Level Control Valve
with Bi-Level Vertical Float

Model 750-66-B

- Reservoir filling
  - Very low pressure supply
  - Low noise generation
  - Energy cost critical systems
  - Systems with poor water quality
- Reservoir outlet
  - Distribution routing
  - Sewerage “fill and flush” systems

The Model 750-66-B Level Control Valve with Bi-Level Vertical Float is a hydraulically controlled, diaphragm actuated, double chambered control valve. The valve is hydraulically powered to fully open at pre-set reservoir low level, and to shut off at pre-set high level regardless of valve differential pressure.

Features and Benefits

- **Line pressure driven –** Independent operation
- **Bi-level hydraulic float control**
  - On/Off service
  - Low cavitation damage
  - Suitable for low quality water
  - Inherent reservoir refreshing
- **Double chamber**
  - Full powered opening and closing
  - Decreased pressure loss
  - No throttling noise
  - Non-slam closing characteristic
  - Protected diaphragm
- **External installation**
  - Easy access to valve and float
  - Easy level setting
  - Less wear and tear
- **Balanced seal disk –** High flow capacity
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features

Major Additional Features

- Pressure sustaining – **753-66**
- Electric float backup – **750-66-65**
- Flow control – **757-66-U**
- Closing surge prevention – **750-66-49**
- Level sustaining – **75A-66**

See relevant BERMAD publications.

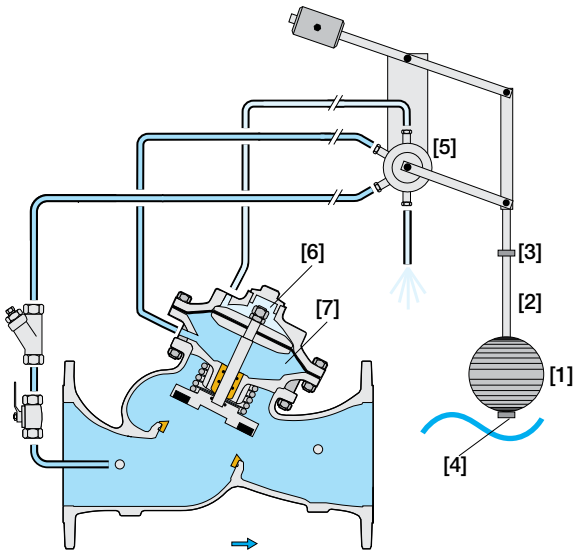
Operation

The Model 750-66-B is a float controlled valve equipped with a 4-Way, “last position,” bi-level float pilot assembly. The float **[1]** slides along the rod **[2]**. When the float reaches either the adjustable high **[3]** or low **[4]** level stoppers, it pulls the rod assembly down or pushes it up, switching the float pilot **[5]** position. When the float is between the adjustable stoppers, the main valve remains in its last position.

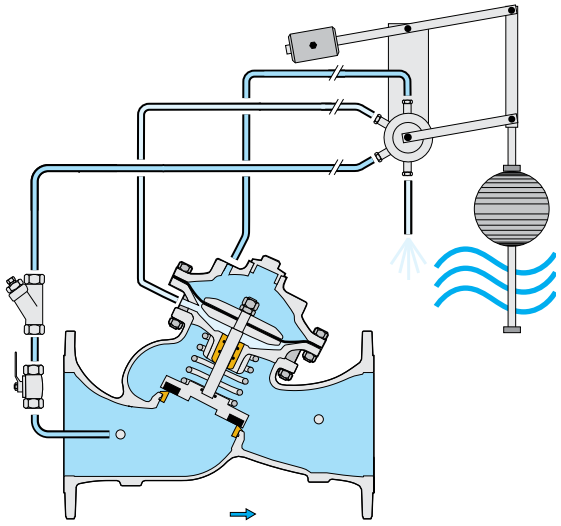
At high level, the float pilot applies pressure to the upper control chamber **[6]**, and vents the lower control-chamber **[7]**, powerfully shutting off the main valve.

At low level, the float pilot applies pressure to the lower control chamber, and vents the upper control chamber, powerfully opening the main valve.

For 10” valves and larger, two accelerators quicken valve response.



Low Level – Open Valve



High Level – Closed Valve

Pilot System Specifications

Standard Materials:

Float Pilot:

Body: Brass or Stainless Steel 316
Elastomers: Synthetic Rubber
Internal parts: Stainless Steel 316 & Brass
Lever system: Brass or Stainless Steel 316
Float: Plastic
Float rod: Stainless Steel
Base plate: Fusion bonded epoxy coated Steel or Stainless Steel 316

Tubing & Fittings:

Stainless Steel 316 or Copper & Brass

Accessories:

Stainless Steel 316, Bronze, Brass and Synthetic Rubber Elastomers

Notes:

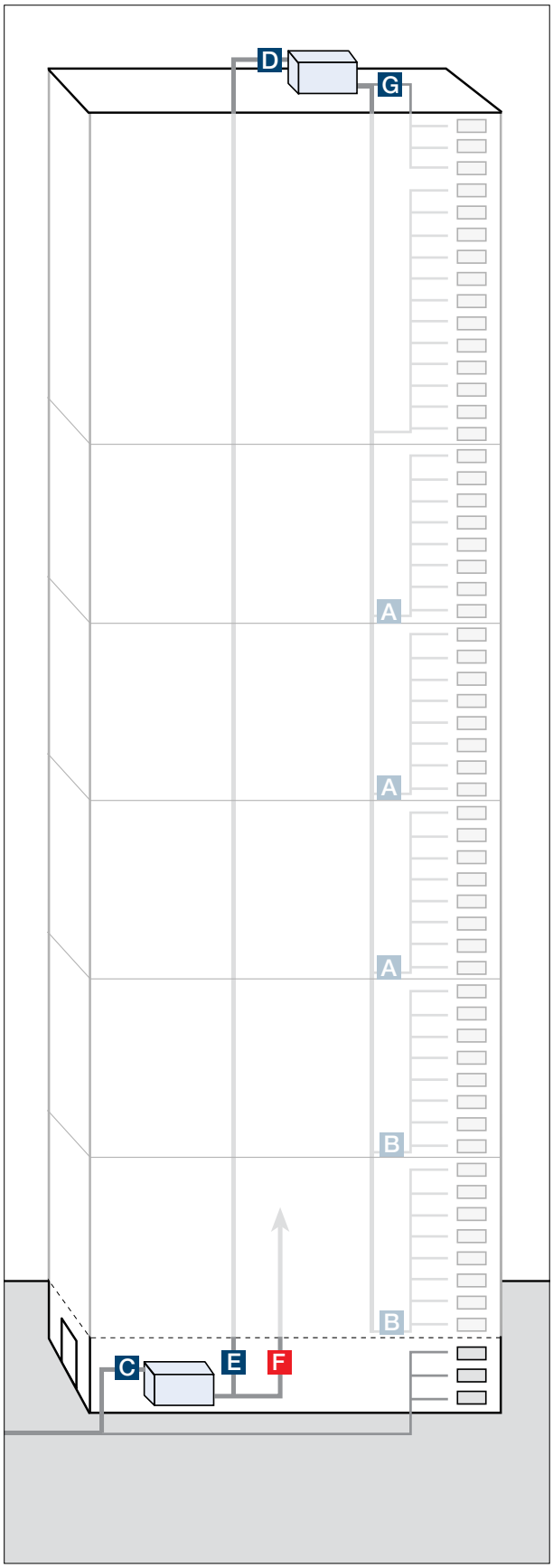
- Minimum level differential: 15 cm (6”)
- Maximum level differential: 54 cm (21”)
- Each extension rod adds 56 cm (22”). One extension rod supplied
- Extra counterweight required if second extension rod used
- If inlet pressure is below 0.5 bar (7 psi) or above 10 bar (150 psi), consult factory
- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec
- See BERMAD float installation recommendation

Typical Level Control Systems in High-Rise Buildings

Water supply system design requirements for high-rise buildings present unique issues:

- Supply cut-off is unacceptable and single source supply is common.
- Reservoir overflow might be extremely expensive and even dangerous.
- Reservoirs are often located next to prestigious residential and office space. Extraneous noise and maintenance activities are to be avoided.
- Most of the occupants of high-rise buildings are completely dependent on the reservoir system of the building for their water needs: potable water, firewater, air conditioning system, flushing, etc.
- Pressure for upper floor consumers and for fire protection systems must be prioritized during reservoir filling.
- As reservoir systems are designed to meet maximum (emergency) consumption, although actual consumption is usually far less, there is a risk of stagnant reservoir water.

The Model 750-66-B backed by BERMAD'S accumulated know-how, addresses these issues and presents appropriate solutions.



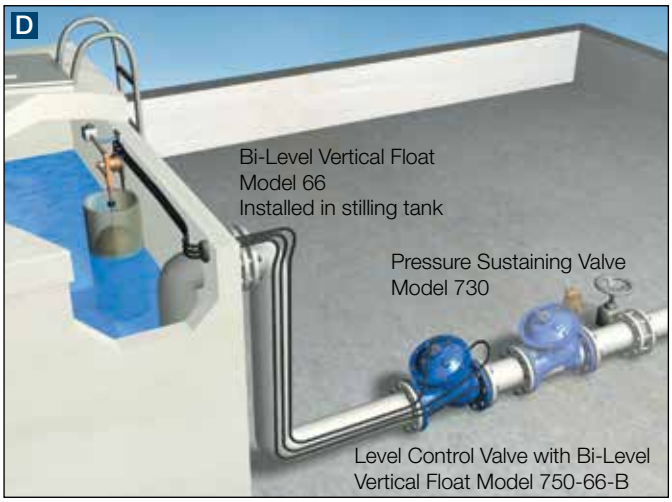
- A Higher zone pressure reducing system installation
- B Lower zone pressure reducing system (two-stage) installation
- C Bottom reservoir level control system
- D Roof reservoir level control system
- E Potable water pumping system
- F Fire protection pumping system
- G Upper floors pumping system

Rooftop Reservoirs

Rooftop reservoir level control is attained by electric control of the basement pumps according to reservoir level. As overflow of a rooftop reservoir can cause costly damage, hydraulic backup protection is recommended.

The Model 750-66-B is suited to this function. When open, it presents minimal interference, but when needed, it shuts off securely.

To prioritize pressure to upper floor consumers or fire protection system, install the Model 730 Pressure Sustaining Valve upstream from the Model 750-66-B.



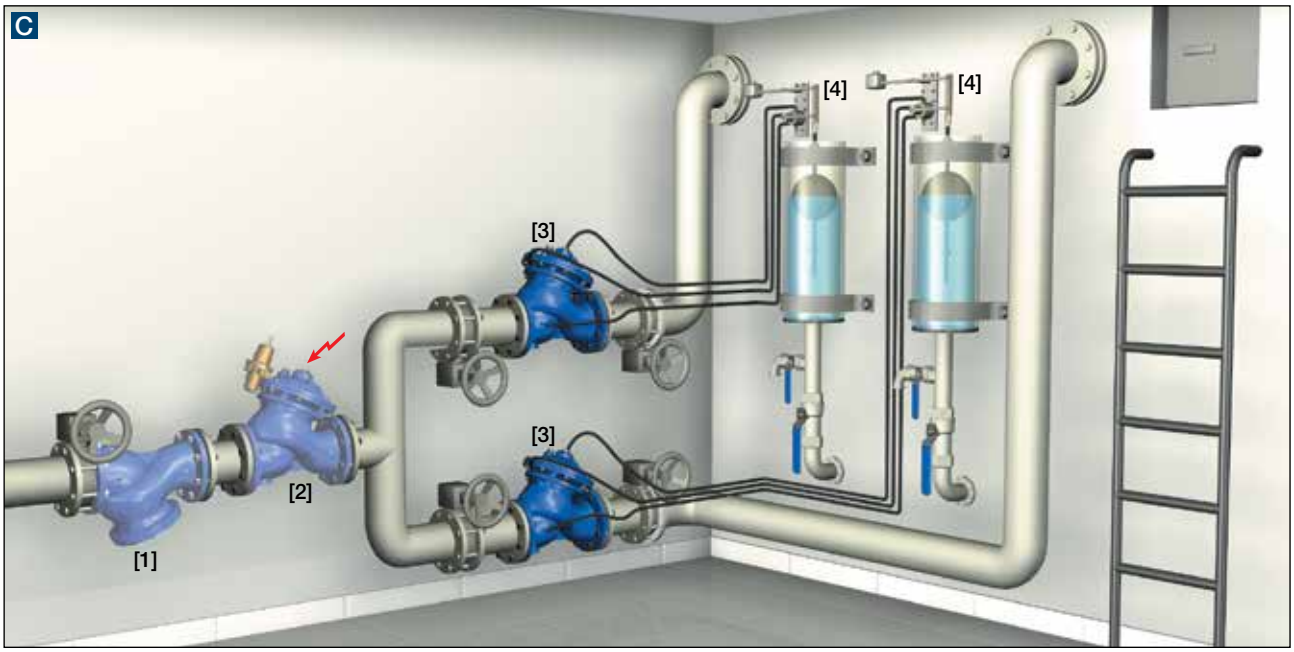
Basement Reservoirs

Basement reservoir design requires consideration of specific issues:

- Supply cut-off is unacceptable.
- Reservoir overflow might damage expensive equipment.
- Noise level* and duration should be limited.
- Municipal supply pressure might be low.

The Model 750-66-B, as part of the system shown, fulfills these requirements and more.

* For other measures that might be needed to further reduce system noise, see relevant BERMAD publications.



In addition to the Model 750-66-B, BERMAD recommends these systems include:

[1] Strainer Model 70F: To prevent debris from damaging valve operation.

[2] Pressure Sustaining Valve Model 730-65: To ensure municipal supply to lower floors & provide electric backup.

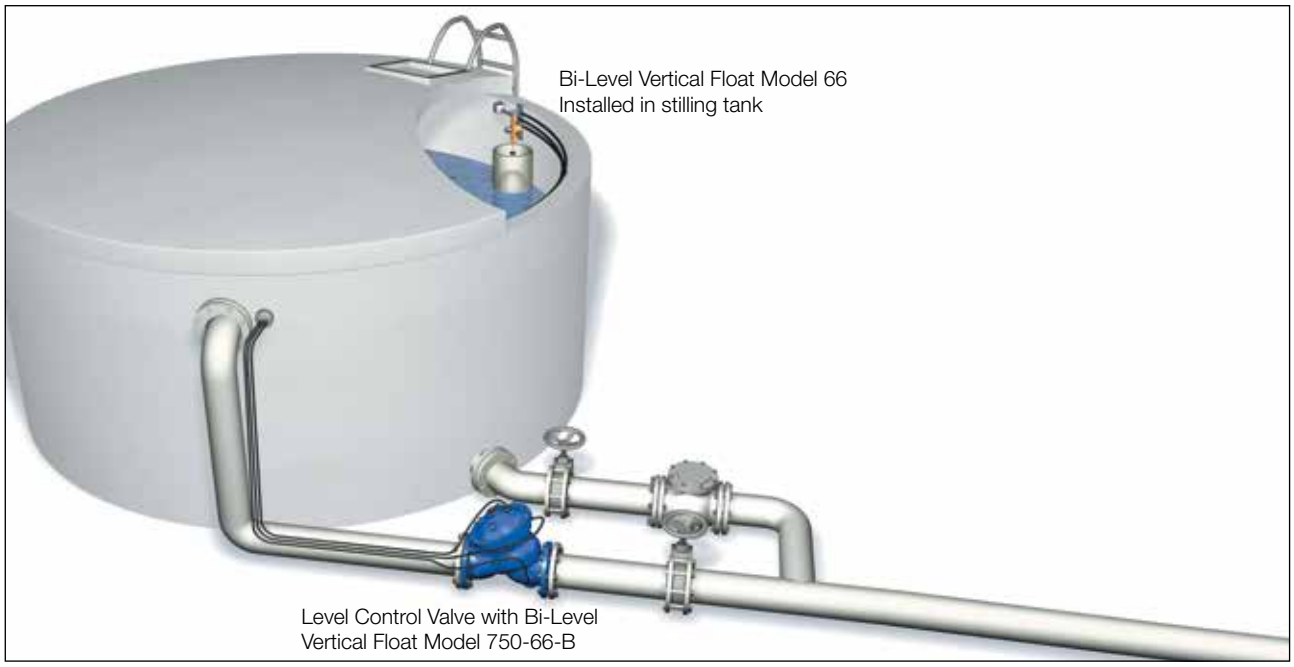
[3] Parallel Redundant Branch Model 750-66-B: To ensure uninterrupted supply.

[4] Float Assembly: To allow out-of-tank installation.

Typical Applications

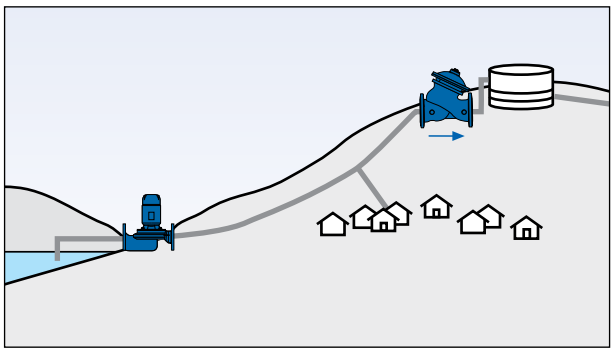
Infrastructure Reservoirs

Optimal design of reservoir systems requires specifying a level control valve that reduces pumping costs by minimizing the extra pumping pressure required to operate standard valves.
Even at very low pressure, the Model 750-66-B ensures full opening, maximum flow capacity, and secure closing.
It should be included during the system design phase or with changing needs.



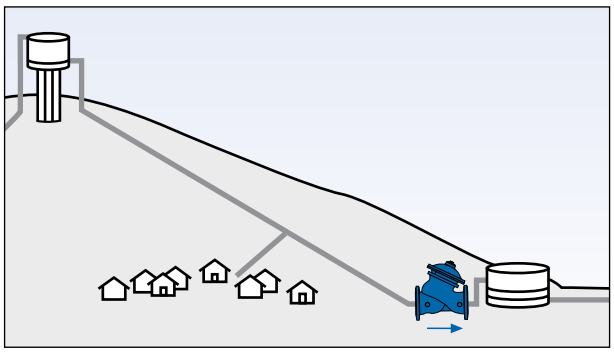
Pumping to Uphill Reservoir

In a reservoir system where a **pump provides pressure**, consumers are prioritized over reservoir filling by installing the **Model 753-66** Level Control and Pressure Sustaining Valve.

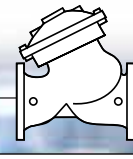


Gravity Filling a Downhill Reservoir

Where a **reservoir provides pressure** to consumers and fills a low lying reservoir, the consumers should be prioritized over filling the lower reservoir.
Defining the pressure set point for the standard level control and pressure sustaining valve is usually impossible, as there is only a very small potential differential pressure to operate the valve.
The solution: Rather than controlling the pressure during filling, control the filling flow ensuring sufficient pressure for consumers.
Install the **Model 757-66-U** Level and Flow Control Valve.



BERMAD Waterworks



700 Series

Technical Data

Size Range: DN40-900 ; 1½–36”
End Connections (Pressure Ratings):
Flanged: ISO PN16, PN25 (ANSI Class 150, 300)
Threaded: BSP or NPT
Others: Available on request
Valve Patterns: “Y” (globe) & angle, globe (DN600-900 ; 24”-36”)
Working Temperature: Water up to 80°C ; 180°F
Standard Materials:
Body & Actuator: Ductile Iron
Internals: Stainless Steel, Bronze & coated Steel
Diaphragm: Synthetic Rubber Nylon fabric-reinforced
Seals: Synthetic Rubber
Coating: Fusion Bonded Epoxy, RAL 5005 (Blue) approved for drinking water or Electrostatic Polyester Powder

Differential Pressure Calculation

$$\Delta P = \left(\frac{Q}{(Kv;Cv)}\right)^2$$

ΔP = Differential Pressure for fully open valve (bar; psi)

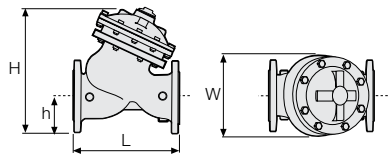
Q = Flow rate (m^3/h; gpm)

Kv = Metric system - valve flow coefficient (flow in m^3/h at 1 bar ΔP with 15°C water)

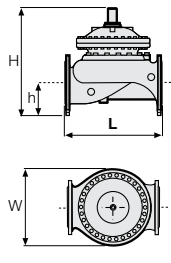
Cv = US system - Valve flow coefficient (flow in gpm at 1 psi ΔP with 60°F water)
Cv = 1.155 Kv

Flow Data & Dimensions Table

		DN / Size	40	1.5”	50	2”	65	2.5”	80	3”	100	4”	150	6”	200	8”	250	10”	300	12”	350	14”	400	16”	450	18”	500	20”
Flow Data	700ES	Kv / Cv - Flat	54	62	57	66	60	69	65	75	145	167	395	456	610	705	905	1,045	1,520	1,756	-	-	2,250	2,599	-	-	4,070	4,701
		Kv / Cv - V-Port	46	53	48	56	51	59	55	64	123	142	336	388	519	599	769	888	1,292	1,492	-	-	1,913	2,209	-	-	3,460	3,996
	700 & 700EN	Kv / Cv - “Y” Flat	42	49	50	58	55	64	115	133	200	230	460	530	815	940	1,250	1,440	1,850	2,140	1,990	2,300	3,310	3,820	3,430	3,960	3,550	4,100
		Kv / Cv - “Y” V-Port	36	41	43	49	47	54	98	113	170	200	391	450	693	800	1,063	1,230	1,573	1,820	1,692	1,950	2,814	3,250	2,916	3,370	3,018	3,490
700-ES	PN16; 25	L (mm / inch)	230	9.1	230	9.1	290	11.4	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	1,100	43.3	-	-	1,250	49.2
		W (mm / inch)	150	5.9	165	6.5	185	7.3	200	7.9	235	9.3	300	11.8	360	14.2	425	16.7	530	20.9	-	-	626	24.6	-	-	838	33
		h (mm / inch)	80	3.1	90	3.5	100	3.9	105	4.1	125	4.9	155	6.1	190	7.5	220	8.7	250	9.8	-	-	320	12.6	-	-	385	15.2
		H (mm / inch)	240	9.4	250	9.8	250	9.8	260	10.2	320	12.6	420	16.5	510	20.1	605	23.8	725	28.5	-	-	895	35.2	-	-	1,185	46.7
		Weight (Kg/lb)	10	22	10.8	23.8	13.2	29	15	33	26	57.2	55	121	95	209	148	326	255	561	-	-	437	960	-	-	1,061	2,334
700-EN	PN16; 25	L (mm / inch)	-	-	-	-	-	-	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	-	-	-	-	-	-
		W (mm / inch)	-	-	-	-	-	-	200	7.9	235	9.3	320	12.6	390	15.4	480	18.9	550	21.7	-	-	-	-	-	-	-	-
		h (mm / inch)	-	-	-	-	-	-	100	3.9	118	4.6	150	5.9	180	7.1	213	8.4	243	9.6	-	-	-	-	-	-	-	-
		H (mm / inch)	-	-	-	-	-	-	305	12	369	14.5	500	19.7	592	23.3	733	28.9	841	33.1	-	-	-	-	-	-	-	-
		Weight (Kg/lb)	-	-	-	-	-	-	21	46.2	31	68.2	70	154	115	253	198	436	337	741	-	-	-	-	-	-	-	-
700 Flanged	“Y” PN16 Class 150	L (mm / inch)	205	8.1	210	8.3	222	8.7	250	9.8	320	12.6	415	16.3	500	19.7	605	23.8	725	28.5	733	28.9	990	39	1,000	39.4	1,100	43.3
		W (mm / inch)	155	6.1	165	6.5	178	7	200	7.9	223	8.8	320	12.6	390	15.4	480	18.9	550	21.7	550	21.7	740	29.1	740	29.1	740	29.1
		h (mm / inch)	78	3.1	83	3.3	95	3.7	100	3.9	115	4.5	143	5.6	172	6.8	204	8	242	9.5	268	10.6	300	11.8	319	12.6	358	14.1
		H (mm / inch)	239	9.4	244	9.6	257	10.1	305	12	366	14.4	492	19.4	584	23	724	28.5	840	33.1	866	34.1	1,108	43.6	1,127	44.4	1,167	45.9
		Weight (Kg/lb)	9.1	20	10.6	23	13	29	22	49	37	82	75	165	125	276	217	478	370	816	381	840	846	1,865	945	2,083	962	2,121
	“Y” PN25 Class 300	L (mm / inch)	205	8.1	210	8.3	222	8.7	264	10.4	335	13.2	433	17	524	20.6	637	25.1	762	30	767	30.2	1,024	40.3	1,030	40.6	1,136	44.7
		W (mm / inch)	155	6.1	165	6.5	185	7.3	207	8.1	250	9.8	320	12.6	390	15.4	480	18.9	550	21.7	570	22.4	740	29.1	740	29.1	750	29.5
		h (mm / inch)	78	3.1	83	3.3	95	3.7	105	4.1	127	5	159	6.3	191	7.5	223	8.8	261	10.3	295	11.6	325	12.8	357	14.1	389	15.3
		H (mm / inch)	239	9.4	244	9.6	257	10.1	314	12.4	378	14.9	508	20	602	23.7	742	29.2	859	33.8	893	35.2	1,133	44.6	1,165	45.9	1,197	47.1
		Weight (Kg/lb)	10	22	12.2	27	15	33	25	55	43	95	85	187	146	322	245	540	410	904	434	957	900	1984	967	2,132	986	2,174
700 Threaded	“Y” PN16; 25 Class 150; 300	L (mm / inch)	155	6.1	155	6.1	212	8.3	250	9.8																		
		W (mm / inch)	122	4.8	122	4.8	122	4.8	163	6.4																		
		h (mm / inch)	40	1.6	40	1.6	48	1.9	56	2.2																		
		H (mm / inch)	201	7.9	202	8	209	8.2	264	10.4																		
		Weight (Kg/lb)	5.5	12	5.5	12	8	18	17	37																		
	Angle PN16; 25 Class 150; 300	L (mm / inch)	-	-	121	4.8	140	5.5	159	6.3																		
		W (mm / inch)	-	-	122	4.8	122	4.8	163	6.4																		
		R (mm / inch)	-	-	40	1.6	48	1.9	55	2.2																		
		h (mm / inch)	-	-	83	3.3	102	4	115	4.5																		
		H (mm / inch)	-	-	225	8.9	242	9.5	294	11.6																		
		Weight (Kg/lb)	-	-	5.5	12	7	15	15	33																		



		DN / Size	600	24”	700	28”	750	30”	800	32”	900	36”
Globe PN16 Class 150		L (mm / inch)	1,450	57.1	1,650	65	1,750	68.9	1,850	72.8	1,850	72.8
		W (mm / inch)	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2
		h (mm / inch)	470	18.5	490	19.3	520	20.5	553	21.8	600	23.6
		H (mm / inch)	1,965	77.4	1,985	78.1	2,015	79.3	2,048	80.6	2,095	82.5
		Weight (Kg/lb)	3,250	7,150	3,700	8,140	3,900	8,580	4,100	9,020	4,250	9,350
Globe PN25 Class 300		L (mm / inch)	1,500	59.1	1,650	65	1,750	68.9	1,850	72.8	1,850	72.8
		W (mm / inch)	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2
		h (mm / inch)	470	18.5	490	19.3	520	20.5	553	21.8	600	23.6
		H (mm / inch)	1,965	77.4	1,985	78.1	2,015	79.3	2,048	80.6	2,095	82.5
		Weight (Kg/lb)	3,500	7,700	3,700	8,140	3,900	8,580	4,100	9,020	4,250	9.370



Specify when ordering:

- Size
- Main model
- Additional features
- Pattern
- Body material
- End connection
- Coating
- Voltage & main valve position
- Tubing & Fittings materials
- Operational data (according to model)
- Pressure data
- Flow data
- Reservoir level data
- Settings

* Use Bermad’s Waterworks Ordering Guide

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