

Type 185, 186, 187, 188

Electrically Actuated 3-Way Ball Valve

Standard Features

- **Size**
3/8"-2"
- **Voltage**
24 AC or DC
110-230 AC
- **Emergency Manual Override**
- **Material**
Horizontal - PVC, CPVC, PROGEF
Polypropylene
Vertical - PVC
- **Connection Ends**
Socket, Spigot (PVDF and PP only),
Threaded NPT
- **Seat**
PTFE
- **Seals**
EPDM or FPM
- **Mounting**
Stainless steel threaded inserts
for easy and secure mounting
- **Duty Cycle**
100%



Optional Features

- Pneumatic Actuation
- Limit Switches
- Positioner (voltage or current)
- Position Feedback

General

The Type 185-188 electrically actuated ball valve has a modular design and is adaptable to a variety of conditions and applications. Using the 543 3-way ball valve incorporates all the latest in ball valve technology. The valve is available in PVC, CPVC, Polypropylene, and PVDF materials. With the optional positioner, the valve can perform complex functions such as mixing chemicals or controlling process temperature by blending cooling water.

The system at a glance

The new three-way ball valve type 543 from GF Piping Systems offers a universal model series with a wide range of options for all versions – from the manual valve to the actuated. The ball valve is the perfect valve for demanding mixing and diverting processes. It follows the design of the ball valve type 546 and is available in the dimensions DN10 to DN50.

Horizontal or vertical: the perfect ball valve

The new 543 three-way ball valve provides quality, flexibility and reliability – in both the horizontal and the vertical versions. The horizontal version comes with an L or T bore and is available in PVC, PVC-C, ABS, PP and PVDF. So you have the right valve for all your applications.

The vertical version of the 543 ball valve is available in the materials PVC and ABS. For

the vertical model, the third outlet consists of a solvent cement spigot in metric standard. As an additional version besides the L bore, we also offer a diverter ball for the ball valve.

International focus

Our global line of end connector options corresponds to ISO, BS, ASTM and JIS standards.

Standards and approvals

- EN ISO 16135: Industrial valves – Thermoplastic ball valves
- ISO 9393: Thermoplastic valves for industrial applications
- DIBt (Deutsches Institut für Bautechnik), pending
- NSF 61*: System components for drinking water, pending

*Only products bearing the NSF mark are certified.



More Perfection in detail

L-bore, 5 functions



Basic position for diverting function



Diverting function



Mixing function with reduced flow



Outlet closed, passage open with reduced flow



Shut-off function

T-bore, 4 functions



Basic position for mixing function



Outlet closed, passage open



Diverting function



Diverting function

➤ Intelligence in motion



Technical specifications

Electric actuators 21



EA 21

Size	3/8"-2"
Nominal torque Mdn	10 Nm
Peak torque	20Nm
Cycle of time	5 s/ 90° at Mdn
Actuating angle	max. 180°, set to 90°
L/W/H	150/122/167
Cycles at 68°F and Mdn	250,000
Flanges	F05
Housing materials	PP fiberglass reinforced, flame retardant, captive stainless steel screws externally
Position indicator	optical, integrated
Emergency manual override	integrated
Rated voltage	100- 230V, 50/60 Hz 24V, AC/DC, 50/60Hz
Rated voltage tolerance	+/- 10%
Rated output	28 Watts
Direct impedance	230V, 100k 24V, 4k7
Duty cycle ED	100%
Protection class	IP 65 per EN 60529 (3) UL/CSA: for interior use, Nema 4X
Overload protection	current / time dependent (resetting) (1), temperature-dependent
Overvoltage category (5)	II
Electrical connections	Connector plug 3 P+ E per DIN EN 175301-03 (formerly DIN 43650), screw cable gland M20x1.5 per ISO 724
Pollution grade (5)	2
Height over NN (UL/CSA)	< 2000m
Ambient temperature	14° to 122°F (2)
Allowable humidity	max. 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 in the torque range, the actuator runs again.

(2) At temperatures below 14°F and if there is condensation, the heating element no. 198 190 086 should be built in.

(3) Protection class IP67 for use of cable glands and vertical installation.

(4) Linear decrease up to 50% relative humidity at 104°F.

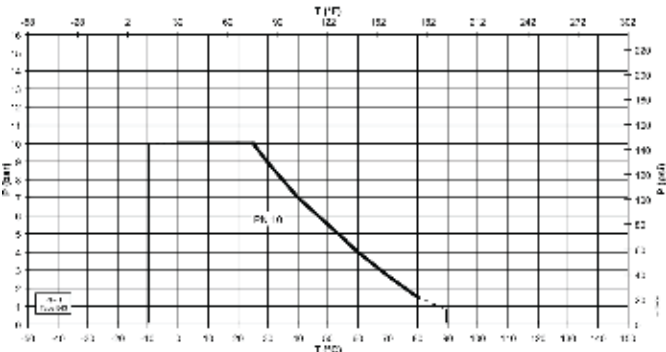
* pending

(5) According to DIN EN 61010-1

Pressure-temperature diagrams

The following pressure temperature diagrams are based on a lifetime of 25 years and the medium water or similar media.

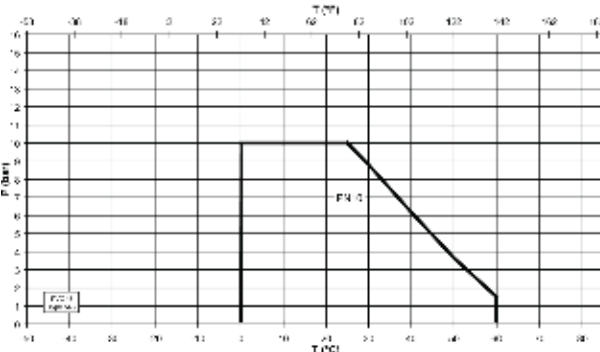
PP-H



p Permissible pressure in bar, psi
T Temperature in °C, °F

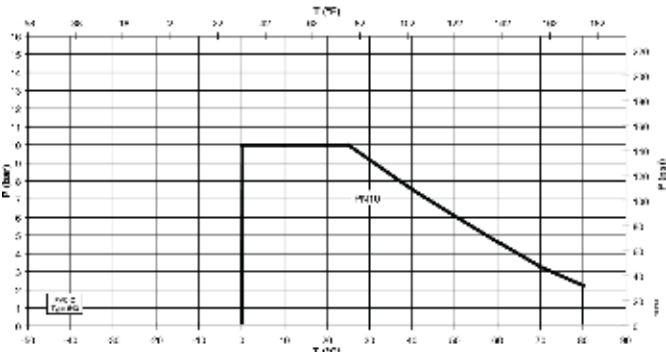
For applications with temperatures in the range of the dotted lines, please contact your GF representative.

PVC-U



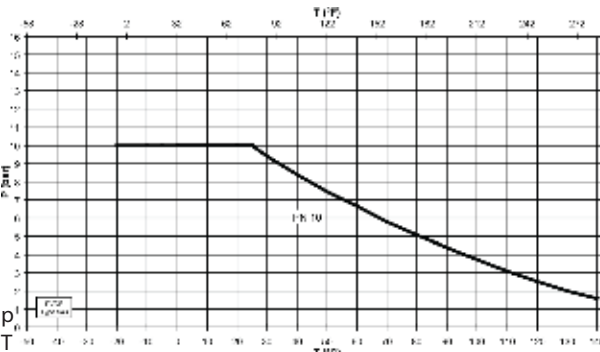
p Permissible pressure in bar, psi
T Temperature in °C, °F

PVC-C



p Permissible pressure in bar, psi
T Temperature in °C, °F

PVDF



Permissible pressure in bar, psi
Temperature in °C, °F
EPDM seal, max. 100 °C



Type 188 Electrically Actuated 3-way Ball Valve - PVC Vertical Manual override standard

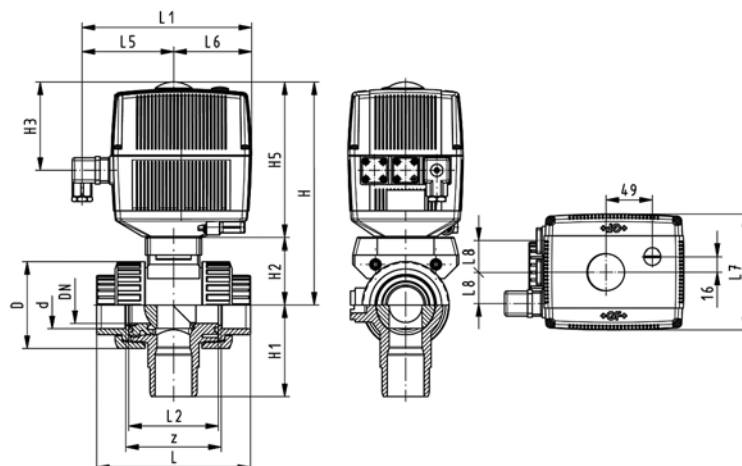
size	psi	Cv-value [gal(US)/min]
3/8	150	4
1/2	150	5
3/4	150	11
1	150	20
1 1/4	150	34
1 1/2	150	43
2	150	86

ASTM Socket

size	D	H	H1	H2	H3	H5	L	L1	L2	L5	L6	L7	L8	z
3/8	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
1/2	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
3/4	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
1 1/4	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
1 1/2	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

NPT Thread

size	D	H	H1	H2	H3	H5	L	L1	L2	L5	L6	L7	L8	z
3/8	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
1/2	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
3/4	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
1 1/4	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
1 1/2	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





Type 185 Electrically Actuated 3-way Ball-PVC/CPVC Horizontal With manual emergency override

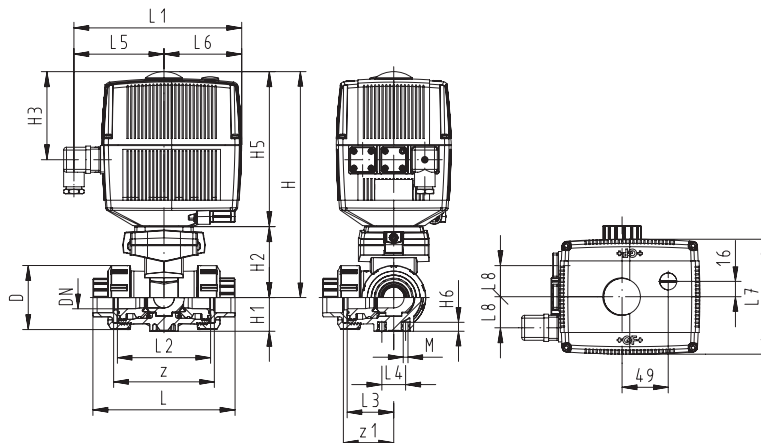
size	psi	Cv-value [gal(US)/min]
3/8	150	4
1/2	150	5
3/4	150	11
1	150	20
1 1/4	150	34
1 1/2	150	43
2	150	86

ASTM Socket

size	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M	z	z1
3/8	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
1/2	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
3/4	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
1 1/4	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
1 1/2	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

NPT Thread

NPT	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M	z	z1
3/8	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
1/2	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
3/4	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
1 1/4	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
1 1/2	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





Type 186 & 187 Electrically Actuated 3-way Ball-Polypropylene/PVDF Horizontal With manual emergency override

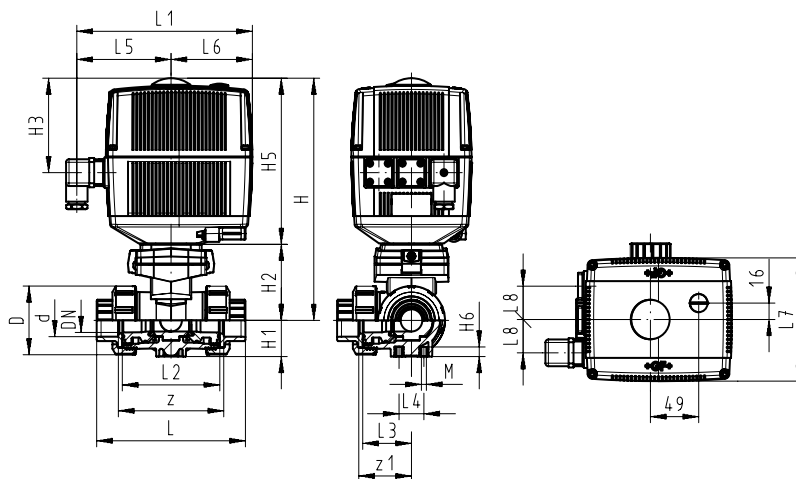
size	psi	Cv-value [gal(US)/min]
3/8	150	4
1/2	150	5
3/4	150	11
1	150	20
1 1/4	150	34
1 1/2	150	43
2	150	86

ASTM Socket

size	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M	z	z1
3/8	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
1/2	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
3/4	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
1	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
1 1/4	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
1 1/2	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
2	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

NPT Thread

NPT	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M	z	z1
3/8	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
1/2	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
3/4	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
1 1/4	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
1 1/2	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





d [mm]	DN [inch]	Cv-value [gal(US)/min]	lbs
1/2	150	14	4.868
3/4	150	33	5.232
1	150	56	5.780
1 1/4	150	90	6.931
1 1/2	150	134	8.298
2	150	217	12.222

Butt Fusion Spigots

d	D	H	H1	H2	H3	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	L8	M	closest inch
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	1/2
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	3/4
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	1
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	1 1/4
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	1 1/2
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	2