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Manifold mounted solenoid valves for gradient, mixing and diverting applications

- Precise flow characteristics
- Compact, robust construction
- Minimal dead volume
- Fast response time
- All PTFE wetted parts; other materials available

## Compact valve / manifold configurations

The Bio-Chem Valve flow selection valves are available with three valve sizes, using 0.38 inch, 0.75 inch and 1.00 inch solenoid shell diameters. These sizes correspond to orifice diameters spanning from 0.032 inches to 0.125 inches, covering a broad range of application requirements. For ease of installation, all inlet ports are positioned on the same side of the manifold. The common outlet port is centered between the inlet ports. (Note: in diverting applications, the inlet and outlet ports are reversed.) The compact manifold construction ensures minimal internal volumes.

## Optimized flow characteristics

Every solenoid actuator on the flow selection valve is individually adjusted in the factory so as to provide equal flow rates at the same pressure. Ultra-fast response times for gradient applications. Through rapid cycling of the solenoid, the valves can be used to provide modulating flow rates at constant pressures. With opening and closing times of only 2 milliseconds, the 040T valve series is ideally suited to gradient applications.

## Choice of inert wetted materials

The isolation valve design used with the Bio-Chem Valve flow selection valves ensures that the only wetted parts are the valve diaphragm and the valve seat, which is part of the manifold. In the standard flow selection valve, both parts are made of PTFE, offering the most chemically inert solution available. For different mechanical and chemical requirements, the customer also has the option of using PEEK™ or PPS for the manifold material and EPDM, Viton® or a perfluorelastomer for the diaphragm material.

## Quick-Change Customization™

Through Bio-Chem Valve's Quick-Change Customization™ process, the standard flow selection valve configurations shown on this product data sheet can be modified to meet the customer's specifications. For possibilities regarding solenoid and spring response times, operating pressures, port threads and locations, wetted material and other features, please consult Bio-Chem Valve and Omnifit.



# Specifications

## Valve Series

The flow selection valves are offered in three valve series, distinguished by the solenoid shell sizes:

Valve Series	Shell Diameter
040T	0.38 inches
080T	0.75 inches
105T	1.00 inches

## Electrical

Valve Series	Voltage	Power @ 70°F (21°C)	Current @ 70°F (21°C)
040T	12 VDC	1.9 Watts	0.17 amps
040T	24 VDC	1.9 Watts	0.08 amps
080T	12 VDC	2.6 Watts	0.22 amps
080T	24 VDC	2.6 Watts	0.10 amps
105T	12 VDC	8.0 Watts	0.63 amps
105T	24 VDC	8.0 Watts	0.33 amps

Note: 115 VAC and 220 VAC solenoid coils are also available.

## Flow Configurations

Valve Series	Number of Inlet Ports Available						
	2	3	4	5	6	8	10
040T		✓	✓				
080T	✓	✓	✓	✓	✓	✓	✓
105T	✓	✓	✓		✓		

**Note 1:** All flow selection valves have a common outlet port.

**Note 2:** In fluid diverting applications, the inlet and outlet ports are reversed.

**Note 3:** The standard flow selection valves are offered with all ports normally closed. For the 080T and 105T series, normally open ports are optionally available.

## Internal Volumes ( µL)

Valve Series	Orifice Diameter	Common Port						Inlet Ports (per port)	
		T2	T3	T4	T5	T6	T8	T2	T3+
040T	0.032"	n/a	28 µl	36 µl	n/a	n/a	n/a	n/a	21 µl
040T	0.054"	n/a	60 µl	77 µl	n/a	n/a	n/a	n/a	44 µl
080T	0.032"	7 µl	24 µl	30 µl	45 µl	53 µl	96 µl	14 µl	15 µl
080T	0.062"	27 µl	91 µl	117 µl	174 µl	207 µl	373 µl	24 µl	35 µl
080T	0.078"	42 µl	140 µl	180 µl	269 µl	318 µl	574 µl	69 µl	69 µl
105T	0.092"	79 µl	233 µl	300 µl	n/a	616 µl	n/a	105 µl	110 µl
105T	0.125"	146 µl	444 µl	573 µl	n/a	1175 µl	n/a	233 µl	240 µl

## Orifice diameter options & maximum operating pressures

Valve Series	Orifice Diameters					
	0.032" (0.80 mm)	0.054" (1.40 mm)	0.062" (1.57 mm)	0.078" (1.98 mm)	0.092" (2.34 mm)	0.125" (3.18 mm)
040T	20 psi	20 psi	n/a	n/a	n/a	n/a
080T	20 psi	n/a	20 psi	10 psi	na/	n/a
105T	n/a	n/a	n/a	n/a	10 psi	10 psi

Note : All valves can be operated at a vacuum.

# Specifications (contd.)

## Reaction times (for normally closed operators)

Valve Series	Opening time (milliseconds)		Closing time (milliseconds)
	Standard	with CoolCube™	
040T	5 ms	2 ms	2 ms
080T	10 ms	5 ms	3 ms
105T	20 ms	8 ms	8 ms

**Note 1:** Reaction times were tested with air. Reaction times will vary depending on the medium.

**Note 2:** The Bio-Chem Valve CoolCube™ control module allows the application of over-voltage to actuate the valve (e.g. using 24 VDC to actuate a valve rated for 12 VDC). After a delay of 110 milliseconds, the CoolCube drops the voltage to 1/3 (e.g. to 8 VDC from the original 24 VDC), which is sufficient to hold the valve in position. (Please refer to the CoolCube specification sheet.)

**Note 3:** The reaction times of the 040T valves are optimized for use in gradient applications. Assuming that the valves are used with over-voltage (24 VDC with a 12 VDC valve or 48 VDC for a 24 VDC valve), the opening and closing times are equal at 2 ms, ensuring a well controlled flow characteristic.

## Ordering Information

1	Select valve size	040T, 080T, 105T
2	Indicate number of inlets (all valves have one common outlet).	2, 3, 4, 5, 6, 8, 10
3	Indicate voltage	12 VDC, 24 VDC, 115 VAC, 220 VAC
4	Indicate orifice diameter (in 1/1000 inch)	32, 54, 62, 78, 92, 125
5	Manifold body material (PTFE Standard)	4 (PPS), 5 (PEEK™)
6	Diaphragm material (PTFE Standard)	E (EPDM), V (Viton®), P (Perfluoroelastomer)

Part Number Example:

080T	4	24	-	62	-	5	V
Valve Size	Inlets	Voltage		Orifice Diameter		Body Material <small>(Leave blank for PTFE)</small>	Diaphragm Material <small>(Leave blank for PTFE)</small>

## Port Threads

The standard flow selection valve has 1/4"-28 flat bottom port threads.

Other port threads are available, such as M6 x 1.0 and 10-32. 5/16"-24 threads are available for valves with three or more inlets.

## Wetted material options

Bio-Chem Valve offers a selection of material options for both the valve diaphragms as well as the manifolds:

- Manifold materials: PTFE, PEEK™, PPS
- Valve diaphragm materials: PTFE, EPDM, Viton®, Perfluoroelastomer

## Mounting

Clip mounting is available for 2-inlet valves. (Please see Mounting Accessories and Options specifications sheet.)

Two 0.156 inch (4 mm) diameter mounting holes are provided in the manifold body for flow selection valves with 3 or more inlets.

## Lead Wires

15 inches (380 mm) 26-gauge Teflon® coated. Different lengths of lead wires and terminal connectors can be provided.

Consult Bio-Chem Valve for options concerning:

- Normally open valve operators
- Port threads
- Helicoils
- Terminal connectors and non-standard lead wire lengths
- Above standard operating pressure requirements
- Manifold configurations

Please see the following product specification sheets for accessories:

- Fitting Systems
- CoolCube™ control module
- Mounting Accessories & Options

Trademarks:

CoolCube™ is a trademark of Bio-Chem Valve Inc.  
 PEEK™ is a trademark of Victrex plc  
 Quick-Change Customization™ is a trademark of Bio-Chem Valve Inc.  
 Teflon® is a registered trademark of E.I. du Pont de Nemours and Company  
 ® of DuPont Dow Elastomers

# Installation Drawings

