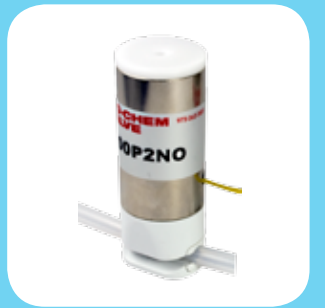








BIO-CHEM FLUIDICS

BIO-CHEM VALVE Solenoid Operated Pinch Valves



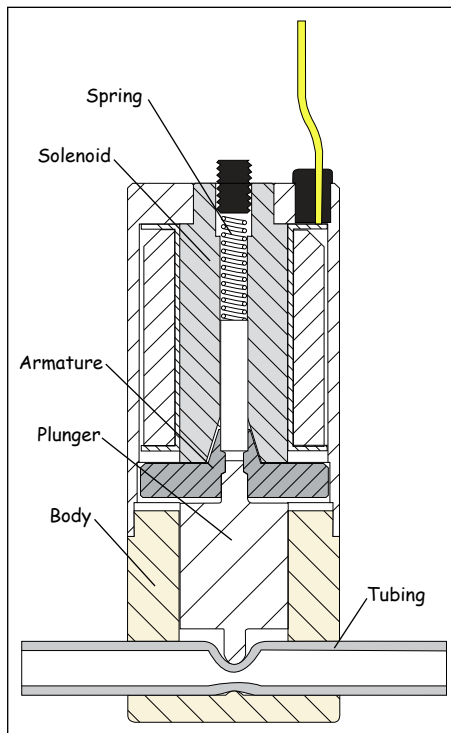
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PINCH VALVES GENERAL INFORMATION

What is a Pinch Valve?

The Bio-Chem Valve™ Pinch Valve is a solenoid-operated device. It is designed to open and close tubing to achieve controlled fluid flow.



Only the inside of the tubing contacts the fluid. Energizing the solenoid retracts the valve plunger. This either opens the tubing (in the normally closed configuration, as shown left) or closes the tubing (normally open configuration). De-energizing the solenoid allows a spring to push the plunger back to its original position. This returns the tubing to its original closed or open position. A 3-way valve has both a normally open and a normally closed flow path, which are operated simultaneously. The

tubing is held in place by the plunger and precisely sized grooves in the valve body.

Why choose a Pinch Valve?

There are many reasons to use Bio-Chem Valve™ Pinch Valves (refer to page 4 for more details) but pinch valves themselves have specific features that lend themselves to particular applications:

- **Unobstructed flow path.** Pinch valves create minimal pressure drop, which is important for controlling downstream instrumentation.
- **Tubing is soft yet durable.** Pinch valves are highly tolerant of particulates in the fluid stream.
- **Tubing is easy to change.** The user can change tubes if a sterile fluid path is required (for instance, blood collection) or when chemicals create clogs (for instance, system waste lines).
- **Zero dead volume.** Consecutive samples are not contaminated by the previous one.
- **Fluid contacts tubing only.** The materials of construction of the body and plunger do not have to be highly corrosion resistant, which means pinch valves are often very economical when compared to alternatives.
- **Simple.** Pinch valves do not require complicated electronic controls - they are either energized or not. Pinch valves do support the use of "Hit and Hold" circuits which significantly reduce the power required to hold the valve in its energized position (for more detail see the CoolCube™ on page 14).

Pinch Valve Selection Guide

Valves with Bio-Chem Valve™ silicone or C-Flex® tubing

1. Select the tubing material – either silicone, C-Flex® or tubeless. (See page 5 for additional information about these tubing material options.)
2. Choose your required tubing internal diameter or flow rate, then flow configuration - normally closed (NC), normally open (NO), 3-way or multi-tube
3. Turn to the pages indicated to see full details and ordering information for each valve.

Tubeless pinch valves

Bio-Chem Valve™ Pinch Valves can be supplied tubeless. These valves are manufactured identically to the silicone tubing version and are supplied without tubing. The designation for these valves is xx#, where xx is the size of tube that should be used.

Silicone tubing / Tubeless

Tubing designation	Internal diameter	Full flow* lpm	Flow configuration			
			2-way NC	2-way NO	3-way	2 or 3-way dual tube
10S/10#	0.010" / 0.3mm		075P2NC (pg. 6)	075P2NO (pg. 6)	075P3MP (pg. 6)	
23S/23#	0.023" / 0.6mm					
01S/01#	1/32" / 0.8mm					
50S/50#	0.050" / 1.3mm					
02S/02#	1/16" / 1.6mm					
01S/01#	1/32" / 0.8mm		100P2NC (pg. 9)	100P2NO (pg. 9)	100P3MP (pg. 10)	100PD (pg. 10)
02S/02#	1/16" / 1.6mm					
03S/03#	1/16" / 1.6mm					
05S/05#	1/8" / 3.2mm				100P3MP (pg. 10)	

C-Flex® tubing

Tubing designation	Internal diameter	Full flow* lpm	Flow configuration			
			2-way NC	2-way NO	3-way	2 or 3-way dual tube
23B	0.023" / 0.6mm		075P2NC (pg. 6)	075P2NO (pg. 6)	075P3MP (pg. 6)	
01B	1/32" / 0.8mm					
02B	1/16" / 1.6mm					
01B	1/32" / 0.8mm		100P2NC (pg. 9)	100P2NO (pg. 9)	100P3MP (pg. 10)	100PD (pg. 10)
02B	1/16" / 1.6mm					
03B	1/16" / 1.6mm					
05B	1/8" / 3.2mm				100P3MP (pg. 10)	
01B	1/32" / 0.8mm Multi-tube			108P (pg. 13)		

* flow through open tube at maximum rated pressure

Valves for customer-specific tubing

If the customer intends to use the pinch valves with tubing other than Bio-Chem Fluidics-supplied tubing, this can be easily accommodated. The customer should provide a sample of tubing to Bio-Chem Fluidics, who will select the appropriate valve size and adjust the stroke and force settings to match the tubing diameter and durometer.

Bio-Chem Fluidics will assign a special part number to this valve - contact your local office for more details.

Polymers referenced in this brochure:

ASA/PC = acrylonitrile styrene acrylate / polycarbonate
 PPS = polyphenylene sulfide
 POM = polyoxymethylene (Acetal resin)
 PEEK = polyetheretherketone

Features of Bio-Chem Valve™ Pinch Valves

Contoured Body

Bio-Chem Valve™ Pinch Valves incorporate a contoured body which is designed to meet the market demand for better looking and easier to use valves. The contoured body features a smooth profile and enhanced aesthetics with features that benefit not only instrument designers but also the system end-user.

Choice of de-energized state

Bio-Chem Valve™ Pinch Valves are supplied in the following standard configurations:

- 2-way normally closed
- 2-way normally open
- 3-way (where one tube, or set of tubes, is normally open and the other normally closed. When the valve is energized the operation is reversed so the normally open tube is closed and the normally closed tube is opened)

Dual tubing configurations (i.e. two tubes being operated simultaneously) are offered for smaller tubing sizes. Multi-tube pinch valves with 4, 6 or 8 tubes and normally open operation are also available.



2-way
Normally Closed



2-way
Normally Open



3-way

Choice of tubing materials

Bio-Chem Fluidics offers two high-purity medical grade tubing materials for pinch valves:

- Platinum cured silicone tubing
- C-Flex® tubing

Bio-Chem Valve™ Pinch Valves can also be configured to use customer supplied tubing, within a recommended durometer range of 45-60 Shore A.

Easy tube insertion

The tubing entry area of the valve body is contoured to guide the tubing into its seat.

Tubing securely seated

Molded grooves hold the tubing securely in the proper position. The gap between the valve plunger and the valve's anvil is slightly smaller than the tubing's outer diameter. The tubing is held in place during operation without need for mechanical locking features. Fluid flow and pressure drop are minimally affected, achieving approx. 95% of full flow given the nominal tubing inner diameter.



Valve body is contoured to aid tube insertion. Grooved insert clearly identifies the tubing size.

Long life cycles

Bio-Chem Valve™ Pinch Valves are designed to last for a minimum of 2 million open and close cycles*. Silicone tubing is rated for over 500,000 cycles and C-Flex tubing is rated for over 200,000 cycles.

Continuous duty

Bio-Chem Valve™ Pinch Valves can remain in the fully energized state indefinitely without damage to the valve or the tubing.

Low power consumption

The pinch valves' efficient construction permits the use of low wattage solenoid coils, ranging from 2.8 Watt for 075-series valves to 8.1 Watt for 100-series valves, which in turn minimizes heat generation. Both power usage and heat generation can be lowered further by stepping down the voltage after actuation by using a CoolCube™ "Hit and Hold" circuit (refer to page 14 for more details).

* As tested under accelerated laboratory conditions at nominal voltage, maximum rated pressure (air), 3Hz cycle rate and ambient temperature. Actual results may vary depending upon application parameters.

Tubing for Bio-Chem Valve™ Pinch Valves

Platinum-cured silicone tubing

1. Test Standards. Bio-Chem Valve™ silicone tubing is tested in accordance to the standards set by the United States Pharmacopoeia National Formulary XVII, 1990, Class VI Biological Test for Plastics. It is FDA Masterfile listed (MAF 819).
2. Durability. This tubing has been selected for use with pinch valves. Platinum curing performed on the tubing during the extrusion process imparts superior strength and durability. The tubing has a low compression set and resists sticking shut even after prolonged periods in the closed position. Excellent memory characteristics ensure full opening and unencumbered flow. The silicone tubing is rated for 500,000 pinch valve cycles.
3. Sterilization. The silicone tubing can be sterilized through steam autoclaving, boiling, dry heat, and gamma radiation.
4. Gas permeability. Silicone tubing has a poor gas permeability rating.

Bio-Chem Valve™ Pinch Valves with an “S” suffix have silicone tubing already installed. The tubing is also available in 50-foot (15-meter) coils. The coils can be ordered under the part numbers listed below:

Tubing Designation	Diameter		Pressure		Nominal Durometer*
	Inner	Outer	Minimum	Maximum	
10025-10S	0.010"/0.3mm	0.093"/2.4mm	28.2 inHg vac.	30 psi / 2.0 bar	50
10025-23S	0.023"/0.6mm	0.093"/2.4mm	28.2 inHg vac.	20 psi / 1.3 bar	60
10025-01S	1/32"/0.8mm	3/32"/2.4mm	28.2 inHg vac.	25 psi / 1.6 bar	60
10025-50S	0.05"/1.3mm	0.134"/3.4mm	28.2 inHg vac.	15 psi / 1.0 bar	60
10025-02S	1/16"/1.6mm	1/8"/3.2mm	28.2 inHg vac.	25 psi / 1.6 bar	50
10025-03S	1/16"/1.6mm	3/16"/4.8mm	28.2 inHg vac.	25 psi / 1.6 bar	50
10025-05S	1/8"/3.2mm	1/4"/6.4mm	28.2 inHg vac.	20 psi / 1.3 bar	50

* Shore A

C-Flex® tubing

1. Test Standards. The C-Flex® tubing used in Bio-Chem Valve™ pinch valves is tested in accordance to the standards set by the United States Pharmacopoeia National Formulary XVII, 1990, Class VI Biological Test for Plastics. It is FDA Masterfile listed.
2. Material. C-Flex® tubing is made from a thermoplastic elastomer based on styrene-ethylene-butylene. It does not contain leachable plasticizers.
3. Chemical compatibility. C-Flex® can be used with many acids and alkalis. It is not recommended for use with oils and organic solvents.
4. Durability. This tubing has been selected for use with pinch valves. The tubing has a low compression set and resists sticking shut even after prolonged periods in the closed position. Good memory characteristics ensure full opening and unencumbered flow. C-Flex® tubing is rated for 200,000 pinch valve cycles.
5. Sterilization. C-Flex® tubing can be sterilized through steam autoclaving, ethylene oxide (ETO), and gamma radiation.
6. Gas permeability. C-Flex® tubing has a fair gas permeability rating. It has lower gas permeability than silicone.

Bio-Chem Valve™ Pinch Valves with a “B” suffix have C-Flex® tubing already installed. The tubing is also available in 50-foot (15-meter) coils. The coils can be ordered under the part numbers listed below:

Tubing Designation	Diameter		Pressure		Nominal Durometer*
	Inner	Outer	Minimum	Maximum	
10025-23B	0.023"/0.6mm	0.093"/2.4mm	28.2 inHg vac.	20 psi / 1.3 bar	45
10025-01B	1/32"/0.8mm	3/32"/2.4mm	28.2 inHg vac.	25 psi / 1.6 bar	45
10025-02B	1/16"/1.6mm	1/8"/3.2mm	28.2 inHg vac.	25 psi / 1.6 bar	45
10025-03B	1/16"/1.6mm	3/16"/4.8mm	28.2 inHg vac.	25 psi / 1.6 bar	50
10025-05B	1/8"/3.2mm	1/4"/6.4mm	28.2 inHg vac.	20 psi / 1.3 bar	50

* Shore A

075P SERIES PINCH VALVES

For use with soft-walled tubing with inner diameters from 0.010"/0.3mm to 1/16"/1.6mm

- Continuous duty solenoid operated valve. Can remain fully energized for indefinite time period
- Valve life above 2 million cycles
- Precise stroke and closing force setting to protect tubing and extend valve life
- Chemically resistant PPS plunger and ASAPC body materials
- 24" (610mm) lead wires
- Low power consumption (3.6 Watts or less) and minimal heat generation



075P2NC (2-way Normally Closed)



075P2NO (2-way Normally Open)



075P3 (3-way)

NOTE:

1. For 24 VDC, replace 075P2Nx12 with 075P2Nx24 (or for a 3-way valve replace 075P3MP12 with 075P3MP24) in any of the part numbers listed.

A. 2-way normally closed valves

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
12 VDC valves with silicone tubing, 12" (305mm) length of silicone tubing is installed in the valve ¹.					
075P2NC12-10S	0.010 / 0.3	0.093 / 2.4	28.2	30 / 2.0	2.9
075P2NC12-23S	0.023 / 0.6	0.093 / 2.4	28.2	20 / 1.3	2.9
075P2NC12-01S	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	2.9
075P2NC12-50S	0.050 / 1.3	0.134 / 3.4	28.2	15 / 1.0	3.6
075P2NC12-02S	1/16 / 1.6	1/8 / 3.2	28.2	15 / 1.0	2.9
12 VDC valves with C-Flex® tubing, 12" (305mm) length of C-Flex® tubing is installed in the valve.					
075P2NC12-23B	0.023 / 0.6	0.093 / 2.4	28.2	20 / 1.3	2.9
075P2NC12-01B	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	2.9
075P2NC12-02B	1/16 / 1.6	1/8 / 3.2	28.2	15 / 1.0	2.9

B. 2-way normally open valves

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
12 VDC valves with silicone tubing, 12" (305mm) length of silicone tubing is installed in the valve ¹.					
075P2NO12-10S	0.010 / 0.3	0.093 / 2.4	28.2	30 / 2.0	2.9
075P2NO12-23S	0.023 / 0.6	0.093 / 2.4	28.2	20 / 1.3	2.9
075P2NO12-01S	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	2.9
075P2NO12-50S	0.050 / 1.3	0.134 / 3.4	28.2	15 / 1.0	3.6
075P2NO12-02S	1/16 / 1.6	1/8 / 3.2	28.2	15 / 1.0	2.9
12 VDC valves with C-Flex® tubing, 12" (305mm) length of C-Flex® tubing is installed in the valve.					
075P2NO12-23B	0.023 / 0.6	0.093 / 2.4	28.2	20 / 1.3	2.9
075P2NO12-01B	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	2.9
075P2NO12-02B	1/16 / 1.6	1/8 / 3.2	28.2	15 / 1.0	2.9

075P SERIES PINCH VALVES continued

C. 3-way valves (one port normally open, other port normally closed)²

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
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12 VDC valves with silicone tubing, two 6" (152mm) lengths of silicone tubing joined by 'Y' connector installed in the valve.

075P3MP12-23S	0.023 / 0.6	0.093 / 2.4	28.2	20 / 1.3	3.6
075P3MP12-01S	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	3.6
075P3MP12-50S	0.050 / 1.3	0.134 / 3.4	28.2	15 / 1.0	3.6
075P3MP12-02S	1/16 / 1.6	1/8 / 3.2	28.2	15 / 1.0	3.6

12 VDC valves with C-Flex® tubing, two 6" (152mm) lengths of C-Flex® tubing joined by 'Y' connector installed in the valve.

075P3MP12-23B	0.023 / 0.6	0.093 / 2.4	28.2	20 / 1.3	3.6
075P3MP12-01B	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	2.9
075P3MP12-02B	1/16 / 1.6	1/8 / 3.2	28.2	15 / 1.0	2.9

NOTES:

- For tubeless version use "#" in place of "S"
- The operation of 3-way valves can be compromised by extended continuous operation. A "Hit and Hold" circuit is strongly recommended to reduce heat generation in extended use applications.

D. Available options, 075P series pinch valves

1. **"Quiet" operation (suffix = "Q").** The quiet option reduces the valve noise level from about 72 dB (A) to less than 50 dB (A). The quiet option is available for:

- 075P2NC 2-way normally closed valves
- 075P2NO 2-way normally open valves

The quiet option cannot be used on 075P3MP 3-way valves. The noise level of the 3-way valves is inherently attenuated by the tubing which dampens the motion in both directions.

2. **Mounting holes (suffix = "M").** Threaded holes situated on the bottom of the valve body. Refer to installation drawing (page 8) for details and dimensions.

The mounting holes cannot be used in combination with the manual override button.

3. **Manual override button (suffix = "K").** The manual override button releases the tubing either to facilitate easier tubing changes or in the event of electrical power loss. The manual override is available for:

- 075P2NC 2-way normally closed valves
- 075P3 3-way valves

4. **Position feedback sensor (suffix = "F").** The feedback sensor provides secondary, independent confirmation of the plunger position (more details on page 14). The feedback option is available for:

- 075P2NC 2-way normally closed valves
- 075P3 3-way valves

5. **Factory-installed mounting flange (suffix = "L").** The mounting flanges are available for all 075P pinch valve configurations. They will be installed at a 90° angle to the tubing with the orientation to the outside of the bulkhead.

This mounting flange can be purchased as a stand-alone item under part number MU-075 (more details on page 16).

E. "Hit and Hold" voltage reduction

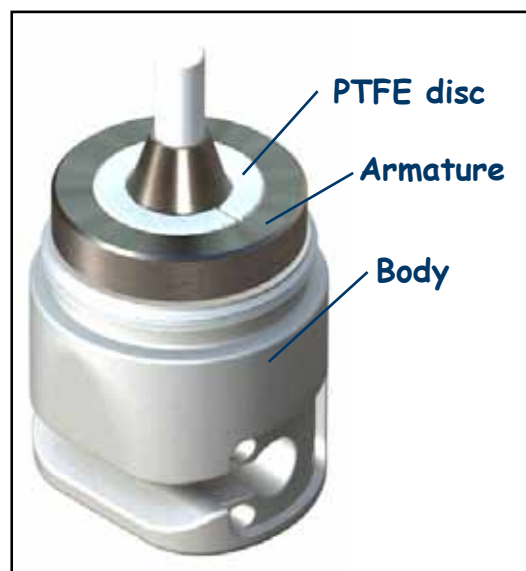
Within 100 ms of valve actuation, the voltage required to hold the valve in position can be reduced. The voltage step-down results in the dual benefits of power conservation and heat reduction. The amount of the voltage reduction possible is 66% (i.e. 24 Vdc to 8 Vdc or 12 Vdc to 4 Vdc) for all 075P pinch valves that do not incorporate the "quiet" feature. This results in a power usage reduction of 89%, resulting in a correspondingly large drop in heat generation.

For the 075P pinch valves with the "quiet" feature, voltage can be reduced by 50% (i.e. 24 Vdc to 12 Vdc and 12 Vdc to 6 Vdc) after 100 ms for a power usage drop of 75%.

This voltage reduction can be accomplished using the Bio-Chem Fluidics CoolCube™ hit-and-hold circuit (more details on page 14).

Option Highlight

Quiet Option



Features: Reduces the valve noise level from about 72 dB (A) to less than 50 dB (A).

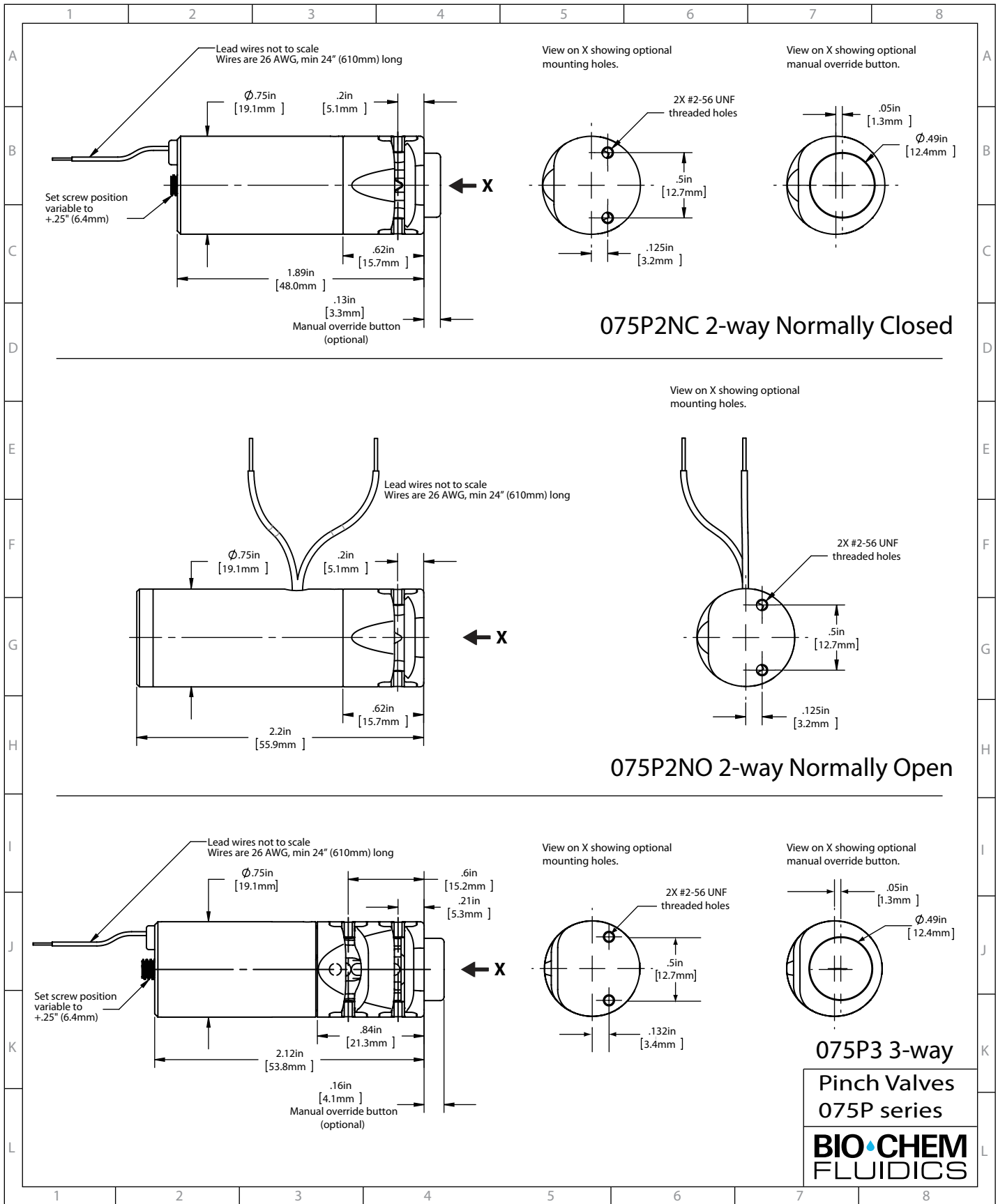
How it works: A PTFE disc is inserted between the internal components. The disc cushions the motion of the plunger, leading to a substantial reduction in noise.

Availability: 075P2NC, 075P2NO, 100P2NC and 100P2NO valves.

Ordering info: Add suffix "Q" to part number (refer to numbering convention on page 18 for more details).

075P SERIES PINCH VALVES continued

INSTALLATION DRAWINGS



075P3 3-way
Pinch Valves
075P series
BIO-CHEM
FLUIDICS

100P SERIES PINCH VALVES

For use with soft-walled tubing with inner diameters from 1/32"/0.8mm to 1/8"/3.2mm

- Continuous duty solenoid operated valve. Can remain fully energized for indefinite time period
- Valve life above 2 million cycles
- Precise stroke and closing force setting to protect tubing and extend valve life
- Chemically resistant PPS plunger and ASA/PC body materials (unless otherwise noted)
- 24" (610mm) lead wires
- Low power consumption (mostly 4.0 Watts) and minimal heat generation



100P2NC (2-way Normally Closed)



100P2NO (2-way Normally Open)



100P3 (3-way)

NOTE:

1. For 24 VDC, replace 100P2Nx12 with 100P2Nx24 (or for a 3-way valve replace 100P3MP12 with 100P3MP24) in any of the part numbers listed.

A. 2-way normally closed valves

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
12 VDC valves with silicone tubing, 12" (305mm) length of silicone tubing is installed in the valve ¹.					
100P2NC12-01S	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100P2NC12-02S	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0
100P2NC12-03S	1/16 / 1.6	3/16 / 4.8	28.2	25 / 1.6	4.0
100P2NC12-05S	1/8 / 3.2	1/4 / 6.4	28.2	20 / 1.3	4.0
12 VDC valves with C-Flex® tubing, 12" (305mm) length of C-Flex® tubing is installed in the valve.					
100P2NC12-01B	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100P2NC12-02B	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0
100P2NC12-03B	1/16 / 1.6	3/16 / 4.8	28.2	25 / 1.6	4.0
100P2NC12-05B	1/8 / 3.2	1/4 / 6.4	28.2	20 / 1.3	4.0

B. 2-way normally open valves

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
12 VDC valves with silicone tubing, 12" (305mm) length of silicone tubing is installed in the valve ¹.					
100P2NO12-01S	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100P2NO12-02S	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0
100P2NO12-03S	1/16 / 1.6	3/16 / 4.8	28.2	25 / 1.6	4.0
100P2NO12-05S	1/8 / 3.2	1/4 / 6.4	28.2	20 / 1.3	4.0
12 VDC valves with C-Flex® tubing, 12" (305mm) length of C-Flex® tubing is installed in the valve.					
100P2NO12-01B	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100P2NO12-02B	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0
100P2NO12-03B	1/16 / 1.6	3/16 / 4.8	28.2	25 / 1.6	4.0
100P2NO12-05B	1/8 / 3.2	1/4 / 6.4	28.2	20 / 1.3	4.0

C. 3-way valves (one port normally open, other port normally closed) ²

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
12 VDC valves with silicone tubing, two 6" (152mm) lengths of silicone tubing joined by 'Y' connector installed in the valve.					
100P3MP12-01S	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100P3MP12-02S	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0
100P3MP12-05S	1/8 / 3.2	1/4 / 6.4	28.2	20 / 1.3	8.1

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
12 VDC valves with silicone tubing, two 6" (152mm) lengths of C-Flex® tubing joined by 'Y' connector installed in the valve.					
100P3MP12-01B	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100P3MP12-02B	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0
100P3MP12-05B	1/8 / 3.2	1/4 / 6.4	28.2	20 / 1.3	8.1

D. Valves with dual tubing

For use with soft-walled tubing with inner diameters of 1/32" / 0.8mm and 1/16" / 1.6mm.

Features of standard 100PD series dual-tubing pinch valves are identical to those of single-tubing pinch valves except:

- The body and plunger material is POM
- There are two sets of tubing in every valve



100PD2NC (2-way Normally Closed, Dual tubing)

NOTE:

1. For 24 VDC, replace 100PD2Nx12 with 100PD2Nx24 (or for a 3-way valve replace 100PD3MP12 with 100PD3MP24) in any of the part numbers listed.

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
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PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
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2-way normally closed 12 VDC valves with silicone tubing, two 12" (305mm) lengths of silicone tubing are installed in the valve ¹.

100PD2NC12-01S	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100PD2NC12-02S	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0

2-way normally closed 12 VDC valves with C-Flex® tubing, two 12" (305mm) lengths of C-Flex® tubing are installed in the valve.

100PD2NC12-01B	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100PD2NC12-02B	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0

2-way normally open 12 VDC valves with silicone tubing, two 12" (305mm) lengths of silicone tubing are installed in the valve ¹.

100PD2NO12-01S	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100PD2NO12-02S	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0

2-way normally open 12 VDC valves with C-Flex® tubing, two 12" (305mm) lengths of C-Flex® tubing are installed in the valve.

100PD2NO12-01B	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100PD2NO12-02B	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0

3-way 12 VDC valves with silicone tubing, four 6" (152mm) lengths of silicone tubing joined by 'Y' connectors installed ¹.

100PD3MP12-01S	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100PD3MP12-02S	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0

3-way 12 VDC valves with C-Flex® tubing, four 6" (152mm) lengths of C-Flex® tubing joined by 'Y' connectors installed.

100PD3MP12-01B	1/32 / 0.8	3/32 / 2.4	28.2	25 / 1.6	4.0
100PD3MP12-02B	1/16 / 1.6	1/8 / 3.2	28.2	25 / 1.6	4.0

NOTES:

1. For tubeless version use "#" in place of "S"

2. The operation of 3-way valves can be compromised by extended continuous operation. A "Hit and Hold" circuit is strongly recommended to reduce heat generation in extended use applications.

E. Available options, 100P series pinch valves

1. **“Quiet” operation (suffix = “Q”).** The quiet option reduces the valve noise level from about 72 dB (A) to less than 50 dB (A). The quiet option is available for:

- a. 100P2NC 2-way normally closed valves
- b. 100P2NO 2-way normally open valves

The “quiet” option cannot be used on 100P3 3-way valves. The noise level of the 3-way valves is inherently attenuated by tubing dampening the motion in both directions.

2. **Mounting holes (suffix = “M”).** Threaded holes situated on the bottom of the valve body. Refer to installation drawing (page 12) for dimensions.

The mounting holes cannot be used in combination with the manual override button.

3. **Manual override button (suffix = “K”).** The manual override button releases the tubing either to facilitate easier tubing changes or in the event of electrical power loss. The manual override is available for:

- a. 100P2NC 2-way normally closed valves
- b. 100P3 3-way valves

4. **Position feedback sensor (suffix = “F”).** The feedback sensor provides secondary, independent confirmation of the plunger position (more details on page 14). The feedback option is available for:

- a. 100P2NC 2-way normally closed valves
- b. 100P3 3-way valves
- c. 100PD dual tubing valves

5. **Factory-installed mounting flange (suffix = “L”).** The mounting flanges are available for all 100P pinch valve configurations. They will be installed at a 90° angle to the tubing with the orientation to the outside of the bulkhead.

This mounting flange can be purchased as a stand-alone item under part number MU-100 (more details on page 16).

E. “Hit and Hold” voltage reduction

Within 100 ms of valve actuation, the voltage required to hold the valve in position can be reduced. The voltage step-down results in the dual benefits of power conservation and heat reduction. The amount of the voltage reduction possible is 66% (i.e. 24 Vdc to 8 Vdc or 12 Vdc to 4 Vdc) for all 100P pinch valves that do not incorporate the “quiet” feature. This results in a power usage reduction of 89%, resulting in a correspondingly large drop in heat generation.

For the 100P pinch valves with the “quiet” feature, voltage can be reduced by 50% (i.e. 24 Vdc to 12 Vdc and 12 Vdc to 6 Vdc) after 100 ms for a power usage drop of 75%.

This voltage reduction can be accomplished using the Bio-Chem Fluidics CoolCube™ hit-and-hold circuit (more details on page 14).

Option Highlight

Manual override button



Features: A manual button that releases the tubing either to facilitate easier tubing changes or in the event of electrical power loss.

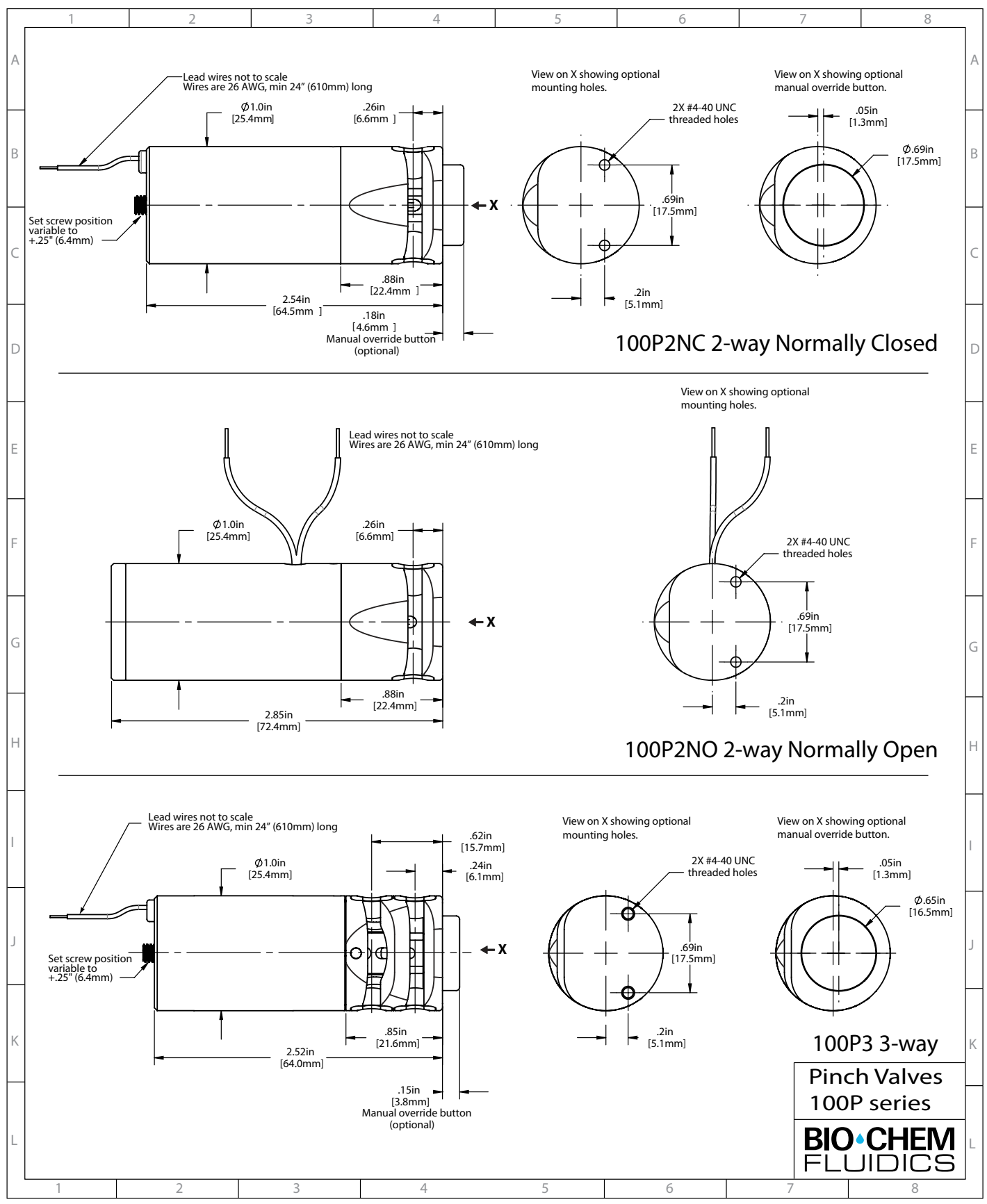
How it works: The button attaches to the plunger through the valve body. Pressing the button pushes the plunger into the energized state, thereby releasing the tubing.

Availability: 075P2NC, 100P2NC, 075P3 and 100P3 valves.

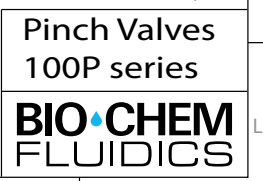
Ordering info: Add suffix “K” to part number (refer to numbering convention on page 18 for more details).

100P SERIES PINCH VALVES continued

INSTALLATION DRAWINGS



Installation drawings for 100PD series are available on request.



108P SERIES MULTI-TUBING PINCH VALVES

For use with soft-walled tubing with inner diameter of 1/32"/0.8mm. Simultaneous operation of 4, 6 or 8 tubes.

- Continuous duty solenoid operated valve. Can remain fully energized for indefinite time period
- Valve life above 2 million cycles
- Precise stroke and closing force setting to protect tubing and extend valve life
- Chemically resistant PEEK plunger and POM body materials
- 15-inch (38cm) lead wires
- Low power consumption (3.5 Watts) and minimal heat generation
- Integrated flange with mounting holes
- Stainless steel push bar
- C-Flex® tubing (silicone tubing is not available for this pinch valve series)

NOTE:

1. For 24 VDC, replace 108PxNO12 with 108PxNO24 in any of the part numbers listed.



108P8NO (8-tube Normally Open)

4, 6 & 8 - tube normally open valves with C-Flex® tubing

PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
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4 tube, 12 VDC valves with C-Flex® tubing, each length of tubing is 12" (305mm) long.

108P4NO12-01B	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	3.5
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PART NO.	INNER DIAMETER inch/mm	OUTER DIAMETER inch/mm	MIN PRESSURE inHg vac.	MAX PRESSURE psi/bar	POWER AT 21°C Watts
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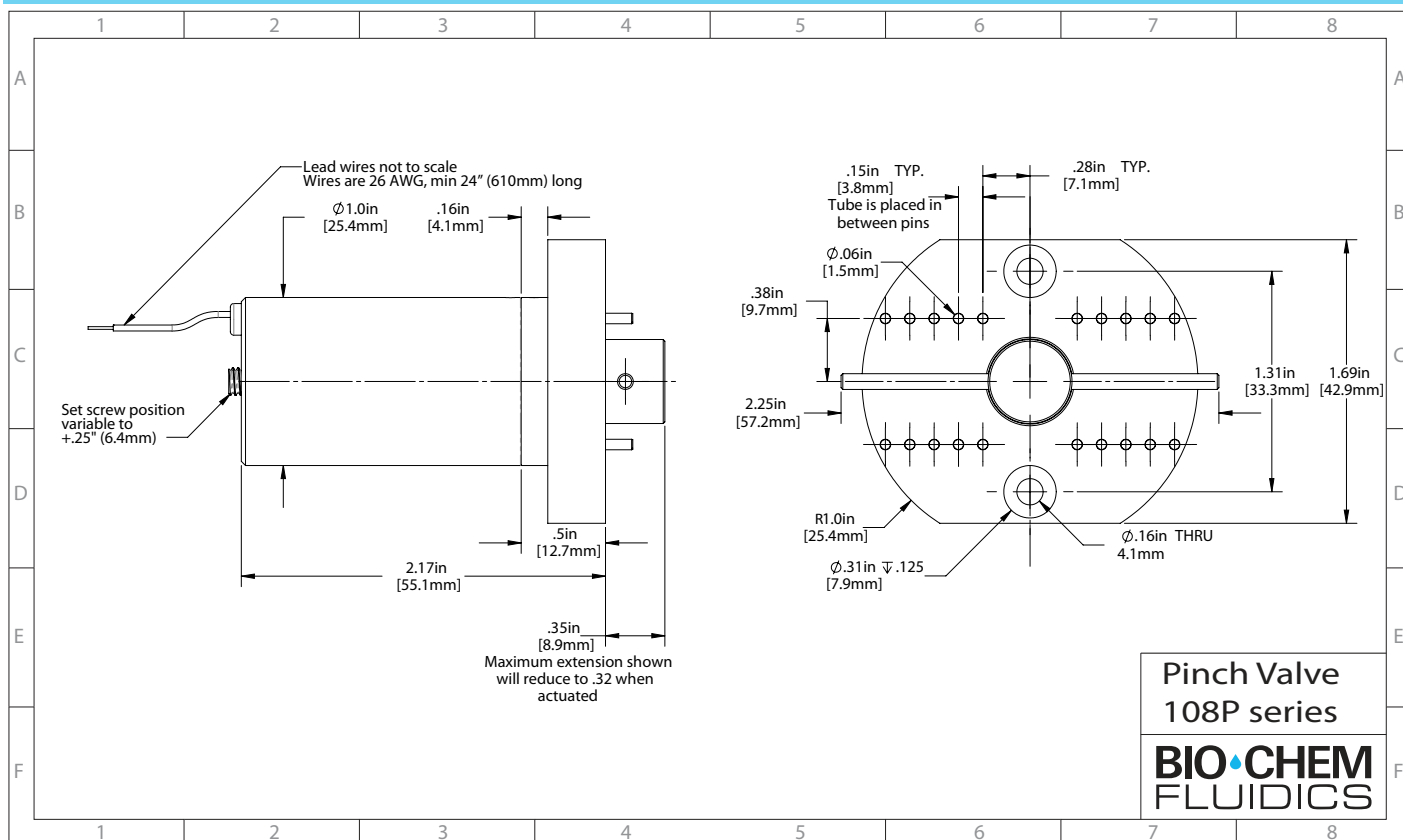
6 tube, 12 VDC valves with C-Flex® tubing, each length of tubing is 12" (305mm) long.

108P6NO12-01B	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	3.5
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8 tube, 12 VDC valves with C-Flex® tubing, each length of tubing is 12" (305mm) long.

108P8NO12-01B	1/32 / 0.8	3/32 / 2.4	28.2	15 / 1.0	3.5
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INSTALLATION DRAWINGS



OPTICAL POSITION FEEDBACK SENSOR

Position feedback is provided through a compact, factory-mounted infrared optical sensor that instantaneously detects the position of the pinch valve pusher/armature assembly. An electrical signal is transmitted back to the instrument control system, confirming whether the valve is open or closed. With no moving parts, the optical sensor has a virtually unlimited life. The position feedback sensor is an essential feature in many critical operations, such as in medical applications.

Availability:

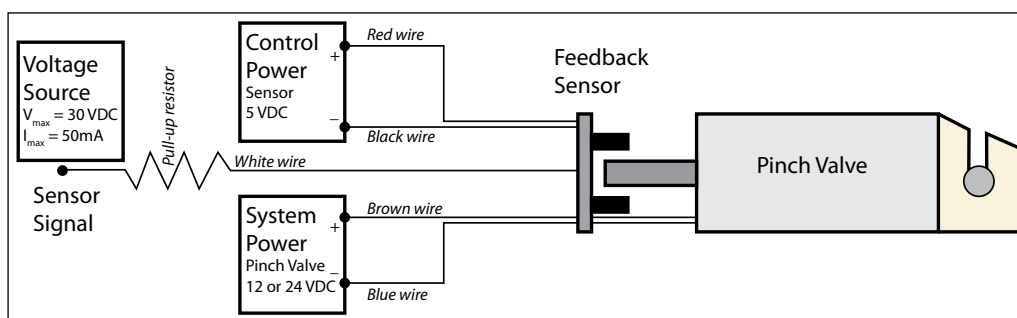
075P2NC, 100P2NC, 075P3, 100P3 and 100PD valves

Electrical specifications:

Input voltage: 5.0 VDC
 Maximum output voltage: 30.0 VDC
 Maximum output current: 50.0 mA

Proper valve function is indicated by a drop in feedback voltage when the valve is open.

Typical set-up diagram:



Feedback sensor mounted on 100P2NC valve

CoolCube™ "HIT AND HOLD" CIRCUIT

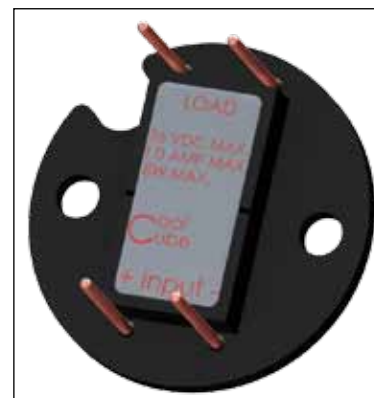
The CoolCube™ "Hit and Hold" circuit steps down DC voltage through Pulse Width Modulation after 100 ms. This reduces power consumption and heat generation while in "hold" setting and permits faster response and greater force through brief use of voltage above valve nominal rating. There is no power storage and the valve turns off immediately when power is cut to the circuit. The CoolCube™ includes terminal pins for easy in-line installation.

Availability:

CoolCube™ is available for ALL pinch valve configurations. 100PD range pinch valves, 108P range pinch valves and pinch valves with "quiet" option require the CoolCube-50R, otherwise select the CoolCube-R.

Specifications:

SERIES	COOLCUBE-R	COOLCUBE-50R
Time from "hit" to "hold" voltage:	100 ms	100 ms
Voltage step down percentage:	67%	50%
Max input voltage:	36 VDC	36 VDC
Max input current:	1 amp	1 amp
"Hold" voltage with 36 VDC input:	12 VDC	18 VDC
"Hold" voltage with 24 VDC input:	8 VDC	12 VDC
"Hold" voltage with 12 VDC input:	4 VDC	6 VDC
Power consumption reduction:	89%	75%



CoolCube™

For more information please refer to "CoolCube™" spec sheet.

PINCH VALVE CONNECTOR ACCESSORIES

Bio-Chem Valve™ Pinch Valves are designed to allow for fast and easy replacement of the tubing that makes up the fluid path through the valve. Inevitably the soft wall tubing has to interface with either other tubing or a threaded port. Bio-Chem Fluidics offers the following options to provide connectivity between the pinch valve and ancillary instrumentation and equipment.

Y-connectors



Use to split one soft wall tube into two streams or to combine two inputs into one output.

Polypropylene construction, three sizes available:

DESCRIPTION	PART NO.	PACK SIZE
Y-connector for 1/32" ID	Y-01P	10
Y-connector for 1/16" ID	Y-02P	10
Y-connector for 1/8" ID	Y-05P	10

Straight connectors



Use to connect two equal sized tubes.

Polypropylene construction, three sizes available:

DESCRIPTION	PART NO.	PACK SIZE
Straight connector for 1/32" ID	S-01P	10
Straight connector for 1/16" ID	S-02P	10
Straight connector for 1/8" ID	S-05P	10

Reducers

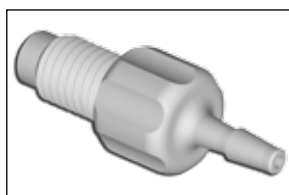


Use to connect two un-equal sized tubes.

Polypropylene construction, two sizes available:

DESCRIPTION	PART NO.	PACK SIZE
Reducer for 1/16" ID to 1/32" ID	R-02/-01P	10
Reducer for 1/8" ID to 1/16" ID	R-05/-02P	10

Barbed Adaptors



Use to connect soft-walled tubing to threaded port.

Acetal construction, three sizes available:

DESCRIPTION	PART NO.	PACK SIZE
Adaptor for 1mm ID to 1/4"-28 thread	008NB10-AD5B	5
Adaptor for 1.5mm ID to 1/4"-28 thread	008NB15-AD5B	5
Adaptor for 3.2mm ID to 1/4"-28 thread	008NB32-AD5B	5

MOUNTING OPTIONS

Bio-Chem Valve™ Pinch Valves are easy to mount using one of our stock mounting accessories. The MU-series mounting flanges were designed specifically with these pinch valves in mind. The flanges allow direct attachment to a bulkhead - either inside or outside the panel. Screw hole spacing matches dimensions from other manufacturers for simple replacement in existing systems.

Features of MU-series mounting flange:

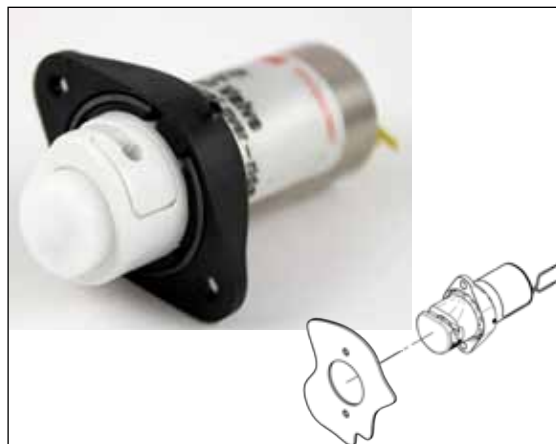
- Constructed from sturdy, glass-filled Polypropylene
- Spring steel retainer and set screw ensure a secure fit
- Surface withstands alcohol, bleaches and other common cleaning agents
- Screw hole orientation relative to tubing can be adjusted to fit available system space



MU-series mounting flanges



Outside bulkhead mounted



Inside bulkhead mounted

Other options:

Mounting rings (MR-075 & MR-100) and mounting clips (MC-075 & MC-100) are also available. Both provide economic options for securing the valves within an instrument.



MR-series
Mounting ring

Features of MR-series mounting rings:

- Constructed from Aluminum
- Set screw secures ring firmly to valve but can be loosened for re-positioning
- Can be bulkhead mounted, inside or outside
- Screw hole orientation relative to tubing can be adjusted to fit available system space

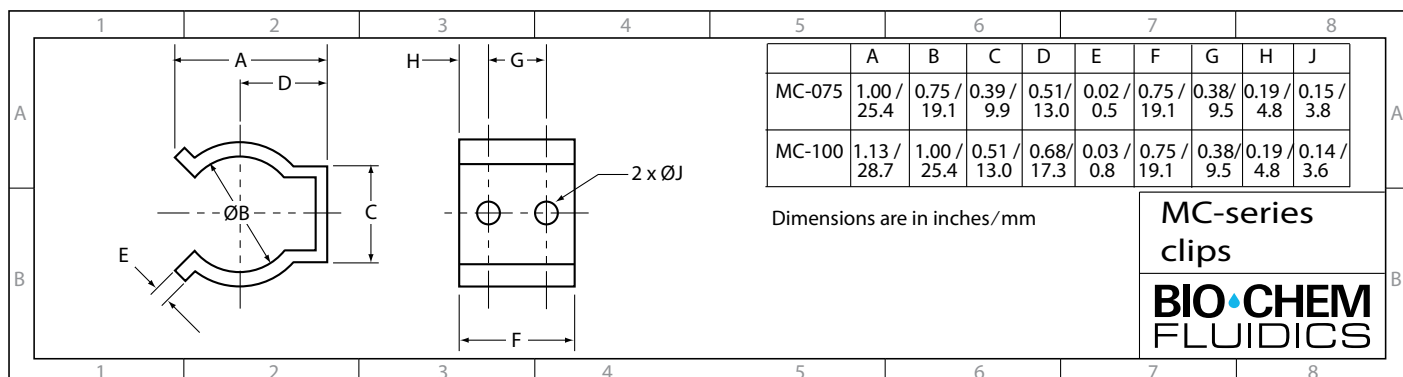
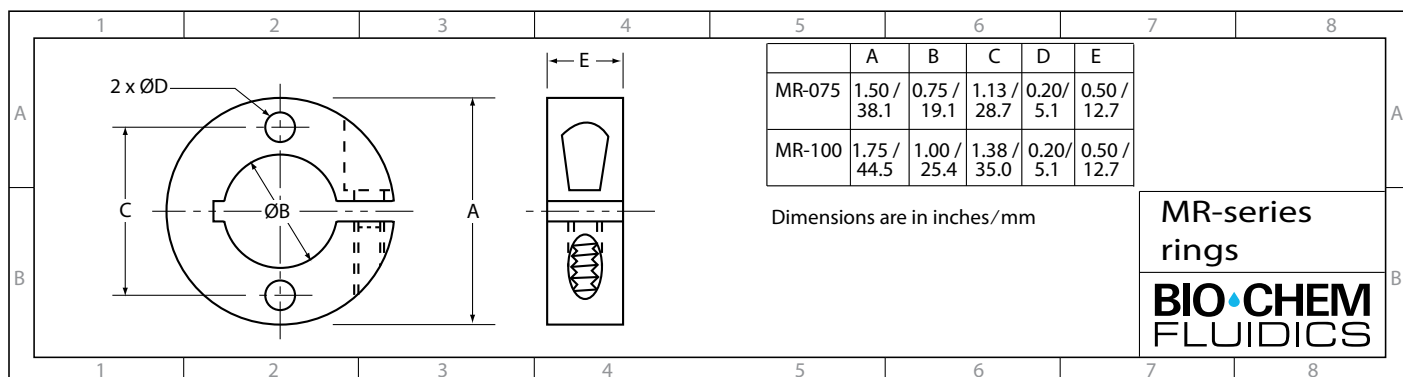
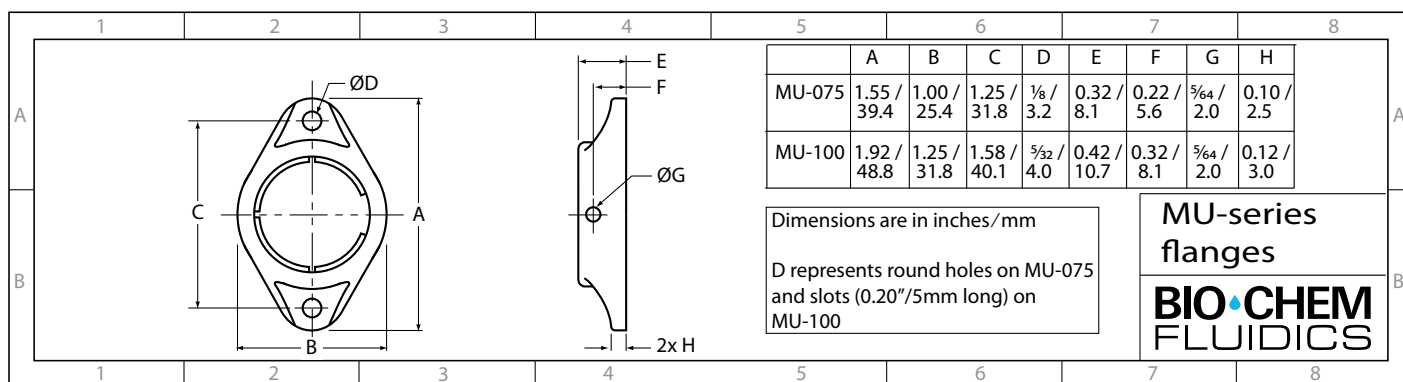


MC-series
Mounting clip

Features of MC-series mounting clips:

- Constructed from Spring Steel
- Simple construction - no tools required to secure valve into position
- Holds valve securely inside instrument

INSTALLATION DRAWINGS



Option Highlight

Mounting holes



Features: Mounting holes allow a valve to be mounted directly to a plate or base.

How it works: Small tapped holes are drilled directly into the bottom of the valve body.

Availability: All 075P and 100P valves. Can not be used in combination with manual override button.

Ordering info: Add suffix "M" to part number (refer to numbering convention on page 18 for more details).

PINCH VALVE PART NUMBERING

Single or dual tube pinch valves (refer to page 15 for options on 108P range)

Part numbers are constructed according to the following convention:

1. Shell size corresponds to the diameter of the solenoid shell. Available sizes are 075P (3/4" diameter) and 100P (1" diameter).
2. Flow path options are "2" (2-way), "3" (3-way), "D2" (dual 2-way), and "D3" (dual 3-way).
3. Flow configuration options are "NC" (normally closed), "NO" (normally open), and "MP" (3-way with one port normally open and the other port normally closed).
4. Voltages offered are "12" (12 Vdc) and "24" (24 Vdc).
5. Tube size designators are assigned according to the table on page 3.

100P	2	NC	24	- 02	S	QMF
Shell size	Paths	Flow conf.	Voltage	Tube size	Tube material	Options
075P 100P	2 3 D2 D3	NC NO MP	12 24	10* 23 01 50* 02 03 05	S B #	Q M K F C L

* indicates only available in "S" tube material option

"Q" option not available with "3" or "D3" paths
 "M" and "K" options not available on same valve
 "K" and "F" options not available on normally open valves

Example shown: 100P2NC24-02SQMF (1" shell, 2-way normally closed valve, 24 VDC, -02S tube with Quiet option, mounting holes and feedback sensor). Color blocks refer to availability for specific shell sizes; 075P 100P

6. Tubing material options are "S" (silicone), "B" (C-Flex®) and "#" (tubeless - set for silicone, but supplied with no tubing).

7. Valve options can be designated by the following letters, which should be added in the sequence indicated below:

Q – "quiet" valves, available for 075P and 100P 2-way valves.

M – mounting holes situated on the bottom of the valve body.

K – manual override button, available for 075P and 100P normally open valves without dual tubing. When the manual override button is chosen, the "M" for mounting holes cannot be selected.

F – position feedback sensor, available for 075P and 100P normally open valves.

C – factory-installed CoolCube™, available for all 075P and 100P pinch valves.

L – factory-installed mounting flange, available for all 075P and 100P valves. The flanges will be installed at 90° to the tubing path.

When an option is not selected, the corresponding part number position is simply left blank.

CUSTOMIZED SOLUTIONS

We understand that many applications require customized solutions. Our design and prototyping expertise enables us to offer simple modifications of standard products as well as completely customized designs. Over 90% of the solenoid valves we sell are customized to one extent or another. Customizable options include (but are not limited to):

- Materials of construction
- Operating voltage
- Mounting options
- Tagging / labeling
- Length and/or style of connecting leads
- Custom manifolds

We look forward to working with you to meet your design engineering objectives!

THE BIO-CHEM FLUIDICS BRAND FAMILY

Bio-Chem Fluidics is dedicated to providing instrument manufacturers and laboratories with the industry's best choice of inert, miniature fluid handling components.

Under the Bio-Chem Valve™ brand name we offer a complete fluid system solution for a wide range of industries including analytical chemistry, clinical diagnostics and medical device manufacturers as well as the scientific community.

BIO-CHEM VALVE

INERT SOLENOID VALVES AND PUMPS, ELECTRIC ROTARY VALVES

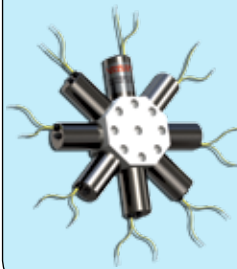
MICRO-PUMPS



ISOLATION VALVES



FLOW SELECTION VALVES



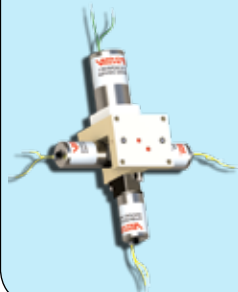
PINCH VALVES



ELECTRIC ROTARY VALVES



MANIFOLD ASSEMBLIES



ACCESSORIES



CUSTOMIZATION SERVICES



INERT FLUID HANDLING COMPONENTS AND ACCESSORIES

- 1/4"-28, 5/16"-24, and M6 fittings for pressures up to 1000 psig
- CoolCube™, "Hit and hold" circuit for all Bio-Chem Valve™ solenoid operated valves
- PTFE, Silicone and C-Flex® tubing

Trademarks

C-Flex® is a registered trademark of Saint-Gobain Performance Plastics.

CoolCube™ is a trademark of Bio-Chem Fluidics Inc.

Bio-Chem Valve™ is a trademark of Bio-Chem Fluidics Inc.

BIO•CHEM
FLUIDICS

www.biochemfluidics.com

Bio-Chem Fluidics Inc
85 Fulton Street, Boonton NJ 07005 USA
t: (973) 263 3001 f: 973 263 2880 e: sales.us@biochemfluidics.com

Bio-Chem Fluidics Ltd
2 College Park, Coldhams Lane, Cambridge CB1 3HD UK
t: +44 (0) 1223 416642 f: +44 (0) 1223 416787 e: sales.eu@biochemfluidics.com

Bio-Chem Fluidics Technology (Shanghai) Co. Ltd
South Metropolis Industrial Park, Jindu Road, Minhang District, Shanghai, PRC 201108
t: +86 21 61519058 f: +86 21 61519090