Isolates system from the effects of pump starting and stopping, preventing surge generation rather than minimizing surge damage.

Built-in operating modes that can be selected on-site.

Provides surge-free starting and stopping of supplementary pumps.

Allows surge-free switching between "on-duty" pumps.

Quick Active Check Valve

Booster Pump Control Valve

Technical Data

Dimensions and Weights

Control System

Attributes

Flow Rate - m³/h

Flow Rate - gal/min

Pressure Loss - psi

Pressure Loss - bar

Flow Chart

General Selection

How to Order

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

Legend:

Size Range:

Additional Feature

Operational and Sealing Based Control

Solenoid 745-U

Solenoid 747-U

Flat No-Contact Valve

Flat Mechanical Valve

Flow Control 745

Flow Control 743-2Q

Deep Well Pump Electric Control 740

Battery of Variable speed pumps (add)

Battery of Single speed pumps (add & switch)

Pressure reducing - 740

Pressure reducing - 740-

Pump circulation control - 740

Deep well pump electric control - 740-

Fluid powered opening & closing - 740-

Electronic control - 740-

Pressure reducing & Pressure reducing - 740-

See revised BERMAD publications.

WWW-740Q

Epoxy FB Blue EB

Built-in operating modes that can be selected on-site.

Prevents surge generation rather than minimizing surge damage.

The Model 740Q Booster Pump Control Valve is a double chambered, hydraulically operated, diaphragm actuated active check valve that opens fully or shuts off in response to electric signals. It isolates the pump from the system during pump starting and stopping to prevent pipeline surges.

Features and Benefits

In-line pressure driven

Independent operation

No motor required

Long term drip tight sealing

Solenoid controlled

Low cost setting

Wide range of pressure and voltages

Normally Open or Normally Closed

Check feature (spring-loaded type)

Replaces line sized check valve

Fast-safety mechanical closure

In-line serviceable - Easy maintenance

Double chamber

Full powered opening (option "B") and closing

Non-earm opening and closing characteristics

Pitot diaphragm

Balanced seal disk - High flow capacity

Flexible design - Easy addition of hydraulic features

Isolates system from the effects of pump starts and stops for:

- Battery of single speed pumps
- Battery of single speed pumps (add & switch)
- Battery of variable speed pumps (add)

WWW-740Q

Epoxy FB Blue EB

WWW-740Q

Epoxy FB Blue EB
Sequence of Operation (Normally-Open Type)

The Model 740Q is a solenoid controlled valve equipped with a limit switch, a 3-Way solenoid pilot and check valves. For large valves, an accelerator quickens valve response.

Pump Starting Procedure

Prior to pump start, the valve is hydraulically closed although electrically open. Even though the de-energized solenoid [2] vents the upper control chamber [3], it remains full as no opening hydraulic forces are applied. Pump start command is issued to the BR740-E electronic controller [1], which starts the pump. Valve upstream pressure builds and rises above system static pressure, causing opening hydraulic forces to rise. Pressure is then released from the upper control chamber through the solenoid, allowing the valve to open gradually.

Pump Operating Procedure

In pumping systems with standard check valves, the shut down command is issued directly to the pump, abruptly shutting it down. In systems with “active check valves”, the shut down command is issued to the BR740-E electronic controller [1], which de-energizes the solenoid [2]. The solenoid then applies pumped pressure to the upper control chamber, gradually closing the main valve, and isolating the running pump. After a preset time delay, the controller de-energizes the solenoid and resets the limit switch command, allowing the pump to start when next signaled. The valve remains hydraulically closed and electrically open.

Pump Shutoff Procedure

In systems with standard check valves, the valve remains closed as the pumped pressure sustains feature to the Booster Pump Control Valve

- When the pump curve (Flow versus Pressure) is relatively flat, pump protection with respect to discharge pressure is not sufficient, and protection according to flow is recommended.
- When the pump curve (Flow versus Pressure) is relatively steep, circulation valve is recommended.
- When pump pressure specification is higher than system resistance, it is recommended to reduce the discharge pressure. The Model 740Q adds a pressure reducing feature to the operation sequence of the standard Model 740Q.

Engineer Specifications

The Pump Control Valve shall open fully or shut off in response to electric signals. It shall isolate the pump from the system during pump starting and stopping, to prevent pipeline surge.

Main Valve: The main valve shall be a center guided, diaphragm actuated globe valve of either stainless steel or carbon steel design. The body shall have a removable, welded, stainless steel seat ring. The valve shall have an unobstructed flow path, with even flow guides, bearings or supporting legs. 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 interlocking separation partition between the linear output shaft and the valve body. The entire actuator assembly (shaft to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shall be center guided by a bearing in the separating partition. The fail-safe mechanical load device shall include a redundant seal and shall be capable of accepting a 5 PSI Throttling Plug by footing.

Control System: The control system shall consist of a 3-Way solenoid for all 3-Way check valves (or 12” and larger valves, an additional check valve, a limit switch, and a filter. All filters shall be forged brass or stainless steel. This assembled valve shall be hydraulically tested.

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, WAFS, and other recognized standards.
**Typical Installation**

In this system, a pump battery supplies the mains through a manifold.

- Prevents surge generation rather than minimizing surge damage
- Provides surge free starting and stopping of supplementary pumps
- Allows surge free switching between "on-duty" pumps
- Delay reaction of variable speed primary pump to single speed supplementary pump going on line or off line.

**Isolates system from the effects of pump WW-740Q**

**Epoxy FB Blue EB**

**Prevent errors that might occur during on-site programming.**

These modes are based on accumulated know-how to built-in operating modes that can be selected on-site.

The BR 740-E coordinates between all system components

- Delays reaction of variable speed primary pump to single speed supplementary pump going on line or off line.
- Prevents surge generation rather than minimizing surge damage

In this system, a pump battery supplies the main line through a manifold.

**Closing and Opening Speed Control 03**

No Additional Feature 00

**Standard Materials:**

- Brass or Stainless Steel
- Brass or Stainless Steel
- Brass or Stainless Steel
- Brass or Stainless Steel
- Brass or Stainless Steel
- Ductile Iron Standard C
- Non-slam opening and closing characteristic
- Replacement of check valves
- Low cost wiring
- No motor required
- Flow control –
- Electronic control –
- Deep well pump electric control –
- Pressure sustaining & Pressure reducing –
- Electronic control –
- Pressure sustaining & Pressure reducing –
- Pressure reducing –

**Major Additional Features**

- Pressure sustaining – 763
- Pressure reducing – 762
- Flow control – 767-U
- Pump circulation control – 748
- Deep well pump electric control – 765
- Full powered opening & closing – 769-B
- Electronic control – 740-32

See relevant BERMAD publications.

**Features and Benefits**

- Line pressure driven
- Independent operation
- Wide range of pressures and voltages
- Normally Open or Normally Closed
- Check feature (spring-loaded type)
- Solenoid controlled
- Low cost setting
- Fluid-actuated active check valve that opens fully or shuts off in response to electric signals. It isolates the pump from the system during pump starting and stopping, to prevent pipeline surges.

**How to Order**

Please specify the requested valves in the following sequence (for more options, refer to Ordering Guide):
Sequence of Operation (Normally-Open Type)

This Model 740Q is a solenoid controlled valve equipped with a limit switch, a 3-Way solenoid pilot and check valves. For large valves, an accelerometer quickens valve response.

Pump Starting Procedure

Prior to pump start, the valve is hydraulically closed although electrically open. Even though the de-energized solenoid [3] vents the upper control chamber [2], it remains full of air so no opening hydraulic forces are applied. A pump start command is issued to the BR740-E electronic controller [5], which sends the solenoid voltage. Valve upstream pressure forces the air down and allows the system static pressure, causing opening hydraulic forces to rise. Pressure is then released from the upper control chamber through the solenoid, allowing the valve to open gradually.

Pump Stopping Procedure

In pumping systems with standard check valves, the shut down command is issued directly to the pump, abruptly shutting it down. In systems with “active check valves”, the shut down command is issued to the BR740-E electronic controller [5], which de-energizes the solenoid [3]. The solenoid then applies pumped pressure to the upper control chamber, gradually closing the main valve, and isolating the running pump. The actuator [1] moves down, it activates the valve’s limit switch [6], signaling the controller to shut down the pump. After a preset time delay, the controller de-energizes the solenoid and resets the limit switch command, allowing the pump to start when next signaled. The valve remains hydraulic closed and electrically open.

Sequence of Operation (Normally Closed Type)

This Model 740Q is a solenoid controlled valve equipped with a limit switch, a 3-Way solenoid pilot and check valves. For large valves, an accelerometer quickens valve response.

Pump Starting Procedure

Prior to pump start, the valve is closed hydraulically and electrically. The de-energized solenoid [3] together with the inlet check valve [9] and the airfree check valve [8] trap the pressure in the upper control chamber [2]. Pump start command is issued to the BR740-E electronic controller [5], which simultaneously starts the pump and energizes the solenoid [3]. Pump pressure forces the solenoid down to isolate the system static pressure, causing opening hydraulic forces to rise. The controller releases the pressure from the upper control chamber, allowing the main valve to open gradually.

Pump Stopping Procedure

In pumping systems with standard check valves, the shut down command is issued directly to the pump, abruptly shutting it down. In systems with “active check valves”, the shut down command is issued to the BR740-E electronic controller [5], which de-energizes the solenoid [3]. The solenoid then applies pumped pressure to the upper control chamber, gradually closing the main valve, and isolating the running pump. The actuator [1] moves down, it activates the valve’s limit switch [6], signaling the controller to shut down the pump. After a preset time delay, the controller de-energizes the solenoid and resets the limit switch command, allowing the pump to start when next signaled. The valve remains hydraulic closed and electrically open.

Additional Applications

Boosters, Pump Control & Pressure Sustaining Valve Model 747-U

Network demand is greater than pump design specifications:

- Drawing supply pipeline filling
- Over-riding demand by consumers

- When pump performance is required to be higher than system resistance

- Any of the conditions cause pump overload & cavitation damage. The Model 740 adds a pressure sustaining feature to the operation sequence for preventing the pump rotor from damaging due to cavitation. By regulating the pump's output, it maintains the operation sequence of the standard Model 740Q.

Boosters, Pump Control & Flow Control Valve Model 747-U

When the pump curve (flow versus Pressure) is relatively flat, pump protection with respect to discharge pressure is not sufficient, and protection according to flow is recommended. The Model 747-U offers a flow limiting feature in the operation sequence of the standard Model 740Q.

Boosters, Pump Control & Pressure Reducing Valve Model 742

Standard pumps are specified to boost pressure by a constant differential. Increased suction pressure causes excessive discharge pressure, which requires reduction. When the pump curve (flow versus Pressure) is relatively flat, suction pressures are relatively lower than the discharge pressure. This protects the pump and the system while maintaining the operation sequence of the standard Model 740Q.

Engineer Specifications

The Pump Control Valve shall open fully or shut off in response to electric signals. It shall isolate the pump from the system during pump starting and stopping. To prevent pipeline surges.

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 be cast iron, carbon, stainless steel, or brass. The valve shall have an unrestricted flow path, with no runguides, bearings or supporting legs. The body and cover shall be ductile iron. All external nuts, bolts 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 intermittent separating partition between the lower suction chamber and the upper discharge chamber. The actuator assembly is designed to be inserted as an integral unit. The stainless steel valve shall be center guided by a bearing in the separating partition. The actuator actuated rod shall be a minimum of 3/8” in diameter and shall be capable of accepting a 1/4” pipe thread. The actuator shall be made from Duplex® base material.

Control System: The control system shall consist of a 3-Way solenoid (for 8” and larger valves, an accelerator shall be added to the solenoid), two check valves for 12” and larger valves, and an additional check valve, a limit switch, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically leak proof.

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.

Function Mains Empties in the upper control chamber, trapping the pressure in the upper control chamber and allowing the valve to open gradually. If a pump failure occurs, the valve is immediately hydraulically closed upon the failure, trapping the system static pressure, causing opening hydraulic forces to rise. Pressure is then released from the upper control chamber through the solenoid, allowing the valve to open gradually.

Power Failure – Spring Loaded, Zero Velocity Non Return Valve

If electric power fails during pumping, the upstream pressure immediately drops causing the hydraulic forces acting on the diaphragm assembly [8] and closure [7] balance. The spring [4] then breaks this balance, closing the valve before the flow can change direction. Check valve [8] allows airflow into the upper control chamber to break possible vacuum and quicken the closing speed.

Power Failure – Spring Loaded, Zero Velocity Non Return Valve

If electric power fails during pumping, the upstream pressure immediately drops causing the hydraulic forces acting on the diaphragm assembly [8] and closure [7] balance. The spring [4] then breaks this balance, closing the valve before the flow can change direction. Check valve [8] allows airflow into the upper control chamber to break possible vacuum and quicken the closing speed.

Pressure Relief Feature Models 743 Valves: an option to close the pressure relief valve (PRV) on the system at any time, allowing the running booster pump to continue operating while the PRV is closed. This protects the pump from cavitation damage and maintains the system pressure at a safe level. The pressure relief valve is designed to close when the system pressure reaches a pre-determined value and open gradually to maintain system pressure. This valve is typically used in systems where the pump is not designed to handle cavitation damage, or in systems where the pump is not the only source of water supply. The pressure relief valve adds an additional level of protection to the system, ensuring that the system pressure remains within safe limits.
**Sequence of Operation (Normally-Open Type)**

This model 740Q is a solenoid-controlled valve equipped with a limit switch, a 3-way solenoid pilot and check valves. For large valves, an accelerator quickens valve response.

**Pump Starting Procedure**

Prior to pump start, the valve is hydraulically closed although electrically open. Even though the de-energized solenoid [7] vents the upper control chamber [9], it remains in a no opening force due to air pressure. Pump start command is issued to the BERMAD electronic controller [8], which starts the pump. Valve upstream pressure builds up to full system static pressure, causing opening hydraulic force to rise. Pressure is then released from the upper control chamber through the solenoid, allowing the valve to open gradually.

**Pump Stopping Procedure**

When the pump curve (Flow versus Pressure) is relatively flat, pump protection with respect to discharge pressure is not sufficient, and protection according to flow is recommended. The Model 740Q adds a flow limiting feature to the operation sequence of the standard Model 740Q.

When the shut down command is issued directly to the pump, abruptly shutting it down, in systems with "active check valves", the shut down command is issued to the BERMAD electronic controller [8], which de-energizes the solenoid [7]. The solenoid then applies pumped pressure to the upper control chamber, gradually closing the main valve, and isolating the running pump from the system. As the indicator collar [9] moves down, it activates the valve’s limit switch [8], signaling the controller to shut down the pump. After a preset time delay, the controller de-energizes the solenoid and resets the limit switch command, allowing the pump to start when first signaled. The valve remains hydraulically closed and electrically open.

**Flow Control Valve Model 747-U**

- **Engineer Specifcations**

  The Pump Control Valve shall open fully or shut off in response to electric signals. It shall isolate the pump from the system during pump starting and stopping, to prevent pipeline surges.

  **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 impervious, hard, abrasion resistant hard face. The valve shall have an upstream flanged, with a recess guide, bearings or supporting flanges. The body and cover shall be stainless steel. 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 interconnecting bellows between the lower piston. The entire actuator assembly shall be removed from the valve as an integral unit. The stainless steel valve shall be center guided by a bearing in the separating partition. The combination valve shall include a resilient seat and shall be capable of accepting a V-Port Thrustline Plug by bolting.

  **Control System**

  - The control system shall consist of a 3-way solenoid valve (10) and large valves, an accelerator shall be added to the solenoid, two check valves (12) and large valves, an additional check valve, a limit switch, and a filter. All fittings shall be forged brass or stainless steel. This assembled valve shall be hydraulically tested.

  **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.

**Sequence of Operation (Normally Closed Type)**

This model 740Q is a solenoid-controlled valve equipped with a limit switch, a 3-way solenoid pilot and check valves. For large valves, an accelerator quickens valve response.

**Pump Starting Procedure**

Prior to pump start, the valve is hydraulically closed although electrically open. Even though the de-energized solenoid [7] vents the upper control chamber [9], it remains in a no opening force due to air pressure. Pump start command is issued to the BERMAD electronic controller [8], which starts the pump. Valve upstream pressure builds up to full system static pressure, causing opening hydraulic force to rise. Pressure is then released from the upper control chamber through the solenoid, allowing the main valve to open gradually.

**Pump Stopping Procedure**

In pumping systems with standard check valves, the shut down command is issued directly to the pump, abruptly shutting it down. In systems with "active check valves", the shut down command is issued to the BERMAD electronic controller [8], which de-energizes the solenoid [7]. The solenoid then applies pumped pressure to the upper control chamber, gradually closing the main valve, and isolating the running pump from the system. As the indicator collar [9] moves down, it activates the valve’s limit switch [8], signaling the controller to shut down the pump. After a preset time delay, the controller de-energizes the solenoid and resets the limit switch command, allowing the pump to start when first signaled. The valve remains hydraulically closed and electrically open.

**Power Failure – Spring Loaded, Zero Velocity Non-Return Valve**

In electric power fails during pumping, the upstream pressure immediately drops causing the hydraulic forces acting on the diaphragm assembly [4] and closure [7] balance. The spring [5] then breaks this balance, closing the valve before the flow can change direction. Check valve [8] allows airflow into the upper control chamber to break possible vacuum and quicken the closing speed.

**Power Failure – Spring Loaded, Zero Velocity Non-Return Valve**

- The solenoid releases the pressure from the upper control chamber, allowing the main valve to open gradually.

**Power Failure – Spring Loaded, Zero Velocity Non-Return Valve**

- 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.
Prevent errors that might occur during on-site programming. These modes are based on accumulated know-how to built-in operating modes that can be selected on-site.

The BR 740-E coordinates between all system components to delay reaction of variable speed primary pump to single speed supplementary pump going on line or off line. Delays reaction of variable speed primary pump to single speed supplementary pump going on line or off line. Prevents surge generation rather than minimizing surge damage.

The Model 740Q Booster Pump Control Valve is a double chambered, hydraulically operated, diaphragm actuated active check valve that opens fully or shuts off in response to electric signals. It isolates the pump from the system during pump starting and stopping, to prevent pipeline surges.

Features and Benefits:
- Line pressure driven
- Independent operation
- No motor required
- Low maintenance
- Low cost operation
- Wide range of pressures and voltages
- Normal Open or Normally Closed
- Check feature (spring-loaded type)
- Replaces line sized check valve
- No external mechanical closure
- In-line serviceable – Easy maintenance
- Double chamber
- Full powered opening & closing
- Non-slam opening and closing characteristics
- Full powered opening & closing
- Balanced seal disk – High flow capacity
- Flexible design – Easy addition of hydraulic features

Major Additional Features:
- Pressure sustaining – 763
- Pressure reducing – 762
- Flow control – 767-U
- Pump circulation control – 745
- Deep well pump electric control – 745
- Full powered opening & closing – 745-B
- Electronic control – 748-52
- Pressure sustaining & Pressure reducing – 743-20

For more flow charts, refer to Engineering Section.