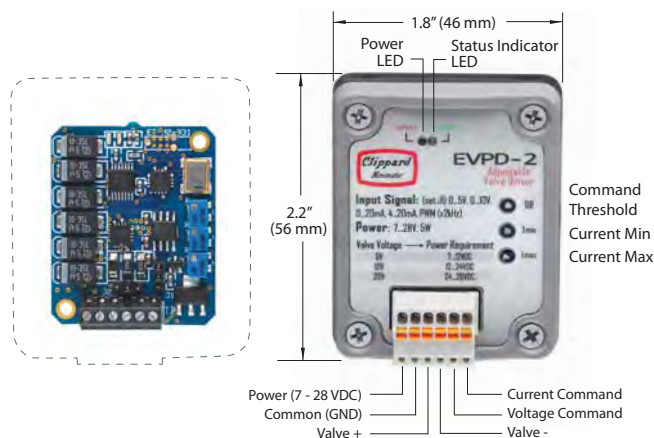
Output: 0 to 0.4 A (selectable range)

Temperature Range: 0° to 155°F (-18° to 68°C)

Size: Open card: 1.5" x 1.3" x 0.4" unmounted; Enclosed: 2.2" x 1.8" x 0.7" excluding DIN clip

RoHS Compliant

For further information, visit www.clippard.com/evpd



Features

- Plug-and-play interface between Clippard's EVP series valves and PLCs or other controls
- Linearized valve response right "out of the box"
- Three selectable valve output ranges
- Five signal inputs to choose from
- Easy integration with existing machine controls
- User-adjustable parameters
- Automatic Temperature Compensation to maintain constant current
- Two configuration options: stand-alone PCB or enclosed in housing
- Compact size.

Power Requirements

Power input requirements are specified as supply voltage ranges for each EVP valve. Supplying voltages outside of these ranges may result in valve malfunctioning. Power requirements are determined by the valve voltage specification.

EVP Valve Type	Input Voltage Range	EVPD Max Output*
0 to 5 VDC	7 to 12 VDC	400 mA
0 to 10 VDC	12 to 28 VDC	200 mA
0 to 20 VDC	14 to 28 VDC	100 mA

* See EVP Valve Current Requirements

Part No.	Description
EVPD-2	EVPD Driver Assembly in Enclosure
EVPD-1	EVPD Driver Board
EVPD-2DIN	DIN Rail Mounting Clip (shown at right) with Screws



Effect on Valve Flow

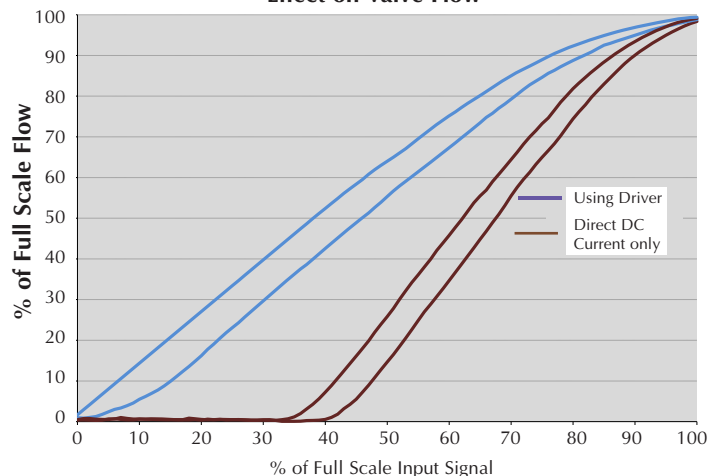
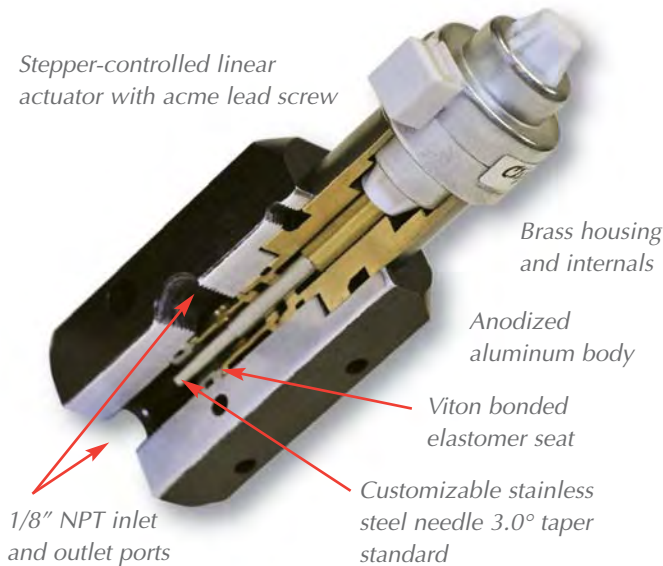


Figure 1: Effect of Driver Output on EVP Flow



NEW! 2-WAY STEPPER-CONTROLLED PROPORTIONAL VALVE

Stepper-controlled linear actuator with acme lead screw



Utilizing the industry's most robust and powerful linear actuator, the high-flow stepper-controlled proportional valve outperforms the competition in performance and durability.

The bonded elastomeric seat achieves excellent sealing ensuring smooth opening and fine control at low flow for millions of cycles.

This valve is ideal in critical applications such as gas delivery, medical, analytical, and industrial automation requiring high resolution, high flow, and low hysteresis. In addition, the unique design allows for custom flow profiles when required.

Features

- 2% hysteresis
- Excellent Linearity — 2.5% of full-scale
- 2 ms reaction time
- Millions of cycles
- Holds position for power savings or at loss of power

Medium: Compatible gases and liquids

Configuration: 1 1/8" square body with 1/8" NPT ports

Typical Cycle Time for Full Travel: 0.95 seconds at 100% duty cycle; 0.55 seconds at 25% duty cycle (full open to full close or full close to full open)

Wetted Material: Stainless steel, aluminum, brass, and FKM*

Pressure Range: Vac to 100 psig (Vac to 7 bar)*

Flow Range: 0 to 300 slpm*

Flow Resolution: 0.56 slpm per step

Position Resolution: 0.001" per step

Temperature Range: 32 to 184°F (0 to 84°C)

Driver: Bipolar chopper drive required

Supply Voltage: 12 to 40 VDC (40 VDC optional)

Response Time: 0.95 sec. fully-open to fully-closed*

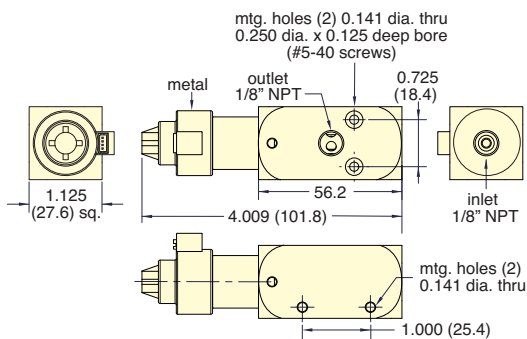
Mounting: In-line

Power Consumption: 3.85 watts nominal only during adjustment. Zero power consumption to maintain position.

Ports: 1/8" NPT. Others available upon request.

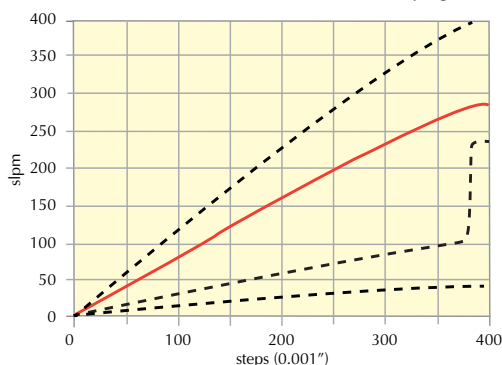
Seals: FKM standard. Others available.

* This product is highly modifiable for OEM applications including alternate body materials, flow profiles, cartridge styles, manifold mounting, etc. Please consult factory.



Characteristic Curve

Flow Rate for SCPV-1-3 @ 100 psig



Part No.	Description
SCPV-1-3	Proportional Valve, 3° Needle

For further information, visit www.clippard.com/scpv

NEW! 2-WAY STEPPER-CONTROLLED PROPORTIONAL VALVE

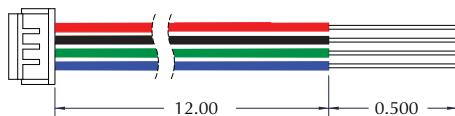


Control Data

A **Bipolar Chopper Drive** (not included) is a power-efficient method of using current to drive a stepping motor to obtain high stepping rates. The chopper gets its name from the technique of rapidly turning the output voltage on and off (chopping) to control motor current.

Stepper motors require some external electrical components in order to operate. These components typically include a power supply, logic sequencer switching components and a clock pulse source to determine the step rate. Many commercially available drives have integrated these components into a complete package. See www.clippard.com/scpv for more information.

Wiring Harness (included)

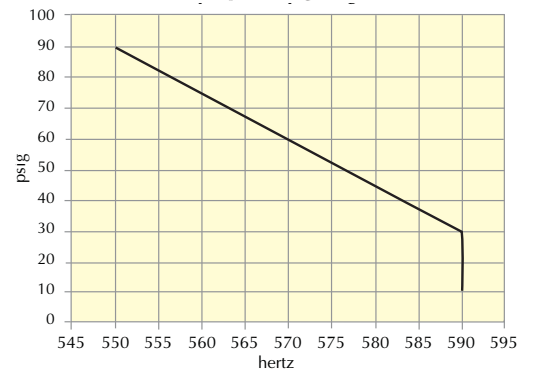


Pin	Color	Pin	Color
1	Red (A+)	3	Green (B-)
2	Black (A-)	4	Blue (B+)

Salient Characteristics Linear Actuator

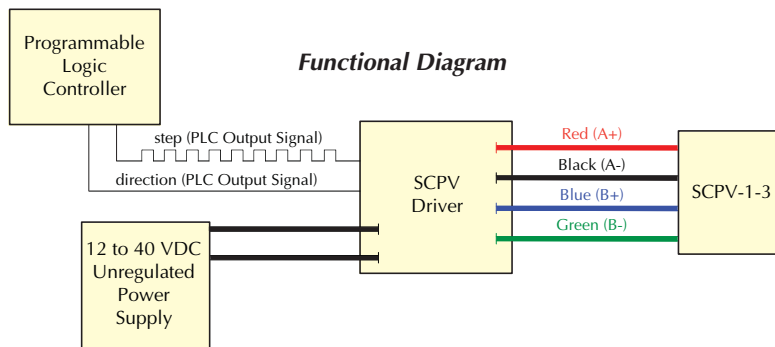
Wiring:	Bipolar
Current/Phase:	385 mA
Motor Voltage:	5 VDC
Resistance/Phase:	13 W
Inductance/Phase:	8.08 mH
Power Consumption:	3.85 Watts
Rotor Inertia:	1.07 gcm ²
Temperature Rise:	135°F (75°C)
Insulation Resistance:	20M ohms

Maximum Step Pulse Frequency vs. Operating Pressure



Potential Applications

- Medical/Analytical/Industrial Gas Mixing
- Anesthesia Equipment
- Precision Flow Control
- Cuff/Bladder Pressure Control
- Process Flow Control
- Variable Speed Control
- Automation of Needle Valve



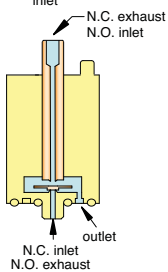
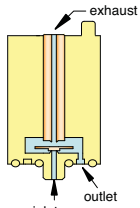
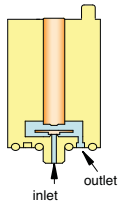
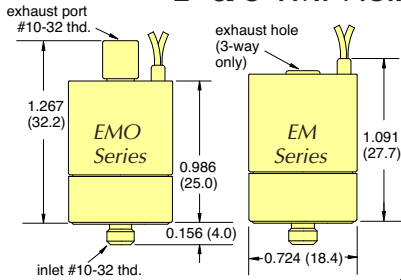
For helpful information and video, visit www.clippard.com/scpv





EM STUD MOUNT 2-WAY & 3-WAY VALVES

2- & 3-WAY NORMALLY-CLOSED & 3-WAY N.O./N.C. VALVES, MANIFOLD MOUNT



Part No.	Pressure Range			Voltage		2-Way N.C.	3-Way N.C.	3-Way N.O./N.C.
	Vac. to 105 psig +	Vac. to 50 psig	Vac. to 25 psig	12 VDC	24 VDC			
EM-2-12 EM-2-24 EM-2-12-L EM-2-24-L EM-2-12-H EM-2-24-H	•	•	•	•	•			
EM-3-12 EM-3-24 EM-3-12-L EM-3-24-L EM-3-12-H EM-3-24-H	•	•	•	•	•			
EMO-3-12 EMO-3-24 EMO-3-12-L EMO-3-24-L EMO-3-12-H EMO-3-24-H	•	•	•	•	•			

Options (add to end of Part No.)	Standard	Non-Standard
FKM Seals	-V	
EPDM Seals		-E
Silicone Seals		-S
Metric Ports	-M5	

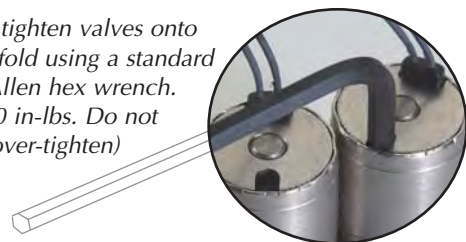
Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig <i>+call for special configurations</i>	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

An even smaller Mouse valve! When space is critical, the EM Series Valve provides the best solution. At just over an inch tall, and less than 3/4" in diameter, the EM Valve uses Clippard's special "spider" design. This reliable and proven design for long life is housed in a miniature body, and incorporates wire leads out the top, allowing body rotation for close-center mounting. In addition, the valve features higher flow; combining fast shifting speed, extremely high cycle life with the design flexibility to make this valve a "small wonder" for demanding applications.

This valve is perfect for air and/or gas control, pilot control, and any application where space is limited, but desired performance is not.

- Medium:** Clean, dry air (40 micron filter)
- Power Consumption:** 1 watt
- Temperature Range:** 32 to 150°F (0 to 82°C)
- Response:** 10 milliseconds at nominal voltage (15 milliseconds N.O.)
- Operating Range:** 90 to 120% of rated voltage
- Voltage:** 12 VDC or 24 VDC. Other voltages available upon request.
- Ports:** #10-32 Exhaust (M5 optional)

Simply tighten valves onto the manifold using a standard 1/8" Allen hex wrench. (4-10 in-lbs. Do not over-tighten)



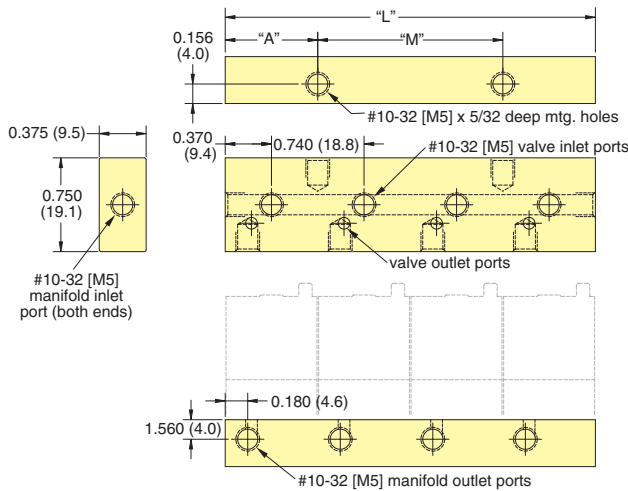
EM Series Manifolds

Construction: Black anodized aluminum

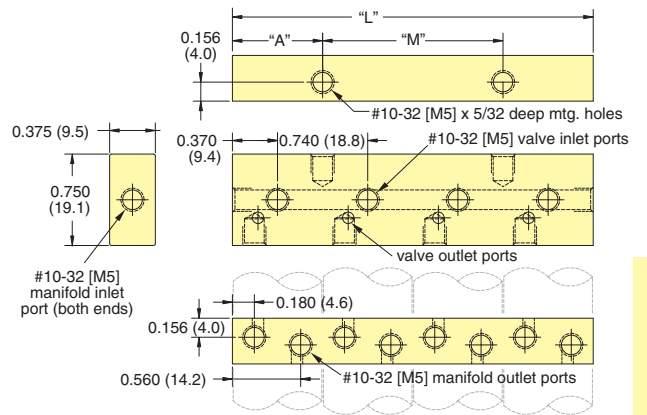
Option: Add -M5 for Metric version



Part No.	Stations	Part No.	Stations	Length "L"	Mtg. "M"	"A"
<i>Single-Sided</i>		<i>Double-Sided</i>				
15681-2	2	15682-4	4	1.480"	0.740"	0.370"
15681-4	4	15682-8	8	2.960"	1.480"	0.740"
15681-6	6	15682-12	12	4.440"	2.960"	0.740"
15681-8	8	15682-16	16	5.920"	4.440"	0.740"



Single-Sided



Double-Sided



Manifold Assemblies

Our Value Added department provides assembly services for all Clippard components. If you have a need for special or standard manifolds, and would like to receive a single part number with all components assembled and tested, just contact Clippard. We provide application assistance, special testing, kitting of parts, control boxes, manifold assemblies, and more. Let our experience and capabilities work for you.

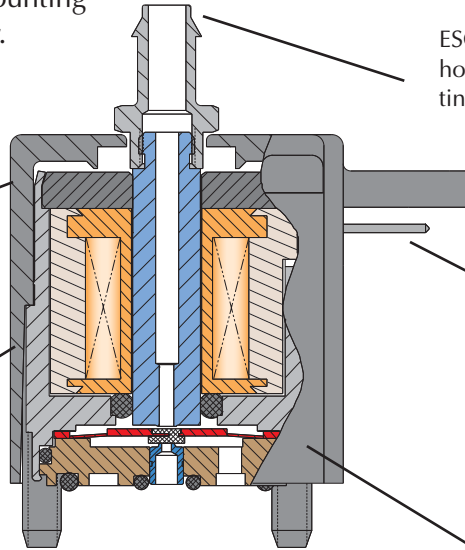


ES, ESO SERIES VALVES

Valves are small in size with a variety of coil voltages and flow options. Mounting is as close as 7/8" on center.

Housing is molded Zytel® ST 801 for toughness and rigidity.

Valves feature low power, cool running, quiet operation and fast response time. They convert low voltage, low current signals into high pressure pneumatic outputs.



ESO and similar styles have top hose barb or #10-32 threaded fitting for N.C. exhaust or N.O. inlet.

Coils are available to mate with TE Connectivity #5-103956-2 with connector or with 18" wire leads which utilize #26 wire.

Clippard ES valves are unique, with only one internal moving part that travels a mere 0.007".

Quality Design

The compact ES valve, like Clippard EV and ET valves, converts low voltage, low current signals into high pressure (0 to 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

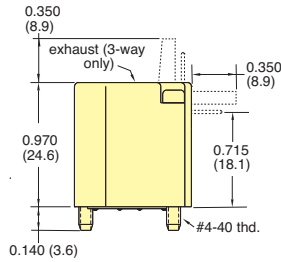
- Close mounting - 7/8" on center
- Overall height less than 1"
- Easy to mount on manifold with two #4-40 screws
- Geometric design
- Polymer housing - Zytel ST 801® super tough
- TE Connectivity-style pin connection or 18" wire leads
- Flow up to 0.6 scfm (17 l/min)

Zytel ST 801® super tough and Zytel® are a registered trademark of DuPont

NOMINAL			Power (watts)	Working Range (cont. duty)
Voltage*	Current (amps)	Resistance (ohms)		
12	0.083	144	1.0	90 to 120% of rated voltage
24	0.042	576	1.0	

*Other voltages available. Please consult factory.

ES SERIES 2- & 3-WAY NORMALLY-CLOSED VALVES



		Pressure Range		Voltage		2-Way	3-Way
		Vac. to 105 psig ⁺		Vac. to 50 psig			Part No.
		Vac. to 25 psig		12 VDC			
				24 VDC			
	<p>Side Pin Connector</p>	•		•	•	ES-2S-12	ES-3S-12
		•		•	•	ES-2S-24	ES-3S-24
	<p>Top Pin Connector</p>	•		•	•	ES-2T-12	ES-3T-12
		•		•	•	ES-2T-24	ES-3T-24
	<p>Wire Leads Side (Radial)</p>	•		•	•	ES-2W-12	ES-3W-12
		•		•	•	ES-2W-24	ES-3W-24
	<p>Board Mount</p>	•		•	•	ES-2B-12	ES-3B-12
		•		•	•	ES-2B-24	ES-3B-24
		•		•	•	ES-2B-12-L	ES-3B-12-L
		•		•	•	ES-2B-24-L	ES-3B-24-L
		•		•	•	ES-2B-12-H	ES-3B-12-H
		•		•	•	ES-2B-24-H	ES-3B-24-H

Medium: Clean, dry air (40 micron filter)

Power Consumption: 1 watt at rated voltage

Temperature Range: 32 to 150°F (0 to 64°C)

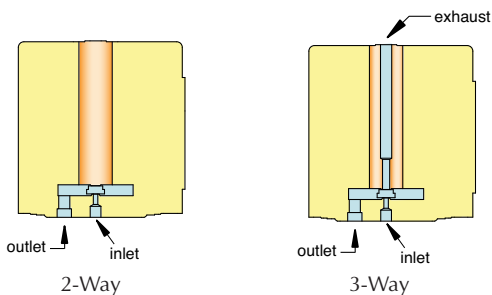
Response: 5 to 10 milliseconds at max rated pressure

Operating Range: 90 to 120% of rated voltage

Ports: Inlet and outlet through manifold; 3-way exhaust through top of valve (3-way only)

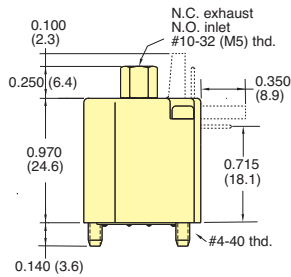
Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig <i>+ call for special configurations</i>	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

See page 176 for flow charts.



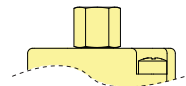


ESO SERIES 3-WAY FULLY-PORTED VALVES

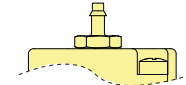


		Pressure Range			Voltage		Part No.
		Vac. to 105 psig +			Vac. to 50 psig		
		Vac. to 25 psig			12 VDC		
		24 VDC					
<p>Side Pin Connector</p>	•			•		ESO-3S-12*	
	•			•		ESO-3S-24*	
		•		•		ESO-3S-12-L*	
		•		•		ESO-3S-24-L*	
			•		•		ESO-3S-12-H*
			•			ESO-3S-24-H*	
<p>Top Pin Connector</p>	•			•		ESO-3T-12*	
	•			•		ETO-3T-24*	
		•		•		ESO-3T-12-L*	
		•		•		ESO-3T-24-L*	
			•		•		ESO-3T-12-H*
			•			ESO-3T-24-H*	
<p>Wire Leads Side (Radial)</p>	•			•		ESO-3W-12*	
	•			•		ESO-3W-24*	
		•		•		ESO-3W-12-L*	
		•		•		ESO-3W-24-L*	
			•		•		ESO-3W-12-H*
			•			ESO-3W-24-H*	
<p>Board Mount</p>	•			•		ESO-3B-12*	
	•			•		ESO-3B-24*	
		•		•		ESO-3B-12-L*	
		•		•		ESO-3B-24-L*	
			•		•		ESO-3B-12-H*
			•			ESO-3B-24-H*	

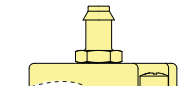
Top Port Options (below)



#10-32 (M5)
(standard)



1/16" I.D. Hose Barb
(option "-1")



1/8" I.D. Hose Barb
(option "-2")

Medium: Clean, dry air (40 micron filter)

Power Consumption: 1 watt at rated voltage

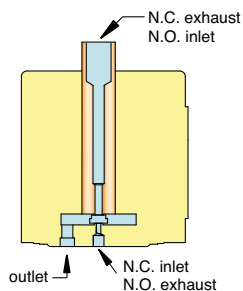
Temperature Range: 32 to 150°F (0 to 64°C)

Response: 5 to 10 milliseconds at max rated pressure

Operating Range: 90 to 120% of rated voltage

Ports: Normally-Closed: Inlet and outlet through manifold; exhaust through top of valve (#10-32/M5)

Normally-Open: Exhaust and outlet through manifold; inlet through top of valve (#10-32/M5)



* Options (add to end of Part No.)	Standard
#10-32 Female	(blank)
1/16" I.D. Hose Barb	-1
1/8" I.D. Hose Barb	-2
Metric Ports	-M5

Pressure Range	Orifice	Air Flow
28" Hg Vac. to 105 psig <i>+call for special configurations</i>	0.025"	0.6 scfm @ 100 psig (17 l/min @ 7 bar)
28" Hg Vac. to 50 psig	0.040" (-L)	0.5 scfm @ 50 psig (14 l/min @ 3.5 bar)
28" Hg Vac. to 25 psig	0.060" (-H)	0.45 scfm @ 25 psig (13 l/min @ 1.8 bar)

See page 176 for flow charts.

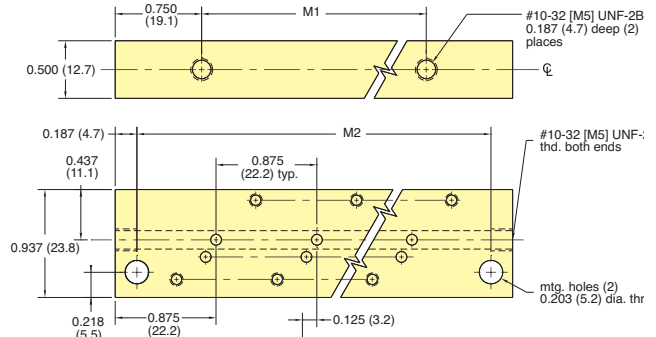
For Cable and Connectors, see Page 184.



Single-Sided Dual Mount Manifold

Part No.	Description
26081-□	Single-Sided Manifold

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

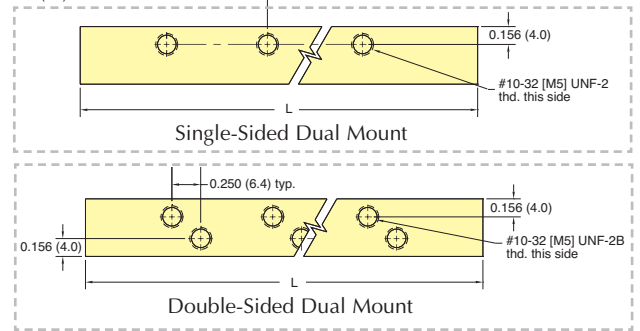


Double-Sided Dual Mount Manifold

Part No.	Description
26082-□	Double-Sided Manifold

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

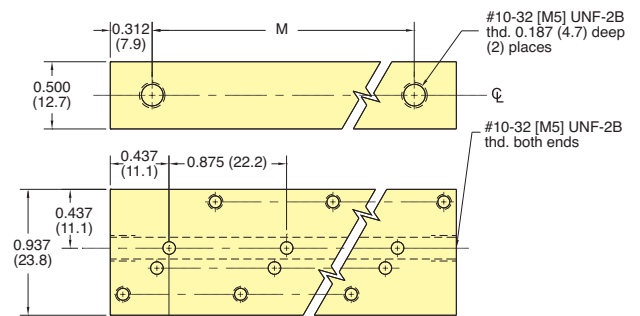
* ESM-CP plate is to cover individual unused manifold station.



Single-Sided Rear Mount Manifold

Part No.	Description
26083-□	Single-Sided Manifold

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

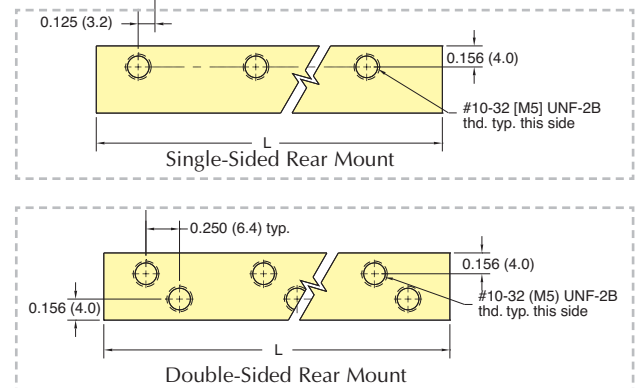


Double-Sided Rear Mount Manifold

Part No.	Description
26084-□	Double-Sided Manifold

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

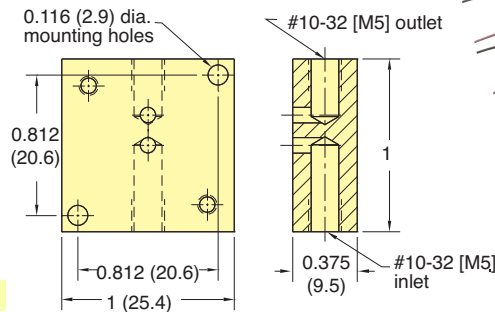
* ESM-CP cover plate is available for one manifold station.



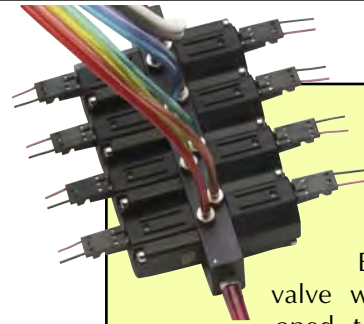


ES & ESO SERIES VALVES SINGLE MANIFOLDS

Single-Station Side Port Manifold

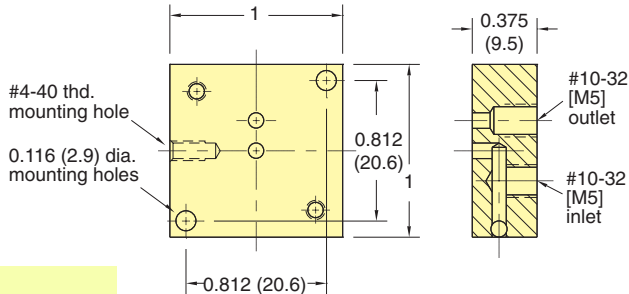


Part No. 26090-1
Description Side Port Manifold



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.

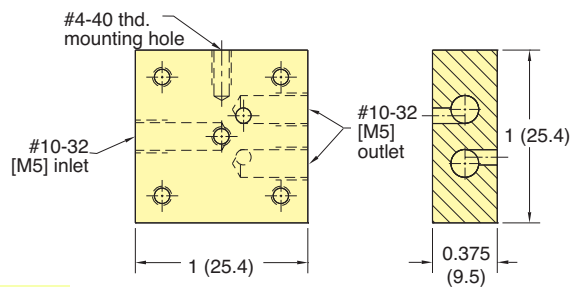
Single-Station Bottom Port Manifold



Part No. 26090-2
Description Bottom Port Manifold

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.

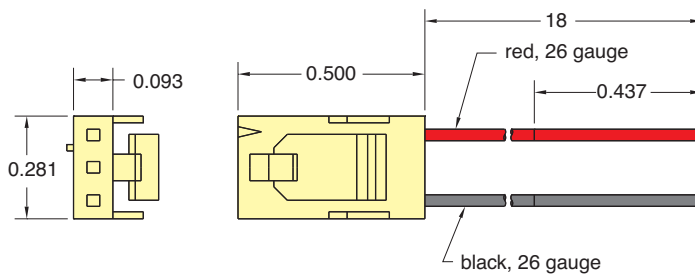
Dual-Station Manifold



Part No. 26090-3
Description Dual Station Manifold

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.

TE Connectivity #5-103956-2 with 18" Wire Leads for ES/ESO Valves



Lead Set Chart For ES Valve						
Part No.	Used On	Wire Colors			Lead Length	Wire Gauge
		Pin 1	Pin 2	Pin 3		
C3-RXB18	ES	red	~	black	18"	#26

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 areas where compact electronically-controlled pneumatics are needed.

This series has a high strength, engineered light-weight 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.



10 mm Standard Series

Direct operating valves well-suited for single- or multiple-valve mounting in small spaces.

[See pages 202 - 204.](#)



10 mm Latching Series

A short pulse of current shifts this valve which "latches" indefinitely; another pulse returns the valve.

[See page 205.](#)



NEW! 10 mm High Flow 2-Way Series

Specialty series for high flow applications.

[See page 206.](#)



NEW! 10 mm ISO 15218 Series

Conforms to ISO standard for mounting and port locations.

[See page 207.](#)



15 mm Standard Series

Direct operating valves well-suited for single- or multiple-valve mounting in small spaces.

[See pages 209 - 211.](#)



15 mm Latching Series

A short pulse of current shifts this valve which "latches" indefinitely; another pulse returns the valve.

[See page 212.](#)



NEW! 15 mm High Flow 2-Way Series

Specialty series for high flow applications.

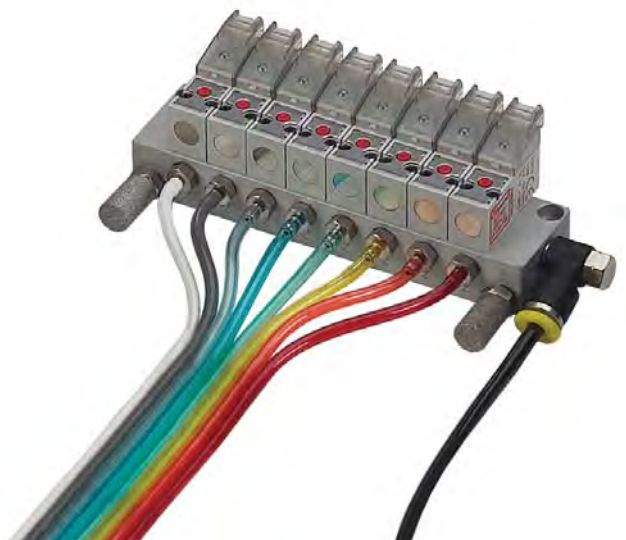
[See page 213.](#)

All 10 mm and 15 mm valves are RoHS compliant.

Valve Material: Glass filled Nylon, Stainless Steel, Buna-N or Fluorocarbon Elastomer

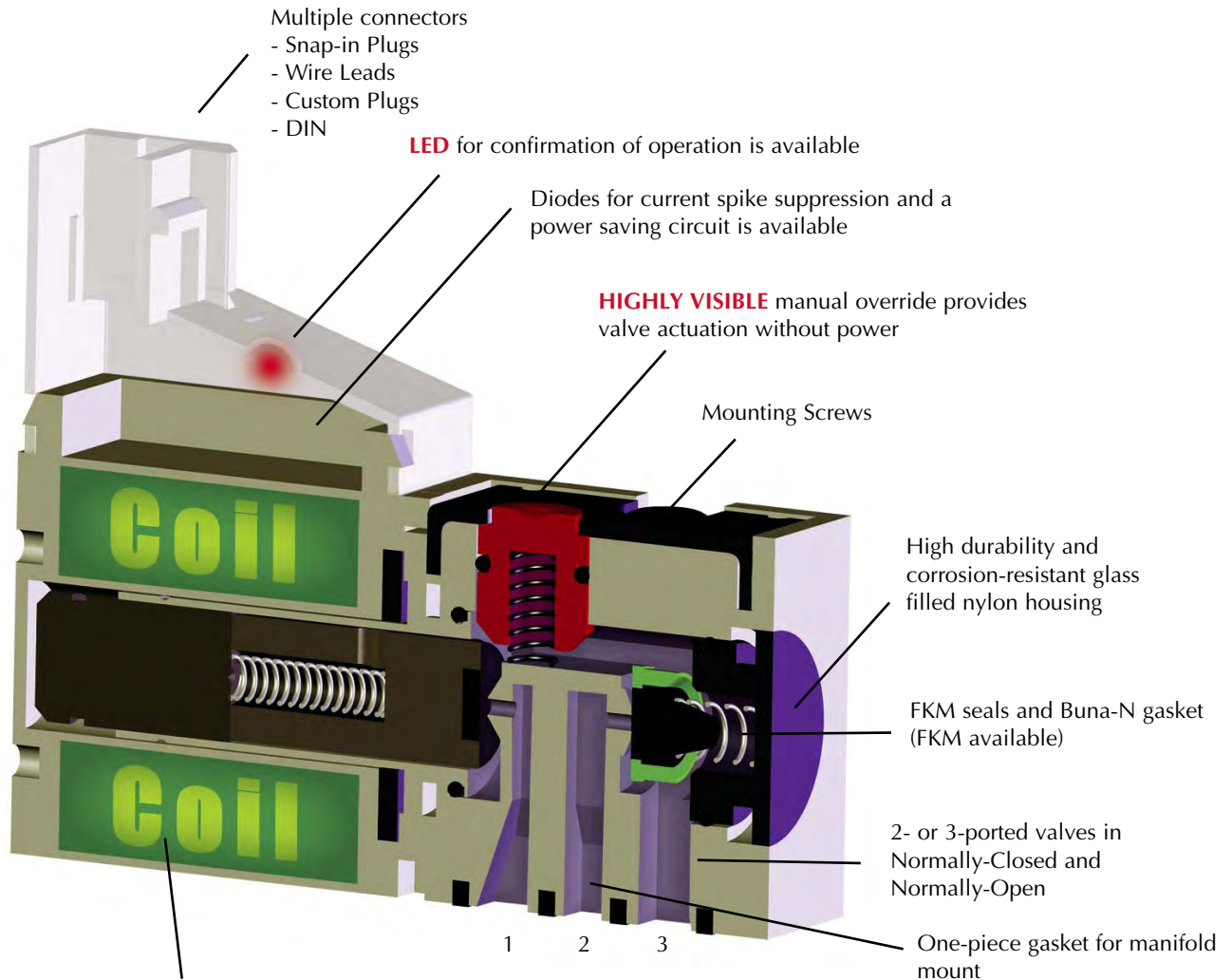
Electrical: The coil is constructed of copper wire and is insulated according to the class "F" standard. All circuitry and connections are protected from corrosion.

Weight: 10 mm Series: 0.4 oz.; 15 mm Series: 1.3 oz.





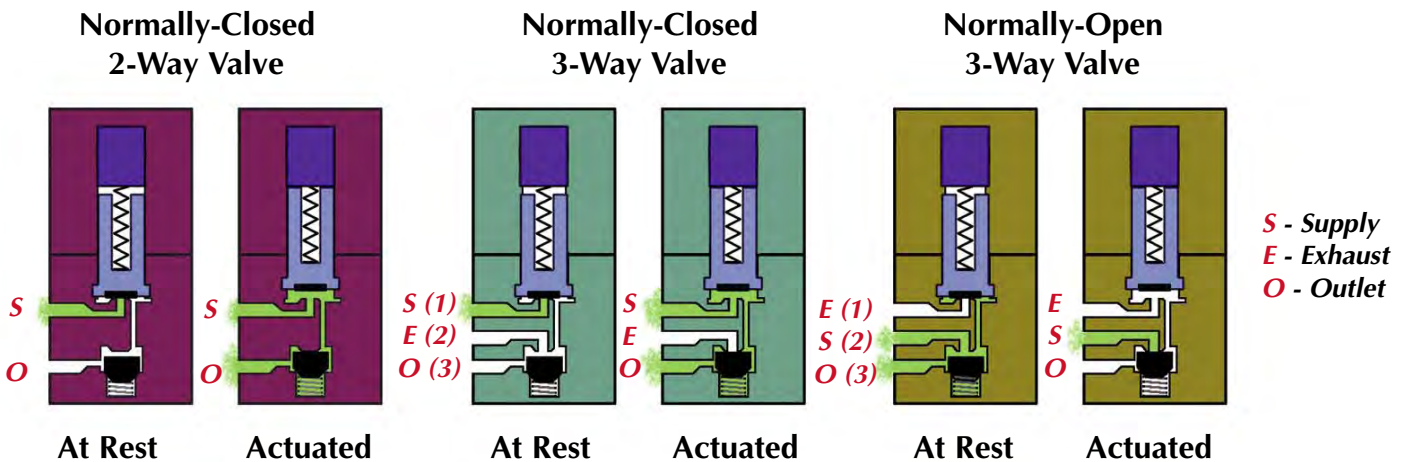
10 MM MINIATURE VALVES



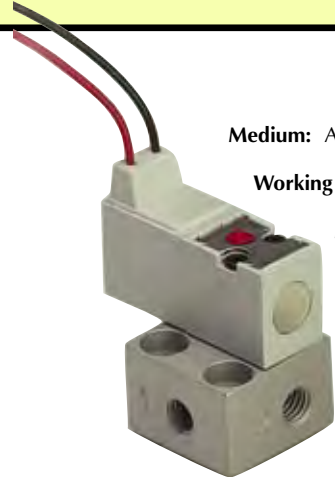
Encapsulated low wattage coils. Available in 12 VDC or 24 VDC. Special voltages available for OEMs.

Config.	1	2	3
N.C.	supply	exhaust	outlet
N.O.	exhaust	supply	outlet

Functional Schematics



Specifications



Medium: Air, Gas or other Compatible Fluids

Working Pressure: See Chart below

Max. Flow Rate:

0.020" (0.50 mm) Orifice: 14 l/min (0.5 scfm)
0.030" (0.75 mm) Orifice: 31.2 l/min (1.1 scfm)

Exhaust Flow:

0.020" (0.50 mm) Orifice: 22.7 l/min (0.8 scfm)
0.030" (0.75 mm) Orifice: 34 l/min (1.2 scfm)

Response Time: 8 ms when energized; 10 ms when de-energized

Electrical: 12 VDC or 24 VDC

Voltage Tolerance: -5% to 10%

Power Consumption: 0.6 or 1.3 watts dependent on orifice size and pressure

Material: Stainless steel core and springs, nylon body, FKM dynamic seals, and Buna-N gasket and static seals. FKM gasket and static seals available, consult factory.

Coil Insulation Class: F 311°F (155°C)

Temperature Range: 23 to 122°F (-5 to 50°C). When below 32°F (0°C), must use clean, dry air

Order Information

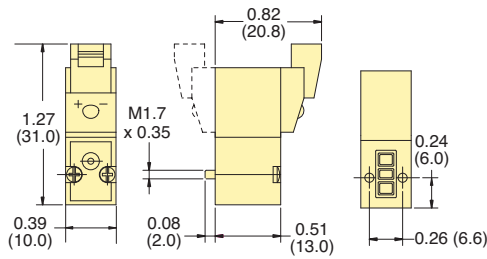
Type	Base No.	Connector	Orifice	Wattage	Working Pressure
2/2 Normally-Closed 	<u>E210A-1E*</u>	90° Connector	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E210C-2E*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E210A-1L*</u>	90° Connector with LED	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E210C-2L*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E210A-1F*</u>	In-Line Connector	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E210C-2F*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E210A-1C*</u>	In-Line Connector with LED	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E210C-2C*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
3/2 Normally-Closed 	<u>E310A-1E*</u>	90° Connector	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E310C-2E*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E310A-1L*</u>	90° Connector with LED	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E310C-2L*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E310A-1F*</u>	In-Line Connector	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E310C-2F*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E310A-1C*</u>	In-Line Connector with LED	0.020"	0.6	14.7 to 110 psig/7.6 bar
	<u>E310C-2C*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
3/2 Normally-Open 	<u>E3010A-1E*</u>	90° Connector	0.020"	0.6	14.7 to 70 psig/4.8 bar
	<u>E3010C-2E*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E3010A-1L*</u>	90° Connector with LED	0.020"	0.6	14.7 to 70 psig/4.8 bar
	<u>E3010C-2L*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E3010A-1F*</u>	In-Line Connector	0.020"	0.6	14.7 to 70 psig/4.8 bar
	<u>E3010C-2F*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E3010A-1C*</u>	In-Line Connector with LED	0.020"	0.6	14.7 to 70 psig/4.8 bar
	<u>E3010C-2C*</u>		0.030"	1.3	0 to 110 psig/7.6 bar
	<u>E3010A-1W*</u>	Wire Leads, 11.8" (300 mm)	0.020"	0.6	14.7 to 70 psig/4.8 bar
	<u>E3010C-2W*</u>		0.030"	1.3	0 to 110 psig/7.6 bar

* Add Voltage Choice to the end of each Base Part Number. "012" (12 VDC) or "024" (24 VDC).
Example: E210A-1C012

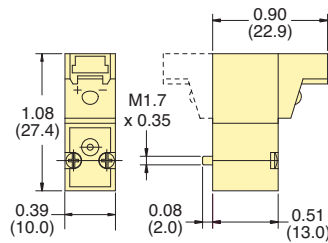


10 MM MINIATURE VALVES

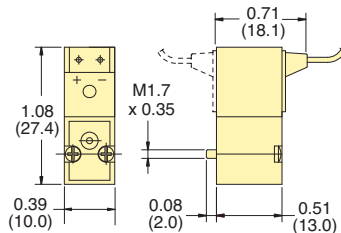
In-Line Connector with LED



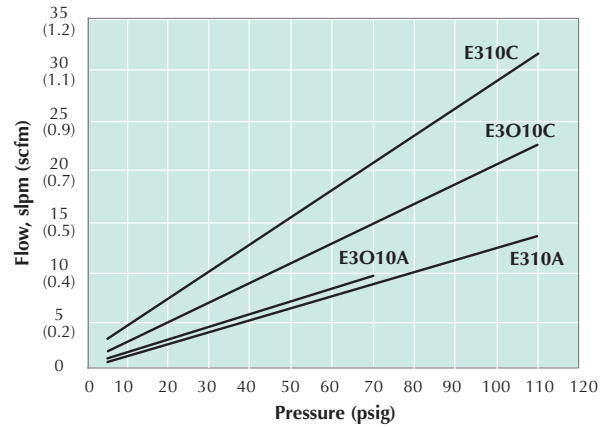
90° Connector with LED



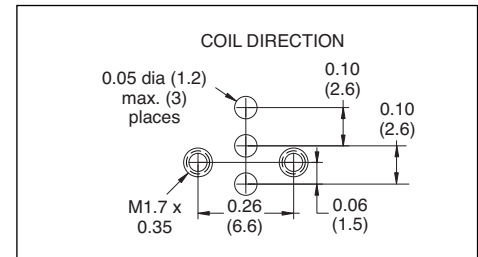
Wire Leads



Typical Air Flow



Mounting Interface



Connectors

Wire Connector must be ordered separately. 24 AWG. Stranding 7/32.

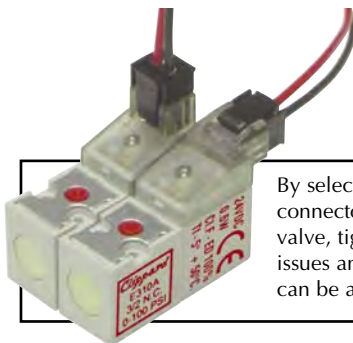


Custom plugs, wire lengths, connectors and flavors are available for your specific requirements. Call for details.

Part No.

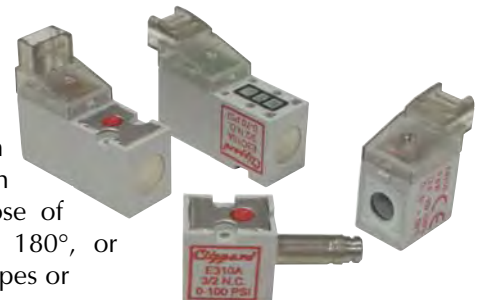
- C2A-RB300 Connector with Cable, 11.8" (300 mm)
- C2A-RB500 Connector with Cable, 19.69" (500 mm)
- C2A-RB1000 Connector with Cable, 39.37" (1,000 mm)

Molex terminal insert #050013-8000, #28139 plug and 24 AWG wire.



By selecting the appropriate connector type for your 10 mm valve, tight spaces, orientation issues and electrical requirements can be accommodated easily.

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.

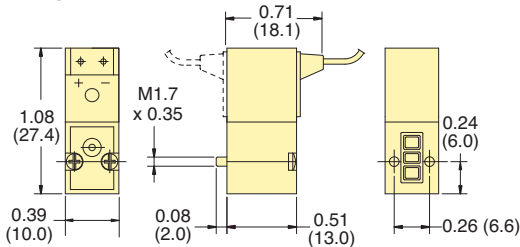


LATCHING 10 MM MINIATURE VALVES



- 2-Way & 3-Way Normally-Closed configurations
- Pulse-actuated (on or off)
- Polarity reverse required
- Stable latch

Clippard's 10 mm Latching Valves have many of the same features as the popular 10 mm valve line including small, compact design, exceptional life and reliability, light-weight design and more. A careful balance of forces—through the precise placement of a permanent magnet in the valve core—produces a bi-stable valve. A short pulse of current opens the valve, which “latches” open indefinitely after the current stops. A subsequent pulse of current in the opposite direction closes the valve. The valve consumes less energy and produces less heat than a standard solenoid valve when used in extended duty cycle applications, since the coil is energized for only a small fraction of the total duty cycle.



Max. Flow Rate: 31.2 l/min (1.1 scfm)

Working Pressure: 0 to 110 psig/7.6 bar

Orifice: 0.030" (0.75 mm)

Electrical Connection: 2-Wire Reverse Polarity, 300 mm, 24 AWG

Electrical: 12 VDC (“-012”) or 24 VDC (“-024”). 6 VDC also available. Call for further information.

Electrical Tolerance: -5 to 10%

Response Time: 8 ms when energized; 10 ms when de-energized

Connector: Wire Leads

Copper Wire Isolation Class: F 311°F (155°C)

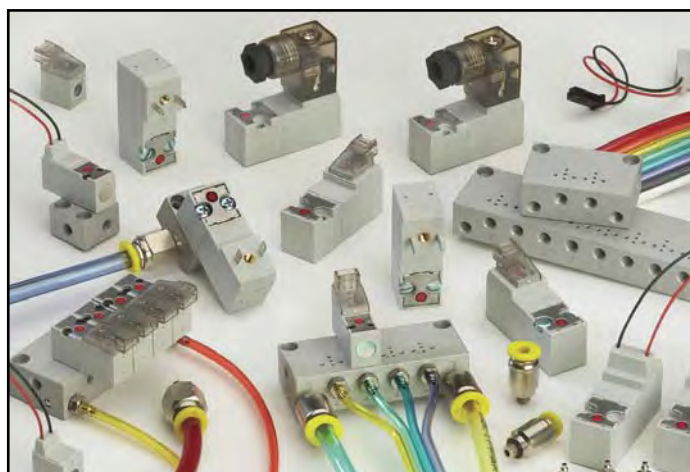
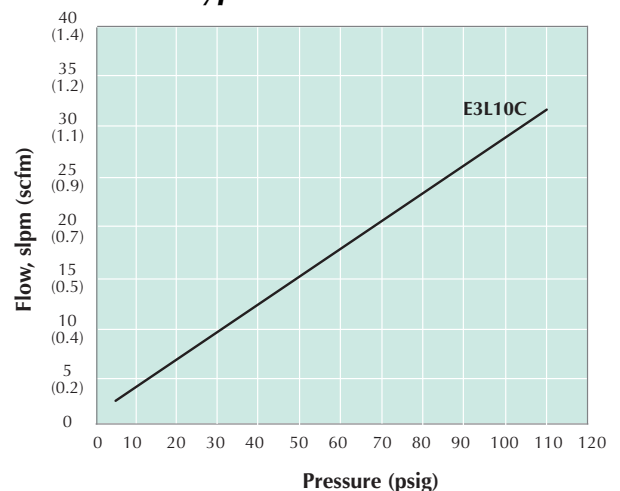
Material: Stainless steel core and springs, nylon body, FKM dynamic seals, and Buna-N gasket and static seals. FKM gasket available, consult factory.

Temperature Range: 23 to 122°F (-5 to 50°C). When below 32°F (0°C), must use clean, dry air

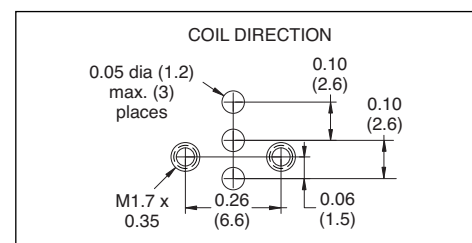
Medium: Air, Gas or other Compatible Fluids

Type	Part No.	Voltage	Wattage
2-Way	E2L10C-7W012	12 VDC	2.0
	E2L10C-6W024	24 VDC	1.7
3-Way	E3L10C-7W012	12 VDC	2.0
	E3L10C-6W024	24 VDC	1.7

Typical Air Flow



Mounting Interface



See [pages 204 & 208](#) for connectors and manifolds



NEW! HIGH FLOW 2-WAY 10 MM MINIATURE VALVES

Specifications

Medium: Air, Gas or other Compatible Fluids

Working Pressure: 0 to 30 psig/2.0 bar

Max. Flow Rate: 28 lpm (1.0 scfm)

Orifice: 0.055" (1.4 mm)

Response Time: 8 ms when energized; 10 ms when de-energized

Electrical: 12 VDC or 24 VDC

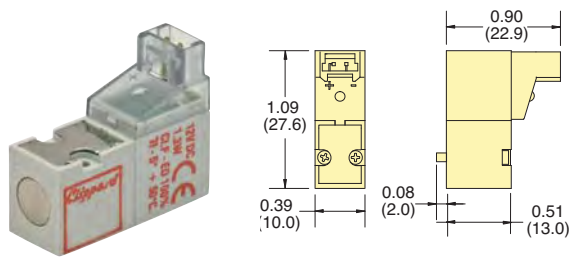
Power Consumption: 3.5 watts in rush phase; 15 ms/0.35 watts in maintenance phase

Voltage Tolerance: -5% to 10%

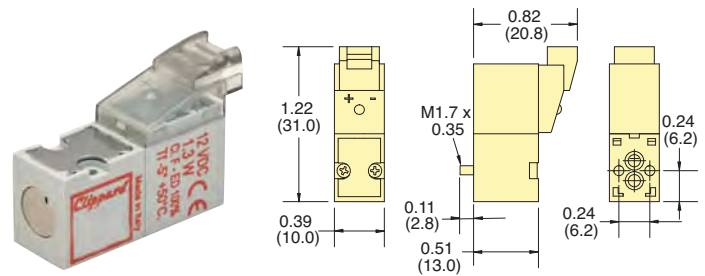
Material: Stainless steel core and springs, nylon body, FKM dynamic seals, and Buna-N gasket and static seals. FKM gasket and static seals available, consult factory.

Temperature Range: 23 to 122°F (-5 to 50°C). When below 32°F (0°C), must use clean, dry air

90° Connector with LED

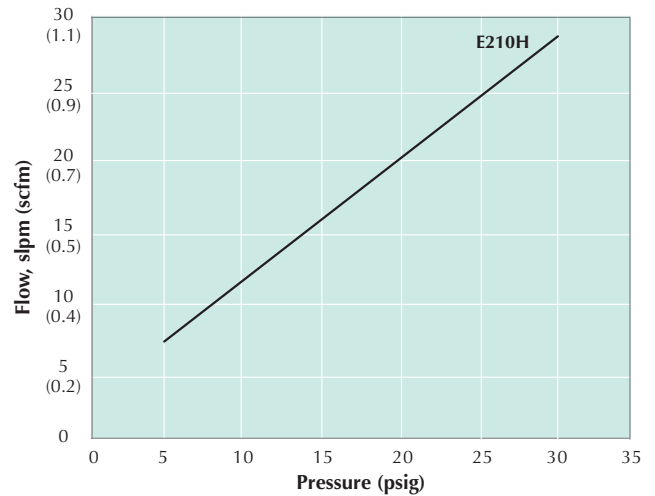


In-Line Connector with LED

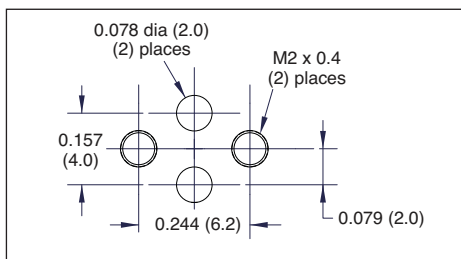


Part No.	Connector	Voltage
E210H-3L012	90° Connector	12 VDC
E210H-3L024	with LED	24 VDC
E210H-3C012	In-Line Connector	12 VDC
E210H-3C024	with LED	24 VDC

Typical Air Flow

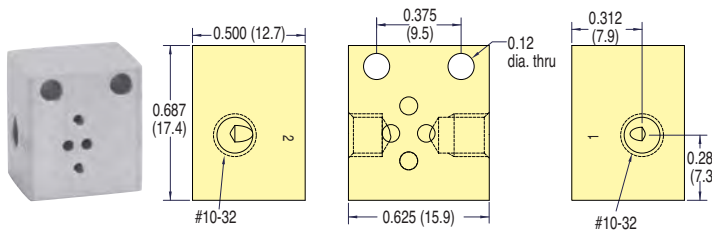


Mounting Interface



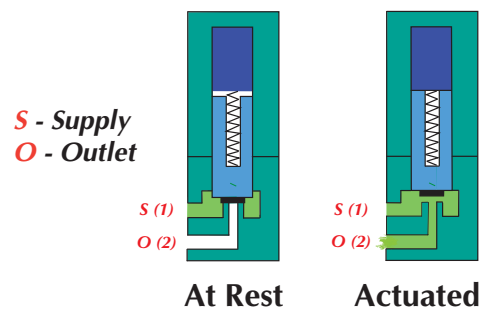
10 mm High Flow Single-Station Manifold

Spare hardware and closing plates available. Add -M5 for metric ports.



Part No.	Description
E10HM-01	10 mm Single-Station Manifold

Functional Schematics



Specifications

Medium: Air, Gas, or other Compatible Fluids

Working Pressure: 0 to 102 psig/7.0 bar

Maximum Flow Rate: 42 l/min (1.5 scfm)

Exhaust Flow: 49 l/min (1.7 scfm)

Orifice: 0.043" (1.1 mm)

Response Time: 8 ms when energized; 10 ms when de-energized

Material: Stainless steel core and springs, nylon body, FKM seals, and Buna-N gasket. FKM gasket available, consult factory

Voltage: 12-volt DC or 24-volt DC

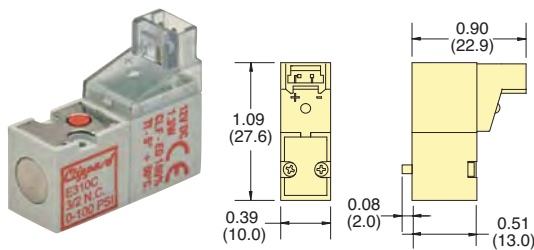
Voltage Tolerance: -5% to 10%

Power Consumption: 3.5 watts in rush phase; 15 ms/0.35 watts in maintenance phase

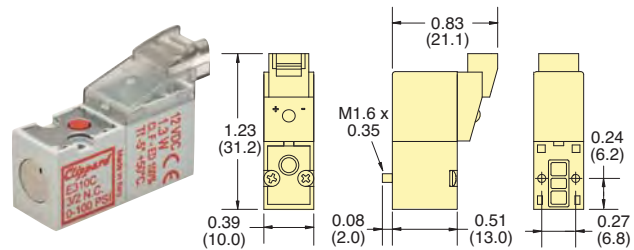
Coil Insulation Class: F 311°F (155°C)

Temperature Range: 23 to 122°F (-5 to 50°C)

90° Connector with LED

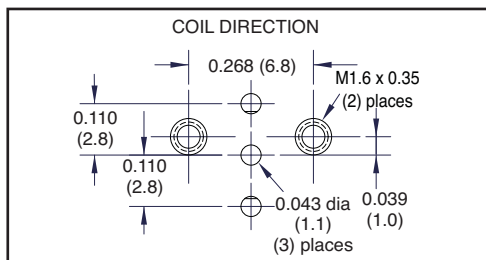


In-Line Connector with LED

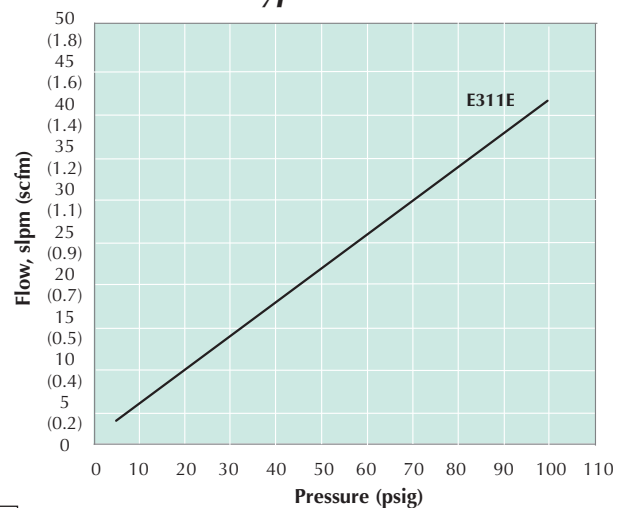


Part No.	Connector	Voltage
E311E-3L012	90° Connector	12 VDC
E311E-3L024	with LED	24 VDC
E311E-3C012	In-Line Connector	12 VDC
E311E-3C024	with LED	24 VDC

Mounting Interface

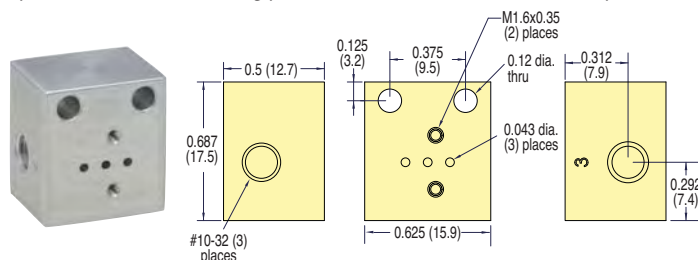


Typical Air Flow



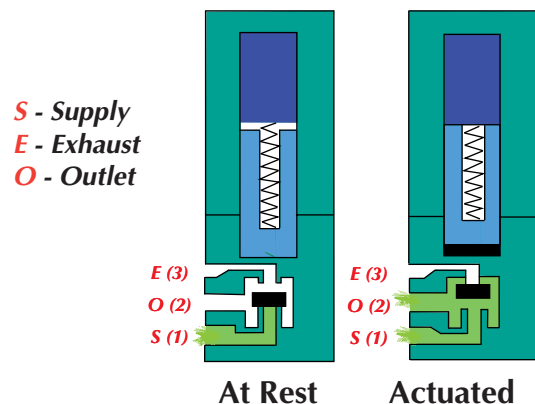
ISO 15218 10 mm High Flow Single-Station Manifold

Spare hardware and closing plates available. Add -M5 for metric ports.



Part No.	Description
E10LM-01	ISO 10 mm Single-Station Manifold

Functional Schematics

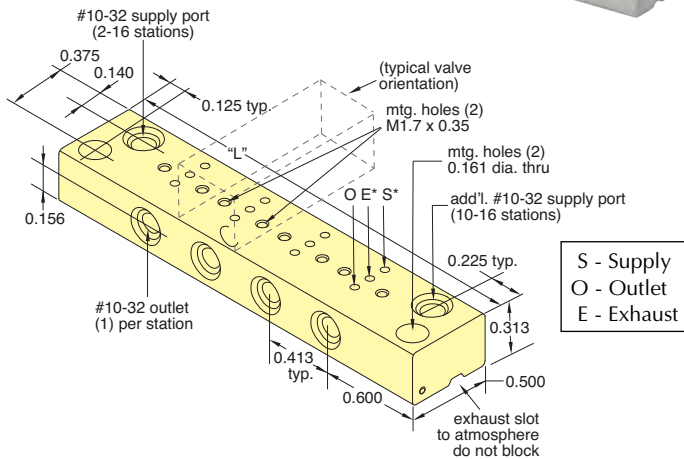




10 MM MINIATURE VALVE ACCESSORIES

Sub-Miniature Manifolds

Small, compact manifolds offer the efficient grouping of 10 mm valves along with fast installation. Easy manifold features a common inlet, individually-ported outlets, and exhaust to atmosphere.



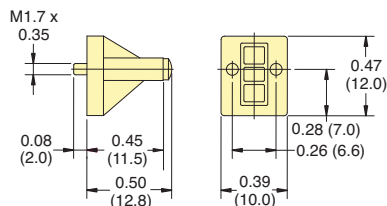
* For Normally-Open valves, supply to "E" and "S" becomes exhaust.

Stations	Supply Ports	Part No.	Length "L"
2	1	E10SM-02	1.61 (40.9)
4	1	E10SM-04	2.44 (62.0)
6	1	E10SM-06	3.27 (82.8)
8	1	E10SM-08	4.09 (103.8)
10	2	E10SM-10	4.92 (125.0)
12	2	E10SM-12	5.74 (145.8)
14	2	E10SM-14	6.57 (166.9)
16	2	E10SM-16	7.40 (187.7)

Cover Plate

Manifold Cover Plate includes plate, gasket and two screws.

Part No.
[E10M-CP](#) 10 mm Cover Plate



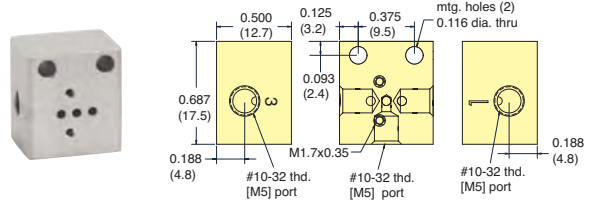
Standard Manifolds

Standard manifolds are available for one to 12 valves with ported exhaust. Spare hardware and closing plates available. Add -M5 for metric ports.

Part No.

[E10M-01](#)

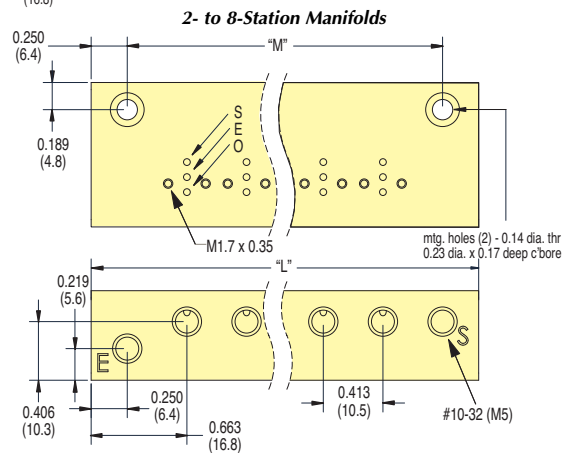
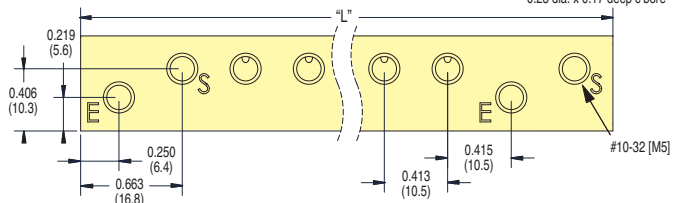
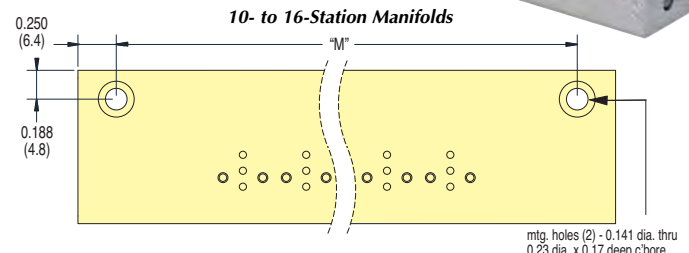
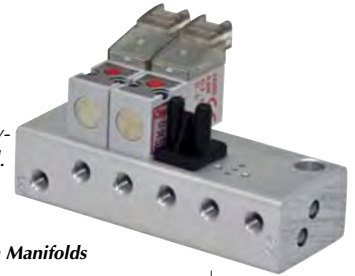
Single-Station Manifold



Multi-Station Manifolds

When using these manifolds with Normally-Open valve configurations:

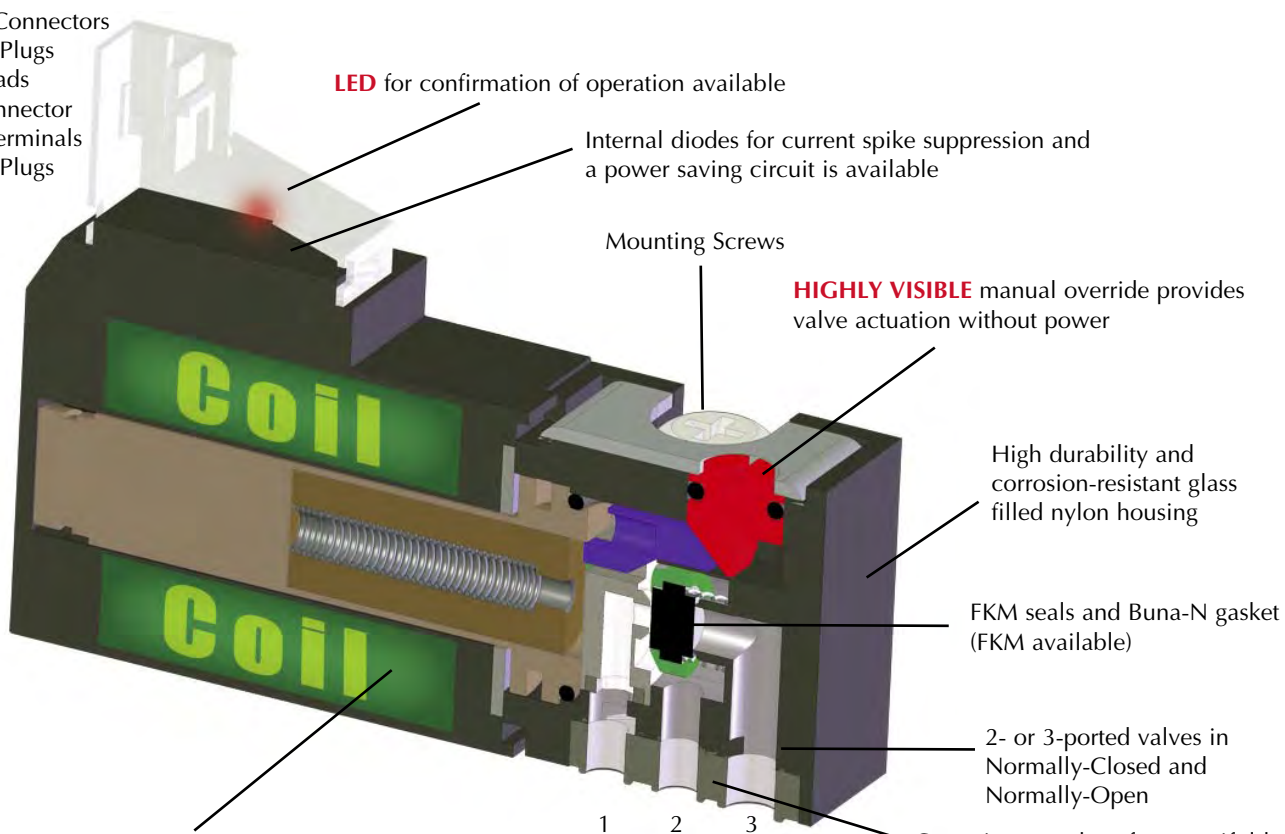
1. They cannot be used with Normally-Closed valves on the same manifold.
2. "E" becomes Supply, and "S" becomes Exhaust.



Part No.	Stations	Length "L"	Length "M"
E10M-02	2	1.74 (44.2)	1.24 (31.5)
E10M-04	4	2.57 (65.2)	2.07 (52.5)
E10M-06	6	3.39 (86.1)	2.89 (73.4)
E10M-08	8	4.22 (107.2)	3.72 (94.5)
E10M-10	10	5.87 (149.1)	5.37 (136.4)
E10M-12	12	6.70 (170.2)	6.20 (157.5)
E10M-14	14	7.52 (191.0)	7.02 (178.3)
E10M-16	16	8.35 (212.1)	7.85 (199.4)

Multiple Connectors

- Snap-in Plugs
- Wire Leads
- DIN Connector
- Spade Terminals
- Custom Plugs



Encapsulated low wattage coils. Available in: 12 VDC, 24 VDC, 24 VAC, 110 VAC or 220 VAC. Special voltages available for OEMs.

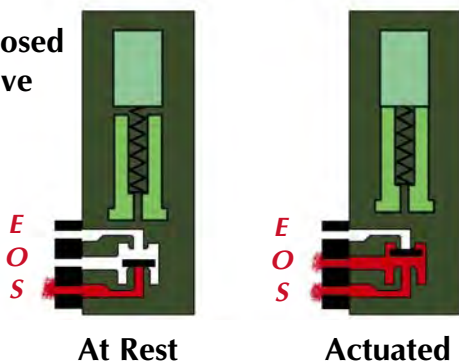
Configuration	1	2	3
N.C. & N.O.	exhaust	outlet	supply

One-piece gasket for manifold mounted and supply/exhaust port reversed for same manifold mounting of N.O. or N.C. valve

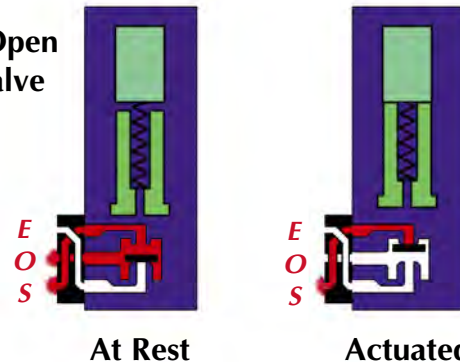
Functional Schematics

Normally-Closed 3-Way Valve

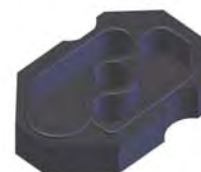
S - Supply
E - Exhaust
O - Outlet



Normally-Open 3-Way Valve



Porting Gasket
The Normally-Open and Normally-Closed configurations allow both models to be mounted on the same manifold.





15 MM MINIATURE VALVES

Specifications

Medium: Air, Gas, or other Compatible Fluids

Working Pressure: See Chart below.

Maximum Flow Rate:

0.032" (0.8 mm) Orifice: 45 l/min (1.6 scfm)
 0.043" (1.1 mm) Orifice: 70 l/min (2.6 scfm)
 0.063" (1.6 mm) Orifice: 91 l/min (3.2 scfm)

Response Time: 10 ms when energized; 12 ms when de-energized



Material: Stainless steel core and springs, springs, nylon body, FKM seals, and Buna-N gasket. FKM gasket available, consult factory

Voltage: 12-volt DC, 24-volt DC or 24-volt AC. 110-volt AC and 220-volt AC only available with DIN Connectors.

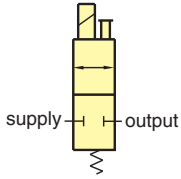
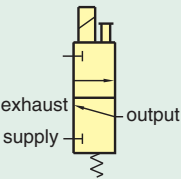
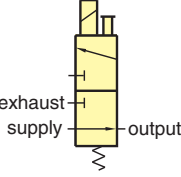
Voltage Tolerance: -5% to 10%

Power Consumption: 1.0 or 2.5 watts dependent on orifice size and pressure

Coil Insulation Class: F 311°F (155°C)

Temperature Range: 23 to 122°F (-5 to 50°C)

Order Information

Type	Base No.	Connector	12	24	24	110	220	Orifice	Wattage	Working Pressure
			VDC	VDC	VAC	VAC	VAC			
2/2 Normally-Closed 	E215D-1T*	Terminal	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
	E215E-2T*		•	•	•			0.043"	2.5	0 to 150 psig/10.3 bar
	E215F-2T*		•	•	•			0.063"	2.5	0 to 110 psig/7.6 bar
	E215D-1D*	DIN Connector	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
	E215E-2D*		•	•	•	•		0.043"	2.5	0 to 150 psig/10.3 bar
	E215F-2D*		•	•	•	•		0.063"	2.5	0 to 110 psig/7.6 bar
	E215D-1W*	Wire Leads, 11.8" (300 mm)	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
	E215E-2W*		•	•	•			0.043"	2.5	0 to 150 psig/10.3 bar
	E215F-2W*		•	•	•			0.063"	2.5	0 to 110 psig/7.6 bar
	E215D-1L*	90° Connector with LED	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
E215E-2L*	•		•				0.043"	2.5	0 to 150 psig/10.3 bar	
E215F-2L*	•		•				0.063"	2.5	0 to 110 psig/7.6 bar	
E215D-1C*	In-Line Connector with LED	•	•				0.032"	1.0	0 to 150 psig/10.3 bar	
E215E-2C*		•	•				0.043"	2.5	0 to 150 psig/10.3 bar	
E215F-2C*		•	•				0.063"	2.5	0 to 110 psig/7.6 bar	
3/2 Normally-Closed 	E315D-1T*	Terminal	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
	E315E-2T*		•	•	•			0.043"	2.5	0 to 150 psig/10.3 bar
	E315F-2T*		•	•	•			0.063"	2.5	0 to 110 psig/7.6 bar
	E315D-1D*	DIN Connector	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
	E315E-2D*		•	•	•	•		0.043"	2.5	0 to 150 psig/10.3 bar
	E315F-2D*		•	•	•	•		0.063"	2.5	0 to 110 psig/7.6 bar
	E315D-1W*	Wire Leads, 11.8" (300 mm)	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
	E315E-2W*		•	•	•			0.043"	2.5	0 to 150 psig/10.3 bar
	E315F-2W*		•	•	•			0.063"	2.5	0 to 110 psig/7.6 bar
	E315D-1L*	90° Connector with LED	•	•				0.032"	1.0	0 to 150 psig/10.3 bar
E315E-2L*	•		•				0.043"	2.5	0 to 150 psig/10.3 bar	
E315F-2L*	•		•				0.063"	2.5	0 to 110 psig/7.6 bar	
E315D-1C*	In-Line Connector with LED	•	•				0.032"	1.0	0 to 150 psig/10.3 bar	
E315E-2C*		•	•				0.063"	2.5	0 to 150 psig/10.3 bar	
E315F-2C*		•	•				0.063"	2.5	0 to 110 psig/7.6 bar	
3/2 Normally-Open (110 psig max.) 	E3O15E-2T*	Terminal	•	•	•			0.043"	2.5	0 to 110 psig/7.6 bar
	E3O15F-2T*		•	•	•			0.063"	2.5	0 to 75 psig/5.2 bar
	E3O15E-2D*	DIN Connector	•	•	•	•	•	0.043"	2.5	0 to 110 psig/7.6 bar
	E3O15F-2D*		•	•	•	•	•	0.063"	2.5	0 to 75 psig/5.2 bar
	E3O15E-2W*	Wire Leads, 11.8" (300 mm)	•	•	•			0.043"	2.5	0 to 110 psig/7.6 bar
	E3O15F-2W*		•	•	•			0.063"	2.5	0 to 75 psig/5.2 bar
	E3O15E-2L*	90° Connector with LED	•	•				0.043"	2.5	0 to 110 psig/7.6 bar
	E3O15F-2L*		•	•				0.063"	2.5	0 to 75 psig/5.2 bar
E3O15E-2C*	In-Line Connector with LED	•	•				0.063"	2.5	0 to 110 psig/7.6 bar	
E3O15F-2C*		•	•				0.063"	2.5	0 to 75 psig/5.2 bar	

• Indicates standard items

* Add Voltage Choice to the end of each Base Part Number. "012" (12 VDC), "024" (24 VDC) "24A" (24 VAC), "110" (110 VAC) or "220" (220 VAC). Example: **E315D-1C012**

15 MM MINIATURE VALVES



Terminal Connector



Industrial Form C Connector ordered separately below.

DIN Connector



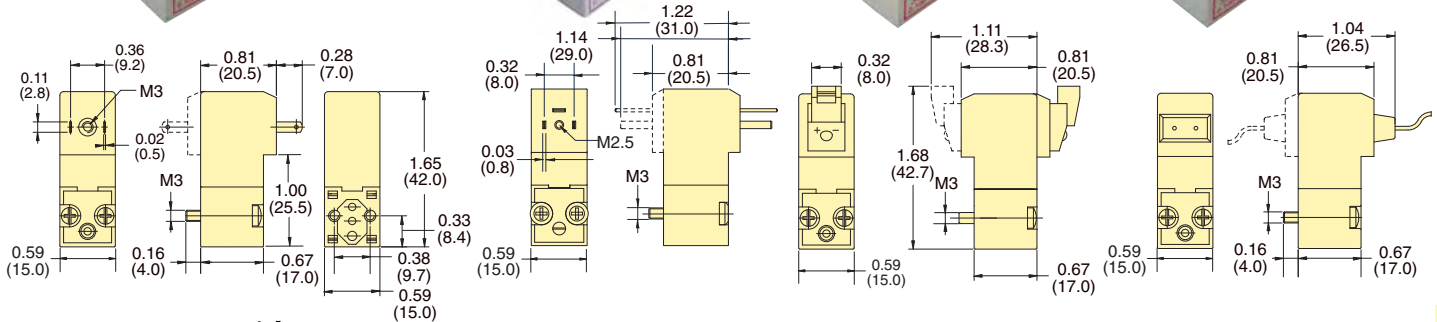
In-Line Connector with LED



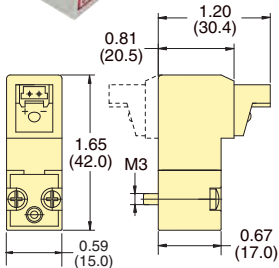
Wire Leads



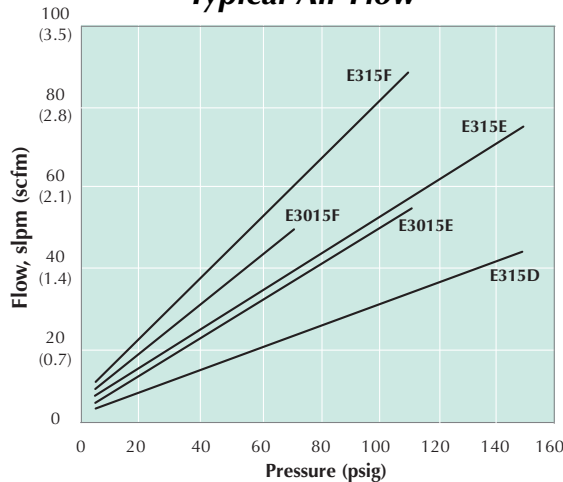
DIN Connector ordered separately below.



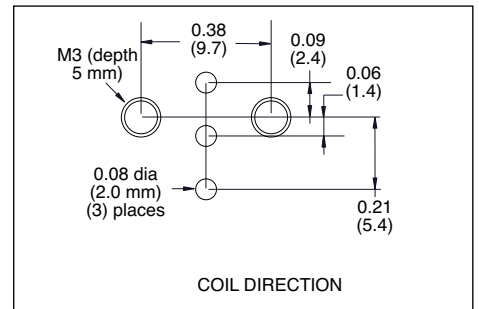
90° Connector with LED



Typical Air Flow



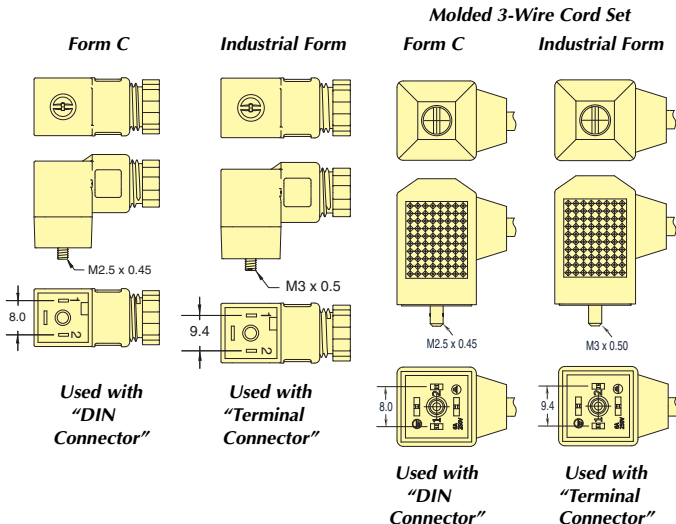
Mounting Interface



DIN Connectors

For Use with 15 mm Valves Only

DIN 43650 Form C Connectors with 8 mm spade center spacing mate with the 15 mm DIN connector coil. Industrial Form Connectors with 9.4 mm spade center spacing are designed to connect to 15 mm terminal coils. Both are available with or without surge suppression, and 152 or 381 mm PVC molded three-wire cord set.



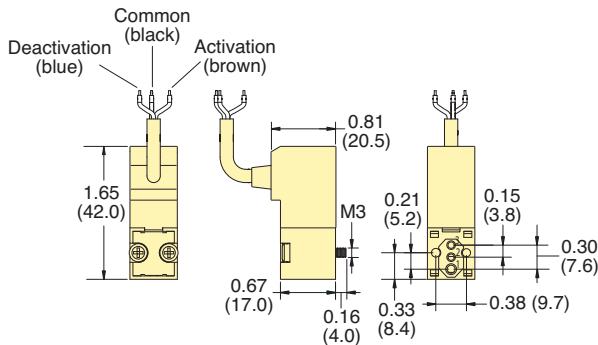
Form C Part No.	Industrial Form Part No.	Volts	LED	Cord
CC-C	CC-I	6-240	no	-
CC-C-P6	CC-I-P6	6-240	no	6'
CC-C-P15	CC-I-P15	6-240	no	15'
CC-CLL	CC-ILL	6-24	yes	-
CC-CLL-P6	CC-ILL-P6	6-24	yes	6'
CC-CLL-P15	CC-ILL-P15	6-24	yes	15'
CC-CLM	CC-ILM	48-110	yes	-
CC-CLM-P6	CC-ILM-P6	48-110	yes	6'
CC-CLM-P15	CC-ILM-P15	48-110	yes	15'



LATCHING 15 MM MINIATURE VALVES



- 2-Way & 3-Way Normally-Closed configurations
- Pulse-actuated (on or off)
- 3-wire coil. No polarity reverse required
- Stable latch



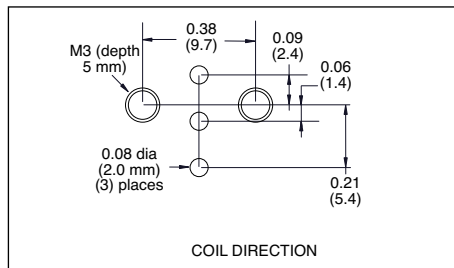
Response Time: 10 ms when energized; 12 ms when de-energized

Copper Wire Isolation Class: F 311°F (155°C)

Material: Stainless steel core and springs, nylon body, FKM dynamic seals, and Buna-N gasket and static seals. FKM gasket available, consult factory.

Temperature Range: 23 to 122°F (-5 to 50°C). When below 32°F (0°C), must use clean, dry air

Mounting Interface



Clippard's 15 mm Latching Valves have many of the same features as the popular 15 mm standard valve line including small, compact design, exceptional life and reliability, light-weight design and more. A careful balance of forces—through the precise placement of a permanent magnet in the valve core—produces a bi-stable valve. A short pulse of current opens the valve, which “latches” open indefinitely after the current stops. A subsequent pulse of current in the opposite direction closes the valve. The valve consumes less energy and produces less heat than a standard solenoid valve when used in extended duty cycle applications, since the coil is energized for only a small fraction of the total duty cycle.

Medium: Air, Gas or other Compatible Fluids

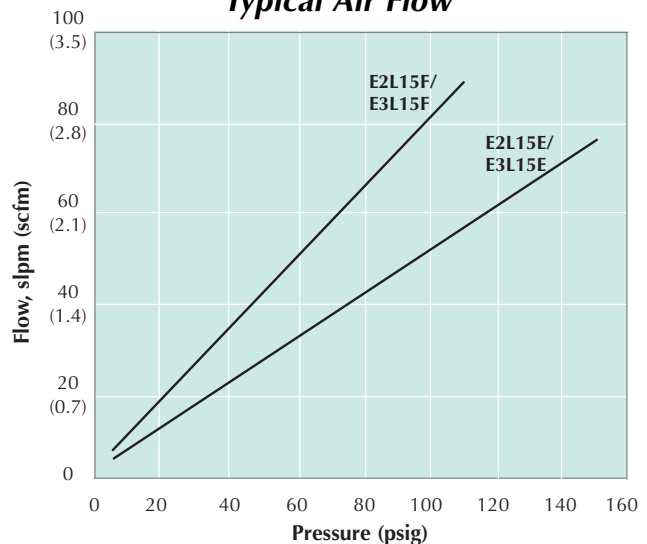
Max. Flow Rate: 0.043" (1.1 mm) Orifice: 59 l/min (2.1 scfm)
0.063" (1.6 mm) Orifice: 84 l/min (3.0 scfm)

Electrical Connection: 3-Wire Molded Cord, 300 mm, 24 AWG 4.5 mm external jacket; tinned copper wires; silicone jacket and conductor insulation

Electrical: 12 VDC (“-012”) or 24 VDC (“-024”). 6 VDC also available. Call for further information.

Electrical Tolerance: -5 to 10%

Typical Air Flow



Type	Part No.	Connector	Orifice	Voltage	Wattage	Pressure Range
2-Way	E2L15E-4W012	3-Wire Molded Cord, 300 mm	0.043" (1.1 mm)	12 VDC	4.0	0 to 150 psig/10.3 bar
	E2L15E-4W024		0.043" (1.1 mm)	24 VDC		0 to 150 psig/10.3 bar
	E2L15F-4W012		0.063" (1.6 mm)	12 VDC		0 to 110 psig/7.6 bar
	E2L15F-4W024		0.063" (1.6 mm)	24 VDC		0 to 110 psig/7.6 bar
3-Way	E3L15E-4W012	3-Wire Molded Cord, 300 mm	0.043" (1.1 mm)	12 VDC	4.0	0 to 150 psig/10.3 bar
	E3L15E-4W024		0.043" (1.1 mm)	24 VDC		0 to 150 psig/10.3 bar
	E3L15F-4W012		0.063" (1.6 mm)	12 VDC		0 to 110 psig/7.6 bar
	E3L15F-4W024		0.063" (1.6 mm)	24 VDC		0 to 110 psig/7.6 bar

See [page 214](#) for connectors and manifolds

Specifications

Medium: Air, Gas, or other Compatible Fluids

Working Pressure: 0 to 43 psig/3.0 bar

Maximum Flow Rate: 120 l/min (4.3 scfm)

Orifice: 0.118" (3.0 mm)

Material: Stainless steel core and springs, nylon body, FKM seals, and Buna-N gasket. FKM gasket available, consult factory

Response Time: 10 ms when energized; 12 ms when de-energized

Voltage: 12-volt DC or 24-volt DC

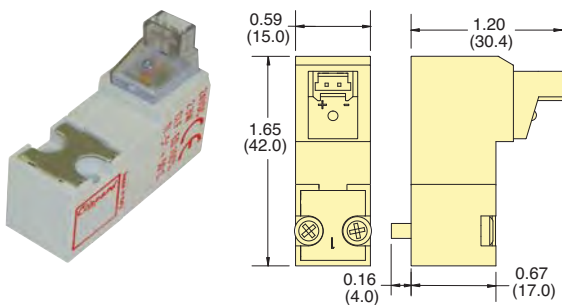
Voltage Tolerance: -5% to 10%

Power Consumption: 4.0 watts

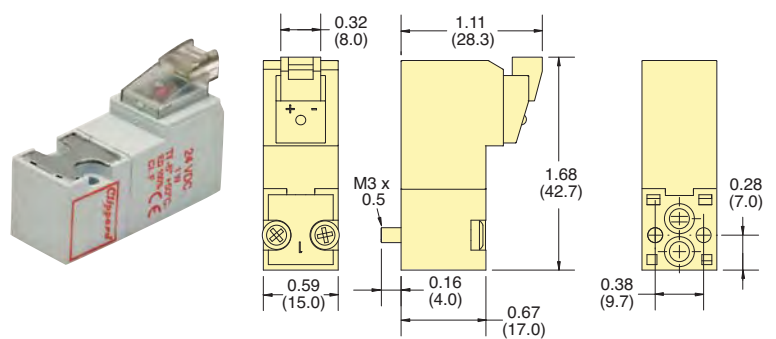
Coil Insulation Class: F 311°F (155°C)

Temperature Range: 23 to 122°F (-5 to 50°C)

90° Connector with LED

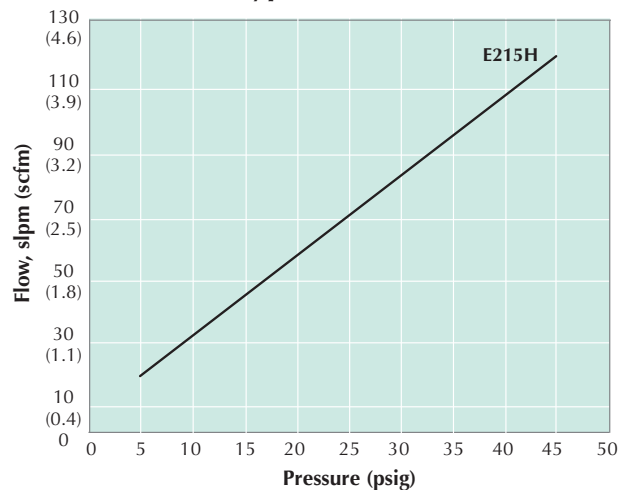


In-Line Connector with LED

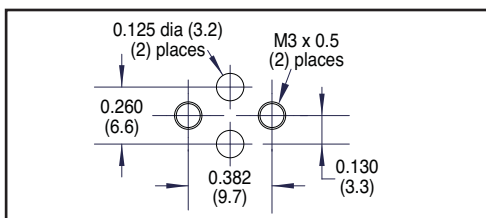


Part No.	Connector	Voltage
E215H-3L012	90° Connector	12 VDC
E215H-3L024	with LED	24 VDC
E215H-3C012	In-Line Connector	12 VDC
E215H-3C024	with LED	24 VDC

Typical Air Flow

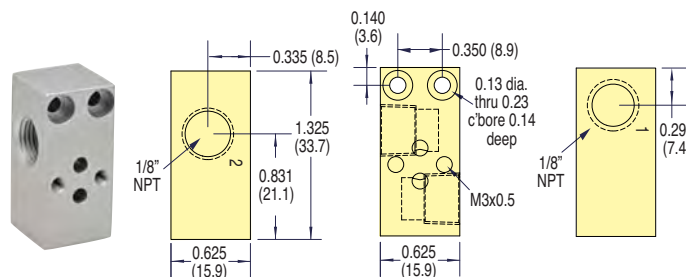


Mounting Interface



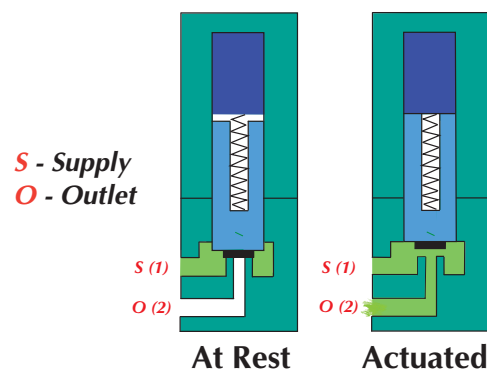
15 mm High Flow Single-Station Manifold

Spare hardware and closing plates available. Add -M5 for metric ports.



Part No.
[E15HM-01](#) 15 mm Single-Station Manifold

Functional Schematics

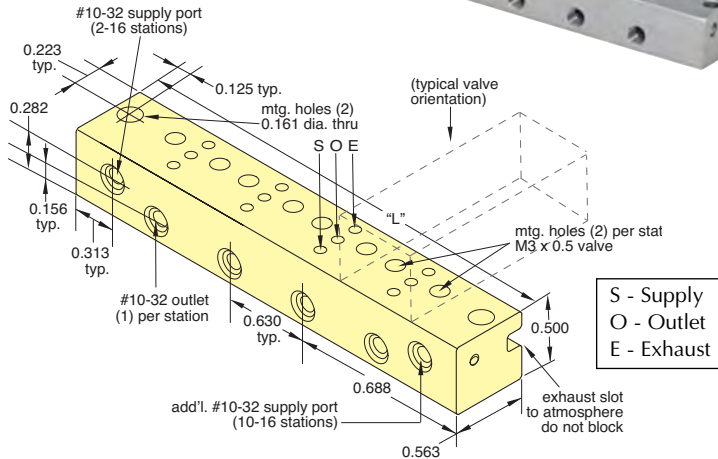
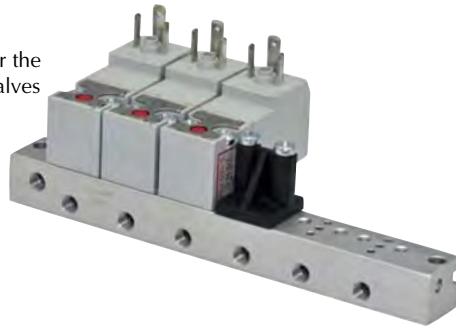




15 MM VALVE ACCESSORIES

Sub-Miniature Manifolds

Small, compact manifolds offer the efficient grouping of 15 mm valves along with fast installation. Each manifold features a common inlet, individually-ported outlets, and exhaust to atmosphere.



Stations	Supply Ports	Part No.	Length "L"
2	1	E15SM-2	2.01 (51.1)
4	1	E15SM-4	3.27 (83.1)
6	1	E15SM-6	4.53 (115.1)
8	1	E15SM-8	5.79 (147.1)
10	2	E15SM-10	7.05 (179.1)
12	2	E15SM-12	8.31 (211.1)
14	2	E15SM-14	9.57 (243.1)
16	2	E15SM-16	10.82 (274.8)



Connectors

Wire Connector must be ordered separately. 24 AWG. Stranding 7/32.

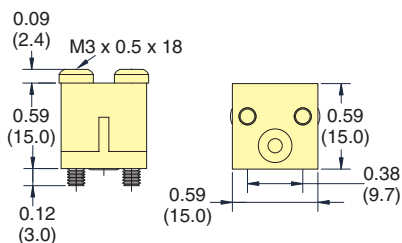
Part No.

- [C2A-RB300](#) Connector with Cable, 11.8" (300 mm)
- [C2A-RB500](#) Connector with Cable, 19.69" (500 mm)
- [C2A-RB1000](#) Connector with Cable, 39.37" (1,000 mm)

Molex terminal insert #050013-8000, #28139 plug and 24 AWG wire.

Cover Plate

Manifold Cover Plate includes plate, gasket and two screws.

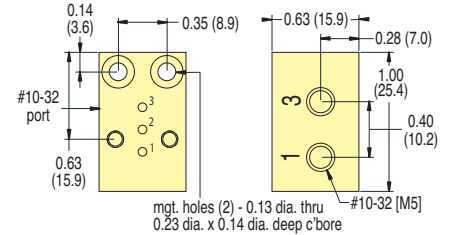


Part No.

- [E15M-CP](#) 15 mm Cover Plate

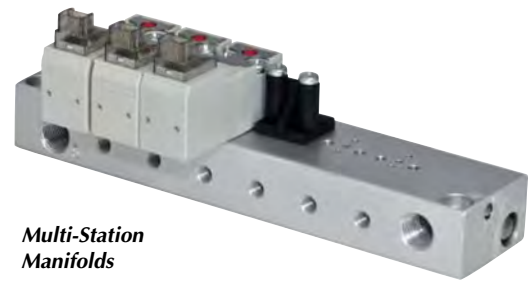
Standard Manifolds

Standard manifolds are available for one to 16 valves with ported exhaust. Spare hardware and closing plates also available. Add -M5 for metric ports.



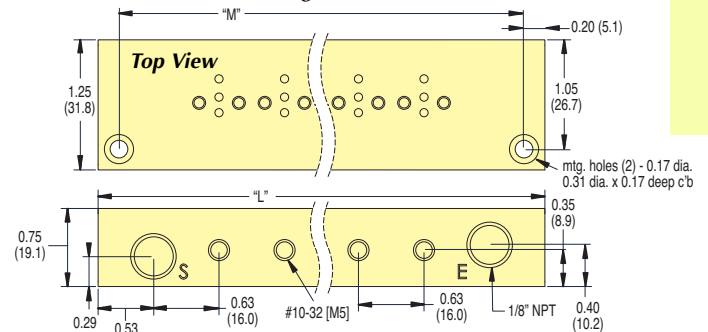
Part No.

- [E15M-01](#) Single-Station Manifold

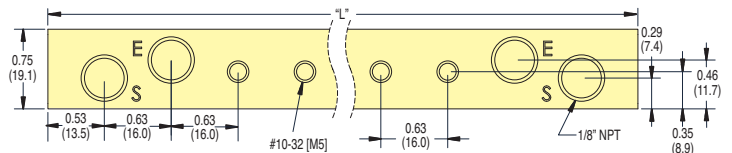
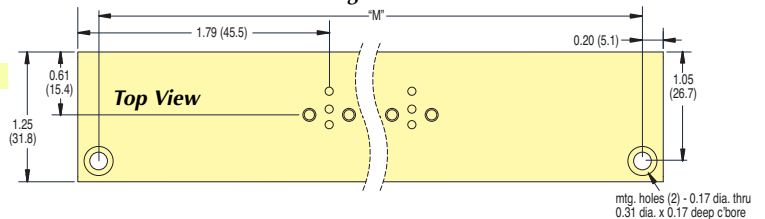


Multi-Station Manifolds

2- through 8-Station



10- through 16-Station



Stations	Part No.	Length "L"	Length "M"
2	E15M-02	2.95 (74.2)	2.55 (64.8)
4	E15M-04	4.21 (106.9)	3.81 (96.8)
6	E15M-06	5.47 (138.9)	5.07 (128.8)
8	E15M-08	6.73 (170.9)	6.33 (160.8)
10	E15M-10	9.25 (235.0)	8.85 (224.8)
12	E15M-12	10.51 (277.0)	10.1 (256.8)
14	E15M-14	11.77 (299.0)	11.4 (288.8)
16	E15M-16	13.03 (331.0)	12.6 (320.0)

Maximatic®



Maximatic Solenoid Valves

Clippard's Maximatic 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: 0 to 115 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 milliseconds

Mounting: Manifold standard. Actuator (1/4" only) or NAMUR (3/8" NPT only) available.

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 Industrial Form "C" (9.4 mm centers) 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	@ 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

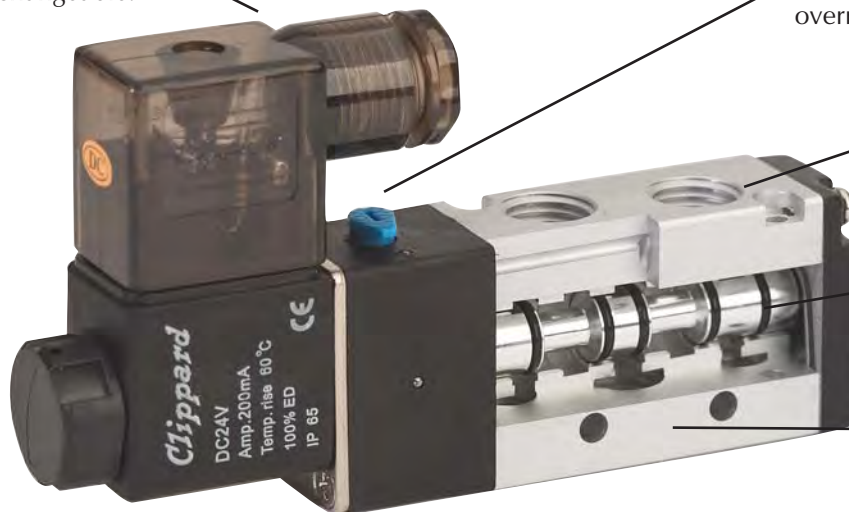
2-, 3- & 4-Way Designs

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 VDC, 24 VDC, 24 VAC, 110 VAC and 220 VAC. Consult factory for other voltages.

All Maximatic® Solenoid Valves are IP 65 CE Rating

MAXIMATIC® SOLENOID VALVES

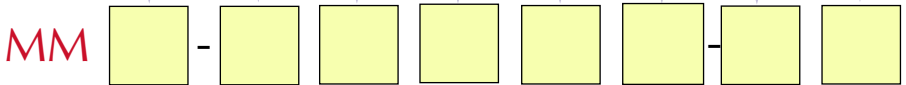


Valve Series	Enter	<input type="text"/>
Electronic	E	
Air Pilot	A	
Valve Type	Enter	<input type="text"/>
2-Way (Direct-Acting only)	2	
3-Way	3	
4-Way	4	
Body/Port Size	Enter	<input type="text"/>
Direct-Acting		
1/8" NPT	P	
1/8" NPT Stacking	S	
1/4" NPT	Q	
Spool Type		<input type="text"/>
#10-32	1N	
1/8" 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	<input type="text"/>
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	<input type="text"/>
Standard Manifold	(blank)	* Only available on 3- or 4-Way Electronic Valves. 1/4" NPT Actuator or 3/8" NPT NAMUR Mount.
Actuator/NAMUR*	B	
Spool Type	Enter	<input type="text"/>
2-Position, Spool	(blank)	Only available on 4-Way Valves with "AA" or "EE" Actuator. Standard Manifold Mount only.
3-Position, Closed Center	C	
3-Position, Exhaust Center	E	
3-Position, Pressure Center	P	
Electrical Connector	Enter	<input type="text"/>
DIN Connector	D	Only required on Electronic Valves.
Wire Leads (18")	W	
Voltage	Enter	<input type="text"/>
12-Volt DC	012	Only required on Electronic Valves.
24-Volt DC	024	
24-Volt AC	24A	
110-Volt AC	110	
220-Volt AC	220	



Single Solenoid Electronic Valves Mounted on 8-Station Manifold

Note: 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: MM **E** - **4** **2Q** **ES** - **D** **110**



MAXIMATIC® SOLENOID VALVES

2-Way Valves										
Series No.	Style	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	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	27 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	Inlet	Ports Outlet	Exhaust	Function	Cv	Flow @ 100 psig	Spool Configuration		
								Flow @ 100 psig	Closed Center	Exhaust 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



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.

- 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

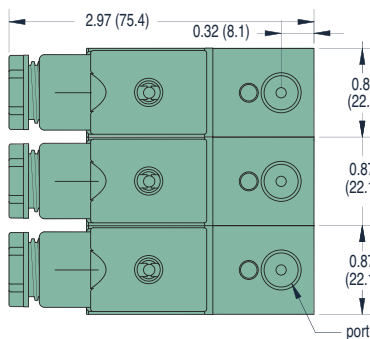
Medium: Air (40 micron filtration), Inert Gas or Liquid
Operating Range: 0 to 115 psig

Replacement Stacking Kit

Replacement Stacking Kits are available which include two long screws, two short screws, one gasket and two nuts.

Part No.
27048

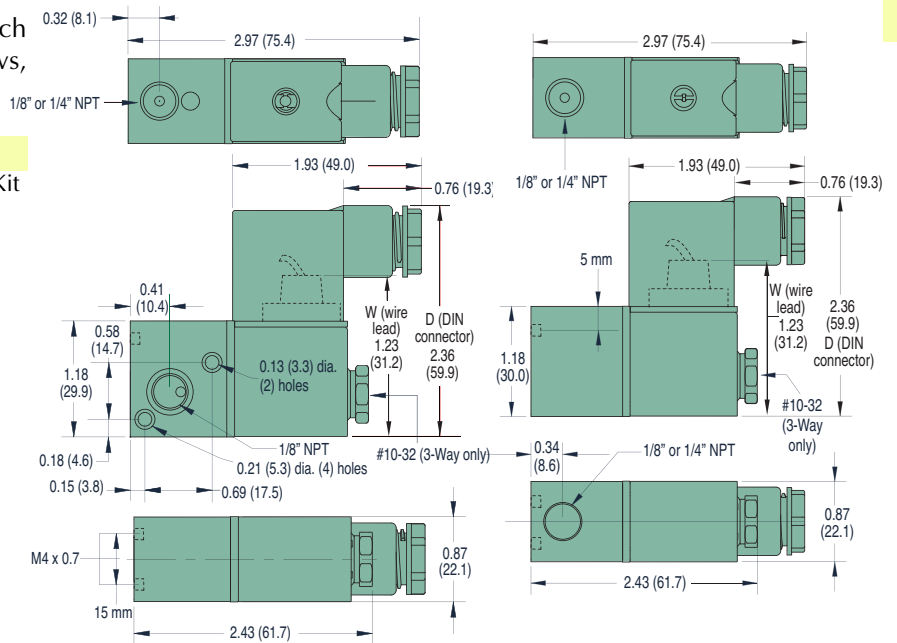
Replacement Stacking Kit



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	0.12/6.7	MME-3PDS-	A	1/8" NPT	1/8" NPT	#10-32	0.10/2.3
MME-2SDS-**	W	0.05/2.3	MME-3SDS-**	W	1/8" NPT	1/8" NPT	#10-32	0.10/2.3
MME-2QDS-	P	0.12/6.7	MME-3QDS-	P E	1/4" NPT	1/4" NPT	#10-32	0.10/2.3

** 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**



MAXIMATIC® 3-WAY VALVES

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

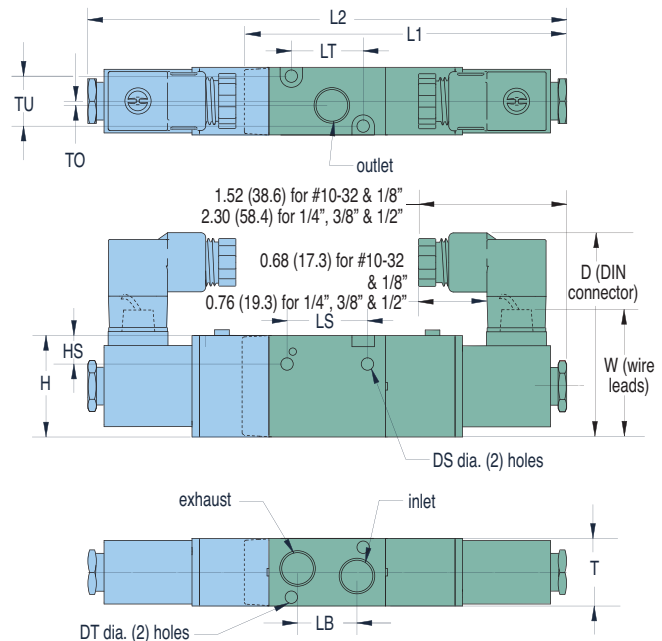
Mounting: Body Ported, Manifold Mount, Actuator (1/4" NPT only) or NAMUR (3/8" NPT only) available. See [Page 221](#).

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)	1.37 (34.8)	1.61 (40.9)
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	0.50 (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-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	1/4" NPT	0.89/49
MME-33WES-		MME-33WEE-		3/8" NPT	3/8" NPT	3/8" 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**

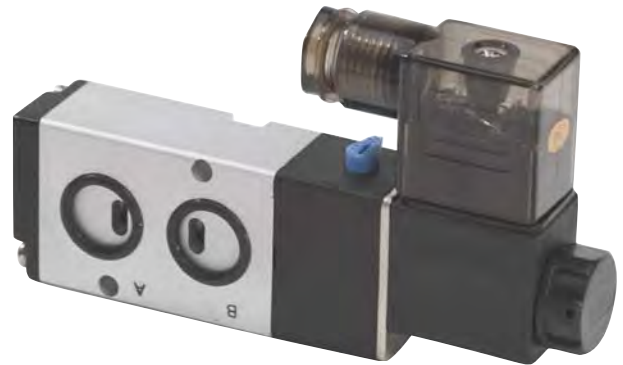


2-Position Single Solenoid Valves

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

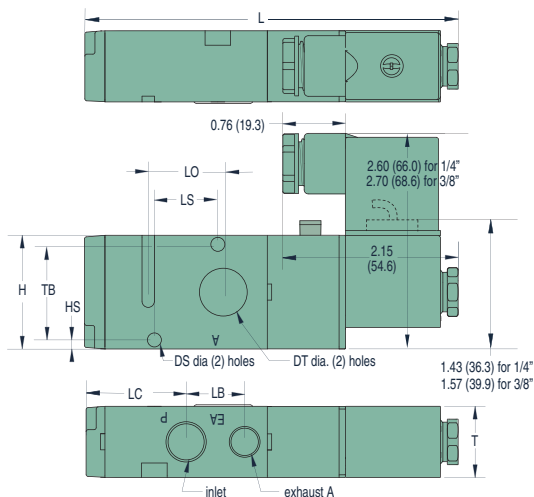
Mounting: Actuator (1/4" NPT only) or NAMUR (3/8" NPT only).

Manual Override: Locking

Power Consumption: 3 Watts

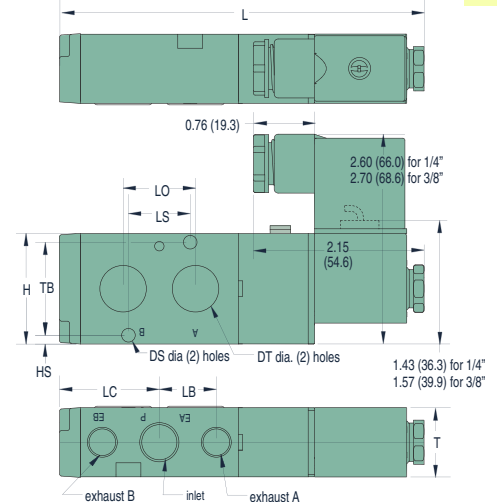
NAMUR/Actuator mount available on other 3- and 4-way Electronic and Air Pilot valves—
Call for specifications.

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

MME-32QESB-
MME-33WESB-



Supply Port

1/4" NPT
3/8" NPT

Outlet

0.72"
0.78"

Exhaust

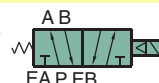
1/4" NPT
1/4" NPT

Cv/scfm*

0.89/49
1.68/93

4-Way Single Solenoid Valves

MME-42QESB-
MME-43WESB-



Supply Port

1/4" NPT
3/8" NPT

Outlet

0.72"
0.78"

Exhaust

1/4" NPT
1/4" NPT

Cv/scfm*

0.89/49
1.68/93

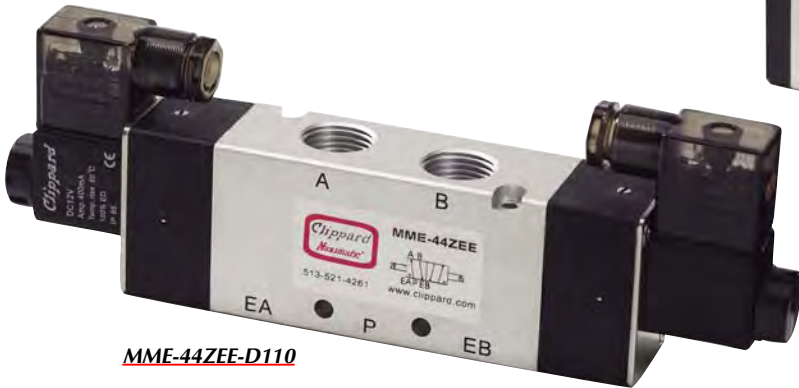
* scfm based on flow @ 100 psig

Add Electrical Connection and Voltage Choices to the end of each Base Part Number - Example: **MME-42QESB-D110**



MAXIMATIC® 4-WAY VALVES

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) 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")

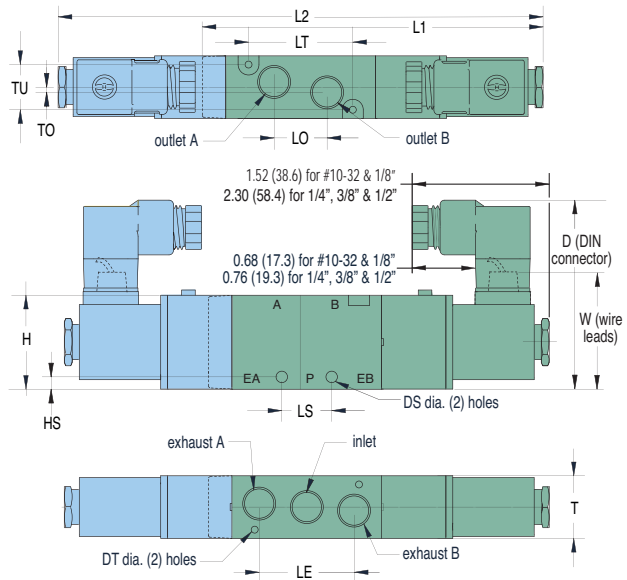
Number of Ports: 5

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*
<u>MME-41NES-</u>		<u>MME-41NEE-</u>		#10-32	#10-32	#10-32	0.58/27
<u>MME-41PES-</u>		<u>MME-41PEE-</u>		1/8" NPT	1/8" NPT	1/8" NPT	0.67/31
<u>MME-42QES-</u>		<u>MME-42QEE-</u>		1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
<u>MME-43WES-</u>		<u>MME-43WEE-</u>		3/8" NPT	3/8" NPT	1/4" NPT	1.68/93
<u>MME-44ZES-</u>		<u>MME-44ZEE-</u>		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**

3-Position Spring Centered Double Solenoid Valves



MME-44ZEEC-D024

Maximatic® 4-way double solenoid spring centered valves with closed center, pressure 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")

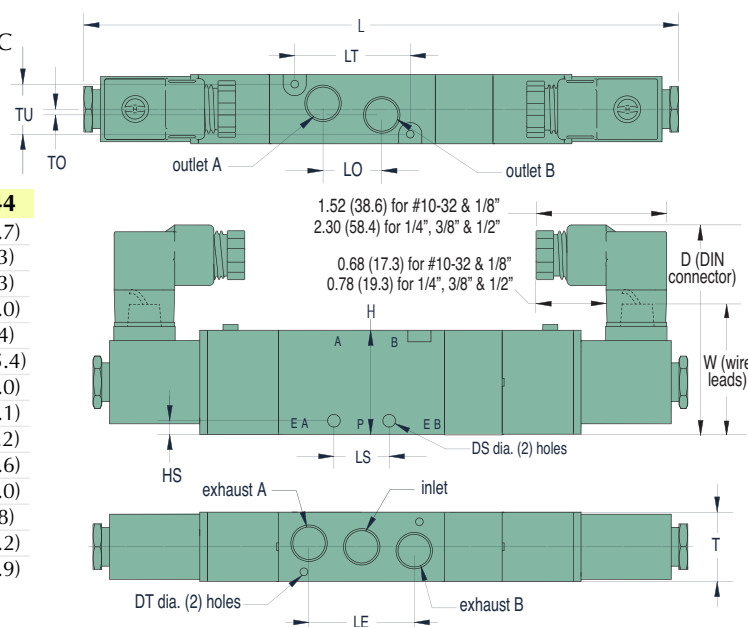
Voltage: 12-volt DC ("-012"), 24-volt DC ("-024"), 24-volt AC ("-24A"), 110-volt AC ("-110"), or 220-volt AC ("-220")

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*
<u>MME-41NEEC-</u>	<u>MME-41NEEP-</u>	<u>MME-41NEEE-</u>	#10-32	#10-32	#10-32	0.50/23
<u>MME-41PEEC-</u>	<u>MME-41PEEP-</u>	<u>MME-41PEEE-</u>	1/8" NPT	1/8" NPT	1/8" NPT	0.50/23
<u>MME-42QECC-</u>	<u>MME-42QECP-</u>	<u>MME-42QECE-</u>	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
<u>MME-43WECC-</u>	<u>MME-43WECP-</u>	<u>MME-43WEEC-</u>	3/8" NPT	3/8" NPT	1/4" NPT	1.00/72
<u>MME-44ZECC-</u>	<u>MME-44ZEEP-</u>	<u>MME-44ZEEC-</u>	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**

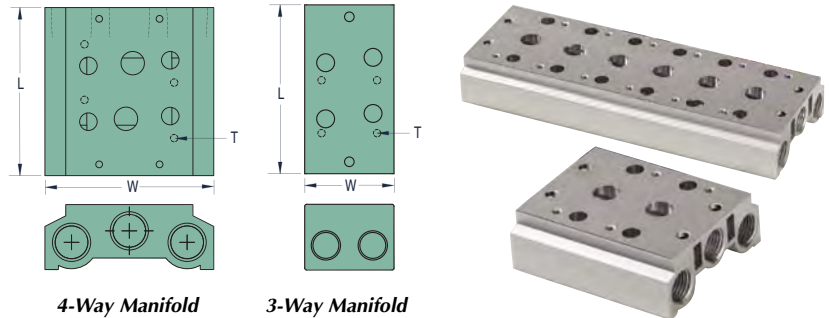


MAXIMATIC® VALVE ACCESSORIES

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.	Description
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



Valve Series	"L" Dimension					"T" Mtg. Thd.
	2-Station	4-Station	6-Station	8-Station	16-Station	
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 2 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	27041-33 Hardware Kit for MME-33 Series Valves
27041-32 Hardware Kit for MME-32 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	27041-43 Hardware Kit for MME-43 Series Valves
27041-42 Hardware Kit for MME-42 Series Valves	27041-44 Hardware Kit for MME-44 Series Valves



Replacement Coils



Industrial Form
2.5 Watt
#10-32 & 1/8"

Form B
3.0 Watt
1/4", 3/8" & 1/2"

Form B
6.5 Watt
Direct-Acting

Replacement coils for solenoid valves are available in volt-ages from 12 VDC to 220 VAC with either DIN connector or 18" wire leads. Refer to DIN Connectors below.

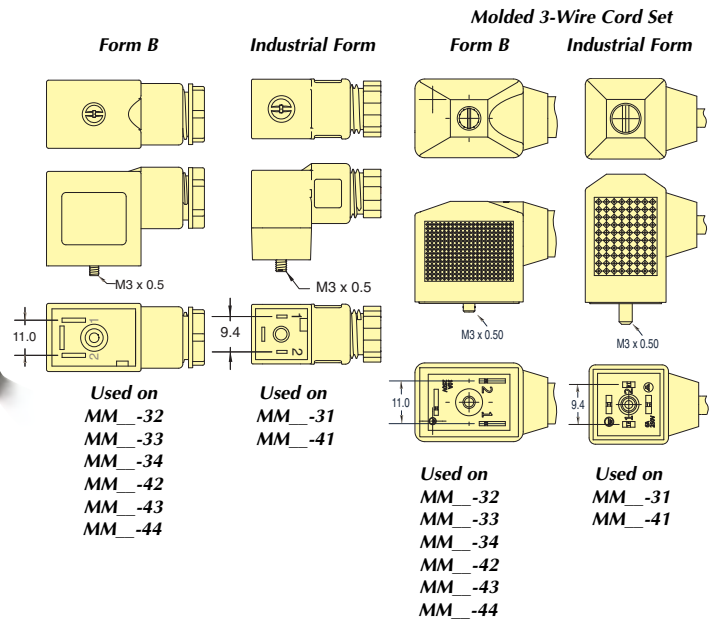
Description	2.5 Watt #10-32 & 1/8"	3.0 Watt 1/4", 3/8" & 1/2"	6.5 Watt Direct-Acting
DIN Connectors			
12-Volt DC	27001-D012	27065-D012	27002-D012
24-Volt DC	27001-D024	27065-D024	27002-D024
110-Volt AC	27001-D110	27065-D110	27002-D110
220-Volt AC	27001-D220	27065-D220	27002-D220
24-Volt AC	27001-D24A	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

DIN Connectors

DIN 43650 Form B Connectors with 11 mm spade center spacing. DIN type size 2, 3 and 4 Maximatic valves. Industrial Form Connectors with 9.4 mm spade center spacing are designed to connect to 15 mm terminal coils. Both are available with or without surge suppression, and 152 or 381 mm PVC molded three-wire cord set.



Form B Part No.	Industrial Form Part No.	Volts	LED	Cord
CC-B	CC-I			-
CC-B-P6	CC-I-P6	6-240	no	6'
CC-B-P15	CC-I-P15			15'
CC-BLL	CC-ILL			-
CC-BLL-P6	CC-ILL-P6	6-24	yes	6'
CC-BLL-P15	CC-ILL-P15			15'
CC-BLM	CC-ILM			-
CC-BLM-P6	CC-ILM-P6	48-110	yes	6'
CC-BLM-P15	CC-ILM-P15			15'
CC-BLH				-
CC-BLH-P6		208-240	yes	6'
CC-BLH-P15				15'



Sub-Assemblies & Kits

Call Clippard to inquire more about our Value Added services.





NEW! Exhaust Mufflers

For quiet system operation, see [page 312](#) for effective exhaust mufflers.



NEW! Speed Control Mufflers

For quiet system operation with speed control, see [page 164](#).



Push-Quick Fittings

See [pages 290 through 298](#) for a complete selection of easy-to-install Push-Quick Fittings.



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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.

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.



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



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.



Alternate Valve Configurations for Pneumatic Modules

In order to gain maximum functionality of these circuits, Clippard provides alternate valves that alter the characteristic of the circuit.

In general:

As an alternate valve to the [R-402](#), the [R-412](#) provides automatic reset function. When supply air is removed from the [R-412](#), a reset spring positions the valve element so that when the air is re-applied, the actuator will go to its “home” position.

The [VA-06](#), [VA-031](#) and [VA-033](#) pneumatic modules sense pressure decay when the actuator stops moving. The standard valve for sensing this stop is the [R-305](#). The use of an [R-301](#) speeds up the end of stroke turnaround time enabling a faster cycle rate. The [R-343](#) is a time delay which increases the dwell time before the actuator reverses direction.

If any of the above alterations to these circuits are desired, individual components may be selected from the “Bill of Materials” listed on each page. For more information, or a more detailed description of these options, please contact Clippard for assistance.

Binary Redirect Module ("Flip-Flop" Circuit)



Size: 4.50" x 2.75" x 3.50"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: The input signal alternates the outputs A and B, sometimes referred to as a push-on/push-off circuit. The circuit manifold combines the R-451 and R-412 in a binary redirect or flip-flop circuit.

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.

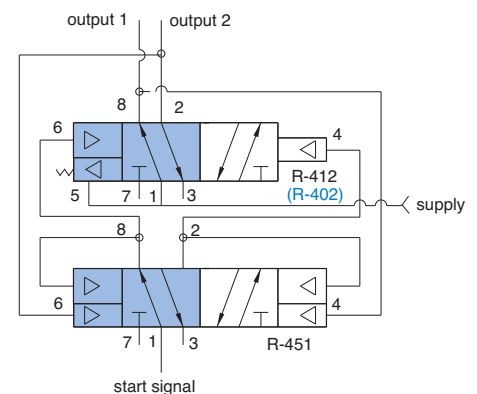
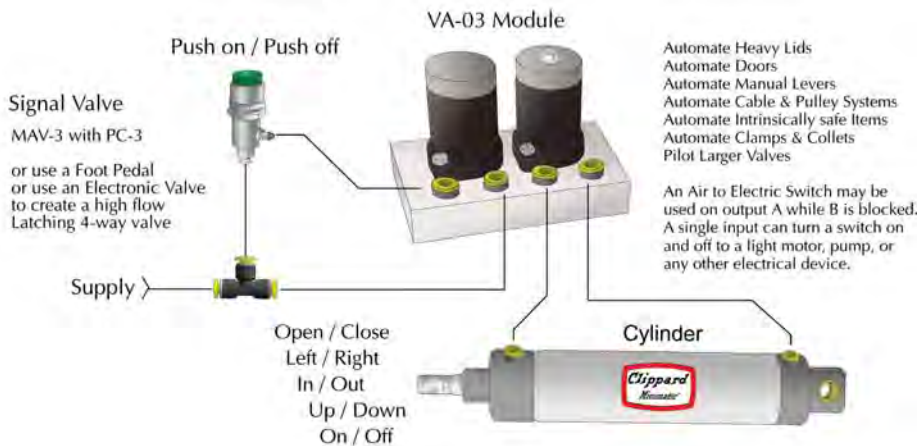
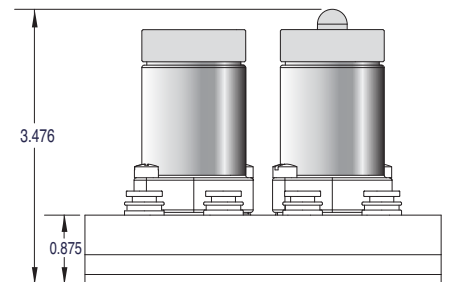
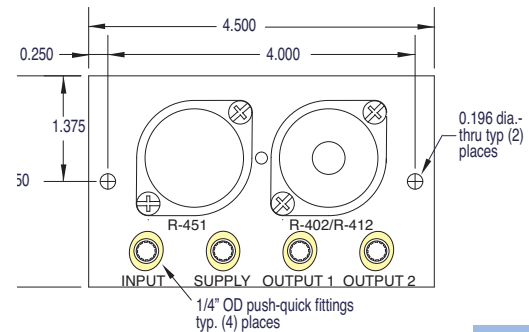
Part No.	Description
<u>VA-03</u>	Binary Redirect Module

Bill of Materials in Assembly

Qty.	Part No.	Description
1	<u>R-451</u>	4-Way Binary Trigger Modular Valve
1	<u>R-412</u>	4-Way Modular with Memory Reset
1	<u>CM-03-PO</u>	Binary Redirect Circuit Manifold

All components are also available for purchase

The CM-03 subplate is available with 1/8" NPT Ports on A, B, C & D.



Note: See [Page 258](#) for alternative valve (in parenthesis above).



Oscillator Module or Auto-Cycling of a Single-Acting Cylinder



Size: 2.50" x 4.00" x 3.50"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: The VA-011 module is designed to use an "on-off" toggle valve (or alternative input) for an oscillating output that can be used to actuate a single-acting cylinder.

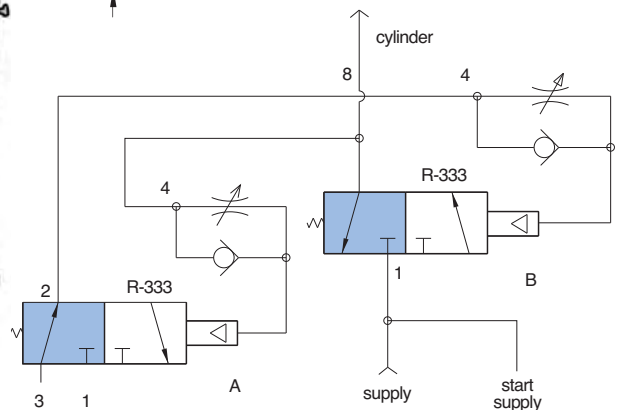
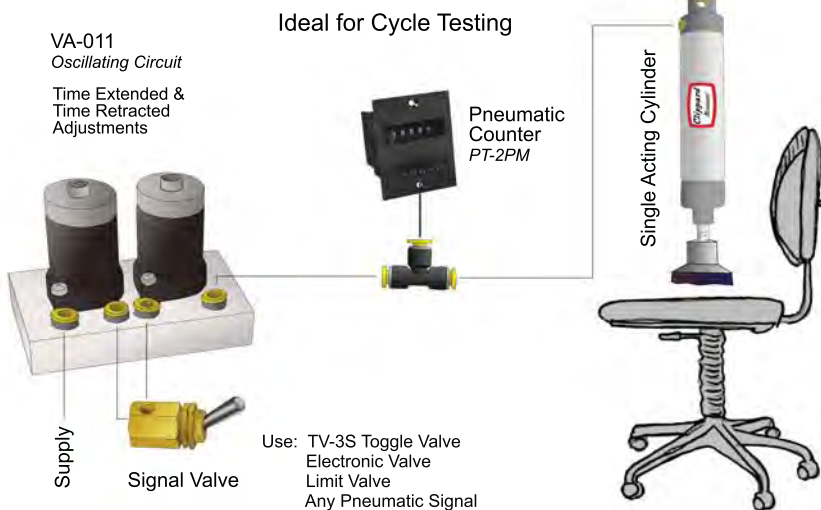
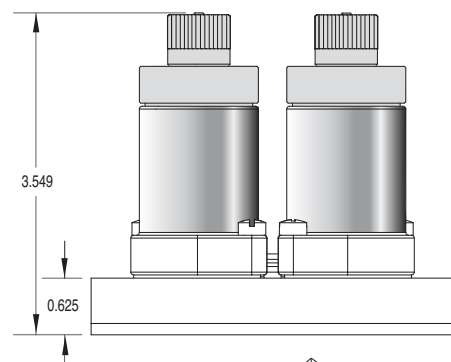
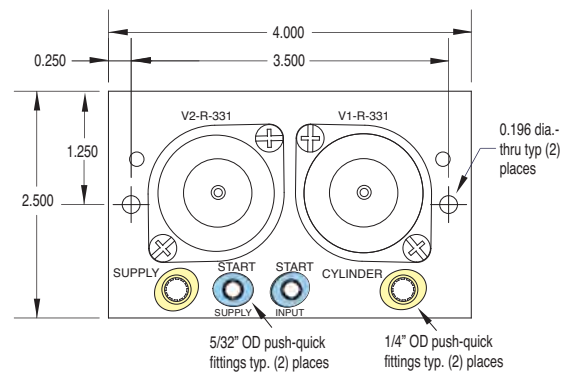
Operation: With no start input, the cylinder will remain in retracted position. Turning on the start input signal causes each valve to shift upon the others output signal. The output "on time" can be adjusted for longer or shorter times, and the "off time" is also adjustable.

Part No.	Description
<u>VA-011</u>	Oscillator Module or Auto-Cycling of a Single-Acting Cylinder

Bill of Materials in Assembly		
Qty.	Part No.	Description
2	<u>R-333</u>	3-Way Adjustable Delay Modular Valve
1	<u>CM-011-PQ</u>	Circuit Manifold
10'	<u>URT1-0805-GNT</u>	1/4" O.D. Polyurethane Tubing, Green
5'	<u>URT1-0503-CLR</u>	5/32" O.D. Polyurethane Tubing, Clear

All components are also available for individual purchase

The CM-011 subplate is available with 1/8" NPT and #10-32 threads



Module for Single Input Clamp Control



Size: 7.00" x 4.00" x 4.00"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: The Clippard VA-08 module uses a single input (from pneumatic foot pedal or button) to provide a simple and clean "OPEN/CLOSE" clamp control with adjustable pressure and speed controls.

The use of the VA-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 so when supply is turned on, the clamp will always go to the open position.

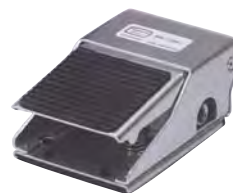
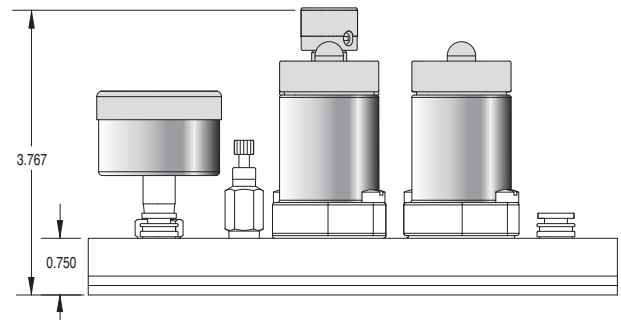
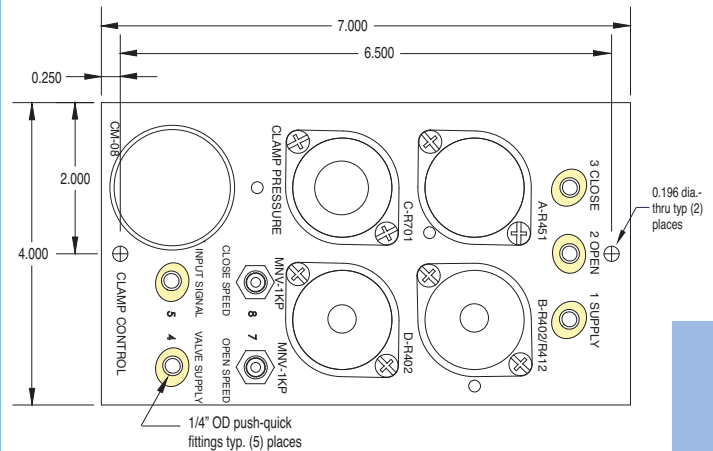
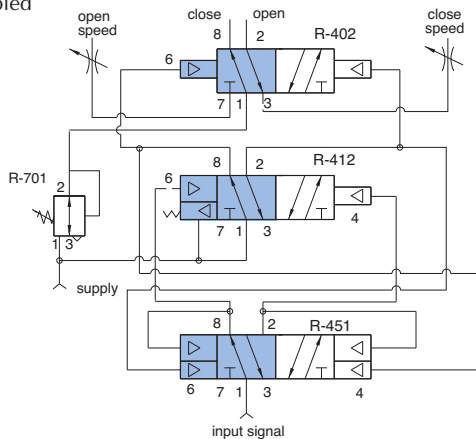
Part No.	Description
VA-08	Module Only
VA-08-FP	Module with Foot Pedal Actuator
VA-08-GN	Module with Green Palm Button

Bill of Materials in Assembly		
Qty.	Part No.	Description
1	R-402	4-Way Modular Valve
1	R-412	4-Way Modular Valve with Memory Reset
1	R-451	4-Way Binary Trigger Modular Valve
1	R-701	Regulator
1	CM-08-PQ	Circuit Manifold
2*	PQ-UE08P	1/4" Universal Elbow Push-Quick Fitting
20'*	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green
2	MNV-1KP	Miniature Needle Valve
1	PG-101	Pressure Gauge
1*	MMV-F3QM-F	Foot Pedal Actuator
1*	PB-1-GN	Green Palm Button
2	15070	Noise Muffler

* Only on designated Part Numbers as shown below

All components are also available for purchase

The **CM-08** subplate is available with 1/8" NPT threads and no valve assembled



1 Foot Pedal Actuator ([MMV-F3QM-F](#)) and fittings included with Part No. [VA-08-FP](#)



1 Green Palm Button ([PB-1-GN](#)) is included with Part No. [VA-08-GN](#)



Two-Hand, No-Tie-Down (THNTD) Circuit



Size: 6.25" x 3.50" x 3.25"

Temperature: 32 to 140°F

Pressure Range: 50 to 120 psig

Use: The main function of this control is to require a machine operator to use both hands at the same time to actuate the equipment, helping to insure that the operator's hands are not in a position to be injured by the machine as it is in motion.

Operation: Clippard's Minimatic® VA-023 circuit module is a self-contained modular circuit board with all interconnections required to provide a Two-Hand, No-Tie-Down (THNTD) pneumatic circuit. Use of the VA-023 will assure simple and rapid installation of your Two-Hand, No-Tie-Down circuit.

Part No.	Description
VA-023	THNTD Circuit without Palm Buttons
VA-023-GN	THNTD Circuit with Green Palm Buttons
VA-023-RD	THNTD Circuit with Red Palm Buttons

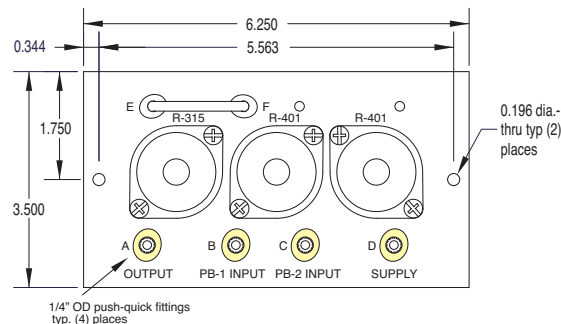
Bill of Materials in Assembly

Qty.	Part No.	Description
1	R-315	3-Way Modular Multi-Piloted Valve
2	R-401	4-Way Modular Valve
1	CM-023-PQ	THNTD Circuit Manifold
2*	PB-1-GN	Green Palm Button with (2) 1/4" Push-Quick Fittings
2*	PB-1-RD	Red Palm Button with (2) 1/4" Push-Quick Fittings
10*	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green
4"	URT1-0503-YLT	5/32" O.D. Polyurethane Tubing, Yellow
4*	PQ-UE08P	1/4" Universal Elbow Push-Quick Fitting
1	PQ-PG05	5/32" Push-Quick Plug

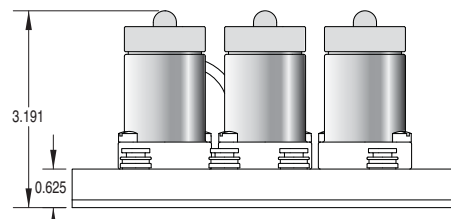
* Comes with "-GN" and/or "-RD" options only

All components are also available for purchase

The [CM-023](#) subplate is available with 1/8" NPT ports on A, B, C & D, and #10-32 threads for Ports E & F



1/4" OD push-quick fittings typ. (4) places



(2) Green Palm Buttons ([PB-1-GN](#)) are included with Part No. [VA-023-GN](#)

(2) Red Palm Buttons ([PB-1-RD](#)) are included with Part No. [VA-023-RD](#)

Limited Warranty

When properly used, this equipment meets ANSI B11.1-1971 and OSHA 1910.217 safety standards for Two-Hand, No-Tie-Down controls. It is the buyer's sole responsibility to determine proper application, location installation, use and maintenance of this equipment. This equipment performs the function of a Two-Hand, No-Tie-Down control only. All other prescribed safety devices must be used with this equipment. Seller shall not be responsible for any failure to so comply which results from the application, installation, location, operation, use or maintenance of this equipment or from alteration of the equipment by persons other than the seller, or from design or instruction furnished by the buyer or his agents. Sellers liability shall be limited to replacement or modification of the equipment to comply with OSHA standards or to refund the purchase price. Seller will be responsible for any fines, penalties or consequential damage. Clippard makes no other warranty of any kind, expressed or implied.

VA-023 & CM-023 Special Features



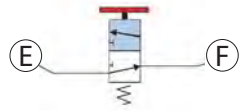
Maintained Output occurs as long as both palm buttons are held. Release of either button terminates the output (shipped in this configuration).

How: Connect E to F using a piece of 5/32" O.D. tubing as a jumper



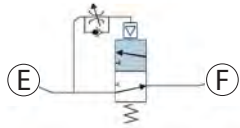
Momentary Output gives a single output pulse that is about 50 ms in duration.

How: Plug E with 5/32" Push-Quick Plug (11755 screw plug if using CM-023); F is open



Cancelable Output terminates the output after a Normally-Open 3-way limit valve has been tripped, even if both palm buttons are held.

How: Interpose Normally-Open 3-way valve or other circuit function



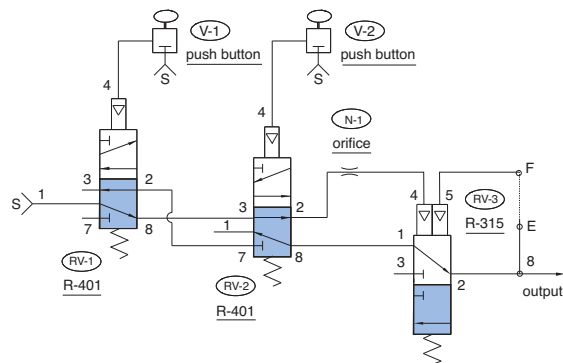
Cancel Output after Time Delay is a variation of Cancelable Output (above) where pneumatic delay valve, such as Clippard's Model R-331, is set to cancel the output after a designated time interval has elapsed regardless of how long the buttons are held.

How: Interpose Normally-Open 3-way delay valve (see R-331)



It is the user's responsibility to determine which special feature can be safely used in their particular application. Because of the variety of applications for this equipment, detailed instructions cannot be given for each possible use. Users are warned that improper application, use, installation, maintenance and/or alterations to this product may result in malfunctions and possible damage or injuries. This device, and all equipment and/or machinery associated with it, should be tested weekly by qualified personnel for proper function and operation.

Two-Hand, No-Tie-Down ANSI Circuit



Absolutely no alterations or modifications should be made to this circuit or its components parts.

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 determines the time span during which both signals must be received in order to obtain the 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 and 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.



VA-034 Add-On Provides Back Pressure Latch Control



Size: 2.50" x 4.25" x 3.50"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

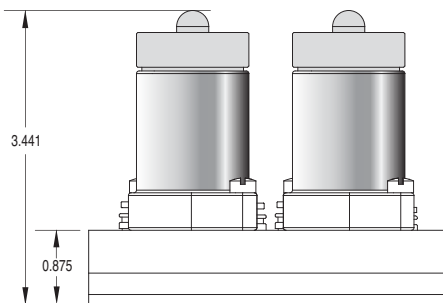
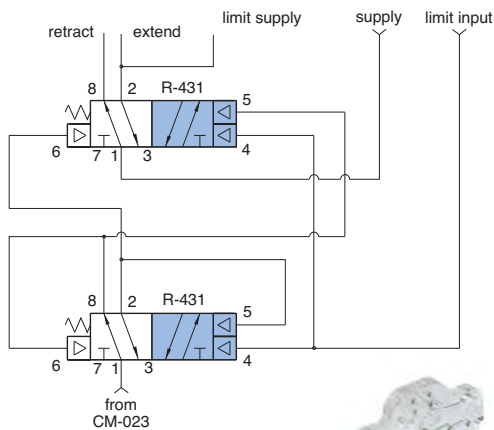
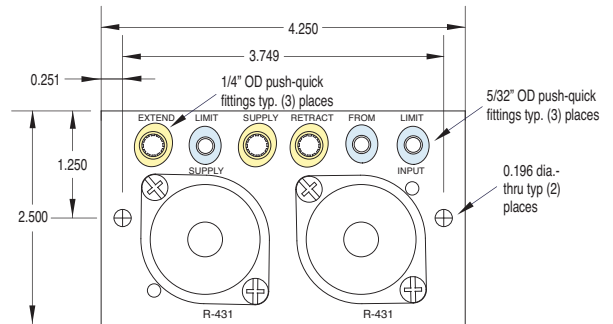
Use: The VA-034 module is for operation of a clamp or collet system where Two-Hand, No-Tie-Down input is required to be held continuously until the position desired (limit valve) is fully engaged. Two-Hand, No-Tie-Down circuit is re-engaged to release the clamp mechanism.

Operation: Output of the CM-023 or VA-023 goes to the VA-034 module and begins to extend cylinder. The two palm buttons on the Two-Hand, No-Tie Down must remain actuated until the limit valve is actuated or unit will retract the cylinder. When the cylinder has depressed the limit valve, the unit locks the valve, and the cylinder continues to see pressure on the extend port. The unit is latched and buttons can now be released. A second input from the CM-023 or VA-023 (depressing both buttons) will now release the latch and retract the cylinder to the starting position as shown, and the circuit is ready for another operation.

Part No.	Description	
VA-034	Back Pressure Latch Control for VA-023	
Bill of Materials in Assembly		
Qty.	Part No.	Description
2	R-431	4-Way Twin Pilot Modular Valve
1	CM-034-PQ	Circuit Manifold
10'	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green
5'	URT1-0503-CLR	5/32" O.D. Polyurethane Tubing, Clear

All components are also available for individual purchase

The **CM-034** subplate is available with 1/8" NPT and #10-32 threads



SPEEDY CIRCUIT ASSEMBLY

You can have a faster, more dependable way to produce multiples of the same pneumatic circuit. This system enables speedy assembly while assuring accurate connections. By utilizing Clippard's unique manufacturing process, these clear acrylic subplates provide sealed passageways between valves without the need for gaskets, clamps, or piping. It's the fastest, most efficient circuit system available.

Two-Hand, No-Tie-Down Circuit with Latching Control (Combination of VA-023 & VA-034)



Size: 4.50" x 6.00" x 3.50"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: The VA-038 module is for operation of a clamp or cylinder operation where Two-Hand, No-Tie-Down input is required to be held continuously until the position desired (limit valve) is fully engaged. The Two-Hand, No-Tie-Down circuit releases the latch and returns the cylinder to the retracted position.

Operation: The two palm buttons on the Two-Hand, No-Tie-Down must remain actuated until the limit valve is actuated, or the unit will retract the cylinder. When the cylinder has depressed the limit valve, the unit locks the valve, and the cylinder continues to see pressure on the extend port. The unit is latched, and buttons can now be released. A second input from depressing both buttons will now release the latch and retract the cylinder to the starting position as shown, and the circuit is ready for another operation.

Part No.	Description
VA-038	Module Only without Palm Buttons
VA-038-GN	Module with 2 Green Palm Buttons
VA-038-RD	Module with 2 Red Palm Buttons

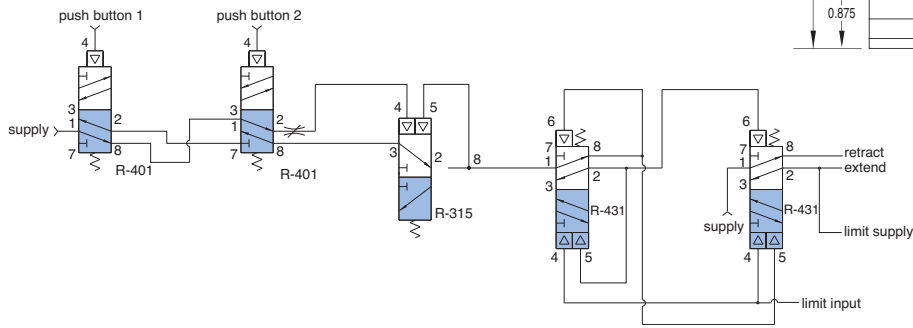
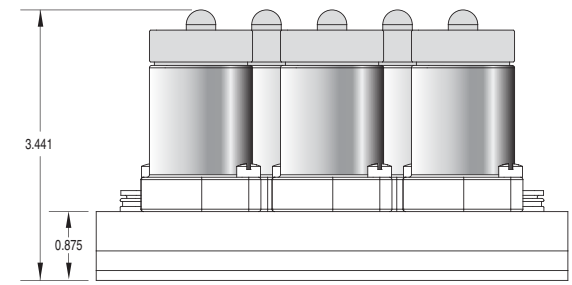
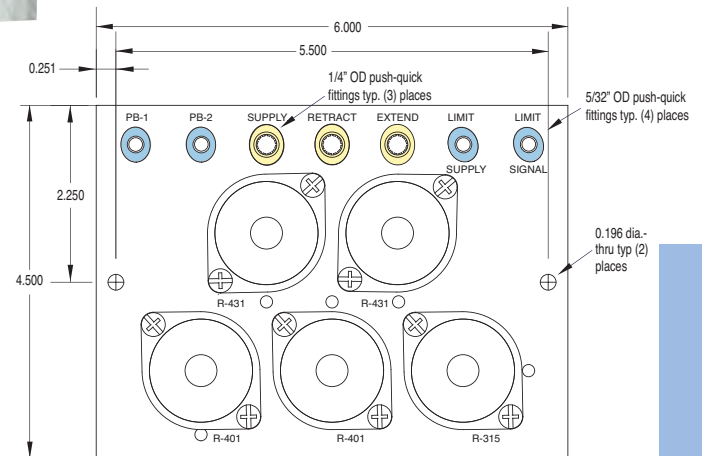
Bill of Materials in Assembly

Qty.	Part No.	Description
2	R-431	4-Way Twin-Pilot Modular Valve
2	R-401	4-Way Modular Valve
1	R-315	3-Way Modular Multi-Piloted Valve
2*	PB-1-GN	Green Palm Button
2*	PB-1-RD	Red Palm Button
1	CM-038-PQ	Circuit Manifold
4	PQ-UE08P	1/4" Universal Elbow Push-Quick Fitting
10'	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green
10'	URT1-0503-CLT	5/32" O.D. Polyurethane Tubing, Clear

* Included in designated Part Numbers only

All components are also available for individual purchase

The CM-038 subplate is available with 1/8" NPT and #10-32 threads



Palm Buttons are included with Part No. VA-038-GN and VA-038-RD



Auto-Cycling of a Double-Acting Cylinder



Size: 2.75" x 4.25" x 3.25"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: Similar to the VA-06, this is a more compact version designed for automatic cycling of double-acting cylinders without the use of limit valves or a magnetic sensor.

Operation: This circuit enables a double-acting cylinder to reciprocate without the use of limit valves and to control its speed in each direction. The two R-333 and R-453 valves also incorporate adjustable delay features that will control the time between retract and extend cycles.

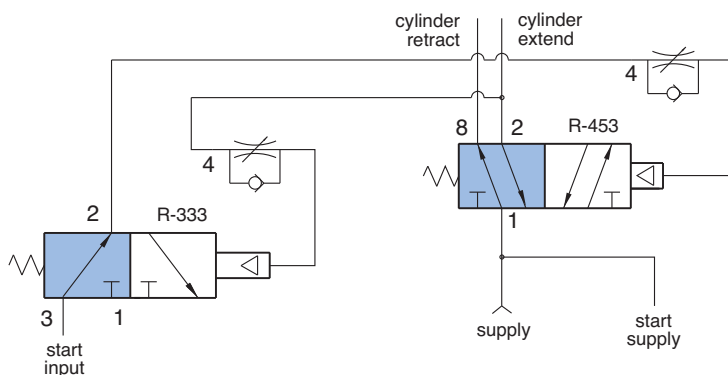
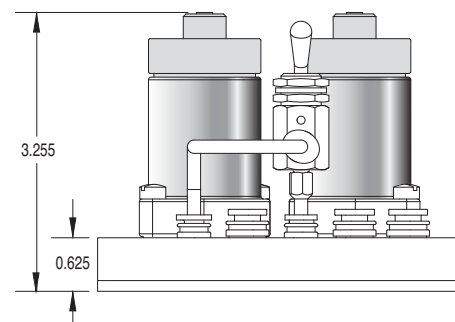
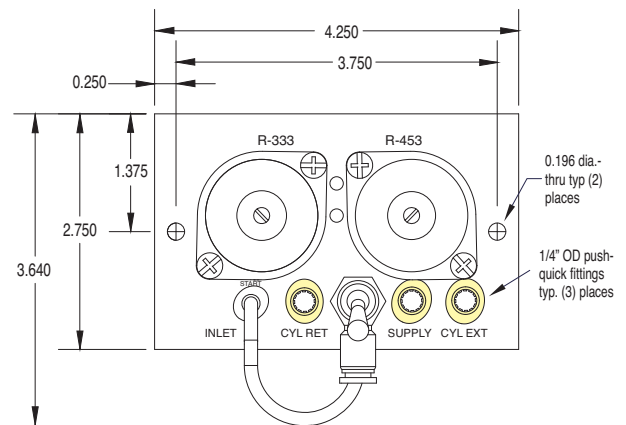
Part No.	Description
VA-028	Auto-Cycling of a Double-Acting Cylinder

Bill of Materials in Assembly

Qty.	Part No.	Description
1	R-333	3-Way Modular Multi-Piloted Valve
1	R-453	4-Way Modular Valve
1	TV-3S	On-Off Toggle Valve
1	11675-05	Fitting Adapter
1	CM-028-PQ	Circuit Manifold
1	PQ-CC05N	5/32" Male Connector Push-Quick Fitting
4'	URT1-0503-YLT	5/32" O.D. Polyurethane Tubing, Yellow
10'	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green

All components are also available for individual purchase

The [CM-028](#) subplate is available with 1/8" NPT and #10-32 threads



Auto-Cycling of a Double-Acting Cylinder



Size: 6.00" x 3.25" x 3.50"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: The VA-06 module is designed to use an "on-off" toggle valve (or alternative input) for the cycling of a double-acting cylinder without the use of limit valves.

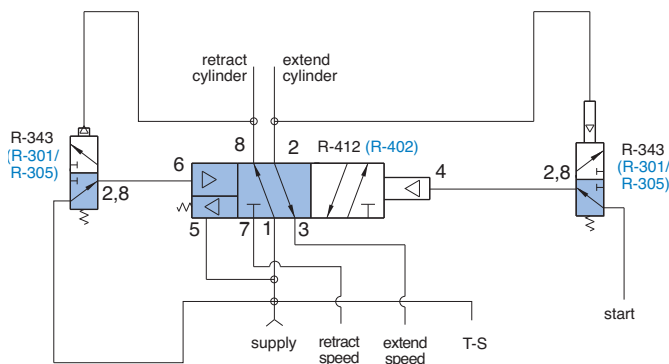
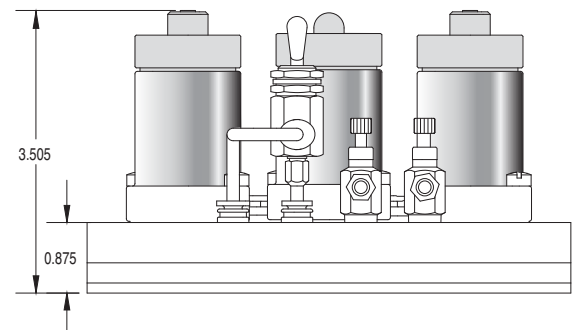
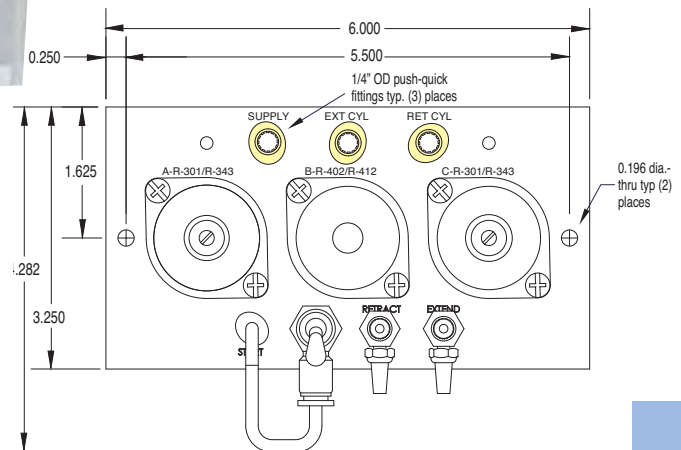
Operation: This circuit enables a double-acting cylinder to reciprocate without the use of limit valves and to control its speed in each direction. The two R-343 valves also incorporate adjustable delay features that will control the time between retract and extend cycles. With the miniature needle valves, the speed of the cylinder is also adjustable for your application.

Part No.	Description
VA-06	Auto-Cycling of a Double-Acting Cylinder

Bill of Materials in Assembly

Qty.	Part No.	Description
2	R-343	3-Way Modular Delay Valve
1	R-412	4-Way Modular Reset Valve
1	TV-3S	On-Off Toggle Valve
1	11675-05	Fitting Adapter
2	MNV-1KP	Miniature Needle Valve
2	15070	Noise Muffler
1	CM-06-PQ	Circuit Manifold
1	PQ-CC05N	5/32" Male Connector Push-Quick Fitting
4'	URT1-0503-YLT	5/32" O.D. Polyurethane Tubing, Yellow
10'	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green

All components are also available for individual purchase
 The CM-06 subplate is available with 1/8" NPT and #10-32 threads



Note: See Pages 248, 249 and 258 for alternative valve(s) (in parenthesis above).



CLIPPARD QUALITY STAINLESS STEEL CYLINDERS

Visit www.clippard.com/cylinders for a complete line of pneumatic cylinders featuring polished I.D 304 stainless steel tubes for low friction.

Clippard—The Preferred Cylinder!



Back Pressure Sensing for Double-Acting Cylinder



Size: 6.00" x 3.25" x 3.75"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

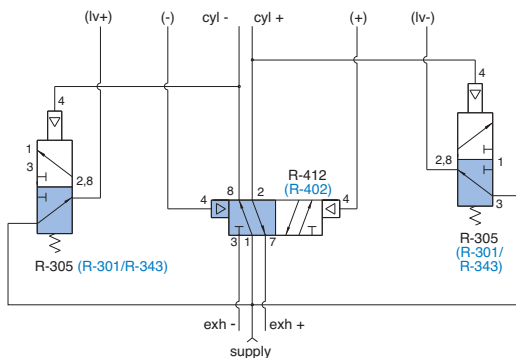
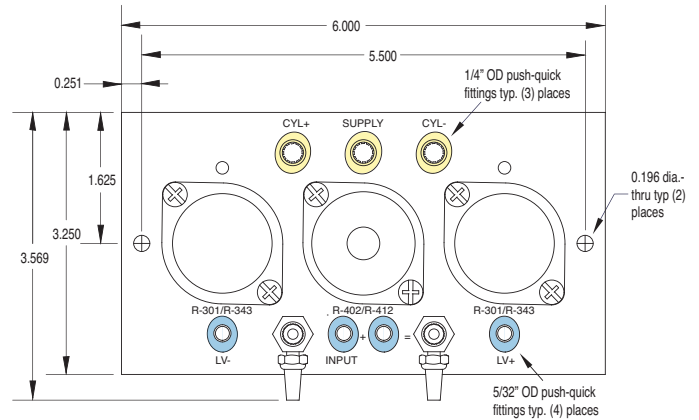
Use: The VA-031 module is very versatile for controlling a double-acting cylinder without limits. The circuit uses back pressure to send a signal when the cylinder finishes moving. This module is ideal for integrating into a larger circuit with electronic valves or all pneumatic components.

Operation: This circuit enables a double-acting cylinder to give an output-on-output - (LV-) when the cylinder is finished retracting and an output-on-output + (LV+) when cylinder is finished extending. Using these outputs allows you to loop them back to the module's inputs, and create an auto-cycling circuit using back pressure, opposed to a timing signal such as the VA-06 module. You can also use the output to go to a manual button, pneumatic delay valve, electronic valve and PLC, or pneumatic sequencer (such as a R-932 circuit) and allow those options to signal back to the module to begin the next cycle. Call Clippard for assistance to fit the right pneumatic module into your application.

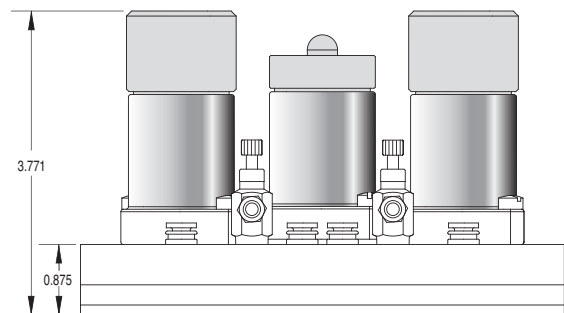
Part No.	Description	
<u>VA-031</u>	Back Pressure Sensing for Double-Acting Cylinder	
Bill of Materials in Assembly		
Qty.	Part No.	Description
2	R-305	3-Way Modular Low Pressure Pilot Valve
1	R-412	4-Way Modular Reset Valve
2	MNV-1KP	Miniature Needle Valve
2	15070	Noise Muffler
1	CM-031-PQ	Circuit Manifold
10'	URT1-0805-GNT	1/4" O.D. Polyurethane Tubing, Green
5'	URT1-0503-CLR	5/32" O.D. Polyurethane Tubing, Clear

All components are also available for individual purchase

The CM-031 subplate is available with 1/8" NPT and #10-32 threads



Note: See Pages 249, 255 and 258 for alternative valve(s) (in parenthesis above).



Back Pressure Sensing with a Double-Acting Cylinder Using External Power Valve



Size: 6.0" x 2.75" x 3.50"

Temperature: 32 to 140°F

Pressure Range: 40 to 150 psig

Use: The VA-033 module is very similar to the VA-031 for controlling a double-acting cylinder without limits. The circuit uses back pressure to send a signal when the cylinder finishes moving. This module is designed to be used in conjunction with an external power valve.

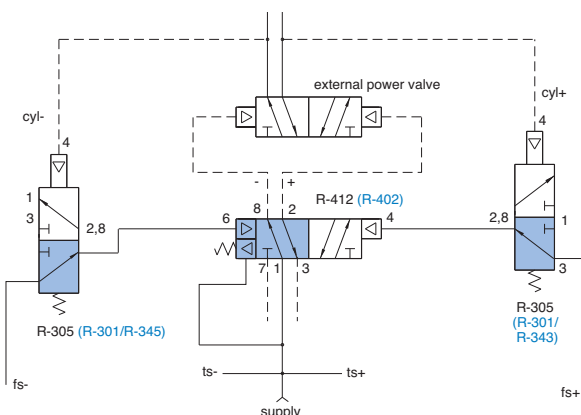
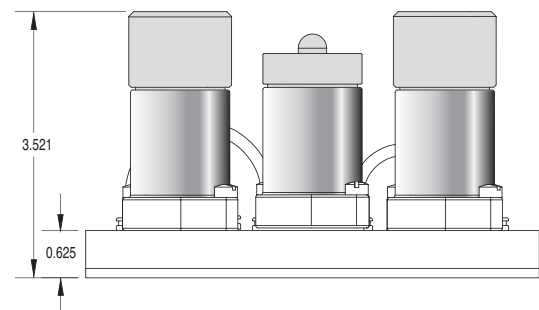
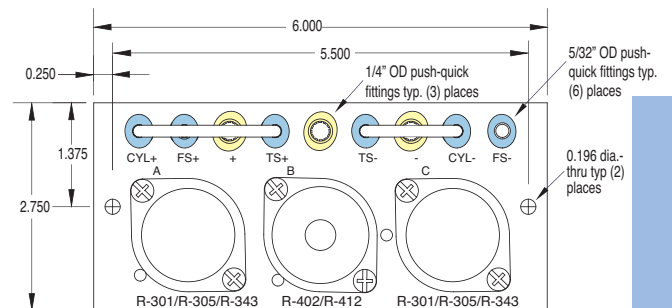
Operation: This circuit enables feedback from the external valve outputs to signal back to the module ports CYL+ and - when back pressure is building. Utilizing ports TS and FS allows you to loop them back to the module's inputs, and create an auto-cycling circuit using back pressure, opposed to a timing signal such as the VA-06 module. Or you can use the output to go to a manual button, pneumatic delay valve, electronic valve and PLC, or pneumatic sequencer (such as a R-932 circuit), and allow those options to signal back to the module to begin the next cycle. Call Clippard for assistance to fit our pneumatic modules into your application.

Part No.	Description
<u>VA-033</u>	Back Pressure Sensing with Double-Acting Cylinder Using External Power Valve

Bill of Materials in Assembly		
Qty.	Part No.	Description
2	<u>R-305</u>	3-Way Modular Pressure Pilot Valve
1	<u>R-412</u>	4-Way Modular Reset Valve
1	<u>CM-033-PQ</u>	Circuit Manifold
8'	<u>URT1-0503-YLT</u>	5/32" O.D. Polyurethane Tubing, Yellow
10'	<u>URT1-0805-GNT</u>	1/4" O.D. Polyurethane Tubing, Green
5'	<u>URT1-0503-CLR</u>	5/32" O.D. Polyurethane Tubing, Clear

All components are also available for individual purchase

The CM-033 subplate is available with #10-32 threads and no valve assembled



Note: See Pages 248, 255 and 258 for alternative valve(s) (in parenthesis above).



PNEUMATIC I/O MODULES

What is it?

Pneumatic I/O Modules meet unique needs for 100% pneumatically-controlled applications. Today PLC control is commonly used and cost-effective for applications where complex or multiple programs are used and when multiple platforms are required, such as pneumatic, electronic, hydraulic, and/or data acquisition. These pneumatic I/O devices are ideal for Intrinsically Safe environments; simple custom machinery requiring only one program; and PLC type applications that have all pneumatic components for inputs and outputs. This system provides a safe, simple, and cost-efficient answer for pneumatic automation control solutions.



R-932 is a 4-way, 5-ported, double-piloted, two-position valve designed for sequence control I/O modules.

Temperature: 32° to 140°F

Pressure Range: 50 to 150 psig

Input Signals: Requires 40 psig minimum

Output Signals: 9 scfm @ 100 psig (designed to pilot only)

Ports: #10-32 UNF (main supply on VA-024 is 1/8" NPT)

Number of I/O's Available: How many do you want? Clippard recommends a minimum of 2 pneumatic actuators (2 outputs) and up to 8 pneumatic actuators (16 outputs) maximum for this option to be cost-effective compared to PLC controllers and electronic valves. The sequencing circuit is unlimited for applications requiring more outputs.

Operation: The primary function of this control system is to safely give a pneumatic output for every input given in the correct sequence without allowing for a possible jump in sequence or false signal.

Part No.

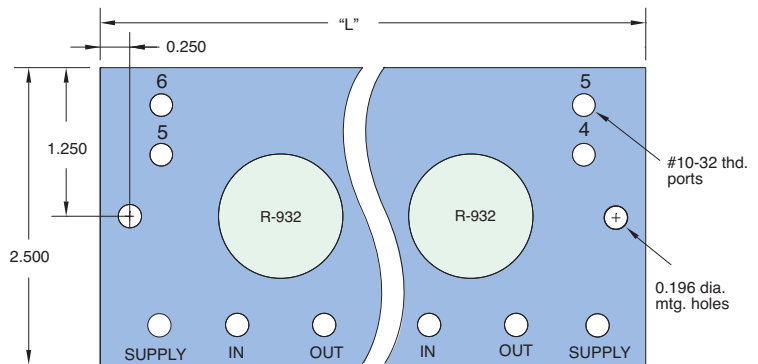
Custom or Design-Your-Own from below information

I/O Modules for Individual Purpose

Part No.	No. of Steps	"L"	Part No.	No. of Steps	"L"
<u>CM-024</u>	5	9.50"	<u>CM-026</u>	3	6.00"
<u>CM-035</u>	4	7.75"	<u>CM-025</u>	2	4.50"
<u>R-932</u>	Sequence Valves		<u>CM-027</u>	1	2.75"

Add 1 step to the number of steps needed for Reset Signal

* Valves are not included with the CM-XXX Part Numbers. Valves must be ordered separately.



If you are looking for a single Part Number—Assembled, Tested and Shipped directly to you, call us for further information.

I/O Sequence Module Installation

Inputs & Outputs throughout all steps are identical and simple to hook up. For every input or limit valve signal coming in the module will give a corresponding output in the appropriate sequence. Keep in mind that outputs are designed for piloting and not for direct use with pneumatic actuators or devices. Use output pilots to actuate other Clippard Modular valves such as the R-412, Maximatic MMA valves or other manufacturer's components to power your cylinders and devices.

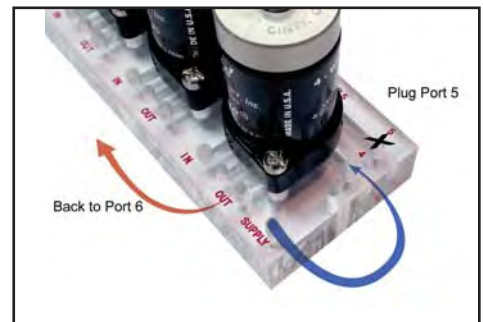
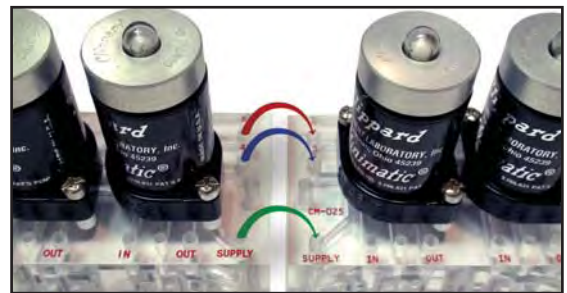
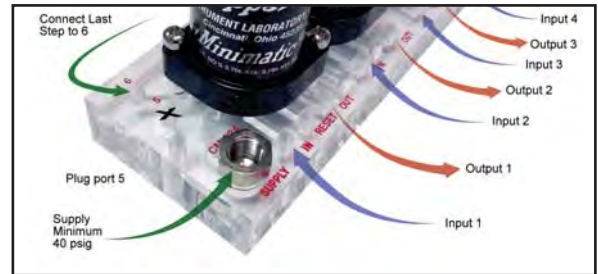
Ports 5 and 6 are used for adding modules and repeating or resetting the sequence. For the first module, plug port 5 and connect port 6 to the last output in sequence in order to reset.

Step one is typically begun with a momentary pneumatic input signal from a toggle valve, push button, Two-Hand, No-Tie-Down control, or solenoid valve. To auto-cycle or repeat the sequence automatically, you will need to keep the signal on until you wish to stop the auto-cycling.

Expanding / Adding Modules allows you to add steps to your sequence. Simply use jumpers to go from port 5 located on the right-hand side of your module, and connect it to port 6 on the left-hand side of the added module. Repeat this for connecting 4 to 5, and don't forget to connect a supply line as well.

Reset and Continuous Cycles is used when the sequence of operation repeats, such as in automated production equipment. This step is required regardless if you are auto-cycling or manually starting each sequence. Port 5 should be plugged, port 4 should be connected to the supply port, and the last step output should go to port 6 on the first step's module. Plug any unused supply ports and you are ready to go.

Added Functionality is commonly desired and easily achieved with these modules. Since there are countless possibilities for pneumatic control, we ask that you contact Clippard directly for pneumatic logic assistance or for a complete design and assembly.



Complete Pneumatic Control Modules



The complete solution:

Not everyone can design pneumatic control circuits like Clippard. Long the leader in pneumatic logic, we are prepared to meet your needs.

If knowledge or time is hard to come by on a pneumatic project, call us for circuit assistance, design, assembly, and testing. Within Clippard's Value-Added department, we have years of experience designing and assembling pneumatic systems for thousands of applications in a variety of markets.

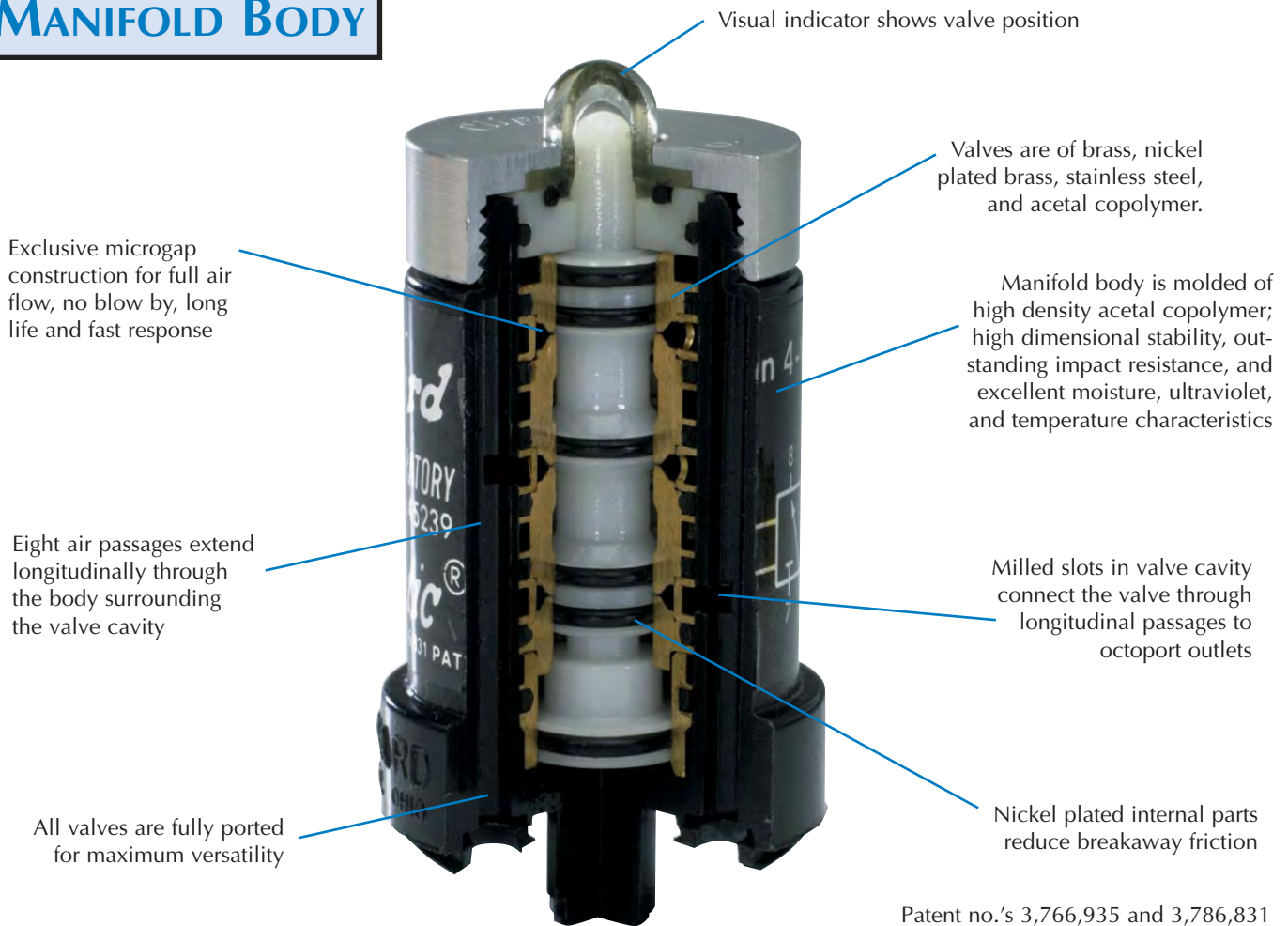
What we need!

Give us your requirements for input and outputs, required response times, flows, and space restrictions. We will propose a fully-assembled control unit that is designed and built just for your needs.



MODULAR VALVE SYSTEM

MANIFOLD BODY



Patent no.'s 3,766,935 and 3,786,831

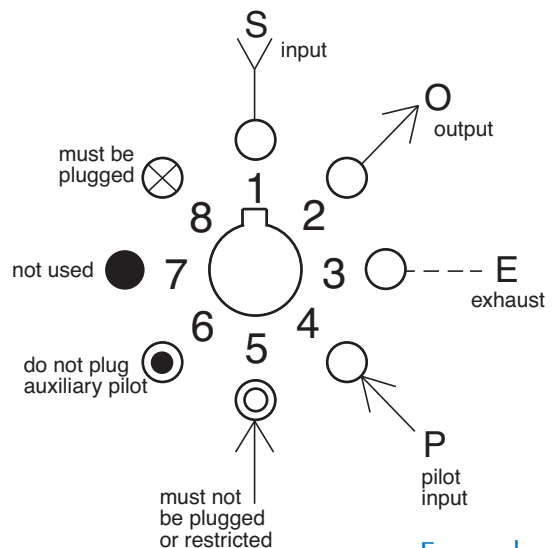
Octoport Port Coding

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: S₁, S₂, 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

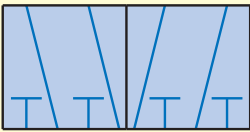
The 3 Base Modular Valves



- 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.)

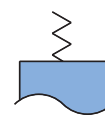


- Can be used as a:
- 6-way fully ported valve
 - Dual 2-way normally closed valve
 - Dual 2-way normally open valve
 - Dual 3-way normally closed valve
 - Dual 3-way normally open valve
 - Dual selector valve

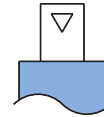
* R-436 and R-421 are exceptions to the Basic 3

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



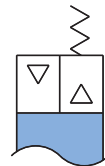
Spring Return



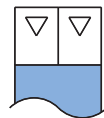
Air Pilot



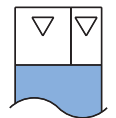
Spring & Auxiliary Pilot



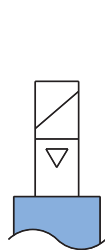
Removable Spring & Auxiliary Pilot



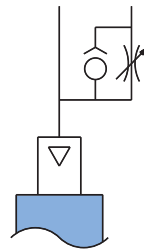
2 Air Pilots "OR"



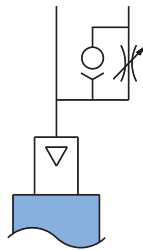
Differential Air Pilots



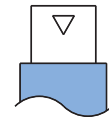
Solenoid Piloted



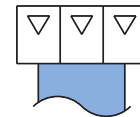
Delay Out From Air Pilot



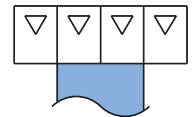
Delay In To Air Pilot



Low Pressure Air Pilot



3 Air Pilots "OR"



4 Air Pilots "OR"



Independent Shuttle Valve & Air Pilot



Shuttle Valve To Air Pilot



Shuttle Valve To Low Pressure



Delay To Air Pilot



Bleed Pressure Pilot



Fluidic Interface Pilot



MODULAR VALVE SYSTEM

SIMPLIFIED ASSEMBLY

Screws and lockwashers (replacement part R-105) plated steel, binder head, #10-32 thread.

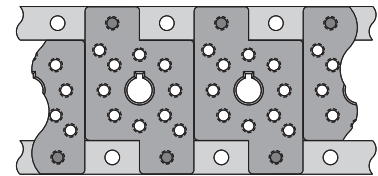
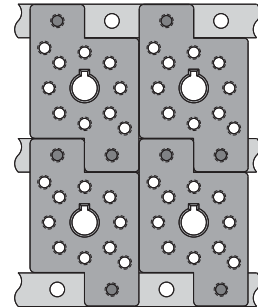


Molded gasket (replacement Part No. R-104) furnished with each module.

Custom plastic manifold subplates of clear plastic have most interconnections inside; speed assembly, assure integrity of circuit. Valves plug in easily.

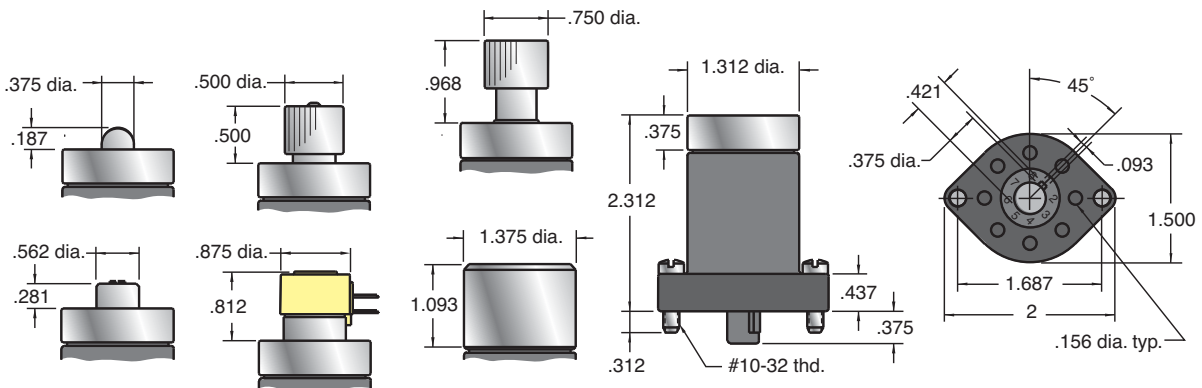


Standard mounting strips attach to interlocked subplates with #10-32 screws. Resulting circuit plate is rigid and strong. Modules plug in to circuit plate and are held by two fully captivated screws. Molded gasket provides seal between each module and subplate.



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.



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.

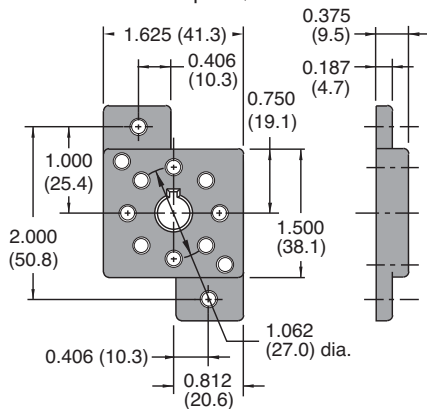


Mounting Subplates provide mounting for up to three modular valves, and provide various port options. Very compact size, lightweight, easy-to-mount, and valves are easily replaced.

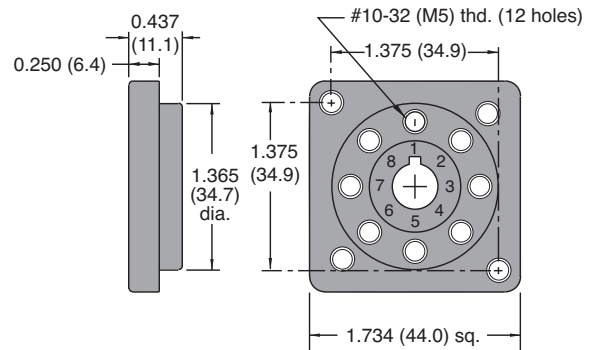
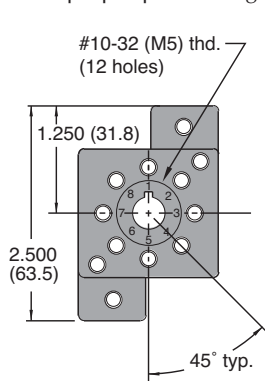
Part No.	No. of Valves	Ports	Length	Width	Height	Mounting
<u>CM-04</u>	1	#10-32	3.00"	3.00"	0.625"	(2) 0.196" dia.
<u>CM-02</u>	1	1/8" NPT	3.50"	3.00"	0.625"	(2) 0.196" dia.
<u>CM-036</u>	2	1/8" NPT	7.00"	3.00"	0.625"	(4) 0.196" dia.
<u>CM-037</u>	3	1/8" NPT	10.75"	3.00"	0.625"	(4) 0.196" dia.

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)

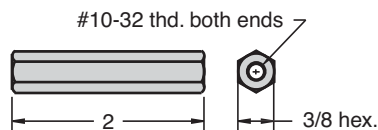


R-111 & R-111-M5 (metric)

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.

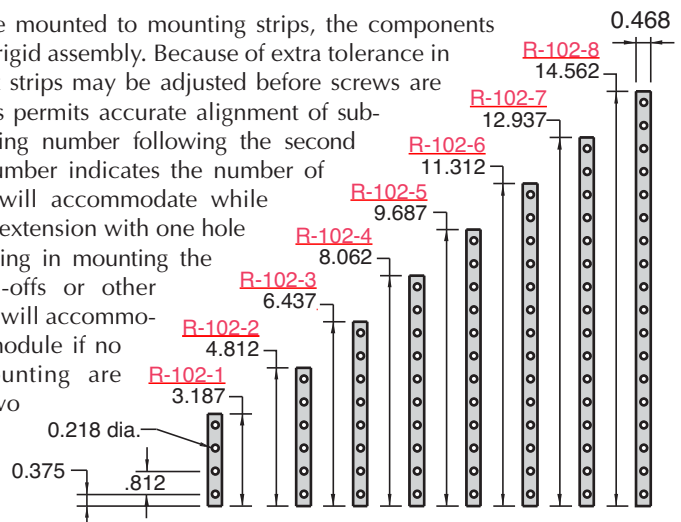
Mounting Strips & Stand-Off Dimensions

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.)

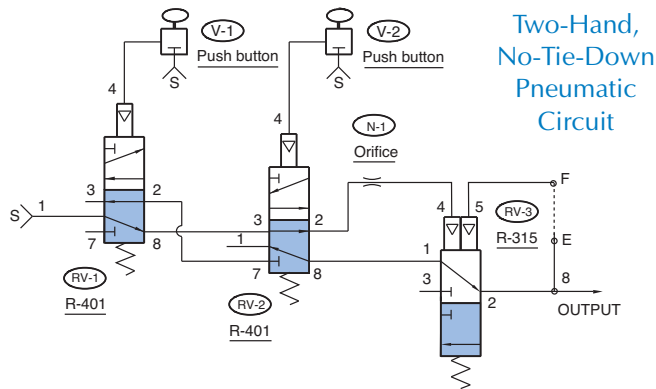


STEP ONE

Pneumatic Circuit

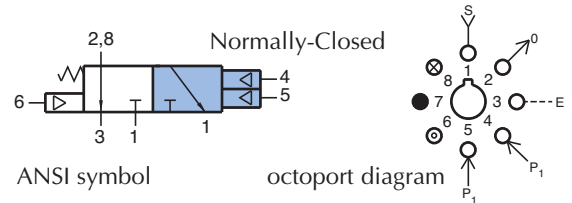
The first step in building a modular circuit is designing the pneumatic circuit using ANSI symbols.

We have chosen the Two-Hand, No-Tie-Down Circuit ([page 232](#)) for this demonstration.



STEP TWO

Specifications for the [R-315](#) modular valve



Octoport Diagrams

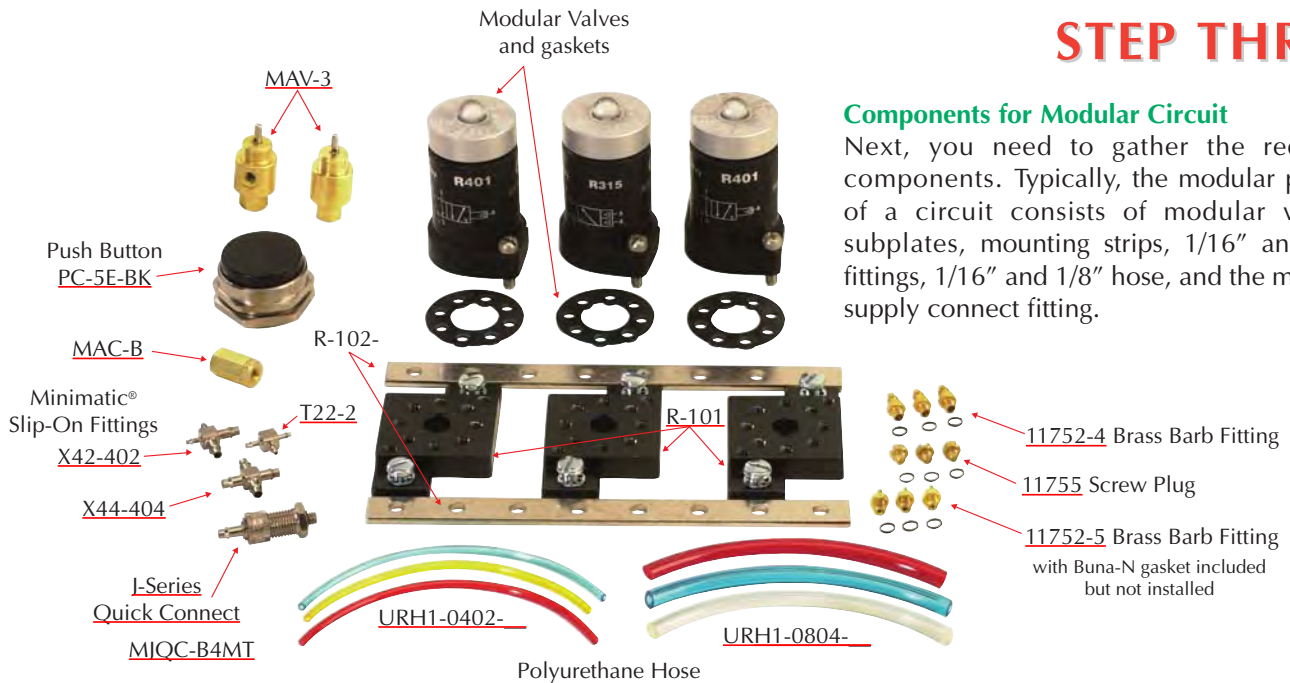
The next step is selecting the octoport diagram for each modular valve. Each Clippard modular valve (R-series) has its own unique octoport diagram which is shown to the right of the ANSI symbol.

See [page 242](#) for clues for deciphering the Octoport port coding.

STEP THREE

Components for Modular Circuit

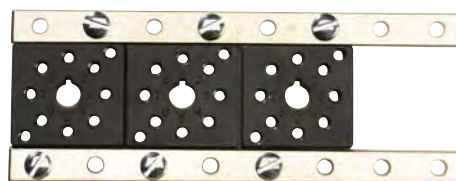
Next, you need to gather the required components. Typically, the modular portion of a circuit consists of modular valves, subplates, mounting strips, 1/16" and 1/8" fittings, 1/16" and 1/8" hose, and the main air supply connect fitting.



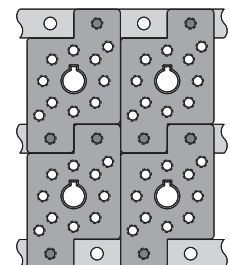
STEP FOUR

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

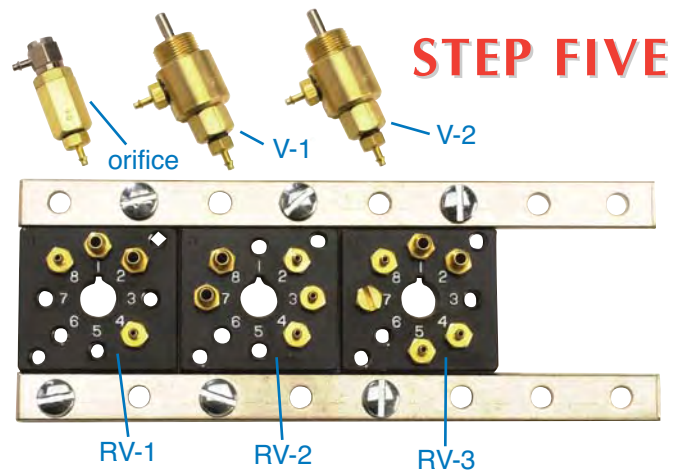


Subplate and Fitting Installation

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.

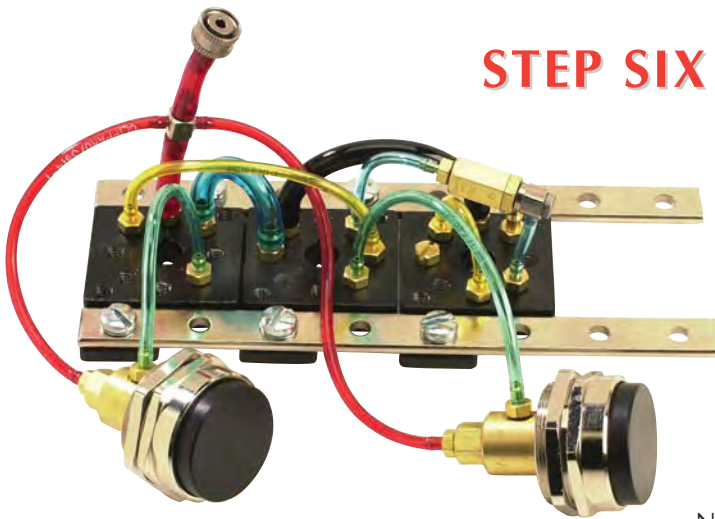
Looking at the Two-Hand, No-Tie-Down circuit:

1. Valve RV-1 has fitting [11752-5](#) (#10-32 to 1/16" I.D. hose fitting) installed in ports 4 and 8
2. Fitting [11752-4](#) (#10-32 thd. to 1/8" I.D. 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.



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.

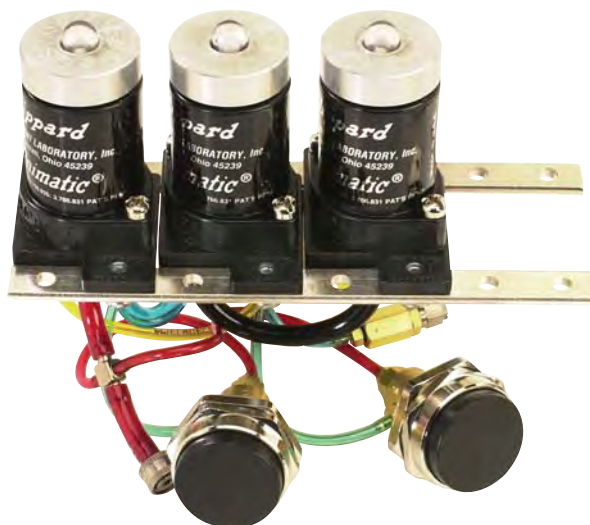
1. Supply lines - Red hose
2. The 1/16" I.D. fittings require URH1-0402 hose
3. The 1/8" I.D. fittings require URH1-0804 hose
4. The main supply line was fitted with a [MIOC-CB4](#) which can be attached to any of the MJQC valve bodies.

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.



MODULAR 3-WAY VALVE

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

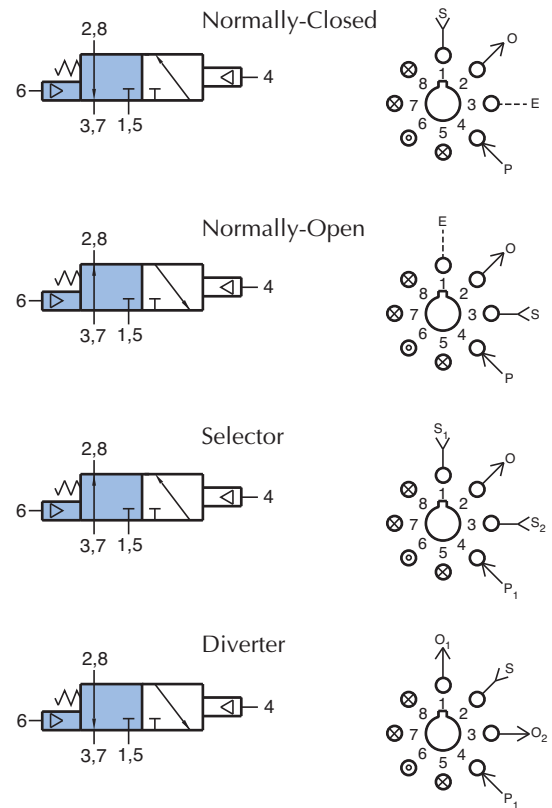
Temperature: 32 to 180°F

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

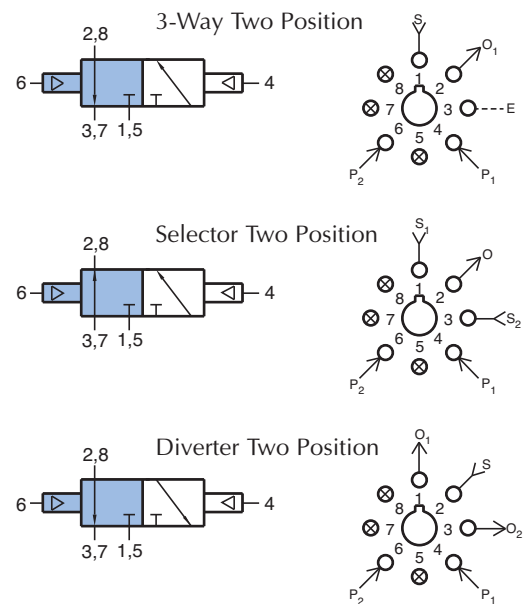
Temperature: 32 to 180°F

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:

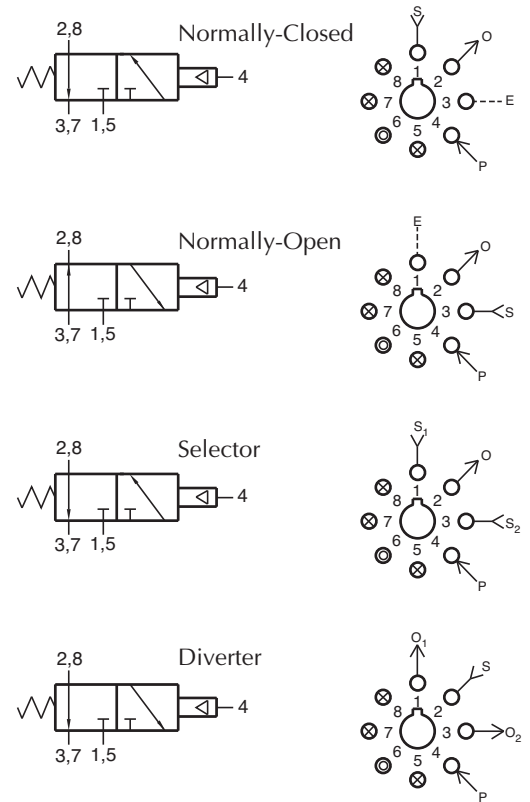
- Pilot actuates valve with low pressure signal
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

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:

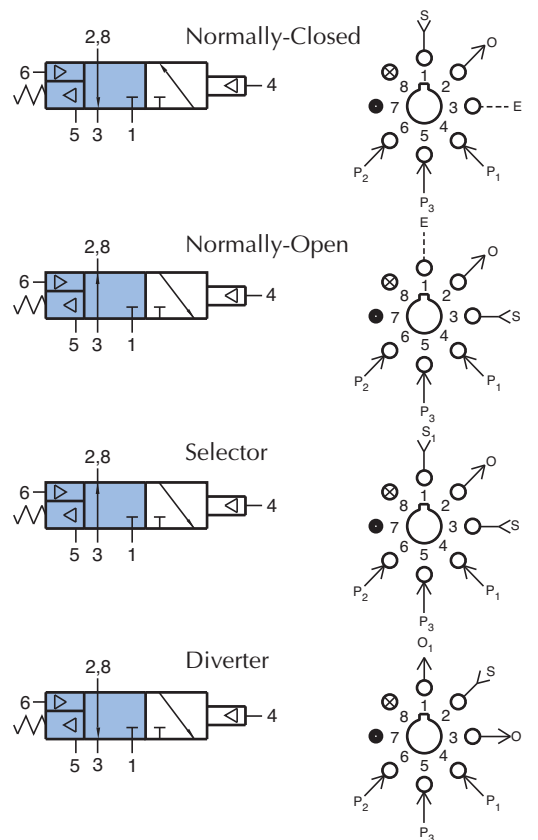
- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts
- Unique piloted spring reset

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 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.





MODULAR 3-WAY VALVES

R-311



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.

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

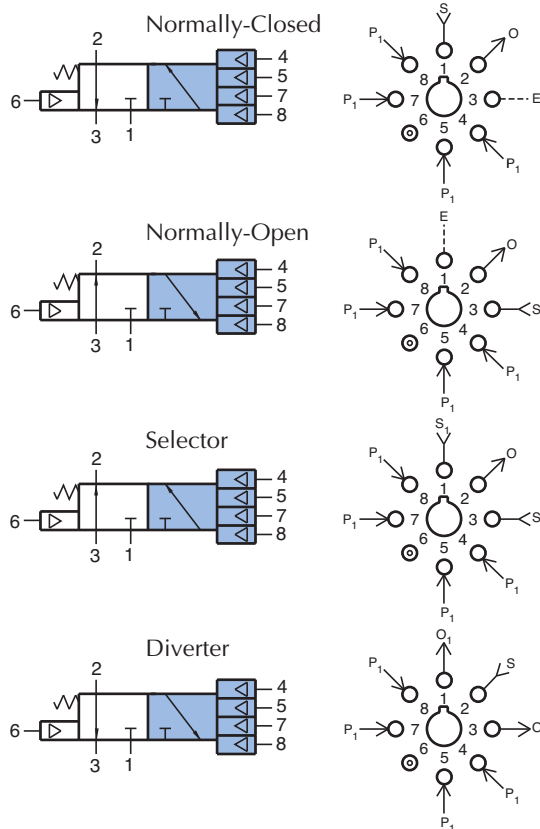
Performance:

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



R-312



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.

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

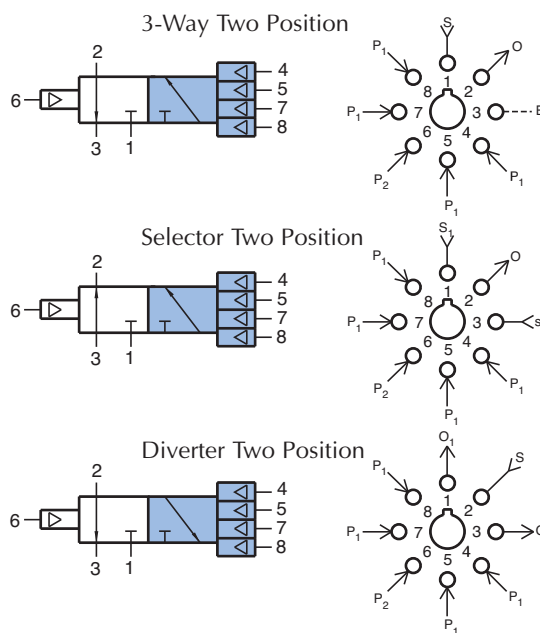
Performance:

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



R-314



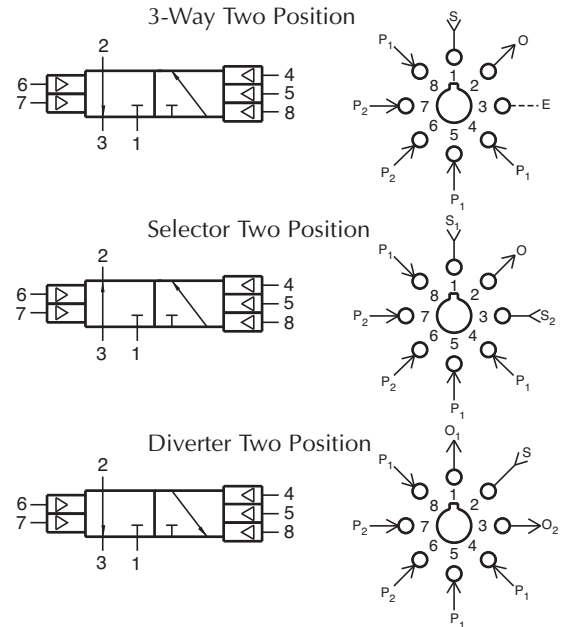
3-Way Multiple Pilot Valve

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



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



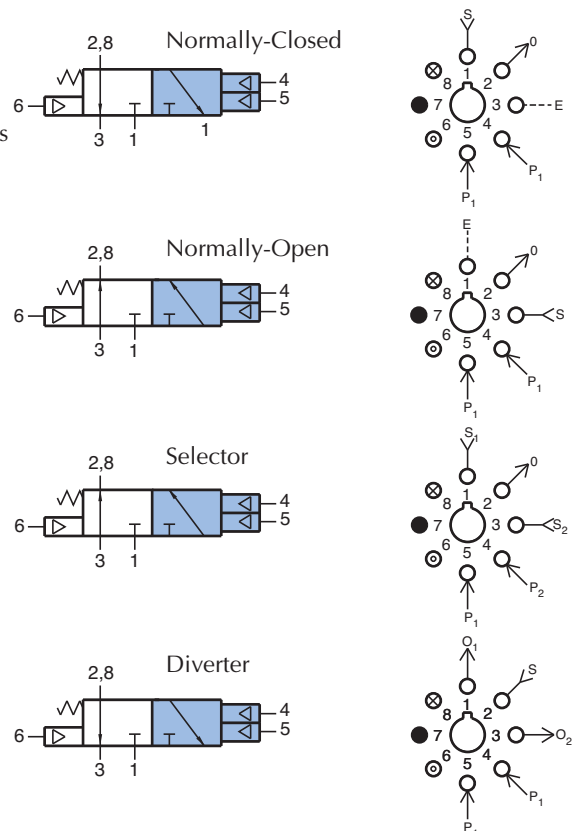
3-Way Multiple Pilot Valve

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



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.



MODULAR 3-WAY COMBINATION VALVES

R-321



3-Way Combination Valve

Features:

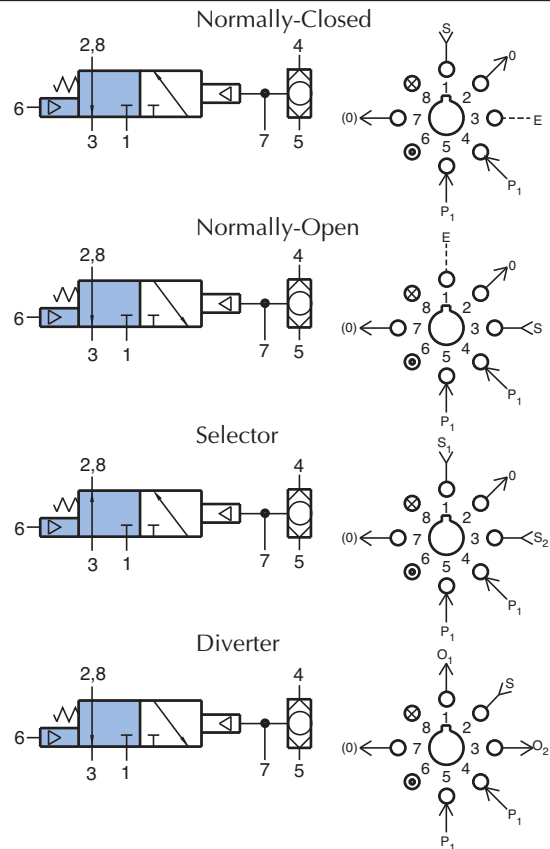
- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

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:

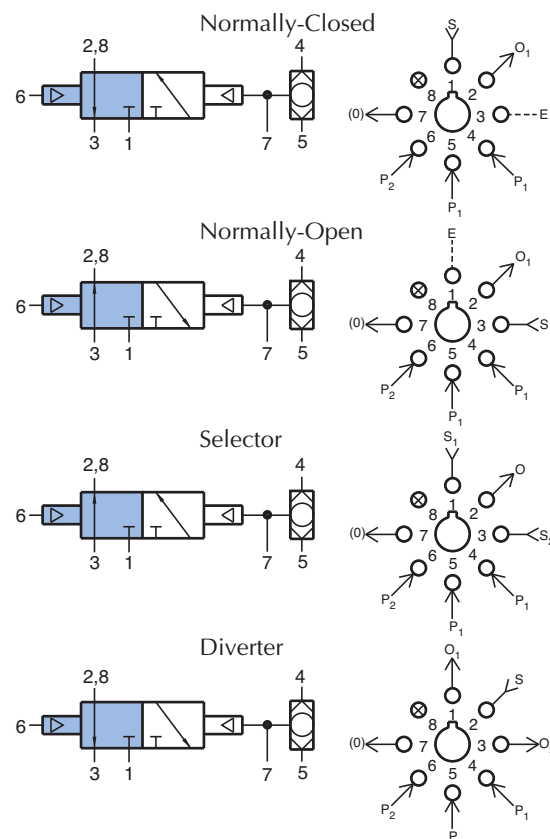
- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

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:

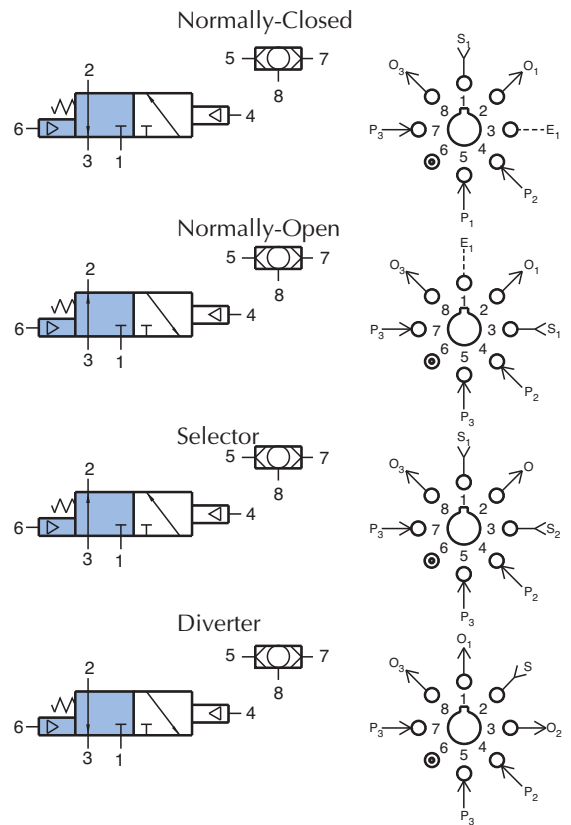
- Indicator shows valve in shaded position
- Multiple valves save space
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

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:

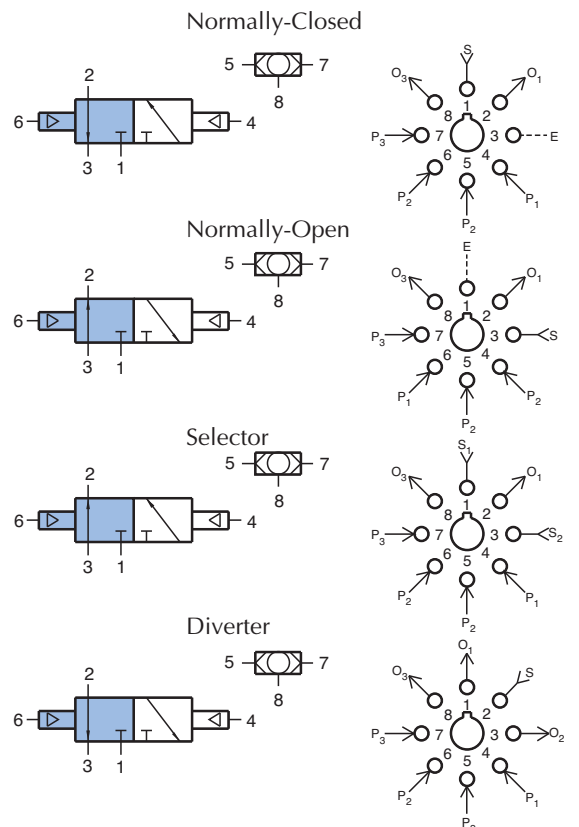
- Indicator shows valve in shaded position
- Multiple valves save space
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

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.





MODULAR 3-WAY COMBINATION VALVES

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

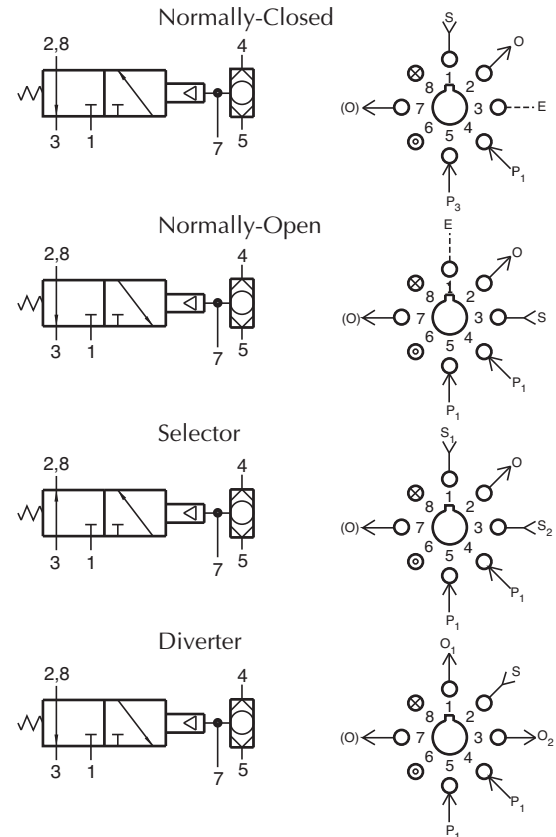
Pilot Pressure Minimum: 15 psig; 1.0 bar

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

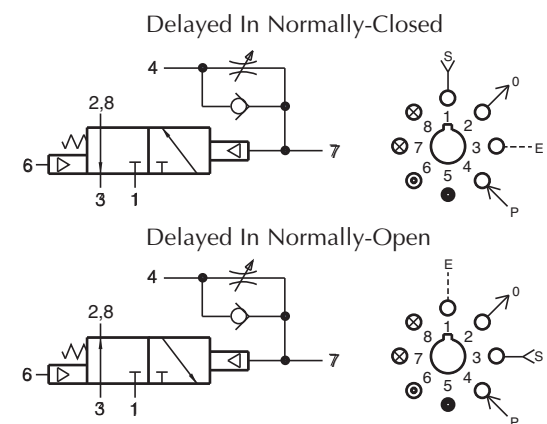
Pilot Pressure Minimum: 40 psig; 2.8 bars

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:

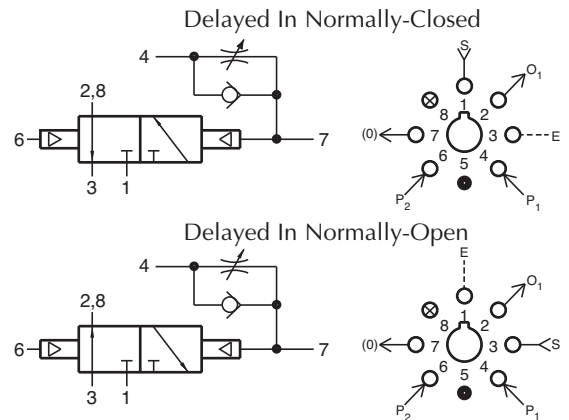
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering (R-334)
- Knurled knob for fast accurate adjustments - no tools needed (R-332)
- 0-3 seconds range

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

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

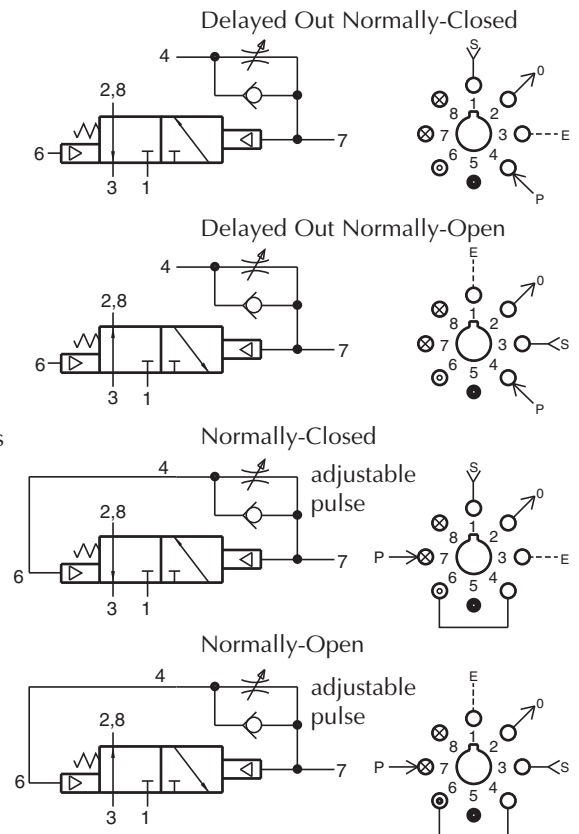
Performance:

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

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.





MODULAR MULTIPLE 3-WAY VALVES

R-351

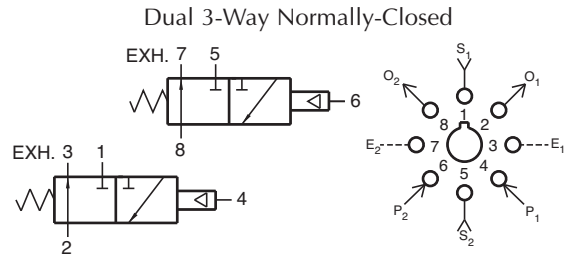
Dual Normally-Closed 3-Way Valve

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



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

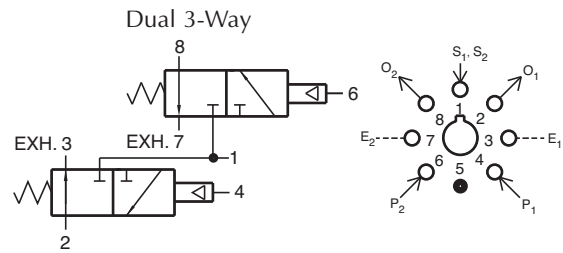
Dual 3-Way Valve

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



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

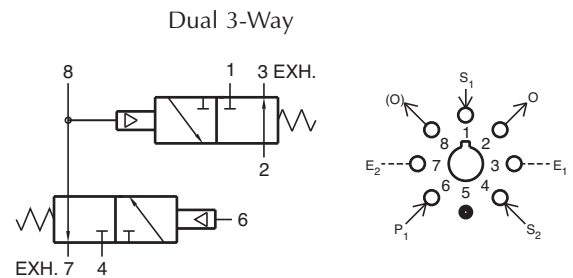
Performance:

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

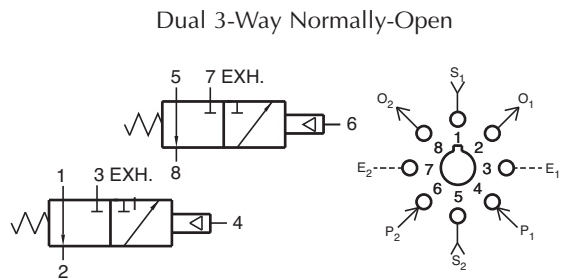
Performance:

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



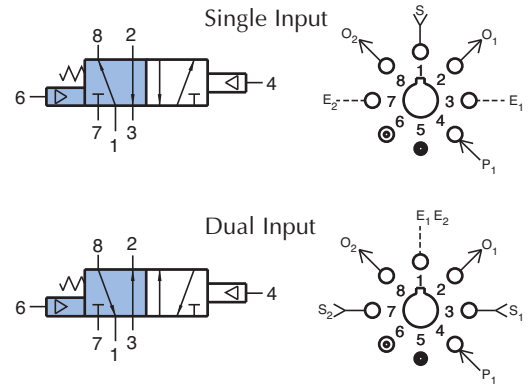
4-Way Valve

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



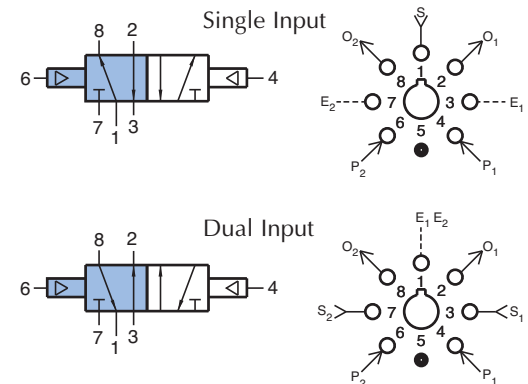
4-Way Valve

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

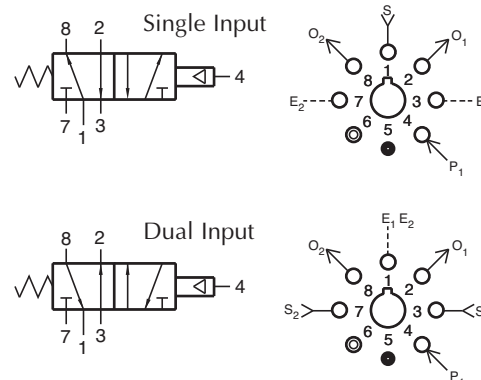
Performance:

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:

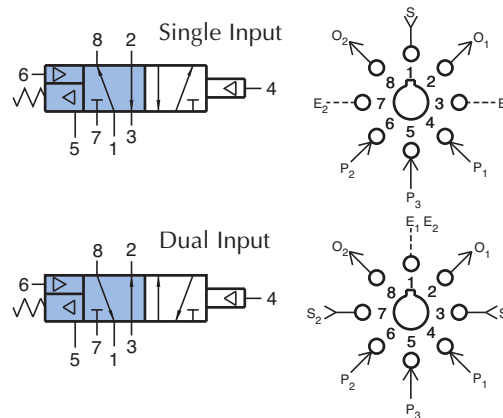
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars

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.



MODULAR 4-WAY VALVES

R-412

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
- Reset feature allows for fail safe circuit design

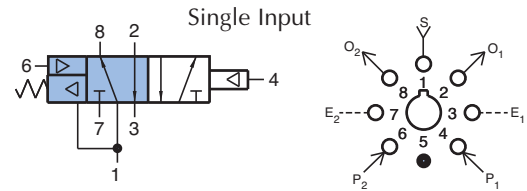
Performance:

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

Features:

- Micro gap construction - snap action and no blow by
- Three positions
- Balanced design allows speed control at exhausts

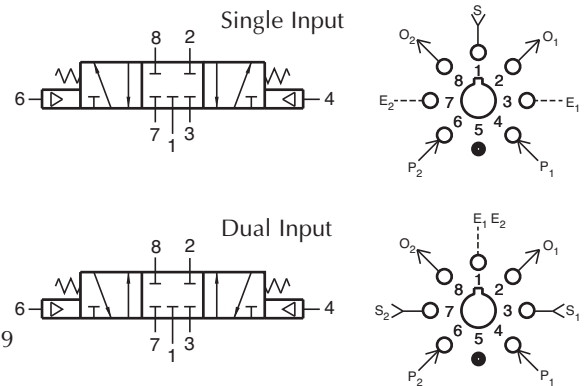
Performance:

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.

MODULAR 4-WAY TWIN PILOT VALVES



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

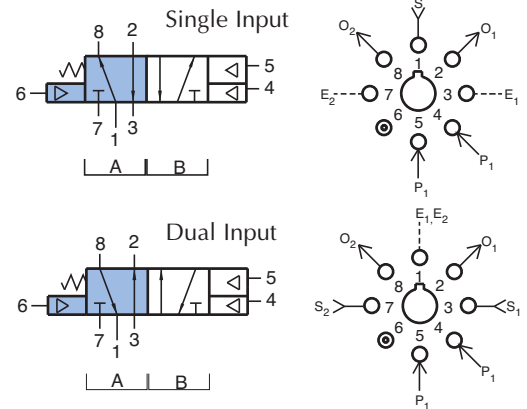
Performance:

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:

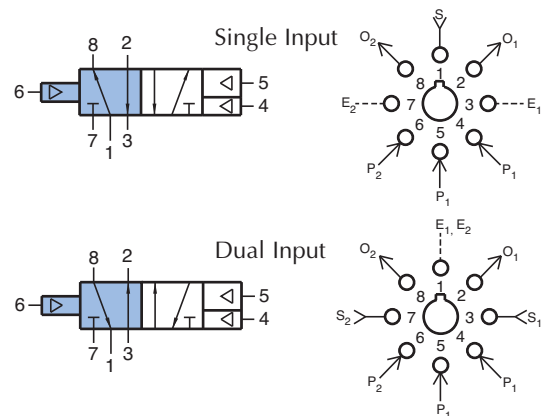
- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

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.





MODULAR 4-WAY TWIN PILOT VALVES

R-433

Twin Pilot 4-Way Valve



Features:

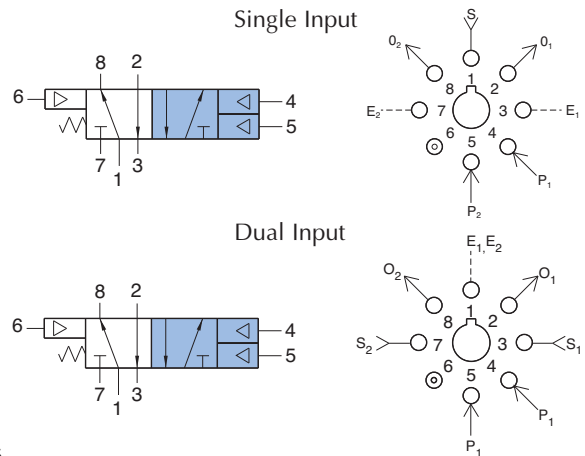
- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

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

Description:

R-433 is a 5 ported, 4-way valve, with spring return and dual pilots.



R-434

Twin Pilot 4-Way Valve



Features:

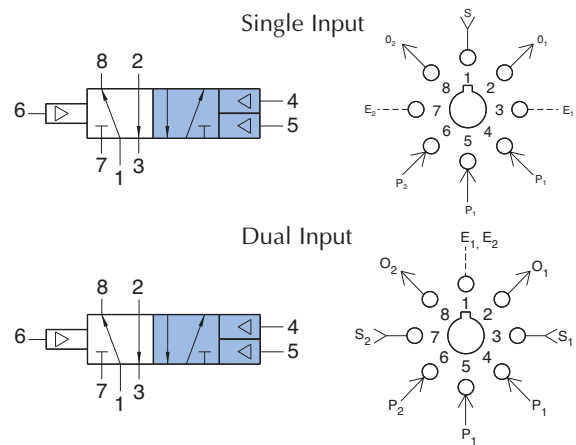
- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

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

Description:

R-434 is a 5 ported, 4-way, two position, double piloted valve.



R-436

Dual Twin Pilot 4-Way Valve



Features:

- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

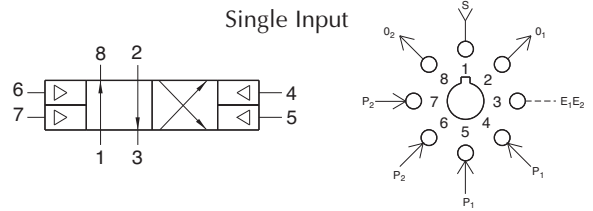
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars

Pilot Pressure Minimum: 20 psig; 1.4 bars

Temperature: 32 to 180°F

Working Pressure: 0 to 150 psig; 0 to 10.3 bars

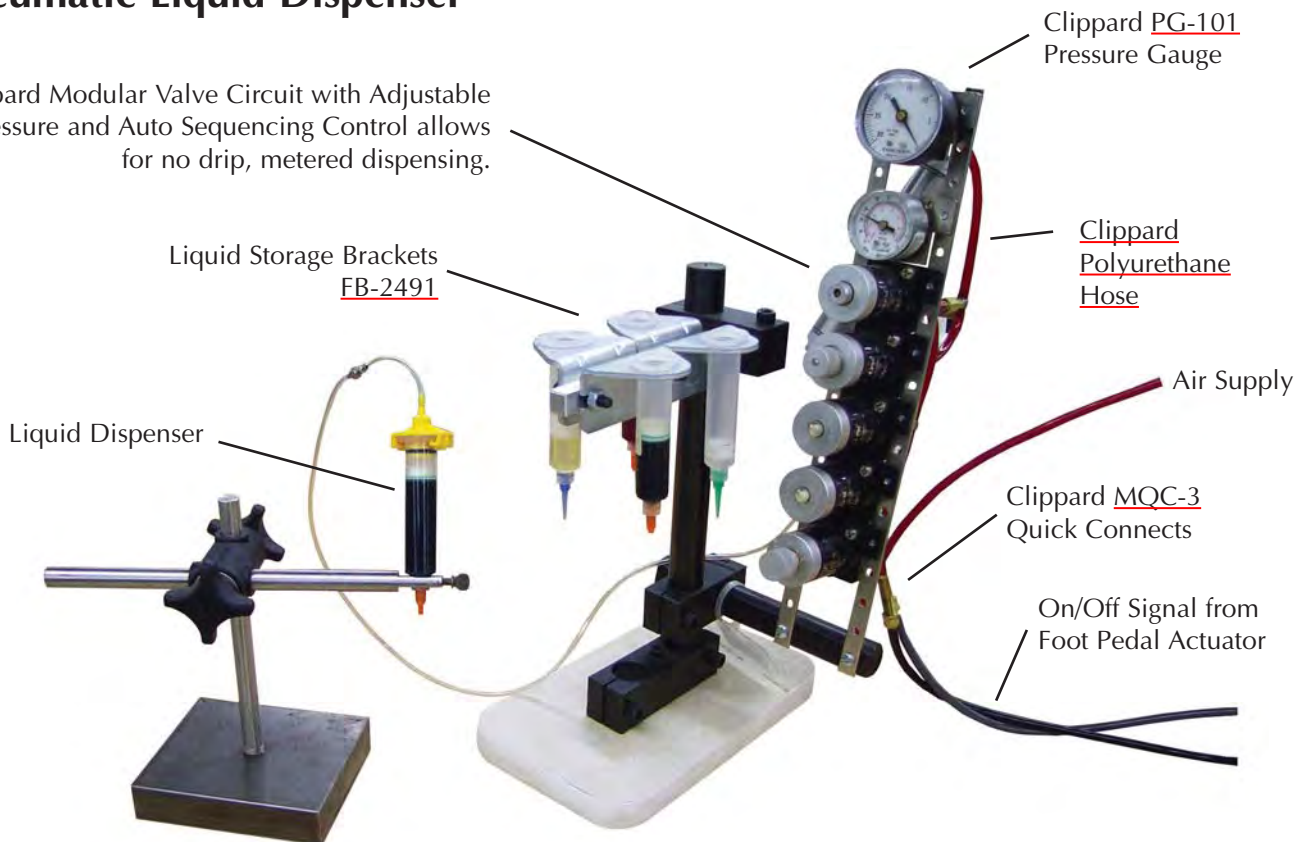


Description:

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

Clippard Modular Valve Circuit with Adjustable Pressure and Auto Sequencing Control allows for no drip, metered dispensing.



This device precisely meters small amounts of liquids to parts with no drip or mess. It is made entirely of Clippard components.



MODULAR 4-WAY BLEED PILOT VALVES

R-441



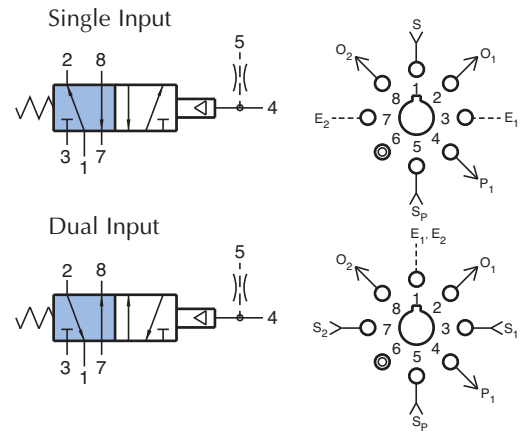
4-Way Valve

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



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



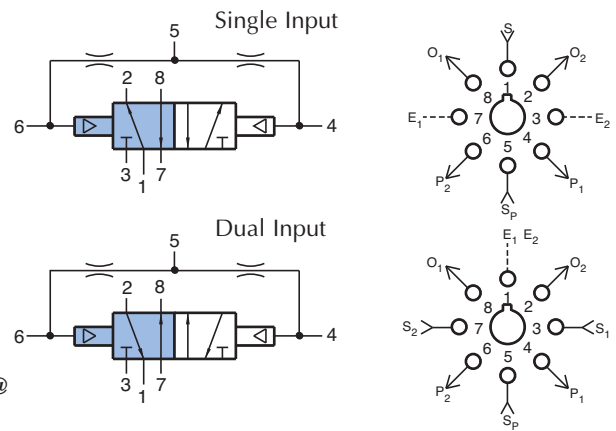
4-Way Valve

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



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



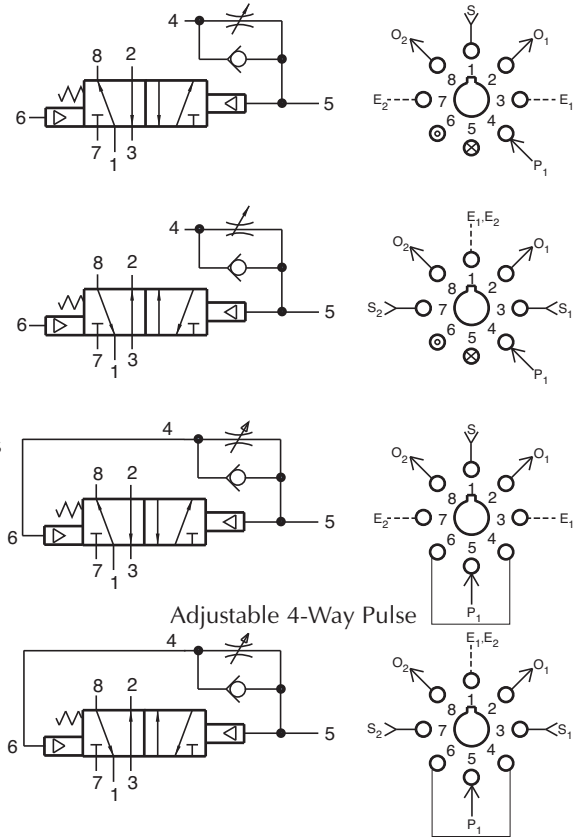
4-Way Delay Valve

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



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



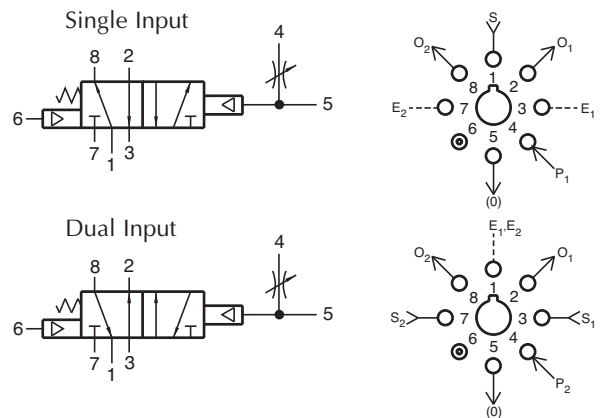
4-Way Delay Valve

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



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.



MODULAR 4-WAY VALVES

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

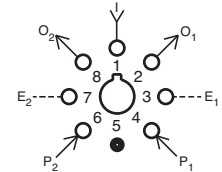
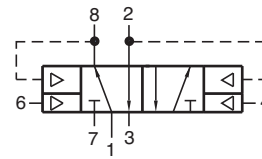
Performance:

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/R-412 valve to provide a single input flip-flop (binary sub-circuit).

R-453



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:

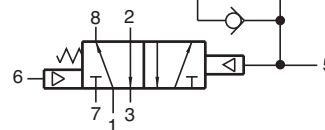
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars

Pilot Pressure Minimum: 40 psig; 2.8 bars

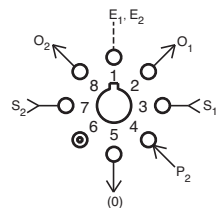
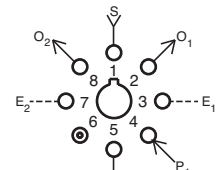
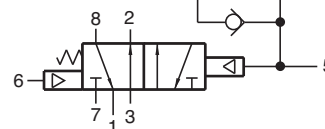
Temperature: 32 to 180°F

Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Single Input



Dual Input



Description:

R-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



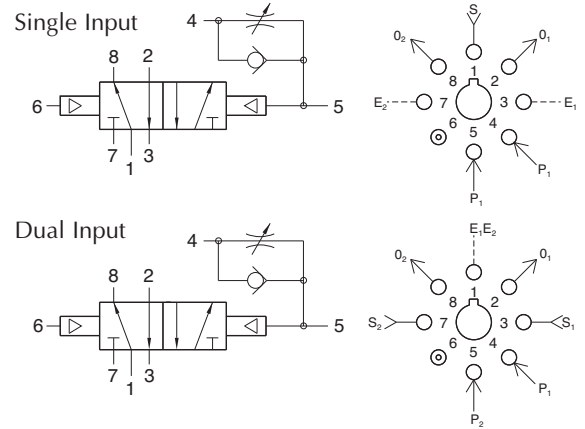
4-Way Delay Valve

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



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



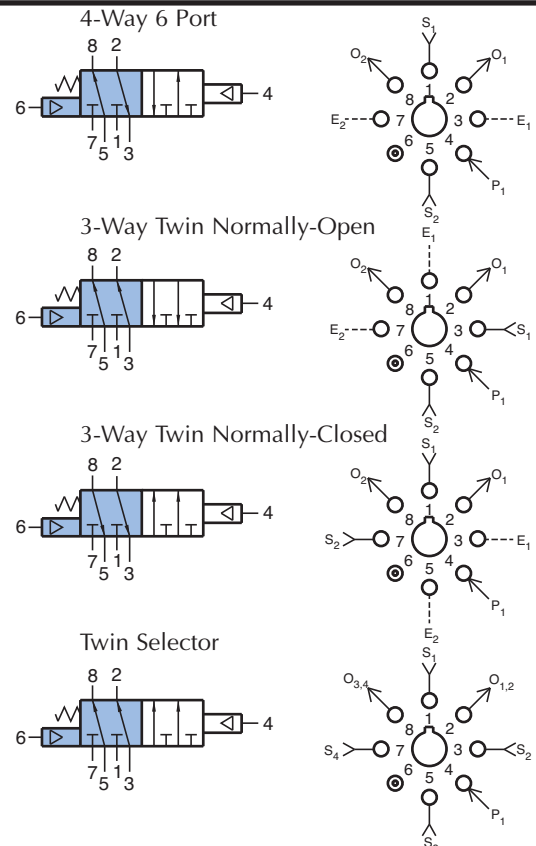
4-Way Valve, 6-Ported

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



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.



MODULAR 4-WAY VALVES

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

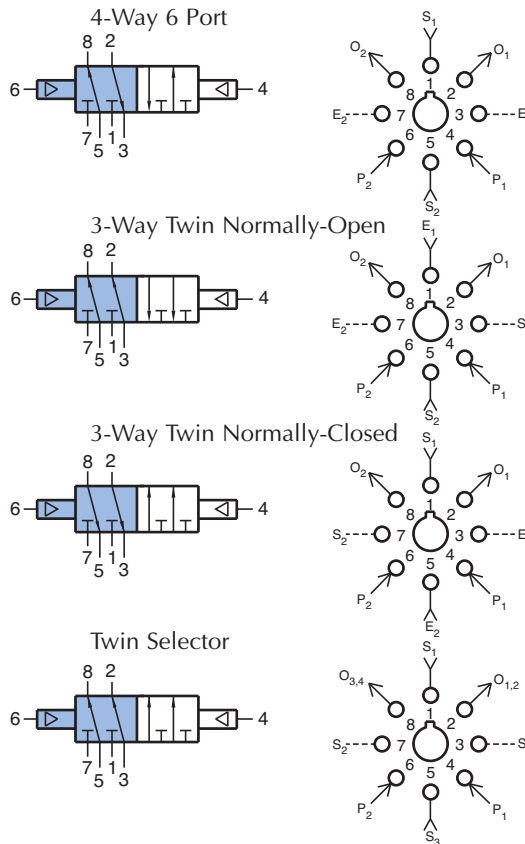
Performance:

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.



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

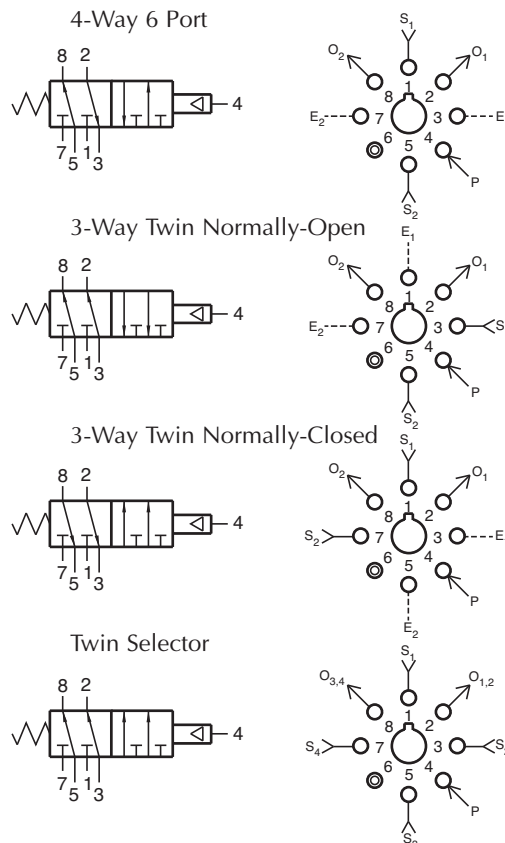
Performance:

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.



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

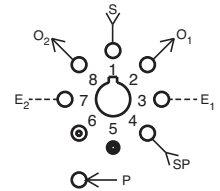
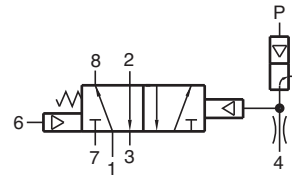
Pilot Pressure (psig) Minimum: 8" H₂O on 1" H₂O off

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

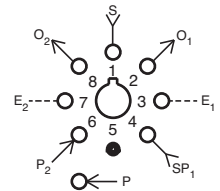
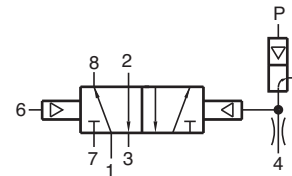
Pilot pressure (psig) Minimum: 8" H₂O on 1" H₂O off

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.



MODULAR 4-WAY ELECTRONICALLY PILOTED VALVES

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:

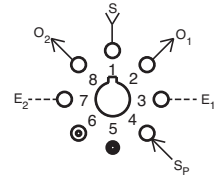
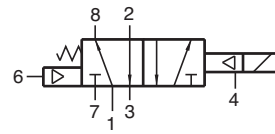
Working Range: 0 to 150 psig; 0 to 10.3 bars

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

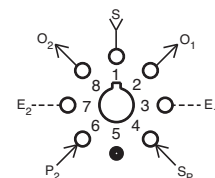
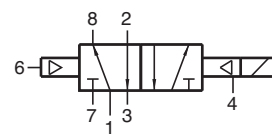
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars

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

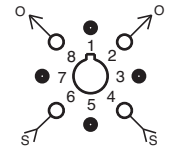
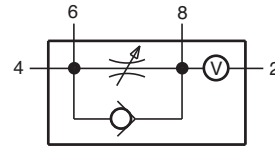
Performance:

Flow: 0 to 1 scfm @ 100 psig; 0 to 28.3 l/min

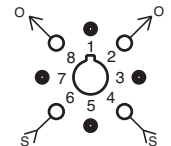
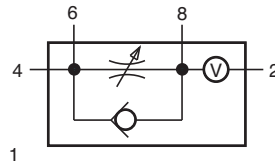
Temperature: 32 to 180°F

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

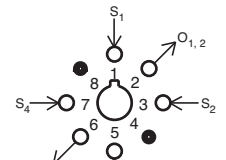
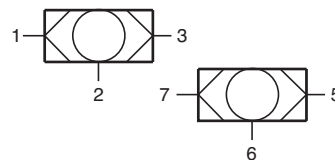
Performance:

Flow: 10 scfm @ 100 psig; 283 l/min @ 6.9 bars

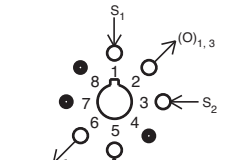
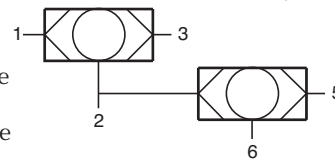
Temperature: 32 to 180°F

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.



MODULAR REGULATOR & PULSE VALVES

R-701

Pressure Regulator

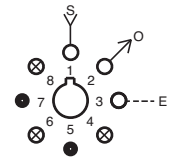
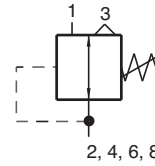


Features:

- 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

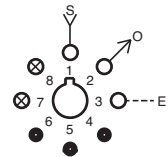
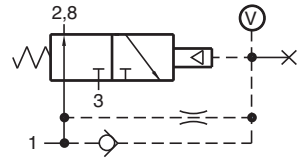


Features:

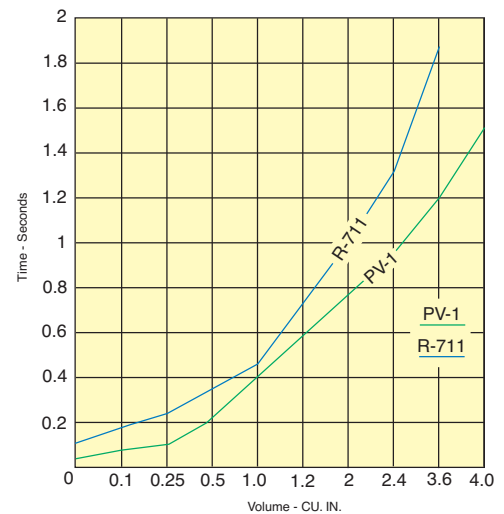
- Multiple porting speeds piping
- Micro Gap Construction - snap action and no blow by
- Complete function in one module

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:

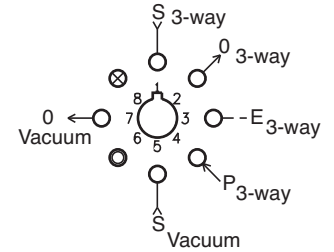
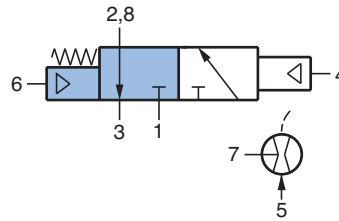
3-Way Valve

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 270](#).

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:

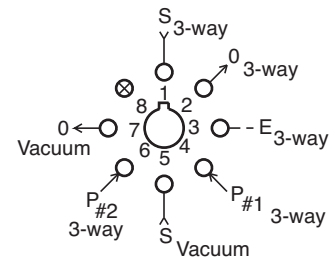
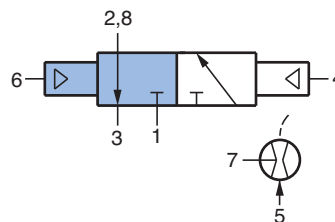
3-Way Valve

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 270](#).



VACUUM GENERATOR

R-781-□



Modular Vacuum Generator

Turn Vacuum on/off

Features:

- Micro gap construction - snap action and no blow by

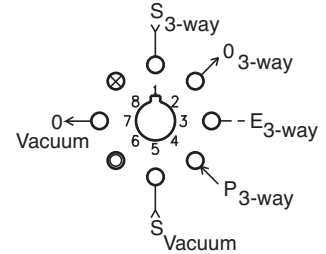
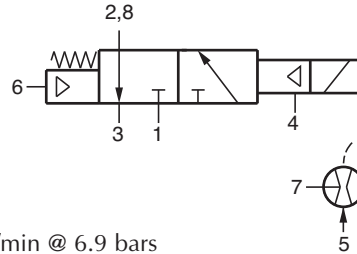
Performance:

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	<u>R-781-6</u>	6 VDC
	<u>R-781-12</u>	12 VDC
	<u>R-781-24</u>	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 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 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

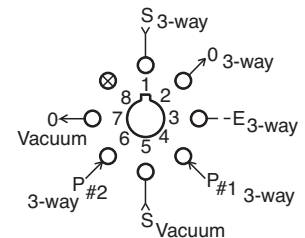
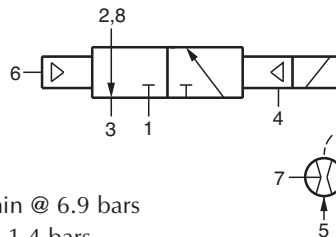
Performance:

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	<u>R-782-6</u>	6 VDC
	<u>R-782-12</u>	12 VDC
	<u>R-782-24</u>	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.

MODULAR VACUUM GENERATOR



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.

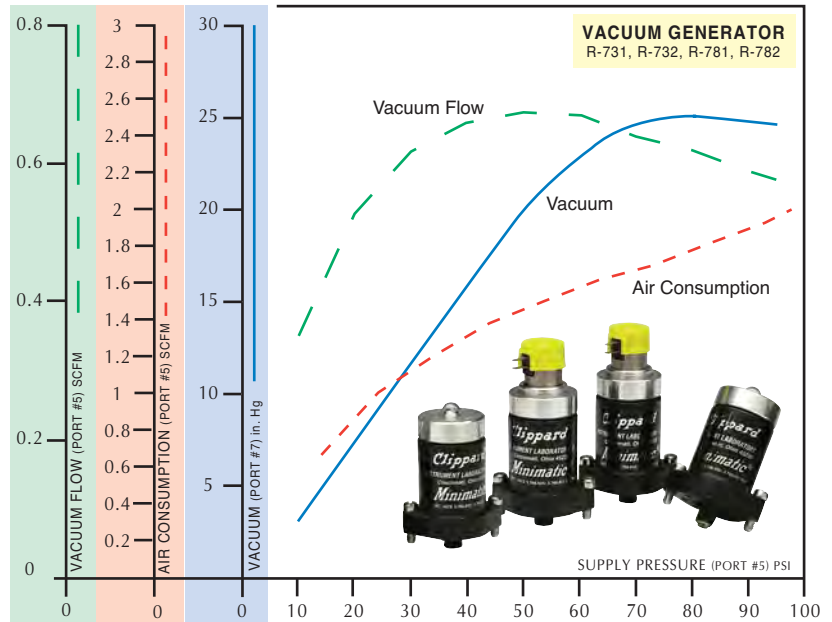
The venturi vacuum generator provides a low cost vacuum source with no required maintenance. It contains a large flow path in a design that is self-cleaning, eliminating the need for a filtered air supply.

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.

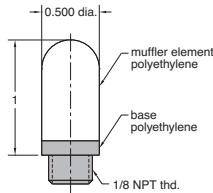
Performance: Clippard modular vacuum generators provide high vacuum flow with high vacuum levels and are field adjustable. The adjustment screw at the base of the modular allows setting to the optimum performance needed to perform the task.



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-111-10 subplate.



Gauge VG-30

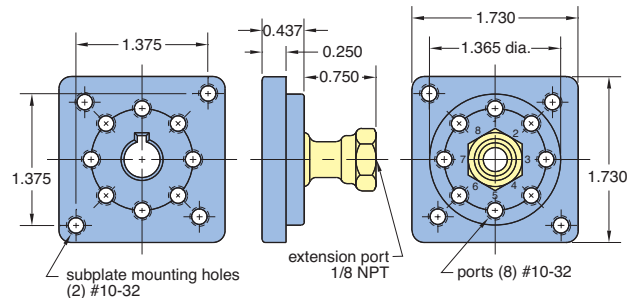
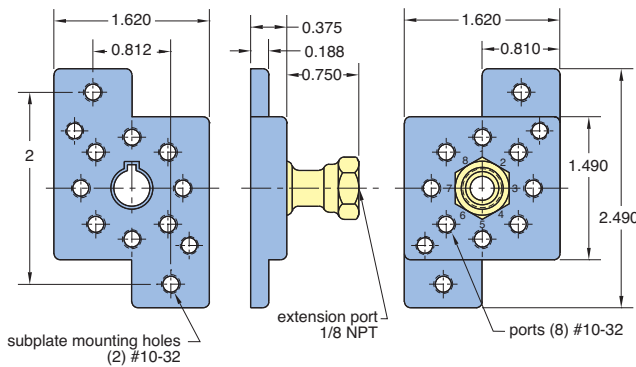


Inlet Vacuum: scale reading from 0 to -30 in. Hg. & 0 to -1 bar

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.





MODULAR VOLUME CHAMBER, FILTER & SEQUENCE VALVE

R-801



Filter

Features:

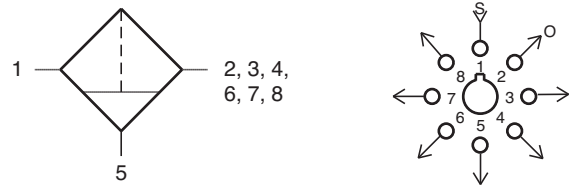
- Multiple porting speeds piping
- Clean out port for easy maintenance
- Protects system - assures proper functioning
- Replaceable filter element (Part no. R-801-14)

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

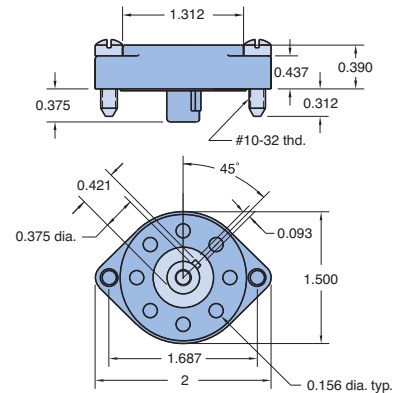


Connector

Connects to subplate R-101/R101-M5, R-111/R-111-M5 and manifolds

Description:

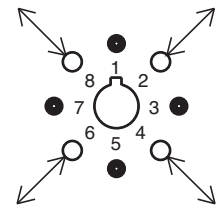
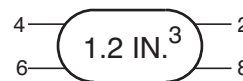
R-811 is an octoport connector that provides rapid and accurate connection of up to eight hoses. Truly a convenience connection; saves time; eliminates mistakes.



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

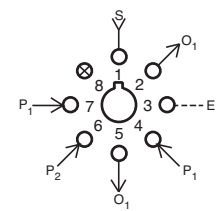
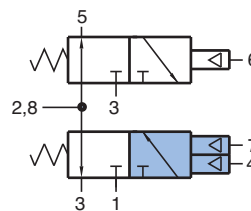
Performance:

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



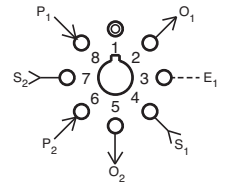
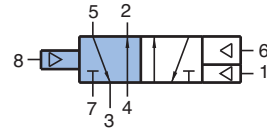
Sequence Valve

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



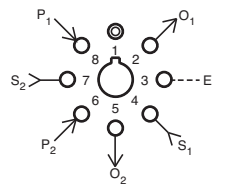
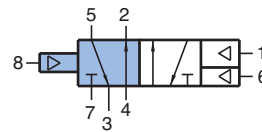
Sequence Valve

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.



MODULAR ELECTRONIC SEQUENCING VALVES

R-982-□

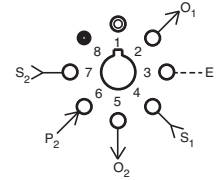
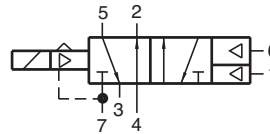
Electronic Piloted Sequence Valve

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	<u>R-982-6</u>	6 VDC
	<u>R-982-12</u>	12 VDC
	<u>R-982-24</u>	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-□

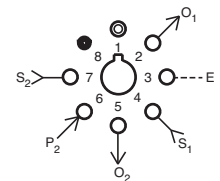
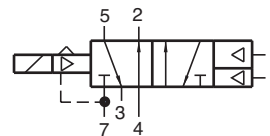
Electronic Piloted Sequence Valve

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	<u>R-984-6</u>	6 VDC
	<u>R-984-12</u>	12 VDC
	<u>R-984-24</u>	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.

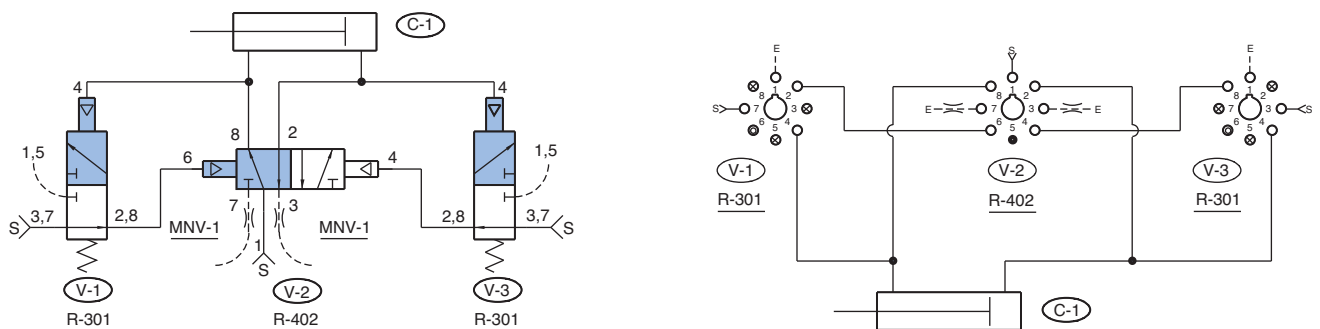
Initial Approach to Designing a Pneumatic Control

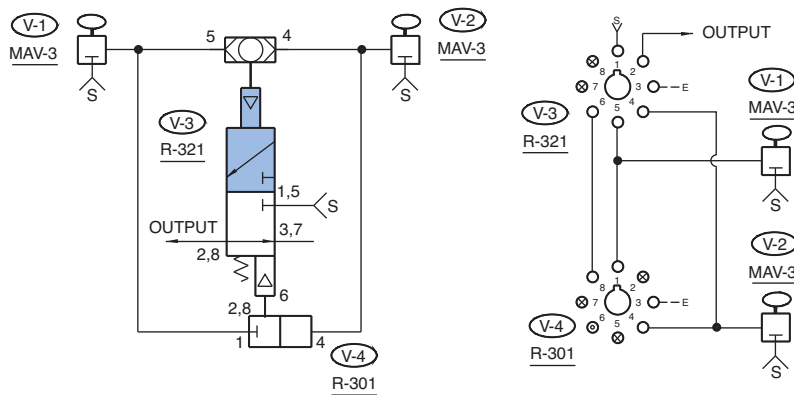
1. Have a clear verbal understanding of the sequence of operations desired.
2. Put down on paper:
 - A. Manual controls necessary or required and what their function is to be.
 - B. Other available input signals from:
 1. Limit valves
 2. Sensors
 3. Other controls or control media
 - C. All output devices (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.

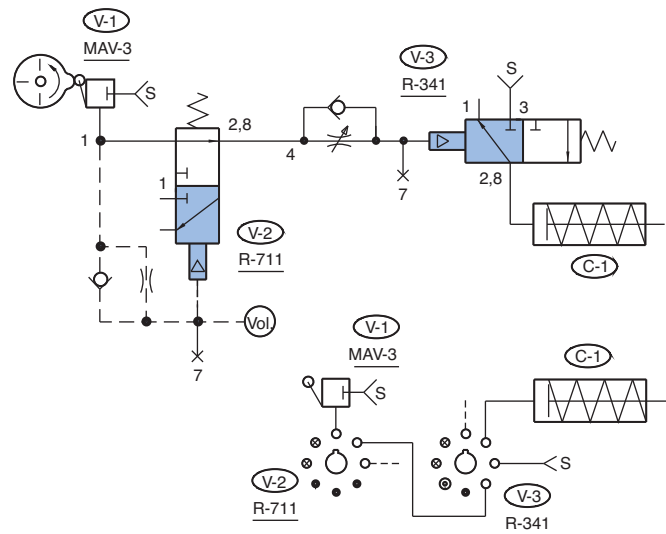
Circuit Function

INPUTS	V-1	off	off	on	on
	V-2	off	on	off	on
OUTPUT	V-3	off	on	on	off

Motion Sensing Circuit

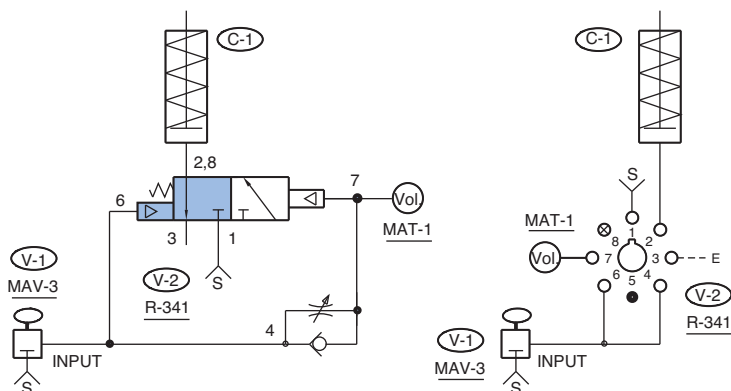
V-1 is actuated by rotary or linear cam. Pressure from V-1 goes to a pulse valve (V-2) where it is converted to a uniform pulse each time V-1 is actuated. Each pulse goes through the check valve of V-3 and holds the pilot down on the valve. C-1 is retracted. The pressure holding the pilot of V-3 is constantly 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.



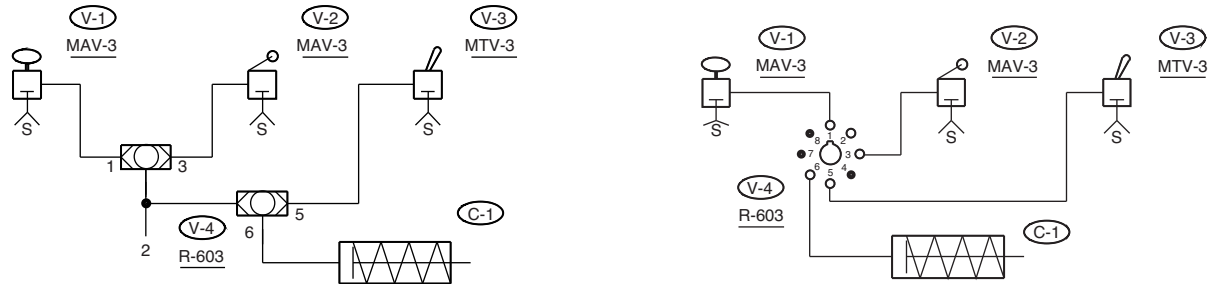
Signal Release Pulse Circuit

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.



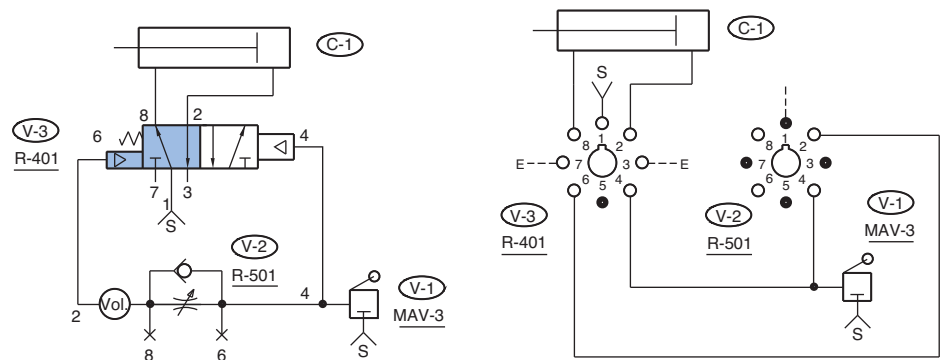
Use of Shuttle Valves

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.



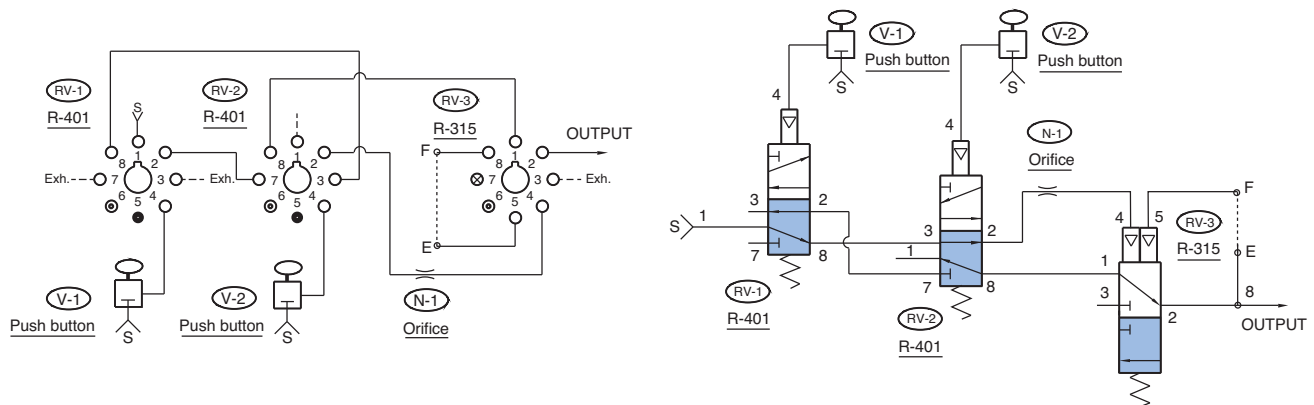
Adjustable 4-Way Pulse

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.



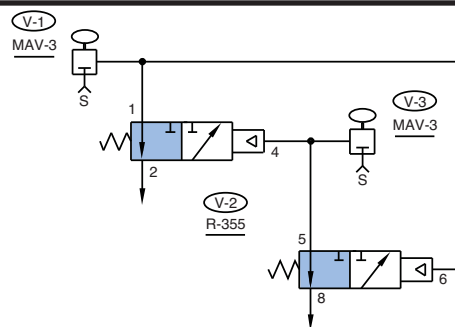
Two-Hand, No-Tie-Down

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.

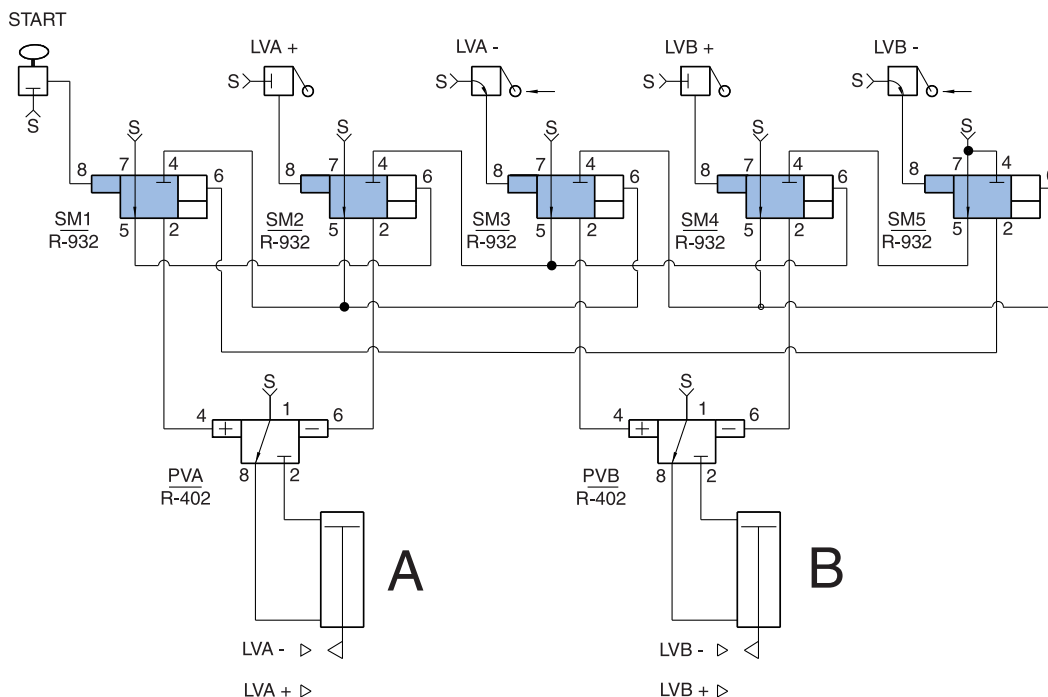
In inactive mode, LVA- and LVB- are held passing, supplying pressure to port 8 of both SM3 and SM5. The valves will not actuate because there is air already at port 6 which connects to a larger pilot.

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.

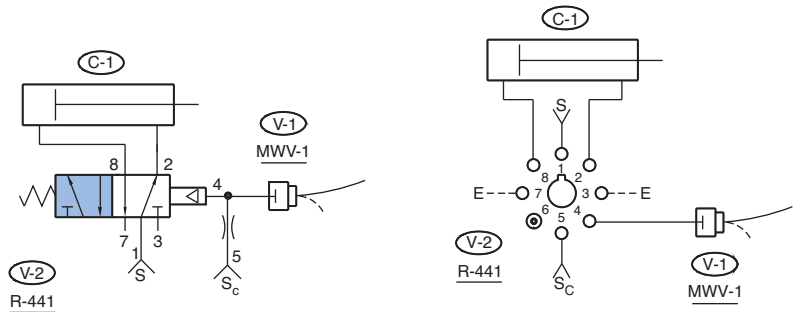
It is important to remember the input signals can come from other types of input devices such as: proximity sensors, gap sensors, back pressure sensors, pressure sensors, limit valves, electronic Hall Effect sensing, liquid level sensing, part sensing, etc.

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.

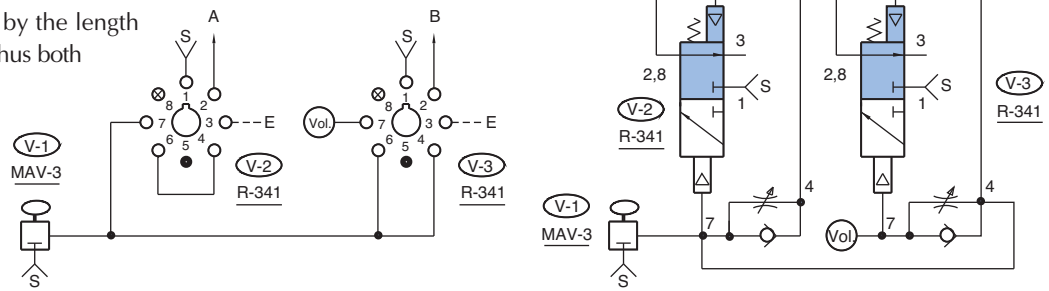


Unique Open-Close Pulse Circuit

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.

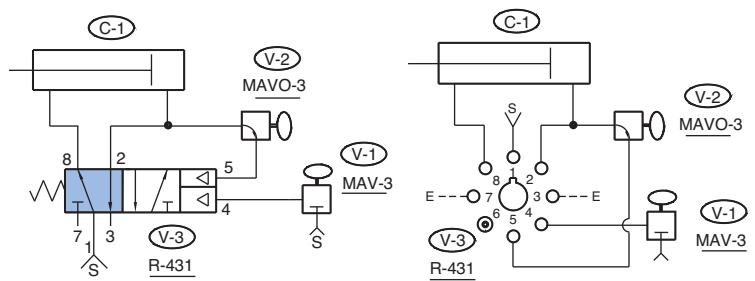
When V-1 is released, a pulse occurs at "B".

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.



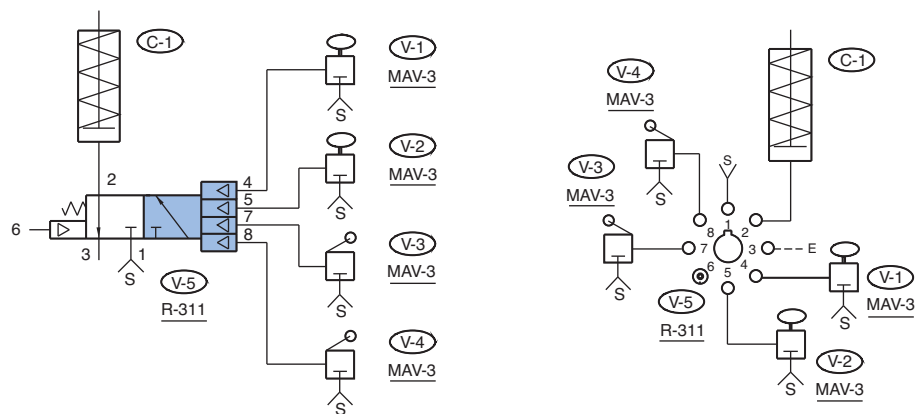
"Latch" Circuit

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.



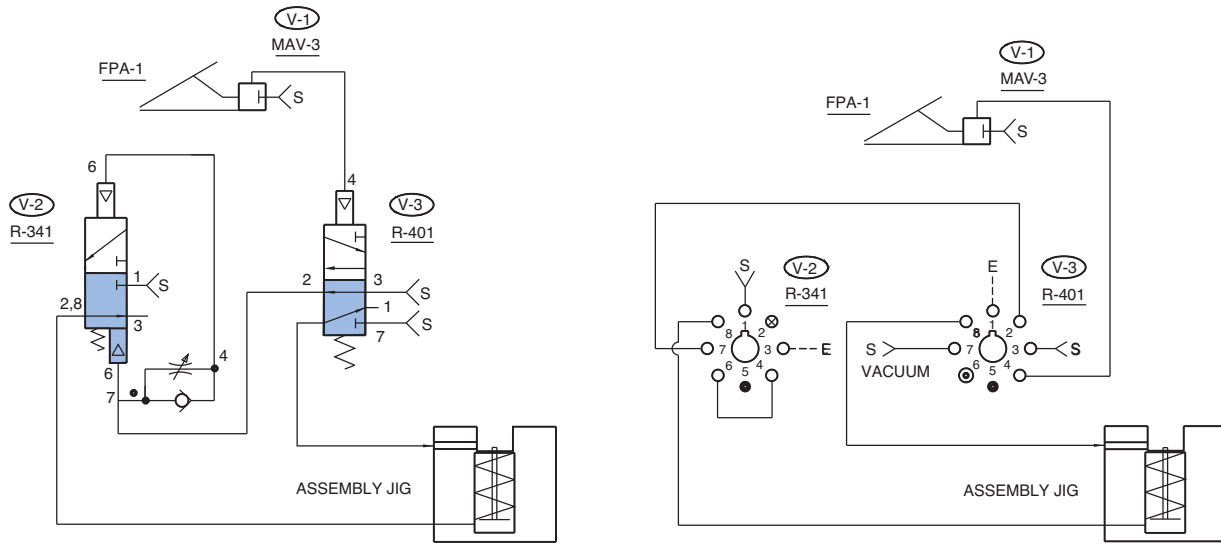
"Active Or" Circuit

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).



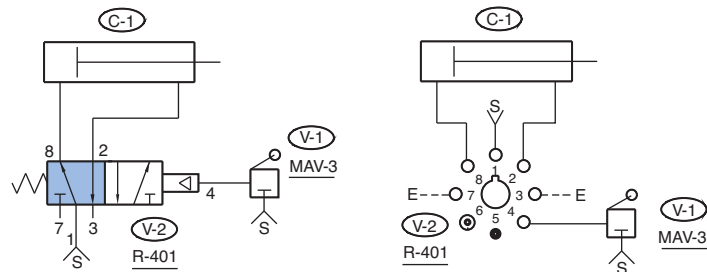
Assembly Jig Control

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.



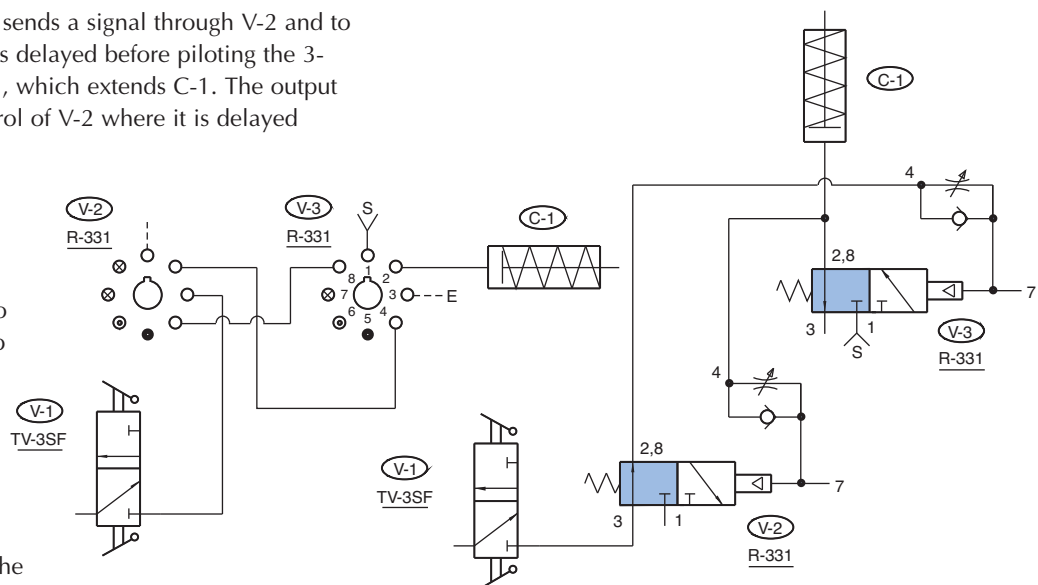
Piloted 4-Way Valve

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.



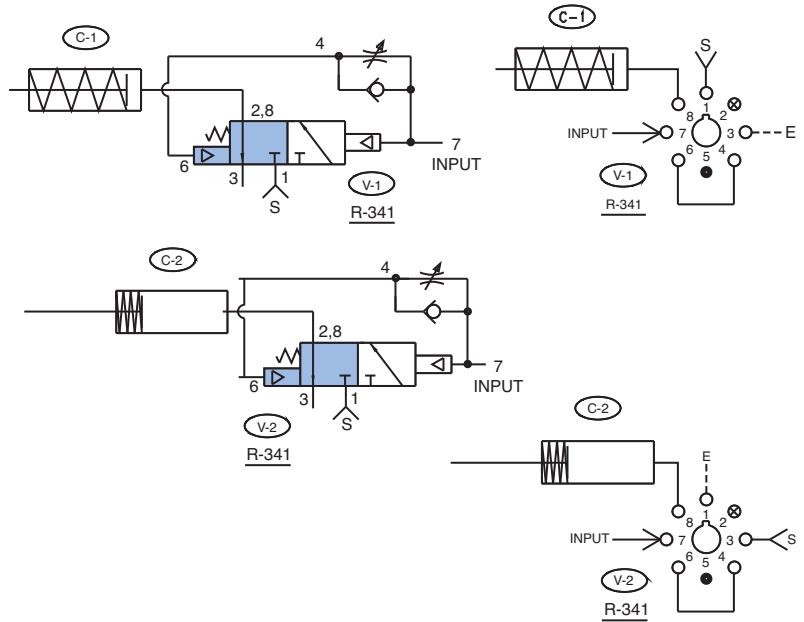
Automatic Cycler

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.

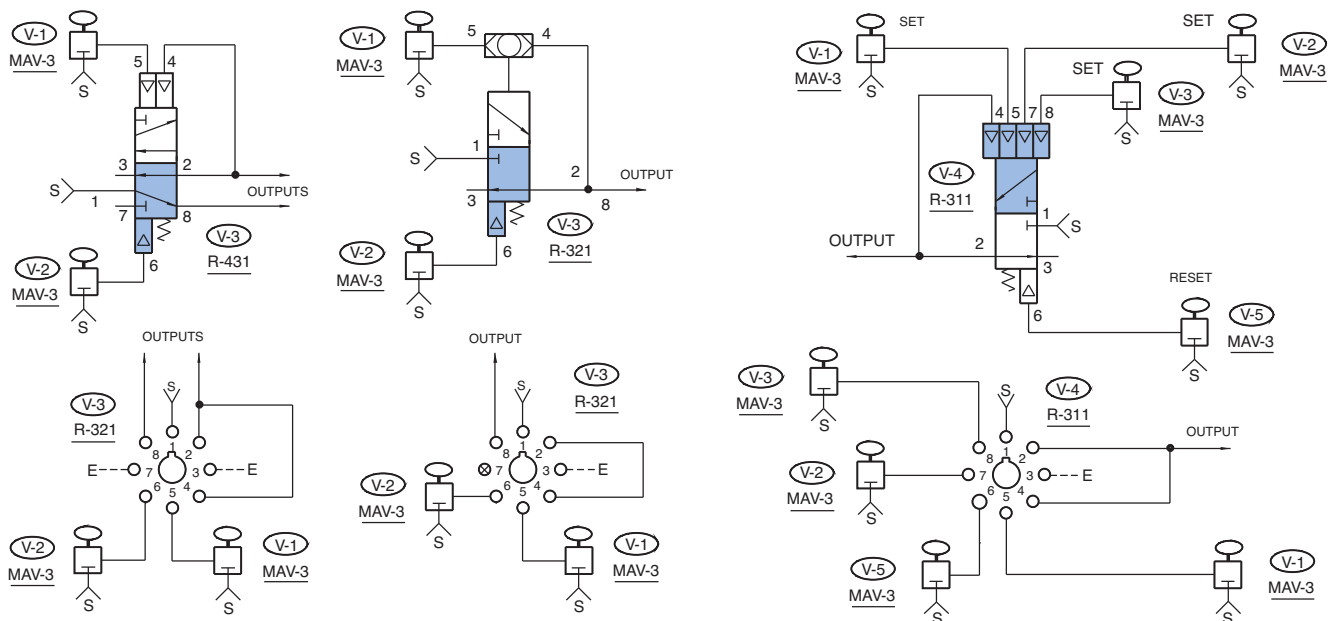


Set-Reset Circuits

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.

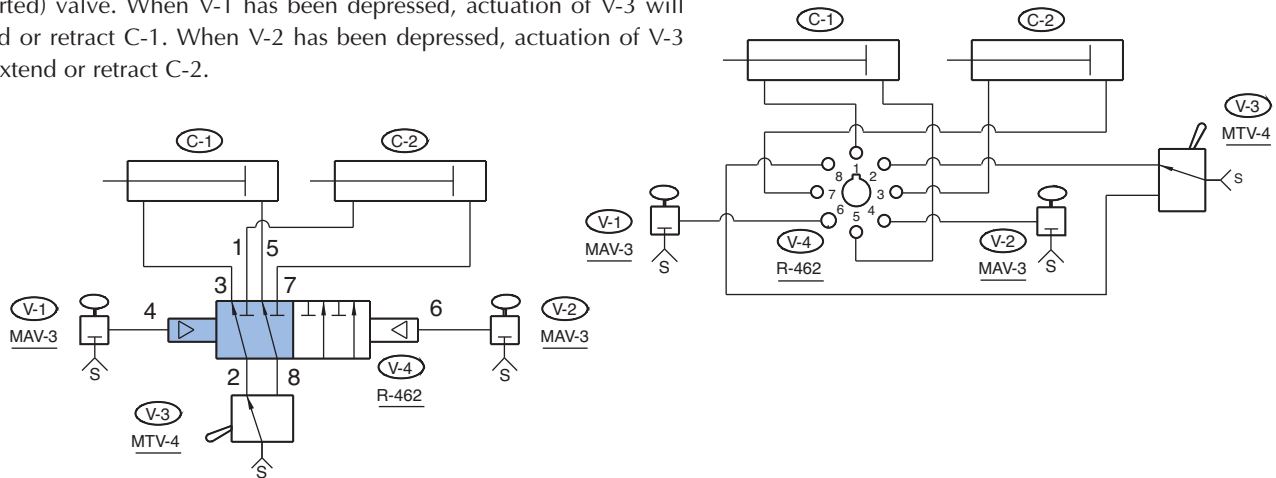
A set occurs when a valve is actuated and part of the output is used to hold the valve in the actuated position, even though the original pilot signal may be gone.

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.



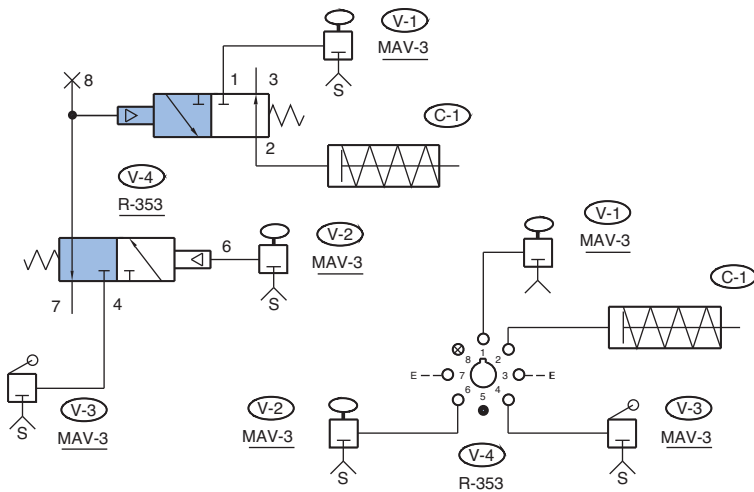
Six Ported 4-Way

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.



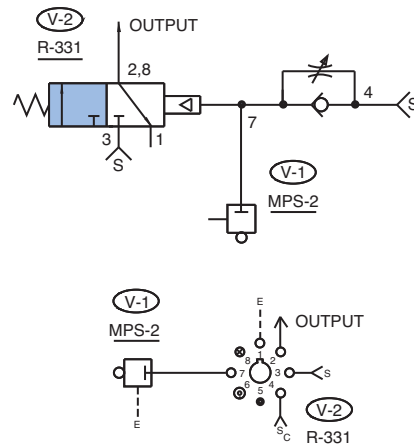
Three Input "And"

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.



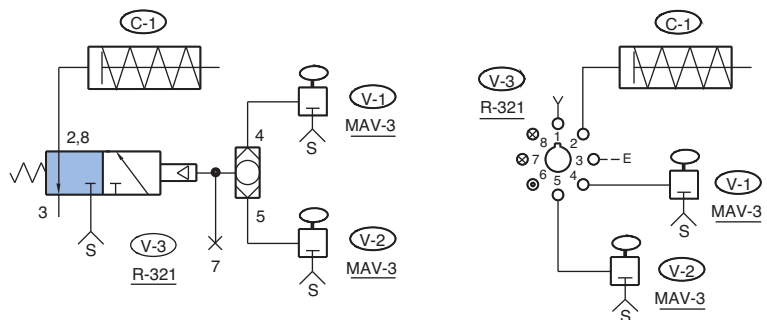
Exhaust Piloted 3-Way Valve

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.



Clippard Instrument Laboratory has pioneered the miniature pneumatic industry. We have an expansive line of components that are used in thousands of applications across many markets. It is this experience and knowledge of our own products that is now available to our customers when collaborating with Clippard to develop the right solution. Our production, engineering, and sales staff will come together with your organization to design, build, QC, and ship your pneumatic assembly when you need it.

Our goal is to optimize a systems design, to increase performance, reduce cost, and allow our customers to concentrate on their core competencies.



Clippard offers the following services:

- Pneumatic Assemblies
- Special Manifold Designs
- Manifold Assemblies
- Pneumatic Circuit Design
- Control Boxes
- Fitting & Tubing Harnesses
- Component Kitting
- Specialized Testing
- KanBan Services



Adding Value is Our Business!

Advantages

- 100% tested sub-assemblies
- Less component stock/inventory
- Fewer vendors and purchase orders
- Requires less manufacturing time
- Increase production efficiency
- Specialized support
- Overall cost reduction
- Taking advantage of Clippard's expertise



Clippard's Integrated Solutions team designed a simple, straight-forward approach for piloting process valves. This assembly greatly simplifies the installation and ease-of-use for the OEM design engineer.

Clippard has a unique advantage by providing custom products and value-added assemblies based on the most successful miniature pneumatic line in the world.



MINIMATIC® FITTINGS



Push-Quick Fittings

Fittings are easy to install, and provide high flow. Threaded and non-threaded available.

See pages 290 - 298.



Barb Fittings

Fittings are available with 1/16", 3/32" or 1/8" hose barbs, #10-32 thread and 1/8" NPT.

See pages 299 - 306.



Compression Fittings

Join standard size pipe to tubing with a convenient ferrule design.

See page 306.



Nipples & Connectors

Used for coupling various cylinders, valves, fittings and other components together.

See page 307.



Threaded Fittings

Offered with #10-32 and 1/8" NPT threads. "L", "T" and "X" configurations.

See page 308.



Adapters & Reducers

Adapt your fittings to the right positions and threads.

See pages 308 - 309.



Bulkhead Fittings

Provide rigid connection through panels or bulkheads up to 1/2" thick.

See page 310.

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.



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.

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.



Plugs

Offered for use to plug unused openings in fittings, manifolds and more.

See pages 310 - 311.

Mufflers

Provides muffled exhaust for quiet system operation.

See page 312.

Manifolds

Ideal for grouping pneumatic valves and other components in applications where space is limited.

See pages 312 - 314.

Quick Connect Fittings

A body and cap assembly which enables fast and easy connection, and tight shut-off when disconnected.

See pages 315 - 318.

Air Jets

Deliver a concentrated flow of air or liquid to a designated location.

See page 319.

Fittings Kits

A variety of the most commonly used fittings and quick connects to save time and avoid delays.

See pages 320 - 321.

Hose & Tubing

Sizes from 1/8" to 1/2" OD in various materials, colors and styles.

See pages 322 - 327.

Tips & Tools

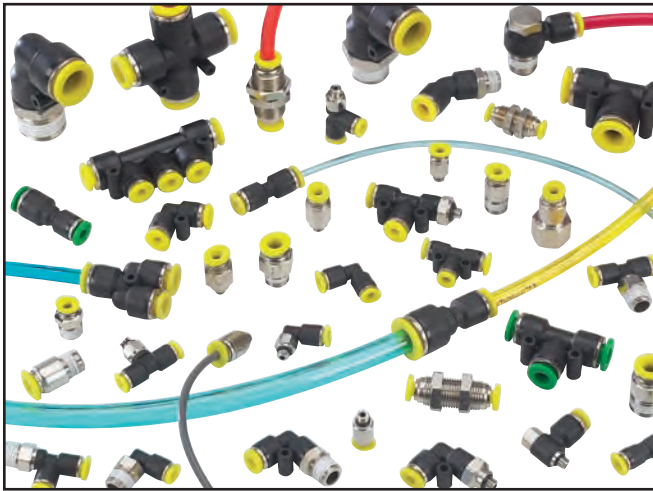
These are provided throughout this section to assist with designing the most efficient pneumatic systems.

See pages 290, 298 - 299, 301, 309, 311, 318, 322 and 327.





PUSH-QUICK FITTINGS



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 to 29.5" Hg

Temperature Range: 32 to 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 nine 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.

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.

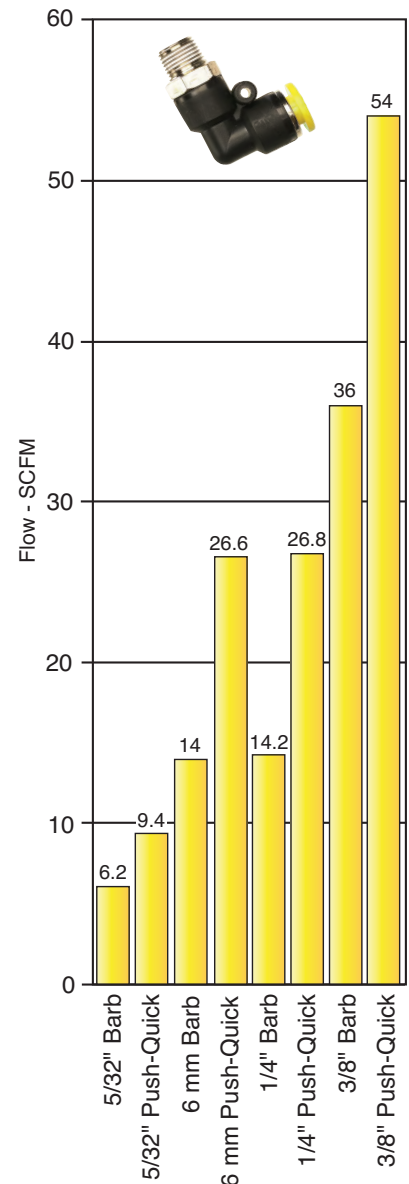
Installation of Pipe Fittings with Pre-Applied sealant

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

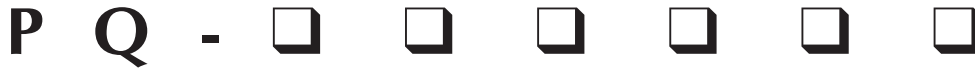
Barb vs Push-Quick Fittings
Flow Comparison @ 100 psig



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 322 through 327 for hose and tubing



Fitting Type		Thread Size
BC - Bulkhead Connector	MA - Male Angle Connector	N - #10-32
BT - Branch Tee	MC - Male Connector	5 - M5 Thd.
BU - Bulkhead Union	ME - Male Elbow	6 - M6 Thd.
CC - Compact Male Conn.	MM - Male Manifold	P - 1/8" NPT
CU - Cross Union	MU - Manifold Union	R - R1/8
EE - Extended Elbow	PE - Plug-In Elbow	Q - 1/4" NPT
ER - Elbow Reducer	PG - Plug	2 - R1/4
EU - Elbow Union	RB - Reduced Branch	W - 3/8" NPT
FC - Female Connector	RT - Run Tee	3 - R3/8
FE - Female Elbow		Z - 1/2" NPT
		04 - 1/8" (0.125")
		04M - 4 mm (0.157")
		05 - 5/32" (0.156")
		06M - 6 mm (0.236")
		08 - 1/4" (0.250")
		08M - 8 mm (0.313")
		10 - 5/16" (0.313")
		12 - 3/8" (0.375")
		16 - 1/2" (0.500")

Threaded Fittings



Female Connector
Page 292



Male Compact Connector
Page 292



Male Connector
Page 292



Bulkhead Connector
Page 296



Male Angle Connector
Page 295



Y Connector
Page 294



Female Elbow
Page 294



Male Elbow
Page 293



Extended Elbow
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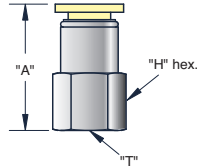
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PUSH-QUICK FITTINGS

Female Connector

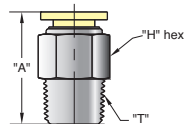
(10/pack)



Tube	Thread "T"	Part No.	"A"	"H" Hex.
5/32"	#10-32	PQ-FC05N	0.905"	7/16"
	1/8" NPT	PQ-FC05P	1.080"	9/16"
4 mm*	M5 x 0.8	PQ-FC04M5	0.905"	12 mm
	R1/8	PQ-FC04MR	1.080"	
6 mm*	R1/8	PQ-FC06MR	1.080"	14 mm
	R1/4	PQ-FC06M2	1.100"	17 mm
1/4"	1/8" NPT	PQ-FC08P	1.080"	9/16"
	1/4" NPT	PQ-FC08Q	1.220"	11/16"
5/16"	1/8" NPT	PQ-FC10P	1.170"	11/16"
	1/4" NPT	PQ-FC10Q	1.250"	11/16"
	3/8" NPT	PQ-FC10W	1.260"	7/8"
8 mm*	R1/8	PQ-FC08MR	1.170"	17 mm
	R1/4	PQ-FC08M2	1.170"	17 mm
	R3/8	PQ-FC08M3	1.250"	19 mm
3/8"	1/4" NPT	PQ-FC12Q	1.380"	7/8"
	3/8" NPT	PQ-FC12W		

Male Connector

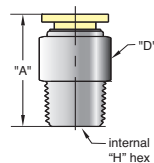
(10/pack)



Tube	Thread "T"	Part No.	"A"	"H" Hex.
1/8"	#10-32	PQ-MC04N	0.899"	
	1/8" NPT	PQ-MC04P	0.836"	7/16"
	1/4" NPT	PQ-MC04Q	0.920"	
5/32"	#10-32	PQ-MC05N	0.899"	7/16"
	1/8" NPT	PQ-MC05P	0.836"	7/16"
	1/4" NPT	PQ-MC05Q	0.920"	9/16"
4 mm*	M5 x 0.8	PQ-MC04M5	0.899"	10 mm
	R1/8	PQ-MC04MR	0.836"	
6 mm*	M5 x 0.8	PQ-MC06M5	0.948"	12 mm
	R1/8	PQ-MC06MR	0.878"	12 mm
	R1/4	PQ-MC06M2	0.873"	14 mm
1/4"	#10-32	PQ-MC08N	0.913"	1/2"
	1/8" NPT	PQ-MC08P	0.913"	1/2"
	1/4" NPT	PQ-MC08Q	0.965"	9/16"
	3/8" NPT	PQ-MC08W	0.965"	11/16"
5/16"	1/8" NPT	PQ-MC10P	1.090"	9/16"
	1/4" NPT	PQ-MC10Q	1.050"	9/16"
	3/8" NPT	PQ-MC10W	1.060"	11/16"
8 mm*	M5 x 0.8	PQ-MC08M5	1.030"	14 mm
	R1/8	PQ-MC08MR	1.030"	14 mm
	R1/4	PQ-MC08M2	1.060"	14 mm
	R3/8	PQ-MC08M3	0.950"	17 mm
3/8"	1/8" NPT	PQ-MC12P	1.280"	11/16"
	1/4" NPT	PQ-MC12Q	1.342"	11/16"
	3/8" NPT	PQ-MC12W	1.241"	11/16"
	1/2" NPT	PQ-MC12Z	1.240"	7/8"
1/2"	1/4" NPT	PQ-MC16Q	1.342"	11/16"
	3/8" NPT	PQ-MC16W	1.241"	11/16"
	1/2" NPT	PQ-MC16Z	1.240"	7/8"

Male Compact Connector

(10/pack)



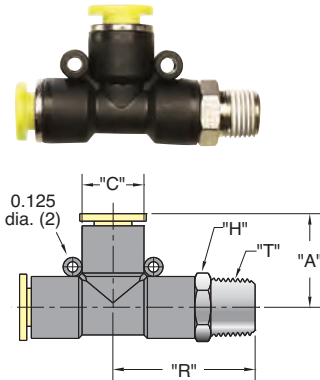
Tube	Thread "T"	Part No.	"A"	"D" Dia.	"H" Hex.
1/8"	#10-32	PQ-CC04N	0.880"	0.410"	5/64"
	1/8" NPT	PQ-CC04P	0.860"		3/32"
5/32"	#10-32	PQ-CC05N	0.890"	0.400"	5/64"
	1/8" NPT	PQ-CC05P	0.840"		3/32"
1/4"	#10-32	PQ-CC08N	0.910"	0.470"	5/64"
	1/8" NPT	PQ-CC08P	0.910"		5/32"
	1/4" NPT	PQ-CC08Q	0.970"		5/32"
3/8"	1/4" NPT	PQ-CC12Q	1.340"	0.670"	7/32"
	3/8" NPT	PQ-CC12W	1.240"		5/16"

* Fittings have a green release button.

Note: Fittings with pipe thread NPT, R1/8, R1/4 and R3/8 are supplied with pre-applied sealant.

Run Tee

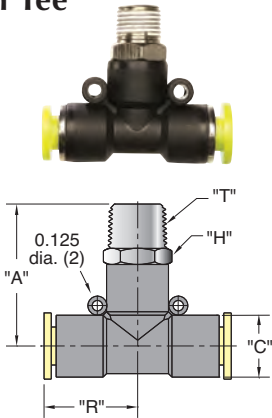
(5/pack)



Tubing	Thread "T"	Part No.	"A"	"C"	"H" Hex.	"R"
1/8"	1/8" NPT	PQ-RT04P	0.722"	0.410"	7/16"	0.980"
5/32"	#10-32 1/8" NPT	PQ-RT05N PQ-RT05P	0.722"	0.410"	7/16"	0.900" 0.980"
4 mm*	M5 x 0.8 R1/8	PQ-RT04M5 PQ-RT04MR	0.722"	0.410"	10 mm	0.900" 0.980"
6 mm*	M5 x 0.8 R1/8 R1/4	PQ-RT06M5 PQ-RT06MR PQ-RT06M2	0.830"	0.524"	12 mm 12 mm 14 mm	1.030" 1.100" 1.140"
1/4"	#10-32 1/8" NPT 1/4" NPT	PQ-RT08N PQ-RT08P PQ-RT08Q	0.840"	0.524"	1/2" 1/2"	1.030" 1.100" 1.230"
5/16"	1/8" NPT 1/4" NPT 3/8" NPT	PQ-RT10P PQ-RT10Q PQ-RT10W	0.880"	0.580"	9/16" 9/16" 11/16"	1.100" 1.230" 1.290"
8 mm*	R1/8 R1/4 R3/8	PQ-RT08MR PQ-RT08M2 PQ-RT08M3	0.880"	0.580"	14 mm	1.290"
3/8"	1/8" NPT 1/4" NPT 3/8" NPT	PQ-RT12P PQ-RT12Q PQ-RT12W	1.100"	0.720"	11/16"	1.380" 1.470" 1.500"

Branch Tee

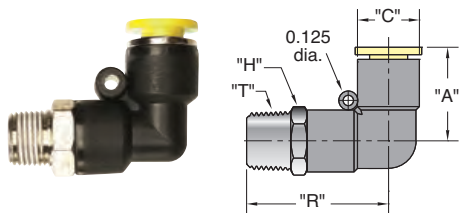
(5/pack)



Tubing	Thread "T"	Part No.	"A"	"C"	"H" Hex.	"R"
5/32"	#10-32 1/8" NPT	PQ-BT05N PQ-BT05P	0.900" 0.980"	0.410"	7/16"	0.722"
4 mm*	M5 x 0.8 R1/8	PQ-BT04M5 PQ-BT04MR	0.900" 0.980"	0.410"	10 mm	0.722"
6 mm*	M5 x 0.8 R1/8 R1/4	PQ-BT06M5 PQ-BT06MR PQ-BT06M2	1.030" 1.100" 1.140"	0.524"	12 mm 12 mm 14 mm	0.830"
1/4"	#10-32 1/8" NPT 1/4" NPT	PQ-BT08N PQ-BT08P PQ-BT08Q	1.030" 1.100" 1.230"	0.524"	1/2" 1/2"	0.840"
5/16"	1/8" NPT 1/4" NPT	PQ-BT10P PQ-BT10Q	1.100" 1.230"	0.580"	9/16"	0.880"
8 mm*	R1/8 R1/4 R3/8	PQ-BT08MR PQ-BT08M2 PQ-BT08M3	1.290"	0.580"	14 mm	0.880"
3/8"	1/8" NPT 1/4" NPT 3/8" NPT	PQ-BT12P PQ-BT12Q PQ-BT12W	1.290" 1.470" 1.500"	0.720"	11/16"	1.100"

Male Elbow

(10/pack)



Tubing	Thread "T"	Part No.	"A"	"C"	"H" Hex.	"R"
1/8"	#10-32 1/8" NPT	PQ-ME04N PQ-ME04P	0.722"	0.410"	7/16"	0.900" 0.980"
5/32"	#10-32 1/8" NPT 1/4" NPT	PQ-ME05N PQ-ME05P PQ-ME05Q	0.722"	0.410"	7/16"	0.900" 0.980" 1.130"
4 mm*	M5 x 0.8 R1/8	PQ-ME04M5 PQ-ME04MR	0.722"	0.410"	10 mm	0.900" 0.980"
6 mm*	M5 x 0.8 R1/8 R1/4	PQ-ME06M5 PQ-ME06MR PQ-ME06M2	0.830"	0.524"	12 mm 12 mm 14 mm	1.030" 1.100" 1.140"
1/4"	#10-32 1/8" NPT 1/4" NPT 3/8" NPT	PQ-ME08N PQ-ME08P PQ-ME08Q PQ-ME08W	0.840"	0.524"	1/2" 1/2" 9/16" 11/16"	1.030" 1.100" 1.230" 1.290"
5/16"	1/8" NPT 1/4" NPT 3/8" NPT	PQ-ME10P PQ-ME10Q PQ-ME10W	0.880"	0.580"	9/16" 9/16" 11/16"	1.100" 1.230" 1.290"
8 mm*	R1/8 R1/4 R3/8	PQ-ME08MR PQ-ME08M2 PQ-ME08M3	0.880"	0.580"	14 mm	1.290"
3/8"	1/8" NPT 1/4" NPT 3/8" NPT 1/2" NPT	PQ-ME12P PQ-ME12Q PQ-ME12W PQ-ME12Z	1.100"	0.720"	11/16" 11/16" 11/16" 7/8"	1.350" 1.470" 1.500" 1.600"
1/2"	1/4" NPT 3/8" NPT 1/2" NPT	PQ-ME16Q PQ-ME16W PQ-ME16Z	1.160"	0.850"	7/8"	1.550" 1.580" 1.670"

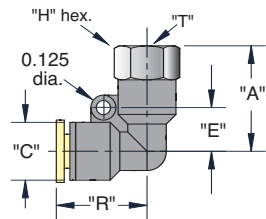
* Fittings have a green release button.
Note: Fittings with pipe thread NPT, R1/8, R1/4 and R3/8 are supplied with pre-applied sealant.



PUSH-QUICK FITTINGS

Female Elbow

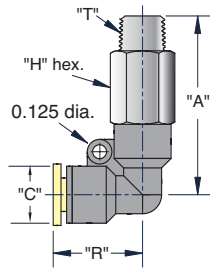
(5/pack)



Tubeing	Thread "T"	Part No.	"A"	"C"	"H" Hex.	"R"
1/8"	#10-32	PQ-FE04N	0.830"	0.410"	7/16"	0.720"
	1/8" NPT	PQ-FE04P	0.950"			
5/32"	#10-32	PQ-FE05N	0.850"	0.410"	7/16"	0.722"
	1/8" NPT	PQ-FE05P	0.990"			
	1/4" NPT	PQ-FE05Q	0.980"			
1/4"	#10-32	PQ-FE08N	0.940"	0.524"	7/16"	0.840"
	1/8" NPT	PQ-FE08P	1.030"			
	1/4" NPT	PQ-FE08Q	1.190"	0.580"	9/16"	0.900"
	1/8" NPT	PQ-FE10P	1.120"			
5/16"	1/4" NPT	PQ-FE10Q	1.220"	0.720"	11/16"	1.100"
3/8"	1/4" NPT	PQ-FE12Q	1.390"			
	3/8" NPT	PQ-FE12W	1.420"		7/8"	

Extended Elbow

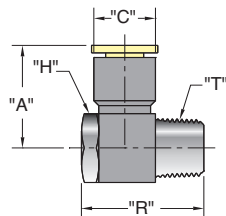
(5/pack)



Tubeing	Thread "T"	Part No.	"A"	"C"	"H" Hex.	"R"	
5/32"	#10-32	PQ-EE05N	0.722"	0.410"	7/16"	1.360"	
	1/8" NPT	PQ-EE05P					1.480"
1/4"	1/8" NPT	PQ-EE08P	0.840"	0.524"	9/16"	1.640"	
	1/4" NPT	PQ-EE08Q					1.820"
	1/2" NPT	PQ-EE08W					1.940"
5/16"	1/8" NPT	PQ-EE10P	0.900"	0.580"	9/16"	1.810"	
	1/4" NPT	PQ-EE10Q					1.900"
	3/8" NPT	PQ-EE10W					2.010"
	1/4" NPT	PQ-EE12Q					2.170"
3/8"	3/8" NPT	PQ-EE12W	1.100"	0.720"	11/16"	2.170"	
	1/2" NPT	PQ-EE12Z					2.560"
1/2"	3/8" NPT	PQ-EE16W	1.160"	0.850"	11/16"	2.470"	
	1/2" NPT	PQ-EE16Z					2.600"

Universal Elbow

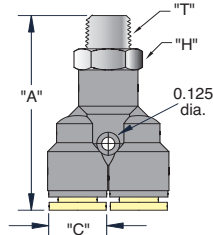
(5/pack)



Tubeing	Thread "T"	Part No.	"A"	"C"	"R"	"H" Hex.	
5/32"	#10-32	PQ-UE05N	0.820"	0.410"	0.790"	5/16"	
	1/8" NPT	PQ-UE05P					1.020"
4 mm*	M5 x 0.8	PQ-UE04M5	0.831"	0.410"	0.790"	8 mm	
	R1/8	PQ-UE04MR					0.921"
6 mm*	M5 x 0.8	PQ-UE06M5	0.976"	0.953"	0.790"	12 mm	
	R1/8	PQ-UE06MR					0.970"
	R1/4	PQ-UE06M2					1.140"
1/4"	#10-32	PQ-UE08N	0.940"	0.524"	0.790"	1/2"	
	1/8" NPT	PQ-UE08P					1.020"
	1/4" NPT	PQ-UE08Q					1.150"
5/16"	1/8" NPT	PQ-UE10P	1.120"	0.580"	1.020"	9/16"	
	1/4" NPT	PQ-UE10Q					1.150"
	3/8" NPT	PQ-UE10W					1.430"
	R1/8	PQ-UE08MR					1.000"
8 mm*	R1/4	PQ-UE08M2	1.120"	0.580"	1.140"	14 mm	
	R3/8	PQ-UE08M3					1.410"
	1/4" NPT	PQ-UE12Q					1.180"
3/8"	1/4" NPT	PQ-UE12Q	1.320"	0.720"	1.180"	11/16"	
	3/8" NPT	PQ-UE12W					1.430"

Y Connector

(5/pack)



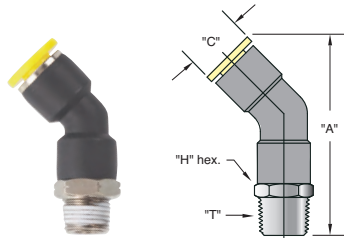
Tubeing	Thread "T"	Part No.	"A"	"C"	"H" Hex.	
1/8"	#10-32	PQ-YC04N	1.630"	0.410"	7/16"	
	1/8" NPT	PQ-YC04P				1.660"
5/32"	#10-32	PQ-YC05N	1.630"	0.410"	7/16"	
	1/8" NPT	PQ-YC05P				1.660"
1/4"	#10-32	PQ-YC08N	1.690"	0.524"	1/2"	
	1/8" NPT	PQ-YC08P				1.770"
	1/4" NPT	PQ-YC08Q				1.830"
5/16"	1/8" NPT	PQ-YC10P	1.830"	0.580"	9/16"	
	1/4" NPT	PQ-YC10Q				1.900"
3/8"	1/4" NPT	PQ-YC12Q	2.340"	0.720"	11/16"	
	3/8" NPT	PQ-YC12W				2.400"
1/2"	3/8" NPT	PQ-YC16W	2.500"	0.850"	7/8"	
	1/2" NPT	PQ-YC16Z				2.600"

* Fittings have a green release button.

Note: Fittings with pipe thread NPT, R1/8, R1/4 and R3/8 are supplied with pre-applied sealant.

Male Angle Connector

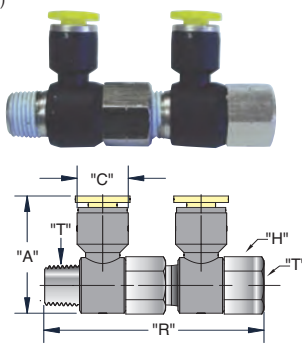
(10/pack)



Tubing	Thread "T"	Part No.	"H" Hex.	"A"	"C"
1/8"	#10-32 1/8" NPT	PQ-MA04N PQ-MA04P	7/16"	1.454" 1.474"	0.410"
5/32"	#10-32 1/8" NPT	PQ-MA05N PQ-MA05P	7/16"	1.454" 1.474"	0.410"
4 mm*	M5 x 0.8 R1/8	PQ-MA04M5 PQ-MA04MR	10 mm	1.454" 1.474"	0.410"
6 mm*	M5 x 0.8 R1/8 R1/4	PQ-MA06M5 PQ-MA06MR PQ-MA06M2	12 mm 10 mm 14 mm	1.556" 1.556" 1.616"	0.520"
1/4"	#10-32 1/8" NPT 1/4" NPT 3/8" NPT	PQ-MA08N PQ-MA08P PQ-MA08Q PQ-MA08W	1/2" 1/2" 9/16" 11/16"	1.620" 1.620" 1.682" 1.722"	0.520"
5/16"	1/8" NPT 1/4" NPT	PQ-MA10P PQ-MA10Q	9/16"	1.800"	0.580"
3/8"	1/8" NPT 1/4" NPT 3/8" NPT	PQ-MA12P PQ-MA12Q PQ-MA12W	11/16"	1.823" 1.923" 1.943"	0.720"
1/2"	1/4" NPT 3/8" NPT 1/2" NPT	PQ-MA16Q PQ-MA16W PQ-MA16Z	7/8"	1.965" 2.125" 2.195"	0.830"

Stack Elbow

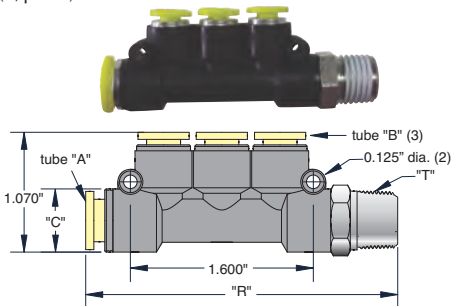
(5/pack)



Tubing	Thread "T"	Part No.	"A"	"C"	"R"	"H" Hex.
5/32"	#10-32 1/8" NPT	PQ-SE05N PQ-SE05P	0.980" 1.095"	0.410"	1.435"	5/16" 1/2"
1/4"	#10-32 1/8" NPT 1/4" NPT	PQ-SE08N PQ-SE08P PQ-SE08Q	1.165" 1.200" 1.365"	0.524"	2.250"	1/2" 11/16"
5/16"	1/4" NPT 3/8" NPT	PQ-SE10Q PQ-SE10W	1.425" 1.570"	0.580"	2.600"	11/16"
3/8"	1/4" NPT 3/8" NPT	PQ-SE12Q PQ-SE12W	1.625" 1.690"	0.720"	2.900"	3/4"
1/2"	3/8" NPT 1/2" NPT	PQ-SE16W PQ-SE16Z	1.740" 1.950"	0.850"	2.970"	3/4" 1"

Manifold Mount

(5/pack)



Tube "A"	Tube "B"	Thread "T"	Part No.	"C"	"R"
1/4"	5/32"	1/8" NPT	PQ-MM0805P	0.524"	2.665"
5/16"	1/4"	1/4" NPT	PQ-MM1008Q	0.580"	2.820"

* Fittings have a green release button.

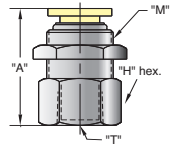
Note: Fittings with pipe thread NPT, R1/8, R1/4 and R3/8 are supplied with pre-applied sealant.



PUSH-QUICK FITTINGS

Bulkhead Connector

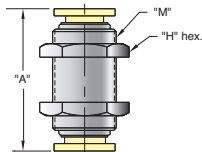
(5/pack)



Tube	Thread "T"	Part No.	"A"	Thread "M"	"H" Hex.
1/8"	1/8" NPT	PQ-BC04P	1.052"	M12x1	9/16"
5/32"	1/8" NPT	PQ-BC05P	1.052"	M12x1	9/16"
4 mm*	R1/8	PQ-BC04MR	1.052"	M12x1	14 mm
6 mm*	R1/8	PQ-BC06MR	1.080"	M14x1	17 mm
	R1/4	PQ-BC06M2	1.150"		
1/4"	1/8" NPT	PQ-BC08P	1.084"	M14x1	11/16"
	1/4" NPT	PQ-BC08Q	1.209"		
5/16"	1/8" NPT	PQ-BC10P	1.150"	M16x1	11/16"
	1/4" NPT	PQ-BC10Q	1.195"		
8 mm*	R1/8	PQ-BC08MR	1.125"	M16x1	17 mm
	R1/4	PQ-BC08M2	1.170"		
3/8"	1/4" NPT	PQ-BC12Q	1.400"	M20x1	7/8"
	3/8" NPT	PQ-BC12W	1.415"		
1/2"	1/2" NPT	PQ-BC16Z	1.525"	M22x1	1"

Bulkhead Union

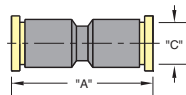
(5/pack)



Tube	Part No.	"A"	Thread "M"	"H" Hex.
1/8"	PQ-BU04	0.415"	M12 x 1	14 mm
5/32"	PQ-BU05	1.370"	M12 x 1	5/8"
6 mm*	PQ-BU06M	1.390"	M14 x 1	17 mm
1/4"	PQ-BU08	1.421"	M14 x 1	3/4"
5/16"	PQ-BU10	1.610"	M16 x 1	3/4"
3/8"	PQ-BU12	1.723"	M20 x 1	15/16"
1/2"	PQ-BU16	1.770"	M22 x 1	1"

Straight Union

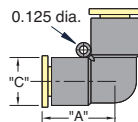
(10/pack)



Tube	Part No.	"A"	"C"
1/8"	PQ-SU04	1.240"	0.410"
5/32"	PQ-SU05	1.239"	0.410"
6 mm*	PQ-SU06M	1.500"	0.524"
1/4"	PQ-SU08	1.500"	0.524"
5/16"	PQ-SU10	1.540"	0.580"
3/8"	PQ-SU12	1.851"	0.720"
1/2"	PQ-SU16	1.810"	0.850"

Elbow Union

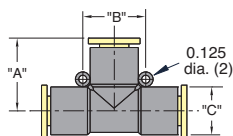
(10/pack)



Tube	Part No.	"A"	"C"
1/8"	PQ-EU04	0.710"	0.410"
5/32"	PQ-EU05	0.722"	0.410"
6 mm*	PQ-EU06M	0.830"	0.524"
1/4"	PQ-EU08	0.840"	0.524"
5/16"	PQ-EU10	0.880"	0.580"
3/8"	PQ-EU12	1.100"	0.720"
1/2"	PQ-EU16	1.130"	0.850"

Tee Union

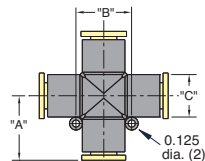
(10/pack)



Tube	Part No.	"A"	"B"	"C"
1/8"	PQ-TU04	0.710"	0.656"	0.410"
5/32"	PQ-TU05	0.722"	0.656"	0.410"
6 mm*	PQ-TU06M	0.830"	0.740"	0.524"
1/4"	PQ-TU08	0.840"	0.740"	0.524"
5/16"	PQ-TU10	0.880"	0.800"	0.580"
3/8"	PQ-TU12	1.100"	0.944"	0.720"
1/2"	PQ-TU16	1.130"	1.120"	0.850"

Cross Union

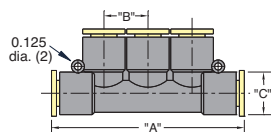
(5/pack)



Tube	Part No.	"A"	"B"	"C"
1/8"	PQ-CU04	0.710"	0.560"	0.410"
5/32"	PQ-CU05	0.722"	0.656"	0.410"
6 mm*	PQ-CU06M	0.830"	0.740"	0.524"
1/4"	PQ-CU08	0.840"	0.740"	0.524"
5/16"	PQ-CU10	0.880"	0.800"	0.580"
3/8"	PQ-CU12	1.100"	0.944"	0.720"

Manifold Union

(5/pack)



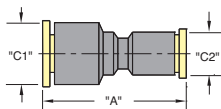
Tube	Part No.	"A"	"B"	"C"
5/32"	PQ-MU0504	2.312"	0.500"	0.560"
6 mm*	PQ-MU06M05	2.435"	0.531"	0.524"
1/4"	PQ-MU0805	2.435"	0.531"	0.524"
5/16"	PQ-MU1008	2.435"	0.580"	0.580"
3/8"	PQ-MU1208	2.312"	0.562"	0.725"

* Fittings have a green release button

Note:
Fittings with pipe thread NPT, R1/8, R1/4 and R3/8 are supplied with pre-applied sealant.

Reduced Union

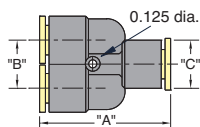
(10/pack)



Tubing	Part No.	"A"	"C1"	"C2"
5/32"-1/8"	PQ-RU0504	1.230"	0.410"	0.410"
6 mm*-5/32"	PQ-RU06M05	1.367"	0.524"	0.410"
1/4"-1/8"	PQ-RU0804	1.367"	0.524"	0.410"
5/16"-1/4"	PQ-RU1008	1.550"	0.580"	0.524"
3/8"-1/4"	PQ-RU1208	1.666"	0.720"	0.524"
1/2"-3/8"	PQ-RU1612	1.810"	0.850"	0.720"

Y Union

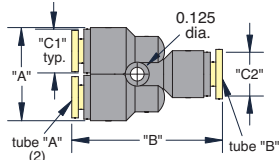
(5/pack)



Tubing	Part No.	"A"	"B"	"C"
1/8"	PQ-YU04	1.340"	0.415"	0.410"
5/32"	PQ-YU05	1.318"	0.517"	0.410"
6 mm*	PQ-YU06M	1.495"	0.531"	0.524"
1/4"	PQ-YU08	1.495"	0.531"	0.524"
5/16"	PQ-YU10	1.495"	0.590"	0.580"
3/8"	PQ-YU12	2.017"	0.720"	0.720"
1/2"	PQ-YU16	2.070"	0.840"	0.840"

Reduced Branch

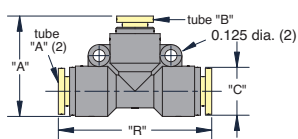
(5/pack)



Tube "A"	Tube "B"	Part No.	"A"	"B"	"C1"	"C2"
1/8"	5/32"	PQ-RB0504	0.830"	1.340"	0.420"	0.410"
5/32"	1/4"	PQ-RB0805	0.830"	1.390"	0.410"	0.524"
1/4"	5/16"	PQ-RB1008	1.025"	1.670"	0.524"	0.580"
1/4"	3/8"	PQ-RB1208	1.025"	1.780"	0.524"	0.720"
3/8"	1/2"	PQ-RB1612	1.420"	2.050"	0.720"	0.850"

Tee Reducer

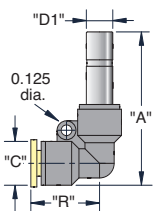
(5/pack)



Tube "A"	Tube "B"	Part No.	"A"	"C"	"R"
5/32"	1/8"	PQ-TR0504	0.910"	0.410"	1.385"
1/4"	5/32"	PQ-TR0805	1.050"	0.524"	1.570"
5/16"	1/4"	PQ-TR1008	1.170"	0.580"	1.835"
3/8"	1/4"	PQ-TR1208	1.380"	0.720"	2.160"
1/2"	3/8"	PQ-TR1612	1.600"	0.850"	2.240"

Elbow Reducer

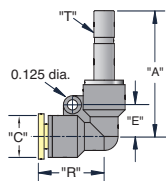
(5/pack)



Tubing	Part No.	"A"	"C"	"D1"	"R"
1/8"	PQ-ER0405	1.480"	0.420"	5/32"	0.710"
5/32"	PQ-ER0508	1.640"	0.410"	1/4"	0.722"
1/4"	PQ-ER0810	1.765"	0.524"	5/16"	0.840"
5/16"	PQ-ER1012	2.020"	0.580"	3/8"	0.880"
3/8"	PQ-ER1216	2.260"	0.720"	1/2"	1.100"

Plug-In Elbow

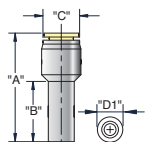
(5/pack)



Tubing	Part No.	"A"	"C"	"E"	"R"
1/8"	PQ-PE04	1.290"	0.410"	0.328"	0.722"
5/32"	PQ-PE05	1.290"	0.410"	0.328"	0.722"
1/4"	PQ-PE08	1.550"	0.524"	0.370"	0.840"
5/16"	PQ-PE10	1.600"	0.580"	0.430"	0.900"
3/8"	PQ-PE12	1.850"	0.720"	0.472"	1.100"
1/2"	PQ-PE16	1.940"	0.850"	0.570"	1.160"

Tube Reducer (Stem)

(10/pack)



Tubing	Part No.	"A"	"B"	"C"	"D1" Dia.
1/8"	PQ-TRS0405	1.320"	0.690"	0.410"	5/32"
5/32"	PQ-TRS0508	1.400"	0.810"	0.524"	1/4"
1/4"	PQ-TRS0810	1.480"	0.850"	0.580"	5/16"
1/4"	PQ-TRS0812	1.610"	0.990"	0.720"	3/8"
3/8"	PQ-TRS1216	1.730"	0.990"	0.850"	1/2"

* Fittings have a green release button.

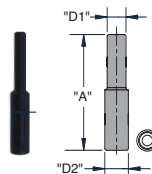
Note: Fittings with pipe thread NPT, R1/8, R1/4 and R3/8 are supplied with pre-applied sealant.



PUSH-QUICK FITTINGS

Stem Reducer

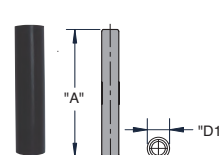
(10/pack)



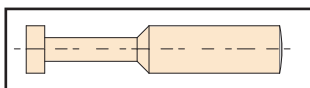
Tubing	Part No.	"A"	"D1"	"D2"
1/8"	PQ-SR0405	1.417"	1/8"	5/32"
5/32"	PQ-SR0508	1.417"	5/32"	1/4"
1/4"	PQ-SR0810	1.535"	1/4"	5/16"
5/16"	PQ-SR1012	1.811"	5/16"	3/8"
3/8"	PQ-SR1216	2.126"	3/8"	1/2"

Stem Coupler

(10/pack)



Tubing	Part No.	"A"	"D1" Dia.
1/8"	PQ-SC04	1.378"	1/8"
5/32"	PQ-SC05	1.378"	5/32"
1/4"	PQ-SC08	1.457"	1/4"



Push-Quick Plugs

Clippard offers a variety of Push-Quick Plugs in sizes to fit 1/8" through 3/8" O.D.,

tubing. These plastic plugs may be used to plug the port of a Push-Quick Fitting for later use. Used as a temporary

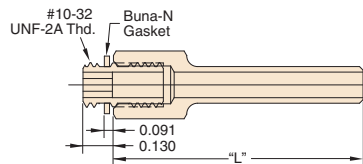
plug, they may later be removed and tubing inserted to connect to an additional line of a circuit.

Part No.	Description	Part No.	Description
PQ-PG04	1/8" O.D. Tube	PQ-PG08	1/4" O.D. Tube
PQ-PG05	5/32" O.D. Tube	PQ-PG10	5/16" O.D. Tube
PQ-PG06M	6 mm O.D. Tube	PQ-PG12	3/8" O.D. Tube

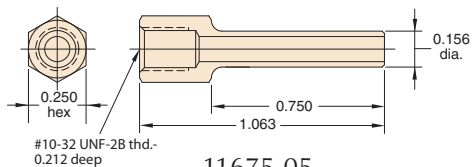
Push-Quick Fitting Adapters

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.

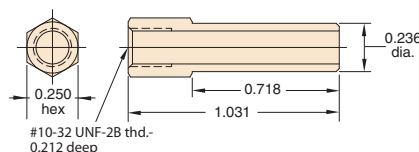
The threaded adapters insert into Push-Quick Fittings and provide either a male or female thread that can be used to mount any Clippard product with a #10-32 threaded inlet. This allows the direct attachment of the product to a Push-Quick Fitting without hoses or additional fittings.



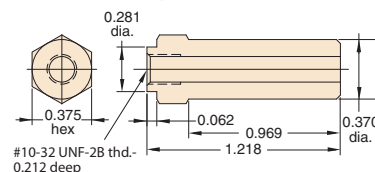
Part No.	"L"	Tube Size
11674-05	1.063"	5/32" OD
11674-08	1.031"	1/4" OD
11674-12	1.218"	3/8" OD



[11675-05](#)
5/32" O.D. Tube



[11675-08](#)
1/4" O.D. Tube

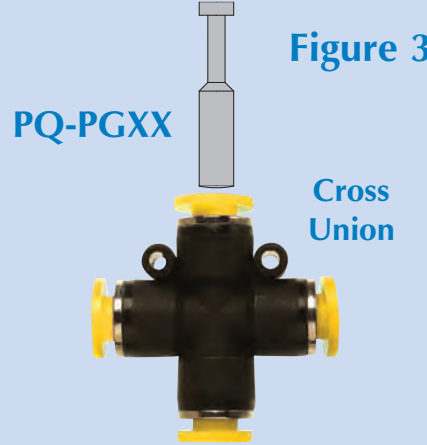


[11675-12](#)
3/8" O.D. Tube

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.





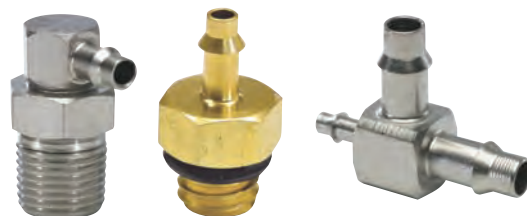
Minimatic barb fittings provide a flexible, easy alternative to ferule and push-to-connect design fittings.

Clippard Minimatic barb 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 barb 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 barb 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 barb 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.

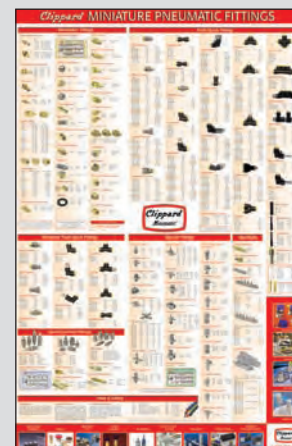
Features

- Miniature size provides low profile
- Multiple configurations for every need
- Brass or 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



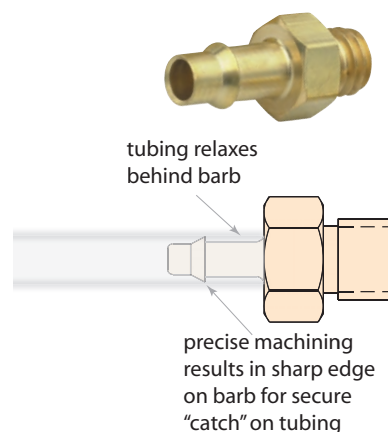
Miniature Pneumatic Fittings Poster

Clippard's full-color fittings poster displays hundreds of available fittings including Push-Quick, Barb, Brass, Quick-Connect and more. Also included is an extensive variety of miniature hose and tubing from copper and nylon to flexible polyurethane, vinyl and Buna-N. Sizes include 1/8" c 1/4", 5/32", 6 mm, 8 mm, 3/8" and 1/2" OD in various styles. Call to request a copy.



Single-Barb Fittings

- Allow for easier assembly onto tubing
- Provide less leakage potential and increased pressure performance
- Reduce the need to constantly tighten the assembly
- Provide a single sharp edge allowing the barb to catch onto the tubing for a leak-free connection
- Require less clamp pressure
- Allow tubing to "relax" to its original size which is essential to the assembly and pressure of the connection.





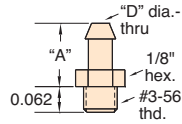
MINIMATIC® BARB CONNECTORS

All fittings are brass unless otherwise noted, i.e. ENP (Electroless Nickel-Plated)

#3-56 to Barb Connectors

#3-56 Male to 1/16" Barb

(10/pack)

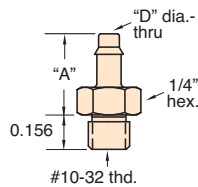


Barb (ID)	Order No.	"A"	"D" Dia.
1/16"	11750-2	0.187"	0.046"

#10-32 to Barb Connectors

#10-32 Male to Single Barb

(10/pack)



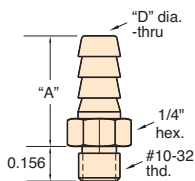
Barb (ID)	Order No.	"A"	"D" Dia.	Material
1/16"	11752-5*	0.312"	0.052"	Brass
3/32"	11752-8*	0.367"	0.073"	Brass
1/8"	11752-4*	0.406"	0.109"	Brass
1/16"	CT2**	0.328"	0.052"	ENP Brass
3/32"	CT3**	0.367"	0.073"	ENP Brass
1/8"	CT4**	0.406"	0.109"	ENP Brass

* Buna-N gasket furnished in pack quantity only

** Gasket pre-installed

#10-32 Male to Multi Barb

(10/pack)

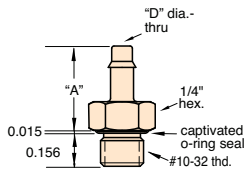


Barb (ID)	Order No.	"A"	"D" Dia.
1/16"	11752-2	0.437"	0.052"
1/8"	11752-3	0.500"	0.109"
1/8"	11752-1	0.656"	0.090"

Buna-N gasket furnished in pack quantity only

#10-32 Male with Captivated O-Rings to Barb, 1/4" Hex.

(10/pack)

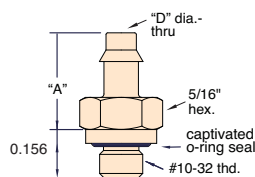


Barb (ID)	Order No.	"A"	"D" Dia.
1/16"	11792-5	0.313"	0.052"
3/32"	11792-8	0.352"	0.073"
1/8"	11792-4	0.391"	0.109"

Buna-N o-ring furnished installed

#10-32 Male with Captivated O-Rings to Barb, 5/16" Hex.

(10/pack)

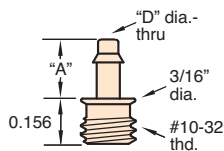


Barb (ID)	Order No.	"A"	"D" Dia.
1/16"	11782-5-ENP	0.481"	0.055"
1/8"	11782-4-ENP	0.512"	0.109"

Buna-N o-ring furnished installed

#10-32 Male Flush Fitting to Barb

(10/pack)



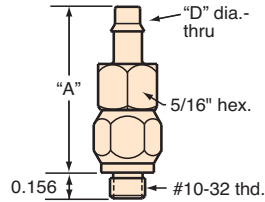
Barb (ID)	Order No.	"A"	"D" Dia.
1/16"	12841	0.203"	0.052"
3/32"	12843	0.242"	0.073"
1/8"	12842	0.325"	0.104"

Gasket not required; thread sealant required. Tighten by hand for flush mounting in #10-32 threaded holes.

All fittings are brass unless otherwise noted, i.e. ENP (Electroless Nickel-Plated)

ENP #10-32 Male to Barb Swivel

(5/pack)

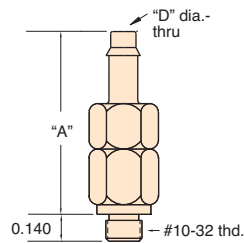


Barb (ID)	Order No.	"A"	#D" Dia.
3/32"	ST3	0.821"	0.052"
1/8"	ST4	0.891"	0.109"

Gasket included, not installed

#10-32 Male to 1/8" I.D. Barb Swivel

(5/pack)



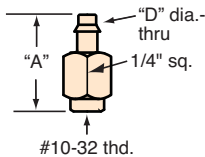
Barb (ID)	Order No.	"A"	"D" Dia.
1/8"	15045	0.762"	0.109"

Not to be used as a constant rotation junction

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 Female to Barb

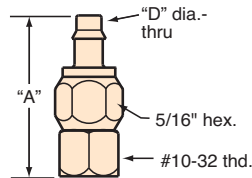
(5/pack)



Barb (ID)	Order No.	"A"	"D" Dia.
1/16"	CF2	0.640"	0.052"
3/32"	CF3	0.640"	0.073"
1/8"	CF4	0.718"	0.109"

ENP #10-32 Female to Barb Swivel

(5/pack)

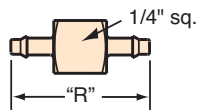


Barb (ID)	Order No.	"A"	"D" Dia.
3/32"	S3F	0.821"	0.052"
1/8"	S4F	0.871"	0.109"

Barb to Barb Connectors

ENP Barb to Barb

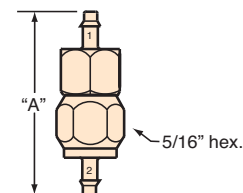
(5/pack)



Barb (ID)	Barb (ID)	Order No.	"R"
1/16"	1/16"	C22	0.656"
1/16"	3/32"	C32	0.684"
1/16"	1/8"	C42	0.734"
3/32"	3/32"	C33	0.712"
3/32"	1/8"	C43	0.762"
1/8"	1/8"	C44	0.812"

ENP Barb to Barb Swivel

(5/pack)



Barb (ID) 1	Barb (ID) 2	Order No.	"A"
3/32"	3/32"	S33	1.052"
1/8"	1/8"	S44	1.183"

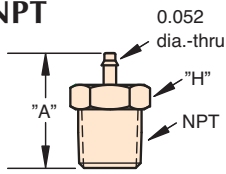


MINIMATIC® BARB TO NPT CONNECTORS

All fittings are brass unless otherwise noted, i.e. ENP (Electroless Nickel-Plated)

1/16" Barb to Male NPT

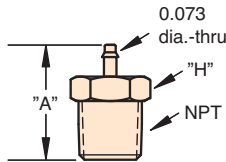
(5/pack)



NPT	Order No.	"A"	"H" Hex.
1/16"	1CI2	0.490"	5/16"
1/8"	2CP2	0.740"	7/16"
1/4"	4CQ2	0.770"	9/16"
3/8"	6CW2	0.890"	11/16"
1/2"	8CZ2	1.020"	13/16"

3/32" Barb to Male NPT

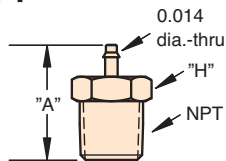
(5/pack)



NPT	Order No.	"A"	"H" Hex.
1/16"	1CI3	0.710"	5/16"
1/8"	2CP3	0.773"	7/16"
1/4"	4CQ3	0.804"	9/16"
3/8"	6CW3	0.929"	11/16"
1/2"	8CZ3	1.054"	13/16"

1/8" Barb to Male NPT

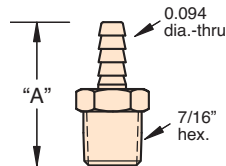
(5/pack)



NPT	Order No.	"A"	"H" Hex.
1/16"	1CI4	0.719"	5/16"
1/8"	2CP4	0.860"	7/16"
1/4"	4CQ4	0.890"	9/16"
3/8"	6CW4	1.020"	11/16"
1/2"	8CZ4	1.140"	13/16"

1/8" Barb to Male NPT

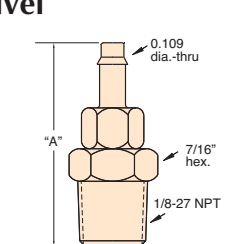
(5/pack)



Barb (ID)	Order No.	"A"
1/8"	11924-1	1.000"

Barb to 1/8" NPT Swivel

(5/pack)

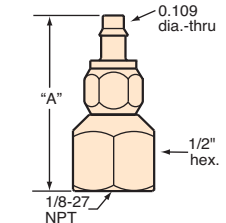


Barb (ID)	Order No.	"A"
1/8"	15055	1.155"

*Buna-N o-ring furnished installed
Not to be used as a constant rotation junction*

ENP 1/8" NPT Swivel

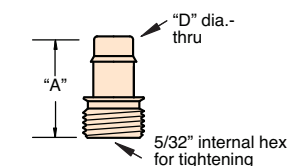
(5/pack)



Barb (ID)	Order No.	"A"
1/8"	S4N	1.103"

1/4" Barb to Male NPT Flush Fittings

(5/pack)



Barb (ID)	Order No.	"A"	NPT
1/8"	12844*	0.625"	1/8"
1/4"	12845*	0.625"	1/4"

** Requires thread sealant. Threads specifically designed to go flush into 1/8" or 1/4" NPT female port*

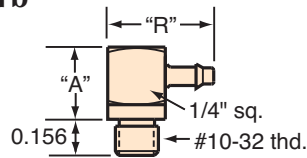
MINIMATIC® ELBOW BARB FITTINGS



All fittings are ENP (Electroless Nickel-Plated)

#10-32 Male to Barb

(5/pack)

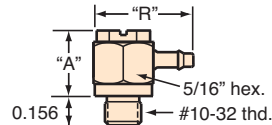


Barb (ID)	Order No.	"A"	"R"
1/16"	CT0-2	0.312"	0.468"
3/32"	CT0-3	0.312"	0.493"
1/8"	CT0-4	0.312"	0.562"

Gasket included, not installed

#10-32 Male to Barb Universal

(5/pack)

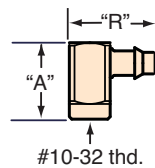


Barb (ID)	Order No.	"A"	"R"
1/16"	UT0-2	0.344"	0.504"
3/32"	UT0-3	0.344"	0.556"
1/8"	UT0-4	0.344"	0.576"

Buna-N o-ring included

#10-32 Female to Barb

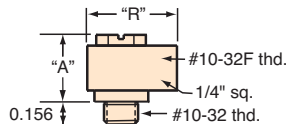
(5/pack)



Barb (ID)	Order No.	"A"	"R"
1/16"	CF0-2	0.468"	0.453"
3/32"	CF0-3	0.468"	0.493"
1/8"	CF0-4	0.468"	0.525"

Universal #10-32

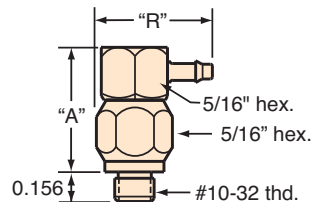
(5/pack)



Order No.	"A"	"R"
UT0-F	0.344"	0.500"

#10-32 Male to Barb Swivel

(5/pack)

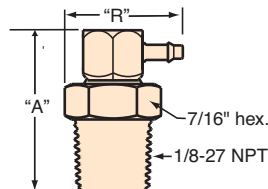


Barb (ID)	Order No.	"A"	"R"
1/16"	ST0-2	0.578"	0.531"
3/32"	ST0-3	0.578"	0.580"
1/8"	ST0-4	0.578"	0.611"

Gasket included, not installed

1/8" NPT Male Swivel

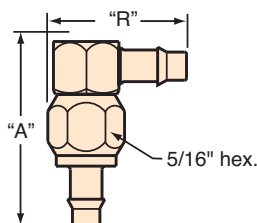
(5/pack)



Barb (ID)	Order No.	"A"	"R"
1/16"	SP0-2	0.843"	0.612"
1/16"	SP0-3	0.843"	0.653"
1/8"	SP0-4	0.843"	0.684"

1/8" Barb to Barb Swivel

(5/pack)



Barb (ID)	Order No.	"A"	"R"
1/8"	S40-4	0.875"	0.656"

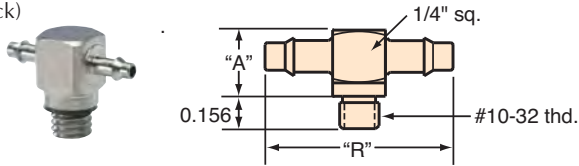


#10-32 BRANCH TEES

All fittings are ENP (Electroless Nickel-Plated)

#10-32 Male to Barb

(5/pack)

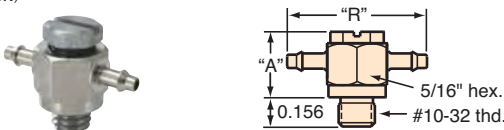


Barb (ID)	Barb (ID)	Order No.	"A"	"R"
1/16"	1/16"	TT0-202	0.312"	0.670"
3/32"	3/32"	TT0-303	0.312"	0.738"
1/8"	1/16"	TT0-402	0.312"	0.748"
1/8"	1/8"	TT0-404	0.312"	0.826"

Buna-N gasket included, not installed

#10-32 Male Universal

(5/pack)

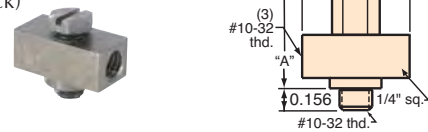


Barb (ID)	Barb (ID)	Order No.	"A"	"R"
1/16"	1/16"	UTO-2002	0.344"	0.718"
1/16"	3/32"	UTO-3002	0.344"	0.759"
1/16"	3/32"	UTO-3003	0.344"	0.800"
1/8"	1/16"	UTO-4002	0.344"	0.790"
1/8"	3/32"	UTO-4003	0.344"	0.832"
1/8"	1/8"	UTO-4004	0.344"	0.863"

Buna-N o-ring included

Universal #10-32

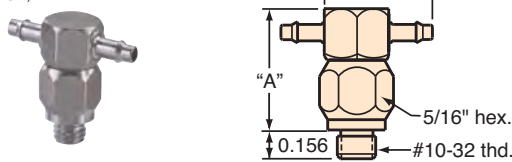
(5/pack)



Order No.	"A"	"R"
UTO-F0F	0.351"	0.500"

#10-32 Male Swivel

(5/pack)

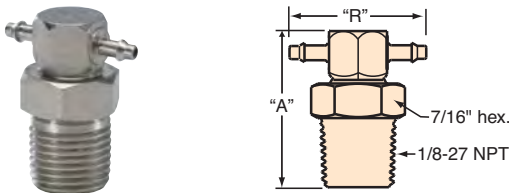


Barb (ID)	Barb (ID)	Order No.	"A"	"R"
1/16"	1/16"	ST0-2002	0.578"	0.718"
3/32"	3/32"	ST0-3003	0.578"	0.801"
1/8"	1/8"	ST0-4004	0.578"	0.863"

Gasket included, not installed

1/8" NPT Male Swivel

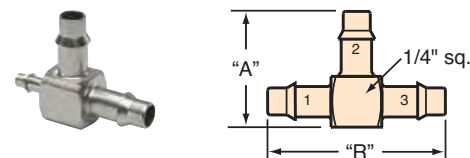
(5/pack)



Barb (ID)	Barb (ID)	Order No.	"A"	"R"
1/16"	1/16"	SP0-2002	0.843"	0.718"
3/32"	3/32"	SP0-3003	0.843"	0.801"
1/8"	1/8"	SP0-4004	0.843"	0.863"

Barb to Barb

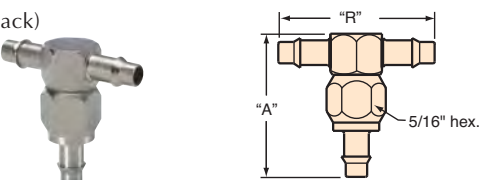
(5/pack)



Barb 1 (ID)	Barb 2 (ID)	Barb 3 (ID)	Order No.	"A"	"R"
1/16"	1/16"	1/16"	T22-2	0.671"	0.460"
1/16"	1/16"	1/8"	T42-2	0.734"	0.460"
1/16"	3/32"	1/16"	T22-3	0.656"	0.494"
1/16"	1/8"	1/16"	T22-4	0.656"	0.538"
1/16"	1/8"	1/8"	T42-4	0.734"	0.538"
3/32"	1/16"	3/32"	T33-2	0.712"	0.460"
3/32"	3/32"	3/32"	T33-3	0.712"	0.494"
3/32"	1/8"	3/32"	T33-4	0.712"	0.538"
1/8"	1/16"	1/8"	T44-2	0.812"	0.460"
1/8"	3/32"	1/8"	T44-3	0.812"	0.494"
1/8"	1/8"	1/8"	T44-4	0.812"	0.538"

Barb to Barb Swivel

(5/pack)

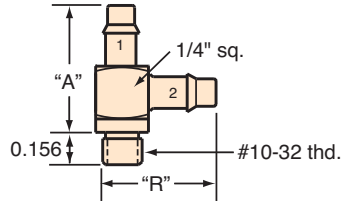


Barb (ID)	Order No.	"A"	"R"
1/8"	S40-4004	0.871"	0.611"

All fittings are ENP (Electroless Nickel-Plated)

#10-32 Male to Barb

(5/pack)

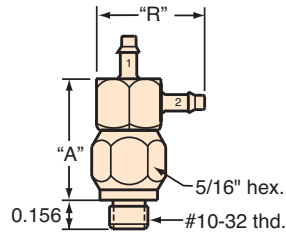


Barb 1 (ID)	Barb 2 (ID)	Order No.	"A"	"R"
1/16"	1/16"	TT2-2	0.515"	0.460"
1/16"	1/8"	TT2-4	0.500"	0.525"
3/32"	3/32"	TT3-3	0.543"	0.493"
1/8"	1/16"	TT4-2	0.593"	0.460"
1/8"	1/8"	TT4-4	0.593"	0.538"

Buna-N gasket included, not installed

#10-32 Male to Barb Swivel

(5/pack)

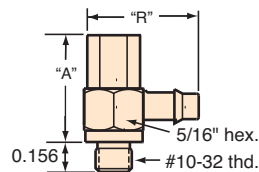


Barb 1 (ID)	Barb 2 (ID)	Order No.	"A"	"R"
1/16"	1/16"	ST2-2	0.793"	0.531"
3/32"	3/32"	ST3-3	0.821"	0.580"
1/8"	1/8"	ST4-4	0.902"	0.611"

Gasket included, not installed

Universal #10-32 to Barb

(5/pack)

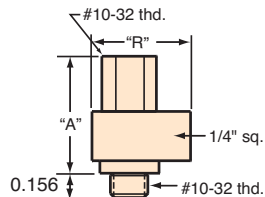


Barb (ID)	Order No.	"A"	"R"
1/16"	UTF-2	0.562"	0.504"
3/32"	UTF-3	0.562"	0.556"
1/8"	UTF-4	0.562"	0.576"

Buna-N o-ring included

Universal #10-32

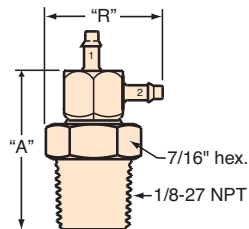
(5/pack)



Order No.	"A"	"R"
UTF-F	0.562"	0.500"

1/8" NPT Male to Barb

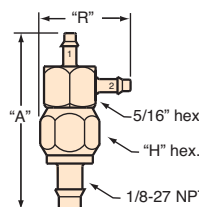
(5/pack)



Barbs (ID)	Order No.	"A"	"R"
1/16"	SP2-2	1.031"	0.625"
3/32"	SP3-3	0.656"	1.062"
1/8"	SP4-4	1.156"	0.718"

Barb to Barb Swivel

(5/pack)



Barb 1 (ID)	Barb 2 (ID)	Order No.	"A"	"R"
1/16"	1/16"	S42-2	1.074"	0.531"
1/8"	1/8"	S44-4	1.183"	0.611"

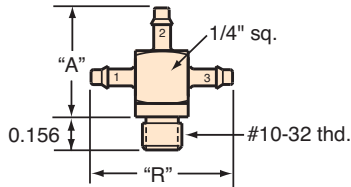


MINIMATIC® CROSS & COMPRESSION FITTINGS

All fittings are ENP (Electroless Nickel-Plated) unless otherwise noted

#10-32 Male to Barb

(5/pack)

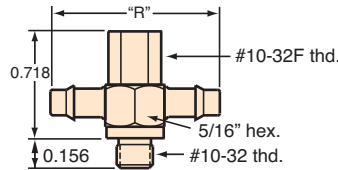


Barb 1 (ID)	Barb 2 (ID)	Barb 3 (ID)	Order No.	"A"	"R"
1/16"	1/16"	1/16"	XT2-202	0.515"	0.670"
1/16"	1/8"	1/16"	XT4-202	0.593"	0.670"
3/32"	3/32"	3/32"	XT3-303	0.543"	0.736"
1/8"	1/16"	1/16"	XT2-402	0.515"	0.748"
1/8"	1/16"	1/8"	XT2-404	0.515"	0.826"
1/8"	1/8"	1/16"	XT4-402	0.593"	0.748"
1/8"	1/8"	1/8"	XT4-404	0.593"	0.826"

Buna-N gasket included, not installed

Universal #10-32 to Barb

(5/pack)

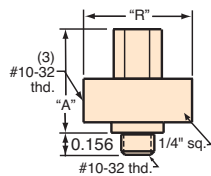


Barb	Barb	Order No.	"A"	"R"
1/16"	1/16"	UTF-2002	0.562"	0.718"
3/32"	3/32"	UTF-3003	0.562"	0.800"
1/8"	1/16"	UTF-4002	0.562"	0.790"
1/8"	1/8"	UTF-4004	0.562"	0.863"

Buna-N o-ring included

Universal #10-32

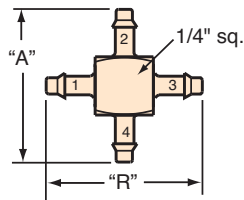
(5/pack)



Order No.	"A"	"R"
UTF-FOE	0.562"	0.625"

Barb to Barb

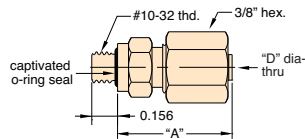
(5/pack)



Barb 1	Barb 2	Barb 3	Barb 4	Order No.	"A"	"R"
1/16"	1/16"	1/16"	1/16"	X22-202	0.656"	0.670"
1/16"	1/16"	1/16"	3/32"	X32-202	0.684"	0.670"
1/16"	1/16"	1/16"	1/8"	X42-202	0.734"	0.670"
1/16"	1/8"	1/16"	1/8"	X44-202	0.812"	0.670"
1/16"	1/8"	1/8"	1/8"	X44-402	0.812"	0.748"
3/32"	1/16"	3/32"	1/16"	X33-202	0.712"	0.748"
3/32"	3/32"	3/32"	3/32"	X33-303	0.712"	0.736"
3/32"	1/8"	3/32"	1/8"	X44-303	0.812"	0.736"
3/32"	3/32"	3/32"	1/8"	X43-303	0.762"	0.736"
1/8"	1/16"	1/16"	1/8"	X42-402	0.734"	0.748"
1/8"	1/8"	1/8"	1/8"	X44-404	0.812"	0.826"

Compression Fittings

Brass #10-32 to Tube Compression Fittings with Captivated O-Rings

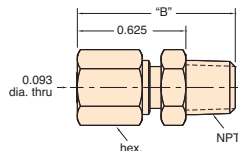


Tube (OD)	Order No.	"A"	"D" Dia.
1/8"	11923	0.694"	0.090"
1/16"	15160	0.694"	0.046"

Options: (-ENP)

Replacement Ferrule and nut #15155 (11923 only)

Brass NPT to 1/8" O.D. Tube Compression Fittings



NPT	Order No.	"B"	Hex
1/8"	3810-1	1.035"	7/16"
1/16"	3810-2	0.914"	3/8"

Options: (-ENP)

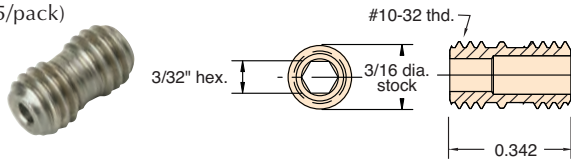
Replacement Ferrule and nut #15155

#10-32 NIPPLES & COUPLINGS



Male #10-32 Nipple

(5/pack)



Order No.

15453

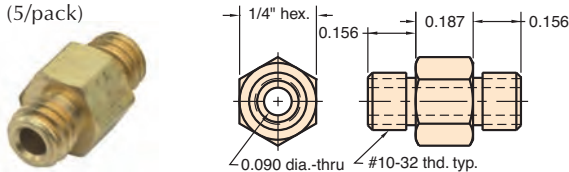
Material: Stainless steel

Seals: Sealant necessary

Use: Excellent for a surface to surface connection of female #10-32 products

#10-32 Male Nipple

(5/pack)



Order No.

11999

Thread: #10-32 both ends

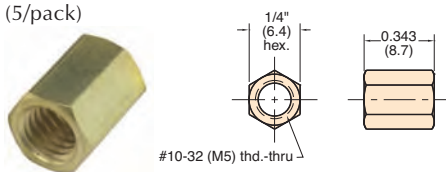
Options: (-ENP)

Gaskets: Buna-N 2 furnished

Use: For coupling cylinders directly to valves, and many other coupling arrangements

#10-32 Female Hex Coupling

(5/pack)



Order No.

15004

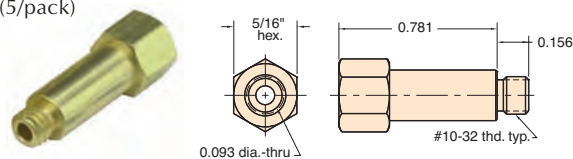
Thread: #10-32 tapped (M5)

Options: (-M5), (-ENP)

Use: For coupling two #10-32 (M5) male fittings

#10-32 Extension Fitting

(5/pack)



Order No.

15010

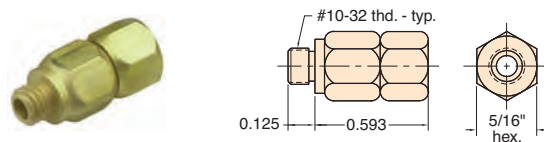
Gasket: Buna-N furnished

Options: (-ENP)

Use: To provide extension for convenience in assembling components

#10-32 Swivel Fitting

(5/pack)



Order No.

15040

Thread: #10-32

Options: (-ENP)

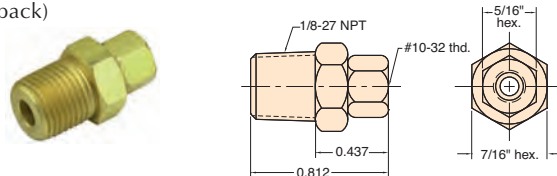
Seals: Buna-N o-ring (gasket furnished package only)

Use: Allows connection to rotate for tightening in confined spaces

Note: Used for positioning not for rotary connector

1/8" NPT to #10-32 Swivel Adapter

(5/pack)



Order No.

15060

Thread: 1/8-27 NPT male and #10-32 tapped **Options:** (-ENP)

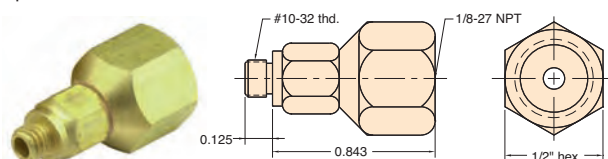
Seals: Buna-N o-ring

Use: Allows connection to rotate for tightening in confined spaces.

Note: Used for positioning not for rotary connector

Female 1/8" NPT to #10-32 Swivel Adapter

(5/pack)



Order No.

15050

Thread: #10-32 and tapped for 1/8-27 NPT **Options:** (-ENP)

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

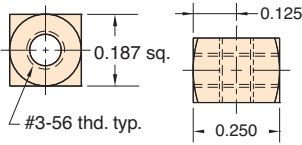


MINIMATIC® L T X FITTINGS


All fittings are Brass unless otherwise noted

#3-56 Couplings

(5/pack)

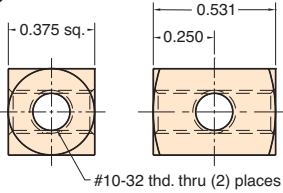


Porting	Order No.
In-Line	11749-1
"T"	11749-2
"X"	11749-3

Thread: M2.5 - 0.45 (#3-56 US equiv.) **Options:** (-ENP) 
Use: Threads into Clippard subminiature cylinder; fits 1/16" I.D. hose

#10-32 "X" Coupling

(5/pack)

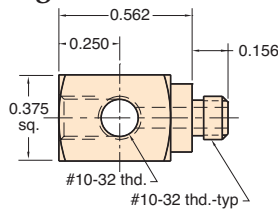


Order No.
15002-5

Options: (-ENP) 

#10-32 to #10-32 Fittings

(5/pack)

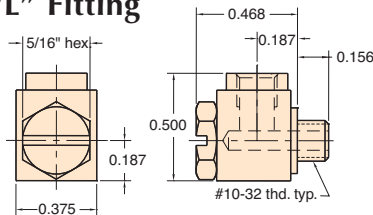


Porting	Order No.	Hex.
"L"	15002-2	7/16"
"T"	15002-3	7/16"
"X"	15002-4	7/16"


Options: (-ENP) 

Adjustable #10-32 "L" Fitting

(5/pack)

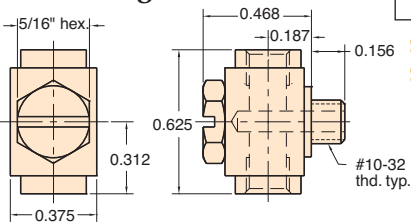


Order No.
15002-1


Stud: Stainless steel hex head with screwdriver slot (12292) 
Seals: Buna-N o-ring furnished **Options:** (-ENP)

Adjustable #10-32 "T" Fitting

(5/pack)

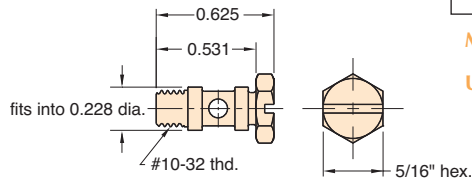


Order No.
15002-6

Stud: Stainless steel hex head with screwdriver slot (12292) 
Seals: Buna-N o-ring furnished **Options:** (-ENP)

Miniature #10-32 Manifold Stud

(5/pack)



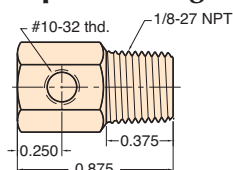
Order No.
12292

Material: Stainless steel **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

1/8" NPT to #10-32 Adapter Fittings

(5/pack)



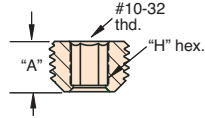
Porting	Order No.	Hex.
"L"	15090-1	7/16"
"T"	15090-2	7/16"
"X"	15090-3	7/16"

Options: (-ENP) 

All fittings are Brass unless otherwise noted

#10-32 Thread to Male NPT

(5/pack)



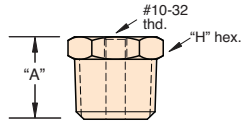
External Thd.	Order No.	"A"	"H" Hex.
1/8" NPT	15036	0.250"	5/32"

Will adapt standard pipe to fittings and Clippard miniature components

To be used with a thread sealant in applications where low profile (no hex) or flush mount is desired.

#10-32 Thread to Male NPT

(5/pack)

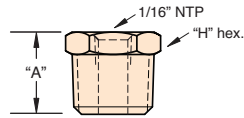


External Thd.	Order No.	"A"	"H" Hex.
1/16" NPT	1CIF	0.468"	5/16"
1/8" NPT	2CPF	0.531"	7/16"
1/4" NPT	4COF	0.562"	9/16"
3/8" NPT	6CWF	0.687"	11/16"
1/2" NPT	8CZF	0.812"	13/16"

Will adapt standard pipe to fittings and Clippard miniature components.
(-ENP) optional.

1/16" NPT Thread to Male NPT

(5/pack)

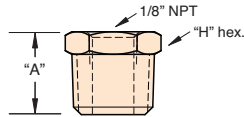


External Thd.	Order No.	"A"	"H" Hex.
1/8" NPT	2CPK	0.531"	7/16"
1/4" NPT	4COK	0.562"	9/16"
3/8" NPT	6CWK	0.687"	11/16"
1/2" NPT	8CZK	0.812"	13/16"

Will adapt standard pipe to fittings and Clippard miniature components.
(-ENP) optional.

1/8" NPT Thread to Male NPT

(5/pack)

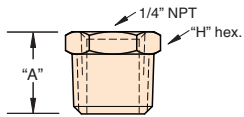


External Thd.	Order No.	"A"	"H" Hex.
1/4" NPT	4CON	0.562"	9/16"
3/8" NPT	6CWN	0.687"	11/16"
1/2" NPT	8CZN	0.812"	13/16"

Will adapt standard pipe to fittings and Clippard miniature components.
(-ENP) optional.

1/4" NPT Thread to Male NPT

(5/pack)

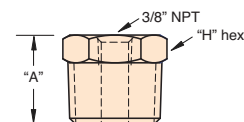


External Thd.	Order No.	"A"	"H" Hex.
3/8" NPT	6CWY	0.687"	11/16"
1/2" NPT	8CZY	0.812"	13/16"

Will adapt standard pipe to fittings and Clippard miniature components.
(-ENP) optional.

3/8" NPT Thread to Male NPT

(5/pack)



External Thd.	Order No.	"A"	"H" Hex.
1/2" NPT	8CZD	0.812"	13/16"

Will adapt standard pipe to fittings and Clippard miniature components.
(-ENP) optional.

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



PLUGS & BULKHEAD FITTINGS

#10-32 Screw Plugs

Gasket: Buna-N furnished package only

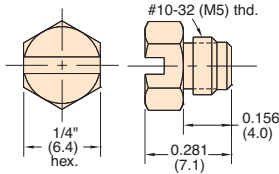
Use: For plugging unused ports in manifolds, air lines and other devices

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

Headless Plug

(5/pack)



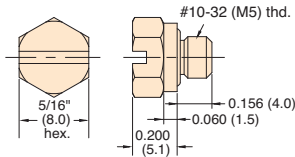
Order No.	Description
11755	Brass Plug

Options: (-ENP)



Headless Plug with Captivated O-Ring

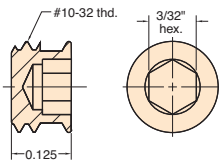
(5/pack)



Order No.	Description
11782-7	ENP Plug

Headless Plug

(5/pack)

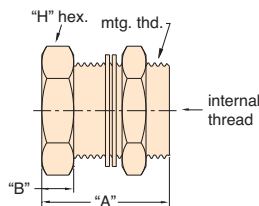


Order No.	Description
0035-2	Stainless Steel Headless Plug

Thread sealant required

Bulkhead Fittings

(5/pack)



Internal Thd.	Mtg. Thread	Order No.	"A"	"B"	"H" Hex.
#10-32	#15/32-32	15027	0.500"	0.125"	9/16"
1/8" NPT	1/8-27 NPT	15029-1	1.000"	0.250"	7/8"
1/4" NPT	3/4-20	15029-2	1.000"	0.250"	7/8"

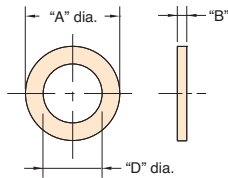
Options: (-ENP) **Locking Nut:** Two steel lockwashers



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.



Gaskets



Buna-N gaskets are designed for use with #10-32 threads; included with packaged Clippard fittings. -40 to 250°F.

Viton gaskets are designed for use with #10-32 threads in high temperature applications. -20 to 450°F.

Material	Order No.	"A" Dia.	"B"	"D" Dia.
Buna-N	11761-2	0.240"	0.022"	0.150"
Viton	11761-8	0.240"	0.022"	0.150"
Nylon	11761-4	0.307"	0.031"	0.192"
EPDM	11761-7	0.240"	0.002"	0.150"

Designed for use with #10-32 threads

Nylon gaskets are designed for use with #10-32 threads in applications that require nylon for chemical compatibility. 40 to 200°F.

EPDM gaskets are 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. -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

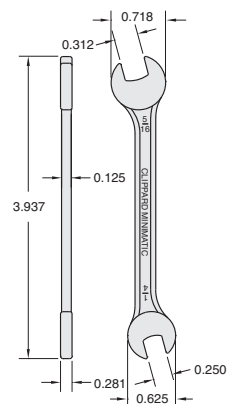
The first two methods will provide adequate sealing for normal air pressures. When extra resistance to vibration is necessary or a permanent orientation of the fitting is required, use of the combination of both gasket and sealant is recommended.

Tips On Using Barb 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" ID for pilots and 1/8" ID 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.

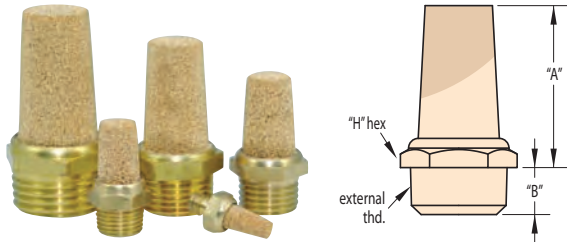




MUFFLERS & MANIFOLDS

All fittings are Brass unless otherwise noted

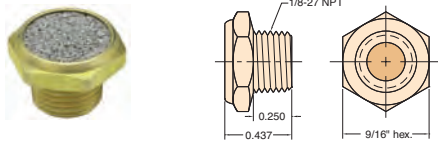
NEW! Brass Mufflers



External Thd.	Order No.	"A"	"B"	"H" Hex.
#10-32	11130-N	0.195"	0.560"	8 mm
1/8" NPT	11130-P	0.259"	0.259"	12 mm
1/4" NPT	11130-Q	0.300"	0.300"	14 mm
3/8" NPT	11130-W	1.129"	0.330"	17 mm
1/2" NPT	11130-Z	1.331"	0.386"	21 mm

Sintered bronze muffler (40 micron), Buna-N gasket furnished on #11130-N only

1/8" NPT Muffler



Order No.	Description
15080	1/8" NPT Muffler

Material: Solid brass body; sintered stainless steel insert (100 micron)

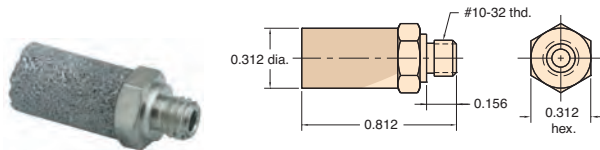
Thread: 1/8" NPT

Options: (-ENP)

Use: To muffle exhaust for quiet system operation



#10-32 ENP Muffler



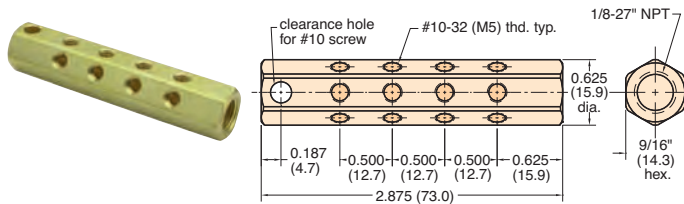
Order No.	Description
15070	#10-32 Muffler

Material: Electroless nickel plated brass body sintered stainless steel muffler (60 micron)

Gasket: Buna-N furnished

Use: To muffle exhaust for quiet system operation

12-Port Manifold



Order No.
MAN-12

Material: Brass

Options: (-ENP)

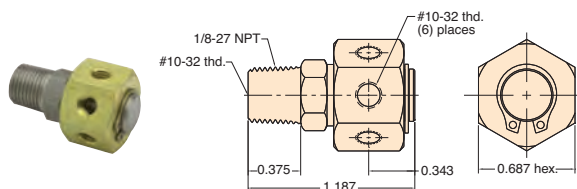
Thread: Tapped ports: 1/8" standard pipe tapped inlet

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



6-Port Rotary Manifold



Order No.
MRM-6

Material: Brass and stainless steel

Thread: 1/8" NPT for inlet is also tapped #10-32; outlet consists of 6 ports tapped #10-32

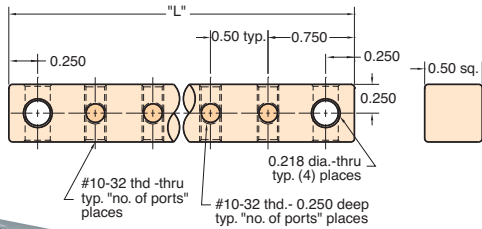
Seals: Buna-N o-ring furnished

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

Miniature Terminal Blocks



15028-4 pictured at left

Order No.	# of Ports	"A"	"L"
15028-4	4	2.500"	3.000"
15028-6	6	3.500"	4.000"
15028-8	8	4.500"	5.000"
15028-10	10	5.500"	6.000"

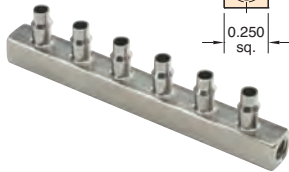
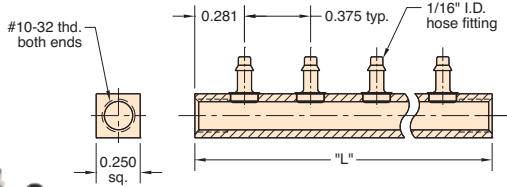
Material: Anodized aluminum

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

#10-32 Block Manifolds

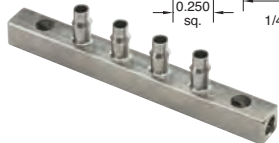
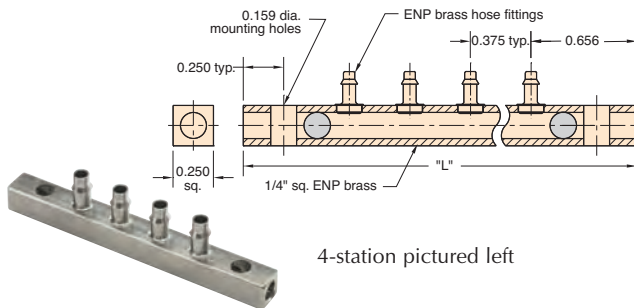


6-station pictured left

Order No.	# of Stations	Hose Barbs	"L"
BTT2-04	4	1/16" I.D.	1.687"
BTT2-06	6	1/16" I.D.	2.437"
BTT2-08	8	1/16" I.D.	3.187"
BTT2-10	10	1/16" I.D.	3.937"
BTT2-12	12	1/16" I.D.	4.687"
BTT4-04	4	1/8" I.D.	1.687"
BTT4-06	6	1/8" I.D.	2.437"
BTT4-08	8	1/8" I.D.	3.187"
BTT4-10	10	1/8" I.D.	3.937"
BTT4-12	12	1/8" I.D.	4.687"

One end may be used as the air supply to the manifold and the other end plugged.

#10-32 Block Manifolds with #6 Screws



4-station pictured left

Order No.	# of Stations	Hose Barbs	"L"
BHH2-04	4	1/16" I.D.	2.437"
BHH2-06	6	1/16" I.D.	3.187"
BHH2-08	8	1/16" I.D.	3.937"
BHH2-10	10	1/16" I.D.	4.687"
BHH2-12	12	1/16" I.D.	5.437"
BHH4-04	4	1/8" I.D.	2.437"
BHH4-06	6	1/8" I.D.	3.187"
BHH4-08	8	1/8" I.D.	3.937"
BHH4-10	10	1/8" I.D.	4.687"
BHH4-12	12	1/8" I.D.	5.437"

One of the stations must be used as the air supply to the manifold.

CUSTOMer solutions

If you need a product that fits your application perfectly, Clippard has the capability to design or modify one of its products to suit your exact needs. We understand that a standard catalog product may be close but not be exactly what you need. **Let us know YOUR Need, and we will help to find YOUR Solution!**



Bleed Valves

This miniature device is a vent or bleed valve that uses a tire stem valve in a small panel-mounted body with integral hose barb.



Standard fittings don't always fit!

Clippard manufactures custom fittings to meet your exact requirements.





In-Line Manifolds

Clippard's aluminum pipe thread manifolds are an economical and efficient choice for grouping pneumatic valves and other components in applications where space is limited. In addition, manifolds help to reduce potential leak points and allow for faster installation, all with one common air supply and less piping.

A unique feature of this series of manifolds is a bottom T-slot mounting system which allows for secure mounting using only two carriage bolts on any center distance along the length of the manifold. Hardware Kit ordered separately.

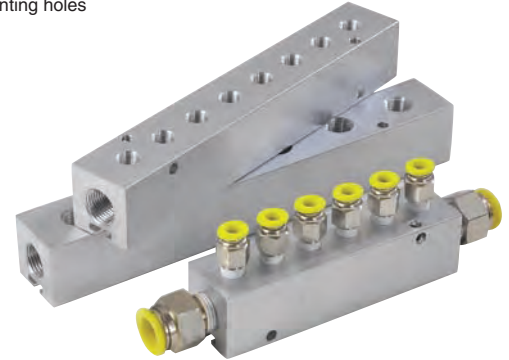
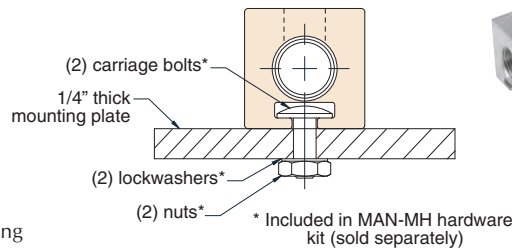
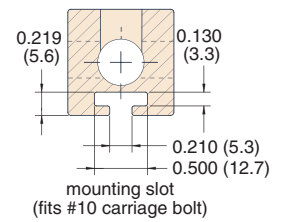
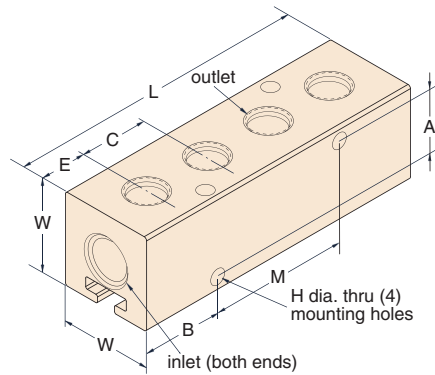
Medium: Air or Liquid

Material: Clear Anodized Aluminum

Outlet Ports (Top Ports): 1/8" NPT or 1/4" NPT

Inlet Ports (End Ports): 1/4" NPT or 3/8" NPT

Mounting: Top-to-bottom and front-to-back mounting holes as well as bottom T-slot mounting system



Part No.	Stations**	Width "W"	End Inlets	Top Outlets	Center "C"***	End "E"	Length "L"	Mtg. "M"	"A"	"B"	Hole* "H"
MAN-ASF1-04	4						3.250"	1.500"			
MAN-ASF1-06	6	1"	1/4" NPT	1/8" NPT	0.750"	0.500"	4.750"	3.000"	0.700"	0.875"	0.172"
MAN-ASF1-08	8	Sq.					6.250"	4.500"			(#8 screw)
MAN-ASF1-10	10						7.750"	6.000"			
MAN-ALF1-04	4						3.250"	1.500"			
MAN-ALF1-06	6	1 1/4"	3/8" NPT	1/8" NPT	0.750"	0.500"	4.750"	3.000"	0.875"	0.875"	0.201"
MAN-ALF1-08	8	Sq.					6.250"	4.500"			(#10 screw)
MAN-ALF1-10	10						7.750"	6.000"			
MAN-ALF2-04	4						4.125"	1.750"			
MAN-ALF2-06	6	1 1/4"	3/8" NPT	1/8" NPT	0.875"	0.750"	5.875"	3.500"	0.875"	1.187"	0.201"
MAN-ALF2-08	8	Sq.					7.625"	5.250"			(#10 screw)
MAN-ALF2-10	10						9.375"	7.000"			
MAN-ALY2-04	4						3.875"	1.750"			
MAN-ALY2-06	6	1 1/4"	3/8" NPT	1/4" NPT	0.875"	0.625"	5.625"	3.500"	0.875"	1.062"	0.201"
MAN-ALY2-08	8	Sq.					7.375"	5.250"			(#10 screw)
MAN-ALY2-10	10						9.125"	7.000"			
MAN-ALY6-04	4						5.875"	2.750"			
MAN-ALY6-06	6	1 1/4"	3/8" NPT	1/4" NPT	1.375"	0.875"	8.625"	5.500"	0.875"	1.562"	0.201"
MAN-ALY6-08	8	Sq.					11.375"	6.250"			(#10 screw)
MAN-ALY6-10	10						14.125"	11.000"			

* 0.172" can be tapped by the user for #10-32 thread; 0.201" may be tapped by user for 1/4"-20 thread for mounting.

** Variations available—consult factory.

MINIMATIC® J-SERIES QUICK CONNECT



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.

M J Q C - □ □ □ □

Cap

- B4** - 1/8" hose barb
- FT** - #10-32 female thd.
- PF** - Panel mount #10-32 female thd.
- PB** - Panel mount 1/8" hose barb
- MP** - 1/8" male NPT thd.
- MQ** - 1/4" male NPT thd.

Valve Body

- B4** - 1/8" hose barb
- FT** - #10-32 female thd.
- MT** - #10-32 male thd.
- MP** - 1/8" male NPT thd.
- FP** - 1/8" female NPT thd.
- MQ** - 1/4" male NPT thd.

To order just the cap

M J Q C - C □ □

To order just the valve body

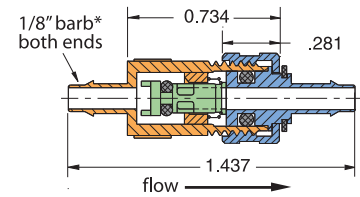
M J Q C - V □ □

Valve Body & Cap Assemblies

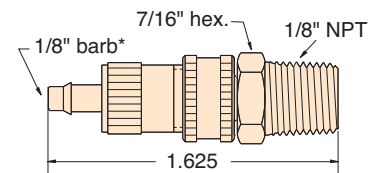
*1/8" Barb - fits 1/8" I.D. hose. Ideal for use with Clippard [URH1-0804](#) polyurethane hose.

- 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, or Water
- Working Pressure: 0 to 150 psig max.

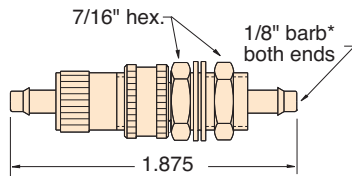
Minimatic J-Series quick connect fittings are very compact yet provide a very high flow. The electroless nickel plated brass body is available with #10-32 threads (M or F), 1/8" NPT threads (M or F), 1/4" NPT threads (M) or a 1/8" hose single barb configuration.



Part No.	Description
MIQC-B4B4	1/8" Barb Outlet, 1/8" Barb Inlet (MJQC-VB4/MJQC-CB4 Combo)

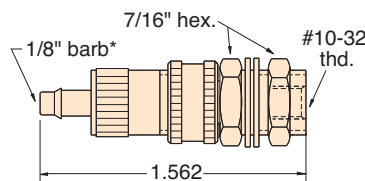


Part No.	Description
MIQC-MPB4	1/8" Barb Outlet, 1/8" NPT Inlet (MJQC-VB4/MJQC-CMP Combo)



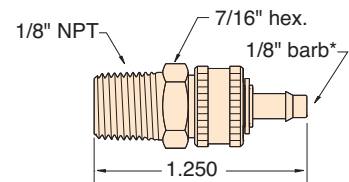
Part No.	Description
MIQC-PBB4	1/8" Barb Outlet, 1/8" Barb Inlet with Thread (MJQC-VB4/MJQC-CPB Combo)

(supplied with mounting nut and two washers)



Part No.	Description
MIQC-PFB4	1/8" Barb Outlet, #10-32 Inlet (MJQC-VB4/MJQC-CPF Combo)

(supplied with mounting nut and two washers)



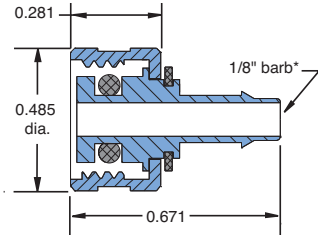
Part No.	Description
MIQC-B4MP	1/8" NPT Outlet, 1/8" Barb Inlet (MJQC-VMP/MJQC-CB4 Combo)



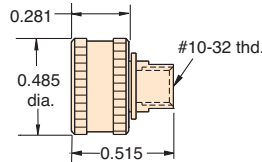
MINIMATIC® J-SERIES QUICK CONNECT FITTINGS

Caps with Open Flow Path

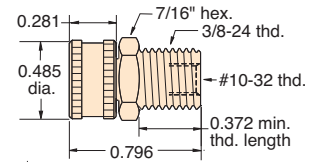
Minimatic J-Series quick connect fittings are ideal for use in jigs, fixtures, feeding devices, logic control circuitry and automatic or semi-automatic machinery. Assembly is simple, and the tightening of the knurled cap assures a positive, leakproof, high pressure connection that will stay connected.



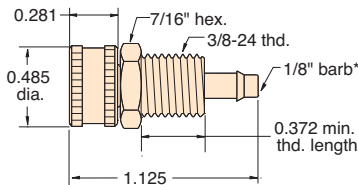
Part No. MIQC-CB4 **Description**
1/8" Barb



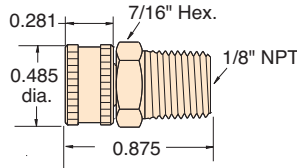
Part No. MIQC-CFT **Description**
#10-32



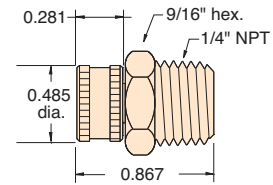
Part No. MIQC-CPF **Description**
3/8" Thread



Part No. MIQC-CPB **Description**
1/8" Barb
(supplied with mounting nut and two washers)



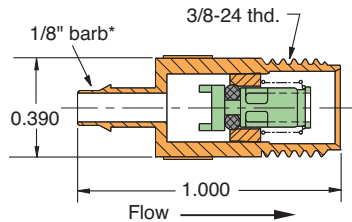
Part No. MIQC-CMP **Description**
1/8" NPT



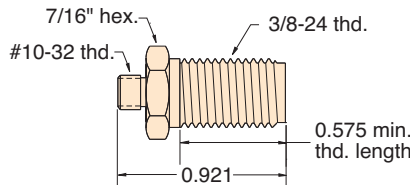
Part No. MIQC-CMQ **Description**
1/4" NPT

Valve Bodies with Shut-Off Valve

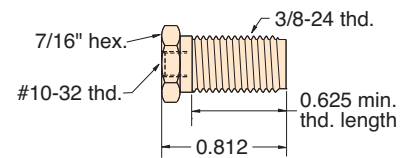
Minimatic J-Series quick connect fittings are very compact yet provide a high flow of 14 scfm @ 100 psig. The electroless nickel plated brass body is available with #10-32 threads (M or F), 1/8" NPT threads (M or F), 1/4" NPT threads (M) or a 1/8" hose single barb configuration that is ideal for use with Clippard URH1-0804 polyurethane hose.



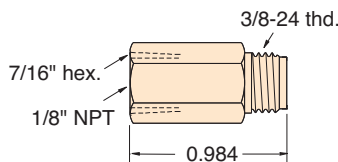
Part No. MIQC-VB4 **Description**
1/8" Barb, 3/8-24 Thd.



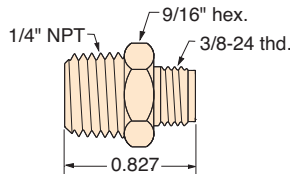
Part No. MIQC-VMT **Description**
#10-32 Male, 3/8-24 Thd.
(supplied with mounting nut and two washers)



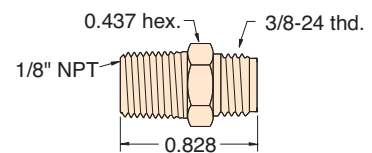
Part No. MIQC-VFT **Description**
#10-32 Female, 3/8-24 Thd.
(supplied with mounting nut and two washers)



Part No. MIQC-VFP **Description**
1/8" NPT Female, 3/8-24 Thd.



Part No. MIQC-VMQ **Description**
1/4" NPT Male, 3/8-24 Thd.



Part No. MIQC-VMP **Description**
1/8" NPT Male, 3/8-24 Thd.

*1/8 Barb - fits 1/8" I.D. hose. Ideal for use with Clippard URH1-0804 polyurethane hose.

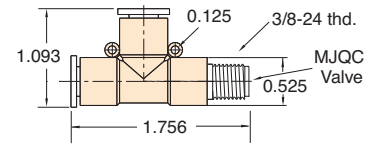
Push-Quick Fittings with MJQC Quick-Connect Port



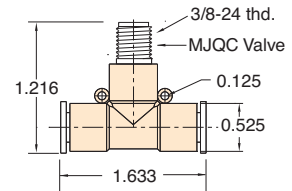
These 1/4" fittings combine the quick, easy Push-Quick functionality with the flexibility and security of the Quick-Connect series with no circuit interruption. MJQC Quick-Connect Caps (ordered separately on previous page) attach to the threaded port allowing for a variety of uses.

Part No.	Description
PQ-RT08QC	Run Tee with 3/8-24 Thread
PQ-BT08QC	Branch Tee 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

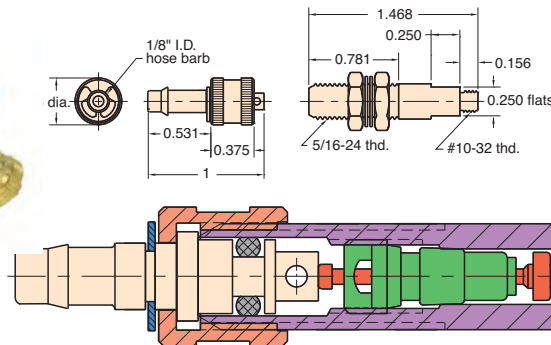


PQ-RT08QC



PQ-BT08QC

Quick Connect Assembly



Part No.	Description
MQC-2S	QC Assembly

Flow ←

Type: One way check quick connect assembly of valve body MQC-V2 and hose connector MQC-F

Material: Body- brass, Stem- brass

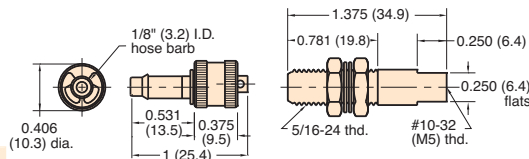
Seals: Buna-N

Working Pressure: 0 to 300 psig

Air Flow: 3.0 scfm @ 50 psig
5.8 scfm @ 100 psig

Triple Barb: Order MQC-2

Quick Connect Assembly



Part No.	Description
MQC-3S	QC Assembly

Type: One way check quick connect assembly of valve body MQC-V3 and hose connector MQC-F

Material: Body- brass, Stem- brass

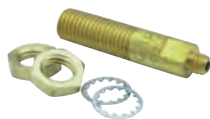
Seals: Buna-N

Working Pressure: 0 to 300 psig

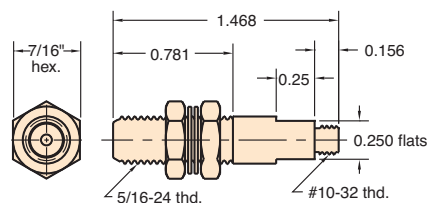
Air Flow: 3.0 scfm @ 50 psig
5.8 scfm @ 100 psig

Triple Barb: Order MQC-3 or MQC-3-M5 (metric)

Valve Body



Part No.	Description
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: (-ENP)

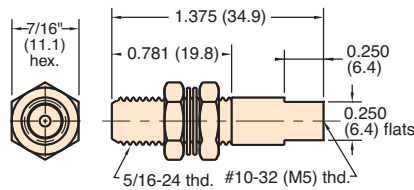




MINIMATIC® QUICK CONNECT

All fittings are Brass

Valve Body



Part No.	Description
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<u>MQC-V3</u>	Valve Body
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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

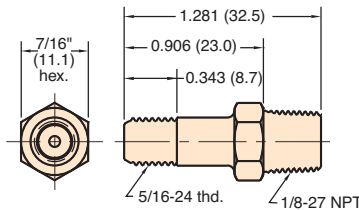
Seals: Buna-N

Use: For connection with external shut-off to external hose, use hose connectors: MQC-F, MQC-FT, MQC-F2

Options: (-ENP), (-M5)



Valve Body



Part No.	Description
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<u>MQC-VP</u>	Valve Body
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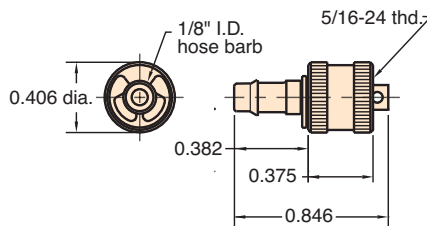
Thread: 1/8" NPT base; 5/16-24 body

Use: For connection with external shut-off to external hose, use hose connectors: MQC-F, MQC-FT, MQC-F

Seals: Buna-N

Options: (-ENP), (-MR)

1/8" Hose Connector



Part No.	Description
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<u>MQC-FS</u>	Hose Connector
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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

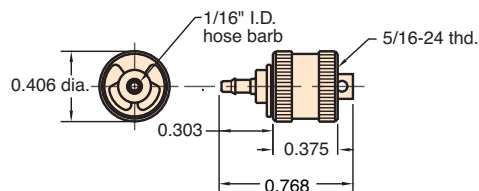
Installation: Simply push hose onto barbed end and secure with hose clamp 5000-1, 5000-2 or 5000-1A.

Seals: Buna-N

Options: (-ENP)

Triple Barb: Order MQC-F

1/16" Hose Connector



Part No.	Description
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<u>MQC-F2S</u>	Hose Connector
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Thread: I.D. of knurled end screws onto male end of valve bodies

For Use With: Subminiature VYH1-0402-CLT 1/16" ID vinyl hose

Installation: Simply push hose onto barbed end and secure with slip-over hose clamp furnished

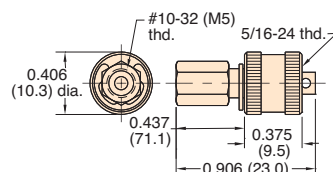
Seals: Buna-N

Options: (-ENP)

Triple Barb: Order MQC-F2



#10-32 (M5) Tapped Connector



Part No.	Description
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<u>MQC-FT</u>	#10-32 Connector
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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

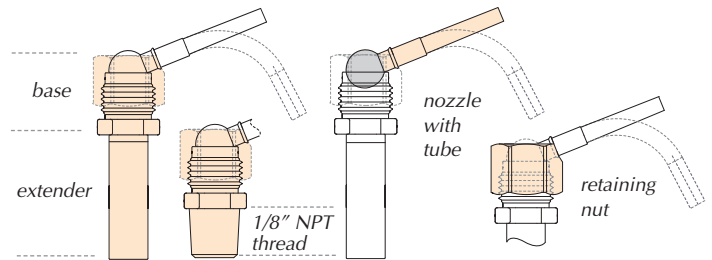
Mounting: Outlet mounts with #10-32 (M5) short coupling 11999

Seals: Buna-N

Options: (-ENP), (-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.



Air Jet Bases & Extenders*

Order No.

- AJB-F Base with #10-32 Female Thread, No Extender
- AJB-N Base with #10-32 Male Thread, No Extender
- AJB-P Base with 1/8" NPT Thread, No Extender
- AJB-10 Base with #10-32 Female Thread, 1" Extender
- AJB-15 Base with #10-32 Female Thread, 1.5" Extender
- AJB-20 Base with #10-32 Female Thread, 2" Extender

* All come complete with retaining nut. Nozzles ordered separately below

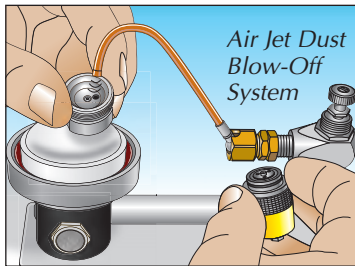
Air Jet Nozzles

- AJT-B Ball Nozzle Only
- AJT-1S1 Ball Nozzle with 1/32" ID Straight Brass Tube, 1"
- AJT-1S2 Ball Nozzle with 1/32" ID Straight Brass Tube, 2"
- AJT-1S3 Ball Nozzle with 1/32" ID Straight Brass Tube, 3"
- AJT-2S1 Ball Nozzle with 1/16" ID Straight Brass Tube, 1"
- AJT-2S2 Ball Nozzle with 1/16" ID Straight Brass Tube, 2"
- AJT-2S3 Ball Nozzle with 1/16" ID Straight Brass Tube, 3"
- AJT-3S1 Ball Nozzle with 3/32" ID Straight Brass Tube, 1"
- AJT-3S2 Ball Nozzle with 3/32" ID Straight Brass Tube, 2"
- AJT-3S3 Ball Nozzle with 3/32" ID Straight Brass Tube, 3"
- AJT-2F4 Ball Nozzle with Flexible Copper Tube, 4" 1/16" ID only)
- AJT-1N Ball Nozzle with 1/32" ID 90° Tube
- AJT-2N Ball Nozzle with 1/16" ID 90° Tube
- AJT-3N Ball Nozzle with 3/32" ID 90° Tube

Accessories

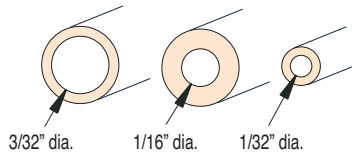
- AIK Air Jet Kit (see web site for details)
- AJS Mounting Squeeze Block
- 27801-PKG Retaining Nut

Air jets are used extensively within the manufacturing environment. They are designed to deliver a concentrated flow of air or liquid to a specific location. They are used in blow-off, cleaning, drying, part ejecting, and cooling applications. Clippard's new line provides a wide variety of nozzles, bases, and mounting hardware to accomplish these functions in a simple, cost-effective way. By selecting the appropriate orifice size, the nozzle can deliver anywhere from a large blast to a small pinpoint stream of air, water, or oil. Nozzles can be easily aimed and locked into position for precise delivery of air or liquid. Nozzle tubes are interchangeable.

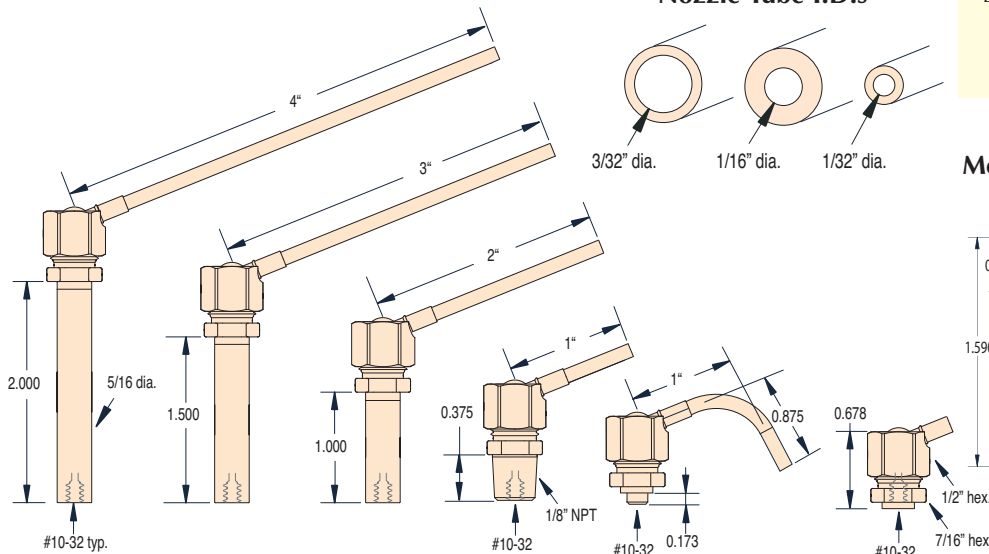


- Medium:** Air, gases, water, compatible cooling fluids
- Materials:** Corrosion-resistant brass and stainless steel
- Ports:** #10-32 male, #10-32 female, 1/8-27 NPT
- Pressure Range:** Up to 200 psig
- Mounting:** Mounting squeeze block, direct-mount
- Temperature Range:** 32 to 180°F (0 to 82°C)

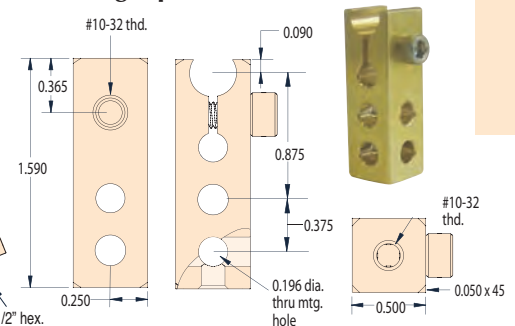
Nozzle Tube I.D.s



Blank ball nozzles are available to allow customers to install their own special nozzle tubes. Consult Clippard with requirements.



Mounting Squeeze Block





MINIMATIC® FITTINGS KITS



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.



Minimatic Slip-On Fittings Kit



- UT0-FOF Universal Tee #10-32M to #10-32F
- UT0-F Universal Elbow #10-32M to #10-32F
- UTF-F Universal Tee #10-32M to #10-32F
- UTF-FOF Universal Cross #10-32M to #10-32F

- In-Line 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 Tee to 1/16" I.D. Hose
- T44-2 1/16" I.D. Hose Tee to 1/8" I.D. Hose
- X44-404 1/8" I.D. Hose Cross
- X22-202 1/16" I.D. Hose Cross

- SP0-4 1/8" MNPT to Elbow 1/8" I.D. Hose
- SP0-2 1/8" MNPT to Elbow 1/16" I.D. Hose
- SP0-4004 1/8" MNPT to Tee 1/8" I.D. Hose
- SP0-2002 1/8" MNPT to Tee 1/16" I.D. Hose

- T22-2 1/16" I.D. Hose Tee
- T44-4 1/8" I.D. Hose Tee
- XT4-404 1/8" I.D. Hose Cross with #10-32M
- XT2-202 1/16" I.D. Hose Cross with #10-32M

- CT2 1/16" I.D. Hose to #10-32M
- CT4 1/8" I.D. Hose to #10-32M
- Inline Swivel Connectors

- S44 1/8" I.D. Hose to 1/8" I.D. Hose
- ST4 1/8" I.D. Hose to #10-32M
- S4F 1/8" I.D. Hose to #10-32F

Contains:

- CT0-2 Connector Elbow 1/16" I.D. Hose to #10-32M
- UT0-2 Universal Elbow 1/16" I.D. Hose to #10-32M
- ST0-2 Swivel Elbow 1/16" I.D. Hose to #10-32M
- CT0-4 Connector Elbow 1/8" I.D. Hose to #10-32M
- UT0-4 Universal Elbow 1/8" I.D. Hose to #10-32M
- ST0-4 Swivel Elbow 1/8" I.D. Hose to #10-32M
- TT0-202 Connector 1/16" I.D. Hose Tee with #10-32M
- UT0-2002 Universal 1/16" I.D. Hose Tee with #10-32M
- ST0-2002 Swivel 1/16" I.D. Hose Tee with #10-32M
- TT0-404 Connector 1/8" I.D. Hose Tee with #10-32M
- UT0-4004 Universal 1/8" I.D. Hose Tee with #10-32M
- ST0-4004 Swivel 1/8" I.D. Hose Tee with #10-32M
- Clippard 1/4" & 5/16" Wrench 11770
- 11761-2 Gasket
- Hose Samples

Part No.	Description
<u>17555-SF1</u>	Slip-On Fittings Kit



Minimatic Fittings Kit



Contains:

- 1/8" NPT to #10-32 Elbow [15090-1](#)
- #10-32 Elbow 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" MNPT to 1/8" I.D. Hose Adapter [11924-1](#)
- Adjustable #10-32 Elbow Fitting [15002-1](#)
- #10-32 Cross Fitting [15002-4](#)
- Female #10-32 Hex Connector [15004](#)
- #10-32M to 1/8" I.D. Hose with Swivel [15045](#)
- 1/4" MNPT to #10-32F Adapter [4CQF](#)
- 1/8" NPT to #10-32 Tee [15090-2](#)
- #10-32 Tee Fitting [15002-3](#)
- #10-32M 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" MNPT to #10-32F Adapter [2CPF](#)

Part No.	Description
17555	Minimatic Fittings Kit

Minimatic Quick Connect Fittings Kit



Contains:

- 1/8" I.D. Tee Connector [T44-4](#)
- Panel Mount #10-32F Cap [MJQC-CFP](#)
- Panel Mount 1/8" I.D. Hose Cap [MJQC-CBP](#)

- 3/8-24 Nuts [0107-48](#)
- Lockwasher [0302-43](#)
- 1/8" NPTF Valve [MJQC-VFP](#)
- 1/4" NPTM Valve [MJQC-VMQ](#)
- 1/8" NPTM Valve [MJQC-VMP](#)
- 1/8" NPTM Cap [MJQC-CMP](#)
- 1/4" NPTM Cap [MJQC-CMQ](#)
- 1/8" I.D. Hose Valve [MJQC-VB4](#)
- Panel Mount #10-32F Valve [MJQC-VFT](#)
- Panel Mount #10-32M Valve [MJQC-VMT](#)
- #10-32F Cap [MJQC-CFT](#)
- 1/8" I.D. Hose Cap [MJQC-CB4](#)
- Gasket [11761-2](#)
- Hose Samples
- Clippard 1/4" & 5/16" Wrench [11770](#)
- #10-32M to 1/8" I.D. [CT4](#)
- UTO-4 [UTO-4004](#)

Part No.	Description
17555-QC1	Quick Connect Fittings Kit



HOSE & TUBING

hose \`hōz \ n : a flexible tube for conveying gases or fluids

tubing \`(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.

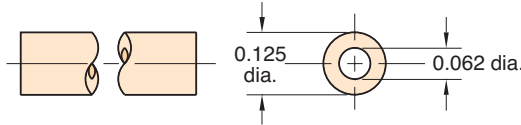
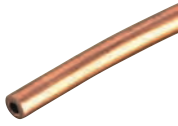
Clippard offers a variety of miniature hose and tubing from copper and nylon tubing to flexible urethane, vinyl and Buna-N hose. The chart below lists these products and their available colors and lengths.



	□	-	□	-	□	-	□		
Hose or Tubing Type								Available Lengths	
NYT1 - Single Nylon Tubing								050 - 50' Roll	
VYH1 - Single Vinyl Hose								500 - 500' Spool	
VYH2 - Dual Vinyl Hose									
URH1 - Single 85 Duro. Polyurethane Hose									
URH2 - Dual 85 Duro. Polyurethane Hose									
URH8 - Ribbon 85 Duro. Polyurethane Hose									
URT1 - Single 95 Duro. Polyurethane Tubing									
PET1 - Single Polyethylene Tubing									
		Size: O.D. x I.D.		Colors: Solid			Translucent		
		0402 - 1/8" x 1/16"		BLS - Blue			BLT - Blue		
		0403 - 1/8" x 3/32"		BKS - Black			CLT - Clear		
		0503 - 5/32" x 3/32"		BRS - Brown			GNT - Green		
		0804 - 1/4" x 1/8"		GNS - Green			PUT - Purple		
		0805 - 1/4" x 0.160"		GYS - Gray			ORT - Orange		
		1208 - 3/8" x 1/4"		NAS - Natural			RDT - Red		
		1610 - 1/2" x 0.320"		ORS - Orange			YLT - Yellow		
		Metric Sizes		RDS - Red			02T - BLT/GNT/GYS/ORT/ PUT/RDT/WHS/YLT (ribbon only)		
		0604M - 6 mm x 4 mm		WHS - White					
		0805M - 8 mm x 5 mm		YLS - Yellow					
				01S - Gray/Black (dual only)					

This chart is to be used as an explanation of our ordering system. See individual listings following this page for sizes and colors available.

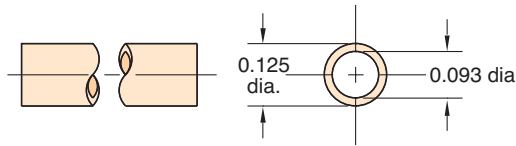
1/8" O.D. Copper Tubing



Part No. 3811-1-RL
Description Copper Tubing

Material: High pressure copper
Working Pressures: to 2,500 psig
Static Burst Pressure: over 10,000 psig
Lengths Available: 50'
Bend Radius: 3/8"
Use With: Ferrule tubing connectors: [3810-1](#), [3810-2](#), [11923](#)

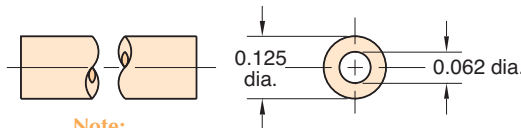
3/32" I.D. Nylon Tubing



Part No. NYT1-0403-CLT-□

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'
Bend Radius: 3/8"

1/16" I.D. 80A Vinyl Hose

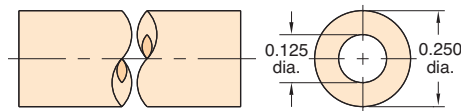


Part No. VYH1-0402-CLT-□

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'
Bend Radius: 3/8"

1/8" I.D. 80A Vinyl Hose

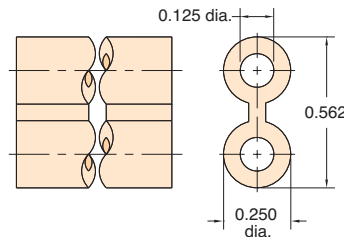


Part No. VYH1-0804-CLT-□

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'
Bend Radius: 1/2"

1/8" I.D. Twin Vinyl Hose



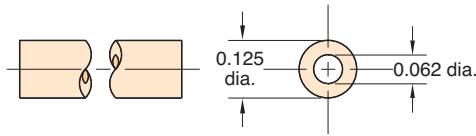
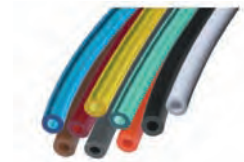
Part No. VYH2-0804-GYS-□

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'
Bend Radius: 1/2"



HOSE & TUBING

1/16" I.D. 85A Polyurethane Hose



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'

Bend Radius: 3/16"

Note: In normal application hose clamps are not required with hose when used with Clippard hose barb fittings

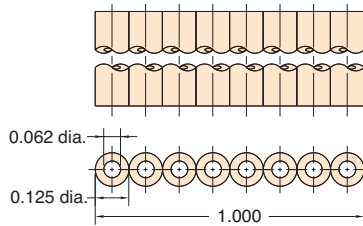
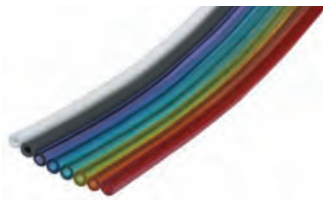
Part No.

URH1-0402-□-□

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.

1/16" I.D. 85A Polyurethane Ribbon Hose



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'

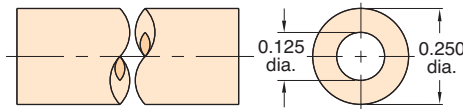
Bend Radius: 3/16"

Note: In normal application, hose clamps are not required with hose when used with Clippard hose barb fittings

Part No.

URH8-0402-02T-050

1/8" I.D. 85A Polyurethane Hose



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'

Bend Radius: 3/8"

Note: In normal application hose clamps are not required with hose when used with Clippard hose barb fittings

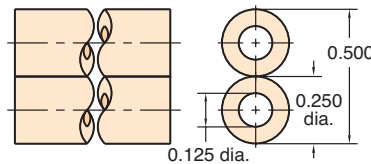
Part No.

URH1-0804-□-□

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.

Twin 1/8" I.D. 85A Polyurethane Hose



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'

Bend Radius: 3/8"

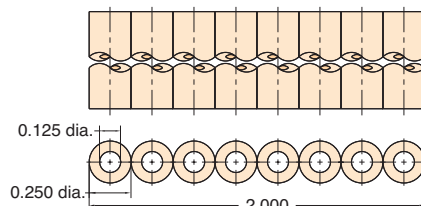
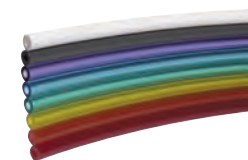
Use: Ideal for feeding supply in on one line and out on the other; reduces labor; makes neat assembly; may be parted with any sharp cutting edge

Note: In normal application, hose clamps are not required with URH2-0804-01S hose when used with Clippard hose barb fittings

Part No.

URH2-0804-01S-□

1/8" I.D. 85A Polyurethane Ribbon Hose



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'

Bend Radius: 3/8"

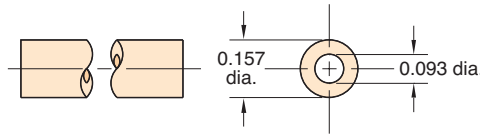
Note: In normal application, hose clamps are not required with hose when used with Clippard hose barb fittings

Part No.

URH8-0804-02T-050

5/32" O.D. 95A Polyurethane Tubing

Flexible, durable ether based tubing



Part No.

URT1-0503-□-□

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.

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

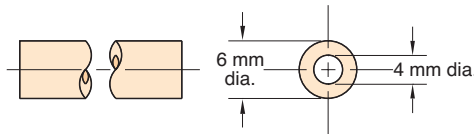
Lengths Available: 50' and 500'

Bend Radius: 3/8"

Note: Designed for use with push-in fittings.

6 mm O.D. 95A Polyurethane Tubing

Flexible, durable ether based tubing



Part No.

URT1-0604M-□-□

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.

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

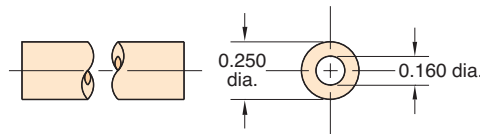
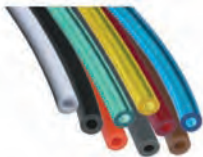
Lengths Available: 50' and 500'

Bend Radius: 1/2"

Note: Designed for use with push-in fittings.

1/4" O.D. 95A Polyurethane Tubing

Flexible, durable ether based tubing



Part No.

URT1-0805-□-□

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.

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

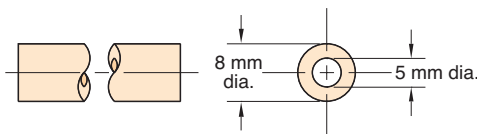
Lengths Available: 50' and 500'

Bend Radius: 1/2"

Note: Designed for use with push-in fittings.

8 mm O.D. 95A Polyurethane Tubing

Flexible, durable ether based tubing



Part No.

URT1-0805M-CLT-□

Working Range: 0 to 105 psig at 100°F Maximum 120°F

Static Burst Pressure: Over 465 psig at 75°F

Color: Clear

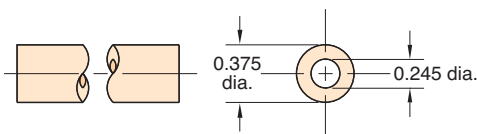
Lengths Available: 50' and 500'

Bend Radius: 3/4"

Note: Designed for use with push-in fittings.

3/8" O.D. 95A Polyurethane Tubing

Flexible, durable ether based tubing



Part No.

URT1-1208-□-□

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.

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'

Bend Radius: 7/8"

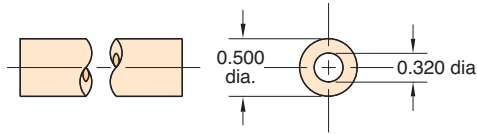
Note: Designed for use with push-in fittings.



HOSE & TUBING

1/2" O.D. 95A Polyurethane Tubing

Flexible, durable ether based tubing



Part No.

URT1-1610-CLT-□

Working Range: 0 to 105 psig at 100°F Maximum 120°F

Static Burst Pressure: Over 420 psig at 75°F

Color: Clear

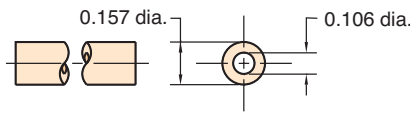
Lengths Available: 50' and 250'

Bend Radius: 1 1/8"

Note: Designed for use with push-in fittings.

5/32" O.D. 50D Polyethylene Tubing

Linear low density tubing



Part No.

PET1-0503-□-□

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.

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

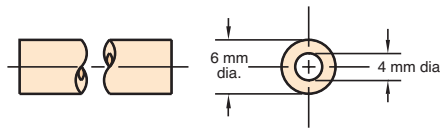
Lengths Available: 50' and 500'

Bend Radius: 1/2"

Note: Designed for use with push-in fittings.

6 mm O.D. 50D Polyethylene Tubing

Linear low density tubing



Part No.

PET1-0604M-□-□

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.

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

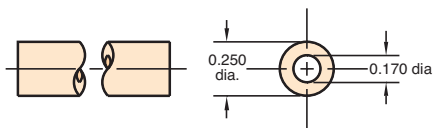
Lengths Available: 50' and 500'

Bend Radius: 1 1/4"

Note: Designed for use with push-in fittings.

1/4" O.D. 50D Polyethylene Tubing

Linear low density tubing



Part No.

PET1-0805-□-□

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.

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

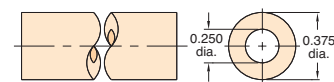
Lengths Available: 50' and 500'

Bend Radius: 1 1/4"

Note: Designed for use with push-in fittings.

3/8" O.D. 50D Polyethylene Tubing

Linear low density tubing



Part No.

PET1-1208-□-□

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.

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'

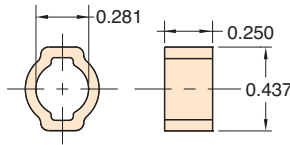
Bend Radius: 2"

Note: Designed for use with push-in fittings.

Quick Set Hose Clamp



Type: Zinc plated steel
Use: 5000-1 with twin vinyl hose

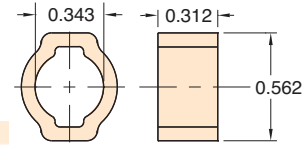


Part No. **Description**
5000-1 Hose Clamp

Quick Set Hose Clamp

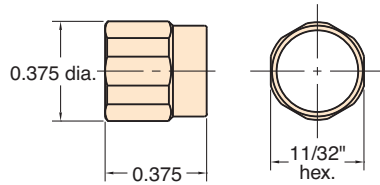


Type: Zinc plated steel



Part No. **Description**
5000-1A Hose Clamp

Reusable Hose Clamp



Part No. **Description**
5000-2 Hose Clamp

Material: Brass, self-threading, reusable

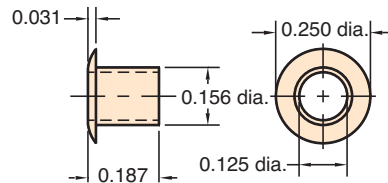
Use With: 11765 Buna-N hose VYH1-0804-CLT vinyl hose and Clippard hose fittings

Installation: Slip sleeve over hose, push onto fitting, then screw into place; tighten with wrench

Options: (-ENP)



Press-On Hose Clamp



Part No. **Description**
5000-4 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: (-ENP)



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

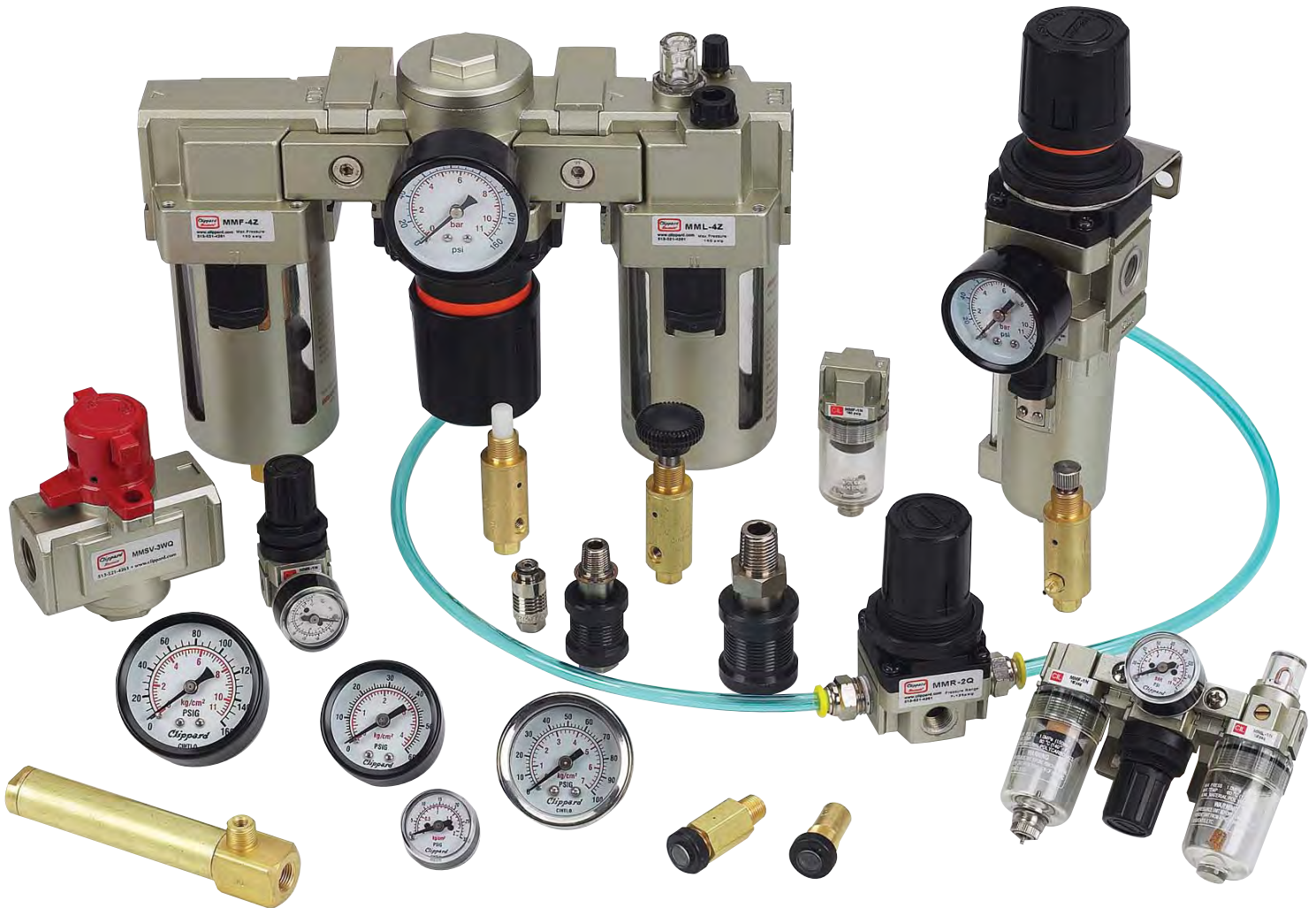
When using hose or tubing, care should always be taken to avoid sharp bends to prevent compressing the inside diameter of the hose or tubing and restricting flow. For extremely close connections, allow a short loop of hose to avoid crimping.

Clippard Hose & Tubing		I.D.	O.D.	Min. Bend Radius
3811-1-RL	Copper Tube	1/16"	1/8"	3/8"
NYT1-XXX	Nylon Tubing	3/32"	1/8"	3/8"
VYH1-XXX	80A Duro. Vinyl Hose	1/16"	1/8"	3/8"
VYH1-XXX	80A Duro. Vinyl Hose	1/8"	1/4"	1/2"
VYH2-XXX	Dual Vinyl Hose	1/8"	1/4"	1/2"
URH1-XXX	85A Duro. Polyurethane Hose	1/16"	1/8"	3/16"
URH8-XXX	Ribbon 85A Duro. Polyurethane	1/16"	1/8"	3/16"
URH1-XXX	85A Duro. Polyurethane Hose	1/8"	1/4"	3/8"
URH2-XXX	Dual 85A Duro. Polyurethane	1/8"	1/4"	3/8"
URH8-0804-XXX	Ribbon 85A Duro. Polyurethane	1/8"	1/4"	3/8"
URT1-0503-XXX	95A Duro. Polyurethane Tubing	3/32"	5/32"	3/8"
URT1-0604M-XXX	95A Duro. Polyurethane Tubing	4 mm	6 mm	1/2"
URT1-0805-XXX	95A Duro. Polyurethane Tubing	0.160"	1/4"	1/2"
URT1-0805M-CLT	95A Duro. Polyurethane Tubing	5 mm	8 mm	3/4"
URT1-1208-XXX	95A Duro. Polyurethane Tubing	0.245"	3/8"	7/8"
URT1-1610-XXX	95A Duro. Polyurethane Tubing	0.320"	1/2"	1 1/8"
PET1-0503-XXX	50D Duro. Polyethylene Tubing	0.106"	5/32"	1/2"
PET1-0604M-XXX	50D Duro. Polyethylene Tubing	4 mm	6 mm	1 1/4"
PET1-0805-XXX	50D Duro. Polyethylene Tubing	0.170"	1/4"	1 1/4"
PET1-1208-XXX	50D Duro. Polyethylene Tubing	1/4"	3/8"	2"



AIR PREPARATION EQUIPMENT

<u>MAXIMATIC® FILTER-REGULATOR-LUBRICATORS</u>	<u>329 - 332</u>
<u>MAXIMATIC® FILTER-REGULATORS</u>	<u>333</u>
<u>MAXIMATIC® FILTERS</u>	<u>334</u>
<u>MAXIMATIC® REGULATORS</u>	<u>335</u>
<u>MAXIMATIC® LUBRICATORS</u>	<u>336</u>
<u>MAXIMATIC® MOUNTING HARDWARE</u>	<u>337 - 339</u>
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<u>MAXIMATIC® FLOW CHARTS</u>	<u>341 - 344</u>





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.

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.

- 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	Enter
FRL	.FRL	Filter	.F
Stacking FRL	.FRLS	Regulator	.R
Stacking Filter-Regulator	.FRS	Lubricator	.L

Body/Port Size	Enter	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		

Options	Automatic Drain (D)	Metal Bowl (M)	30 psig (P30) 60 psig (P60)	5 Micron Filter (F5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Example: MM - -

MM - -

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.



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

Flow rates from 3 scfm to 280 scfm

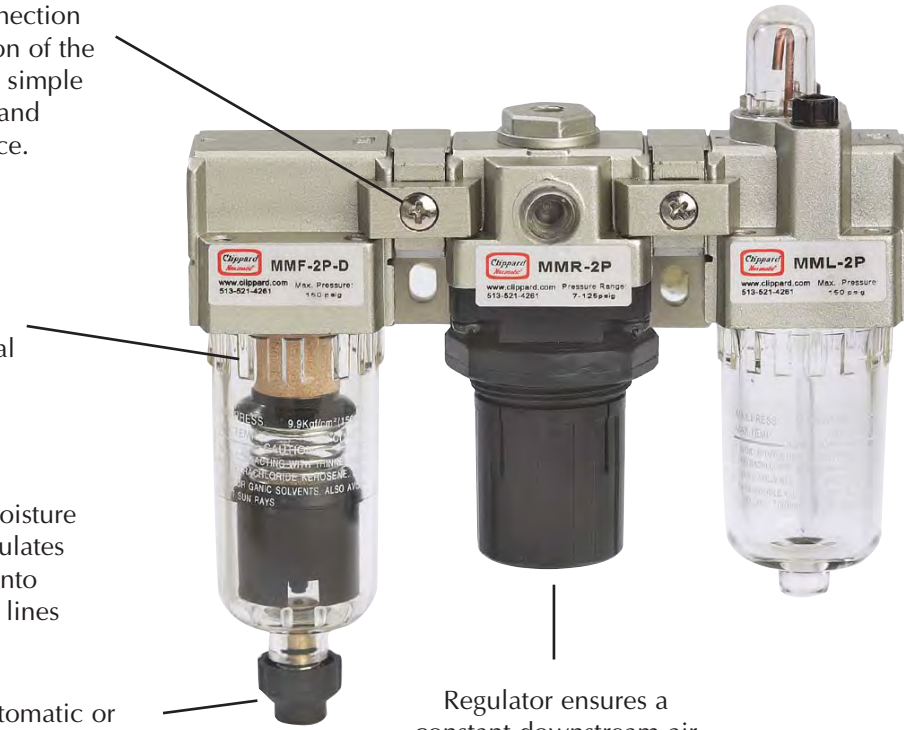
Lubricators increase component life by dispensing oil into the airline supply

25 micron filters standard, 5 micron optional

Filters prevent moisture and solid particulates from getting into compressed air lines

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

MAXIMATIC® FILTER-REGULATOR-LUBRICATORS



MMFRL-2P-D
FRL with Polycarbonate Bowls
and Auto Drain



MMFRL-3W
FRL with Bowl Shields

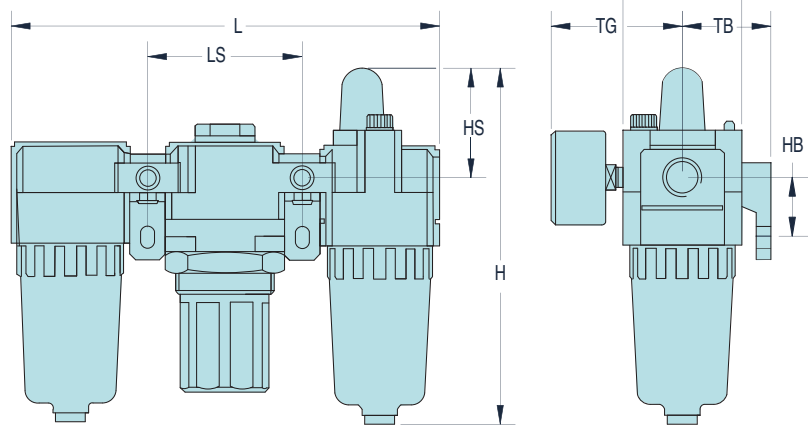
Combination FRLs provide air filtration, regulation and lubrication in one unit for easy mounting and installation. Includes L brackets and gauge.

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-4Z					
	MMFRL-1	MMFRL-2	MMFRL-3	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	no	PG-10-160J
MMFRL-2P	1/8" NPT	1/8" NPT	18 scfm	no	PG-15-160P
MMFRL-2Q	1/4" NPT	1/8" NPT	18 scfm	no	PG-15-160P
MMFRL-3O	1/4" NPT	1/8" NPT	70 scfm	yes	PG-15-160P
MMFRL-3W	3/8" NPT	1/8" NPT	70 scfm	yes	PG-15-160P
MMFRL-4W	3/8" NPT	1/4" NPT	140 scfm	yes	PG-20-160Q
MMFRL-4Z	1/2" NPT	1/4" NPT	140 scfm	yes	PG-20-160Q
MMFRL-4A-M*	3/4" NPT	1/4" NPT	160 scfm	yes	PG-20-160Q
MMFRL-5B-M*	1" NPT	1/4" NPT	180 scfm	yes	PG-20-160Q

* Metal bowl standard



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.

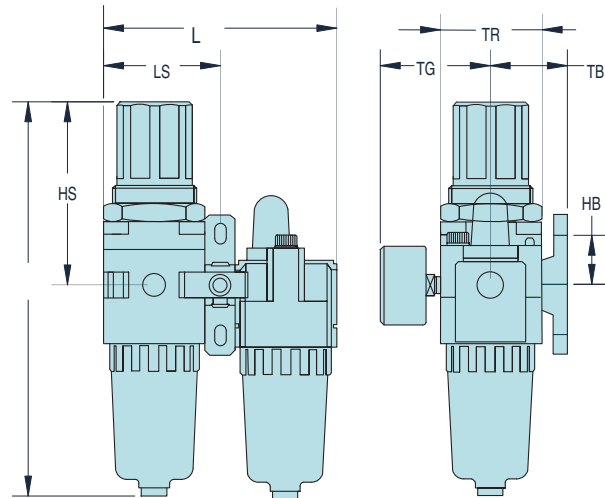
- Includes L bracket and gauge

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-4Z					
	MMFRLS-1	MMFRLS-2	MMFRLS-3	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

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.

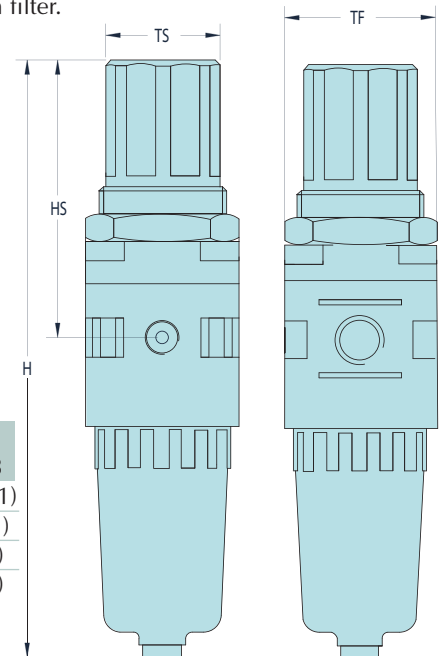
- Includes bracket and gauge (see Page 340 for dimensions).

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. 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 (not available with MMFRS-4A-M).

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-3W	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	no	PG-10-160J
MMFRS-2P	1/8" NPT	1/8" NPT	19 scfm	no	PG-15-160P
MMFRS-2Q	1/4" NPT	1/8" NPT	19 scfm	no	PG-15-160P
MMFRS-3Q	1/4" NPT	1/8" NPT	70 scfm	yes	PG-15-160P
MMFRS-3W	3/8" NPT	1/8" NPT	70 scfm	yes	PG-15-160P
MMFRS-4W	3/8" NPT	1/4" NPT	140 scfm	yes	PG-20-160Q
MMFRS-4Z	1/2" NPT	1/4" NPT	140 scfm	yes	PG-20-160Q
MMFRS-4A-M*	3/4" NPT	1/4" NPT	160 scfm	yes	PG-20-160Q
MMFRS-5B-M*	1" NPT	1/4" NPT	195 scfm	yes	PG-20-160Q

* Metal bowl standard



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

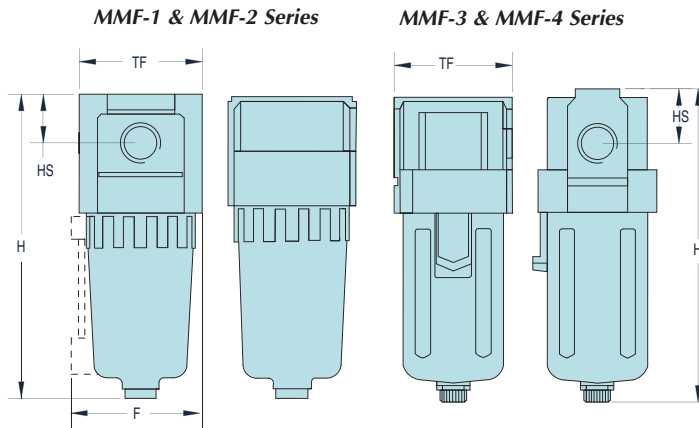
Maximatic® filters remove moisture and contaminants, and provide air filtration through a 25 micron filter. Replacement 25 micron and 5 micron filters are available.

- 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
<u>MMF-1</u>	--	2.60 (66.0)	0.28 (7.1)	0.98 (24.9)
<u>MMF-2</u>	1.81 (50.0)	3.84 (97.5)	0.43 (10.9)	1.57 (39.9)
<u>MMF-3</u>	2.26 (57.4)	5.22 (132.6)	0.55 (14.0)	2.09 (53.1)
<u>MMF-4W/4Z</u>	3.00 (76.2)	6.63 (168.4)	0.71 (18.0)	2.76 (70.1)
<u>MMF-4A-M</u>	3.00 (76.2)	6.79 (172.5)	0.79 (19.8)	2.76 (70.1)
<u>MMF-5B-M</u>	3.00 (76.2)	9.74 (247.4)	0.94 (23.9)	3.54 (89.9)



MAXIMUM
Value. ←
→ Performance.

Part No.	Port	Flow Rate	Bowl Shield
<u>MMF-1N</u>	#10-32	4 scfm 110 l/min	no
<u>MMF-2P</u>	1/8" NPT	26 scfm 750 l/min	no
<u>MMF-2Q</u>	1/4" NPT	26 scfm 750 l/min	no
<u>MMF-3Q</u>	1/4" NPT	70 scfm 2,000 l/min	yes
<u>MMF-3W</u>	3/8" NPT	70 scfm 2,000 l/min	yes
<u>MMF-4W</u>	3/8" NPT	140 scfm 4,000 l/min	yes
<u>MMF-4Z</u>	1/2" NPT	140 scfm 4,000 l/min	yes
<u>MMF-4A-M*</u>	3/4" NPT	210 scfm 6,000 l/min	n/a
<u>MMF-5B-M*</u>	1" NPT	245 scfm 7,000 l/min	n/a

* Metal bowl standard

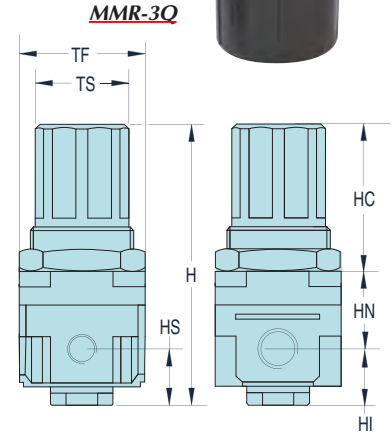
Maximatic® Regulators provide precise air regulation from 7 to 125 psig. The adjustment knob must be pulled out to adjust the pressure, preventing accidental adjustment. Maximum inlet pressure is 150 psig. Includes bracket and gauge.

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.



Dim.	MMR-4Z					
	MMR-1	MMR-2	MMR-3	MMR-4W	MMR-4A	MMR-5
H	2.42 (61.5)	3.74 (95.0)	4.80 (121.8)	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)	1.30 (33.0)	1.44 (36.6)	1.44 (36.6)	1.87 (47.5)
HI	0.43 (10.9)	0.65 (16.5)	1.34 (34.0)	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
<u>MMR-1N</u>	#10-32	1/16" NPT	4 scfm	100 l/min	<u>PG-10-160I</u>
<u>MMR-2P</u>	1/8" NPT	1/8" NPT	19 scfm	550 l/min	<u>PG-15-160P</u>
<u>MMR-2Q</u>	1/4" NPT	1/8" NPT	19 scfm	550 l/min	<u>PG-15-160P</u>
<u>MMR-3Q</u>	1/4" NPT	1/8" NPT	88 scfm	2,500 l/min	<u>PG-15-160P</u>
<u>MMR-3W</u>	3/8" NPT	1/8" NPT	88 scfm	2,500 l/min	<u>PG-15-160P</u>
<u>MMR-4W</u>	3/8" NPT	1/4" NPT	140 scfm	4,000 l/min	<u>PG-20-160Q</u>
<u>MMR-4Z</u>	1/2" NPT	1/4" NPT	140 scfm	4,000 l/min	<u>PG-20-160Q</u>
<u>MMR-4A</u>	3/4" NPT	1/4" NPT	210 scfm	6,000 l/min	<u>PG-20-160Q</u>
<u>MMR-5B</u>	1" NPT	1/4" NPT	280 scfm	8,000 l/min	<u>PG-20-160Q</u>



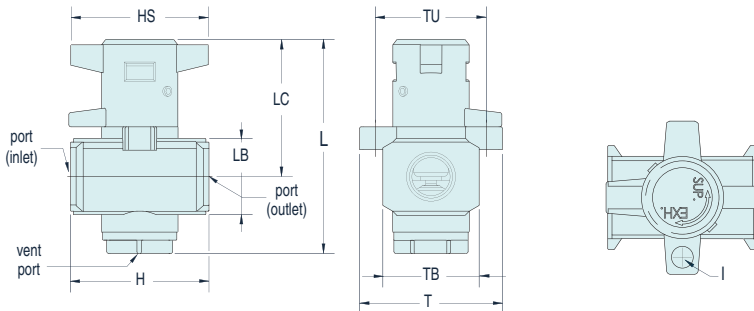
RELIEVING SHUT-OFF/LOCK OUT VALVES

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-3WQ	MMSV-3ZW
	MMSV-3PP	MMSV-3QQ	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:					
				MMFRL-2	MMFRLS-2	MMFR-2	MMFRS-2	MMF-2	MMR-2
<u>MMSV-3PP</u>	1/8" NPT	1/8" NPT	18	MMFRL-2	MMFRLS-2	MMFR-2	MMFRS-2	MMF-2	MMR-2
<u>MMSV-3QP</u>	1/4" NPT	1/8" NPT	25	MMFRL-2	MMFRLS-2	MMFR-2	MMFRS-2	MMF-2	MMR-2
<u>MMSV-3QQ</u>	1/4" NPT	1/4" NPT	60	MMFRL-3	MMFRLS-3	MMFR-3	MMFRS-3	MMF-3	MMR-3
<u>MMSV-3WQ</u>	3/8" NPT	1/4" NPT	90	MMFRL-3	MMFRLS-3	MMFR-3	MMFRS-3	MMF-3	MMR-3
<u>MMSV-3WW</u>	3/8" NPT	3/8" NPT	120	MMFRL-4	MMFRLS-4	MMFR-4	MMFRS-4	MMF-4	MMR-4
<u>MMSV-3ZW</u>	1/2" NPT	3/8" NPT	180	MMFRL-4	MMFRLS-4	MMFR-4	MMFRS-4	MMF-4	MMR-4



MAXIMATIC® LUBRICATORS



MML-3W
Lubricator with
Bowl Shield



MML-2P
Lubricator with
Polycarbonate
Bowl



MML-2Q-M
Lubricator with
Metal Bowl

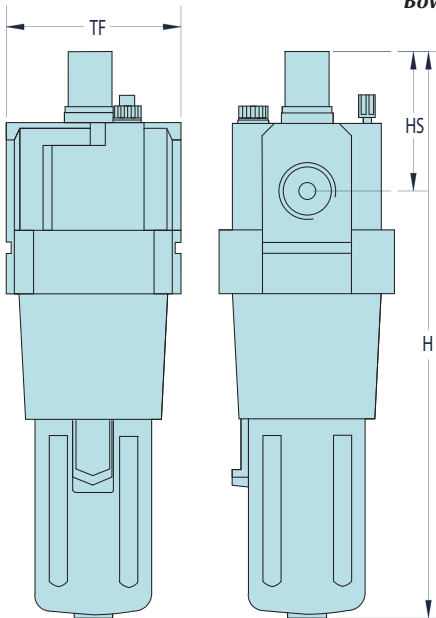
These inexpensive direct-flow lubricators provide lubrication to downstream valves and actuators

Bowl: Polycarbonate standard. Steel Shield provided on models as indicated. Metal bowl with sight glass also available, add “-M” to the Part Number.

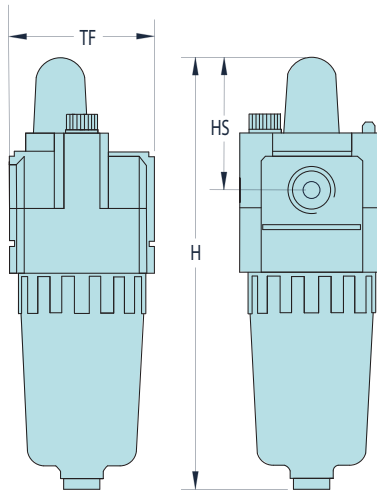


Mounting Hardware

For a complete offering of mounting hardware, spacers, replacement bowls and other accessories, see [pages 337 through 339](#).



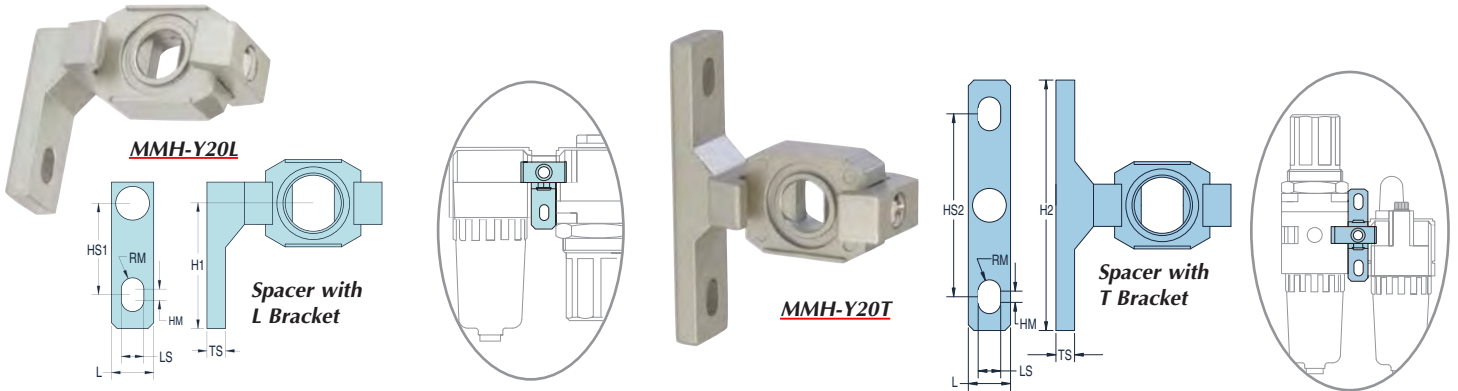
MML-3, MML-4 & MML-5 Series



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)



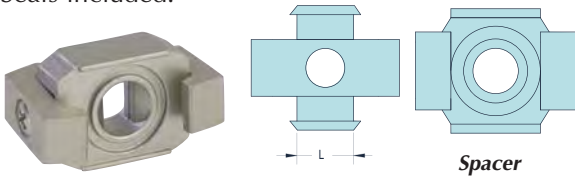
Mounting Hardware for Combination Units

To convert individual Filter, Regulator and Lubricators into combination units. Seals included.

FRL Series	Spacer with L Bracket	Spacer with T Bracket	Dim.	MMH-Y10L	MMH-Y20L	MMH-Y30L	MMH-Y40L	MMH-Y50L	MMH-Y60L
	MMH-Y10L	MMH-Y10T		MMH-Y10T	MMH-Y20T	MMH-Y30T	MMH-Y40T	MMH-Y50T	MMH-Y60T
FRL-1	MMH-Y10L	MMH-Y10T	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)
FRL-2	MMH-Y20L	MMH-Y20T	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)
FRL-3	MMH-Y30L	MMH-Y30T	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)
FRL-4W/4Z	MMH-Y40L	MMH-Y40T	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)
FRL-4A	MMH-Y50L	MMH-Y50T	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)
FRL-5	MMH-Y60L	MMH-Y60T	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)
			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)
			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

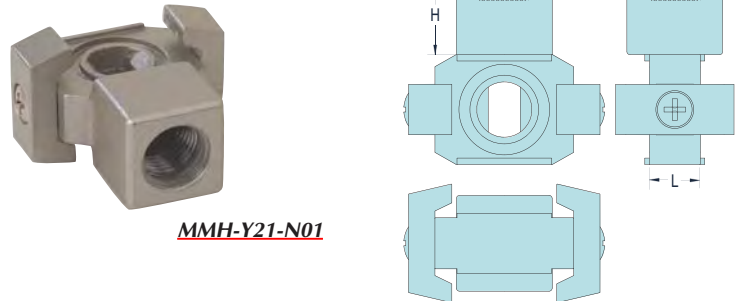
To convert individual Filter, Regulator and Lubricators into combination units without mounting brackets. Seals included.



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)

Spacers with Auxiliary Port

Provides parallel port between components.

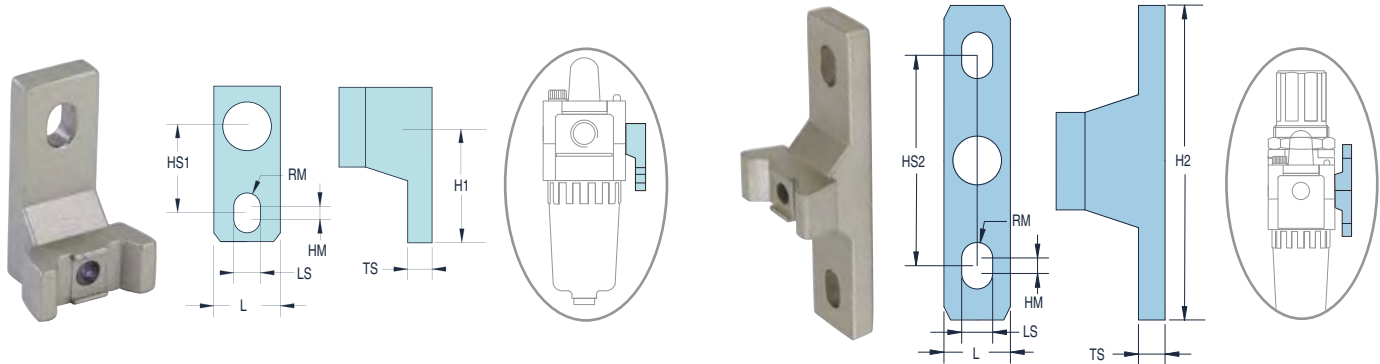


FRL Series	Spacer with Port	Spacer with L Bracket & Port	Spacer with T Bracket & Port	L	Dimension H	W
FRL-2	MMH-Y21-N01 (1/8")	MMH-Y21L-N01 (1/8")	MMH-Y21T-N01 (1/8")	0.41 (10.4)	0.69 (17.5)	0.76 (19.3)
	MMH-Y21-N02 (1/4")	MMH-Y21L-N02 (1/4")	MMH-Y21T-N02 (1/4")	0.41 (10.4)	0.69 (17.5)	0.76 (19.3)
FRL-3	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.	FRL Series	L Bracket Part No.
1	MMH-B110L	4W/4Z	MMH-B410L
2	MMH-B210L	4A	MMH-B510L
3	MMH-B310L	5	MMH-B610L

FRL Series	T Bracket Part No.	FRL Series	T Bracket Part No.
1	MMH-B110T	4W/4Z	MMH-B410T
2	MMH-B210T	4A	MMH-B510T
3	MMH-B310T	5	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
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)
H2	2.13 (54.0)	2.60 (66.0)	3.54 (90.0)	3.94 (100.0)	3.94 (100.0)	4.96 (126.0)
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)
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)
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)

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	27055-3	27056-3-A	27059-3	27059-3-A
MMF-4/5 Series	27055-4	27056-4-A	27059-4	27059-4-A

Lubricator	Poly. Bowl	Metal Bowl
MML-1 Series	27057-1	---
MML-2 Series	27057-2	27060-2
MML-3 Series	27057-3	27060-3
MML-4 Series	27057-4	27060-4
MML-5 Series	27057-5	27060-5

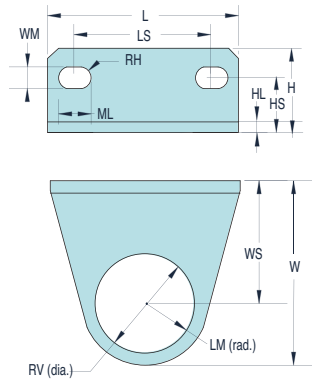




Replacement Mounting Hardware for Regulators & Stacked Filter-Regulators

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



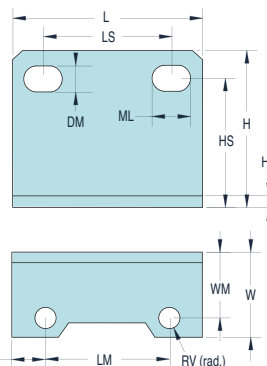
Dim.	MMH-B120	MMH-B220	MMH-B320	MMH-B420
L	1.57 (40.0)	2.17 (55.0)	2.09 (53.0)	2.76 (70.0)
LS	1.10 (28.0)	1.34 (34.0)	1.57 (40.0)	2.13 (54.0)
H	0.67 (17.0)	1.05 (26.7)	0.93 (23.6)	1.15 (29.2)
HS	0.43 (11.0)	0.75 (19.0)	0.55 (14.0)	0.71 (18.0)
W	1.49 (37.8)	1.97 (50.0)	2.52 (64.0)	3.12 (79.2)
WS	0.98 (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)	0.60 (15.2)	0.31 (7.9)	0.41 (10.4)
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)	0.08 (2.0)	0.08 (2.0)	0.08 (2.0)



Mounting Hardware for Lubricators & Filters

No brackets are furnished with Lubricators or Filters. Comes with hardware to mount bracket to MMF/MMML.

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

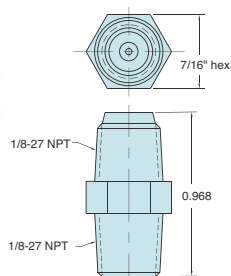


Dim.	MMH-B240	MMH-B340	MMH-B440	MMH-B540	MMH-B640
L	1.58 (40.1)	2.09 (53.0)	2.76 (70.0)	2.76 (70.0)	3.54 (90.0)
LS	1.06 (27.0)	1.59 (40.4)	2.12 (53.8)	2.13 (54.0)	2.60 (66.0)
DM	0.21 (5.3)	0.26 (6.6)	0.34 (8.64)	0.34 (8.64)	0.43 (10.9)
H	1.18 (30.0)	1.51 (38.4)	1.85 (47.0)	1.89 (48.0)	2.50 (63.5)
HS	0.95 (24.1)	1.24 (31.5)	1.49 (37.8)	1.53 (38.9)	2.03 (51.6)
W	0.74 (18.8)	0.95 (24.1)	1.22 (31.0)	1.24 (31.5)	1.69 (43.0)
RV	0.18 (4.5)	0.17 (4.3)	0.22 (5.5)	0.22 (5.5)	0.26 (6.5)
LM	1.03 (26.2)	1.39 (35.3)	1.85 (47.0)	1.79 (45.5)	2.37 (60.2)
ME	0.27 (6.9)	0.35 (8.9)	0.45 (11.4)	0.48 (12.2)	0.59 (15.0)
ML	0.33 (8.4)	0.32 (8.0)	0.41 (10.4)	0.41 (10.4)	5.12 (13.0)
WM	0.56 (14.2)	0.77 (19.6)	0.77 (19.6)	0.79 (20.1)	0.43 (11.0)
HL	0.08 (2.0)	0.08 (2.0)	0.87 (22.1)	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.

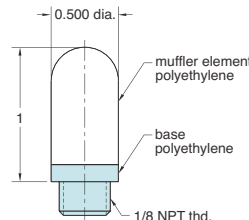


Part No.	Description
9002-01	1/8" NPT Filter

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



GAUGES



Gauge measures pneumatic system pressure. Stud mounted.



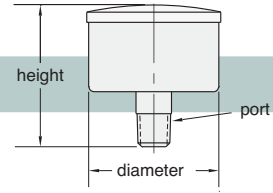
Range: Scale reading up to 160 psig/11 bar. See chart.

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

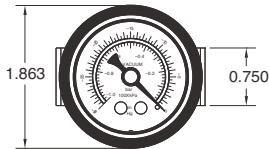
Pressure Gauges



Part No.	Diameter	Height	Port (OD)	Range	
				psig	Bar
<u>PG-10-30J*</u>	1"	1.003"	1/16" NPT	0 to 30	0 to 2
<u>PG-10-60J*</u>	1"	1.003"	1/16" NPT	0 to 60	0 to 4
<u>PG-10-160J*</u>	1"	1.003"	1/16" NPT	0 to 160	0 to 11
<u>PG-15-30P</u>	1.5"	1.540"	1/8" NPT	0 to 30	0 to 2
<u>PG-15-60P</u>	1.5"	1.540"	1/8" NPT	0 to 60	0 to 4
<u>PG-101-BK*</u>	1.625"	1.670"	1/8" NPT	0 to 100	0 to 6.9
<u>PG-101-NP*</u>	1.625"	1.670"	1/8" NPT	0 to 100	0 to 6.9
<u>PG-15-160P</u>	1.5"	1.540"	1/8" NPT	0 to 160	0 to 11
<u>PG-20-30Q</u>	2"	1.680"	1/4" NPT	0 to 30	0 to 2
<u>PG-20-60Q</u>	2"	1.680"	1/4" NPT	0 to 60	0 to 4
<u>PG-20-160Q</u>	2"	1.680"	1/4" NPT	0 to 160	0 to 11

* I.D. - tapped for #10-32 fitting

Vacuum Gauge



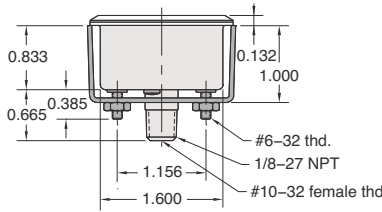
Gauge measures pneumatic vacuum pressure. Mounting bracket included.

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.

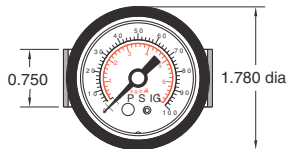
Ports: Connection located at rear is double threaded O.D. - male thread 1/8" NPT I.D. - tapped for #10-32 fitting

Mounting: Stud mount using 1/8" NPT center stud or panel mount using the zinc plated steel bracket supplied.



Part No.	Description
<u>VG-30</u>	Vacuum Gauge

Pressure Gauge



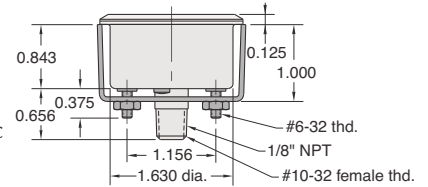
Gauge measures pneumatic system pressure. Mounting bracket included.

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

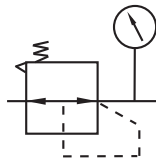
Mounting: With zinc plated steel bracket supplied



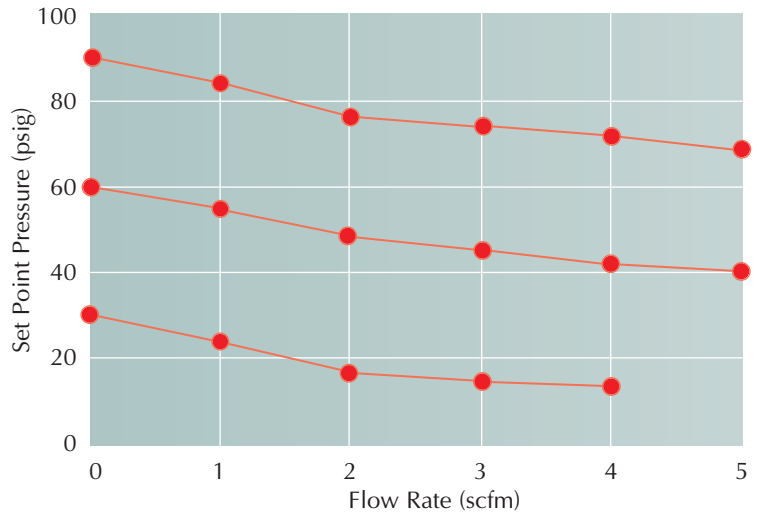
Part No.	Description
<u>PG-100</u>	Pressure Gauge

Flow Rate vs. Set Point Pressure @ 100 psig Supply Pressure

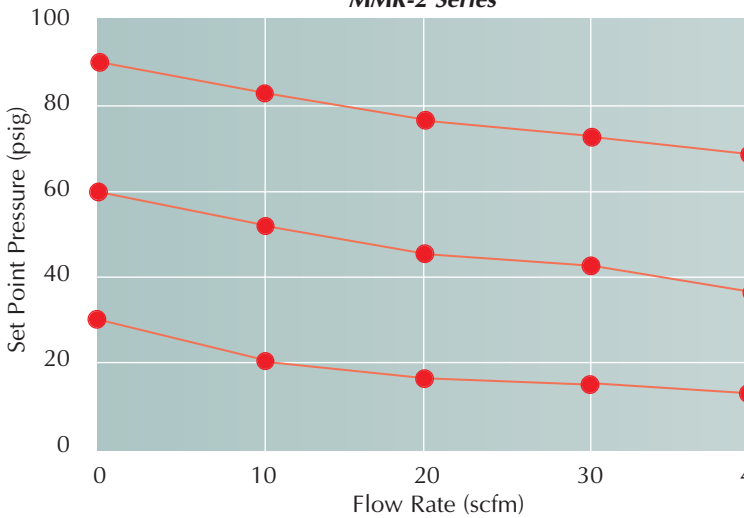
- Find the required flow rate in the graphs below.
- Determine the desired set point pressure.
- With a suggested pressure drop of <15 psig, determine which Regulator size provides the required flow rate.



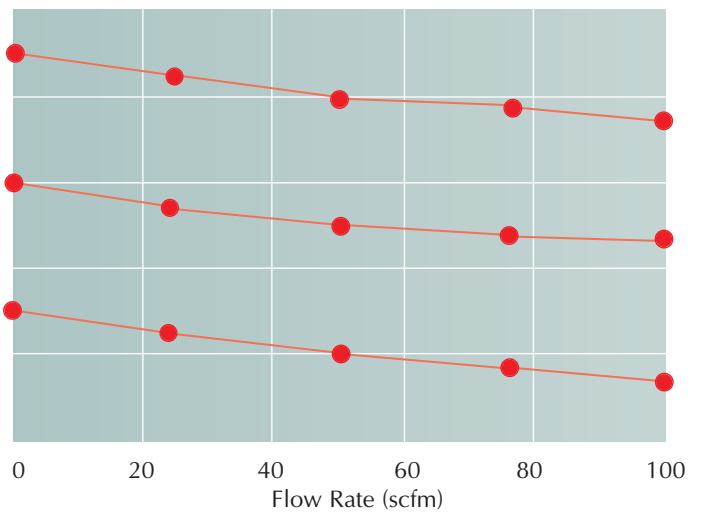
MMR-1 Series



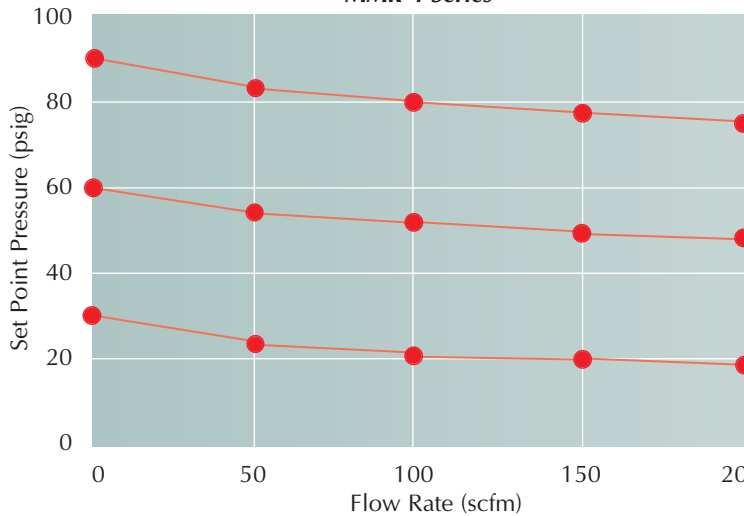
MMR-2 Series



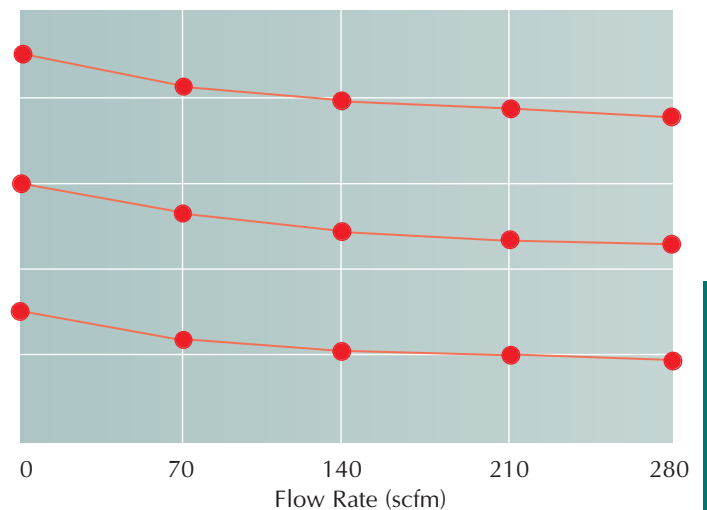
MMR-3 Series



MMR-4 Series



MMR-5 Series



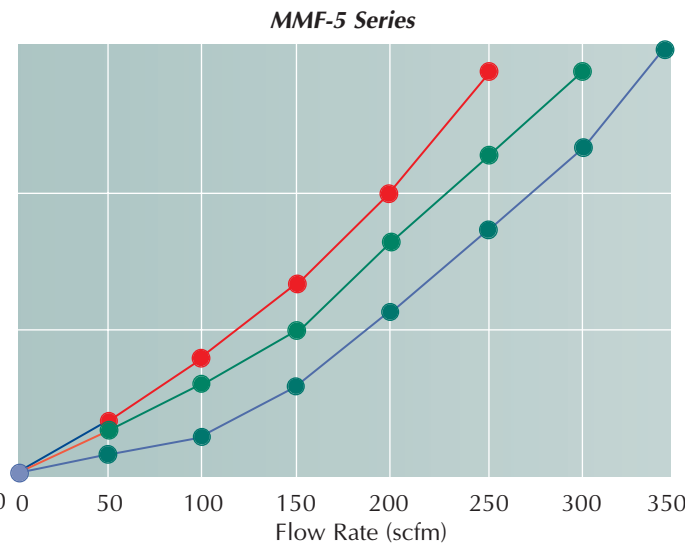
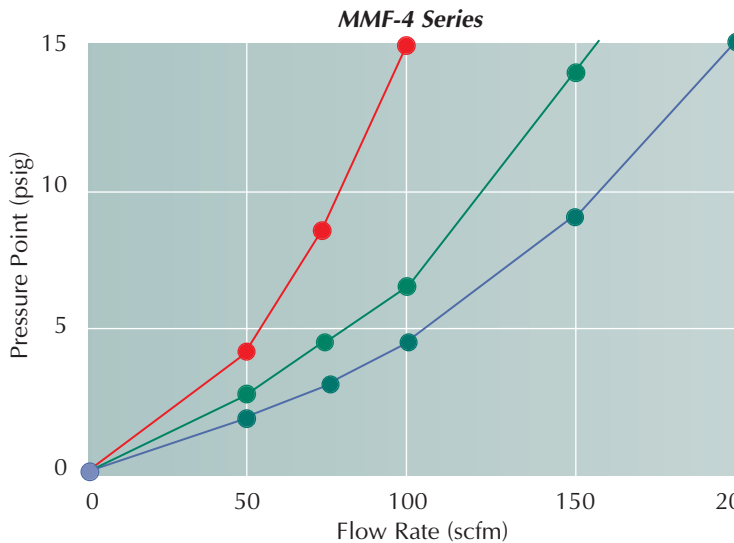
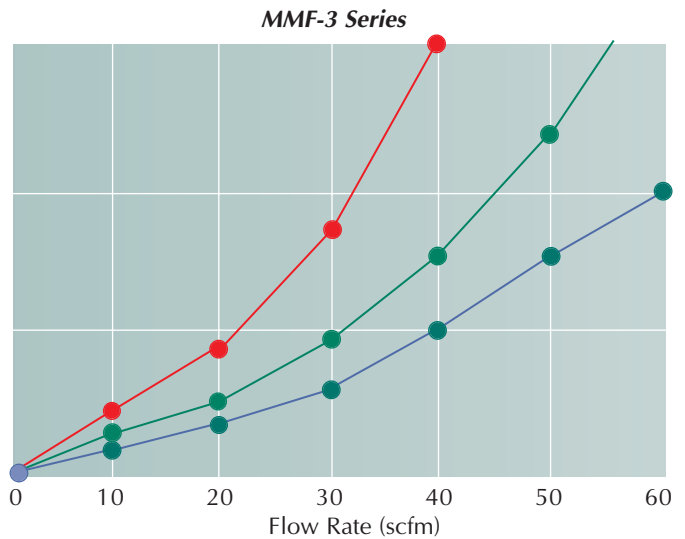
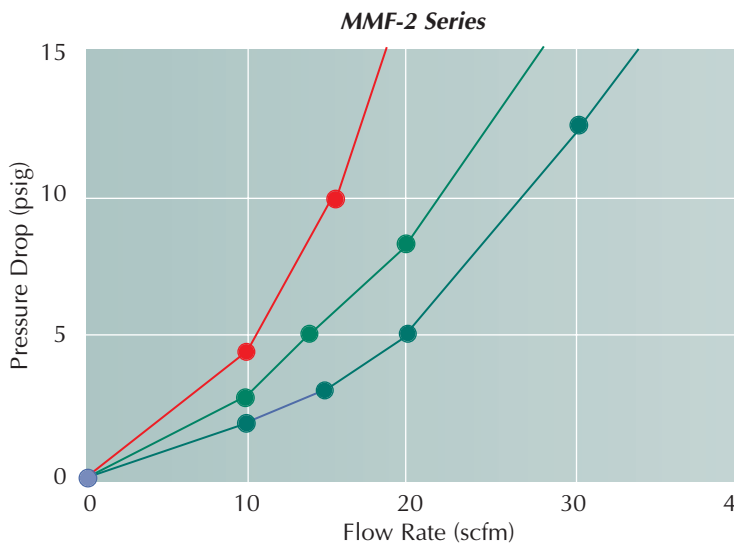
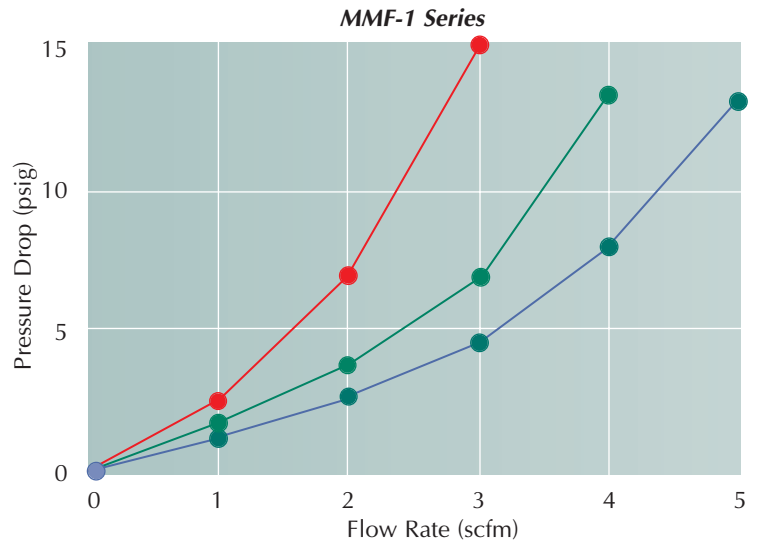
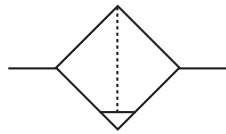


MAXIMATIC® FILTERS

Flow Rate vs. Set Pressure Drop @ 30 ●●●, 60 ●●● & 90 ●●● psig Supply Pressure

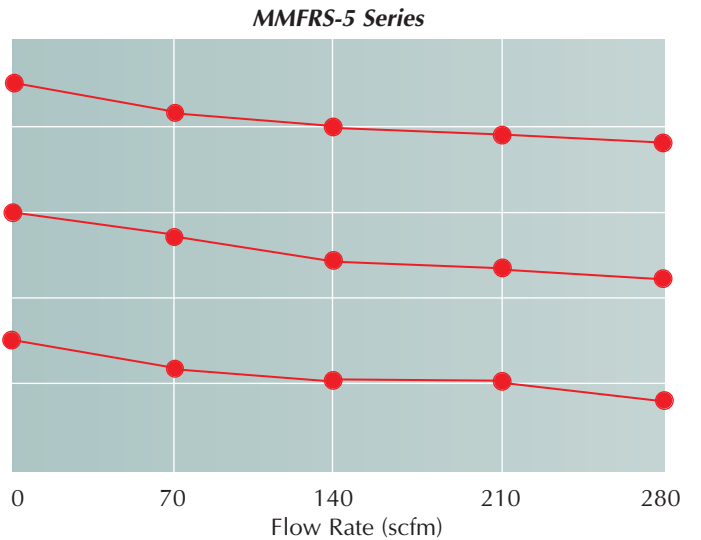
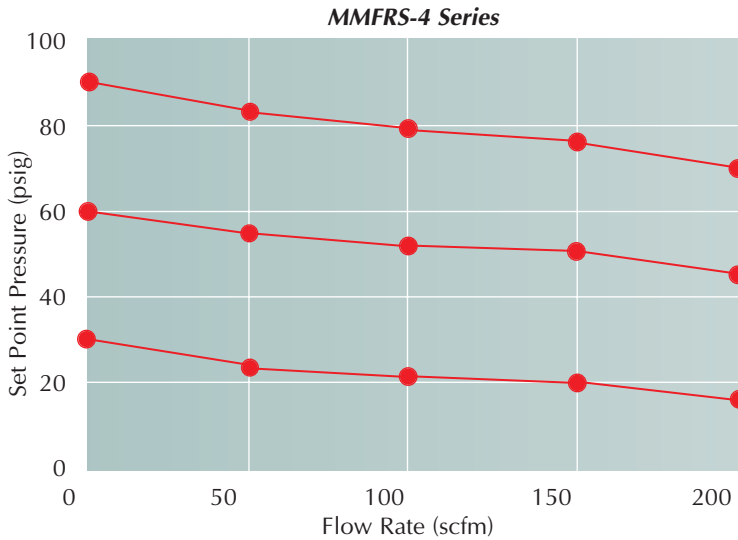
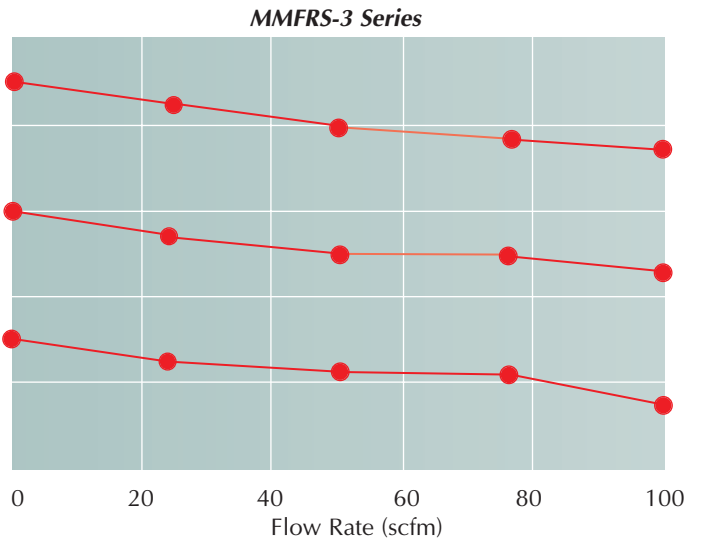
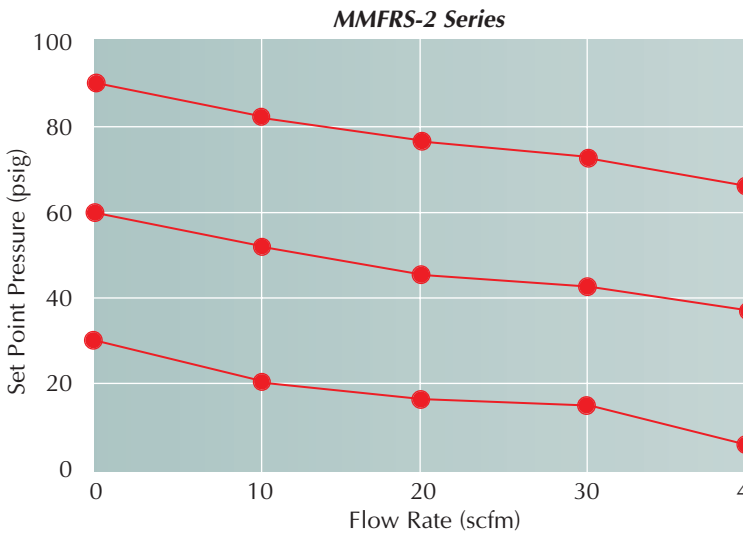
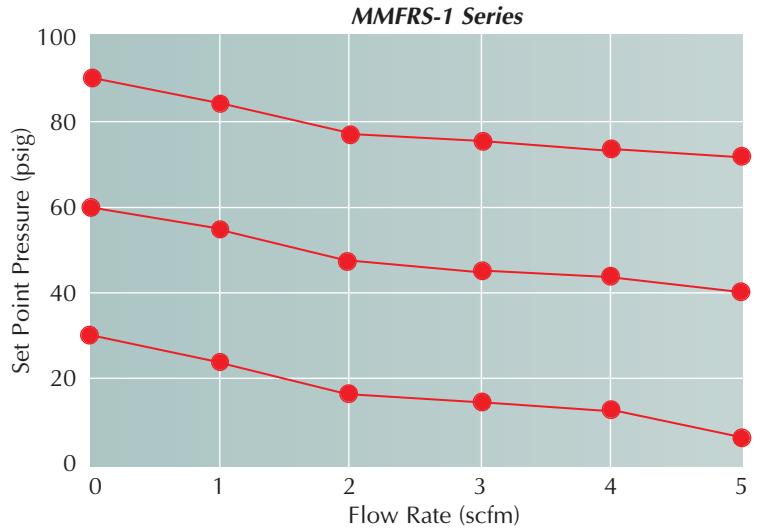
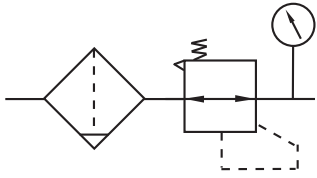


- Find the required flow rate in the graphs below.
- Determine the desired set point pressure.
- With a suggested pressure drop of <15 psig, determine which Filter size provides the required flow rate.



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.

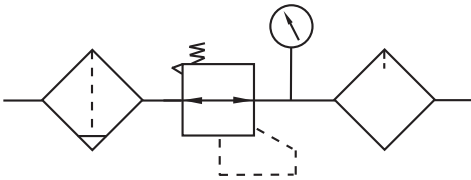




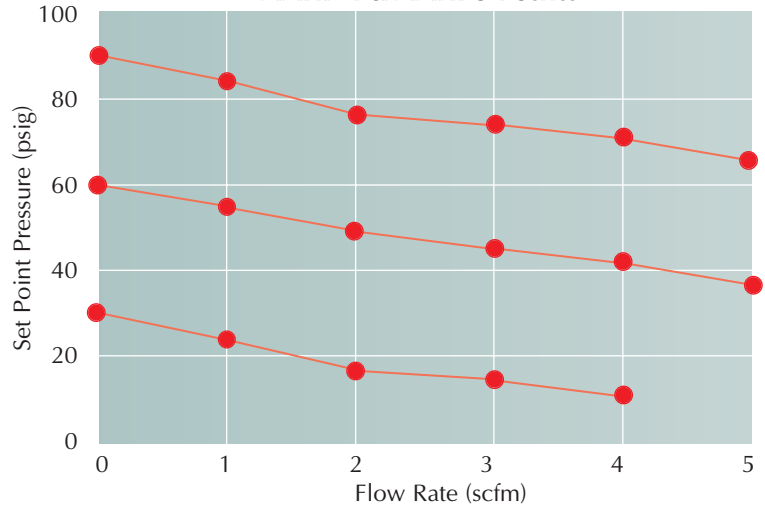
MAXIMATIC® FILTER-REGULATOR-LUBRICATORS

Flow Rate vs. Set Point Pressure @ 100 psig Supply Pressure

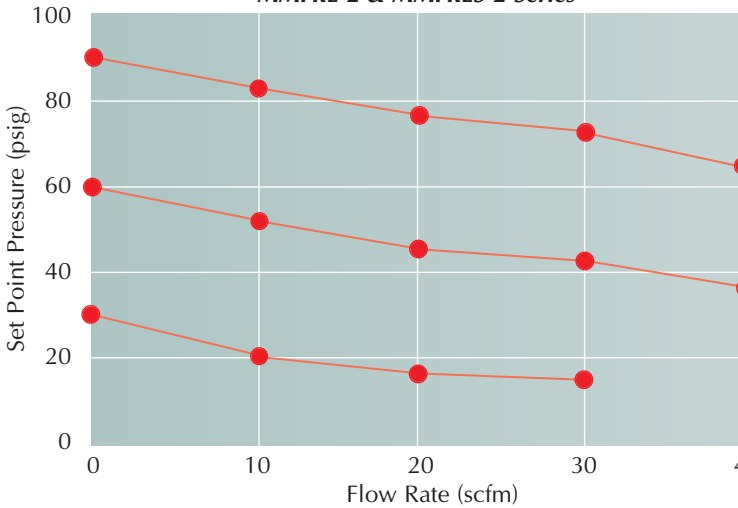
- Find the required flow rate in the graphs below.
- Determine the desired set point pressure.
- With a suggested pressure drop of <15 psig, determine which FRL size provides the required flow rate.



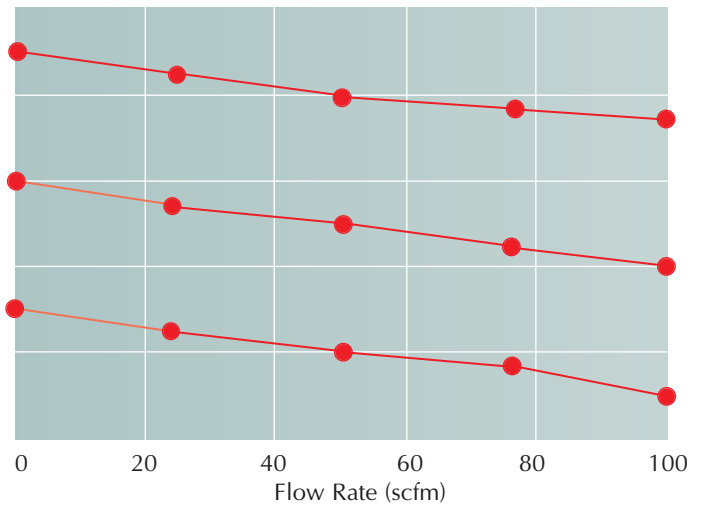
MMFRL-1 & MMFRLS-1 Series



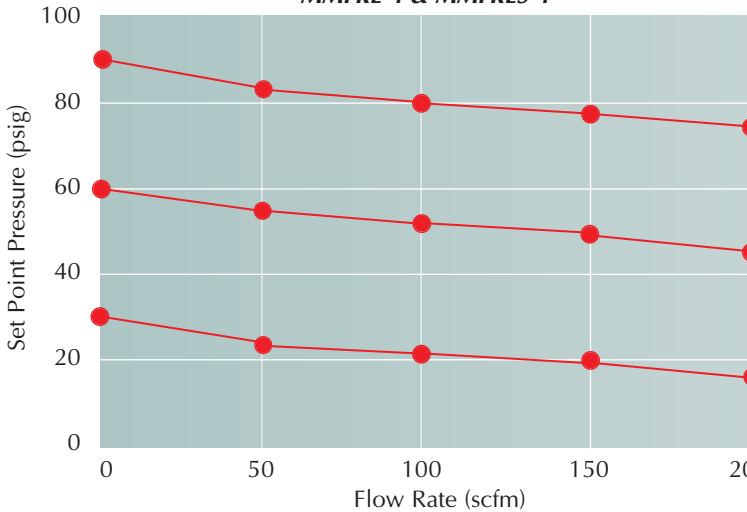
MMFRL-2 & MMFRLS-2 Series



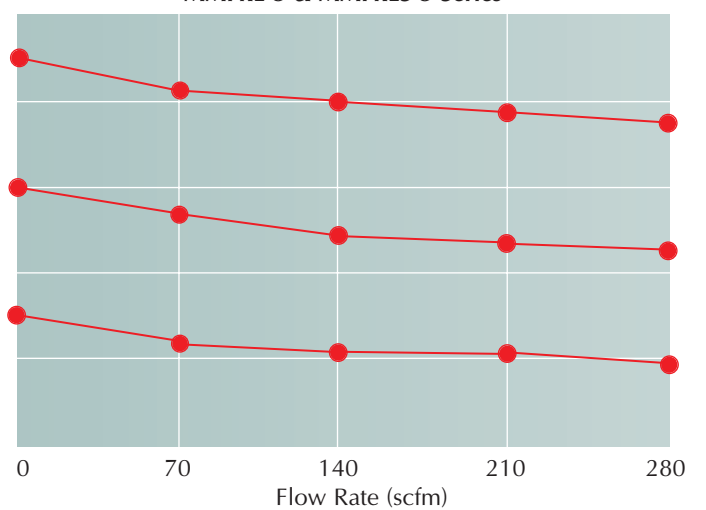
MMFRL-3 & MMFRLS-3 Series



MMFRL-4 & MMFRLS-4

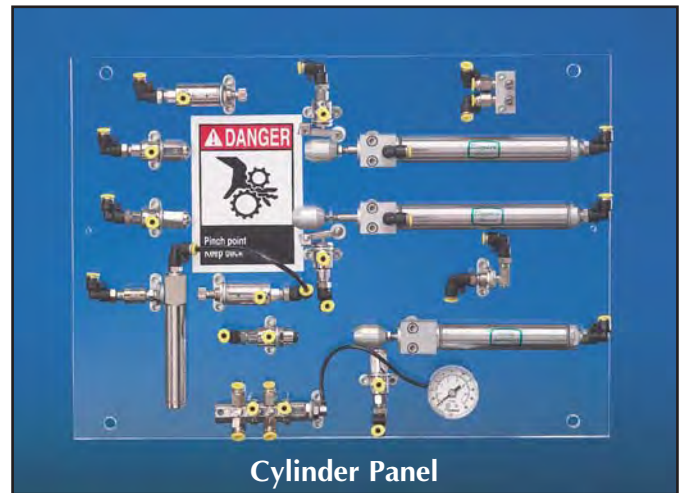


MMFRL-5 & MMFRLS-5 Series





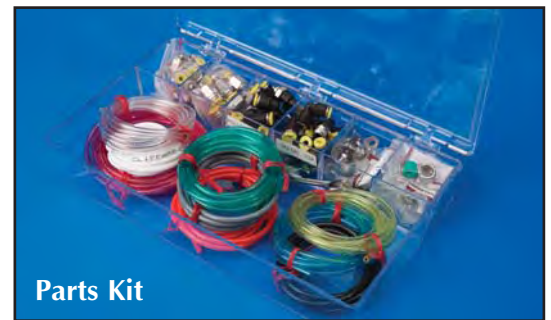
Valve Panel



Cylinder Panel

Clippard's Fluid Power Educational 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 following page
- 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 following page
- 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-ENP, Air Filter
- 1 MAN-12-ENP, 12-Port Manifold
- 2 MAR-1-4-ENP, Pressure Regulators, #10-32
- 6 MAV-3-ENP, Poppet Valves, #10-32
- 3 MBA-1-ENP, Ball Cam Actuators
- 1 MEV-2-ENP, Poppet Type Quick Exhaust Valve, #10-32
- 1 PC-1B-ENP, 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-ENP, Nut
- 2 0107-18-ENP, Nuts
- 22 0026-51, Cap Screws
- 6 0026-52, Cap Screws
- 2 0026-53, Cap Screws
- 1 15027-ENP, #10-32 Bulkhead Fitting
- 1 15453, Male Coupling, #10-32
- 1 17535, Pinch Point Label
- 1 11750-2-ENP, #3-56 to 1/16" ID Hose Barb Fitting
- 6 11755-ENP, 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-ENP, Plunger-Actuated Spring Return Valve, #10-32
- 2 FV-5D-ENP, 2-Position Double Plunger Valves, #10-32
- 1 MAN-12-ENP, 12-Port Manifold
- 1 MAT-2.0-ENP, In-Line Volume Chamber
- 4 MAV-3-ENP, Poppet Valves, #10-32
- 1 MAVO-3-ENP, Normally-Open Spool Valve, #10-32
- 1 MJTV-5-ENP, 2-Position Spool Valve, Brass Toggle, 1/8" NPT
- 5 MPA-3-ENP, Single Acting, Spring Return Actuators, #10-32
- 2 MPA-5-ENP, Single-Acting, Spring Return Actuators, #10-32
- 1 MSV-1-ENP, Shuttle Valve, #10-32 Male Outlet, #10-32 Female Inlets
- 2 PC-1G-ENP, Captivated Push Buttons, 1/8" dia., Green
- 1 PC-1R-ENP, 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-ENP, Pulse Valve, #10-32
- 1 SP0-2-BLK, #10-32 to 1/16 ID "L" Slip-On Fitting
- 1 TV-3SF-ENP, 2-Position Spool Valve, #10-32 Thread
- 1 Miscellaneous Hose & Tubing
- 1 0107-15-ENP, Nut
- 1 0107-18-ENP, Nut
- 4 0019-4, Screws
- 26 0026-51, Screws
- 1 15027-ENP, #10-32 Bulkhead Fitting
- 1 11750-2-ENP, #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		inch		To	millimeter		Multiply By		25.40		
		millimeter			inch				0.03937		
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
0.025	0.635	0.200	5.080	0.375	9.525	0.550	13.970	0.725	18.415	0.900	22.860
0.050	1.270	0.225	5.715	0.400	10.160	0.575	14.605	0.750	19.050	0.925	23.495
0.075	1.905	0.250	6.350	0.425	10.795	0.600	15.240	0.775	19.685	0.950	24.130
0.100	2.540	0.275	6.985	0.450	11.430	0.625	15.875	0.800	20.320	0.975	24.765
0.125	3.175	0.300	7.620	0.475	12.065	0.650	16.510	0.825	20.955	1.000	25.400
0.150	3.810	0.325	8.255	0.500	12.700	0.675	17.145	0.850	21.590		
0.175	4.445	0.350	8.890	0.525	13.335	0.700	17.780	0.875	22.225		

Flow

To Convert		cfm (cubic ft./min.)		To	L / min (liters/min.)		Multiply By		28.317		
		L / min (liters/min.)			cfm (cubic ft./min.)				0.03531		
cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min
0.5	14.159	4.0	113.268	7.5	212.380	11.0	311.493	14.5	410.606	21.0	594.66
1.0	28.317	4.5	127.427	8.0	226.539	11.5	325.652	15.0	438.924	22.0	622.97
1.5	42.476	5.0	141.585	8.5	240.698	12.0	339.811	16.0	453.07	23.0	651.29
2.0	56.634	5.5	155.744	9.0	254.857	12.5	353.970	17.0	481.39	24.0	679.61
2.5	70.793	6.0	169.903	9.5	269.016	13.0	368.129	18.0	509.71	25.0	707.93
3.0	84.951	6.5	184.062	10.0	283.175	13.5	382.288	19.0	538.02		
3.5	99.110	7.0	198.221	10.5	297.334	14.0	396.447	20.0	566.34		

Pressure

To Convert		psig (lbs./sq.inch)		To	bars		Multiply By		0.06895		
		bars			psig (lbs./sq.inch)				14.50		
psig	bars	psig	bars	psig	bar	psig	bars	psig	bars	psig	bars
2.5	0.17	20.0	1.38	37.5	2.59	55.0	3.79	72.5	5.00	90.0	6.21
5.0	0.34	22.5	1.55	40.0	2.76	57.5	3.96	75.0	5.17	92.5	6.38
7.5	0.52	25.0	1.72	42.5	2.93	60.0	4.14	77.5	5.34	95.0	6.55
10.0	0.69	27.5	1.90	45.0	3.10	62.5	4.31	80.0	5.52	97.5	6.72
12.5	0.86	30.0	2.07	47.5	3.28	65.0	4.48	82.5	5.69	100.0	6.90
15.0	1.03	32.5	2.24	50.0	3.45	67.5	4.65	85.0	5.86		
17.5	1.21	35.0	2.41	52.5	3.62	70.0	4.83	87.5	6.03		

Force

To Convert		pounds (lbs.)		To	newtons (N)		Multiply By		4.448		
		newtons (N)			pounds (lbs.)				0.2248		
lbs.	N	lbs.	N	lbs.	N	lbs.	N	lbs.	N	lbs.	N
0.25	1.1	2.00	8.9	3.75	16.7	5.50	24.5	7.25	32.2	9.00	40.0
0.50	2.2	2.25	10.0	4.00	17.8	5.75	25.6	7.50	33.4	9.25	41.1
0.75	3.3	2.50	11.1	4.25	18.9	6.00	26.7	7.75	34.5	9.50	42.3
1.00	4.4	2.75	12.2	4.50	20.0	6.25	27.8	8.00	35.6	9.75	43.4
1.25	5.6	3.00	13.3	4.75	21.1	6.50	28.9	8.25	36.7	10.00	44.5
1.50	6.7	3.25	14.5	5.00	22.2	6.75	30.0	8.50	37.8		
1.75	7.8	3.50	15.6	5.25	23.4	7.00	31.1	8.75	38.9		

Temperature

To Convert		Fahrenheit (°F)		To	Celsius (°C)		Multiply By		(°F - 32) / 1.8		
		Celsius (°C)			Fahrenheit (°F)				1.8°C + 32		
°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
5	-15.0	40	+4.4	75	23.9	110	43.3	145	62.8	180	82.2
10	-12.2	45	+7.2	80	26.7	115	46.1	150	65.6	185	85.0
15	-9.4	50	+10.0	85	18.9	120	48.9	155	68.3	190	87.8
20	-6.7	55	+12.8	90	32.2	125	51.7	160	71.1	195	90.6
25	-3.9	60	15.6	95	35.0	130	54.4	165	73.9	200	93.3
30	-1.1	65	18.3	100	37.8	135	57.2	170	76.7		
35	+1.7	70	21.1	105	+40.6	140	60.0	175	79.4		



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