Level Control Valve
with Altitude Pilot

Model 750-80-X

- High level reservoirs & water towers
- Energy cost critical systems
- Systems with poor water quality
- Inherent refreshing
- Level sustaining at reservoir outlet

The Model 750-80-X Level Control Valve is a hydraulically controlled, diaphragm actuated control valve that shuts off at pre-set reservoir high level and fully opens in response to an approximately one meter (three foot) level drop, as sensed by the 3-Way altitude pilot mounted on the main valve.

Features and Benefits

- Line pressure driven – Independent operation
- Bi-level altitude pilot
  - No float, simple installation
  - On/Off service
  - No cavitation damage
  - Suitable for low quality water
  - Reservoir inherent refreshing
- **Double chamber design**
  - Moderated valve reaction
  - Protected diaphragm
- **External installation**
  - Easy access to valve
  - Easy level setting
  - Less wear and tear
- **Balanced seal disk –** High flow capacity
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features

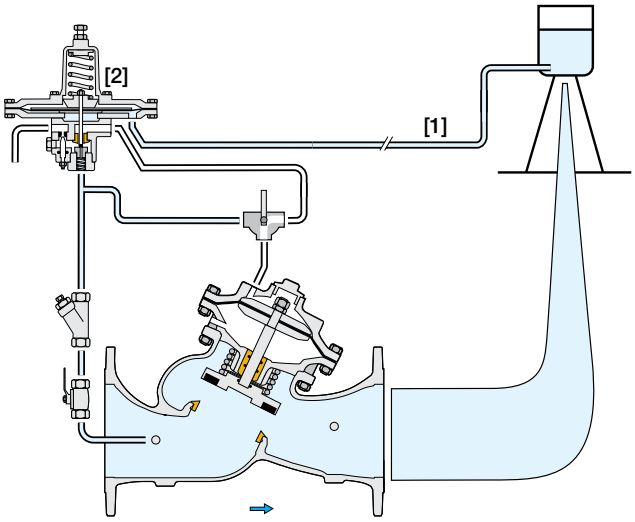
Major Additional Features

- Modulating altitude control – **750-82**
- Pressure sustaining (for 750-80-X) – **753-80-X**
- Pressure sustaining (for 750-82) – **753-82**
- Bi-directional flow – **750-87-X (780-70-X)**
- Full powered opening & closing – **750-80-B**
- Closing surge prevention – **750-80-49**
- Bi-level altitude control – **750-86**
- Level sustaining with high sensitivity pilot – **75A-83**

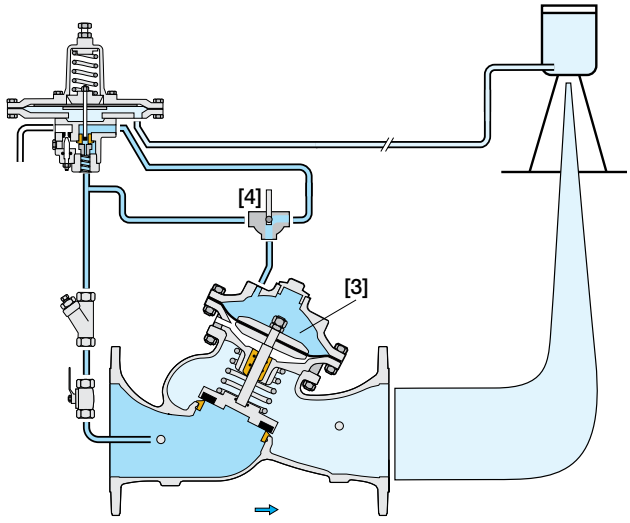
See relevant BERMAD publications.

Operation

The Model 750-80-X is a pilot controlled valve equipped with an adjustable, 3-Way altitude pilot. The pilot senses the static head of the reservoir level via a tube **[1]** connected to a “still point” at the bottom of the reservoir.
Should static head rise to pilot setting, the pilot **[2]** applies pressure to the upper control chamber **[3]** via cock valve **[4]**, powering the main valve to shut off.
Should static head fall below pilot setting approximately 1m (3 ft), the pilot vents the upper control chamber, causing the main valve to fully open.
The 3-Way cock valve **[4]** enables manual closing of the main valve.
For 10” valves and larger, an accelerator quickens valve response.



Low Level – Open Valve



High Level – Closed Valve

Pilot System Specifications

Standard Materials:

Pilot:
Body & Cover: Brass or Stainless Steel
Elastomers: Synthetic Rubber
Spring: Galvanized Steel or Stainless Steel
Internal parts: Stainless Steel
Diaphragm Covers: Fusion bonded epoxy coated Steel or Stainless Steel
Tubing & Fittings:
Stainless Steel 316 or Copper & Brass Open
Accessories:
Stainless Steel 316, Brass and Synthetic Rumersbber Elasto

Altitude Adjustment Range:

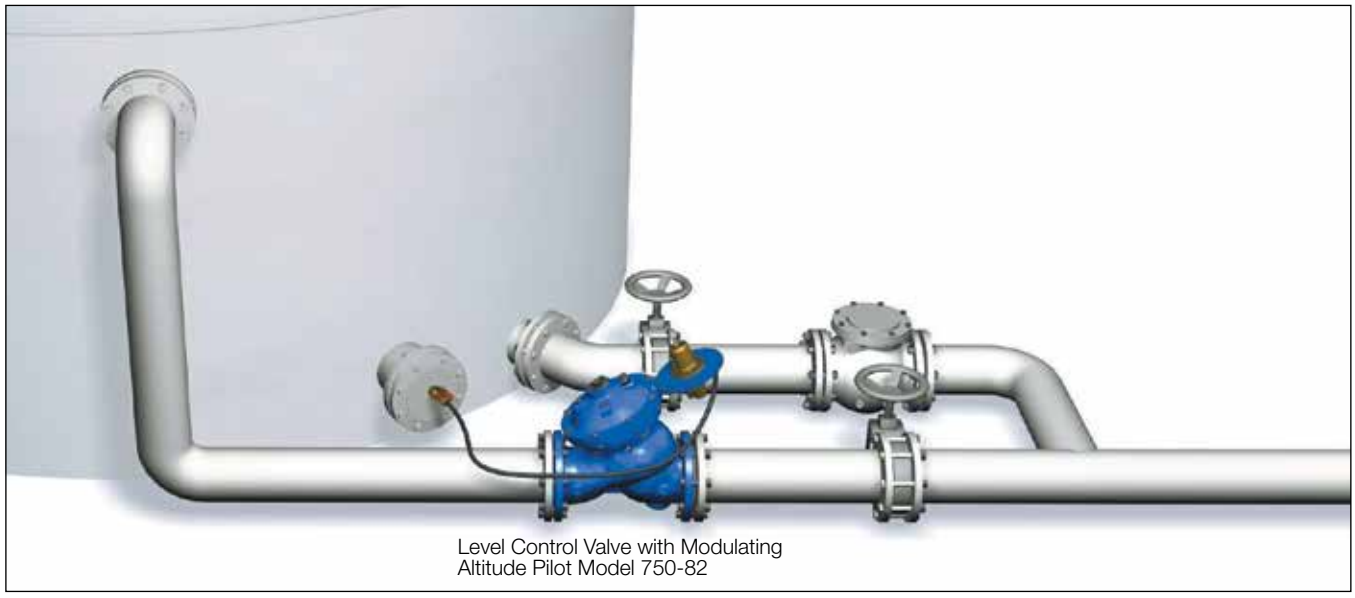
Code	Meter	Feet
M1	2-6	7-20
M6	2-14	7-46
M5	5-22	17-72
M4	15-35	49-115
M8	25-70	82-230

Notes:

- Shut-off level repeatability: 10 cm (4”)
- Re-opening level: approx. 1m (3 ft) below shut-off level
- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec
- Minimum operating pressure: 0.7 bar ; 10 psi. For lower pressure requirements consult factory

"Always Full" - Shallow Reservoirs

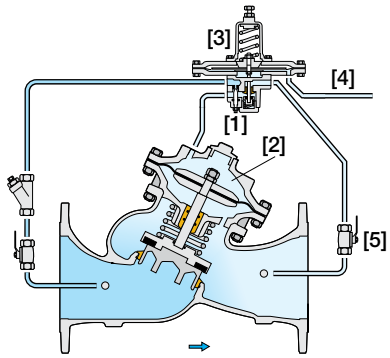
In these reservoirs, the water level should be kept as constant as possible.
The Level Control Valve with modulating altitude pilot **Model 750-82** is well suited to fulfill this condition.
The altitude pilot is highly sensitive to changes and accurately maintains level within a few centimeters.
To do so, the sensing tube end must be connected to a "still point" at the bottom of the reservoir.



Level Control Valve with Modulating
Altitude Pilot Model 750-82

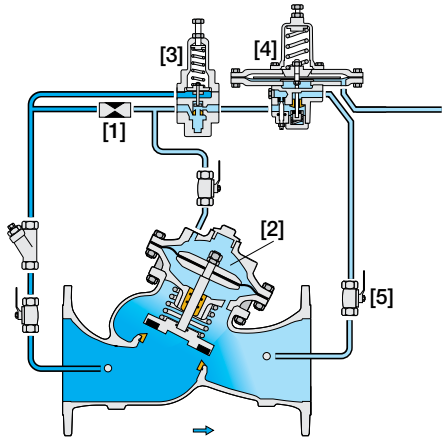
Level Control Valve with Modulating Altitude Pilot Model 750-82

The Model 750-82 modifies the Model 750-80-X "on-off" feature into a modulating feature to maintain an "always full" reservoir.
The needle valve **[1]** continuously allows flow from valve inlet into the upper control chamber **[2]**. The pilot **[3]** senses static head via a sensing tube **[4]**.
Should the static head rise towards pilot setting, the pilot throttles, causing the main valve to throttle closed, reducing filling rate, and eventually closing drip tight. The downstream cock valve **[5]** enables manual control closing.



Adding the Pressure Sustaining Feature Model 753-82

The Model 753-82 combines the modulating altitude control feature with the Model 730 Pressure Sustaining Valve for applications where prioritizing consumers over reservoir filling is needed.
The restriction **[1]** continuously allows flow from valve inlet into the upper control chamber **[2]**. The pressure sustaining pilot **[3]** and the 2-Way altitude pilot **[4]** control outflow from the upper contro chamber.
When reservoir static head decreases below altitude pilot setting, the main valve modulates open while sustaining pre-set minimum upstream pressure.
The downstream cock valve **[5]** enables manual closing.



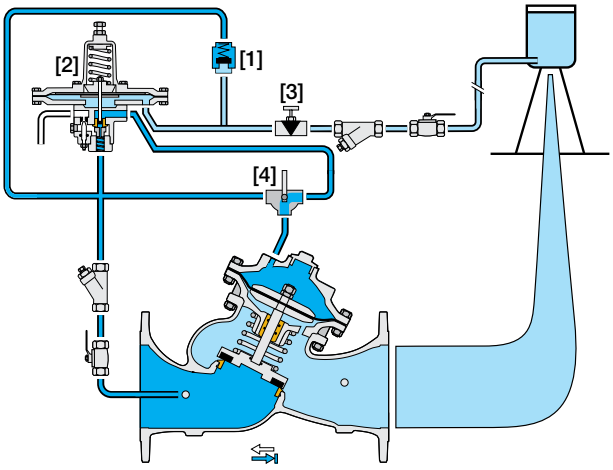
Bi-Directional Flow Level Control Model 750-87-X

The Model 750-87-X modifies the Model 750-80-X to allow bi-directional flow. It saves the need for a line sized, by-pass check valve for reservoirs where the supply line also serves as the outflow line.

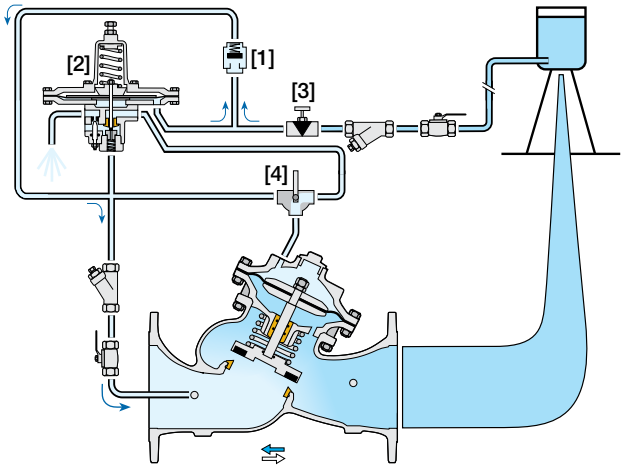
During filling, this valve functions as a standard Model 750-80-X, while the control check valve **[1]** prevents upstream pressure from entering the pilot **[2]** sensing chamber.

Should upstream pressure fall below reservoir static head, the pilot senses “false” low static head, due to the restricted flow released to valve inlet, through the needle valve **[3]**, and the check valve **[1]** The pilot then opens the main valve allowing reverse flow from the reservoir.

The 3-Way cock valve **[4]** enables manual closing of the main valve.



Valve Closed



Reservoir Feeding

Level Sustaining Valve at Reservoir Outlet
Model 75A-83

The Model 75A-83 is an altitude pilot controlled valve designed to maintain minimum reservoir volume.

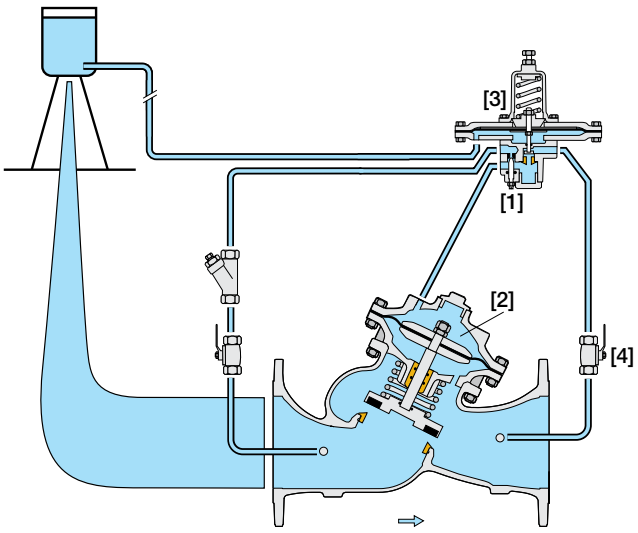
The needle valve **[1]** continuously allows flow from valve inlet into the upper control chamber **[2]**. The pilot **[3]** senses static head from a “still-point” at the bottom of the resrvoir.

Should this head decrease towards pilot setting, the pilot throttles, enabling pressure to accumulate in the upper control chamber causing the main valve to throttle closed and restrict outflow, and eventually close to maintain minimum level.

When reservoir level rises above pilot setting, the pilot releases accumulated pressure from the upper control chamber causing the main valve to modulate open.

To ensure adequate operating pressure, the valve must be positioned sufficiently below the reservoir bottom.

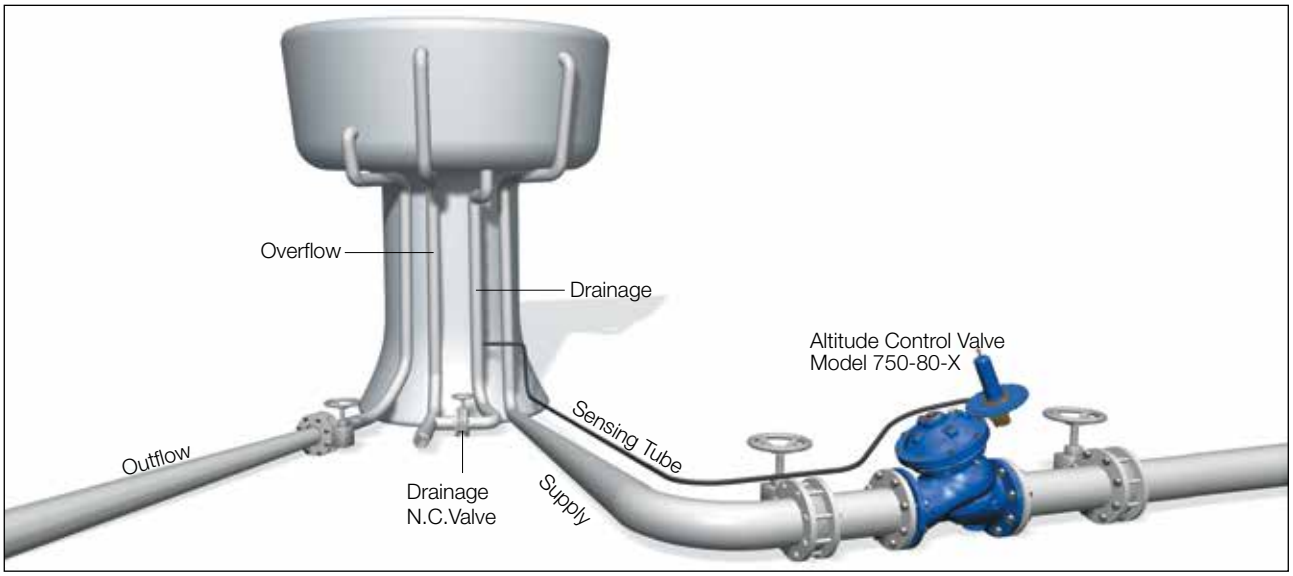
The downstream cock valve **[4]** enables manual closing.



Typical Applications

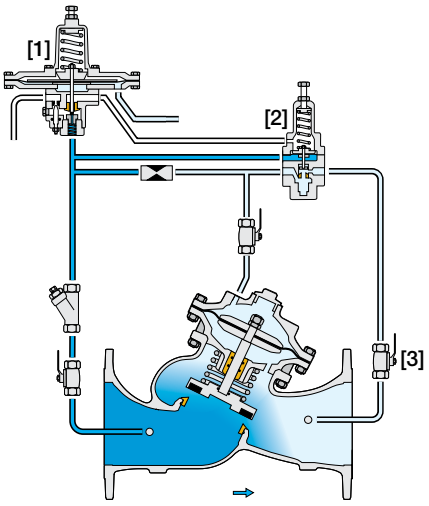
Bi-Level Water Towers

The Model 750-80-X senses the static head of the water level in the tank by means of a high sensitivity pilot. To do so accurately, the sensing tube end must be connected to a “still point” at the bottom of the tank. The drainage pipe provides this “still point,” a location not influenced by flow velocity as in filling and outflow pipes.



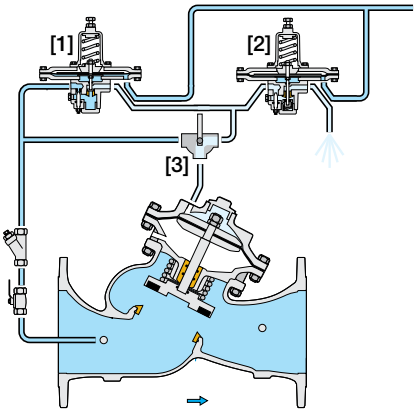
Level Control and Pressure Sustaining Valve with Altitude Pilot Model 753-80-X

The Model 753-80-X adds the altitude control feature to the Model 730 Pressure Sustaining Valve for applications where prioritizing consumers over reservoir filling is needed.
The altitude pilot **[1]** controls the Pressure Sustaining Control Valve by applying pressure to & venting from the pressure sustaining pilot **[2]** sealed spring cell.
Should the altitude pilot sense static head at the setting, it applies pressure to the pressure sustaining pilot spring cell, and the main valve closes. The downstream cock valve **[3]** enables manual closing.

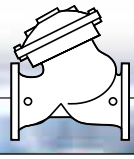


Level Control Valve with Bi-Level Altitude Control Model 750-86

The Model 750-86 adds a low level setting feature to the standard Altitude Control Valve.
A high level pilot **[1]** and a low level pilot **[2]** are adjusted to open at different settings.
Should the static head rise to the closing set point, the high level pilot opens causing the main valve to close.
Should the static head drop to the opening set point, the low level pilot opens causing the main valve to open.
When the level is between pilot settings, both pilots are closed and the main valve remains in its last position.
The 3-Way cock valve **[3]** enables manual closing of the main 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)

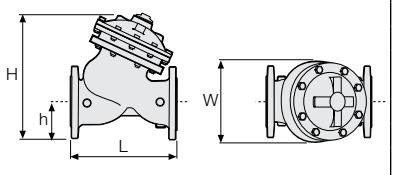
Q = Flow rate (m^3/h; gpm)

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

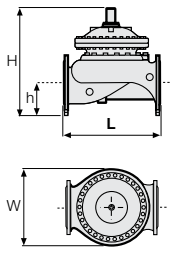
Cv = US system - Valve flow coefficient (flow in gpm at 1 psi ΔP with 60°F water)
Cv = 1.155 Kv

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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