GF Piping Systems

Electrically Actuated 3-way Ball Valves

Type 167-170

General

- **Size**: ⅜"–2"
- **Material**: PVC, CPVC, PROGEF® Standard PP, ABS, SYGEF® Standard PVDF
- **Seat**: PTFE
- **Seals**: EPDM, FPM
- **End Connection**: Solvent cement socket, threaded, flanged, fusion spigot, fusion socket
- **Actuator Housing**: Glass-filled PP
- **Voltage**: 100-230VAC, 24VDC
- **Manual Override**: Integrated
- **Position Indicator**: Optical, integrated

Key Valve Certifications

- **FDA CFR 21 177.1520**: PP and PVDF
- **FDA CFR 21 177.2600**: EPDM and FPM
- **FDA CFR 21 177.1550**: PTFE
- **USP 25 Class VI (physiological non-toxic)**: PP and PVDF

Sample Specification

The Type 167-170 3-way Ball Valve shall be used in either open/close or modulating applications. The actuator shall be a Type EA25. The ball valve shall be true union and utilize a floating ball design. The ball shall be fully molded and full port with two way blocking capability. The stem shall be blowout proof, utilizing a double o-ring seal and a predetermined break point opposite the media side of the stem seals. The seat carrier shall be adjustable and reverse threaded. The valve nut threads shall be of buttress type. Ball seats shall have an elastomeric backing o-ring and all elastomeric seals shall be of like material. ANSI flanged versions shall meet ANSI B16.5 150lb standards. All valves shall be tested in accordance to ISO9393 and designed to ISO16136 standards. All valves shall be manufactured under ISO9001 for Quality and ISO14001 for Environmental Management. Following manual assembly, every valve shall be tested and certified bubble tight exceeding Class VI standards. Following actuated assembly, every valve shall be tested to confirm functionality.

Material Specification

PVC valves shall meet ASTM D1784 cell classification 12454 standards. CPVC valves shall meet ASTM D1784 cell classification 23447-B standards. PP valves shall meet ASTM D5847-14 cell classification PP0510B66851 standards. ABS valves shall meet ASTM D3965 cell classification 42222 standards. PVDF valves shall be type 1, grade 2 according to ASTM D3222 standards. Valves of all materials shall be RoHS compliant.

Key Actuator Certifications

- **Machinery Directive 2006/42/EC, Annex II B**
- **EMV Directive CE 2004/108/CE**
- **EMV VDE 0843 Section 20**
- **Low Voltage Directive CE 2006/95/CE**
- **Vibration Testing EN 60068-2-6**
- **Interface ISO 5211**
- **Actuators for Inustrial Valves EN 15714-2**

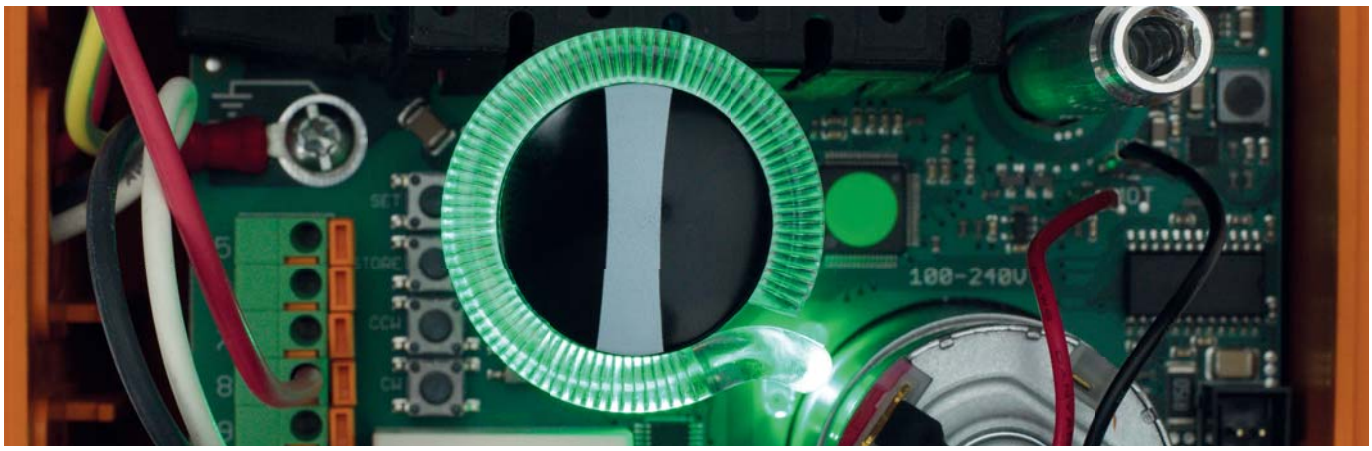
Components

Optional Features

- **Positioner**: Current, voltage
- **Network**: Profibus DP
- **Fail Safe Return**: Battery back up, externally powered board
- **Smart Module**: Cycle monitoring, cycle counter, cycle extension, motor current monitoring
- **Manual Loading Station**: Local control box
- **Protection Class**: IP67 with conduit connection
- **Seals**: Alternative materials available upon request
- **Seat**: PVDF
- **End Connection**: Alternatives available upon request
- **Cleaned**: Silicone free/oil free

Material Availability

Material	Horizontal	Vertical
PVC	All Sizes	All Sizes
CPVC	All Sizes	-
PP	All Sizes	-
ABS	All Sizes	All Sizes
PVDF	All Sizes	-



Actuator Technical Data

	EA 25
Valve Size	⅜"-2"
Cycle Time	5s/90°
Rated Cycles at 70°F	250,000
Actuating Angle	Standard set at 90°, max. 355°
Housing Material	Glass-filled PP
Position Feedback	230V, 6 Amp
Emergency Manual Override	Integrated
Rated Voltage	100- 230V, 50/60 Hz 24V, AC/DC, 50/60Hz
Rated Voltage Tolerance	+/- 15%
Rated Output	35VA @ 100-230VAC 40VA @ 24VAC/DC
Duty Cycle	100%
Protection Class	IP 65 per EN 60529 (3) UL/CSA: For interior use Nema 4X
Overload Protection	Resetting, current-time dependant (1)
Overvoltage Category	Category II according to DIN EN 61010-1
Power Connection	Connector plug 3 P+ E per DIN EN 175301-03
Pollution Grade	Grade 2 according to DIN EN 61010-1
Maximum Elevation	6561 feet
Ambient Temperature	14° to 122°F (2)
Allowable Humidity	90% relative humidity, non condensing

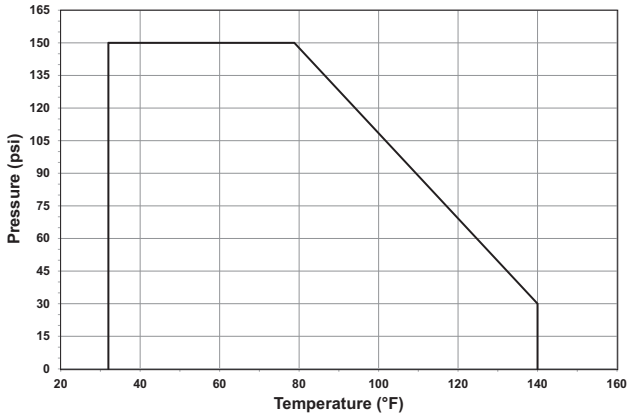
(1) Overload protection of the motor is dimensioned so that the motor and the power supply board are protected. As soon as the load is within the torque range, the actuator will begin operating again.
(2) At temperatures below 14°F and if there is condensation, the heating element should be activated.
(3) Protection class IP67 for use of cable glands and vertical installation.

Technical Data

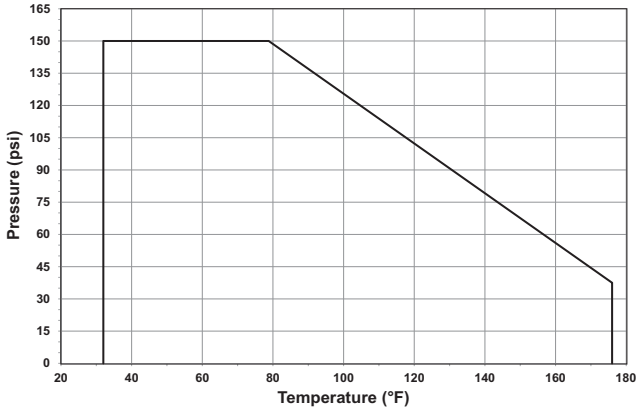
Pressure Temperature Curves

The following graphs are based on a 25 year lifetime water or similar media application

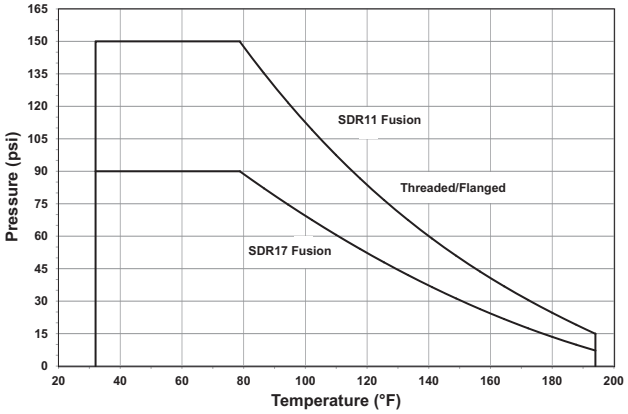
PVC



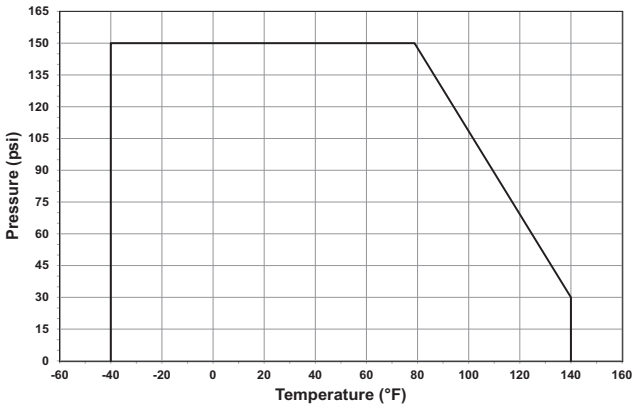
CPVC



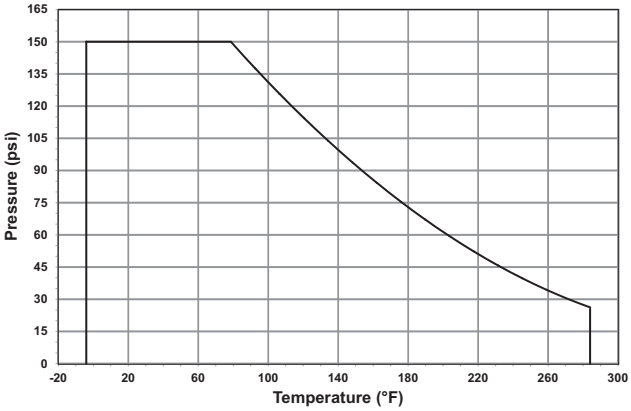
PP



ABS



PVDF



Pressure-Temperature

Material	Temperature Range (°F)	Max Pressure (psi)
PVC	32 to 140	150
CPVC	32 to 176	150
PP	32 to 176	150
ABS	-40 to 140	150
PVDF	-4 to 284	150

Vacuum Service

The Type 167-170 is rated for full vacuum service. Maximum differential pressure of 15psi at 122°F.

Porting

Flow Vertical

Options shown turning the valve handle clockwise. Redundant positions not shown.

Vertical L-port

0°

90°

180°

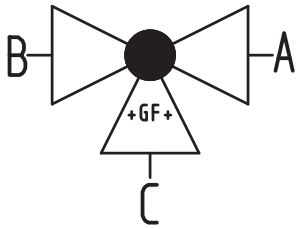
270°

Vertical Diverter

0°

45°

90°

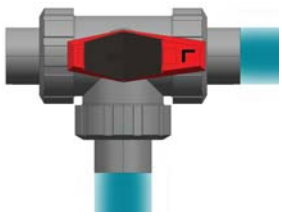


Cv Value (gal/min)

Size (inch)	d (mm)	A-C or B-C
⅜	16	3.5
½	20	5.3
¾	25	10.5
1	32	19.6
1¼	40	33.6
1½	50	43.4
2	63	86.1

Flow Horizontal L-port

Options shown turning the valve handle clockwise. Redundant positions not shown.



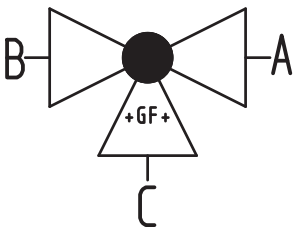
0°

45°

90°

180°

225°



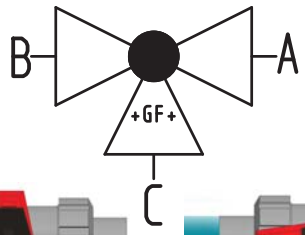
Cv Value (gal/min)

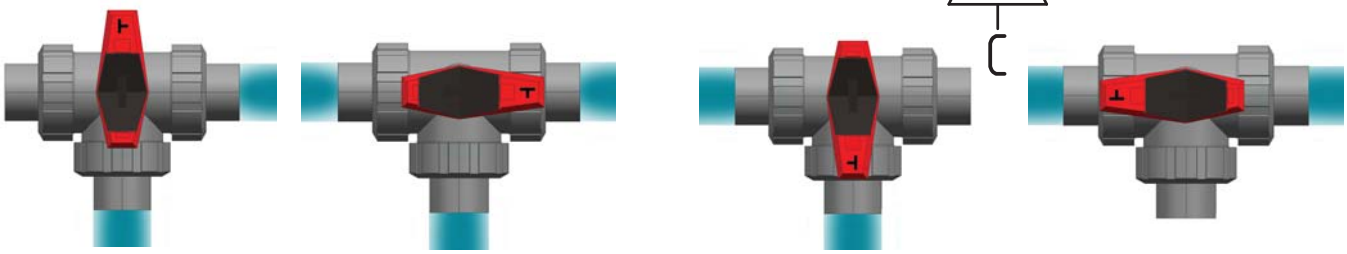
Size (inch)	d (mm)	A-B	C-B or C-A	B-C or A-C
⅜	16	0.7	3.5	3.5
½	20	1.1	4.5	4.5
¾	25	2.1	10.5	10.5
1	32	3.5	19.6	19.6
1¼	40	6.3	33.6	33.6
1½	50	7.7	43.4	43.4
2	63	15.4	86.1	86.1

Porting

Flow Horizontal T-port

Options shown turning the valve handle clockwise. Redundant positions not shown.



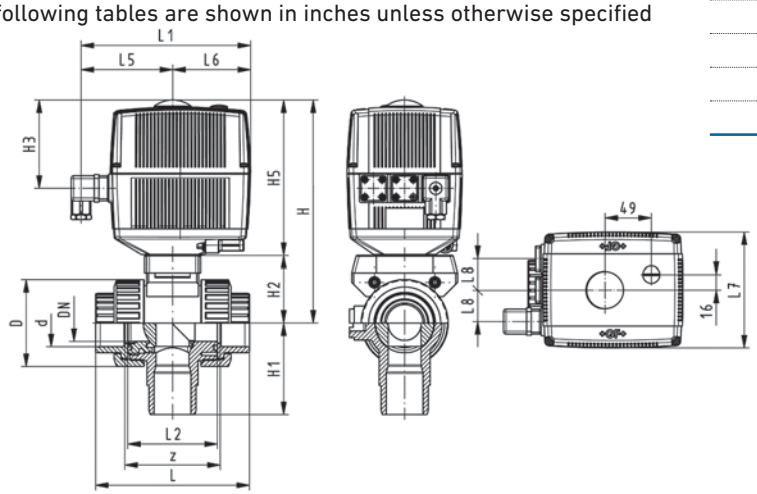


Cv Value (gal/min)

Size (inch)	d (mm)	A-B	C-B or C-A	B-C or A-C
⅜	16	9.8	2.5	2.8
½	20	14	3.5	4.9
¾	25	32.9	9.1	10.5
1	32	55.5	14	17.5
1¼	40	90.3	26.6	32.9
1½	50	133.7	32.9	42
2	63	217	62.3	84.7

Dimensions

The following tables are shown in inches unless otherwise specified



PVC Vertical Socket

Inch	D	H	H1	H2	H3	H5	L	L1	L2	L5	L6	L7	L8	z
⅜	1.97	9.09	2.44	2.52	3.66	6.54	4.17	7.17	2.20	3.9	3.27	4.8	1.3	2.64
½	1.97	9.09	2.44	2.52	3.66	6.54	4.13	7.17	2.20	3.9	3.27	4.8	1.3	2.40
¾	2.28	9.45	2.83	2.87	3.66	6.54	4.76	7.17	2.60	3.9	3.27	4.8	1.3	2.76
1	2.68	9.45	3.03	2.87	3.66	6.54	5.24	7.17	2.80	3.9	3.27	4.8	1.3	2.99
1¼	3.31	9.88	3.43	3.31	3.66	6.54	5.98	7.17	3.35	3.9	3.27	4.8	1.3	3.54
1½	3.82	9.88	3.82	3.31	3.66	6.54	6.50	7.17	3.50	3.9	3.27	4.8	1.3	3.70
2	4.88	10.75	4.41	4.17	3.66	6.54	7.20	7.17	3.98	3.9	3.27	4.8	1.3	4.21

PVC Vertical Threaded NPT

Inch	D	H	H1	H2	H3	H5	L	L1	L2	L5	L6	L7	L8	z
⅜	1.97	9.09	2.44	2.52	3.66	6.54	3.86	7.17	2.20	3.9	3.27	4.8	1.3	2.76
½	1.97	9.09	2.44	2.52	3.66	6.54	3.86	7.17	2.20	3.9	3.27	4.8	1.3	2.52
¾	2.28	9.45	2.83	2.87	3.66	6.54	4.41	7.17	2.60	3.9	3.27	4.8	1.3	2.99
1	2.68	9.45	3.03	2.87	3.66	6.54	5.00	7.17	2.80	3.9	3.27	4.8	1.3	3.27
1¼	3.31	9.88	3.43	3.31	3.66	6.54	5.75	7.17	3.35	3.9	3.27	4.8	1.3	3.90
1½	3.82	9.88	3.82	3.31	3.66	6.54	6.18	7.17	3.50	3.9	3.27	4.8	1.3	4.37
2	4.88	10.75	4.41	4.17	3.66	6.54	7.20	7.17	3.98	3.9	3.27	4.8	1.3	5.31

Dimensions

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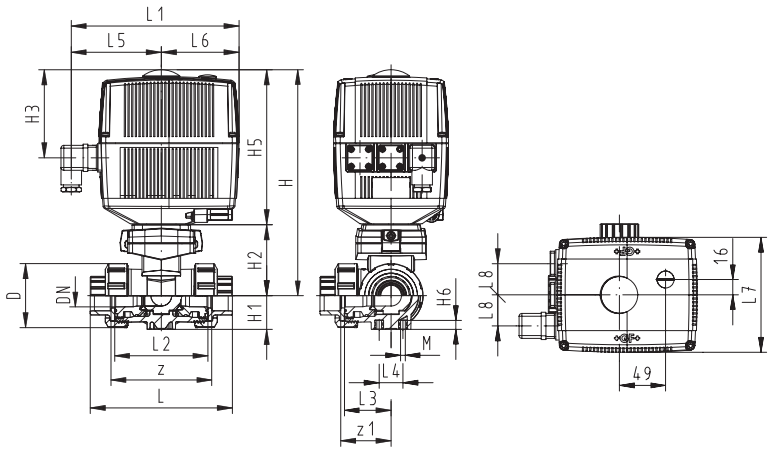

PVC/CPVC Horizontal Socket

Inch	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M (mm)	z	z1
⅜	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.84	7.17	2.87	1.42	0.98	3.82	3.27	4.80	1.30	6	3.35	1.65
½	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.80	7.17	2.87	1.42	0.98	3.82	3.27	4.80	1.30	6	3.03	1.50
¾	2.28	9.45	1.26	2.87	3.66	6.54	0.31	5.55	7.17	3.39	1.69	0.98	3.82	3.27	4.80	1.30	6	3.62	1.81
1	2.68	9.45	1.42	2.87	3.66	6.54	0.31	6.34	7.17	3.90	1.97	0.98	3.82	3.27	4.80	1.30	6	4.13	2.09
1¼	3.31	9.88	1.77	3.31	3.66	6.54	0.31	7.36	7.17	4.72	2.36	1.77	3.82	3.27	4.80	1.30	6	4.96	2.48
1½	3.82	9.88	2.01	3.31	3.66	6.54	0.31	8.39	7.17	5.39	2.72	1.77	3.82	3.27	4.80	1.30	6	5.63	2.83
2	4.88	10.75	2.56	4.17	3.66	6.54	0.31	10.28	7.17	7.05	3.50	1.77	3.82	3.27	4.80	1.30	6	7.28	3.62

PVC/CPVC Horizontal Threaded NPT

Inch	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M (mm)	z	z1
⅜	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.53	7.17	2.87	1.42	0.98	3.82	3.27	4.80	1.30	6	3.35	1.65
½	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.49	7.17	2.87	1.42	0.98	3.82	3.27	4.80	1.30	6	3.03	1.50
¾	2.28	9.45	1.26	2.87	3.66	6.54	0.31	5.16	7.17	3.39	1.69	0.98	3.82	3.27	4.80	1.30	6	3.62	1.81
1	2.68	9.45	1.42	2.87	3.66	6.54	0.31	6.10	7.17	3.90	1.97	0.98	3.82	3.27	4.80	1.30	6	4.13	2.09
1¼	3.31	9.88	1.77	3.31	3.66	6.54	0.31	7.13	7.17	4.72	2.36	1.77	3.82	3.27	4.80	1.30	6	4.96	2.48
1½	3.82	9.88	2.01	3.31	3.66	6.54	0.31	8.07	7.17	5.39	2.72	1.77	3.82	3.27	4.80	1.30	6	5.63	2.83
2	4.88	10.75	2.56	4.17	3.66	6.54	0.31	10.28	7.17	7.05	3.50	1.77	3.82	3.27	4.80	1.30	6	7.28	3.62

Dimensions

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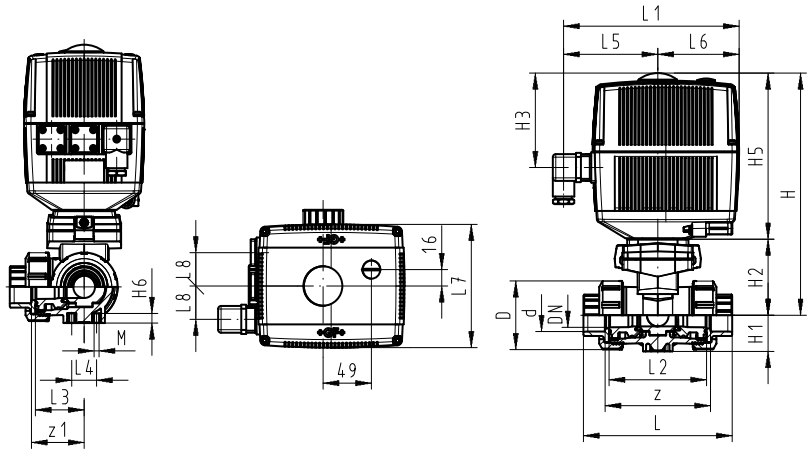

PP/PVDF Horizontal Socket Fusion

d (mm)	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M (mm)	z	z1
16	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.33	7.17	2.83	1.42	0.98	3.82	3.27	4.80	1.30	6	3.35	1.65
20	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.41	7.17	2.83	1.42	0.98	3.82	3.27	4.80	1.30	6	3.03	1.50
25	2.28	9.45	1.26	2.87	3.66	6.54	0.31	5.08	7.17	3.35	1.69	0.98	3.82	3.27	4.80	1.30	6	3.62	1.81
32	2.68	9.45	1.42	2.87	3.66	6.54	0.31	5.75	7.17	3.86	1.93	0.98	3.82	3.27	4.80	1.30	6	4.13	2.09
40	3.31	9.88	1.77	3.31	3.66	6.54	0.31	6.69	7.17	4.65	2.32	1.77	3.82	3.27	4.80	1.30	6	4.96	2.48
50	3.82	9.88	2.01	3.31	3.66	6.54	0.31	7.60	7.17	5.31	2.68	1.77	3.82	3.27	4.80	1.30	6	5.63	2.83
63	4.88	10.75	2.56	4.17	3.66	6.54	0.31	9.61	7.17	6.93	3.46	1.77	3.82	3.27	4.80	1.30	6	7.28	3.62

PP/PVDF Horizontal Threaded NPT

size	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M (mm)	z	z1
⅜	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.53	7.09	2.87	3.9	0.98	3.82	3.27	4.80	1.30	6	3.35	1.65
½	1.97	9.09	1.10	2.52	3.66	6.54	0.31	4.49	7.09	2.87	3.9	0.98	3.82	3.27	4.80	1.30	6	3.03	1.50
¾	2.28	9.45	1.26	2.87	3.66	6.54	0.31	5.16	7.09	3.39	3.9	0.98	3.82	3.27	4.80	1.30	6	3.62	1.81
1	2.68	9.45	1.42	2.87	3.66	6.54	0.31	6.10	7.09	3.90	3.9	0.98	3.82	3.27	4.80	1.30	6	4.13	2.09
1¼	3.31	9.88	1.77	3.31	3.66	6.54	0.31	7.13	7.09	4.72	3.9	1.77	3.82	3.27	4.80	1.30	6	4.96	2.48
1½	3.82	9.88	2.01	3.31	3.66	6.54	0.31	8.07	7.09	5.39	3.9	1.77	3.82	3.27	4.80	1.30	6	5.63	2.83
2	4.88	10.75	2.56	4.17	3.66	6.54	0.31	10.28	7.09	7.05	3.9	1.77	3.82	3.27	4.80	1.30	6	7.28	3.62

PP/PVDF Horizontal IR/Butt Fusion Spigot

d (mm)	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M (mm)
20	1.97	9.09	1.10	2.52	3.70	6.57	0.31	5.75	7.09	2.83	1.42	0.98	3.82	3.27	4.80	1.30	6
25	2.28	9.45	1.26	2.87	3.70	6.57	0.31	6.42	7.09	3.35	1.69	0.98	3.82	3.27	4.80	1.30	6
32	2.68	9.45	1.42	2.87	3.70	6.57	0.31	7.01	7.09	3.86	1.93	0.98	3.82	3.27	4.80	1.30	6
40	3.31	9.88	1.77	3.31	3.70	6.57	0.35	8.03	7.09	4.65	2.32	1.77	3.82	3.27	4.80	1.30	8
50	3.82	9.88	2.01	3.31	3.70	6.57	0.35	9.33	7.09	5.31	2.68	1.77	3.82	3.27	4.80	1.30	8
63	4.88	10.75	2.56	4.17	3.70	6.57	0.35	11.65	7.09	6.93	3.46	1.77	3.82	3.27	4.80	1.30	8

GF Piping Systems
Tel. (714) 731-8800, Toll Free (800) 854-4090, Fax (714) 731-6201
us.ps@georgfischer.com, www.gfpiping.com

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