

Pressure Relief/Sustaining Valve

Model 730

- Prioritizing pressure zones
- Ensuring controlled pipeline fill-up
- Preventing pipeline emptying
- Pump overload & cavitation protection
- Safeguarding pump minimum flow
- Excessive line pressure protection

The Model 730 Pressure Relief/Sustaining Valve is a hydraulically operated, diaphragm actuated control valve that can fulfill either of two separate functions. When installed in-line, it sustains minimum pre-set, upstream (back) pressure regardless of fluctuating flow or varying downstream pressure.

When installed as a circulation valve, it relieves excessive line pressure when above maximum pre-set.



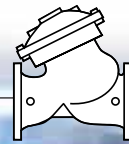
Features and Benefits

- **Line pressure driven** – Independent operation
- **Balanced seal disk** – High relief flow capacity
- **In-line serviceable** – Easy maintenance
- **Double chamber design**
 - Moderated valve reaction
 - Protected diaphragm
- **Flexible design** – Easy addition of features
- **Variety of accessories** – Perfect mission matching
- **“Y” or angle, wide body** – Minimized pressure loss
- **Semi-straight flow** – Non-turbulent flow
- **Stainless Steel raised seat** – Cavitation damage resistant
- **Obstacle free, full bore** – Uncompromising reliability
- **V-Port Throttling Plug** – Low flow stability

Major Additional Features

- UL Listed and FM Approved for fire protection – **FP-730-UL/FM**
- Solenoid control – **730-55**
- Quick pressure relief valve – **730Q**
- Pressure sustaining & reducing valve – **723**
- Check feature – **730-20**
- High sensitivity pilot – **730-12**
- Level control & pressure sustaining valve – **753**
- Pump control & pressure sustaining valve – **743**
- Pump circulation & pressure sustaining valve – **748**
- Electrically selected multi-level settings – **730-45**
- High sensitivity hydraulic positioning – **730-85**
- Electronic pressure sustaining valve – **738-03**

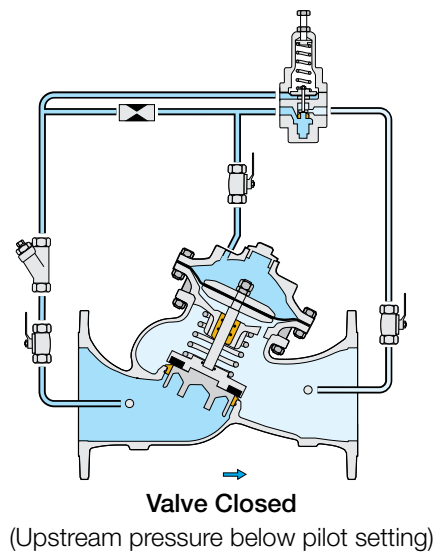
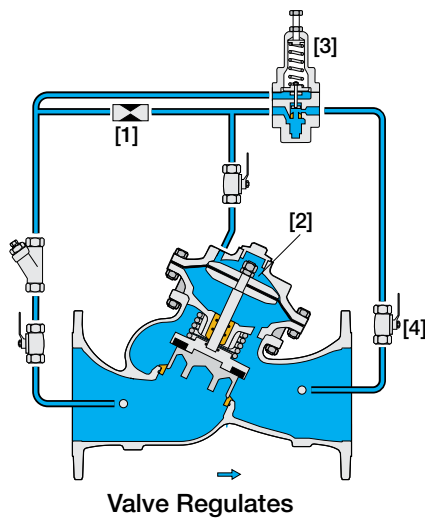
See relevant BERMAD publications.



Operation - Pressure Sustaining (In-Line)

The Model 730 is a pilot controlled valve equipped with an adjustable, 2-Way pressure sustaining pilot. The restriction [1] continuously allows flow from the main valve inlet into the upper control chamber [2]. The pilot [3] senses upstream pressure and should be set to minimum system pressure allowed. Should upstream pressure tend to fall below pilot setting, the pilot throttles, enabling pressure to accumulate in the upper control chamber, causing the main valve to throttle, sustaining upstream (back) pressure at pilot setting. Should upstream pressure be below pilot setting, the pilot closes, causing the main valve to close drip tight. Should upstream pressure tend to rise above pilot setting, the pilot releases accumulated pressure causing the main valve to modulate open.

The downstream cock valve [4] enables manual closing.



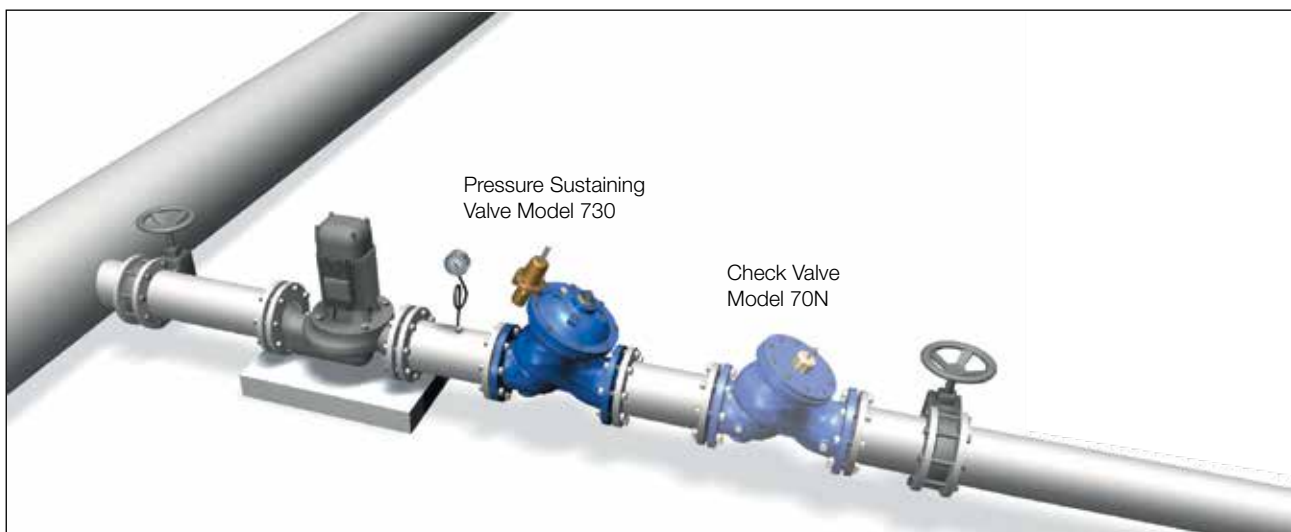
Typical Applications

Pump Overload and Cavitation Protection

The Model 730 sustains pump discharge pressure, preventing pump overload and cavitation damage caused by excessive demand.

By connecting the pilot sensing line to pump suction, the Model 730 becomes Model 730R which sustains pump suction pressure.

Where suction pressure regimes vary, the Model 736 is needed to limit pump flow by sustaining pump differential pressure.

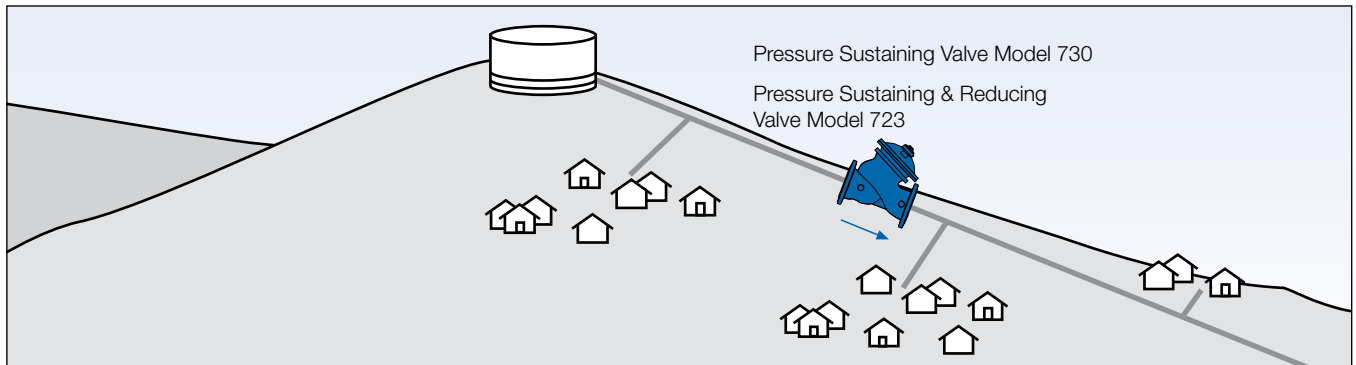




Prioritizing One Zone over Another

This application is usually found in gravity fed systems. The **Model 730** enables prioritizing the higher elevation zone over downhill consumers when they create excessive total demand.

By adding a pressure reducing feature to the primary pressure sustaining function, the Model 730 becomes a **Model 723** that also protects downhill consumers from over pressure during low demand.



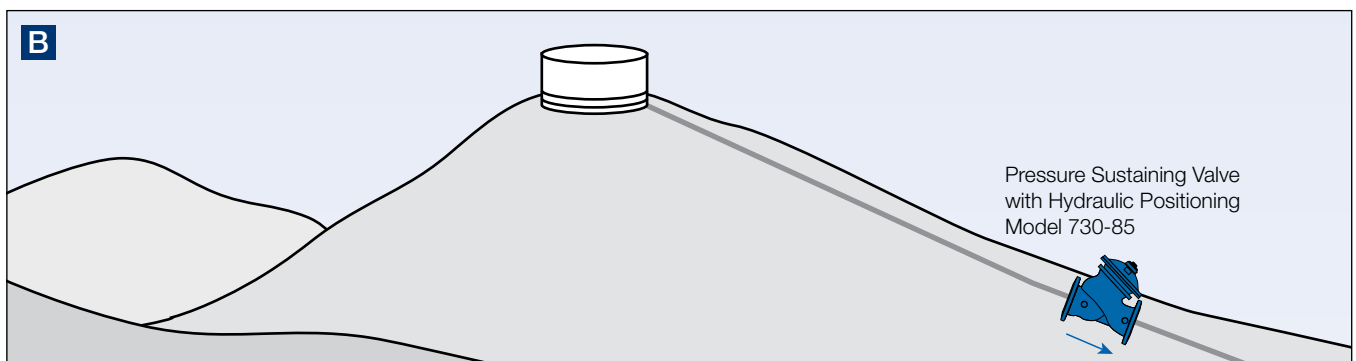
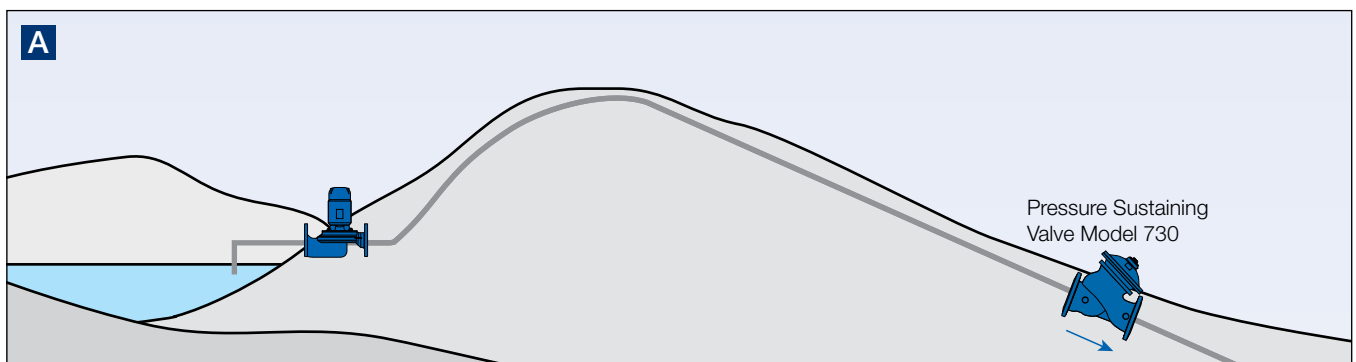
Preventing Line Emptying

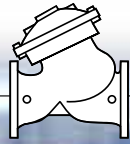
Line emptying presents a serious problem in water distribution networks. Preventing it in downhill networks requires setting the pilot slightly above the elevation differential between the highest point of the line and the valve.

Where a **pump** provides pressure **A**, the relatively high pressure causes the **Model 730** to open wide. When the pump stops, pressure drops below pilot setting and the valve closes drip-tight preventing line emptying.

Where a **reservoir** provides pressure **B**, there is only a small potential for variation in pressure (the difference in high and low reservoir levels). The problem is made worse by having a significant part of that potential pressure lost on line friction. The standard Model 730 might not be enough. The solution is to install a valve with very low head loss, super sensitivity, accuracy and repeatability.

Install the **Model 730-85** pressure sustaining with high sensitivity hydraulic positioning.





Pilot System Specifications

Standard Materials:

Pilot:

Body: Stainless Steel 316 or Bronze

Elastomers: Synthetic Rubber

Spring: Galvanized Steel or Stainless Steel

Tubing & Fittings:

Stainless Steel 316 or Copper & Brass

Accessories:

Stainless Steel 316, Brass and Synthetic Rubber Elastomers

Pilot Adjustment Range:

0.5 to 3.0 bar ; 7 to 40 psi

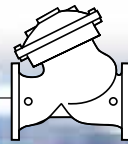
0.8 to 6.5 bar ; 11 to 95 psi

1 to 16 bar ; 15 to 230 psi

5 to 25 bar ; 70 to 360 psi

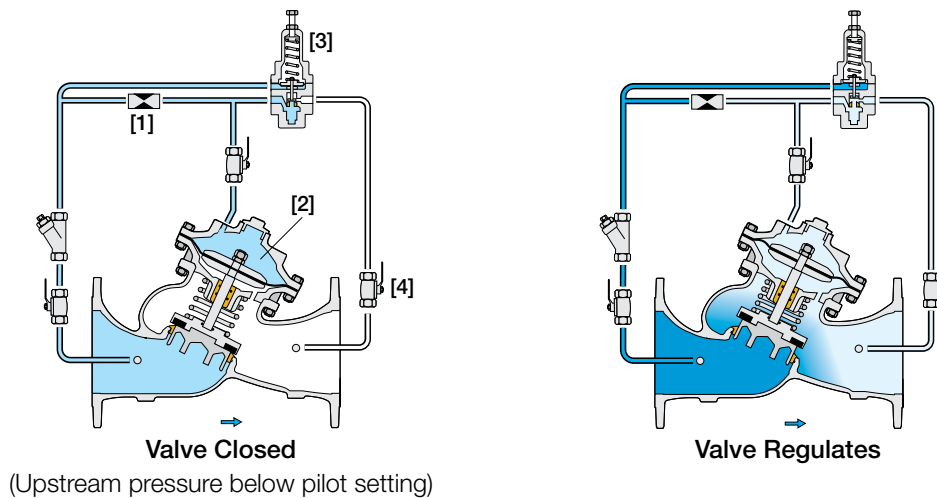
Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis
- 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.



Operation - Pressure Relief (Circulation)

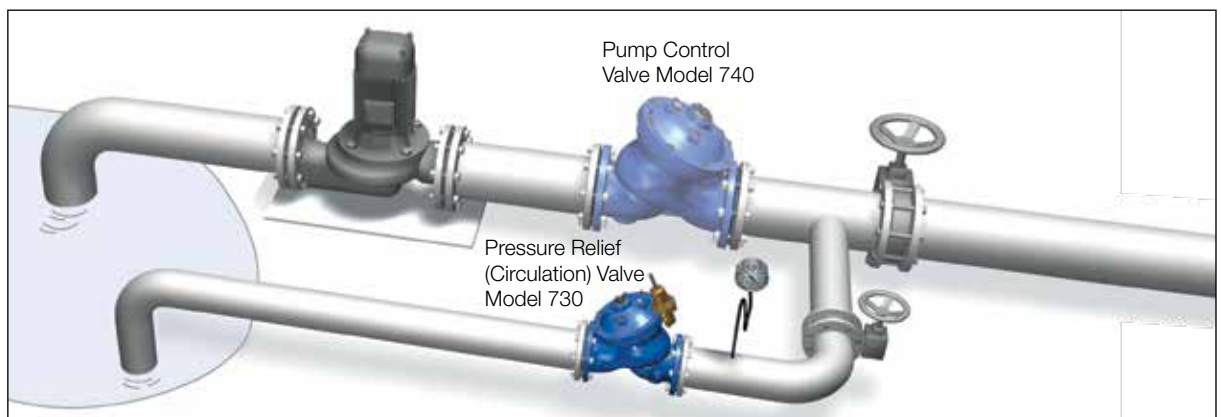
The Model 730 is a pilot controlled valve equipped with an adjustable, 2-Way pressure sustaining pilot. The restriction [1] continuously allows flow from the main valve inlet into the upper control chamber [2]. The pilot [3] senses upstream pressure and should be set slightly above system working pressure. Should upstream pressure rise above pilot setting, the pilot releases pressure from the upper control chamber, causing the main valve to modulate open, relieving excessive upstream pressure. Should upstream pressure fall, the pilot throttles, enabling pressure to accumulate in the upper control chamber, causing the main valve to throttle closed, sustaining upstream (back) pressure at the pilot setting. Should upstream pressure be below pilot setting, the pilot closes, causing the main valve to close drip tight. The downstream cock valve [4] enables manual closing.



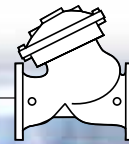
Typical Applications

Safeguarding Pump Minimum Flow

The Model 730 relieves over pressure caused by excessive pump discharge during low demand. To keep a constant discharge pressure, the difference between pumped flow and consumer demand can be circulated back to pump suction.



Circulation valves are often exposed to severe cavitation because valve ΔP and velocity are usually high while downstream pressure is very low. On the other hand, the valves operate under these conditions for relatively short periods. Increased valve durability for applications requiring long operating periods will be achieved by using cavitation resistant materials, adding a downstream orifice, installing an upstream pressure reducing valve, increasing valve size, or any combination of these choices.



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

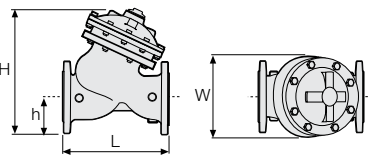
Differential Pressure Calculation

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

ΔP = Differential Pressure for fully open valve (bar; psi)
 Q = Flow rate (m³/h; gpm)
 K_v = Metric system - valve flow coefficient
 (flow in m³/h at 1 bar ΔP with 15°C water)
 C_v = US system - Valve flow coefficient
 (flow in gpm at 1 psi ΔP with 60°F water)
 $C_v = 1.155 K_v$

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	700 & 700ES 700EN	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	
		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	
700 Threaded	"Y" PN16; 25 Class 150, 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	Angle PN16; 25 Class 150, 300	L (mm / inch)	155	6.1	155	6.1	212	8.3	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)	122	4.8	122	4.8	122	4.8	163	6.4	200	7.9	264	10.4	335	13.2	433	17	524	20.6	637	25.1	762	30	767	30.2	1,024	40.3	
		h (mm / inch)	40	1.6	40	1.6	48	1.9	56	2.2	62	2.4	83	3.3	102	4	115	4.5	143	5.6	172	6.8	204	8	242	9.5	268	10.6	
		H (mm / inch)	201	7.9	202	8	209	8.2	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	
		Weight (Kg/lb)	5.5	12	5.5	12	8	18	17	37	37	82	75	165	125	276	217	478	370	816	381	840	846	1,865	945	2,083	962	2,121	



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

		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	

