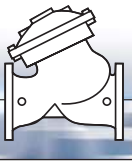


700 Series

Model 730

# Pressure Relief/Sustaining Valve

- 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

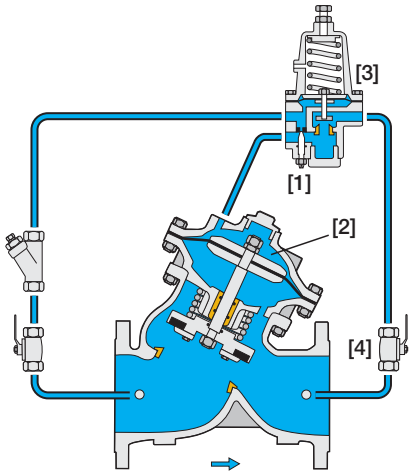
- UL Listed and FM Approved for fire protection – **FP-730-UL/FM**
- Solenoid control – **730-55**
- Quick pressure relief valve – **73Q**
- Pressure sustaining & reducing valve – **723**
- Check feature – **730-20**
- High sensitivity pilot – **730-12**
- Level control & pressure sustaining valve – **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.

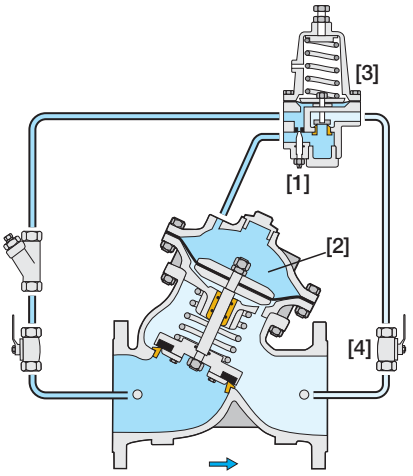
BERMAD

## Operation - Pressure Sustaining (In-Line)

The Model 730 is a pilot controlled valve equipped with an adjustable, 2-Way pressure sustaining pilot.
The needle valve **[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 needle valve controls the closing speed. The downstream cock valve **[4]** enables manual closing.
For sizes 1½" to 4", use pilot #3PB.




**Valve Regulates**

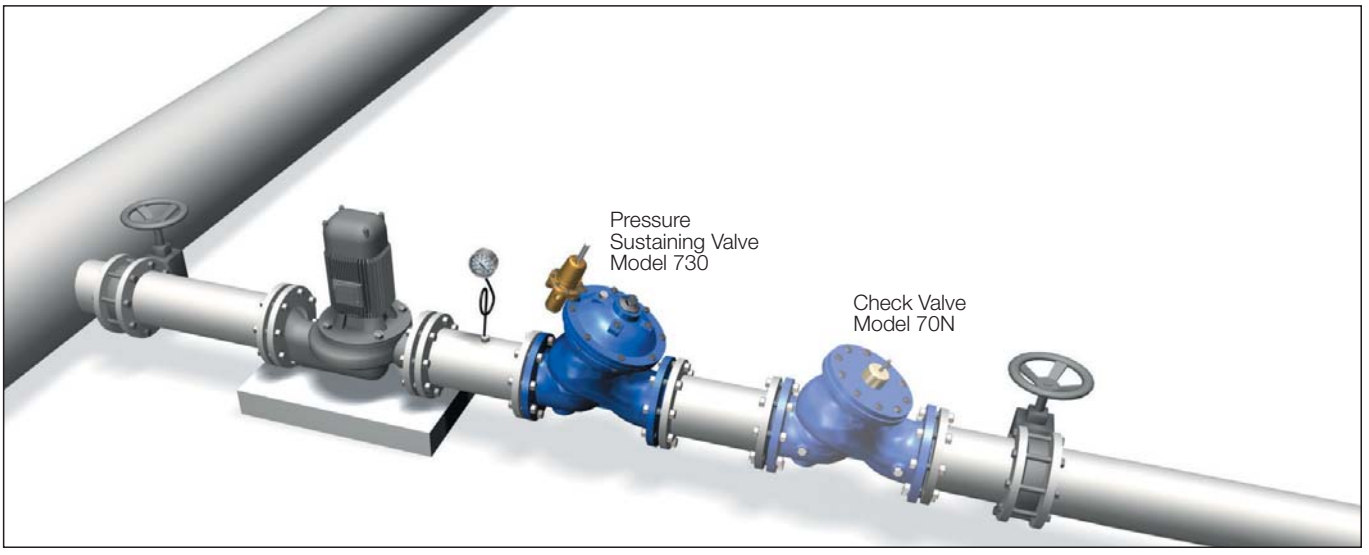



**Valve Closed**
(upstream pressure below pilot setting)

## Typical Applications

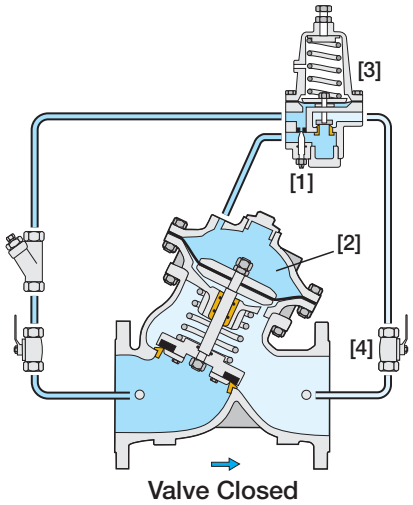
### Pump Overload and Cavitation Protection

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.

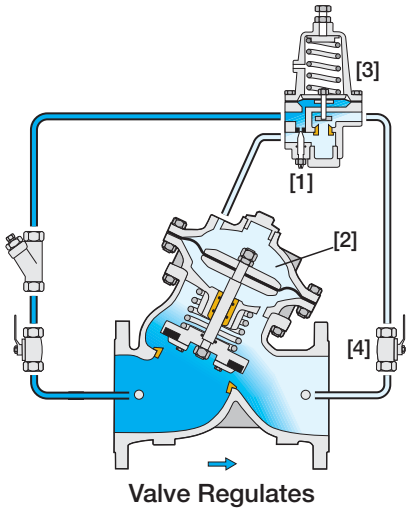


## Operation - Pressure Relief (Circulation)

The Model 730 is a pilot controlled valve equipped with an adjustable, 2-Way pressure sustaining pilot.
The needle valve **[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 needle valve controls the closing speed. The downstream cock valve **[4]** enables manual closing.
For sizes 1½" to 4", use pilot #3PB.




**Valve Closed**
(upstream pressure is below setting)

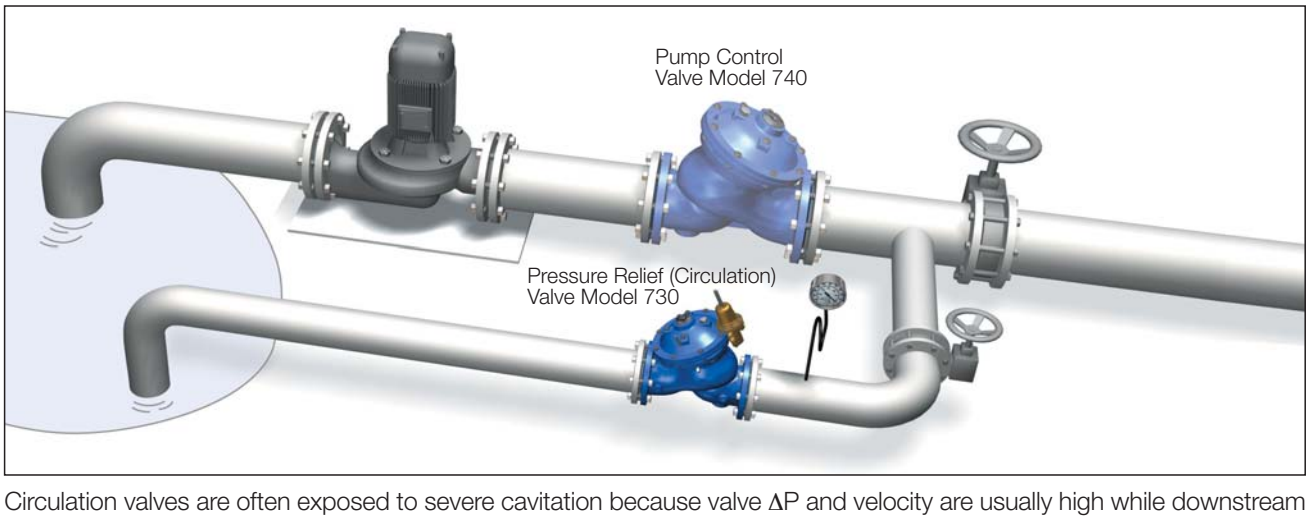



**Valve Regulates**

## Typical Applications

### Safeguarding Pump Minimum Flow

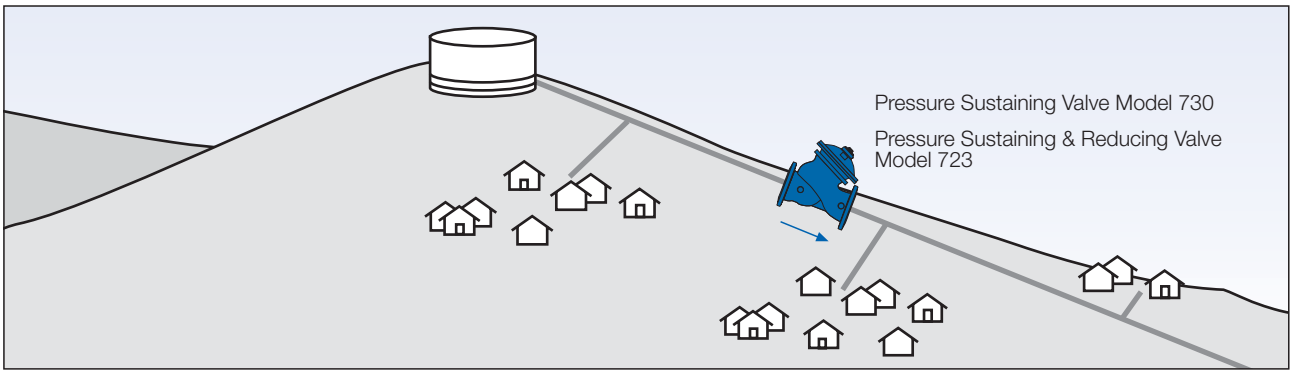
The Model 730 relieves over pressure caused by excessive pump discharge during low demand. To keep a constant discharge pressure, the difference between pumped flow and consumer demand can be circulated back to pump suction.




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.

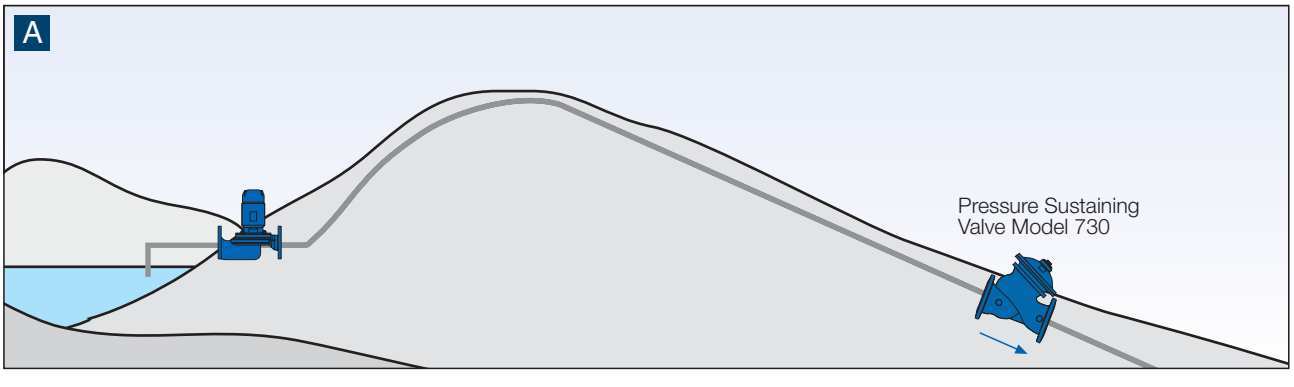
### Prioritizing One Zone over Another

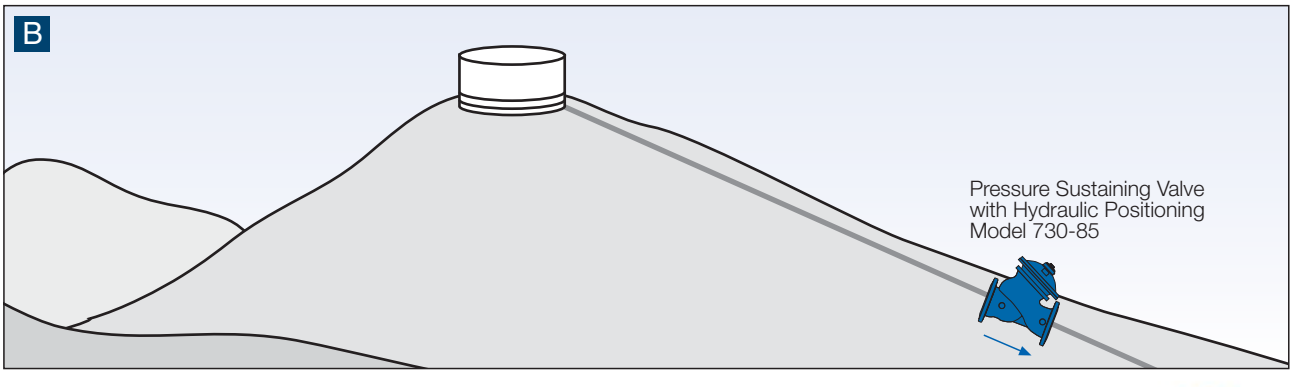
This application is usually found in gravity fed systems. The **Model 730** enables prioritizing the higher elevation zone over downhill consumers when they create excessive total demand.
By adding a pressure reducing feature to the primary pressure sustaining function, the Model 730 becomes a **Model 723** that also protects downhill consumers from over pressure during low demand.

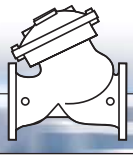



### Preventing Line Emptying

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.







## Engineer Specifications

The Pressure Relief/Sustaining Valve shall fulfill either of two separate functions.
When installed in-line, it shall sustain minimum pre-set, upstream (back) pressure regardless of fluctuating flow or varying downstream pressure.
When installed as a circulation valve, it shall relieve excessive line pressure when above maximum pre-set.

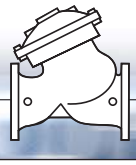
**Main Valve:** The main valve shall be a center guided, diaphragm actuated, globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs. The body and cover shall be ductile iron. All external bolts, nuts, and studs shall be Duplex® coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

**Actuator:** The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.

**Control System:** The control system shall consist of a 2-Way adjustable, direct acting pressure sustaining pilot valve, a needle valve, isolating cock valves, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted to customer requirements.

**Quality Assurance:** The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The main valve shall be certified as a complete drinking water valve according to NSF, WRAS, and other recognized standards.

# BERMAD Waterworks



## 700 Series

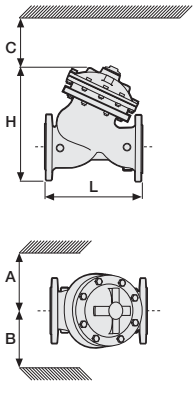
### Model 730

## Technical Data

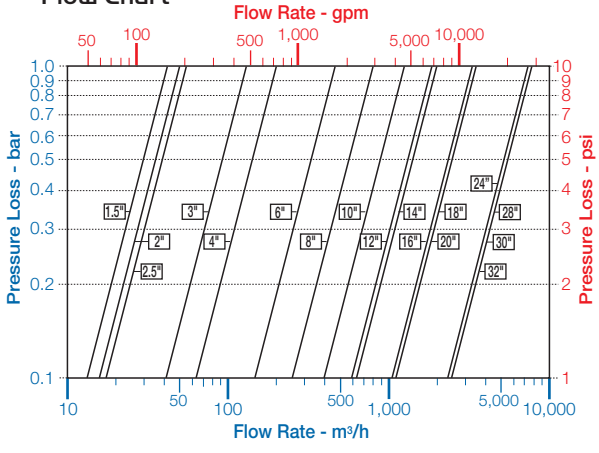
### Dimensions and Weights

| Size | | A, B | | C | | L | | H | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | kg | lbs |
| 40 | 1½" | 350 | 14 | 180 | 7 | 205 | 8.1 | 239 | 9.4 | 9.1 | 20 |
| 50 | 2 | 350 | 14 | 180 | 7 | 210 | 8.3 | 244 | 9.6 | 10.6 | 23 |
| 65 | 2½" | 350 | 14 | 180 | 7 | 222 | 8.7 | 257 | 10.1 | 13 | 29 |
| 80 | 3" | 370 | 15 | 230 | 9 | 250 | 9.8 | 305 | 12.0 | 22 | 49 |
| 100 | 4" | 395 | 16 | 275 | 11 | 320 | 12.6 | 366 | 14.4 | 37 | 82 |
| 150 | 6" | 430 | 17 | 385 | 15 | 415 | 16.3 | 492 | 19.4 | 75 | 165 |
| 200 | 8" | 475 | 19 | 460 | 18 | 500 | 19.7 | 584 | 23.0 | 125 | 276 |
| 250 | 10" | 520 | 21 | 580 | 23 | 605 | 23.8 | 724 | 28.5 | 217 | 478 |
| 300 | 12" | 545 | 22 | 685 | 27 | 725 | 28.5 | 840 | 33.1 | 370 | 816 |
| 350 | 14" | 545 | 22 | 685 | 27 | 733 | 28.9 | 866 | 34.1 | 381 | 840 |
| 400 | 16" | 645 | 26 | 965 | 38 | 990 | 39.0 | 1108 | 43.6 | 846 | 1865 |
| 450 | 18" | 645 | 26 | 965 | 38 | 1000 | 39.4 | 1127 | 44.4 | 945 | 2083 |
| 500 | 20" | 645 | 26 | 965 | 38 | 1100 | 43.3 | 1167 | 45.9 | 962 | 2121 |

Data is for Y-pattern, flanged, PN16 valves
Weight is for PN16 basic valves
"C" enables removing the actuator in one unit
"L", ISO standard lengths available
For more dimensions and weights tables, refer to Engineering Section




### Flow Chart




Data is for Y-pattern, flat disk valves
For more flow charts, refer to Engineering Section

### Main Valve

**Valve Patterns:** "Y" (globe) & angle
**Size Range:** 1½–32" (40-800 mm)
**End Connections (Pressure Ratings):**
**Flanged:** ISO PN16, PN25
(ANSI Class 150, 300)
**Threaded:** BSP or NPT
**Others**: Available on request
**Working Temperature:**
Water up to 80°C (180°F)
**Standard Materials:**
**Body & Actuator:** Ductile Iron
**Internals:**
Stainless Steel, Bronze & coated Steel
**Diaphragm:**
NBR Nylon fabric-reinforced
**Seals:** NBR
**Coating:**
Fusion Bonded Epoxy, RAL 5005 (Blue)
NSF & WRAS approved or Electrostatic
Polyester Powder, RAL 6017 (Green)

### Control System

**Standard Materials:**
**Accessories:**
Bronze, Brass, Stainless Steel & NBR
**Tubing:** Copper or Stainless Steel
**Fittings:** Forged Brass or Stainless Steel
**Pilot Standard Materials:**
**Body:** Brass, Bronze or Stainless Steel
**Elastomers:** NBR
**Springs:** Galvanized Steel or Stainless Steel
**Internals:** Stainless Steel

### Pilot Valve Selection

| Valve Size | Pilot Setting (bar) | Pilot Type | | |
|---|---|---|---|---|
| | | #3PB | #3 | #3HC |
| 1½-4" | <15 | ■ | | |
| 40-250 mm | >15 | | ● | |
| 6-14" | <15 | | ■ | |
| 150-350 mm | >15 | | ● | |
| 16 -32" | <15 | | | ■ |
| 400-800 mm | >15 | | | ● |

■ Standard model ● with high pressure setting kit

## How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide)

| Sector | Size | Primary Feature | Additional Feature | Pattern | Body Material | End Connections | Coating | Voltage & Position | Tubing & Fittings | Additonal Attributes |
|---|---|---|---|---|---|---|---|---|---|---|
| WW | 6" | 730 | 00 | Y | C | 16 | EB | – | CB | I |

**Sector:** WW — Waterworks

**Size:** 6" — 1½ - 32"

**Primary Feature:** 730 — Pressure Relief/Sustaining

**Additional Feature:** 00

| | |
|---|---|
| No Additional Feature | 00 |
| High sensitivity pilot | 12 |
| Check Valve | 20 |
| Solenoid Controlled & Check Valve | 25 |
| Multi-Setting Levels - Electrically Selected | 45 |
| Closing Surge Prevention | 49 |
| Hydraulic Control | 50 |
| Solenoid Controlled | 55 |
| Electric Override | 59 |
| High sensitivity hydraulic positioning | 85 |

Multiple choices permitted

**Pattern:** Y

| | |
|---|---|
| Oblique (up to 20") | Y |
| Angle (up to 18") | A |
| Globe (24-32" only) | G |

**Body Material:** C

| | |
|---|---|
| Ductile Iron Standard | C |
| Cast Steel | S |
| St. Steel 316 | N |
| Nickel Alumin. Bronze | U |

**End Connections:** 16

| | |
|---|---|
| ISO-16 | 16 |
| ISO-25 | 25 |
| ANSI-150 | A5 |
| ANSI-300 | A3 |
| JIS-16 | J6 |
| JIS-20 | J2 |

**Coating:** EB

| | |
|---|---|
| Epoxy FB Blue | EB |
| Polyester Green | PG |
| Polyester Blue | PB |
| Uncoated | UC |

**Voltage & Position:** –

| | |
|---|---|
| 24VAC/50Hz - N.C. | 4AC |
| 24VAC/50Hz - N.O. | 4AO |
| 24VDC - N.C. | 4DC |
| 24VDC - N.O. | 4DO |
| 24VDC - L.P. | 4DP |
| 220VAC/50-60Hz N.C. | 2AC |
| 220VAC/50-60Hz N.O. | 2AO |

Use when additional electric control feature is selected

**Tubing & Fittings:** CB

| | |
|---|---|
| Copper Tubing & Brass Fittings | CB |
| Plastic Tubing & Brass Fittings | PB |
| St. St. 316 Tubing & Fittings | NN |

**Additonal Attributes:** I

| | |
|---|---|
| Valve Position Indicator | I |
| Large Control Filter | F |
| V-Port Throttling Plug | V |
| Electric Limit Switch | S |
| 3-Way Control Loop | X |
| Valve Position Transmitter | Q |
| St. St. 316 Control Accessories | N |
| St. St. 316 Internal Trim (Closure & Seat) | T |
| St. St. 316 Actuator Internal Assembly | D |
| Delrin Bearing | R |
| Elastomers for Seals & Diaphragm | E |
| Pressure Gauge | 6 |

Multiple choices permitted

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