

# Pilots Specifications

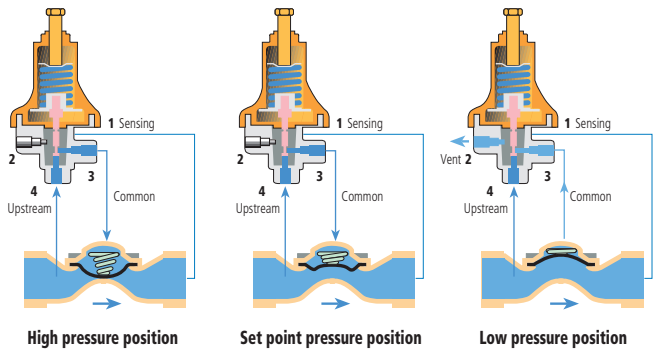


- P-21** 2-way Pressure Reducing metal pilot. 7-230 PSI (0.5-16 bar)
- P-22** 2-way Pressure Sustaining metal pilot. 7-230 PSI (0.5-16 bar)
- P-23** 2-way Quick Relief metal pilot. 7-230 PSI (0.5-16 bar)
- P-24** Altitude metal pilot. 7-230 PSI (0.5-16 bar)
- P-31** 3-way Pressure Reducing/Sustaining plastic pilot. 7-145 PSI (0.5-10 bar)
- P-31D** 3-way differential pressure plastic pilot. 7-145 PSI (0.5-10 bar)



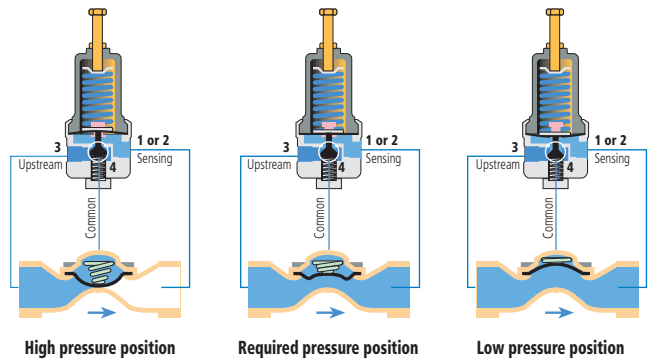
| Port | Pressure Reducing    | Pressure Sustaining |
|------|----------------------|---------------------|
| 1    | Sensing / Downstream | Sensing / Upstream  |
| 2    | Vent                 | Pressure / Upstream |
| 3    | Control Chamber      | Control Chamber     |
| 4    | Pressure / Upstream  | Vent                |

## Principal Operation 3-way Pressure Reducing



| Port   | Pressure Reducing    |
|--------|----------------------|
| 1 or 2 | Sensing / Downstream |
| 3      | Pressure / Upstream  |
| 4      | Control Chamber      |

## Principal Operation 2-way Pressure Reducing



# Pressure Reducing Valve

## Applications

Oval reducing configurations for general water supply systems with medium pressure rating. The plastic pilot model is best for irrigation and low-pressure applications. The plastic materials and straightforward design provide high corrosion resistance and cost-effective prices. The 2-way pilot configuration, together with the unique diaphragm, enables smooth and precise pressure control. Use Oval valves for domestic, water works, and filtration networks.

## Description

Oval valves are piloted hydraulic valves activated by line pressure. The pilot valve has a spring-loaded diaphragm that is sensitive to downstream pressure. The pilot's spring is preset to the desired reduced pressure. The pilot valve maintains a constant downstream pressure by gradually opening and closing the Oval valves at any flow rate.

## Available Models

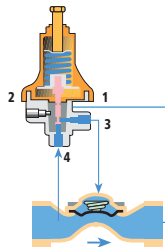
- 3-way Pressure Reducing Valve for sizes 2" -6" with pressure ratings up to 145 PSI (10 bars).
- 2-way Pressure Reducing Valve with pressure rating up to 232 PSI (16 bars).

## Adjustment

- Adjust the reduced pressure set point with the adjusting screw on the pilot.

## Function

The Oval Pressure Reducing Valve is activated by line pressure and controlled by the pilot valve. The pilot includes a spring-loaded diaphragm that is exposed to the downstream pressure. The displacement of the membrane due to downstream fluctuation defines the flow direction inside the pilot. When the downstream pressure is lower than desired, the valve is automatically directed to open. In the reverse case, it is automatically directed to close. When line pressure is inserted into the control chamber of the valve (above its diaphragm) the valve closes. When the control chamber drains, the valve opens as a result of the line pressure from below its diaphragm. In two-way configurations, the control chamber drains downstream, enabling faster reaction time and gradual opening without water discharge.

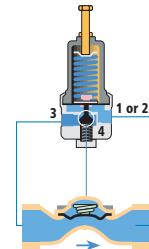


### Control Mode – 3-way Plastic Pilot

**Manual:** Use the three-way selector to close or open the valve by turning the handle to **C** (closed) or **O** (open) positions.

**Automatic:** Position the three-way selector handle to A (automatic). When the downstream pressure is lower than that of the pilot spring, the valves control chamber drains via **ports 3 and 2** of the pilot to open the valve. When the downstream pressure is too high, the pilot diaphragm moves upward allowing **ports 3 and 4** to connect, thus permitting line pressure to close the valve.

In **three-way** configurations, the control chamber drains out to atmosphere, permitting the valve to open entirely.



### Control Mode – 2-way Pilot

**Manual:** To open the Oval, open isolation valves **1** and **2**. To close the Oval, close the downstream isolation valve.

**Automatic:** When the downstream pressure is lower than that of the pilot spring, the control chamber drains downstream and the valve opens. In this case, there is a connection between the **port 3** (inlet upstream), the **port 1 or 2** (outlet downstream) and the control chamber. When the downstream pressure rises above the preset spring load, the pilot's diaphragm is forced upward, closing **port 1** or **2**. The valve then begins closing and downstream pressure decreases.

# Pressure Sustaining / Relief Valve

## Applications

Use the pressure sustaining/relief valve to maintain constant upstream pressure and to avoid undesirable high-pressure situations. This protection is required for most irrigation systems, domestic and industrial utilities, and for general water supply systems. The 3-way plastic pilot model provides high resistance to corrosion at a cost effective price. It is best for irrigation, filtration manifolds, water treatment circulation and low-pressure domestic applications. The 2-way pilot command provides smooth and precise pressure control.

## Description

The pilot valve has a spring-loaded diaphragm that is exposed to upstream pressure. The valve is normally closed. With Pressure Relief Valves, only when the line pressure rises above a preset point does the valve open to reduce the excessive upstream pressure. The excess pressure is released off-line. Pressure Sustaining Valves reduce the excessive downstream pressure without causing surge hazards. When the line pressure drops beneath the desired point, the valve closes.

## Available Models

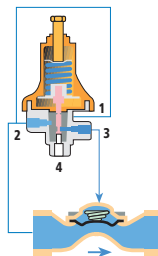
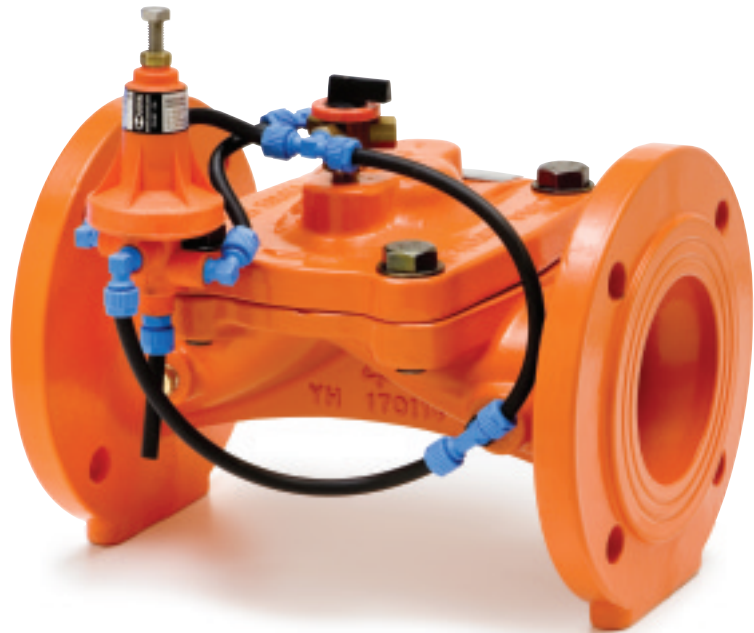
- 3-way plastic piloted pressure sustaining/relief valve for sizes 2"-6" with pressure rating up to 145 PSI (10 bars).
- 2-way Pressure Sustaining/Relief Valve with pressure rating up to 232 PSI (16 bars).

## Adjustment

- Adjust the sustained pressure with the adjustment screw on the pilot.

## Function

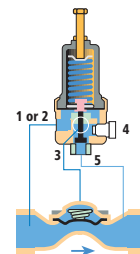
The Pressure Sustaining/ Relief Valve is activated by the line pressure and controlled by a pilot valve. A sustained pressure is preset by adjusting the pilot retaining spring. The pilot is connected to line pressure (upstream). The displacement of the pilot's spring-loaded diaphragm due to upstream pressure defines the flow direction inside the pilot. When the upstream pressure is higher than the set point, the valve is piloted to open. Otherwise the valve remains closed, maintaining the upstream pressure. The excess line pressure is relieved downstream. In 3-way pilot configurations, the valve control chamber drains out, enabling the valve to open fully. In 2-way pilot configurations, the control chamber drains downstream, enabling faster reaction time and gradual closure without water discharge.



## Control Mode – 3-way Plastic Pilot

**Manual:** Use the three-way selector to close or open the valve by turning the handle to **C** (closed) or **O** (open) positions.

**Automatic:** Position the three-way selector handle to A (automatic). When the upstream pressure is low, the pilot's membrane is in its lowest position. The valve's control chamber is exposed to line pressure through **ports 2-3** of the pilot. The valve closes to sustain the upstream pressure. When the upstream pressure is higher than preset, the pressure overcomes the pilot's spring and forces the pilot's diaphragm to move upward. The connection between **ports 3-4** opens and **port 2** closes. The control chamber drains and the valve opens to relieve the excessive pressure downstream. In **3-way** configurations, the control chamber drains out to atmosphere, permitting the valve to open entirely.



## Control Mode – 2-way Pilot

**Manual:** To open the valve, open isolation valves **1** and **2**. To close the valve, close the downstream isolation valve. The upstream isolation valve should remain open.

**Automatic:** When the upstream pressure is lower than that of the sustained pressure set point, the valve's control chamber is connected to the line. This connection occurs through **ports 1 or 2** (inlet upstream) and **port 3**. The valve closes until the desired upstream pressure is achieved. When the upstream pressure rises above the set point, the pilot's diaphragm is forced upward. **Port 5** (outlet downstream) opens and the control chamber of the Oval drains downstream, alleviating the excess pressure.

# Pressure Reducing/Sustaining Valve

## Applications

Use the pressure reducing/sustaining valve to define two pressure zones along a supply line. Typically, this occurs along a downhill flow.

## Description

Pressure Reducing/Sustaining valves are piloted hydraulic valves activated by line pressure and controlled by pilots. Both pilots have spring-loaded diaphragms. One pilot is responsive to upstream pressure and the other to downstream pressure. The combined operation of the two pilot valves sustains the preset minimum upstream pressure of the valve, and at the same time, reduces the downstream pressure to a preset maximum pressure. The valve opens or closes gradually to maintain both required pressures simultaneously.

## Available Models

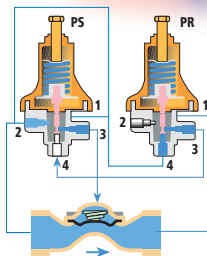
- 3-way plastic piloted Pressure Reducing/Sustaining valve. Plastic pilot is used for 2" -6" sizes with pressure rating up to 145 PSI (10 bar).
- 2-way pressure Reducing/Sustaining valve with pressure rating up to 232 PSI (16 bars).

## Adjustment

- Adjust the pressure set points with the adjusting screws on the pilots.

## Function

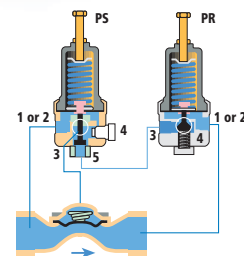
The Pressure Reducing/Sustaining valve is activated by the line pressure and controlled by two pilot valves. Both pilots include spring-loaded diaphragms. The sustaining pilot is preset to sustain the upstream pressure at a preset point. The reducing pilot reduces the downstream pressure and maintains it at a lower preset level. Under normal flow conditions, the valve is partly open to sustain the upstream pressure and reduce the downstream pressure. It partly closes when the downstream pressure rises above the lower set point or when the line pressure drops below the upper set point. It opens again when the upstream pressure rises. In 3-way pilot configurations, the control chamber of the valve drains out to atmosphere, enabling the valve to fully open. In 2-way pilot configurations the control chamber drains downstream, enabling faster reaction time and gradual opening without water discharge.



**Control Mode – 3-way Plastic Pilot**

**Manual:** Use the three-way selector to close or open the valve by turning the handle to **C** (closed) or **O** (open) positions.

**Automatic:** Position the three-way selector handle to **A** (automatic). When the upstream pressure is low, the line pressure flows through **ports 2-3** of the sustaining pilot and flows into the valve's control chamber. The valve closes to sustain upstream pressure. When the upstream pressure reaches the set point, the diaphragm of the reducing pilot moves upward and connects **ports 2-3**. The control chamber drains through the sustaining pilot and exits **port 2** of the reducing pilot. The valve then opens to the preset downstream pressure. When the downstream pressure is greater than the desired level, the reducing pilot's diaphragm moves up, allowing water to flow into the control chamber through **ports 4-3** of the sustaining pilot.



**Control Mode – 2-way Pilot**

**Manual:** To open the valve, open isolation valves **1** and **2**. To close the Valve close the downstream isolation valve. The upstream isolation valve should remain open.

**Automatic:** When the upstream pressure is low, the control chamber is connected through the **2-way** sustaining pilot to the line pressure and the valve closes. When the line pressure rises and overcomes the spring of the sustaining pilot, the pilot's membrane moves upward to open **port 5** (outlet downstream). The control chamber then drains downstream through the **2-way** reducing pilot. The valve then opens and reduces the upstream pressure. As the line pressure is reduced, the sustaining pilot closes, as does the valve. If the downstream pressure is greater than the set point of the reducing pilot, the reducing pilot's membrane moves upward and closes **port 1** or **2** (outlet downstream). The control chamber is connected to the upstream pressure and the valve closes.

# Quick Pressure Relief Valve

## Applications

A Quick Pressure Relief Valve (QPR) protects water systems from rapidly increasing excess pressure. It is recommended to install the Ooval QPR valve at the start of the system near the main supply line or booster pump.

## Description

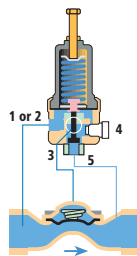
The Pressure Relief Valve is a piloted hydraulic valve activated by line pressure. The 2-way pilot has a spring-loaded diaphragm that is sensitive to upstream pressure. The valve is normally closed. As the line pressure rises above the preset level, the valve opens quickly to relieve the excess pressure.

## Available Models

The valve is a general application 2-way piloted Pressure Relief Valve with a pressure rating up to 232 PSI (16 bars).

## Function

The Pressure Relief Valve is activated by line pressure. The displacement of the diaphragm in the pilot is due to a rise in line pressure against the spring force. As the pressure increases above the set point, the water flow inside the pilot is directed so that the valve quickly opens.



## Control Mode

**Automatic:** When the line pressure is low, the sustaining pilot and the valve are closed by line pressure. The valve remains closed until the line pressure is higher than the set point of the pilot. As pressure increases above the set point, the diaphragm moves upward under the line pressure and **port 5** (outlet downstream) of the pilot opens, allowing the control chamber to drain through the vent. The Ooval opens in a few seconds relieving the excess pressure.

# Electric Control Hydraulic Valve

## Applications

On/Off electric valves are used for remote control of hydraulic valves. Normally open or normally closed configurations are available.

## Description

The valve opens or closes by electric command through a selection of either 2-way or 3-way solenoid valves. The solenoid opens or closes the valve when energized by an electric signal. The electric signal originates with a controller, timer, sensor or remote control device.

## Available Models

Three-way normally closed and 3-way normally open electric control valve.  
Two-way normally closed and 2-way normally open electric control valve.

## Function

**2-way configuration:** The valves control chamber drains downstream, enabling faster and gradual opening without water discharge.

**3-way configuration:** The valve control chamber drains to atmosphere, allowing the valve to open fully.

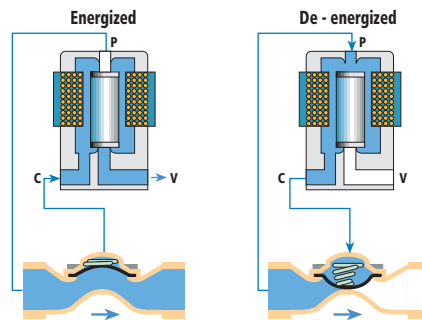
## Control Mode

**Normally Closed Mode:** The line pressure is connected to the Ooval's control chamber above its diaphragm via **port P** (pressure) and **port C** (common). The diaphragm is pressed downward against the valve seat closing the valve. As an electric signal energizes the normally open (NO) solenoid, its plunger changes position and the control chamber drains out through **port V** (vent). The diaphragm is forced upward by the line pressure and the valve fully opens.

**Normally Open Mode:** The valve's control chamber is connected to **port C** (common) of the solenoid. The valve's diaphragm is pressed upward by line pressure keeping the valve in the open position. As the normally closed (NC) solenoid is energized by an electric signal, its plunger changes position and the vent closes. The control chamber of the valve becomes connected to the pressure source via **port P** (pressure) and **port C** and the valve closes.

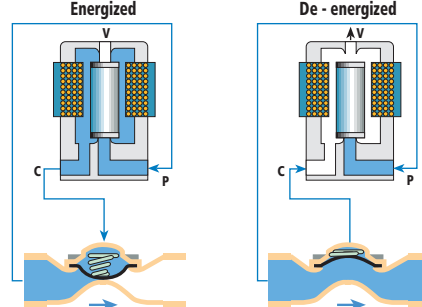


### N.O. Solenoid



C = Common  
P = Pressure  
V = Vent

### N.C. Solenoid



# Hydraulic Remote Control Valve

## Applications

Use valve with a hydraulic remote control in those situations where the command pressure is lower or higher than the working pressure or in situations where there are topographic differences between the command source and the line water pressure at the valve. The hydraulic remote control is also used where the use of wires is not feasible.

## Description

On/Off hydraulic remote control valves are used for the remote control of hydraulic valves. In normally closed (NC) configurations, the valve remains closed until the hydraulic relay receives a hydraulic command. In the normally open (NO) model, the valve is open until the hydraulic relay receives a hydraulic command to close.

## Available Models

Normally open and normally closed configurations are available. Operating pressure is up to 145 PSI (10 bars). A pressure regulating or pressure sustaining pilot may be used in conjunction with the hydraulic relay.

## Function

The valve is activated by line pressure and controlled by the hydraulic relay. The relay includes a spring-loaded diaphragm that determines the pressure required to activate the command. In the normally closed operation (NC), the line pressure is connected to the valve's control chamber keeping the valve closed. In the reverse case (NO), the valve remains in the open position.

## Control Mode

**Normally Closed Mode:** In normally closed applications, when the command is received by way of **port 1**, the line pressure **port 2** is prevented from entering the control chamber through the connection between **port 2-4** and the water in the control chamber drains through **port 3**, causing the valve to open.

**Normally Open Mode:** In normally open applications, **port 3** connects to the upstream line pressure and water is prevented from entering the bonnet. When the command is received by way of **port 1**, **port 3** connects to **port 4** and the valve closes.



## Basic Valve

Basic valve can be operated manually through the use of a 3-way selector. Selector options are:

**Closed:** Upstream pressure or pressure from an external source is applied to the control chamber. The diaphragm is pressed down to close the valve drip-tight.

**Open:** Discharging the water or air pressure to the atmosphere from the control chamber causes the valve to open.

**Automatic:** The automatic port of the 3-way selector is connected to a solenoid, hydraulic relay or pilot, which controls the valve. The common port of the 3-way selector connects the control chamber to either A (automatic), O (open) or C (closed), depending on the direction the selector is pointed.

## 3 Way Plastic Relay

