Founded in 1941 by W. L. Clippard, Jr., the company started out manufacturing electronic test equipment. In the 1950's, Mr. Clippard recognized a need for miniature pneumatic devices in manufacturing, and began to produce a small line of component products. The appeal of these products was such that by the late 1960's, Clippard Instrument Laboratory was strictly a pneumatic manufacturer.

The company has continued to have steady growth through the years bolstered by periodic introductions of new and innovative products. These have included such products as the new line of Directional Control Valves Series HV & GV, the Electronic Proportional Valves, and recently the DV-Valve series, the Next "Gen" Valve.

Today, the company remains family-owned. Manufacturing facilities are located in Cincinnati and Fairfield, Ohio; as well as a distribution and technical support center in Louvain-La-Neuve, Belgium.

Clippard is in its seventh decade of supplying fluid power, motion and process control devices to the Scientific, Medical, Dental, and Analytical markets. We understand the need for precision, reliability and purity in your critical applications and are dedicated to providing expert solutions to meet and exceed your expectations. We ensure that every product meets the highest standards of quality and performance by 100% testing all products before they reach our customers.

In addition to the Scientific market segment, Clippard offers expertise in a wide variety of markets utilizing numerous types of applications. From Semiconductor to Printing, Automotive to Packaging, our products are engineered to the exact specifications you require.

Supported by a platform of over 5.000 standard products, as well as customized solutions, we have the capability to provide you with a full range of products designed to meet the unique demands of your application. For a complete description of these products, please visit our website at www.clippard.com or www.clippard.eu.

Clippard Europe, Belgium

Cincinnati, Ohio (headquarters)

Fairfield, Ohio

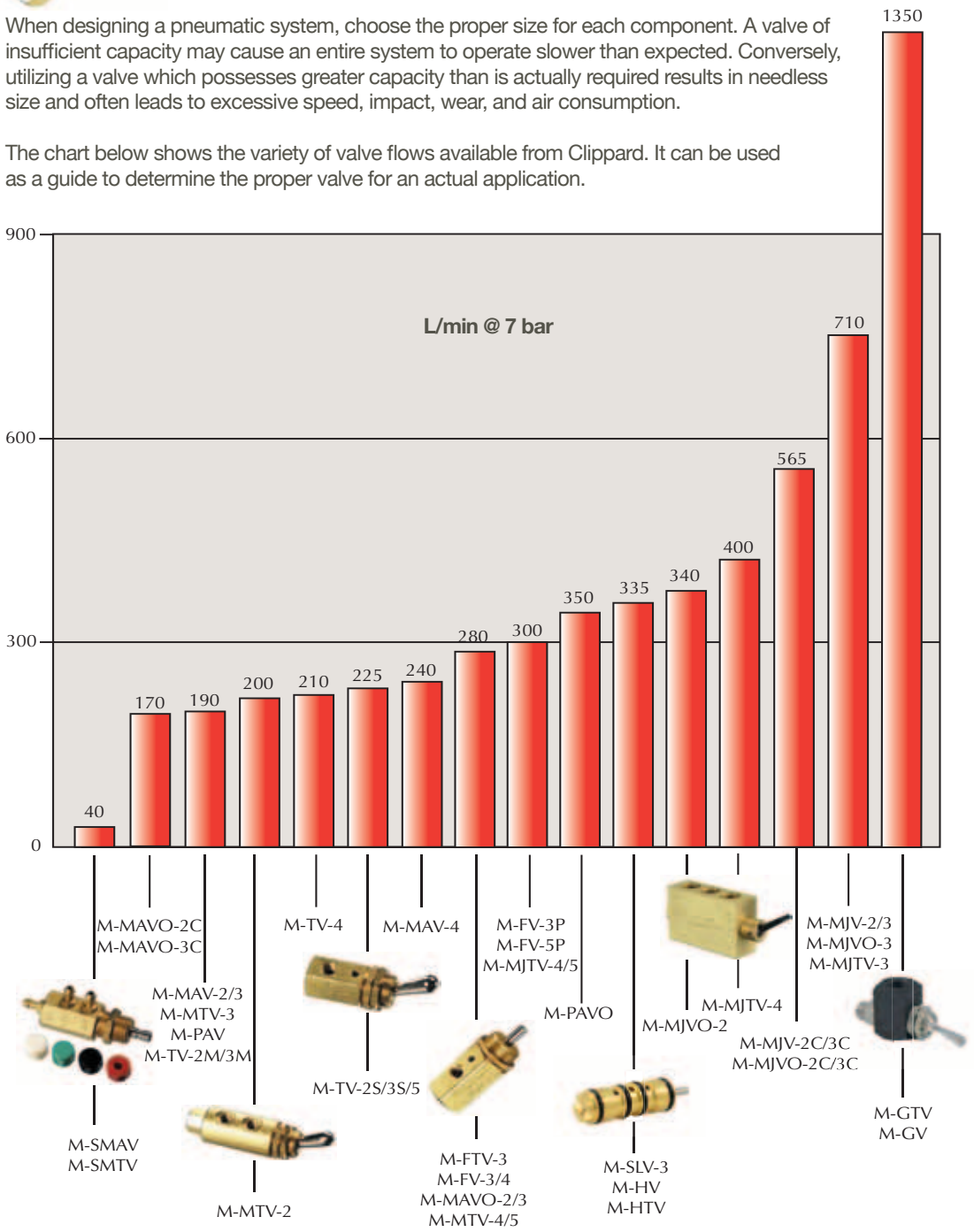
02 **Contents** – Directional Control Valves

04 **Contents** – Control Valves

Every air system is unique . . . and Clippard has the air valve you need. Clippard control valves are available in poppet or spool design; 2/2, 3/2, or 5/2 functions, in sizes from M2,5 and M5 through G1/8" ports; and for pressures to 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.



2/2 Toggle, Stem & Air-Piloted Valves

	Order No.	Style	Flow	Inlet	Outlet	Exhaust	Normally-Open	Normally-Closed	Momentary/Detented	ENP Steel Toggle	Plastic Toggle	Page No.
2/2 Toggle V.	M-GTV-2	Poppet	1900 L/min	G1/4	G1/4	-		▲	D	▲		33
	M-GTV-2Q	Poppet	1900 L/min	R1/4	G1/4	-		▲	D	▲		33
	M-MTV-2	Poppet	200 L/min	M5	M5	-		▲	D	▲		21
	M-TV-2S	Spool	225 L/min	M5	M5	-		▲	D	▲		19
	M-TV-2SF	Spool	225 L/min	M5	M5	-		▲	D		▲	19
2/2 Stem Valves	M-GV-2	Poppet	1900 L/min	G1/4	G1/4	-		▲				33
	M-GV-2Q	Poppet	1900 L/min	R1/4	G1/4	-		▲				33
	M-GV-2C	Poppet	1900 L/min	Cartridge	Cartridge	-		▲				34
	M-MAV-2	Poppet	225 L/min	M5	M5	-		▲				13
	M-MAV-2P	Poppet	225 L/min	R1/8	M5	-		▲				13
	M-MAV-2C	Poppet	170 L/min	Cartridge	Cartridge	-		▲				14
	M-MJV-2C	Poppet	625 L/min	Cartridge	Cartridge	-		▲				17
	M-MAVO-2	Spool	285 L/min	M5	M5	-	▲					13
	M-MAVO-2C	Spool	285 L/min	Cartridge	Cartridge	-	▲					14
	M-MJV-2	Poppet	700 L/min	G1/8	G1/8	-		▲				17
	M-MJVO-2	Spool	340 L/min	G1/8	G1/8	-	▲					17
	M-MJVO-2C	Spool	425 L/min	Cartridge	Cartridge	-	▲					17

3/2 Toggle, Stem & Air-Piloted Valves

	Order No.	Style	Flow	Inlet	Outlet	Exhaust	Normally-Open	Normally-Closed	Momentary/Detented	ENP Steel Toggle	Plastic Toggle	Page No.
3/2 Stem Valves	M-FV-3	Spool	285 L/min	M5	M5	M5	▲	▲				25
	M-FV-3D	Spool	285 L/min	M5	M5	M5	▲	▲				25
	M-FV-3DP	Spool	300 L/min	G1/8	G1/8	G1/8	▲	▲				25
	M-FV-3P	Spool	300 L/min	G1/8	G1/8	G1/8	▲	▲				25
	M-GV-3	Poppet	1900 L/min	G1/4	G1/4	hole in stem		▲				33
	M-GV-3Q	Poppet	1900 L/min	G1/4	G1/4	hole in stem		▲				33
	M-GV-3C	Poppet	1900 L/min	Cartridge	Cartridge	hole in stem		▲				34
	M-HV-3	Spool	335 L/min	M5	M5	hole in body		▲				29
	M-HV-3C	Spool	335 L/min	Cartridge	Cartridge	hole in body	▲	▲				30
	M-MAV-3	Poppet	225 L/min	M5	M5	through stem		▲				13
	M-MAV-3P	Poppet	225 L/min	G1/8	M5	through stem		▲				13
	M-MAV-3C	Poppet	170 L/min	Cartridge	Cartridge	through stem		▲				14
	M-MAVO-3	Spool	285 L/min	M5	M5	through stem	▲					13
	M-MAVO-3C	Spool	285 L/min	Cartridge	Cartridge	holes in body	▲					14
	M-MJV-3	Poppet	700 L/min	G1/8	G1/8	through stem		▲				17
	M-MJV-3C	Poppet	625 L/min	Cartridge	Cartridge	through stem		▲				17
	M-MJVO-3	Spool	340 L/min	G1/8	G1/8	holes in body	▲					17
	M-MJVO-3C	Spool	425 L/min	Cartridge	Cartridge	holes in body	▲					17
3/2 Toggle Valves	M-SMAV-3	Spool	40 L/min	M 2.5 (*)	M 2.5 (*)	M 2.5 (*)	▲	▲				11
	M-FTV-3	Spool	285 L/min	M5	M5	M5		▲	D	▲		28
	M-FTV-3F	Spool	285 L/min	M5	M5	M5		▲	D	▲		28
	M-FTV-3P	Spool	300 L/min	G1/8	G1/8	G1/8		▲	D	▲		28
	M-FTV-3FP	Spool	300 L/min	G1/8	G1/8	G1/8		▲	D		▲	28
	M-GTV-3	Poppet	1900 L/min	G1/4	G1/4	hole in body		▲	D	▲		33
	M-GTV-3Q	Poppet	1900 L/min	R1/4	G1/4	hole in body		▲	D	▲		33
	M-HTV-3	Spool	335 L/min	M5	M5	hole in body	▲	▲	D	▲		30
	M-HTV-3F	Spool	335 L/min	M5	M5	hole in body	▲	▲	D		▲	30
	M-HTV-3C	Spool	335 L/min	Cartridge	Cartridge	hole in body	▲	▲	D	▲		31
	M-HTV-3CF	Spool	335 L/min	Cartridge	Cartridge	hole in body	▲	▲	D		▲	31
	M-MTV-3	Poppet	200 L/min	M5	M5	M5		▲	D	▲		21
	M-MJTV-3	Poppet	700 L/min	G1/8	G1/8	G1/8		▲	D	▲		23
	M-TV-3S	Spool	225 L/min	M5	M5	hole in body		▲	D	▲		19
	M-TV-3SF	Spool	225 L/min	M5	M5	hole in body		▲	D		▲	19
	M-SMTV-3	Spool	40 L/min	M 2.5 (*)	M 2.5 (*)	hole in body		▲	D	▲		11

(*) with 1/16“ ID Hose Barbs Installed

5/2 Toggle, Stem & Air-Piloted Valves

	Order No.	Style	Flow	Inlet	Outlet	Exhaust	Normally-Open	Normally-Closed	Momentary/Detented	ENP Steel Toggle	Plastic Toggle	Page No.
5/2 Toggle Valves	M-HTV-4	Spool	225 L/min	M5	M5	atmos. or hole		▲	D	▲		30
	M-HTV-4F	Spool	225 L/min	M5	M5	atmos. or hole		▲	D		▲	30
	M-HTV-4C	Spool	225 L/min	Cartridge	Cartridge	atmos. or hole		▲	D	▲		31
	M-HTV-4CF	Spool	225 L/min	Cartridge	Cartridge	atmos. or hole		▲	D		▲	31
	M-TV-4D	Spool	210 L/min	M5	M5	holes in body		▲	D	▲	▲	36
	M-TV-4M	Spool	210 L/min	M5	M5	holes in body		▲	M	▲	▲	36
	M-TV-4DM	Spool	210 L/min	M5	M5	holes in body		▲	D/M	▲	▲	36
	M-TV-4DP	Spool	210 L/min	G1/8	G1/8	holes in body		▲	D	▲	▲	36
	M-TV-4MP	Spool	210 L/min	G1/8	G1/8	holes in body		▲	M	▲	▲	36
	M-TV-4DMP	Spool	210 L/min	G1/8	G1/8	holes in body		▲	D/M	▲	▲	36
	M-MTV-4	Spool	285 L/min	M5	M5	holes in body	▲	▲	D	▲		21
	M-MTV-4F	Spool	285 L/min	M5	M5	holes in body	▲	▲	D		▲	21
	M-MJTV-4	Spool	300 L/min	G1/8	G1/8	holes in body	▲	▲	D	▲		23
	M-MJTV-4F	Spool	300 L/min	G1/8	G1/8	holes in body	▲	▲	D		▲	23
	M-MTV-5	Spool	285 L/min	M5	M5	M5	▲	▲	D	▲		21
	M-MTV-5F	Spool	285 L/min	M5	M5	M5	▲	▲	D		▲	21
	M-MJTV-5	Spool	300 L/min	G1/8	G1/8	1/8" NPT	▲	▲	D	▲		23
	M-MJTV-5F	Spool	300 L/min	G1/8	G1/8	1/8" NPT			D			23
5/2 Stem Valves	M-MAV-4	Spool	240 L/min	M5	M5	holes in body	▲	▲				13
	M-MAV-4D	Spool	240 L/min	M5	M5	holes in body	▲	▲				13
	M-MJV-4	Spool	400 L/min	G1/8	G1/8	holes in body	▲	▲				18
	M-MJV-4D	Spool	400 L/min	G1/8	G1/8	holes in body	▲	▲				18
	M-FV-5	Spool	285 L/min	M5	M5	M5	▲	▲				26
	M-FV-5P	Spool	300 L/min	G1/8	G1/8	G1/8	▲	▲				26
	M-FV-5D	Spool	285 L/min	M5	M5	M5	▲	▲				26
	M-FV-5DP	Spool	300 L/min	G1/8	G1/8	G1/8	▲	▲				26
	M-HV-4	Spool	335 L/min	M5	M5	atmosphere	▲	▲				30
	M-HV-4C	Spool	335 L/min	Cartridge	Cartridge	atmosphere	▲	▲				30

All valves above are RoHS Compliant

options (suffix)

ENP Plating "-ENP" • FKM Seals "-V"

-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 5 µ, and does not affect the fit or function of the part.

Imperial

In order to accommodate applications around the globe, also Clippard Control Valves and other product lines are available with imperial ports. Consult factory for availability.

-V FKM

This option replaces the standard Nitrile seals with FKM seals either for high temperature (up to + 200°C) applications or those that require Viton for chemical compatibility.
Consult factory for availability.

Temperature Range

All Directional Control Valves in this section have a temperature range of 0 to 110°C.

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!

www.clippard.com/customersolutions

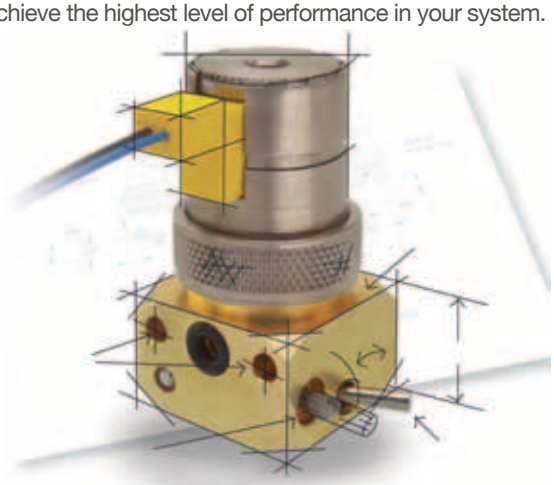
Alternate materials, seals and/or lubrication for specific applications are common (and welcomed) requests at Clippard. Stainless steel, aluminum, plastic or brass. All available, just ask!

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.

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 pneumatic 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.



Clippard's unparalleled history in providing new and innovative products continues today with advanced manufacturing machines and techniques, experienced design and application engineers, and a work force that is not only experienced, but one that genuinely wants to exceed the customer's expectations. We take great satisfaction in shipping you a quality products

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

M-SMTV/M-SMAV Sub-Miniature Spool Valves

3/2 Toggle and Push Button Valves have 1/16” tube barbs. The push button valve can be used as a Normally-Open or Normally-Closed 3/2. The miniature limit valve is designed to serve as a mechanical stop when the stem is fully depressed.

Medium:
Air

Stem Travel:
1.6 mm

Input Pressure:
7 bar max.

Ports:
M 2.5 with 1/16“
ID Hose Barbs

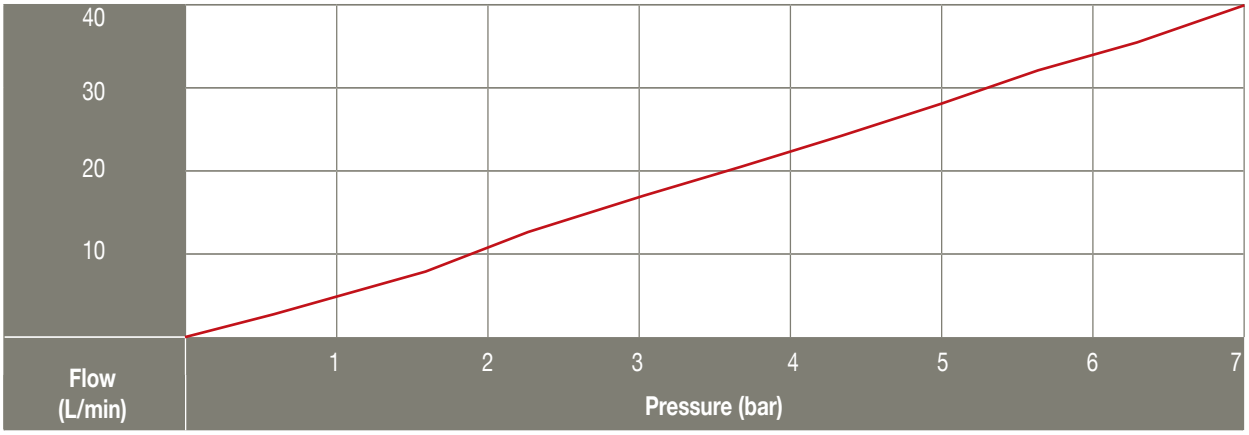
Air Flow:
40 L/min @ 7 bar

Force For Full Stem Travel:
M-SMAV: 0.5 kg
M-SMTV: 0.7 kg nominal

Spool Material:
Delrin® acetal resin

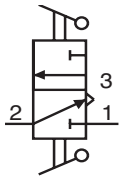
RoHS

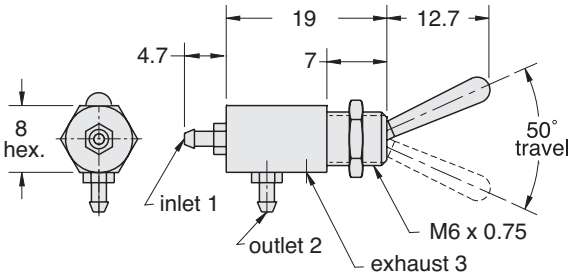
Pressure vs. Flow



- Subminiature size spool design
- Multiple colored buttons for M-SMAV

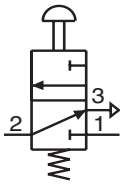
Normally-Closed

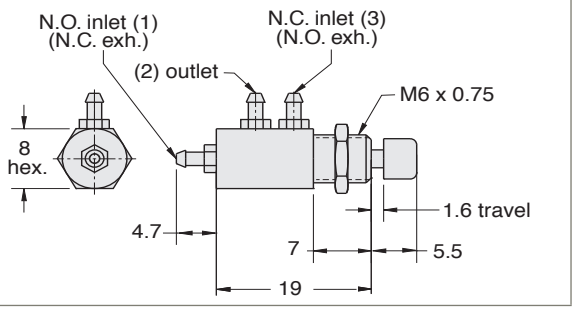




Part No.	Function
M-SMTV-3	Normally-Closed

Normally-Open/Normally-Closed





Part No.	Function
M-SMAV-3	N.O. or N.C.

Four colors of snap-on push buttons included with each valve

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 2/2 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!

M-MAV/M-MAVO Stem Valves

2/2, 3/2 & 5/2 Styles
The M-MAV series are M5 ported 2/2, 3/2 and 5/2 valves that change their flow path when the stem is either depressed or released. The 2/2 and 3/2 valves are offered in both Normally-Closed (not passing) or Normally-Open (passing) versions. The 5/2 valves are typically used to control a double acting air cylinder. On pages 48 through 53 we offer a wide range of pneumatic and mechanical valve actuators that work with all Clippard stem valves.

Medium:
Air, Water or Oil

Input Pressure:
M-MAV-2, M-MAV-3: 21 bar max.;
M-MAVO-2, M-MAVO-3, M-MAV-4: 10 bar max.

Stem Travel:
M-MAV-2, M-MAV-3: 3 mm;
M-MAV-4: 5 mm

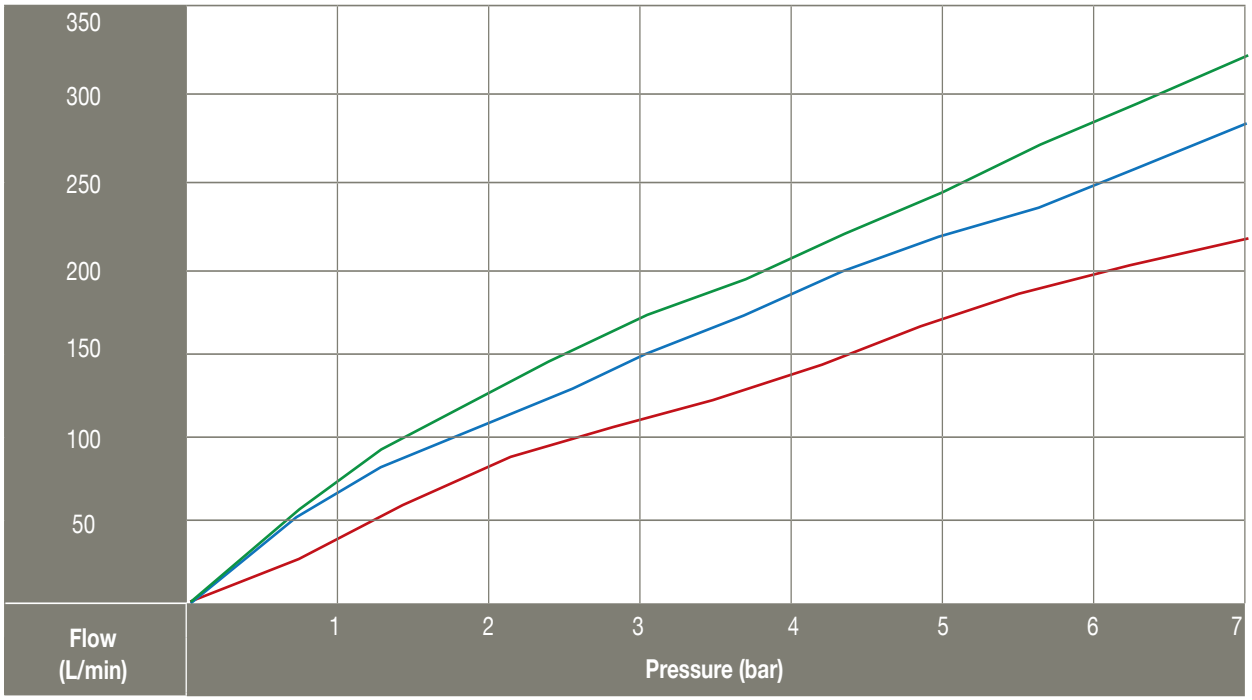
Force For Full Stem Travel:
M-MAV-2, M-MAV-3: 0.7 kg;
M-MAVO-2, M-MAVO-3: 0.9 kg;
M-MAV-4: 1 kg;
M-MAV-4D: 0.35 kg nominal

Mounting:
M 12x0.75 thread. Nut and lockwashers furnished. Cartridge inserts into a 9.5 H7 bore.

Materials:
Brass body, Nitrile seals, stainless steel stem and spring

RoHS

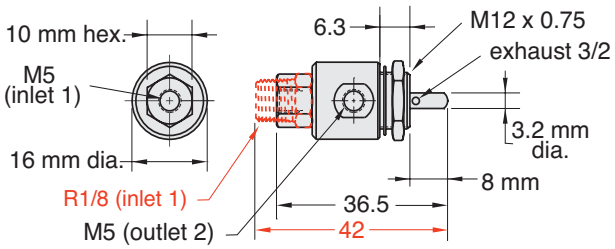
Pressure vs. Flow



- Miniature size with high flow poppet or spool design
- Poppet valves have superior life and spool valves are more versatile.

Normally-Closed Poppet Valves

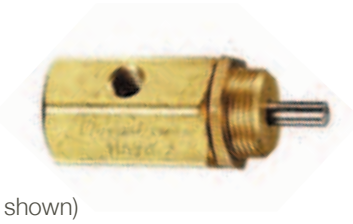
(M-MAV-3 shown)



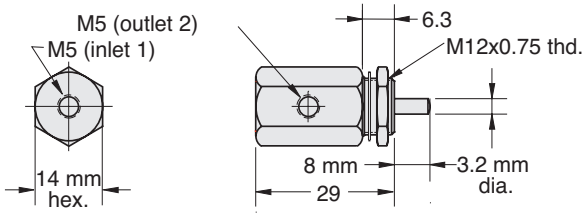
Inlet	Outlet	2/2	3/2
M5	M5	M-MAV-2	M-MAV-3
R1/8	M5	M-MAV-2P	M-MAV-3P

Air Flow: 110 L/min @ 3.5 bar; 190 L/min @ 7 bar

Normally-Open Spool Valves



(M-MAVO-2 shown)

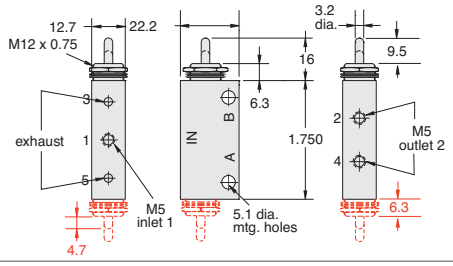


Inlet	Outlet	2/2	3/2
M5	M5	M-MAVO-2	M-MAVO-3

Air Flow: 170 L/min @ 3.5 bar; 285 L/min @ 7 bar

Normally-Closed Spool Valves

(M-MAV-4 shown)



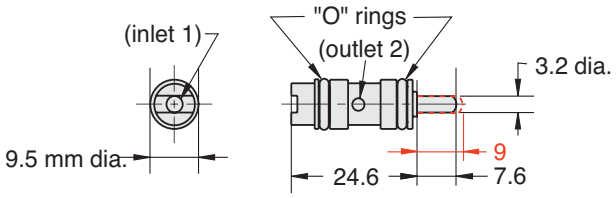
Inlet	Outlet	Actuation	5/2
M5	M5	Spring Return	M-MAV-4
M5	M5	2-Position	M-MAV-4D

Air Flow: 140 L/min @ 3.5 bar; 240 L/min @ 7 bar

M-MAV/M-MAVO Stem Valves Cont´d.

2/2 Cartridge Valves

(M-MAV-2C shown)

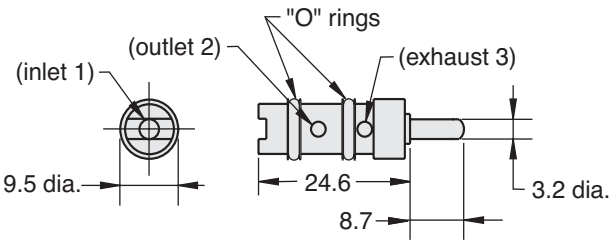


2/2	Function
M-MAV-2C	Normally-Closed
M-MAVO-2C	Normally-Open

Air Flow: 85 L/min @ 3.5 bar; 170 L/min @ 7 bar

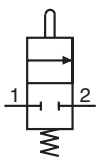
3/2 Cartridge Valves

(M-MAVO-3C shown)

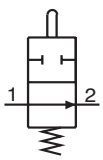


3/2	Function
M-MAV-3C	Normally-Closed
M-MAVO-3C	Normally-Open

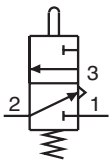
Air Flow: 85 L/min @ 3.5 bar; 170 L/min @ 7 bar



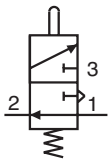
M-MAV-2
M-MAV-2C
M-MAV-2P



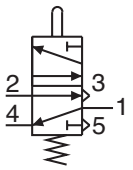
M-MAVO-2
M-MAVO-2C
M-MAVO-2P



M-MAV-3
M-MAV-3C
M-MAV-3P



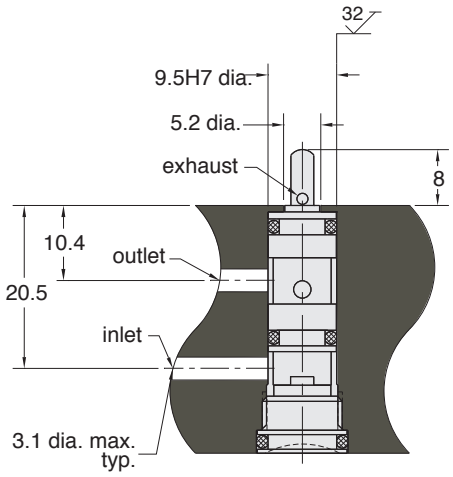
M-MAVO-3
M-MAVO-3C
M-MAVO-3P



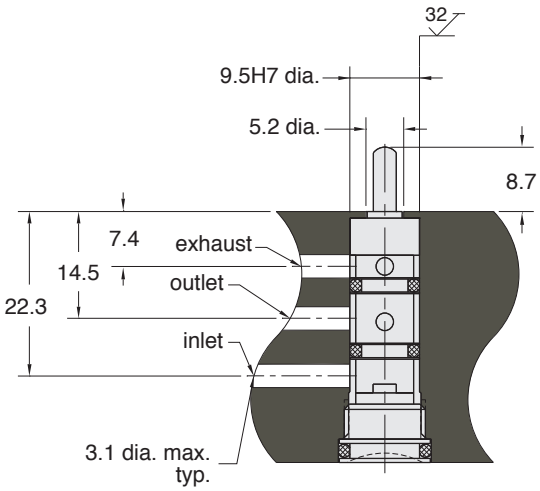
M-MAV-4
M-MAV-4D

Cartridge Valve Mounting

Clippard miniature cartridge valves offer the user flexibility in the application of 2/2 and 3/2 Normally-Open or Normally-Closed valves. 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.



M-MAV-2C/3C



M-MAVO-2C/3C

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 M-MAV, M-MJV, and M-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 42 for more information.

Plastic Button Colors Avaiable in:	
Yellow	Black
Red	White
Green	

Body	
Standard	**Option**
Brass	Electroless Nickel Plated
	Black Chrome

M-MJV/M-MJVO Stem & Cartridge Valves

These are high flow G1/8 ported 2/2, 3/2 and 5/2 valves that change their flow path when the stem is either depressed or released (spring return). The 2/2 and 3/2 valves are offered in both Normally-Closed (not passing) or Normally-Open (passing) versions. The 5/2 valves are typically used to control a double acting air cylinder. On pages 39 through 61 we offer a wide range of pneumatic and mechanical valve actuators that work with all Clippard stem valves.

Medium:
Air, water, oil, or other compatible fluids

Input Pressure:
M-MJVO-2, M-MJVO-3: 10 bar max.;
M-MJV-2, M-MJV-3, M-MJVO-3: 21 bar max.

Stem Travel:
3.2 mm; (M-MJV-4: 4.8 mm)

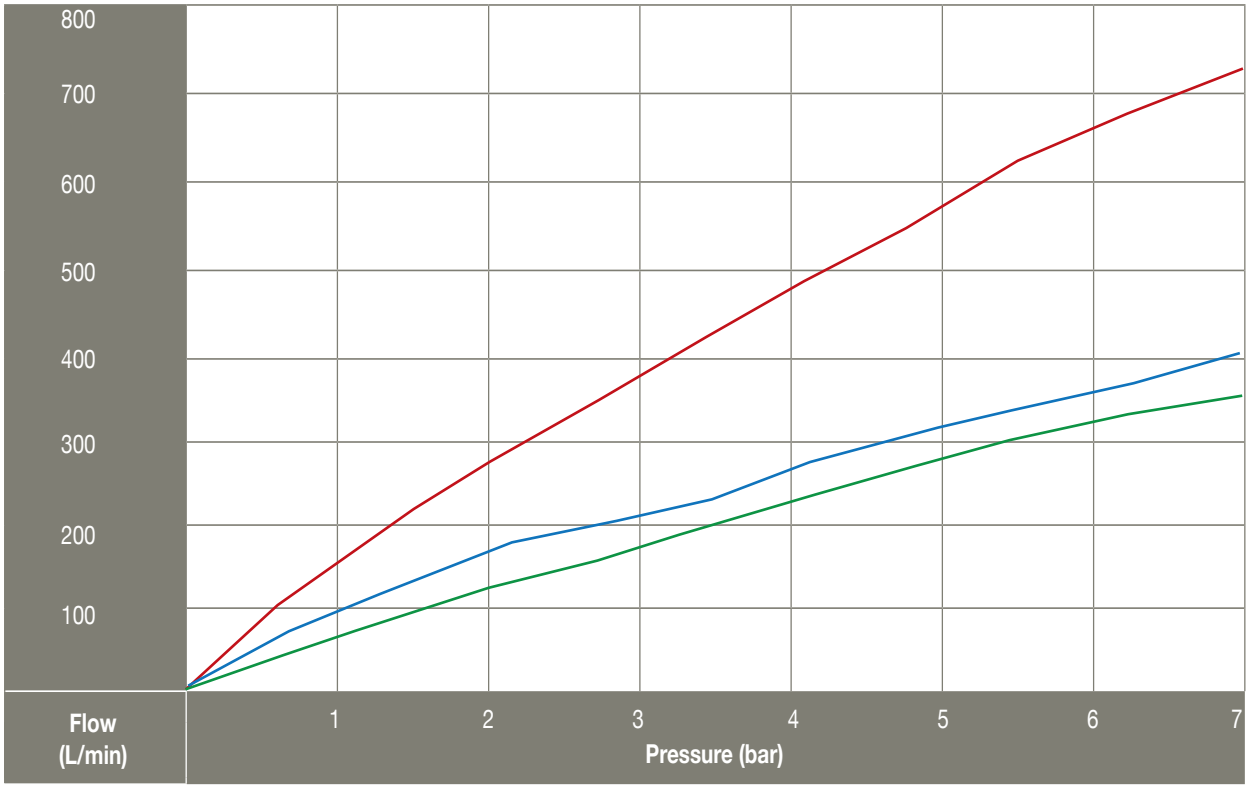
RoHS

Force For Full Stem Travel:
M-MJV-4D: 0.34 kg;
M-MJV-2C, M-MJVO-2C: 0.70 kg;
M-MJVO-2: 1 kg;
M-MJV-2, M-MJV-3, M-MJVO-3, M-MJV-4: 1.1 kg nominal

Mounting:
M12 x 0.75 thread. Nut and lockwashers furnished. M-MJV-4 and M-MJV-4D also have two 5.1 mm diameter mounting holes in valve body. Cartridge version inserts into a 15.9H7 bore.

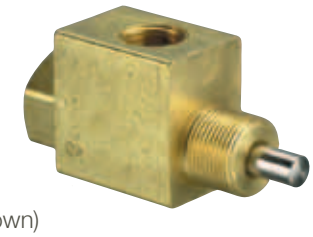
Materials:
Brass body, Nitrile seals, stainless steel stem and spring

Pressure vs. Flow

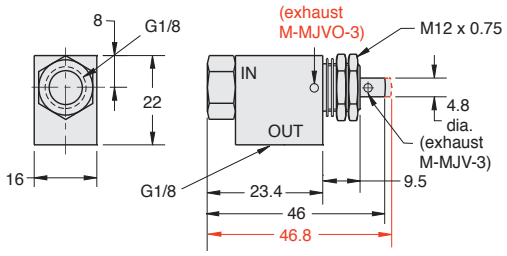


- Miniature size with high flow poppet or spool design
- Poppet valves have superior life and spool valves are more versatile.

Normally-Open/Normally-Closed Poppet Valves



(M-MJV-2 shown)

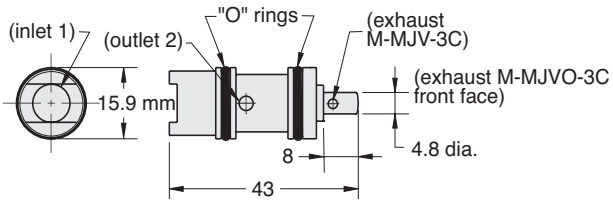


Port(s)	Function	2/2	3/2
G1/8	Normally-Closed	M-MJV-2	M-MJV-3
G1/8	Normally-Open	M-MJVO-2	M-MJVO-3

Air Flow: M-MJV-2, M-MJV-3/M-MJVO-3: 400 L/min @ 3.5 bar; 700 L/min @ 7 bar
M-MJVO-2: 200 L/min @ 3.5 bar; 340 L/min @ 7 bar; 400 L/min @ 7 bar; 700 L/min @ 7 bar

2/2 & 3/2 Cartridge Valves

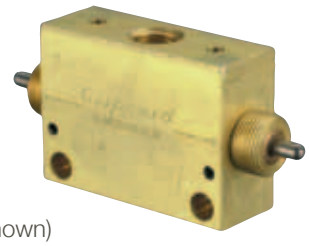
(M-MJV-2C shown)



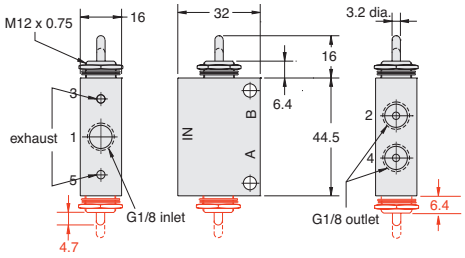
Function	2/2	3/2
Normally-Closed	M-MJV-2C	M-MJV-3C
Normally-Open	M-MJVO-2C	M-MJVO-3C

Air Flow: 310 L/min @ 3.5 bar; 565 L/min @ 7 bar

Normally-Open Spool Valves



(M-MJV-4D shown)



Port(s)	Actuation	5/2
G1/8	Spring Return	M-MJV-4
G1/8	2-Position	M-MJV-4D

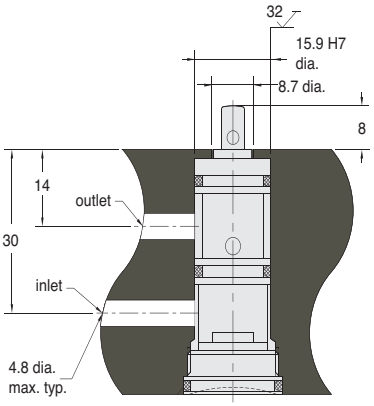
Air Flow: 225 L/min @ 3.5 bar; 400 L/min @ 7 bar

Mounting: two 5.1 mm dia. mounting holes in valve body

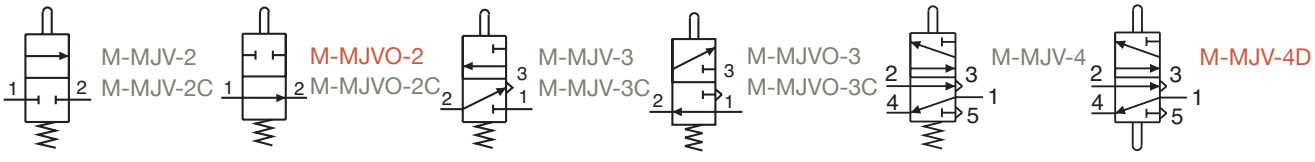
options (suffix)

ENP Plating "-ENP" • FKM Seals "-V"

Clippard miniature Cartridge Valves offer the user flexibility in the application of 2/2 and 3/2 Normally-Open or Normally-Closed valves. 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.



M-MJV-2C/3C,
M-MJVO-2C/3C



M-TV 2-Position Toggle Valves

2/2 & 3/2 Styles
The function of a 2/2 valve is to turn an air supply on and off. In the "on" position, medium flows from inlet to outlet, and in the "off" position, the flow is blocked. 3/2 styles have an exhaust port which vents the outlet to atmosphere.

Medium:
Air, Water or Oil

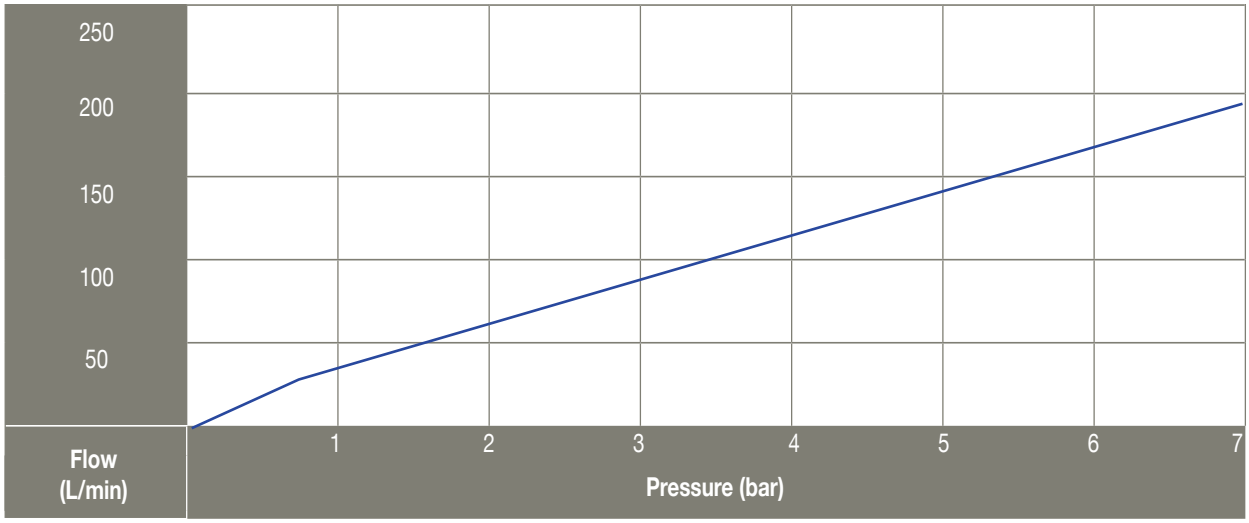
Input Pressure:
10 bar max.

Force to Rotate Toggle:
0.34 kg nominal

Mounting:
M12 x 0.75 thread. Nut and lockwashers furnished.

RoHS

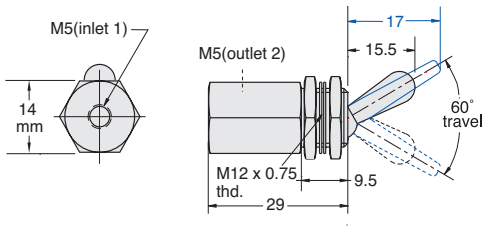
Pressure vs. Flow



- Brass body, Nitrile seals, stainless steel stem and spring
- Steel or plastic toggles

Spool Valves with Detented Actuation

(M-TV-2S shown)



Port(s)	Toggle	2/2	3/2
M5	ENP Steel	M-TV-2S	M-TV-3S
M5	Plastic	M-TV-2SF	M-TV-3SF

Air Flow: 125 L/min @ 3.5 bar; 225 L/min @ 7 bar

M-MTV 2-Position Toggle Valves

These M5 ported 2/2, 3/2 and 5/2 valves are manually actuated with a toggle. The toggles are electroless nickel plated steel and have a detent action. The M-MTV-5 has threaded exhaust and can be connected in a dual inlet pressure configuration.

Medium:
Air, (Water or Oil only for -2 and -5 version)

Input Pressure:
10 bar max.

Air Flow:
M-MTV-2: 110 L/min @ 3.5 bar; 200 L/min @ 7 bar;
M-MTV-3*: 110 L/min @ 3.5 bar; 130 L/min @ 7 bar;
M-MTV-4*: 170 L/min @ 3.5 bar; 285 L/min @ 7 bar;
M-MTV-5: 170 L/min @ 3.5 bar; 285 L/min @ 7 bar

Force to Rotate Toggle:
M-MTV-2, M-MTV-4: 0.34 kg;
M-MTV-3, M-MTV-5: 0.45 kg nominal.

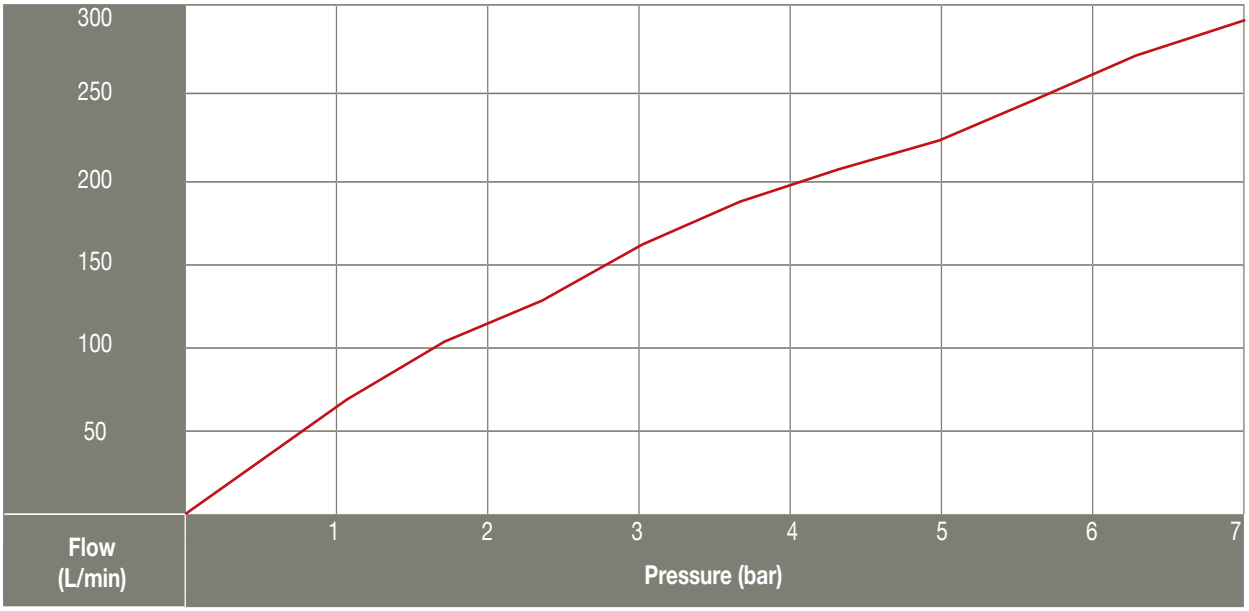
Mounting:
M12 x 0.75 thread. Nut and lockwashers furnished.

Materials:
Brass body, Nitrile seals, stainless steel stem and spring

*not for Oil and Water

RoHS

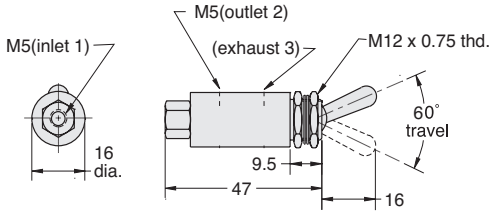
Pressure vs. Flow



- 2/2 and 3/2 are poppet valves
- 5/2 are spool valves

Normally-Closed Poppet Valves

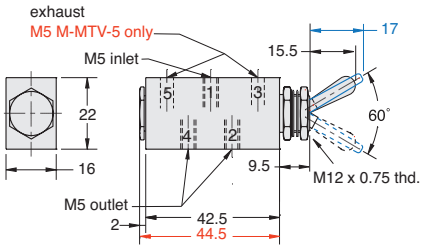
(M-MTV-3 shown)



Port(s)	Toggle	2/2	3/2
M5	ENP Steel	M-MTV-2	M-MTV-3
R1/8	ENP Steel	M-MTV-2P	M-MTV-3P

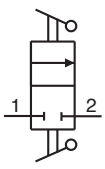
Normally-Open Spool Valves

(M-MTV-4F shown)

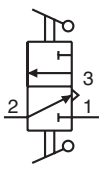


Port(s)	Toggle	Exhaust	5/2
M5	ENP Steel	To Atmosphere	M-MTV-4
M5	Plastic	To Atmosphere	M-MTV-4F
M5	ENP Steel	M5	M-MTV-5
M5	Plastic	M5	M-MTV-5F

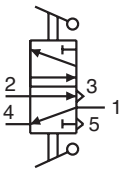
For high temperature applications (up to +200°C), or those that require special seals for chemical compatibility, Clippard offers optional FKM seals.



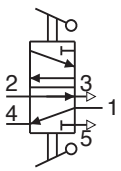
M-MTV-2



M-MTV-3



M-MTV-4
M-MTV-4F



M-MTV-5
M-MTV-5F

M-MJTV G1/8 Toggle Valves

3/2 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. 5/2 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. 5/2 fully ported valves can be plumbed in a dual pressure inlet configuration to save air consumption.

Medium:
Air

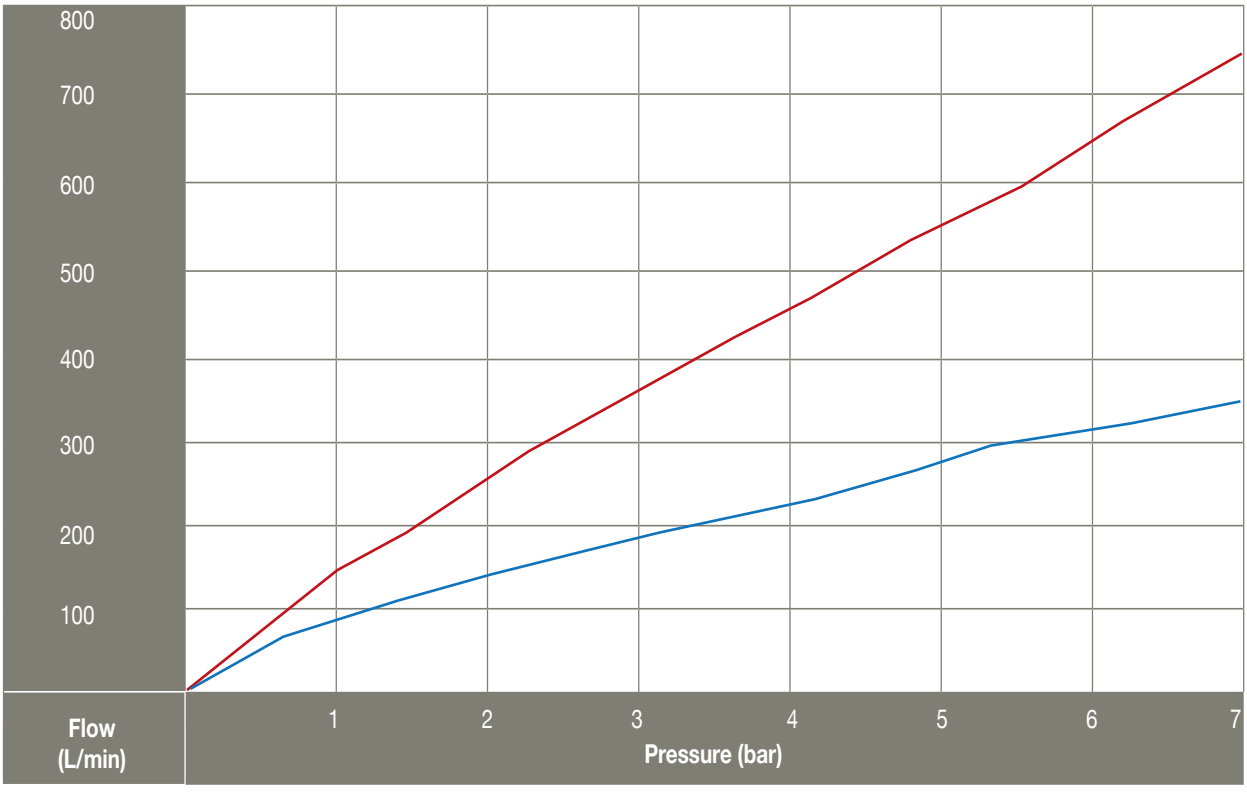
Input Pressure:
M-MJTV-3: 21 bar. max.;
M-MJTV-4/5: 10 bar. max.

Force to Rotate Toggle:
M-MJTV-4: 0.34 kg;
M-MJTV-3, M-MTV-5: 0.45 kg nominal.

Mounting:
M12 x 0.75 thread. Nut and lockwashers furnished.

RoHS

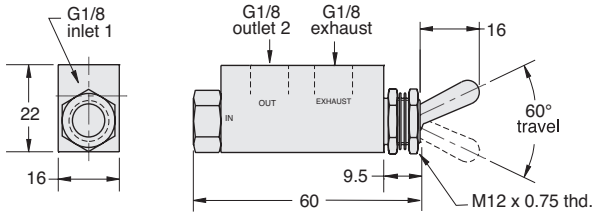
Pressure vs. Flow



- Compact, rugged construction
- Proven reliability
- Brass body, Nitrile seals, stainless steel stem and spring

Normally-Closed 3/2 Poppet Valves

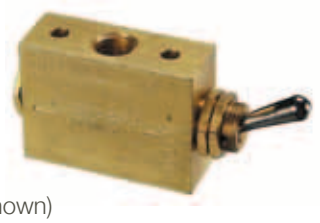
(M-MJTV-3 shown)



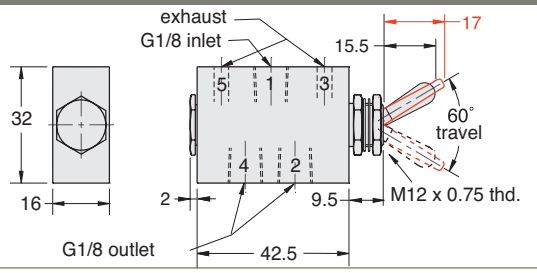
Port(s)	Toggle	3/2
G1/8	ENP Steel	M-MJTV-3

Air Flow: 400 L/min @ 3.5 bar; 700 L/min @ 7 bar

Normally-Open/Normally-Closed 5 Valves



(M-MJTV-4 shown)

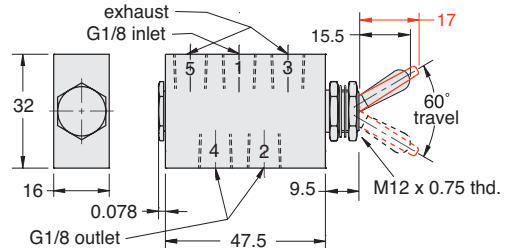


Port(s)	Toggle	5/2
G1/8	ENP-Steel	M-MJTV-4
G1/8	Plastic	M-MJTV-4F

Air Flow: 185 L/min @ 3.5 bar; 300 L/min @ 7 bar

Normally-Open/Normally-Closed 5/2 Fully-Ported Spool Valves

(M-MJTV-5F shown)



Port(s)	Toggle	5/2
G1/8	ENP-Steel	M-MJTV-5
G1/8	Plastic	M-MJTV-5F

Air Flow: 185 L/min @ 3.5 bar; 300 L/min @ 7 bar

M-FV Series Spool Valves

These balanced spool valves are “fully ported” which means that all ports are useable and can handle pressure or vacuum or both. The M-FV-3 is a 3/2 but can be used as a 2/2 Normally-Open or Normally-Closed by plugging port 2 or 4. As a 3/2 it can be connected as a Normally-Closed, Normally-Open and as a selector or diverter. The FV-5 can be connected in a dual pressure inlet configuration.

Medium:
Air, Oil & Water

Input Pressure:
10 bar max.

Stem Travel:
3.2 mm

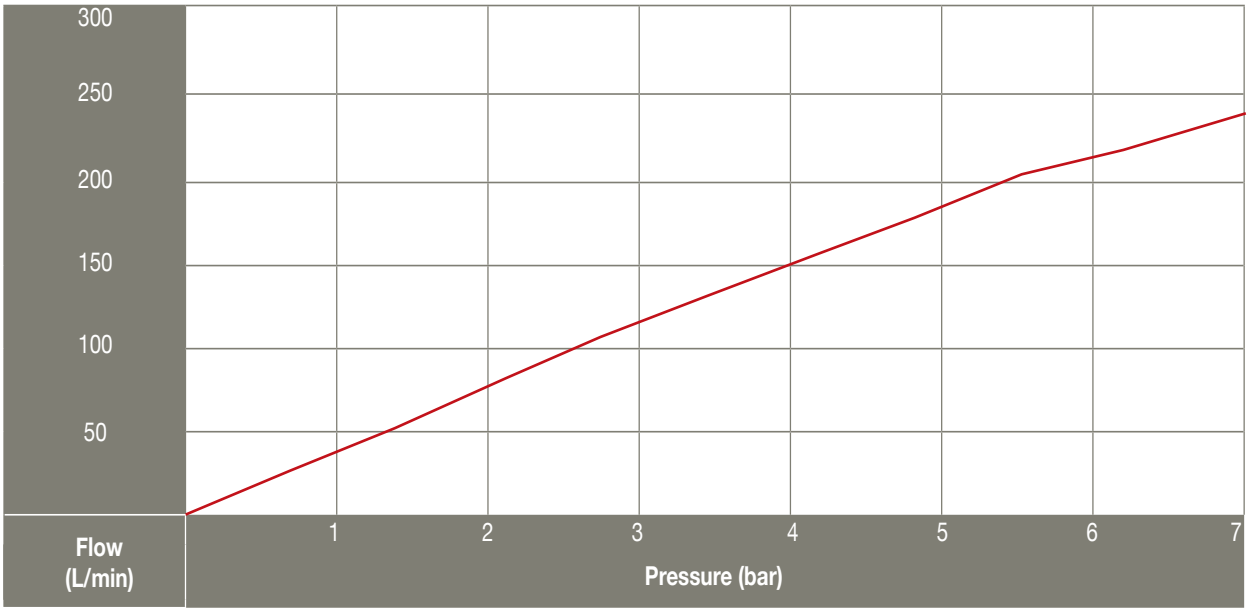
Force For Full Stem Travel:
M-FV-3, M-FV-3P, M-FV-5, M-FV-5P: 2kg nominal.
M-FV-3D, M-FV-3DP, M-FV-5D,
M-FV-5DP: 0.68 kg nominal.

Mounting:
M12 x 0.75 thread. Nut and lockwashers furnished.

Materials:
Brass body, Nitrile seals, stainless steel stem and spring

RoHS

Pressure vs. Flow

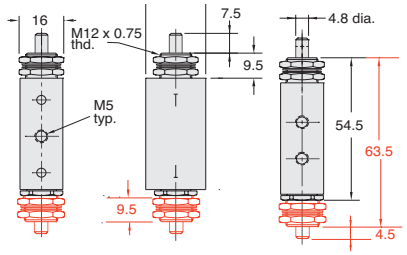


- Designed for use with Clippard manual, air pilot, electrical or mechanical actuators, or combinations

options (suffix)
ENP Plating “-ENP” • FKM Seals “-V”

3/2, M5 Valves

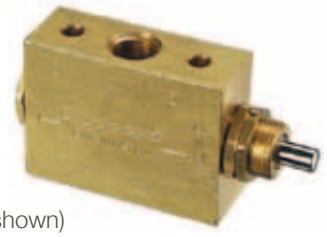
(M-FV-3D shown)



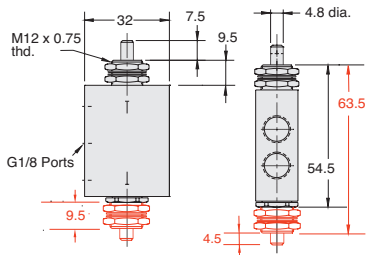
Port(s)	Actuation	3/2
M5	Spring Return	M-FV-3
M5	2-Position	M-FV-3D

Air Flow: 170 L/min @ 3.5 bar; 285 L/min @ 7 bar

3/2, G1/8 Valves



(M-FV-3P shown)



Port(s)	Actuation	3/2
G1/8	Spring Return	M-FV-3P
G1/8	2-Position	M-FV-3DP

Air Flow: 185 L/min @ 3.5 bar; 300 L/min @ 7 bar

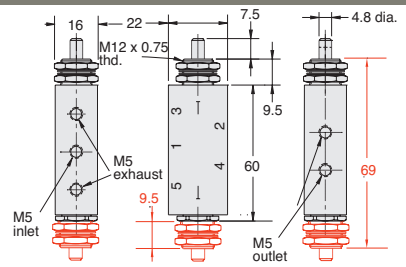
For high temperature applications (up to +200°C), or those that require special seals for chemical compatibility, Clippard offers optional FKM seals.

options (suffix)
ENP Plating "-ENP" • FKM Seals "-V"

M-FV Series Spool Valves Cont´d.

5/2 Fully-Ported M5 Valves

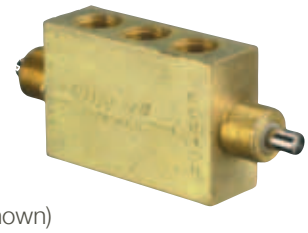
(M-FV-5 shown)



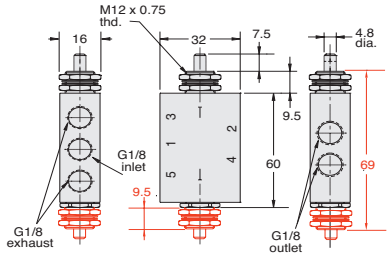
Port(s)	Actuation	3/2
M5	Spring Return	M-FV-5
M5	2-Position	M-FV-5D

Air Flow: 170 L/min @ 3.5 bar; 285 L/min @ 7 bar

5/2, G1/8 Fully-Ported Valves

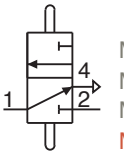


(M-FV-5DP shown)

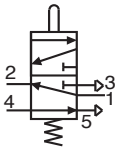


Port(s)	Actuation	3/2
G1/8	Spring Return	M-FV-5P
G1/8	2-Position	M-FV-5DP

Air Flow: 185 L/min @ 3.5 bar; 300 L/min @ 7 bar



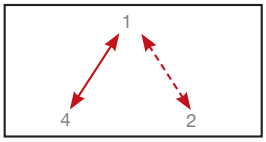
M-FV-3
M-FV-3D
M-FV-3P
M-FV-3DP

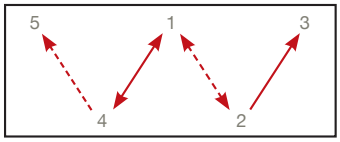


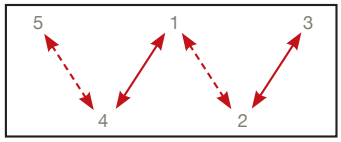
M-FV-5
M-FV-5D
M-FV-5P
M-FV-5DP

Flow Paths for “M-FTV & M-FV” Series Valves

Solid lines indicate flow paths with toggle or stem in one direction. Dotted lines indicate flow paths when the toggle or stem are shifted.







M-FTV Series Toggle Valves

2-Position, M5 & G1/8 Ports
3/2 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.

Medium:
Air

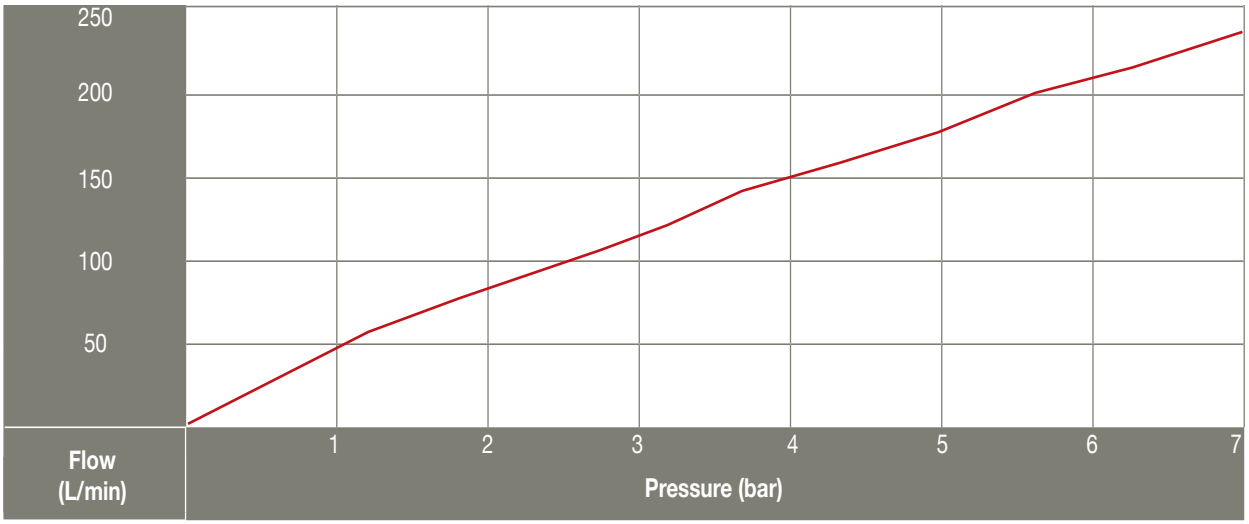
Force to Rotate Toggle:
0.45 kg nominal

Mounting:
M12 x 0.75 thread. Nut and lockwashers furnished.

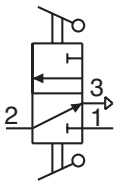
Materials:
Brass body, Nitrile seals, stainless steel stem and spring

RoHS

Pressure vs. Flow



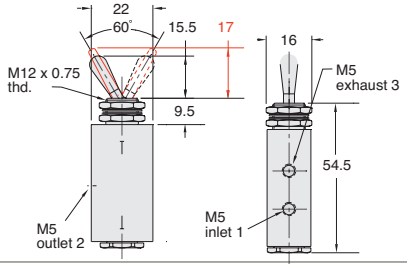
- Compact design
- ENP steel or plastic toggles



options (suffix)
ENP Plating "-ENP" • FKM Seals "-V"

3/2, M5 Valves

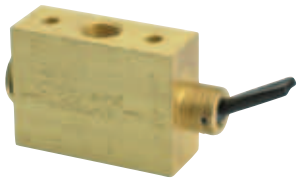
(M-FTV-3 shown)



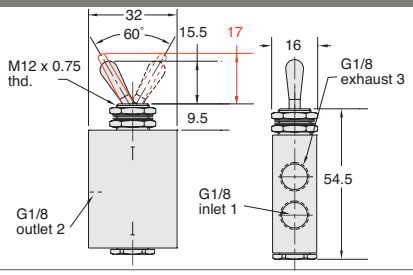
Port(s)	Toggle	3/2
M5	ENP Steel	M-FTV-3
M5	Plastic	M-FTV-3F

Air Flow: 170 L/min @ 3.5 bar; 285 L/min @ 7 bar

3/2, G1/8 Valves



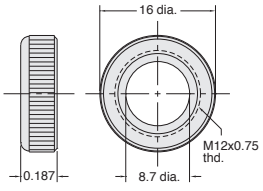
(M-FTV-3FP shown)



Port(s)	Toggle	3/2
G1/8	ENP Steel	M-FTV-3P
G1/8	Plastic	M-FTV-3FP

Air Flow: 185 L/min @ 3.5 bar; 300 L/min @ 7 bar

15/32 Panel Mounting Nut



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

Brass with black or bright nickel finish

NEW

NEW! M-HV Series Stem & Toggle Valves

3/2 & 5/2 Styles

The M-HV-3 Series is a fully-ported 3/2 valve. This can be used as a selector valve choosing between two separate pressures or fluids (port 2 or 4) going to a single output (port 1). Being fully-ported, the inverse will work as well using the valve as a diverter sending a fluid (port 1) to two separate outputs (port 2 or 4). Also, the valve may be used as a Normally-Closed or Normally-Open 3/2 valve. The M-HV-4 series is a 5/2 valve that vents its exhaust ports to atmosphere and is ideal for powering simple cylinder applications.

Medium:
3/2: Air, Oil or Water
5/2: Air

Input Pressure:
10 bar max.

Air Flow:
185 L/min @ 3.5 bar; 335 L/min @ 7 bar

Temperature Range:
0 to 110°C

Force For Full Stem Travel:
2 kg nominal.

Stem:
Stainless Steel
Toggle:
ENP Steel or Plastic

Mounting Cartridge Style:
Inserts into a 13H7 bore

Materials:
Brass body, Nitrile seals, stainless steel stem and spring

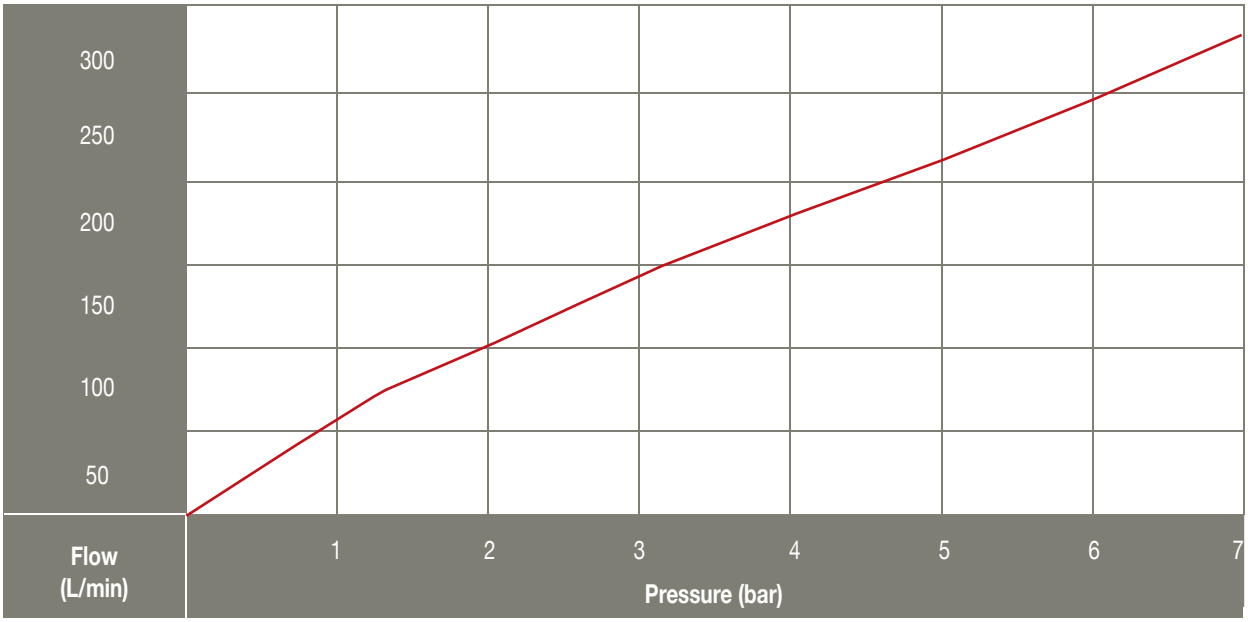
Ports:
M5, Cartridge

Stem Travel:
3.2 mm

Seals:
Nitrile, FKM optional

RoHS

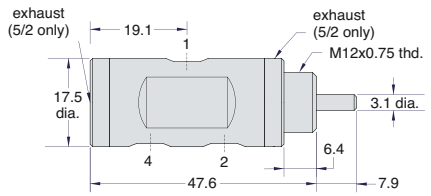
Pressure vs. Flow



- Small, compact size, lightweight
- Design flexibility and fast response
- M12 x 0.75 male thread for panel mounting
- M-HV-3 can be used as a Normally-Open or Closed 3/2 valve
- 5/2 valves exhaust to atmosphere

3/2 & 5/2 Stem Valves

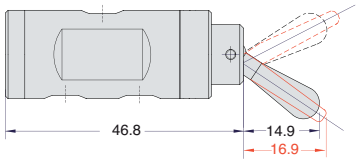
(M-HV-3 shown)



3/2	5/2
M-HV-3	M-HV-4

3/2 & 5/2 Toggle Valves

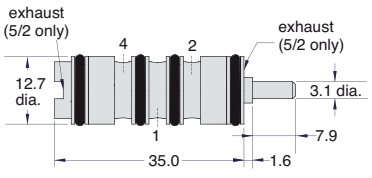
(M-HTV-3F shown)



Toggle	3/2	5/2
ENP Steel	M-HTV-3	M-HTV-4
Plastic	M-HTV-3F	M-HTV-4F

3/2 & 5/2 Stem Cartridge Valves

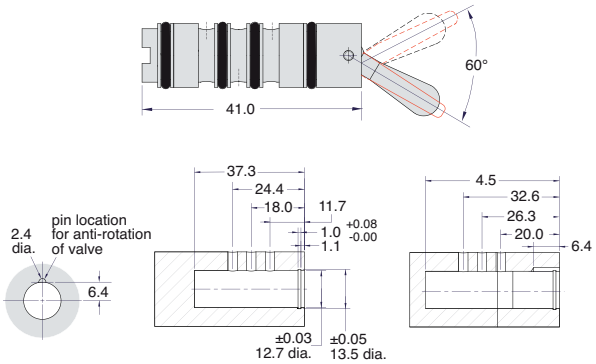
(M-HV-3C shown)



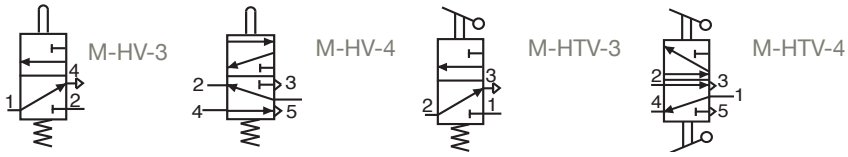
3/2	5/2
M-HV-3C	M-HV-4C

3/2 & 5/2 Toggle Cartridge Style

(M-HTV-3CF shown)



Toggle	3/2	5/2
ENP Steel	M-HTV-3C	M-HTV-4C
Plastic	M-HTV-3CF	M-HTV-4CF



options (suffix)

ENP Plating "-ENP" • FKM Seals "-V"

NEW! M-GV Series High Flow Poppet Valves

Toggle, Stem & Cartridge Styles

The M-GV series valves offer 10 times more flow than the M-MAV series and 2.5 times the flow of the M-MJV series. With Clippard's versatile M12 x 0.75 nose thread, a large variety of buttons and valve actuators can be used with the stem operated valves. The M-GTV series are toggle valves with panel mounting capabilities (M16 x 1 nose thread). The outlet port on all M-GV valves can be easily positioned to any orientation for mounting convenience.

Medium:
2/2: Air, Oil or Water
3/2: Air

Input Pressure:
10 bar max.

Air Flow:
1075 L/min @ 3.5 bar; 1900 L/min @ 7 bar

Temperature Range:
0 to 110°C

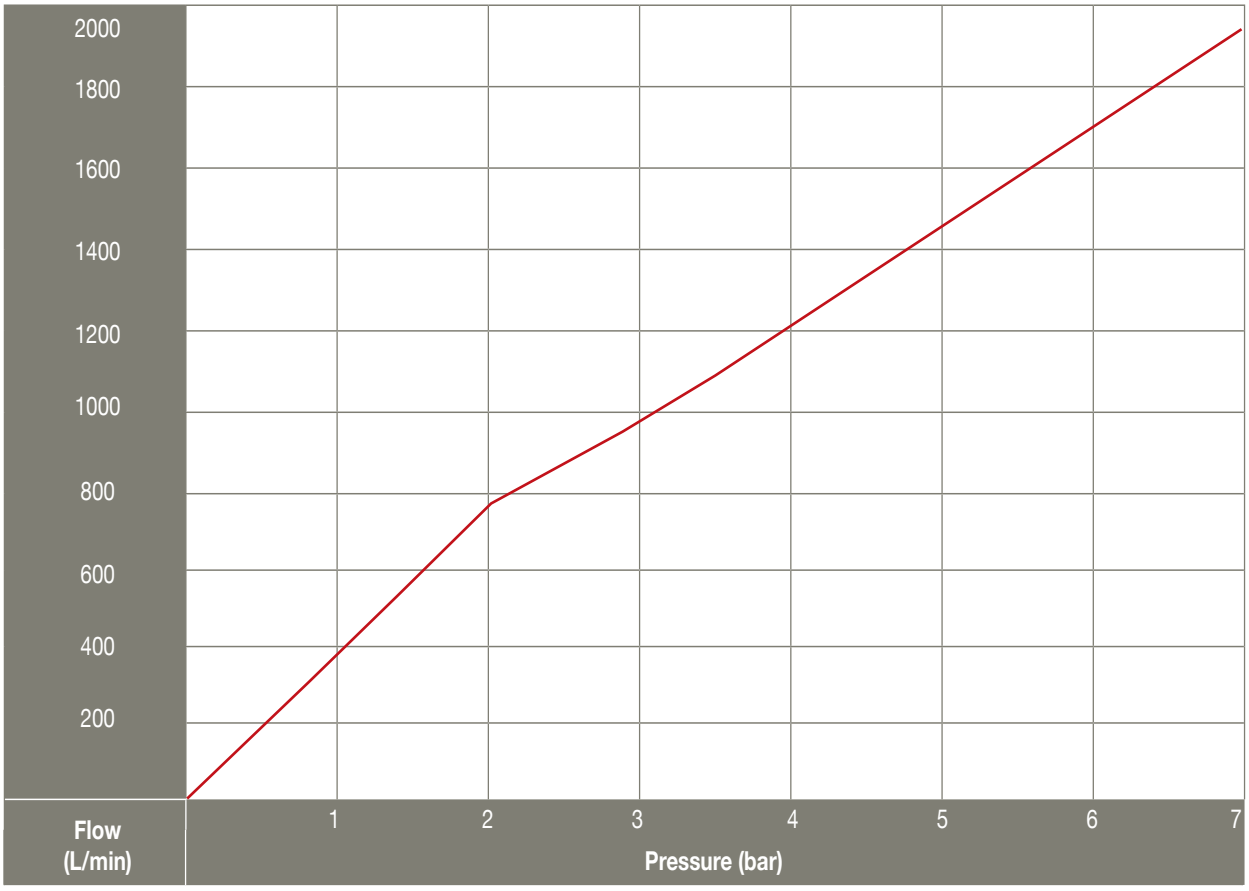
Force For Full Stem Travel:
4kg nominal @ 7 bar

Stem:
Stainless Steel
Toggle:
ENP Steel or Plastic
Stem Travel:
3.2 mm

Ports:
G1/4

RoHS

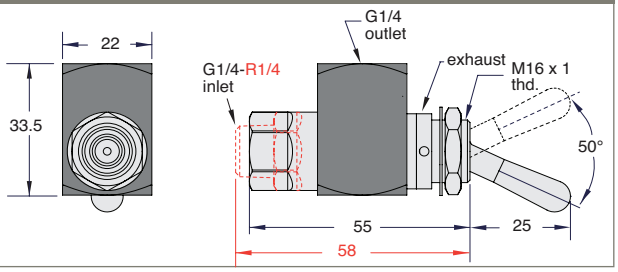
Pressure vs. Flow



- Will accept a variety of manual, air pilot, electrical or mechanical actuators
- Small, compact size, lightweight
- Design flexibility and fast response
- Corrosion-resistant series also available
- Nitrile seals standard, FKM optional

2/2 & 3/2 Toggle Valves, G1/4

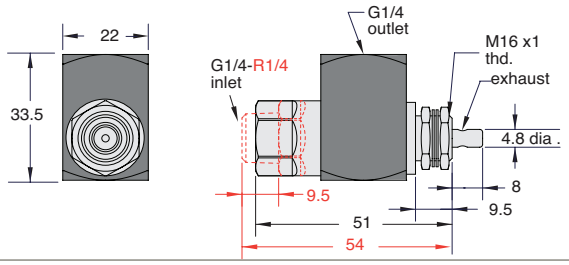
(M-GTV-2Q shown)



Inlet	Outlet	2/2	3/2
G1/4	G1/4	M-GTV-2	M-GTV-3
R1/4	G1/4	M-GTV-2Q	M-GTV-3Q

2/2 & 3/2 Stem Valves, G1/4

(M-GV-2 shown)

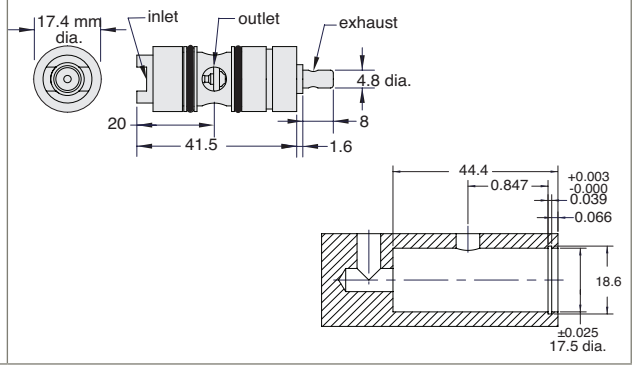


Inlet	Outlet	2/2	3/2
G1/4	G1/4	M-GV-2	M-GV-3
R1/4	G1/4	M-GV-2Q	M-GV-3Q

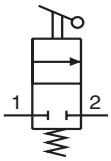
Clippard's New M-EGV Series valves are an electronically piloted versions of the M-GV cartridge valves, ideal for large flow, low leak applications. See EV-Metric catalogue page 75-78.

2/2 & 3/2 Stem Cartridge Valves

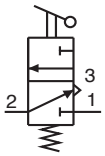
(M-GV-2C shown)



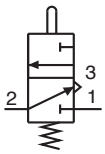
2/2	3/2
M-GV-2C	M-GV-3C



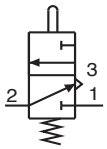
M-GTV-2



M-GTV-3



M-GV-2



M-GV-3

M-TV Series 5/3 Toggle Valves

5/2 toggle valve with outlet ports open to atmosphere in the center position. The valve can be spring centered, 3 position detent or the "DM" provides a detent on one side and spring return on the other side.
The M-TV-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.

Medium:
Air

Input Pressure:
10 bar max.

Air Flow:
125 L/min @ 3.5 bar; 210 L/min @ 7 bar

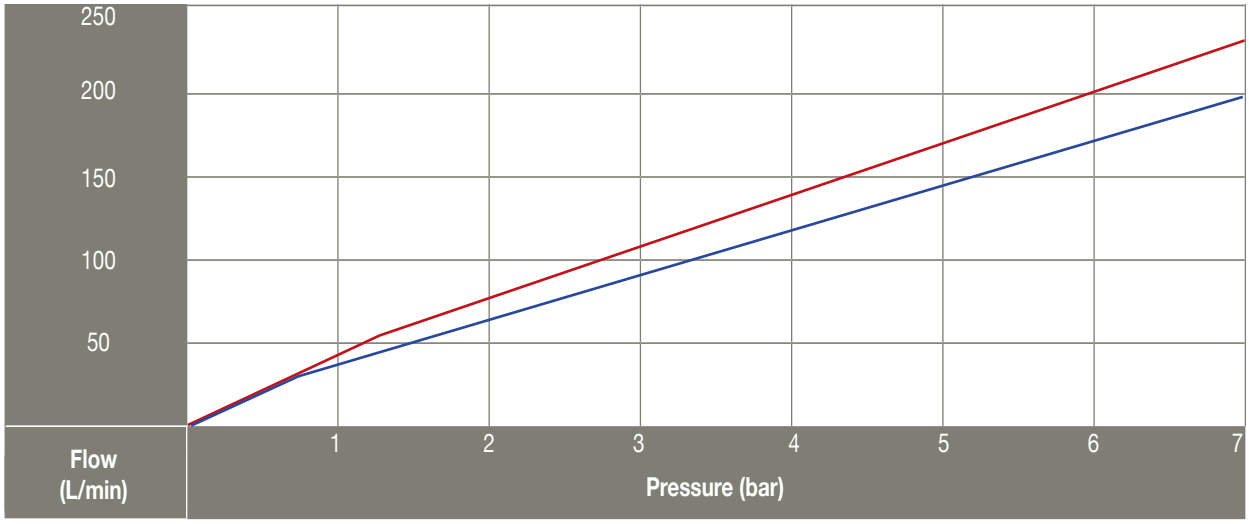
Force to Rotate Toggle:
0.22 kg nominal

Force to Rotate Toggle:
0.22 kg nominal

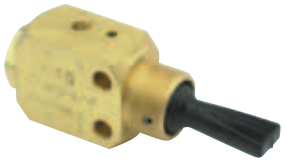
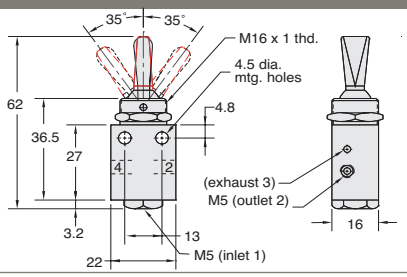
Mounting Cartridge Style:
M16 x 1 thread. Nut and lockwashers furnished.

RoHS

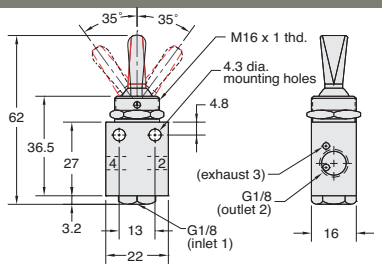
Pressure vs. Flow



- Designed for use with Clippard manual, air pilot,electrical or mechanical actuators, or combinations

5/3, M5 M16 x 1 Valves	
 (M-TV-4D shown)	

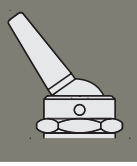
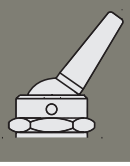
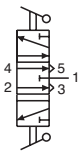
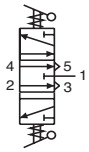
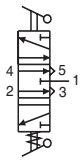
Function	Toggle	5/3
Detented/Detented	Plastic	M-TV-4D
Momentary/Momentary	Plastic	M-TV-4M
Detented/Momentary	Plastic	M-TV-4DM
Detented/Detented	ENP Steel	M-TV-4DH
Momentary/Momentary	ENP Steel	M-TV-4MH
Detented/Momentary	ENP Steel	M-TV-4DMH

5/3, G1/8 Valves	
 (M-TV-4DH shown)	

Function	Toggle	5/3
Detented/Detented	Plastic	M-TV-4DP
Momentary/Momentary	Plastic	M-TV-4MP
Detented/Momentary	Plastic	M-TV-4DMP
Detented/Detented	ENP Steel	M-TV-4DPH
Momentary/Momentary	ENP Steel	M-TV-4MPH
Detented/Momentary	ENP Steel	M-TV-4DMPH

options (suffix)

ENP Plating "-ENP" • FKM Seals "-V"

Model Number					
M-TV-4D M-TV-4DP	M5 G1/8	Detended	SPRING CENTERED supply blocked both sides exhaustes	Detended	
M-TV-4M M-TV-4MP	M5 G1/8	Momentary		Momentary	
M-TV-4DM M-TV-4DMP	M5 G1/8	Detended		Momentary	

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!

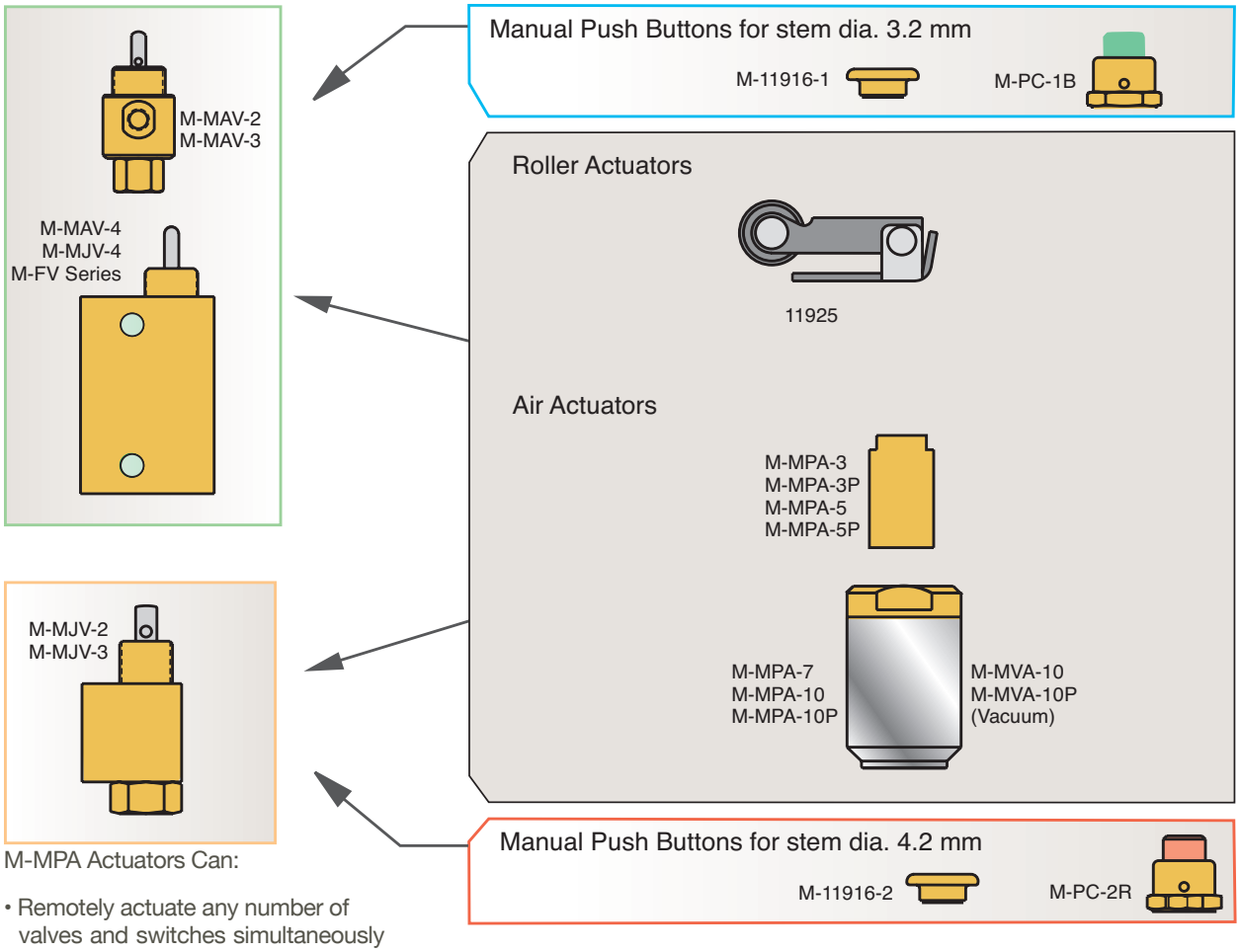
A valve used in dental applications features ports located straight out of the back for ease-of-assembly in a tight space. It also incorporates a special toggle to match the customers' aesthetic requirements.
Use any combination of Clippard's electronic valves to actuate any Clippard control valve with 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 2/2 valve mounted on a manifold adjacent to our electronic valve.

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



The following valve actuators are compatible with all Clippard M-MAV, M-MAVO, M-MJV, M-MJVO & M-FV series valves.

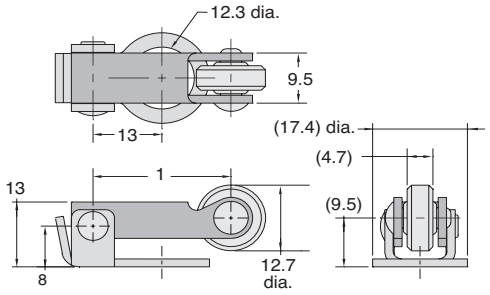
One of the most versatile items in the Clippard line. Permits wide circuit flexibility and allows many control functions to be accomplished pneumatically with less cost, hazards and complexity. Threads onto the tops of M-Miniature 2/2, 3/2, and 5/2 valves to provide fast pilot actuation from a pneumatic signal.



M-MPA Actuators Can:

- Remotely actuate any number of valves and switches simultaneously in different strategic locations from a single miniature 3/2 valve
- Act as an air relay, i.e., one pressure source to another.
- Operate the M-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.

Roller Cam Actuator



Part No.	Description
11925	Roller Cam Follower Actuator

Construction:
Stainless steel with nylon roller

Operation:
Mounts to valve body, actuates valve when mechanically depressed: valve spring provides return

Mounting:
12.3 mm dia. mounting hole fits M12 x 0.75 threaded mounting section of valve bodies

Note for 11925:

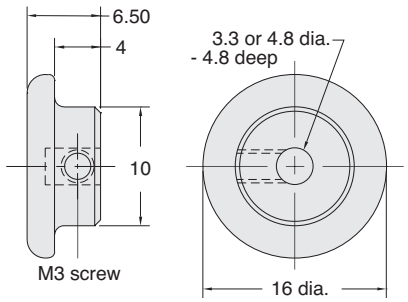
When mounting on a valve, a space should be provided between the body and the actuator according to the chart to the right:

Valve Mtg. Thd.	11925
6.4 thd. length	1.6
9.5 thd. lenght	4.8

A mounting nut (supplied with valve), mounting bracket or washers should be used to obtain the required spacing.

Push Button Actuators

Round Solid Brass 16 mm dia.
Push Button



Part No.	Description
M-11916-1	16 mm Brass Push Button, 3.2 Stem
M-11916-2	16 mm Brass Push Button, 4.8 Stem

Use:
Mounts directly on valve stem for manual operation of valve; prevents over-travel of valve stem by providing a positive stop

Mounting:
3.2 or 4.8 mm dia. mounting hole fits valve stems; locks in place by set screw

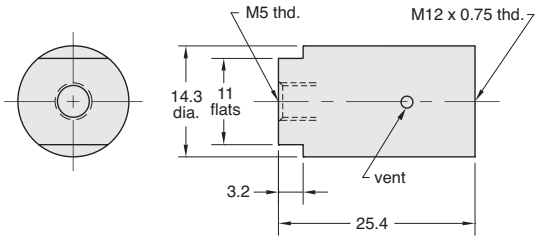
Minimum Pressure Required (bar)

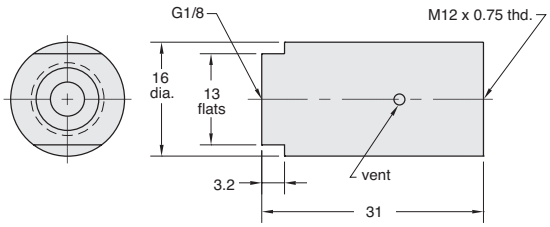
Clippard Valve	Pressure (bar)*			
	M-MPA3	M-MPA-5	M-MPA-7	M-MPA-10
M-MAV-2 Valve	1.6	0.6	0.30	0.15
M-MAV-3 Valve	1.6	0.6	0.30	0.15
M-MAV-4 Valve	2.5	0.8	0.40	0.25
M-MJV-4 Valve	2.5	0.8	0.40	0.25
M-MAV-4D Valve	0.90	0.3	0.10	0.07
M-MJV-4D Valve	0.90	0.3	0.10	0.07
M-MJV-2 Valve	2.0	0.7	0.35	0.20
M-MJV-3 Valve	2.0	0.7	0.35	0.20
M-MAVO-2 Valve	1.9	0.6	0.3	0.17
M-MAVO-3 Valve	1.9	0.6	0.3	0.17
M-MJVO-2 Valve	2.0	0.7	0.35	0.20
M-MJVO-3 Valve	2.0	0.7	0.35	0.20
M-HV-3/4	2.8	1.0	0.5	0.30

Clippard Valve	Pressure (bar)*			
	M-MPA3	M-MPA-5	M-MPA-7	M-MPA-10
M-FV-3	2.8	1	0.5	0.3
M-FV-3P	2.8	1	0.5	0.3
M-FV-5	2.8	1	0.5	0.3
M-FV-5P	2.8	1	0.5	0.3
M-FV-3D	1	0.35	0.17	0.1
M-FV-3DP	1	0.35	0.17	0.1
M-FV-5D	1	0.35	0.17	0.1
M-FV-5DP	1	0.35	0.17	0.1
M-GV-2/3	6	2.1	1.1	0.5

* with 7 bar to valve inlet

Single Acting Air Piloted Actuators





Bore Size: 9.5

Force Factor: 0.1

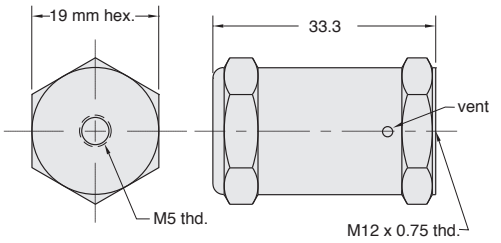
Part No.	Description
M-MPA-3	Single Acting, Spring Return Actuator, M5
M-MPA-3P	Single Acting, Spring Return Actuator, G1/8

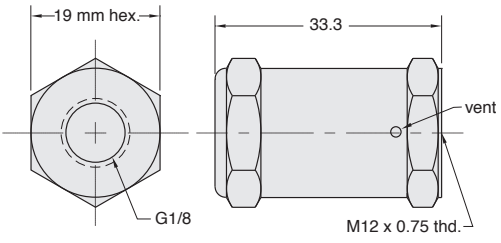
Construction:
Body-brass; Springs- stainless steel; Seals - Buna-N rubber; Piston - Delrin®

Mounting:
M12 x 0.75 female thread to mount to Clippard miniature valves and components

Input Pressure
17 bar max.

Single Acting Air Piloted Actuators





Bore Size: 16

Force Factor: 0.3

Part No.	Description
M-MPA-5	Single Acting, Spring Return Actuator, M5
M-MPA-5P	Single Acting, Spring Return Actuator, G1/8

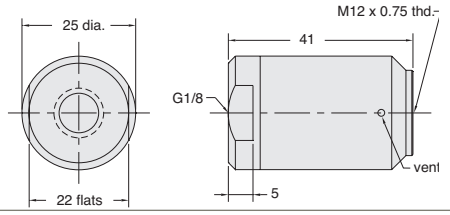
Construction:
Body-brass; Springs- stainless steel; Seals - Buna-N rubber; Piston - Delrin®

Mounting:
M12 x 0.75 female thread to mount to Clippard miniature valves and components

Input Pressure
17 bar max.

® Delrin® is a registered trademark of DuPont for its acetal resin

Single Acting Air Piloted Actuators



Bore Size: 22

Force Factor: 0.6

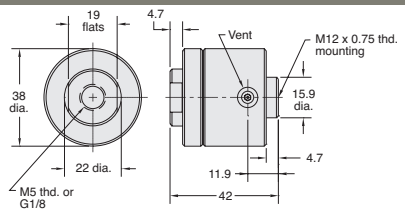
Part No.	Description
M-MPA-7	Single Acting, Spring Return Actuator, G1/8

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

Mounting:
M12 x 0.75 female thread to mount to Clippard miniature valves and components

Input Pressure
17 bar

Pilot Actuators



Bore Size: 31.7

Force Factor: 1.2

Part No.	Description
M-MPA-10	Single Acting, Spring Return Actuator, M5
M-MPA-10P	Single Acting, Spring Return Actuator, G1/8

Input Pressure
10 bar max.

Mounting:
M12 x 0.75 female thread to mount to Clippard miniature valves and components; no spacers or washers are required when assembled to anyClippard valve;may be used with 15018-2 mounting bracket

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 3.2 diameter stems or 4.8 diameter stems. Each kit includes a colored acetyl push button, brass housing nut, 1.6 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 1.6 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 M-MAV, M-MJV, and M-FV series, these push buttons integrate easily into Minimatic® systems, providing optimal quality and efficiency in miniature pneumatic control.

M - P C - ❑ ❑ (- ❑)

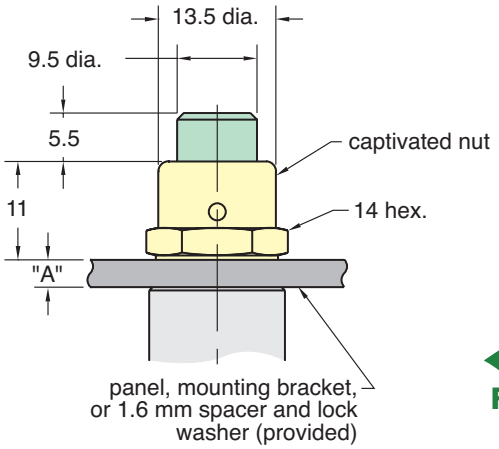
Metric

Push Button Captivated

Valve Stem dia.
1 3.2 dia.
2 4.2 dia.

Push Button Color
B - Black
G - Green
R - Red
W - White
Y - Yellow

Options
BC - Black Chrome
ENP - Electroless Nickel Plated



RoHS

Spacing Reduired for Proper Actuation of Push Button	
Valve	**"A" Dim.**
M-MAV-2, M-MAV-3 M-MAVO-2, M-MAVO-3	2.4
M-MAV-4, M-MAV-4D M-MJV-4, M-MJV-4D	4
M-MJV-2, M-MJV-3 M-MJVO-2, M-MJVO-3 M-FV-3, M-FV-5	5.5

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.

M - P C - ❑ ❑ - ❑ ❑

Metric

Push Button Captivated

Size Mounting Thread
- 3 16 mm
- 4 22 mm
- 5 30 mm

Button Style
- E - Extended
- F - Flush
- M - Mushroom

Push Button Color
- BK - Black
- GN - Green
- OR - Orange
- WH - White
- YL - Yellow
- GR - Grey
- RD - Red
- BL - Blue

Part No.	Description
M-PC-3E-(color)	M16 x 1 Thd., Extended (specify color)
M-PC-3F-(color)	M16 x 1 Thd., Flush (specify color)
M-PC-3M-(color)	M16 x 1 Thd., Mushroom (specify color)

Part No.	Description
M-PC-4E-(color)	M22 x 1 Thd., Extended (specify color)
M-PC-4F-(color)	M22 x 1 Thd., Flush (specify color)
M-PC-4M-(color)	M22 x 1 Thd., Mushroom (specify color)



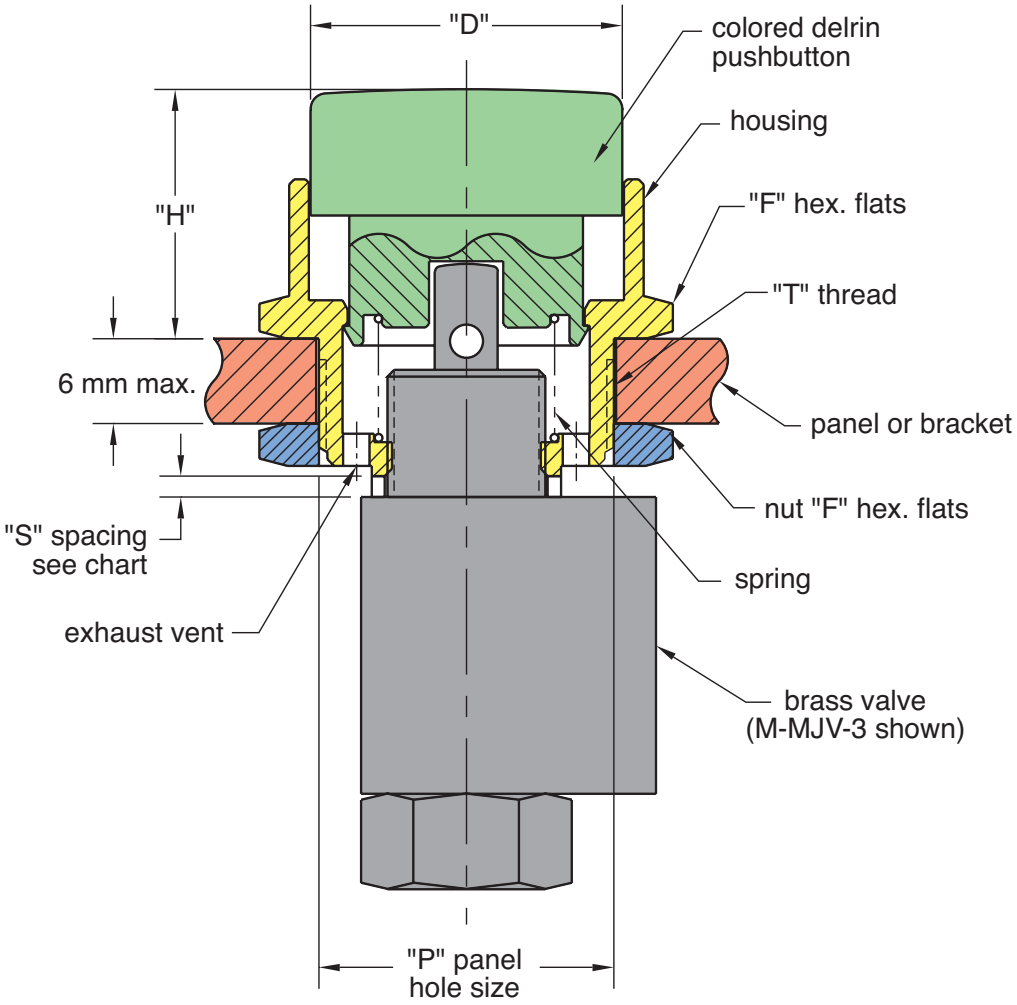
Part No.	Description
M-PC-5E-(color)	M30 x 1.5 Thd., Extended (specify color)
M-PC-5F-(color)	M30 x 1.5 Thd., Flush (specify color)
M-PC-5M-(color)	M30 x 1.5 Thd., Mushroom (specify color)

Features

- Assembles directly to the valve; no adapters required
- Ideal for mounting on panels or brackets, up to 6 mm 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 1.6 mm 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“ $^{+0,8}_{-0}$ Panel Hole**	**„F“ Hex Flats**
16 mm mtg. thd.	M-PC-3E- ❑❑ M-PC-3F- ❑❑ M-PC-3M- ❑❑	16 16 30	19 12.7 23	M16 x 1	16 mm dia.	19
22mm mtg. thd.	M-PC-4E- ❑❑ M-PC-4F- ❑❑ M-PC-4M- ❑❑	23.5 23.5 38	19 12.7 23	M22 x 2	22 mm dia.	27
30 mm mtg. thd.	M-PC-5E- ❑❑ M-PC-5F- ❑❑ M-PC-5M- ❑❑	30 30 38	19 12.7 23	M30 x 1.5	30 mm dia.	33



Spacing "S" Required for Proper Valve Actuation			
Valve series	M-MAV-2, M-MAVO-2 M-MAV-3, M-MAVO-3 M-HV-3, -4	M-MAV-4, -4D MJV-4, -4D	M-MJV-2, -3 M-MJVO-2, -3 M-FV-3, -5 M-GV-2, -3
• Mounting thd. • Stem extension • Valve stroke	M12 x 0.75 8 mm 3.2 mm	M12 x 0.75 9.5 mm 4.8 mm	M12 x 0.75 8 mm 3.2 mm
„S“ Minimum Maximum	none 1.6 mm	none 1.6 mm	1.6 mm 3.2 mm

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 M-PB-22 and M-PB-30 have an aluminum housing that threads on to the actuator, and integral brass sleeve.

Step #1. Select Actuator on pages XX through XX.

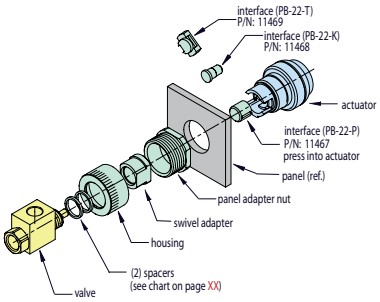
Step #2. Determine spacing requirements using the chart on page XX.

Step #3. Determine Adapter on pages XX and XX.

Step #4. Add Accessories on page XX.

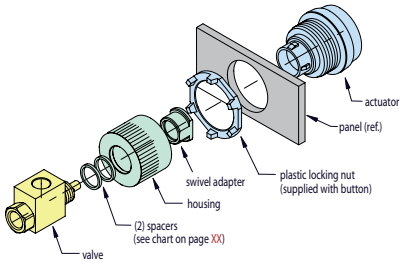
Actuator, Adapter M-PB-22-X & Valve

M-PB-22-X Adapter (22 mm)



Actuator, Adapter M-PB-30 & Valve

M-PB-30 Adapter (30 mm)



Actuator Ordering Guide

M - P ☐ - ☐ ☐ ☐ - ☐

Metric

Manual Actuator

Size
22 - Small (22 mm)
L - Large (30 mm)

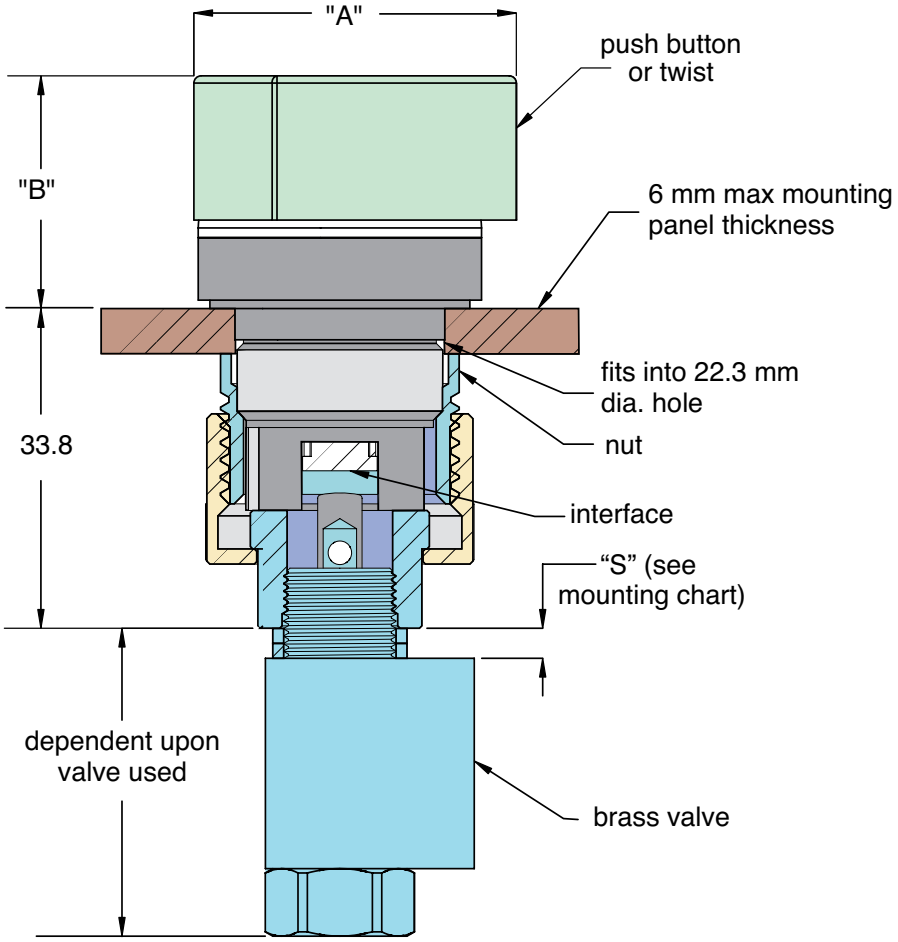
„On" Actuation
P - Push
T - Twist
K - Key
L - Latching (Push)

„Off" Actuation
4 - Key
3 - Twist
2 - Spring

Button Type
F - Flush
E - Extended
M - Mushroom
T - Twist
K - Key

Color
R - Red
G - Green
B - Black
Y - Yellow

Size 22 mm Actuators



M-PB-22-X Adapter			
Actuator	**Adapter**	**„A“**	**„B“**
P22-P2F-	M-PB-22-P	30.5	11.4
P22-P2E-	M-PB-22-P	30.5	16.5
P22-P2M-	M-PB-22-P	40.6	21.6
P22-L3M-	M-PB-22-K	36.8	25.4
P22-L4M-	M-PB-22-K	36.8	30.5
P22-T2T-	M-PB-22-T	30.5	23.5
P22-T3T-	M-PB-22-T	30.5	23.5
P22-T3K-	M-PB-22-T	30.5	25.4
P22-K3K-	M-PB-22-T	30.5	25.4

Spacer Requirements	
Valves	
HV-3, -4, MAV-2, -2P, -2R, -3R, -3, -3P	„S“ None
GV-2, -3 MAVO-2, -3 MJV-2, -3 MJVO-2, -3	3.2
MAV-4, -4D MJV-4, -4D	None
ES-1	
FV-3, -3P, -3D, -3DP FV-4, -4P, -4D, -4DP FV-5, -5P, -5D, -5DP	3.2

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 1.6 mm spacers are furnished with each adapter.

Flush Push Button

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

Manual Push “In”.
Spring Return.

Extended Push Button

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

Manual Push “In”.
Spring Return.

Automatic Push/Turn Mushroom

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

Manual push “In” Latches “In”. Turn clockwise to unlatch. Spring return.

Maintained Twist 90°

Part No.	Description
P22-T3T-B	Black

Turn clockwise to latch “In”. Turn counterclockwise to release.
Black only.

Spring Return Twist 45°

Part No.	Description
P22-T2T-B	Black

Turn clockwise andhold for “In”.
Release for spring return.
Black only.

Manual Push Mushroom

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

Manual Push “In”.
Spring Return.

Key Twist 90° Maintained

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

(P22-T3K-B) Turn key clockwise to latch “In”. Turn key counterclockwise to release. Key withdrawable in both positions. Black only.

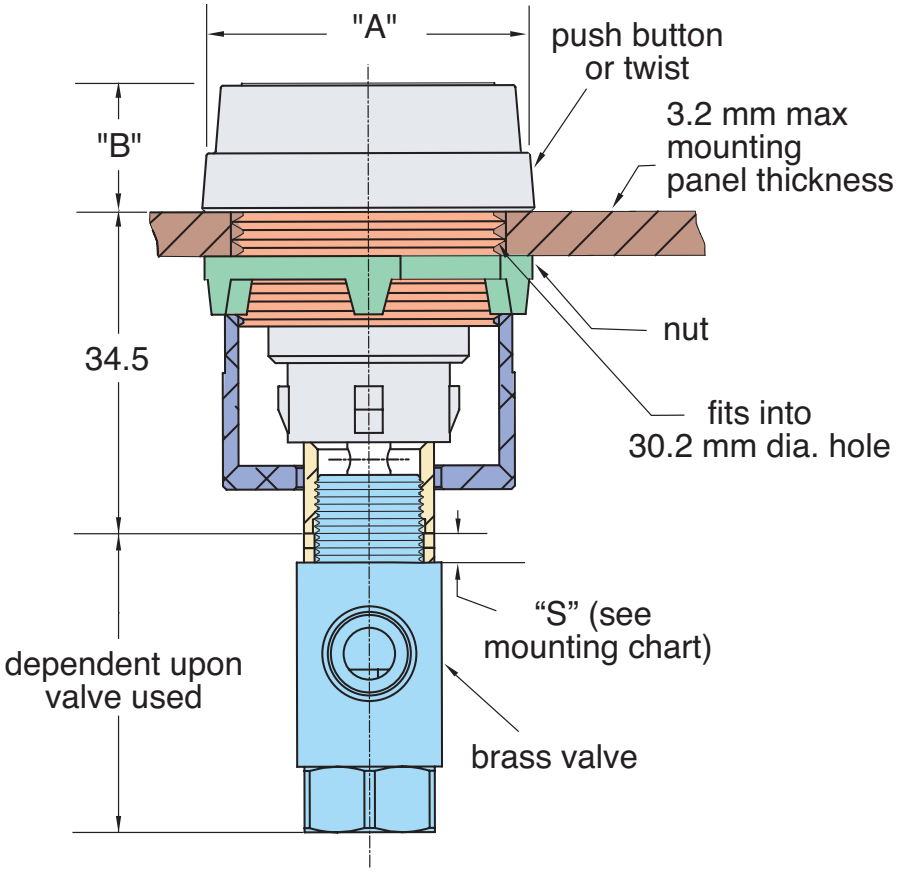
Push Key Mushroom

Part No.	Description
P22-L4M-R	Red

Manual push “In”. Automatic latches “In”. Turn key clock-wise to release. Spring return. Key withdrawable “Out” position only. Red only.

RoHS

Size 30 mm Actuators



Part No.	Description
M-PB-30	Aluminium Adapter

M-PB-30 Aluminium Adapter		
Actuator	**„A“**	**„B“**
PL-P2F-	36.6	14.7
PL-P2E-	36.6	22.4
PL-P2M-	39.6	26.7
PL-L3M-	39.6	26.7
PL-P4K-	36.6	35.6
PL-L4M-	40.1	33.0
PL-T2T-	36.6	27.2
PL-T3T-	36.6	27.2
PL-T3K-	36.6	30.5
PL-K3K-	36.6	30.5

Automatic Push/Turn Mushroom

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

Manual push “In”.
Latches “In”.
Turn clockwise to unlatch.
Spring return.

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 1.6 mm spacers are furnished with each adapter.

Manual Push Mushroom

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

Manual Push “In”.
Spring Return.

Spring Return Twist 45°

Part No.	Description
PL-T2T-B	Black

Turn clockwise andhold for “In”.
Release for spring return.
Black only.

Push Key Push Button

Part No.	Description
PL-P4K-B	Black

Manual push “In”.
Spring return. Turn key counter-clockwise to lock “Out”; clockwise to unlock. Key withdrawable locked or unlocked.

Maintained Twist 90°

Part No.	Description
PL-T3T-B	Black

Turn clockwise to latch “In”. Turn counterclockwise to release.
Black only.

Flush Push Button

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

Manual Push “In”.
Spring Return.

Extended Push Button

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

Manual Push “In”.
Spring Return.

Key Twist 90° Maintained

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

(PL-T3K-B) Turn key clockwise to latch “In”. Turn key counter-clockwise 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.

Push Key Mushroom

Part No.	Description
PL-L4M-R	Red

Manual push “In”. Automatic latches “In”. Turn key clock-wise to release. Spring return. Key withdrawable “Out” position only. Red only.

M-MAR Series Miniature Pressure Regulators

When Clippard introduced a miniature regulator in 1962, the M-MAR-1 became very popular as a simple, robust, and cost-effective regulator in a small package with exceptionally long life. As regulator applications continue to increase, Clippard is meeting the demand with a variety of new models, options and improvements. 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

Input Pressure:
21 bar

Air Flow:
85 L/min @ 3.5 bar; 140 L/min @ 7 bar

Materials:
Brass body, Nitrile seals, stainless steel stem and spring

Mounting:
M 12 x 0.75 thread. Nut and lockwashers furnished.

Adjustment:
By means of a knob with micro-adjustment (40 pitch thread). Screwdriver slot and plastic adjustment versions also available.

1C and 1CP Models: 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. 5.5 mm plunger travel.

RoHS

Cartridge and manifold mount styles also available. Consult factory.

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

New Mounting Configurations

NEW Cartridge Mount Option

NEW M5 Manifold Mount Style

NEW R1/8 Mounted Option with Swivel Output

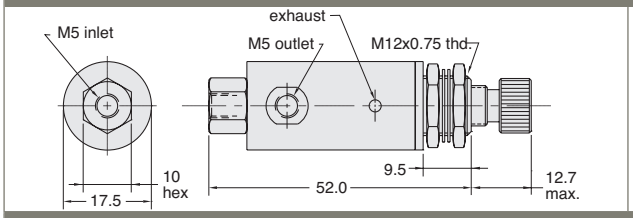
Adjustment Options

Standard Knurled Knob

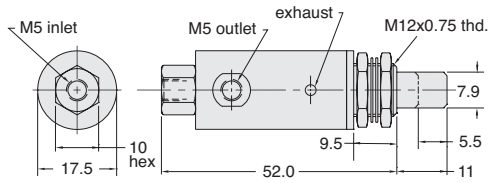
NEW Screwdriver Slot

Large Plastic Knob

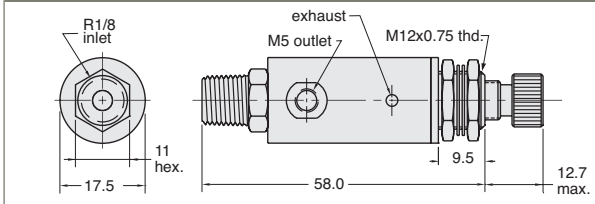
M-MAR-1



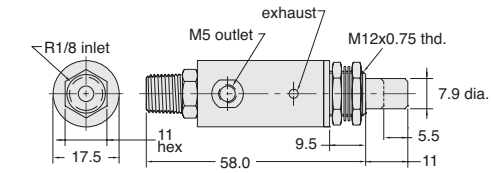
M-MAR-1C



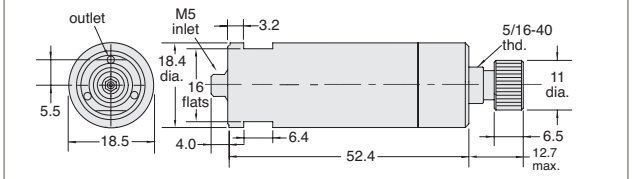
M-MAR-1P



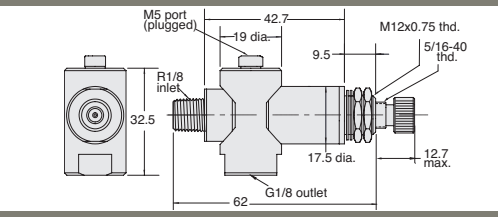
M-MAR-1CP



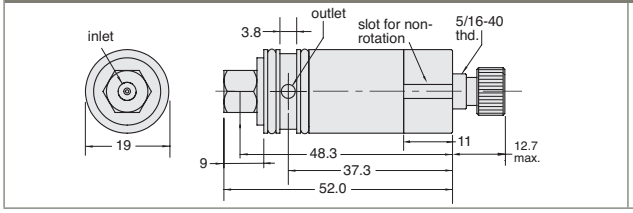
M-MAR-1M



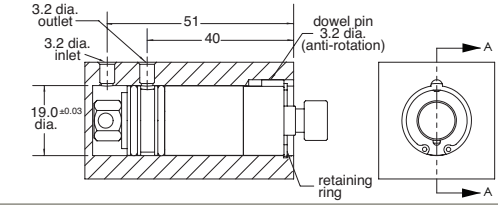
M-MAR-1BP



M-MAR-1R



Cartridge Bore Dimensions



Order Information

Inlet	Outlet	Base Part No.
M5 Female	M5 Female	M-MAR-1
R1/8 Male	M5 Female	M-MAR-1P
M5 Male	Manifold	M-MAR-1M
M5 Female	M5 Female	M-MAR-1C
R1/8 Male	M5 Female	M-MAR-1CP
Cartridge	Cartridge	M-MAR-1R
R1/8 Male	G1/8 Female	M-MAR-1BP

FKM Seals and Electroless Nickel Plating also available
Example Part No.: M-MAR-1BPF-5

Options

Knob

(blank) Knurled Knob
K Plastic Knob
F Screwdriver Slot

Type

(blank) Relieving
NR Non-Relieving

Max. Pressure Range

(blank) 0.7 - 6.9 bar
-2 0.7 - 1.4 bar
-3 0.7 - 2.1 bar
-4 0.7 - 2.8 bar
-5 0.7 - 3.4 bar
-6 0.7 - 4.1 bar
-7 0.7 - 4.8 bar

Expanded Check Valves

Four varieties of check valves are offered by Clippard. Each permits flow in one direction only. All have brightdipped brass bodies that provide inline mounting, Nitrile seals and stainless steel springs as standard. The M-MCV-2 has M5 ports and a "duckbill" seal. The MCV-1 series has M5 ports and a brass poppet.
The M-MJCV-1 series has G1/8 ports and a Zytel 80G33 poppet.

Medium:
Air or Hydraulic

Input Pressure:
21 bar max.
(MJCV Series: 70 bar hydraulic max.)

Pressure To Open:
Cracks at approx.: 35 mbar

Materials:
Brass body, Nitrile seals, stainless steel stem and spring

Mounting:
Direct or in-line

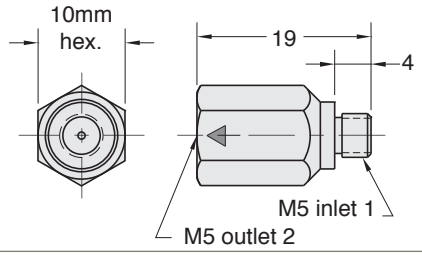
Flow Direction:
Arrow on valve
body indicates direction of flow.

Temperature Range:
0 to 110°C

Note:
Not intended for pressure relief

RoHS

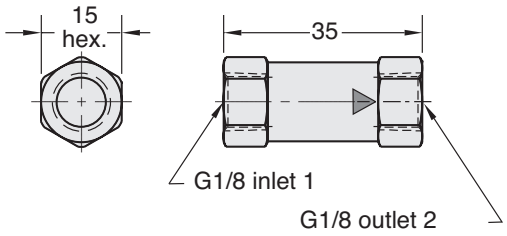
M5 Ports



Part No.
M-MCV-1

Air Flow:
185 L/min @ 3.5 bar;
325 L/min @ 7 bar

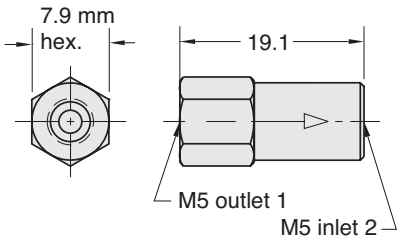
G 1/8 Ports



Part No.
M-MJCV-1

Air Flow:
565 L/min @ 3.5 bar;
1000 L/min @ 7 bar

„Duckbill“ seal, M5 Ports



Part No.
M-MCV-2

Medium:
Air

Input Pressure:
7 bar max.

Air Flow:
28 L/min @ 3.5 bar

Pressure to Crack:
70 mbar

Pressure to Fully Open:
170 mbar

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!

- 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

Medium:
Air, Water or Oil

Pressure Range:
Up to 21 bar

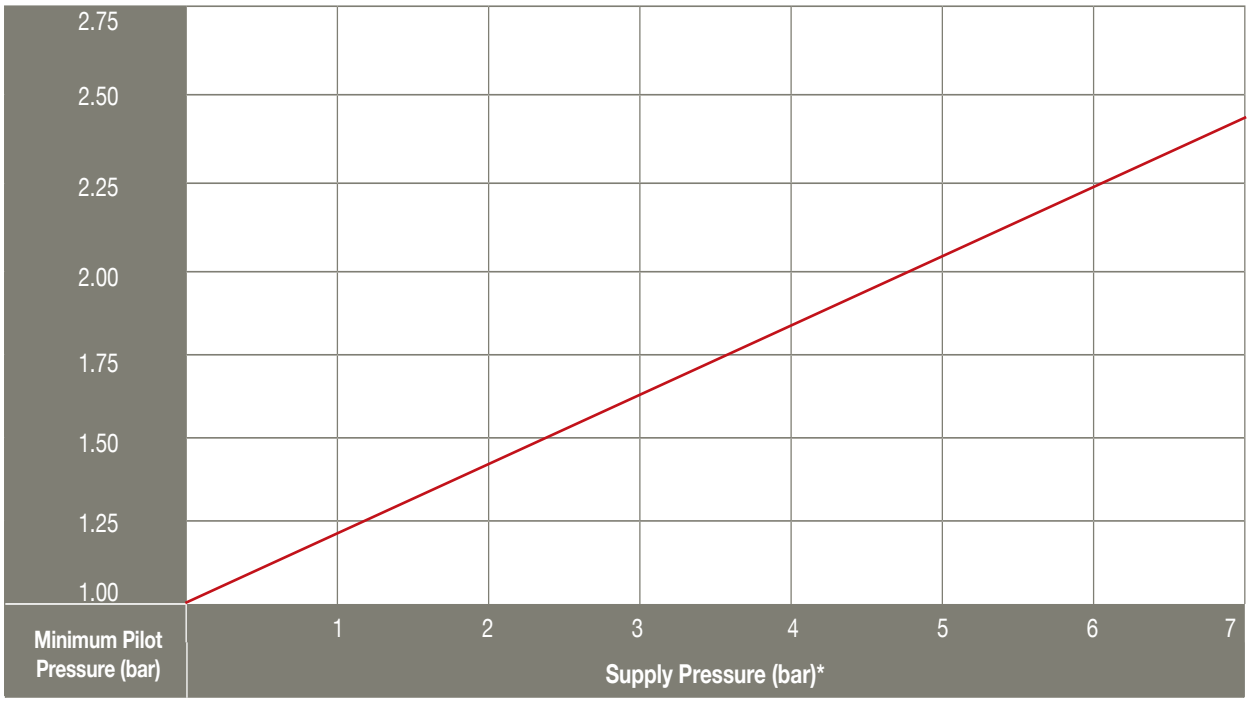
Temperature Range:
0 to 110°C

Materials:
ENP brass, anodized aluminium, stainless steel, Nitrile seals

RoHS

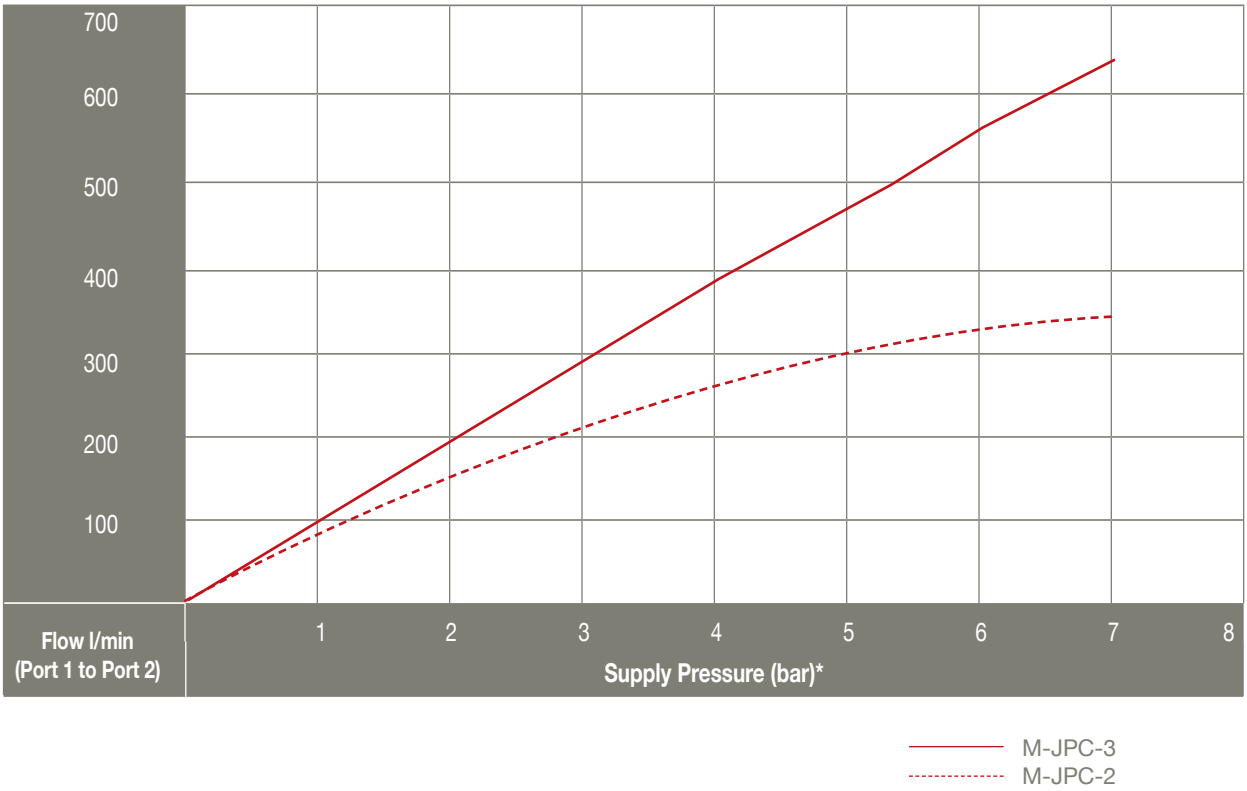
For specialty options such as various seal materials, manual override, or specific pilot to supply ratios, please consult factory.

Minimum Pilot-to-Supply Pressure

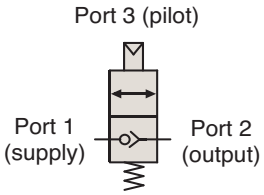


* For Pilot-to-Supply pressure above 7 bar, please contact the factory

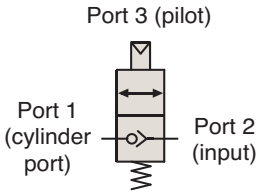
Flow-to-Supply Pressure



High Flow
2/2 Valve

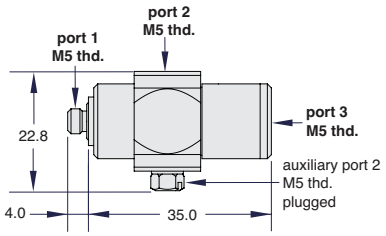


Pilot-Operated
Check Valve



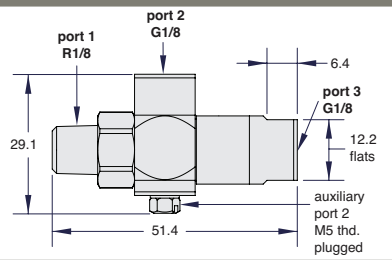
Pilot-Operated Check Valves

M5 Ports



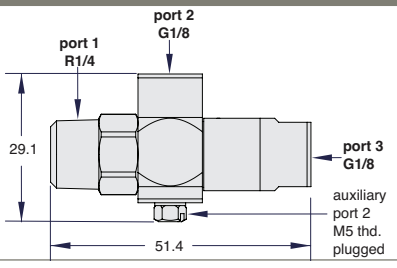
Part No.
M-JPC-2NLN

R 1/8 Inlet Port



Part No.
M-JPC-3FPF*

R 1/4 Inlet Port



Part No.
M-JPC-3FQF*

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

Needle Valves

Adjustable control needle valves restrict flow in both directions. There are four models offered by Clippard, all with M5 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.

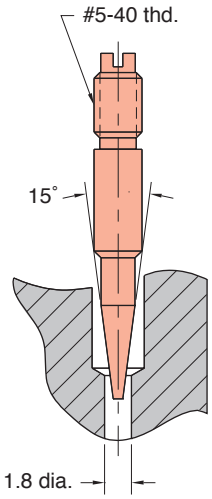
Medium:
Air, Water or Oil

Materials:
Brass body; stainless steel needle; Nitrile seal

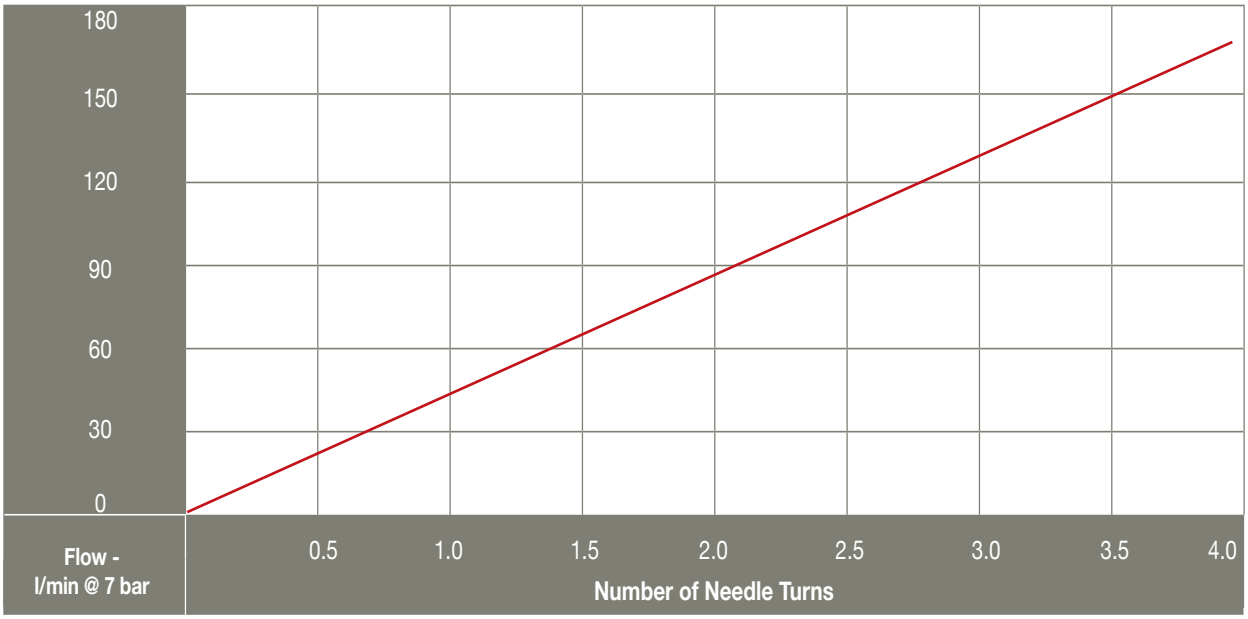
Mounting:
Direct

Adjustment:
Knurled knob (clockwise adjustment provides less flow), or Screwdriver slot (clockwise adjustment provides less flow.

RoHS

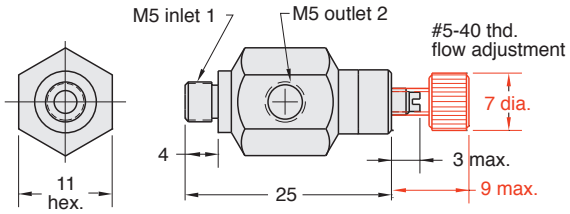


M-MNV-1



Needle Valves

15° Needle Valves, M5

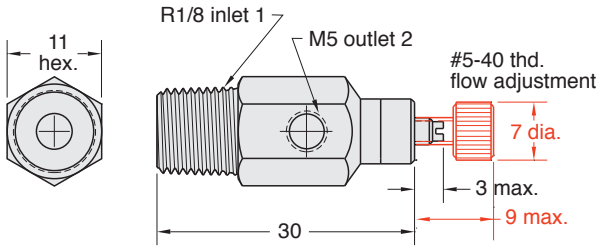


Part No.	Description
M-MNV-1	Needle Valve, M5, Screwdriver Slot
M-MNV-1K	Needle Valve, M5, Knurled Knob

Input Pressure:
140 bar max.

Air Flow:
85 L/min @ 3.5 bar
170 L/min @ 7 bar

15° Needle Valves, R1/8



Part No.	Description
M-MNV-1P	Needle Valve, R1/8, Screwdriver Slot
M-MNV-1KP	Needle Valve, R1/8, Knurled Knob

Input Pressure:
140 bar max.

Air Flow:
85 L/min @ 3.5 bar
170 L/min @ 7 bar

Needle Valves

Needle Valves are used to control the rate of flow in a pneumatic system by controling flow in both directions. Material enters the input port, travels through an adjustable orifice and out the output port. Available with multiple port sizes, flow rates, mounting options and adjustment styles.

Medium:
Air, Water or Oil

Input Pressure:
21 bar max.

Air Flow:
GNV-3: 310 L/min @ 7 bar
GNV-4: 1275 L/min @ 7 bar
GNV-5: 1700 L/min @ 7 bar

Materials:
Electroless nickel plated brass body and needle, anodized aluminium housing

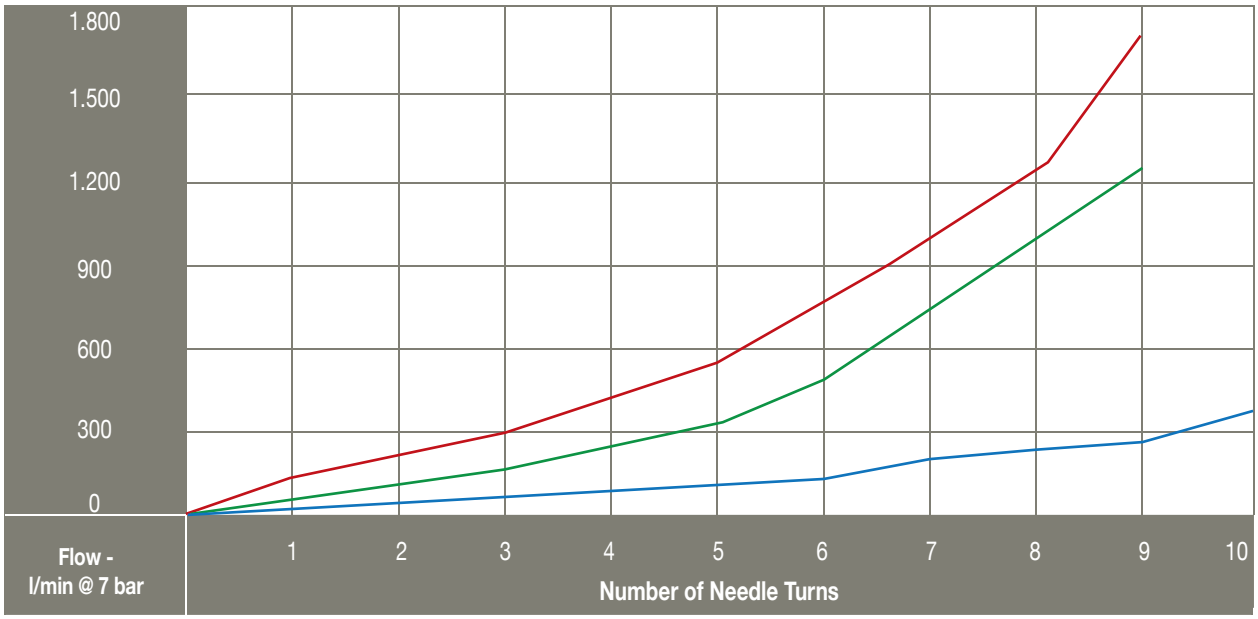
Mounting:
In-line

Ports:
Rotating input allows 360° positioning

Adjustment:
Recessed slotted needle or knurled knob

Seals:
Nitrile standard. FKM optional.

RoHS

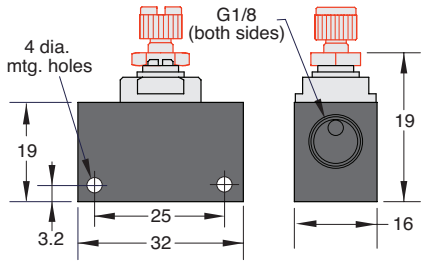


- Provide bidirectional flow control
- Rugged and compact design
- Multiple mounting options
- 360° rotating ports
- Ideal for use with Push-Quick fittings

M-GNV-3
M-GNV-4
M-GNV-5

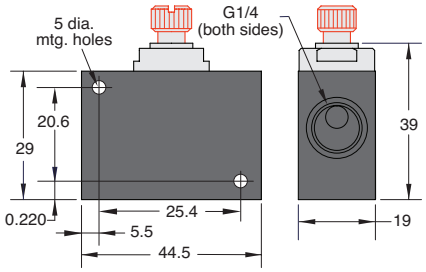
Needle Valves

In-Line Mount Needle Valves, G1/8



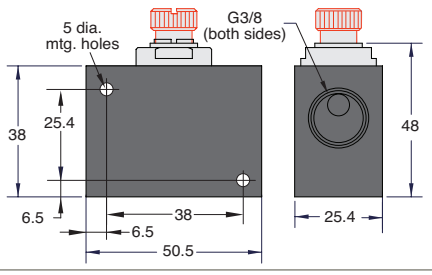
Part No.	Description
M-GNV-3RI	Needle Valve, G1/8, Screwdriver Slot
M-GNV-3KI	Needle Valve, G1/8, Knurled Knob

In-Line Mount Needle Valves, G1/4



Part No.	Description
M-GNV-4RI	Needle Valve, G1/4, Screwdriver Slot
M-GNV-4KI	Needle Valve, G1/4, Knurled Knob

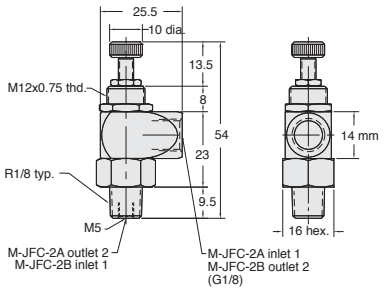
In-Line Mount Needle Valves, G3/8



Part No.	Description
M-GNV-5RI	Needle Valve, G3/8, Screwdriver Slot
M-GNV-5KI	Needle Valve, G3/8, Knurled Knob

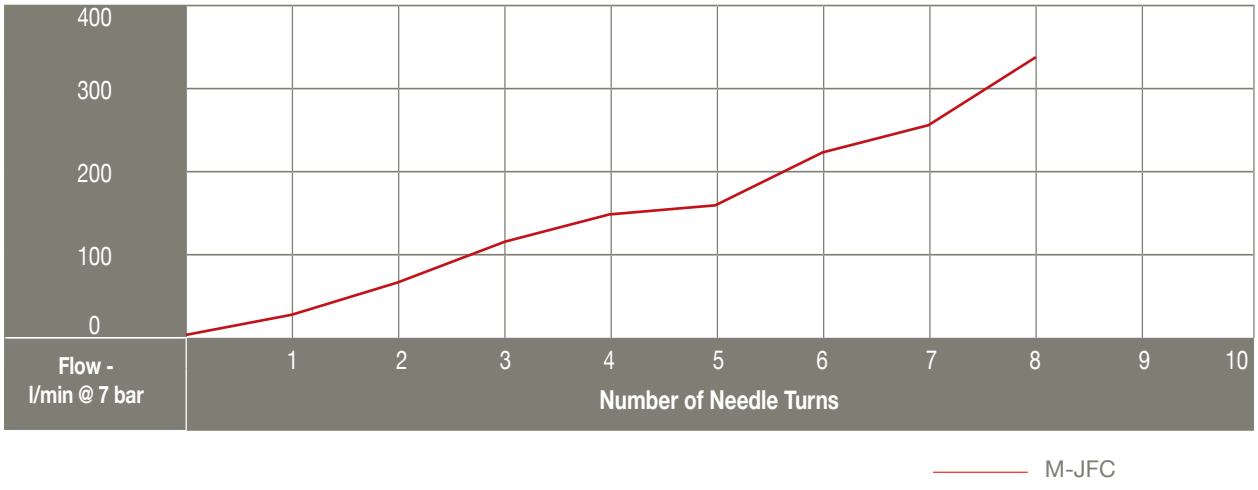
G1/8 Control Valves, Knurled Knob

310 L/min @ 10 bar adjustable



Part No.	Description
M-JFC-2A	Meter Out Control Valves, G1/8
M-JFC-2B	Meter In Control Valves, G1/8

RoHS



Shuttle Valves

These valves feature a shuttle that allows flow from one inlet to the outlet while blocking the other inlet.

Medium:
Air, Water or Oil

Input Pressure:
17.5 bar max.

Air Flow:
140 L/min @ 3.5 bar
270 L/min @ 7 bar

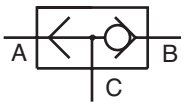
Mounting:
Direct or in-line

Operation:
Flow from “A” to “C” or “B” to “C”

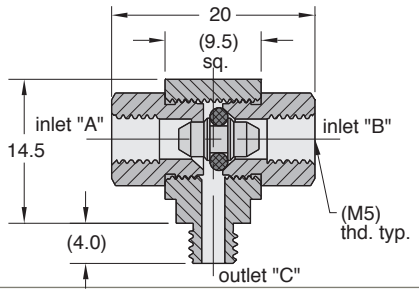
Pressure to Shift:
35 mbar approx.

Exhaust:
Through port where pressure was last applied

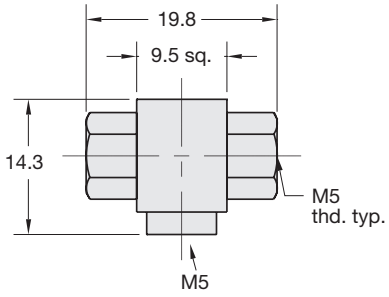
Note:
Shuttle valves should not be used as a pressure selector



RoHS

M5 Ports	
	

Part No.
M-MSV-1

M5 Female Ports	
	

Part No.
M-MSV-1FFF

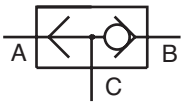
Poppet Type Shuttle Valves

Medium:
Air, Water or Oil

Input Pressure:
21 bar - air; 70 bar - hydraulic

Air Flow:
400 L/min @ 3.5 bar
630 L/min @ 7 bar

Mounting:
Direct or in-line

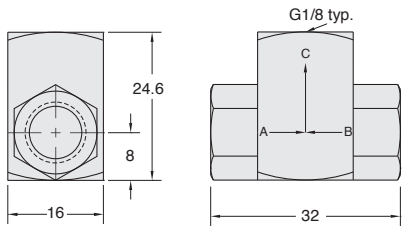


Operation:
Flow from “A” to “C” or “B” to “C”

Pressure to Shift:
35 mbar approx.

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

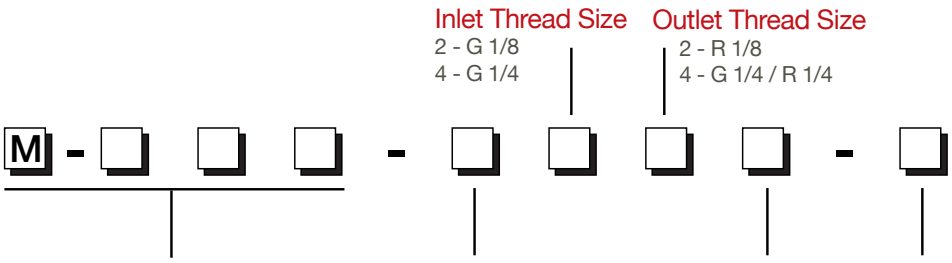
RoHS

G1/8 Poppet Type Valves	
 Brass body, Delrin Poppet, Nitrile seal	

Part No.	Description
M-MJSV-1	Poppet Shuttle Valve, G1/8

M-J-Series Exhaust Valves

Clippard's M-J-Series Exhaust Valve offers a variety of design features and provides fast response times and high flow with G1/4 ports. This compact poppet type valve is constructed of brass and is 100% tested to assure the highest quality. The M-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.



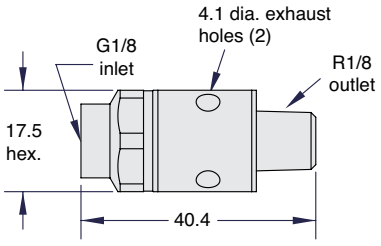
J-Series Exhaust Valve
JEV - Inlet-to-Outlet 90° Orientation

Inlet Thread Type
F - Female Thread

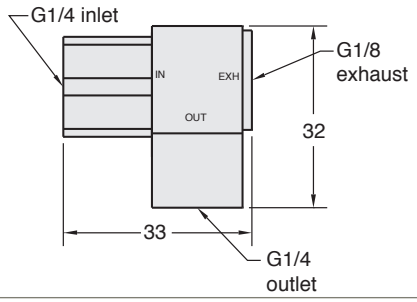
Outlet Thread Type
M - Male Thread
F - Female Thread

Exhaust
N - Unthreaded Exhaust

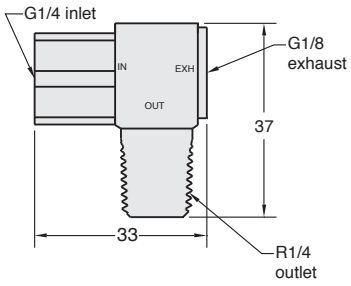
G1/8 Ports In-Line



Part No.
M-JLEV-F2M2-N

G1/4 Female Ports	
	

Part No.
M-JEV-F4F4

G1/4 Ports	
	

Part No.
M-JEV-F4M4

Features

- Enables use of smaller control valves
- 1 to 10 bar maximum
- Male outlet offers direct connection to cylinder
- 1000 L @ 3.5 bar and 1650 L/min @ 7 bar
- Low shift ratio
- 7 standard configurations
- Custom configurations also available
- Brass construction with molded Nitrile seal

RoHS

Miniature Pulse Valves

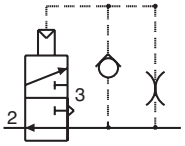
A Normally-Open 3/2 valve that closes shortly after being pressurized and remains closed until supply pressure is exhausted and repressurized. Widely used in control circuits.

Medium:
Air

Input Pressure:
2.7 to 10 bar max.

Mounting:
R1/8 thread; nut furnished

Volume Chamber:
M5

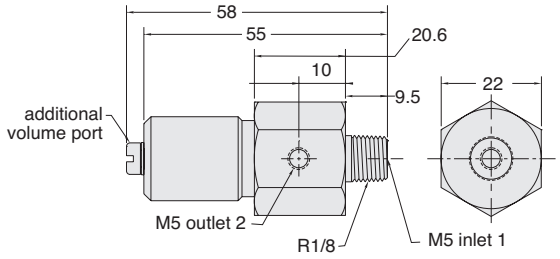


Operation:
Converts a continuous supply of inlet air into a pulse of approximately 100 milliseconds

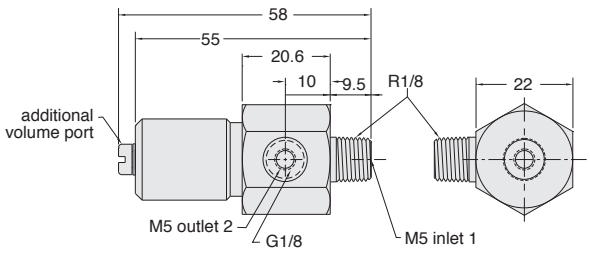
Response:
300 cycles per minute; time delay may be increased by adding standard Clippard volume chambers not to exceed 50 cm^3

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

M5 Ports



1/8 Ports



Part No.	Description
M-PV-1	Pulse Valve, M5
M-PV-1P	Pulse Valve G1/8

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. 5 cc) thus preventing overflow or dribbles. Ideal for use in quenching or water spray applications.

Medium:
Water or Other Light Liquids

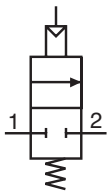
Input Pressure:
7 bar max.

Pilot Pressure:
1.8 bar min.

Flow:
1.2 L. H_2O per min. @ 5.5 bar

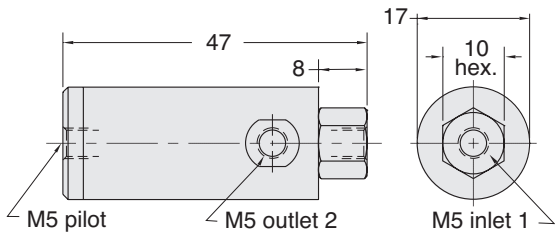
Drawback:
1.2 ml

Mounting:
In-line

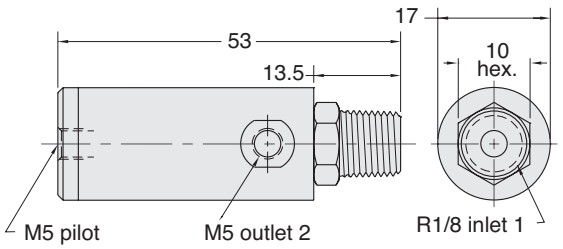


RoHS

M5 Ports



R 1/8 Inlet & M5 Outlet Ports



Part No.	Description
M-WDV-2	Poppet Valve with Air Pilot, M5
M-WDV-2P	Poppet Valve with Air Pilot, R1/8

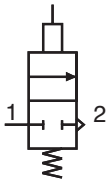
2/2 N-C Whisker Valve

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:
10 bar

Air Flow:
28 L/min @ 3.5 bar; 42 L/min @ 7 bar



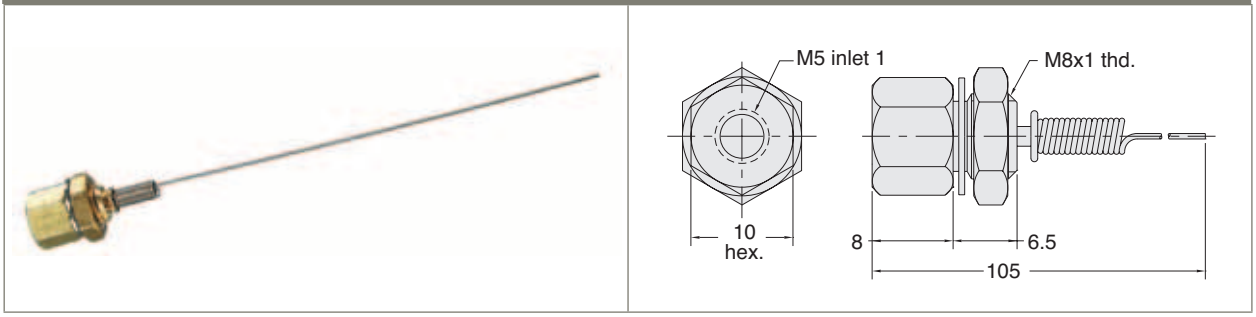
Force For Full Stem Travel:
7 gr. approx.

Mounting:
M8x1 male thread. Nut and lock washers furnished

Bleed:
To atmosphere around whisker stem

Whisker:
Stainless steel, approx. 75 mm length.
Replacement Part No. 12375

M5 Port



Part No.	Description
M-MWV-1	Normally-Closed Whisker Valve

3/2 Normally-Closed Amplifier Valves

3/2 Valve Normally-Closed Interface amplifies very low pressure air-jet sensing signals to working power levels

Medium:
Air

Material:
Anodized aluminum body, Nitrile diaphragms

Input Pressure:
2 to 7 bar

Air Flow:
625 L/min @ 7 bar

Pilot Pressure:
4" H_2O (10 mbar) @ 7 bar

Maximum Allowable Pilot Pressure:
35 mbar

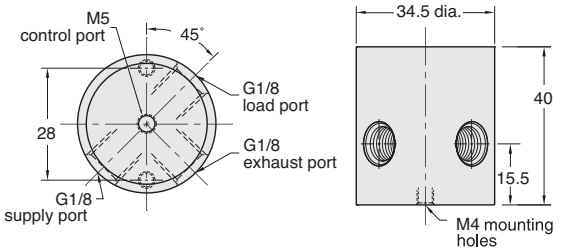
Response Time:
10 milliseconds dead headed

Operating Speed:
50 Hz

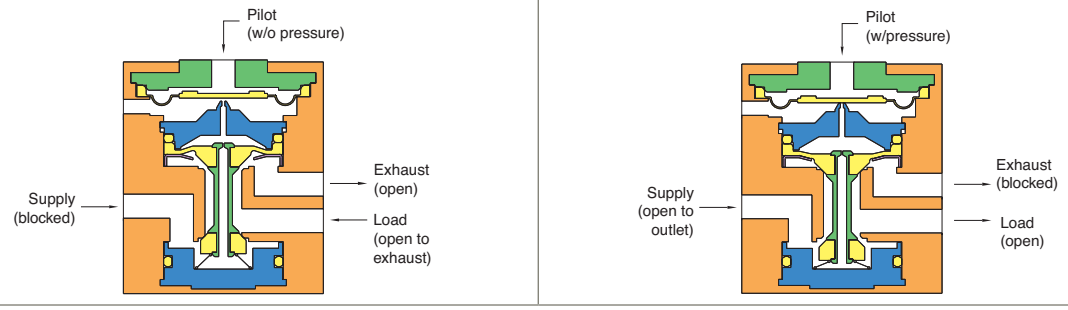
Bleed:
3 L/min @ 7 bar

Ports:
Load - G1/8 female
Supply - G1/8 female
Exhaust - G1/8 female
Control - M5 female

Top View **Side View**



Valve Closed **Valve Open**



Part No.	Description
M-2010	Normally-Closed Interface, G1/8

3/2 N.O. or N.C. Air-Piloted Valves

Medium:
Air

Material:
Anodized aluminum body, Nitrile diaphragms

Input Pressure:
0.7 to 7 bar

Air Flow:
625 L/min @ 7 bar

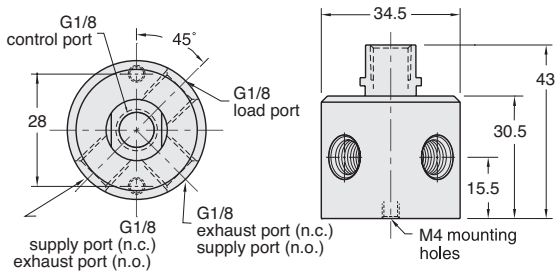
Minimum Pilot Pressure:
N.O. - 90% of supply pressure
N.C. - 60% of supply pressure

Response Time:
15 milliseconds after pilot pressure reaches switch point

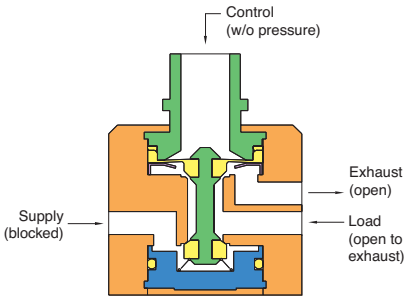
Operating Speed:
1.100 CMP

RoHS

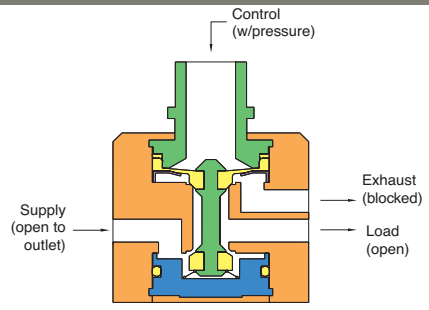
Top View **Side View**



Valve Closed



Valve Open

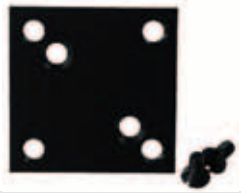


Part No.	Description
M-2012	Pilot Valve, G1/8
M-2012-VAC	Valve for Vacuum Operation (requires positives pressure pilot signal)
M-2012-G	Valve for Liquid Adhesives (silicon diaphragm and seals), G1/8

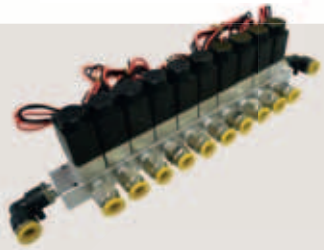
Flat Bracket

Flat mounting bracket available. See page 61.

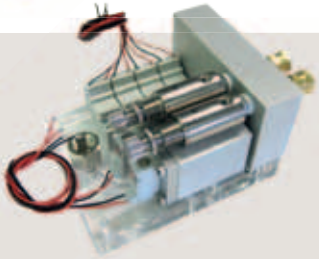
Part No.	Description
M-2010-050	Flat Bracket



Sub-Assembly Manifold for Medical Applications
In order to blend the proper amount of gases to obtain a desire level of anesthesia, these units utilize the capabilities of Clippard control and electronic valves series. These valves allow you to deliver an accurate and continuous supply of gases with a precise concentration to the patient at a safe pressure and flow.



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.



MAR Series Regulators
Special Configurations and Assemblies.

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

Assembly Services
Call Clippard for assistance with your application, assembly and testing.
Clippard can provide full tested sub-assemblies for your application or device.

Value-Added Service

Clippard 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.

For more information on the products, visit
www.clippard.com/cms/clippard-value-added-services.

Value-Added Solutions

Clippard's Electronic Valves
are incredibly flexible from a production standpoint.
• 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.

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.

Adding Value is our business
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.

Advantages:

- 100% tested sub-assemblies
- Less stock
- Fewer venders and purchase orders
- Requires less manufacturing time
- Increase production efficiency
- Overall cost reduction

We offer these turnkey solutions:

- Pneumatic Assemblies
- Special Manifold Design
- Manifold Assemblies
- Pneumatic Circuit Design
- Control Boxes
- Fitting and Tubing Harnesses
- Component Kitting
- Specialized Testing
- KanBan Services