

Fisher™ Multiport Flow Selector Valve

The Fisher Multiport Flow Selector Valve connects up to eight input lines, allowing for the diversion and testing of fluid from any individual line through a rotating plug, while the remaining seven lines continue to flow to a common group outlet. This product provides compact selection and diversion of fluids from individual wells for testing without disrupting the production from all other wells.

The Multiport Flow Selector consists of four main components: the body, bonnet, plug, and actuator. The body consists of inlet and outlet ports to connect all the seven well inlets, one test outlet and common group outlet. The bonnet will hold the plug vertically and balanced to rotate within the valve body and provides tight sealing to the valve body. The plug is used to select which well media or well port is sent through the test outlet port.

Features

- **Reliable Bearing Life**—A tapered roller thrust bearing and wiper are fitted at the top of the plug and a carbon filled PTFE bushing is located at the bottom of the plug. Tapered roller bearings can take large axial forces as well as being able to sustain large radial forces.
- **Sour Service Capability**—Standard material configurations are compliant to NACE MR0175/ISO 15156.
- **Fire Safe Construction**—The Fisher Multiport product has been Fire-Tested in accordance with API 6FA by third party laboratories and has met the external leakage requirements.



X1398

FISHER MULTIPOINT FLOW SELECTOR VALVE

- **Manual Travel Indicator**—Integral travel indication allows for quick visible confirmation of plug alignment to each inlet port within the manifold.
- **Scraper Seat**—The leading edge of the rotating seal contains a scraper seat providing a wiping action on the sealing surface inside the manifold. This removes process debris allowing for the seat to reliably seal around each inlet port.
- **High Differential Seal**—Features a high differential seal assembly, allowing for tight shut off. This dynamic seal prevents leakage and contamination to the test port from the bulk production.

(continued on page 3)

Specifications

Body Design Standards

ASME B16.34

Valve Sizes

NPS ■ 2x4, ■ 3x6, ■ 4x8, ■ 4x10, and ■ 6x16

Reference table 1

Available Configuration

Flanged or FNPT body assembly with optional alternative end connections.

End Connection Styles

■ Raised-face flanges (ASME B16.5) or ■ Threaded connections for NPS 2x4 constructions only

Flow Direction

Typically flow down, flow up optional

Maximum Group Outlet Flow (C_v)

See tables 4 and 5

Maximum Inlet Pressure⁽¹⁾

Flanged: Consistent with ASME CL150, 300, 600, 900, 1500, and 2500 per ASME B16.34

See tables 4 and 5

Maximum Pressure Drops

See tables 4 and 5

Shutoff Classification

Class IV per ANSI/FCI70-2 and IEC 60534-4

Material Temperature Capability

See table 3

Dimensions

See tables 6 and 7

Actuator

Automated with a Bettis™ Multiport Electric Actuator

Approximate Weights

See table 2

1. The pressure/temperature limits in this bulletin and any applicable standard or code limitations should not be exceeded.

Features (continued)

- **Serviceable Seal**—Field adjustable seal/seat with various materials for adverse service conditions. In this manner, seal adjustments can be made in the field without removing the actuator. Replacement soft seal kits are available for maintenance.
- **Plug Alignment**—One-piece angle plug is centered in the body from bonnet to test outlet and provides smooth operation through the full 360 degrees of travel. The bonnet will hold the plug vertically and balanced to rotate within the body and provides tight sealing to the valve body.
- **Precise Positioning**—Inlet port calibration with the Bettis MPA electric actuator provides precision alignment with each inlet throughout the actuators 360 degrees of travel. The Bettis exclusive solid state motor starter and control software provides precise positioning of flow selector within +/- 1 degree of the selected port.

Multiport Functionality

The maximum number of wells that can be connected to a single MPFS is eight. However, for best operation, it is recommended to connect maximum seven number of wells.

The well lines can be easily diverted to production and test separator from MPFS. The seven inlets of the Multiport flow selector are connected to wells along with the isolation valve. The remaining one port is kept free which is the home port.

Table 1. Valve Size, ANSI Ratings, and Flange Compatibility

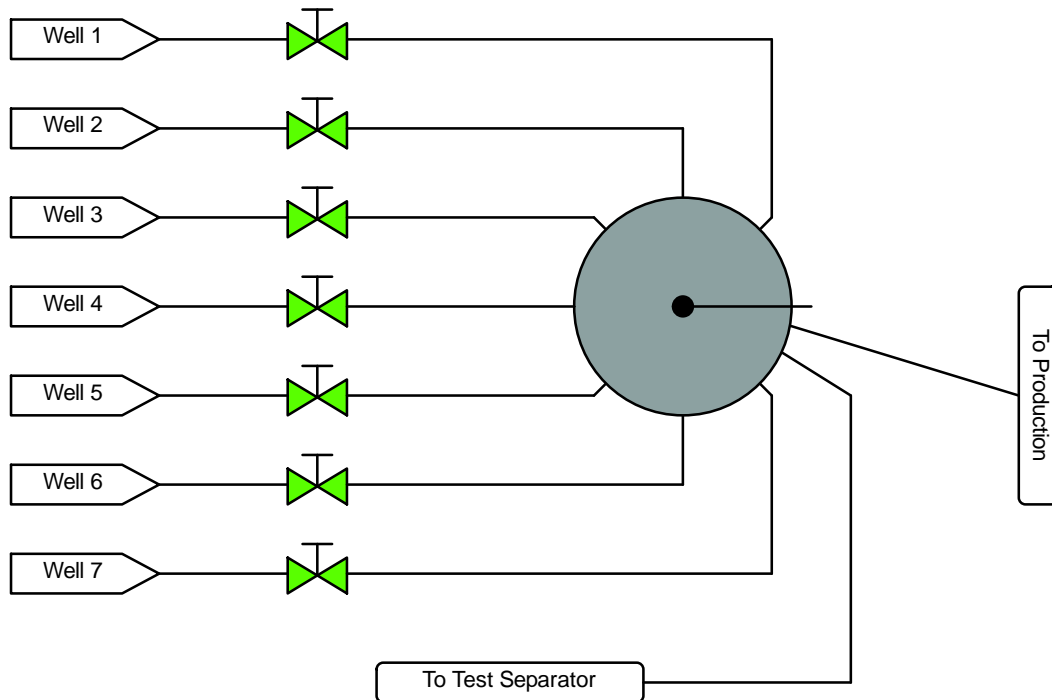
VALVE SIZE, NPS	ANSI CLASS RATING					
	CL150	CL300	CL600	CL900	CL1500	CL2500
2x4	---	X	X	X	X	---
3x6	X	X	X	X	X	X
4x8	---	X	X	X	X	---
4x10	---	---	---	---	---	X
6x16	---	X	X	X	X	X

X indicates availability

Table 2. Approximate Weights

VALVE SIZE, NPS	FLANGED, KG (LB)					
	CL150	CL300	CL600	CL900	CL1500	CL2500
2x4	---	---	90.7 (200)	362.9 (800)	---	---
3x6	551.1 (1215)	629.1 (1387)	655.9 (1446)	678.6 (1496)	968.9 (2136)	---
4x8	---	959.3 (2115)	976.1 (2152)	1134.8 (2502)	---	---
4x10	---	---	---	---	1740 (3836)	---
6x16	---	1809 (3988)	2017.5 (4448)	3589.7 (7914)	5343.3 (11780)	8703 (19187)

Figure 1. Detail Multiport Selector in Production



Arrangement and Working of Multiport Selector in Production Manifold

A Multiport Flow Selector typically has eight inlet and two outlet connections.

- Inlets—Out of eight inlets it is recommended to connect seven to the wells, and the eighth connection is generally used as a parking location
- Outlets—The test outlet connects to the test system and the group outlet carries the flow of all other wells together to the production header.

and/or observation port for the selector plug. This allows for an observation port for temporary maintenance, flushing and allows production of all seven wells if the test system is offline. The internal plug diverts one wells fluid stream to the test port at a time. The plug is rotated to align with the well inlet to be tested.

Table 3. Materials of Construction and Temperature Capabilities

BONNET & BODY MATERIAL	FLANGE MATERIAL	PLUG MATERIAL	SEAL ASSEMBLY MATERIAL	STUD MATERIAL	NUT MATERIAL	O-RING MATERIAL	OPERATING TEMPERATURE RANGE	
							°C	°F
WCB/WCC	WCC or A105N	CF3M/CF8M	S31600/S31603 with 25% carbon graphite filled insert or S31600/S31603 with PTFE-PFA insert	A193 Gr. B7M	A194 Gr. 2HM	AFLAS	-9 to 232	16 to 450
CF3M/CF8M	CF3M or A182 F316L	CF8M						
CD3MN	CD3MN or A182 F51	CD3MN	Inconel 718 with PTFE/25% carbon graphite filled insert or Inconel 718 with PTFE-PFA insert					
CD3MWCuN	CD3MWCuN or A182 F55	CD3MWCuN						

Typical Fisher Multiport Construction Detail

Figure 2. Typical Fisher Multiport

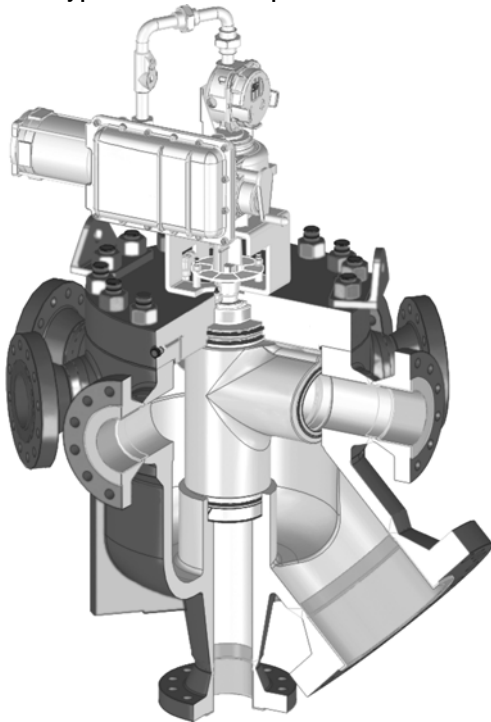


Figure 3. Fisher Multiport Plug Cross Section



Table 4. Multiport Specifications 2x4 and 3x6

	MULTIPORT SIZES						
	2x4		3x6				
ANSI RATING	600 Max (threaded)	900 Max (flanged)	150	300	600	900	1500
MAXIMUM WORKING PRESSURE PSIG (BARG)⁽²⁾	1480 (102)	2220 (153.1)	285 (19.7)	740 (51)	1480 (1480)	2220 (153.1)	3705 (255.5)
TEMP RANGE °C (°F)	-29 to 300 (-20 to 572)						
TEST OUTLET C_V	67		151				100
GROUP OUTLET C_V	262		594				429
INLET PORTS	8 @ 2 FNPT	8 @ 2 flange	8 @ NPS 3 flange				
TEST OUTLET PORT	1 @ 2 FNPT	1 @ 2 flange	1 @ NPS 3 flange				
GROUP OUTLET PORT	1 @ 4 FNPT	1 @ 4 flange	1 @ NPS 6 flange				
WEIGHT, KG (LB)	90.7 (200)	362.8 (800)	551.1 (1215)	629.1 (1387)	655.9 (1446)	678.6 (1496)	968.4 (2135)
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE TEST TO GROUP PSID (BARG)⁽²⁾	600 (41.4)		500 (34.5)				
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE GROUP TO TEST PSID (BARG)⁽²⁾	550 (37.9)						
STATIC STATIONARY DIFFERENTIAL TEST TO GROUP PSID (BARG)^(1,2)	1200 (82.7)		1000 (68.9)				
STATIC STATIONARY DIFFERENTIAL GROUP TO TEST PSID (BARG)^(1,2)	1000 (68.9)						
1. In emergency situations only, the Multiport Flow Selector seal can maintain STATIC STATIONARY DIFFERENTIAL pressure rating per specifications above. However, do not operate the electric actuator at greater than the MAXIMUM DYNAMIC DIFFERENTIAL pressure rating because damage may occur to the electric actuator. 2. Pressure at ambient temperature.							

Table 5. Multiport Specifications 4x8, 4x10, and 6x16

	MULTIPORT SIZES							
	4x8			4x10	6x16			
ANSI RATING	300	600	900	1500	300	600	900	1500
MAXIMUM WORKING PRESSURE PSIG (BARG)⁽²⁾	740 (51)	1480 (102)	2220 (153.1)	3705 (153.1)	740 (51)	1480 (102)	2220 (153.1)	3705 (255.5)
TEMP RANGE °C (°F)	-29 to 300 (-20 to 572)							
TEST OUTLET C_V	270		217	217	951			
GROUP OUTLET C_V	1040		1292	1292	5121			
SHELL HYDROSTATIC TEST PRESSURE PSIG (Kpa)	1110 (7650)	2220 (15300)	3330 (22950)	5560 (38310)	1110 (7650)	2220 (15300)	3330 (22950)	5560 (38310)
INLET PORTS	8 @ NPS 4 flange				8 @ NPS 6 flange			
TEST OUTLET PORT	1 @ NPS 4 flange				1 @ NPS 6 flange			
GROUP OUTLET PORT	1 @ NPS 8 flange			1 @ NPS 10 flange	1 @ NPS 16 flange			
WEIGHT, KG (LB)	959 (2115)	976 (2152)	1135 (2502)	1740 (3836)	1809 (3988)	2017 (4448)	3589 (7914)	5343 (11780)
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE TEST TO GROUP PSID (BARG)⁽²⁾	500 (34.5)							
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE GROUP TO TEST PSID (BARG)⁽²⁾								
STATIC STATIONARY DIFFERENTIAL TEST TO GROUP PSID (BARG)^(1,2)	1000 (68.9)							
STATIC STATIONARY DIFFERENTIAL GROUP TO TEST PSID (BARG)^(1,2)								
1. In emergency situations only, the Multiport Flow Selector seal can maintain STATIC STATIONARY DIFFERENTIAL pressure rating per specifications above. However, do not operate the electric actuator at greater than the MAXIMUM DYNAMIC DIFFERENTIAL pressure rating because damage may occur to the electric actuator. 2. Pressure at ambient temperature.								

Figure 4. Dimensions for Multiport (see table 6)

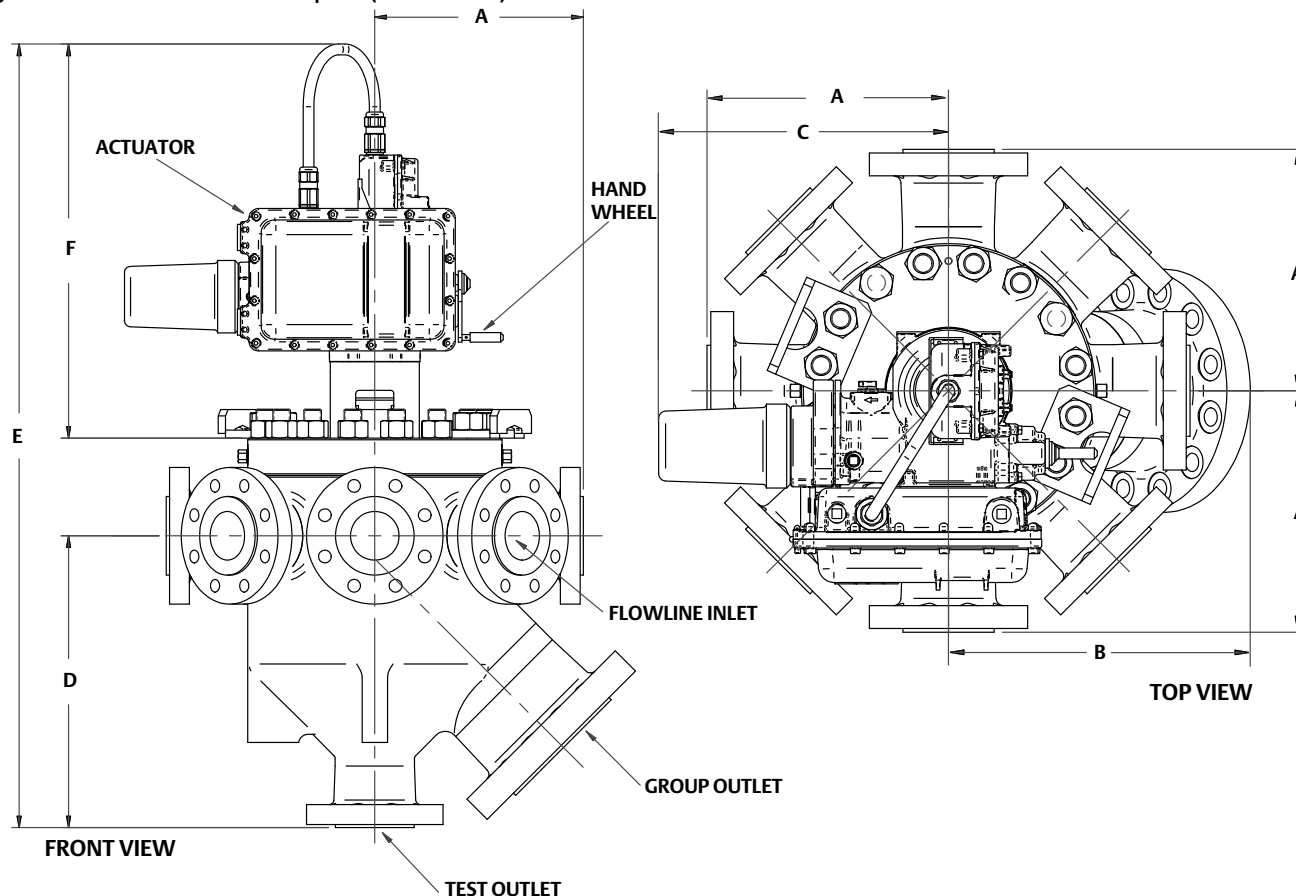
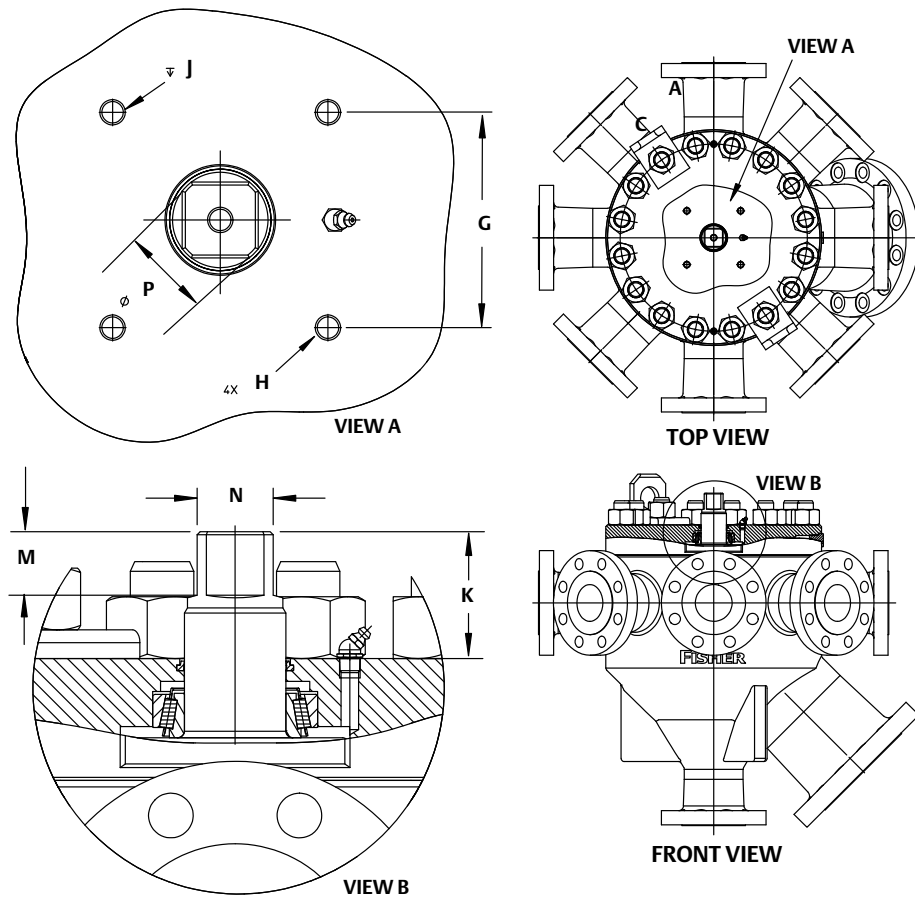


Table 6. Fisher Multiport Valve Body Dimensions (Raised-face Only)

VALVE SIZE, NPS	ASME CLASS	DIMENSIONS, MM (INCH)					
		A	B	C	D	E	F(1)
2x4	CL150	---	---	---	---	---	---
	CL300	353 (13.9)	345 (13.6)	500 (19.7)	417 (16.4)	1161 (45.7)	787 (31)
	CL600	353 (13.9)	358 (14.1)	500 (19.7)	417 (16.4)	1161 (45.7)	787 (31)
	CL900	353 (13.9)	386 (15.2)	500 (19.7)	417 (16.4)	1161 (45.7)	787 (31)
3x6	CL150	340 (13.4)	391 (15.4)	500 (19.7)	437 (17.2)	1382 (54.4)	787 (31)
	CL300	351 (13.8)	411 (16.2)	500 (19.7)	446 (17.6)	1390 (54.7)	787 (31)
	CL600	360 (14.2)	427 (16.8)	500 (19.7)	456 (17.9)	1399 (55.1)	787 (31)
	CL900	379 (14.9)	451 (17.8)	500 (19.7)	475 (18.7)	1399 (55.1)	787 (31)
	CL1500	432 (17.0)	498 (19.6)	500 (19.7)	533 (21.0)	1537 (60.5)	787 (31)
4x8	CL150	---	---	---	---	---	---
	CL300	395 (15.6)	491 (19.3)	500 (19.7)	560 (22.1)	1544 (60.8)	787 (31)
	CL600	417 (16.4)	520 (20.5)	500 (19.7)	583 (22.9)	1565 (61.6)	787 (31)
	CL900	430 (16.9)	558 (22.0)	500 (19.7)	595 (23.4)	1577 (62.1)	787 (31)
4x10	CL1500	478 (18.8)	712 (28.0)	500 (19.7)	661 (26.0)	1793 (70.6)	787 (31)
6x16	CL150	---	---	---	---	---	---
	CL300	527 (20.8)	684 (26.9)	500 (19.7)	361 (33.9)	1908 (75.1)	787 (31)
	CL600	551 (21.7)	721 (28.4)	500 (19.7)	884 (34.8)	1932 (76.1)	787 (31)
	CL900	667 (26.2)	790 (31.1)	500 (19.7)	957 (37.7)	2054 (80.9)	787 (31)
	CL1500	657 (25.9)	919 (36.2)	500 (19.7)	1038 (40.9)	2250 (88.6)	843 (33)
	CL2500	829 (32.6)	950 (37.4)	500 (19.7)	1105 (43.5)	2383 (93.8)	800 (31.5)

1. 28 inches of space is required to remove the actuator assembly from the valve.

Figure 5. Dimensions for Mounting (see table 7)



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Table 7. Fisher Multiport Mounting Dimensions

VALVE SIZE, NPS	ASME CLASS	DIMENSIONS, MM (INCH)						
		G	H	J	K	M	N	P
2x4	CL150	---	---	---	---	---	---	---
	CL300-900	108 (4.24)	1/2-13UNC ⁽¹⁾	19 (0.75)	62 (2.44)	25 (1.00)	25 (1.00)	36 (1.42)
3x6	CL150-900	108 (4.24)	1/2-13UNC	19 (0.75)	63 (2.49)	32 (1.25)	38 (1.50)	48 (1.88)
	CL1500	108 (4.24)	1/2-13UNC	19 (0.75)	65 (2.56)	32 (1.25)	38 (1.50)	48 (1.88)
4x8	CL150	---	---	---	---	---	---	---
	CL300-900	108 (4.24)	1/2-13UNC	19 (0.75)	65 (2.55)	32 (1.25)	38 (1.50)	48 (1.88)
4x10	CL1500	108 (4.24)	3/4-10UNC	25 (1.00)	69 (2.72)	41 (1.63)	38 (1.50)	51 (2.00)
6x16	CL150	---	---	---	---	---	---	---
	CL300-600	117 (4.60)	3/4-10UNC	25 (1.00)	69 (2.70)	41 (1.63)	38 (1.50)	51 (2.00)
	CL900	117 (4.60)	3/4-10UNC	25 (1.00)	75 (2.97)	41 (1.63)	57 (2.25)	76 (3.00)
	CL1500-2500	117 (4.60)	3/4-10UNC	38 (1.50)	75 (2.97)	41 (1.63)	57 (2.25)	76 (3.00)

1. UNC is defined as unified coarse.

Installation

The Multiport Flow Selector is installed vertically with the test port down. Flow is normally from the seven inlets to the group outlet or test outlet. The eighth inlet is normally used as the home port for when testing of an individual inlet is not desired.

The Multiport Flow Selector plug seal/port alignment is factory adjusted when supplied with actuator and should not require further adjustment.

Note

When hydrotesting external piping, position the plug between any two inlet ports in order to equalize test pressure between the multiport body and external piping to prevent possible seal damage from happening.

Ordering Information

Valve Information

To determine what valve ordering information is needed, refer to the specifications table. Review the information under each specification and in the referenced tables; specify your choice whenever there is a selection to be made.

Actuator and Accessory Information

Refer to the specific actuator and accessory bulletins for required ordering information.

Product Bulletin

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