

BERMAD Mining

Hydraulic Control Valves



Advanced Control and Air Valves for the Mining Industry

Over the decades, BERMAD has become one of the world's leading suppliers of advanced valve solutions for the mining of copper, gold, iron and other precious metals mines.

Bringing together extensive experience, cutting-edge technological know-how and precision engineered manufacturing, BERMAD offers a comprehensive range of custom-made, high performance control valves and air valves that are widely deployed and thoroughly proven throughout the industry.

Bermad's cost-effective customized solutions replace older or less advanced manual valves, enabling customers to accurately achieve their specific control requirements.

Control Valves Features & Advantages

- Advanced, hydraulic self-operated valves
 - No need of external power for operation
 - The same energy of the fluid (i.e. water, PLS, RAFF or cyanide solution) is used for opening, shutting off and modulation.
- Accurate operation, high clogging resistance
- Complete selection of control applications
 - Can be configured to provide pressure, flow or level control.
 - Electric controls are available (for ON/OFF and modulation), having always the hydraulic function as backup in case of power failure.
- Customized according to the needs of the system being designed.
- Highly corrosion resistant construction materials.
- Up to 15% better flow capacity than standard globe valves due to "Y-Pattern" design and streamlined internal mechanism
 - Full bore seat with unobstructed flow path, free of in-line ribs or supporting cages
- Variety of joining methods available (flanges, grooves and threads) to install in any pipe line.





Air Valves Features & Advantages

- Straight flow body with nominal inlet and outlet size
- Aerodynamic full-body kinetic shield
 - No need of an external element which disturbs air discharge
 - Prevent premature closing.
- Operation even under low pressure conditions in order to prevent leakage.
- Highly corrosion resistant construction materials.
- Performance really tested and measured with on house specialized unique test bench, including real vacuum pressure conditions.



Mainly Applications

Copper Mining with lixiviation process

- Surge protection for RAFF pumping systems.
- Pressure control in rings around the leaching pads.
- Flow control (leaching rate) inside the pads.
- Surge protection for PLS pumping systems.
- Pressure control in EX/EW plants.
- Deluge systems in EX/EW plants.



Polymetallic mining with concentration process

- Surge and pump protection for recovery water pumping systems in tailings.
- Surge and pump protection for recovery water pumping systems in thickeners.
- Pressure control for seals in pulp pumps.
- Pressure control for process water in plant.
- Vacuum protection in slurry pipe lines.
- Surge protection in water delivery systems.



Underground Mining

- PRV Stations and SKIDS.
 - Pressure reducing.
 - Over pressure protection.
 - Flow metering.
 - Vacuum protection
- Level control in tanks
- Surge and pump protection for dewatering systems.



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Solenoid Controlled Valve

Model MN-710

Hydraulically operated valve that either opens fully or shuts off in response to electric signals.

The Bermad 700 Series valves are hydraulic operated, diaphragm actuated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities. They are made of the highest quality materials, suitable for different mining applications.



Features and Benefits

- Self-operated valves that can work without an external source of power, just a command is needed:
 - Low power consumption
 - Low cost wiring
 - Normally Open, Normally Closed or Last Position
- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design:
 - Full powered opening and closing (option "B")
 - Protected diaphragm
 - Simplified maintenance as it can be removed as a single unit. In-Line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

Major Additional Features

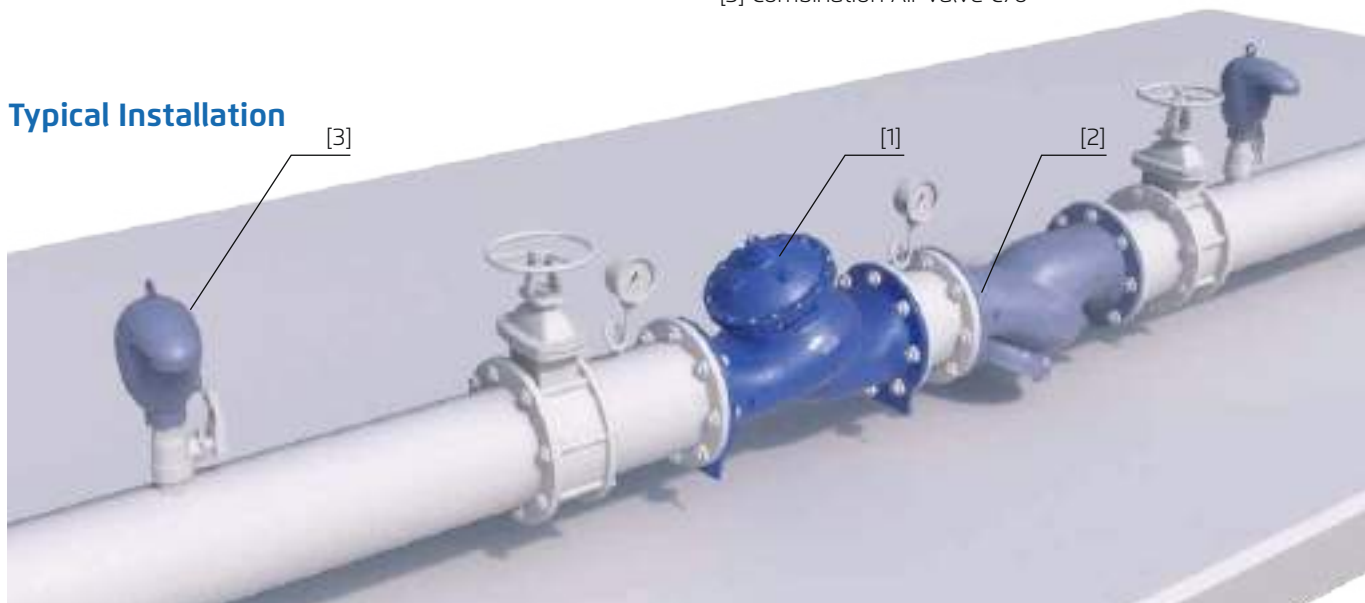
- Full powered opening & closing - **710 - B**
- Check feature - **710 - 20**
- Opening & closing speed control - **710 - 03**
- Relief override - **710 - 3Q**
- Closing surge prevention - **710 - 49**
- External pressure control - **710 - e**

See relevant BERMAD publications

List of Components:

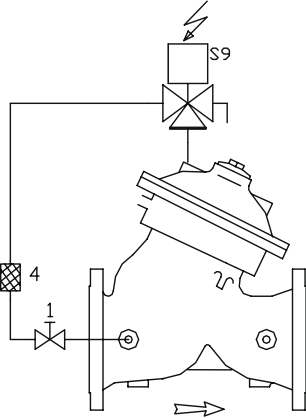
- [1] Solenoid Controlled Valve 710
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 4 Control Filter
- S9 Solenoid / Motorized Ball Valve

Additional features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve's size and class. For poor quality fluids, motorized ball valve option is highly recommended

Operation

- The main valve is equipped with either a 3-way solenoid pilot or a motorized ball valve - MVB.
- To close the main valve, the solenoid - or the MVB - applies upstream pressure to the upper control chamber, harnessing valve differential pressure to power the diaphragm actuator.
- To fully open the main valve, the solenoid - or the MVB - vents the control chamber pressure.
- Opening speed can be set hydraulically using an opening needle valve (optional).
- Closing speed can be set hydraulically using a closing needle valve (optional)

Electrical Data

Solenoid Data:

Voltages: (AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:

(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W

Motorized Ball Valve Data:

Voltages: (AC): 24, 110, 220
(DC): 24

Power Consumption:

(AC/DC): 45W



Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Brass	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Motorized Ball Valve	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Solenoid Controlled Valve

Model MN-810 (For High Pressure Applications)

Hydraulically operated valve that either opens fully or shuts off in response to electric signals.

The Bermad 800 Series valves are hydraulic operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Self-operated valves that can work without an external source of power, just a command is needed:
 - Low power consumption
 - Low cost wiring
 - Normally Open, Normally Closed or Last Position
- Valves are suitable for working with all types of command: Hydraulic, Electric and Pneumatic
- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
 - Excellent anti-cavitation properties
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Wide flow range
 - Drip tight sealing
- Double chamber actuator design:
 - Moderated valve closing (no surges)
 - Full powered opening and closing (option "B")
 - Simplified maintenance as it can be removed as a single unit. In-line Serviceable
- Flexible design - Easy addition of optional features:
 - Visual position indicator
 - Limit switches
- Obstacle free flow path

Major Additional Features

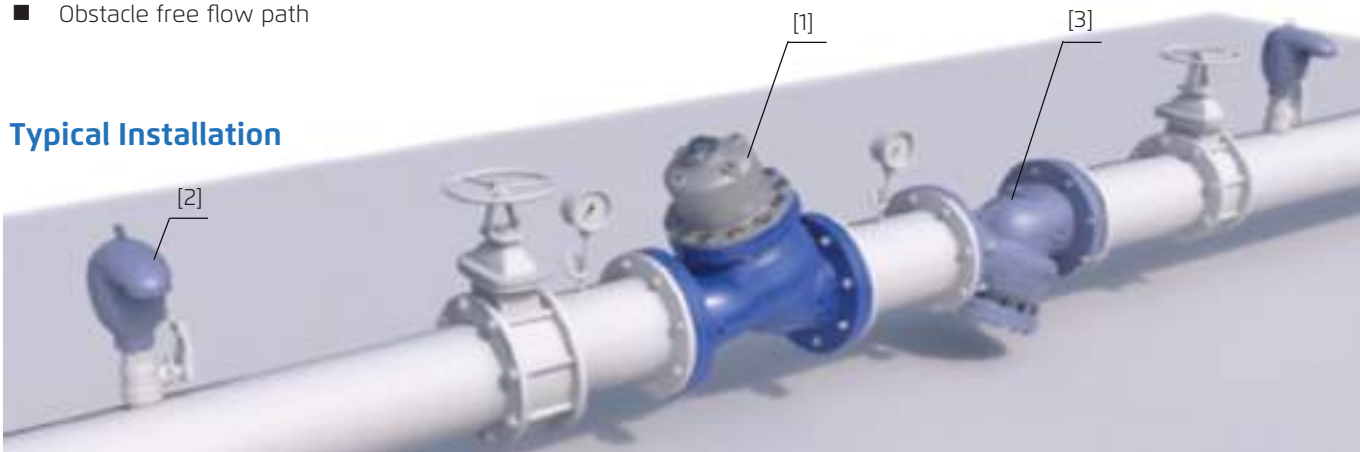
- Full powered opening & closing - **810 - B**
- Check feature - **810 - 20**
- Opening & closing speed control - **810 - 03**
- Relief override - **810 - 3Q**
- Closing surge prevention - **810 - 49**

See relevant BERMAD publications

List of Components:

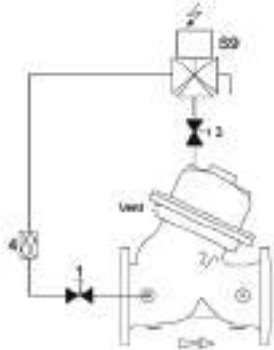
1. Solenoid Controlled Valve 810
2. Combination Air Valve C70
3. Strainer 80F

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 3 2W Isolation valve
- 4 Control Filter
- S9 Solenoid / Motorized Ball Valve

Additional features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve's size and class. For poor quality solutions, motorized ball valve option is highly recommended

Operation :

- The main valve is equipped with either a 3-way solenoid pilot or a motorized ball valve - MVB.
- To close the main valve, the solenoid S9 - or the MVB - applies upstream pressure to the upper control chamber, harnessing valve differential pressure to power the piston actuator.
- To fully open the main valve, the solenoid S9 - or the MVB - vents control chamber pressure.
- Opening speed can be set hydraulically using an opening needle valve (optional).
- Closing speed can be set hydraulically using a closing needle valve (optional).

Electrical Data

Solenoid Data:

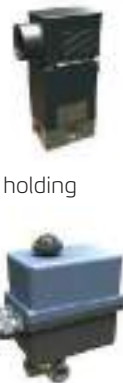
Voltages:
(AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:
(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W

Motorized Ball Valve Data:

Voltages:
(AC): 24, 110, 220
(DC): 24

Power Consumption:
(AC/DC): 45W



Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Stainless Steel 316	Brass	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel 316	Stainless Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Motorized Ball Valve	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI.





Electronic Controlled Valve

Model MN-718-03

Hydraulically operated valve that responds to signals from the electronic controller BERMAD BE (optional), by changing its opening position according to set values programmed into the controller.

This valve combines the advantages of an excellent modulating, line pressure driven, hydraulic control valve with the advantages of electronic control.

The Bermad 700 Series valves are hydraulic operated, diaphragm actuated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and high effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operating conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Self-operated valves that can work without an external source of power, just a command is needed:
 - Low power consumption
 - Low cost wiring
 - Normally Open, Normally Closed or Last Position
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design:
 - Full powered opening and closing (option "B")
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features:
 - V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

- Full powered opening & closing - **718 - 03 - B**
 - Check feature - **718 - 03 - 20**
 - Relief override - **718 - 03 - 3Q**
 - Downstream over pressure guard - **718 - 03 - 48**
 - External pressure control - **718 - e**
- See relevant BERMAD publications

List of Components:

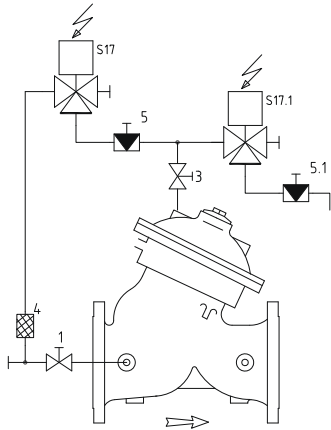
- [1] Electronic Controlled Valve 718
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Cock Valve
- 3 2W Cock Valve
- 4 Control Filter
- 5 Closing Needle Valve
- 5.1 Opening Needle Valve
- S17 Closing 3W Solenoid
- S17.1 Opening 3W Solenoid

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch
- Q Analog Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve’s size and class. For poor quality fluids, use of hydraulic relays is highly recommended

Operation

- The main valve is equipped with two 2-way solenoid pilots.
- The interaction between the two solenoids determines the required opening position as signaled by the dedicated electronic controller (optional BERMAD BE).
- For a more closed position, then the closing solenoid must apply pressure to the upper control chamber, thereby, harnessing valve differential pressure to power the diaphragm actuator to close the main valve.
- For a more open position, the opening solenoid must vent the upper control chamber pressure to open the main valve.

Electrical Data

Solenoid Data:

Voltages: (AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:

(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W



Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Brass	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec-23ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Electronic Controlled Valve

Model MN-818 (For High Pressure Applications)

Hydraulic operated valve that responds to signals from the electronic controller BERMAD BE (optional), by changing its opening position according to set values programmed into the controller.

This valve combines the advantages of an excellent modulating, line pressure driven, hydraulic control valve with the advantages of electronic control.

BERMAD 800 Series valves are hydraulic operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and high effective modulation capacity for high differential pressure applications.

The 800 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the most high quality materials suitable for different mining applications.



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Self-operated valves that can work without an external source of power, just a command is needed:
 - Low power consumption
 - Low cost wiring
 - Normally Open, Normally Closed or Last Position
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design:
 - Full powered opening and closing (option "B")
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In - line serviceable
- Flexible design - Easy addition of optional features
 - Analog position transmitter
 - V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

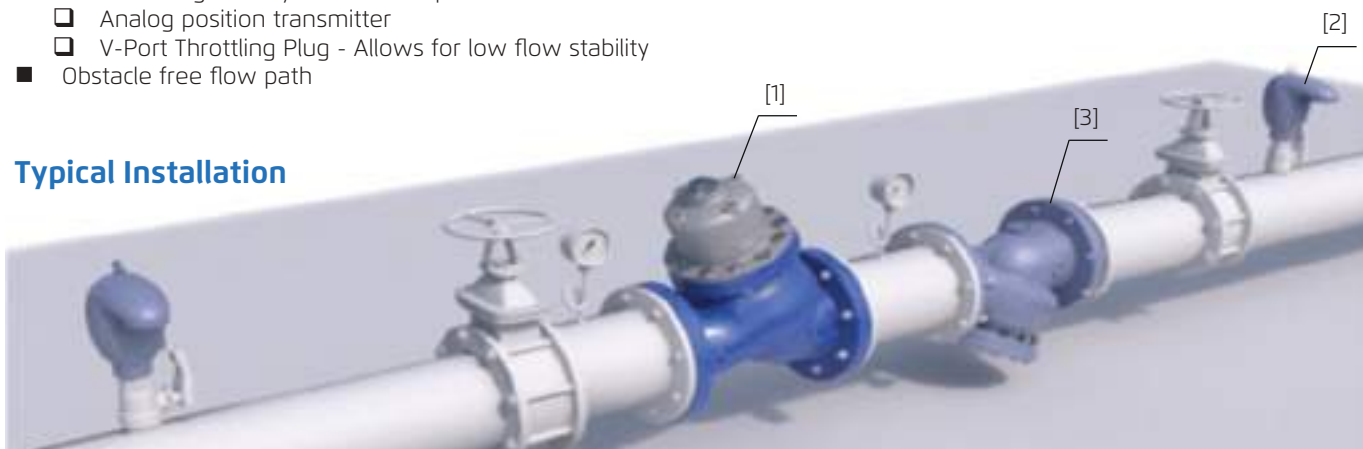
- Full powered opening & closing - **818 - 03 - B**
- Check feature - **818 - 03 - 20**
- Relief override - **818 - 03 - 3Q**
- Downstream over pressure guard - **818 - 03 - 48**

See relevant BERMAD publications

List of Components:

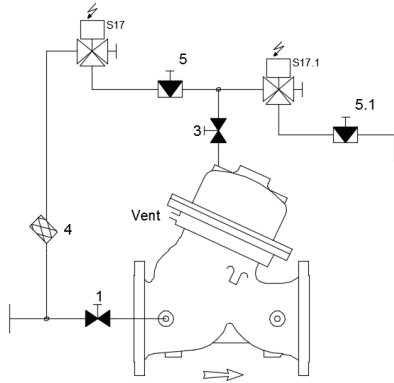
1. Electronic Controlled Valve MN-818
2. Combination Air Valve C70
3. Strainer MN-80F

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 5 Closing Needle Valve
- 5.1 Opening Needle Valve
- S17 Closing 3W Solenoid
- S17.1 Opening 3W Solenoid

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch
- Q Analog Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class. For poor quality solutions, use of hydraulic relays is highly recommended

Operation

- The main valve is equipped with two 2-way solenoid pilots.
- The interaction between the two solenoids determines the required opening position as signaled by the dedicated electronic controller (optional BERMAD BE).
- For a more closed position, then the closing solenoid must apply pressure to the upper control chamber, thereby, harnessing valve differential pressure to power the piston actuator to close the main valve.
- For a more open position, the opening solenoid must vent upper control chamber pressure to open the main valve.

Electrical Data

Solenoid Data:

Voltages:

(AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:

(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W



Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Stainless Steel 316	Brass	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel 316	Stainless Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec; 23ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.



Pressure Reducing Valve

Model MN-720

Hydraulically operated, pressure reducing control valve that reduces higher upstream pressure to lower constant downstream pressure, regardless of fluctuating demand or varying upstream pressure.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operating conditions with minimal cavitation and noise. They are made of the highest quality materials, suitable for different mining applications.



Features and Benefits

- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

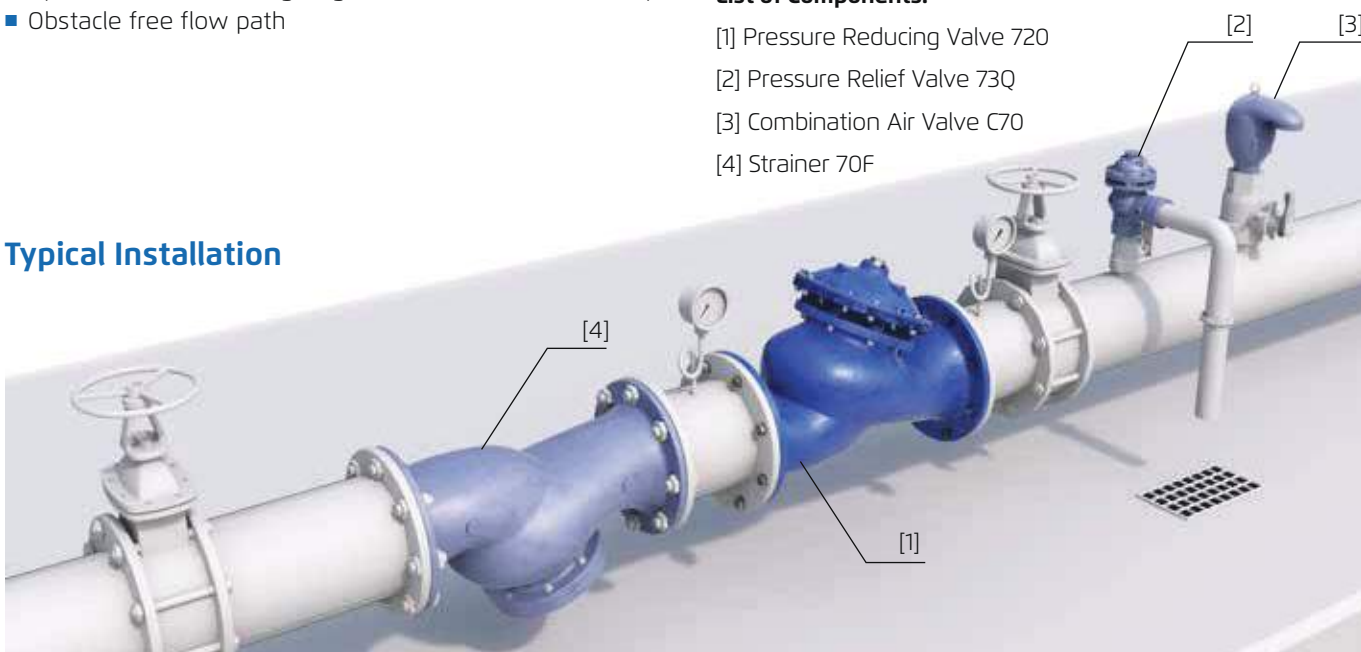
Major Additional Features

- Fixed Proportion PRV - **720 - PD**
 - 3 - Way control - **720 - X**
 - Safety Valve - **720 - TC**
 - Independent flow check - **720 - 25**
 - Hydraulic check valve - **720 - 20**
 - ON/OFF Solenoid Control - **720 - 55**
 - Electrically selected multi-level setting - **720 - 45**
 - High sensitivity pilot - **720 - 12**
 - Downstream over pressure guard - **720 - 48**
- See relevant BERMAD publications

List of Components:

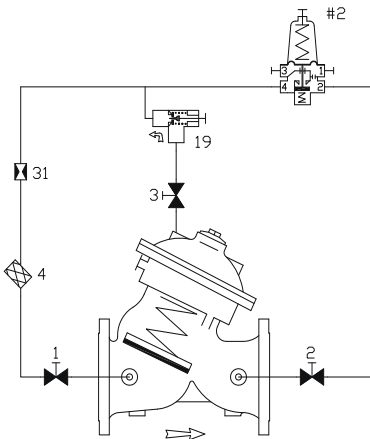
- [1] Pressure Reducing Valve 720
- [2] Pressure Relief Valve 73Q
- [3] Combination Air Valve C70
- [4] Strainer 70F

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 19 Speed Control
- 31 Restriction Orifice
- #2 2W Pressure Reducing Pilot

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- Model MN-720 is equipped with an adjustable pressure reducing pilot, which senses downstream pressure.
- Should this pressure rise above the pilot setting, the pilot throttles, enabling pressure in the control chamber to accumulate; thereby, causing the main valve to throttle closed, decreasing downstream pressure to pilot setting.
- Should the downstream pressure fall below the pilot setting, the pilot releases accumulated pressure, and the main valve modulates open.
- Opening and/or closing speed can be set hydraulically using an opening and/or closing needle valve (optional)

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing pilots product page.

Adjustment Ranges	PSI	Bar
	11-150	0.7-10
	15-230	1-16
	30-430	2-30



Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Pilot	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated
	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass	Brass		
Control Loop Accessories	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec-23ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Pressure Reducing Valve

Model MN-820 (For High Pressure Applications)

Hydraulically operated, pressure reducing control valve that reduces higher upstream pressure to lower constant downstream pressure, regardless of fluctuating demand or varying upstream pressure.

The Bermad 800 Series valves are hydraulic, pilot operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 800 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In - line serviceable
- Flexible design - Easy addition of features
- Obstacle free flow path
- Optional V-Port Throttling Plug - Allows for low flow stability

Major Additional Features

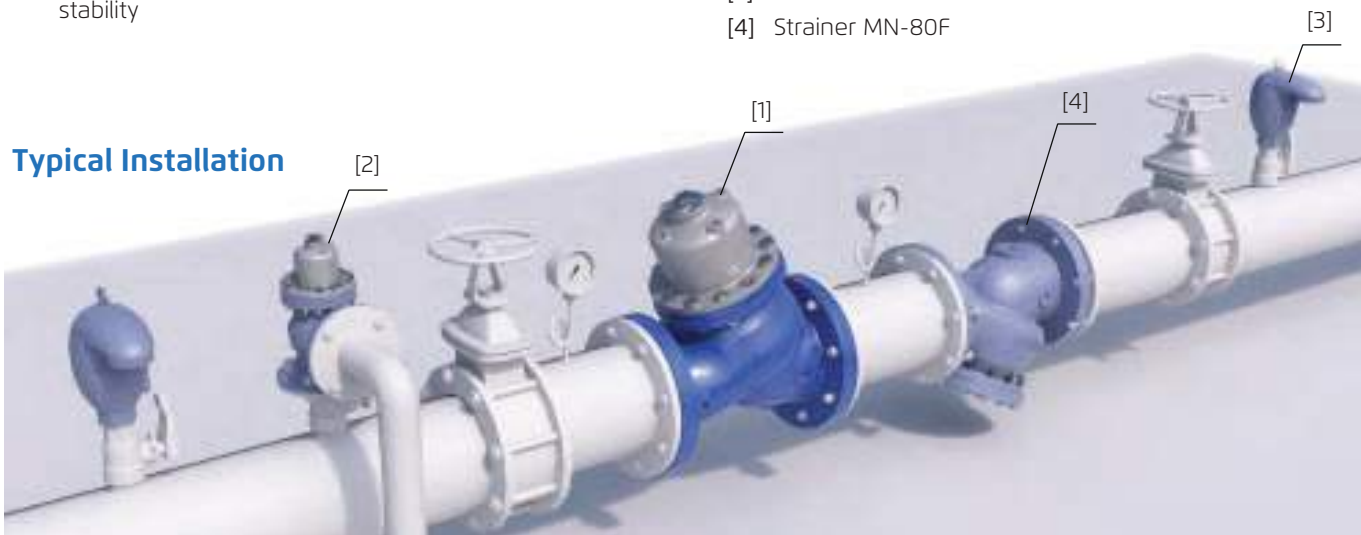
- Fixed Proportion PRV - **820 - PD**
- 3 - Way control - **820 - X**
- Solenoid control & check valve - **820 - 25**
- Hydraulic check valve - **820 - 20**
- ON/OFF Solenoid Control - **820 - 55**
- Electrically selected multi-level setting - **820 - 45**
- Electronic multi-level setting, Type 4T - **820 - 4T**
- Downstream over pressure guard - **820 - 48**

See relevant BERMAD publication

List of Components:

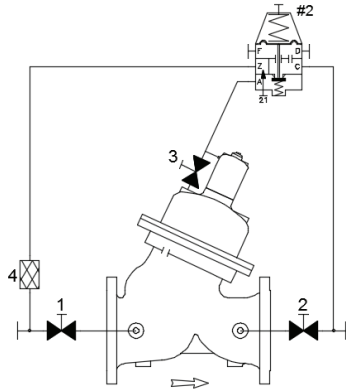
- [1] Pressure Reducing Valve MN-820
- [2] Quick Pressure Relief Valve MN-83Q
- [3] Combination Air Valve C70
- [4] Strainer MN-80F

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 21 Needle Valve
- #2 2W Pressure Reducing Pilot

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Model MN-820 is equipped with an adjustable pressure reducing pilot, which senses downstream pressure.
- Should this pressure rises above pilot setting, pilot throttles, enabling pressure in the control chamber to accumulate; thereby, causing the main valve to throttle closed, decreasing downstream pressure to pilot setting.
- Should downstream pressure falls below pilot setting, the pilot releases accumulated pressure, and the main valve modulates open.
- Opening and/or closing speed can be set hydraulically using an opening and/or closing needle valve (optional).

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing pilots product page.



Adjustment	PSI	Bar
Ranges	30 - 430	2 - 30
	30 - 650	2 - 45

Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec; 23ft/sec.
- Minimum operating pressure: 2 bar / 30 PSI. For lower pressure requirements consult factory.





Pressure Reducing Valve Proportional Type

Model MN-720-PD

Hydraulically operated, diaphragm actuated control valve that reduces higher upstream pressure to lower downstream pressure at a fixed ratio.

Bermad 700 Series valves are hydraulic, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator, that can be disassembled from the body as a separate integral unit.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

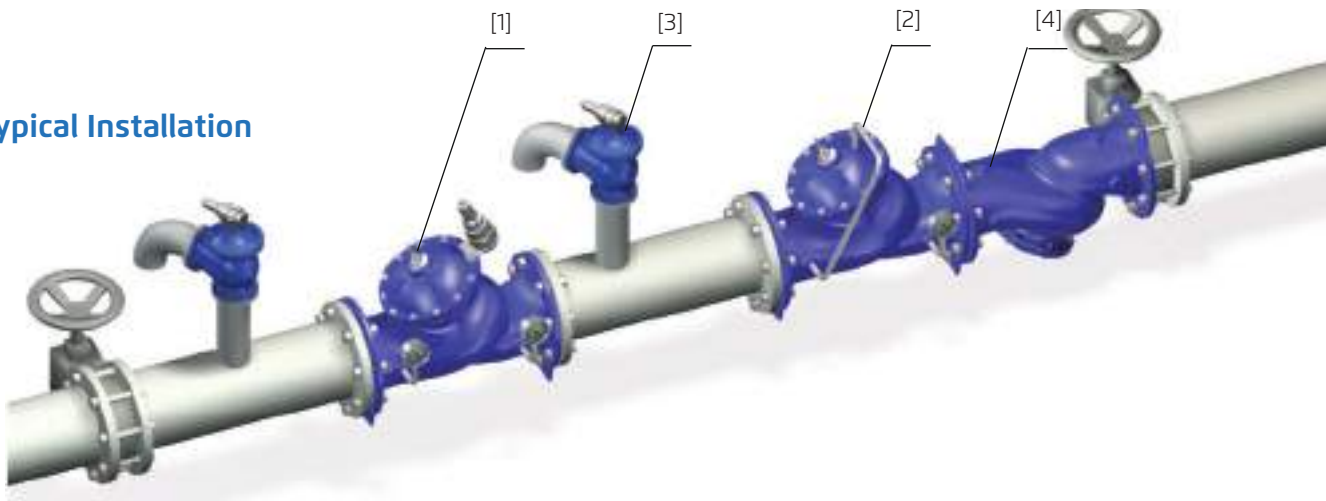
- ON/OFF Solenoid Control - **720 - PD - 55**
- Opening and closing speed control - **720 - PD - 03**
- Emergency pressure reducing valve - **720 - PD - 59**
- Pressure Sustaining - **723 - PD**
- Hydraulic check valve - **720 - PD - 20**

See relevant BERMAD publication

List of Components:

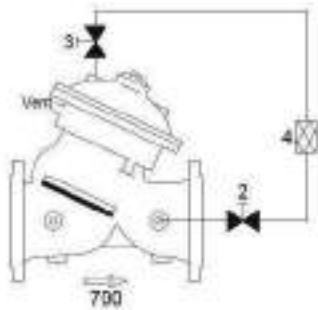
- [1] Pressure Reducing Valve MN-720
- [2] Pressure Reducing Valve, Proportional Type MN-720-PD
- [3] Pressure Relief Valve
- [4] Strainer

Typical Installation





Control Schematic (*)



Standard Configuration

- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- The Model 720-PD: pilotless double chambered control valve. Its downstream pressure is applied as the closing force on the top side of both the diaphragm and the seal disk areas. The upstream pressure is applied as the opening force on the bottom side of the seal disk area.
- The net force, resulting from the two opposing dynamic forces acting on the actuator's diaphragm and seal, determines the degree to which the valve is open. The valve seeks the point where these forces are equal. As the ratio of the areas of the seal disk and the diaphragm is constant, the ratio of the upstream and downstream pressures is constant as well.
- A rise in downstream pressure causes a momentary increase of the closing force. As a result, the valve throttles closed reducing downstream pressure according to the constant ratio.
- A drop in downstream pressure causes a momentary decrease of the closing force. As a result, the valve throttles open increasing downstream pressure according to the constant ratio.
- Adding a V-Port Throttling Plug modifies valve ratio by increasing the effective diaphragm area.
- When demand is zero, downstream pressure rises in proportion to the ratio, causing the valve to shut off.

Reduction Ratios Table

Valve Size		700	
Inches	mm	Flat Disc	V-Port
1.5",2",2.5"	40,50,65	3.7	4.0
3"	80	2.6	2.9
4"	100	2.5	2.8
6"	150	2.5	2.7
8"	200	2.4	2.6
10"	250	2.3	2.5
12"	300	2.2	2.4
14"	350	2.2	2.4
16"	400	2.2	2.3
18"	450	2.2	2.3
20"	500	2.2	2.3

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Recommended continuous flow velocity: 0.1-6m/sec; 0.3-20ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI
- For lower pressure requirements consult factory.





Pressure Reducing Valve Proportional Type

Model MN-820-PD (For High Pressure Applications)

Hydraulically operated, piston actuated control valve that reduces higher upstream pressure to lower downstream pressure at a fixed ratio.

Bermad 800 Series valves are hydraulic, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 800 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In - line Serviceable
- Flexible design - Easy addition of features
- Obstacle free flow path
- Optional V-Port Throttling Plug - Allows for low flow stability

Major Additional Features

- ON/OFF Solenoid Control - **820 - PD - 55**
- Opening and closing speed control - **820 - PD - 03**
- Emergency pressure reducing valve - **820 - PD - 59**
- Pressure Sustaining - **823 - PD**
- Hydraulic check valve - **820 - PD - 20**

See relevant BERMAD publication

List of Components:

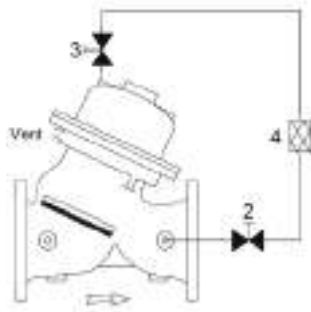
- [1] Pressure Reducing Valve, Proportional Type MN-820-PD
- [2] Pressure Relief Valve MN-83Q
- [3] Pressure Reducing Valve MN-720
- [4] Pressure Relief Valve MN-73Q
- [5] Strainer MN-80F

Typical Installation





Control Schematic (*)



Standard Configuration

- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- The Model 820-PD: pilotless double chambered control valve. Its downstream pressure is applied as the closing force on the top side of both the piston and the seal disk areas. The upstream pressure is applied as the opening force on the bottom side of the seal disk area.
- The net force, resulting from the two opposing dynamic forces acting on the actuator's piston and seal, determines the degree to which the valve is open. The valve seeks the point where these forces are equal. As the ratio of the areas of the seal disk and the piston is constant, the ratio of the upstream and downstream pressures is constant as well.
- A rise in downstream pressure causes a momentary increase of the closing force. As a result, the valve throttles closed reducing downstream pressure according to the constant ratio.
- A drop in downstream pressure causes a momentary decrease of the closing force. As a result, the valve throttles open increasing downstream pressure according to the constant ratio.
- When demand is zero, downstream pressure rises in proportion to the ratio, causing the valve to shut off.

Reduction Ratios Table

Valve Size		800
Inches	mm	
1.5", 2", 2.5"	40, 50, 65	2.3
3"	80	2.3
4"	100	2.5
6"	150	2.2
8"	200	2.3
10"	250	2.3
12"	300	2.1
14"	350	2.1
16"	400	2.2
18"	450	2.2
20"	500	2.2

Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Recommended continuous flow velocity: 0.1-6m/sec; 0.3-20ft/sec
- Minimum operating pressure: 2 bar / 30 PSI
- For lower pressure requirements consult factory.





Pressure Reducing and Sustaining Valve

Model MN-723

Hydraulically operated, Pressure Reducing and Sustaining control valve with two independent functions. It sustains minimum pre-set upstream pressure regardless of fluctuating flow or varying downstream pressure, and it prevents downstream pressure from rising above maximum pre-set regardless of fluctuating flow or excessive upstream pressure.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

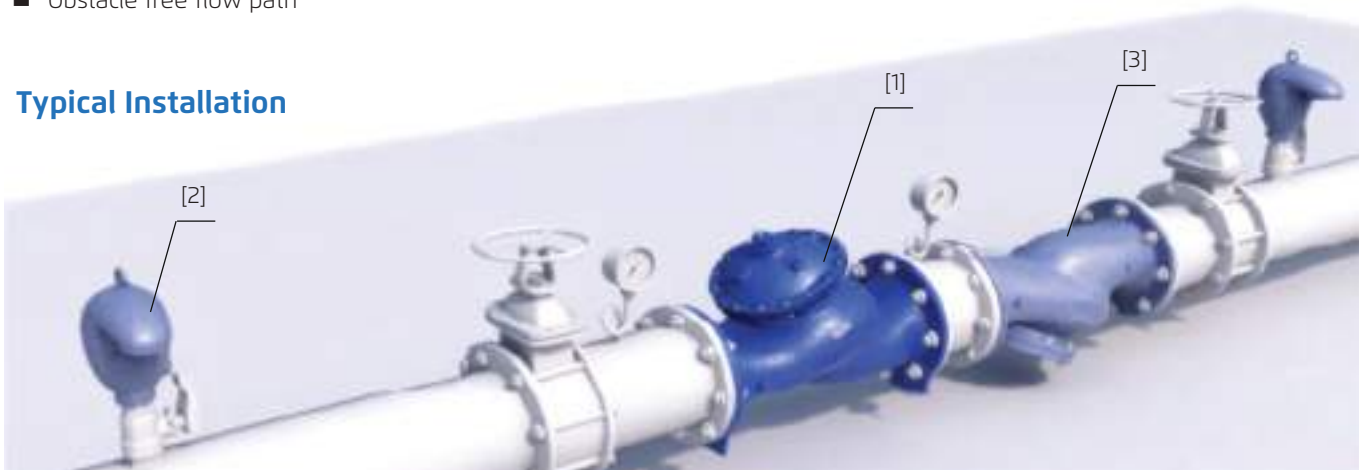
- Solenoid control – **723-55**
- Check feature – **723-20**
- High sensitivity pilots – **723-12**
- Solenoid control & check feature – **723-25**
- Downstream over pressure guard – **723-48**
- Proportional – **723-PD**

See relevant BERMAD publications.

List of Components:

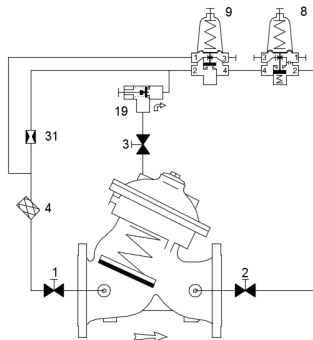
1. Pressure Reducing and Sustaining Valve 723
2. Combination Air Valve C70
3. Strainer

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Y-Control Filter
- 8 Pressure Reducing Pilot
- 9 Pressure Sustaining Pilot, Remote Sensing
- 19 Needle Valve, Opening Speed Control
- 31 Restriction Orifice

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class

Operation

- The Model 723 is a pilot controlled valve equipped with two adjustable, 2-Way pilots, pressure sustaining [PS] and pressure reducing [PR], operating independently in series.
- The orifice [31] continuously allows flow from the valve inlet into the upper control-chamber.
- The PS pilot [9] and the PR pilot [8] together control outflow from the upper control chamber.
- Should upstream pressure fall below PS pilot setting, the pilot closes causing pressure to accumulate in the upper control chamber. The main valve throttles closed sustaining upstream pressure at the pilot setting.
- Should upstream pressure rise above PS pilot setting, the pilot releases accumulated pressure from the upper control chamber to the main valve outlet through the held open PR pilot, opening the main valve.
- Should opening the main valve cause downstream pressure to rise above PR pilot setting, the pilot closes, causing the main valve to throttle closed reducing downstream pressure to PR pilot setting.
- The needle valve controls the opening speed.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing and sustaining pilots product page



	PSI	Bar
Adjustment	11-150	0.7-10
Ranges	15-230	1-16
	30-430	2-30

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Maximum intermittent flow velocity: 7.5m/sec-23ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.



Pressure Sustaining Valve In-Line Valve

Model MN-730

Hydraulically operated, pressure sustaining control valve that sustains a minimum, pre-set upstream (back) pressure, regardless of fluctuating flow or varying downstream pressure.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operating conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

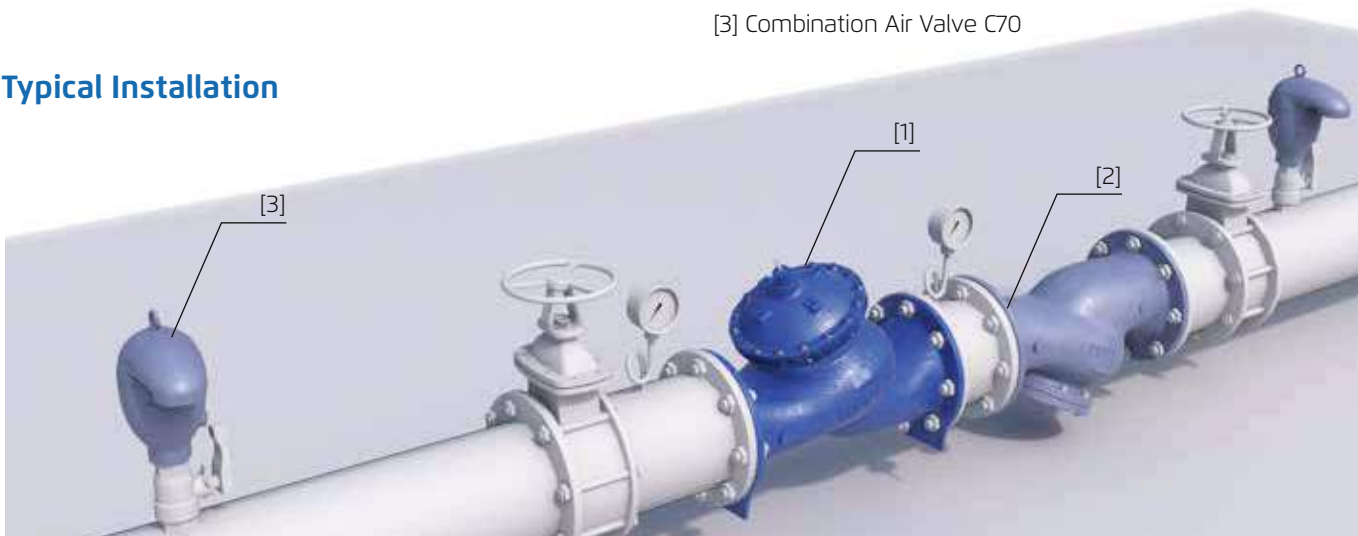
- 3 - Way control - **730 - X**
- Hydraulic check valve - **730 - 20**
- ON/OFF Solenoid Control - **730 - 55**
- Electrically selected multi-level setting - **730 - 45**
- High sensitivity pilot - **730 - 12**
- Pressure reducing & sustaining valve - **723**

See relevant BERMAD publications

List of Components:

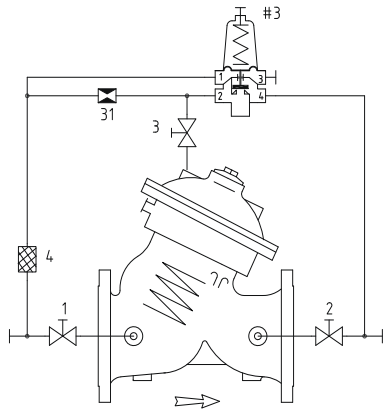
- [1] Pressure Sustaining Valve 730
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 31 Restriction Orifice
- #3 2W Pressure Sustaining Pilot

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- Model MN-730 is equipped with an adjustable pressure sustaining pilot, which senses upstream pressure and should be set to the minimum allowed system pressure.
- Should this pressure tend to fall below the pilot setting, the pilot throttles, enabling pressure in the control chamber to accumulate; thereby, causing the main valve to throttle closed, sustaining upstream (back) pressure at the pilot setting.
- Should the upstream pressure be below the pilot setting, the pilot closes, causing main valve to close drip tight.
- Should the upstream pressure tend to rise above the pilot setting, the pilot releases accumulated pressure, and the main valve modulates open.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure sustaining pilots product page



	PSI	Bar
Adjustment Ranges	11-150	0.7-10
	15-230	1-16
	30-430	2-30

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Pilot	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated
	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass	Brass		
Control Loop Accessories	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec-23ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Pressure Sustaining Valve Circulation Valve

Model MN-730

Hydraulically operated, circulation control valve that relieves excessive line pressure when above maximum pre-set.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator, that can be disassembled from the body as a separate integral unit.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

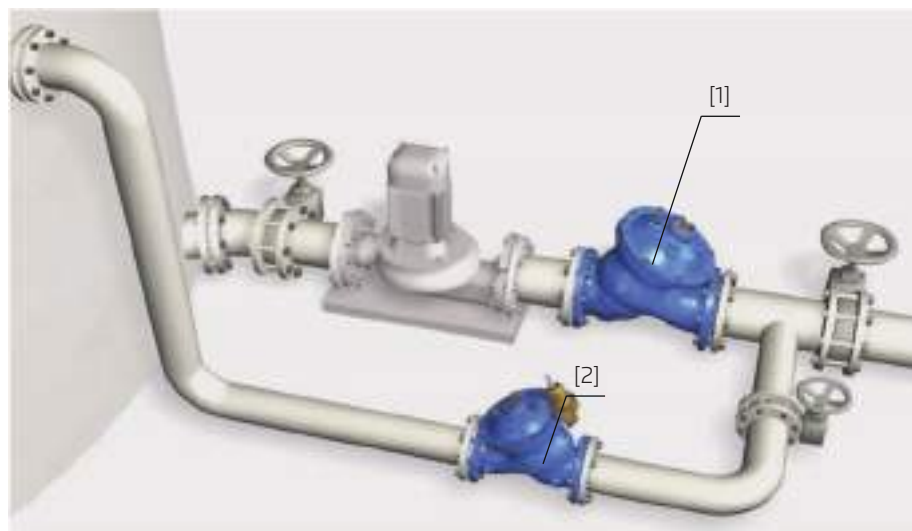
- 3 - Way control - **730 - X**
- ON/OFF Solenoid Control - **730 - 55**
- Electrically selected multi-level setting - **730 - 45**
- High sensitivity pilot - **730 - 12**

See relevant BERMAD publication

List of Components:

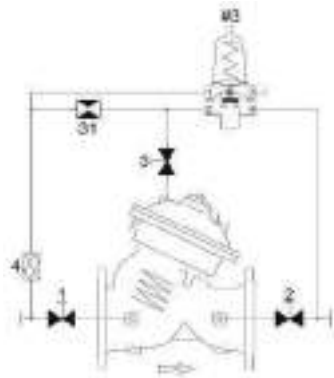
- [1] Pump Control Valve 740
- [2] Pressure Sustaining Valve (Circulation) 730

Typical Installation (as circulation valve)





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 31 Restriction Orifice
- #3 3W Pressure Sustaining Pilot

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Model MN-730 is equipped with an adjustable pressure sustaining pilot, which senses upstream pressure and should be slightly above system working pressure.
- Should upstream pressure tends to rise above pilot setting, the pilot releases control chamber pressure, and the main valve modulates open, relieving excessive upstream pressure.
- Should upstream pressure be below pilot setting, pilot closes, causing the main valve to close drip tight.
- Opening speed can be hydraulically set using an opening needle valve (optional)
- Closing speed can be hydraulically set using a closing needle valve (optional)

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure sustaining pilots product page



	PSI	Bar
Adjustment	11-150	0.7-10
Ranges	15-230	1-16
	30-430	2-30

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Maximum intermittent flow velocity: 7.5m/sec-23ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Pressure Sustaining Valve

Model MN-830 (For High Pressure Applications)

Hydraulically operated, pressure sustaining control valve that sustains a minimum, pre-set upstream (back) pressure, regardless of fluctuating flow or varying downstream pressure.

Bermad 800 Series valves are hydraulic, pilot operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 800 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Obstacle free flow path
- Optional V-Port Throttling Plug - Allows for low flow stability

Major Additional Features

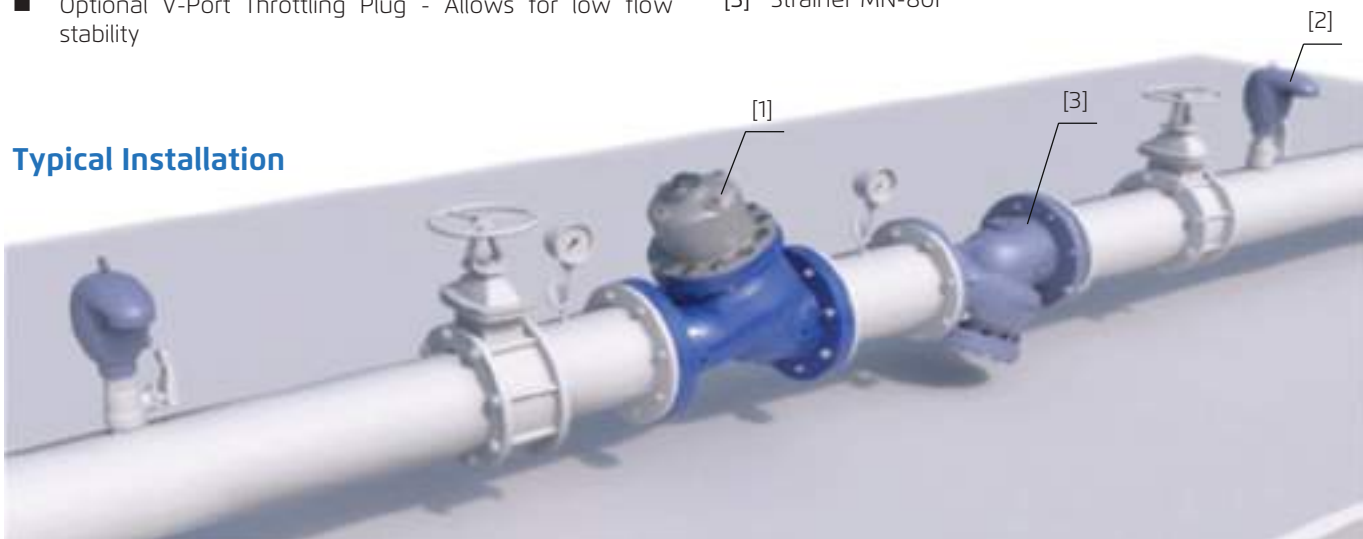
- 3 - Way control - **830 - X**
- ON/OFF Solenoid Control - **830 - 55**
- Electrically selected multi-level setting - **830 - 45**
- High sensitivity pilot - **830 - 12**

See relevant BERMAD publication

List of Components:

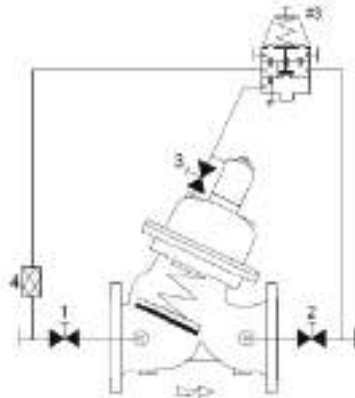
- [1] Pressure Sustaining Valve MN-830
- [2] Combination Air Valve C70
- [3] Strainer MN-80F

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- #3 2W Pressure Sustaining Pilot
- 21 Needle Valve

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Model MN-830 is equipped with an adjustable pressure sustaining pilot, which senses upstream pressure and should be set to the minimum allowed system pressure.
- Should this pressure tends to fall below the pilot setting, the pilot throttles, enabling pressure in the control chamber to accumulate; thereby, causing the main valve to throttle closed, sustaining upstream (back) pressure at the pilot setting.
- Should the upstream pressure tends to rise above pilot setting, the pilot releases the accumulated pressure in control chamber, and the main valve modulates open.
- Opening and/or closing speed can be hydraulically set using an opening and/or closing needle valve (optional).

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing pilots product page.



Adjustment	PSI	Bar
Ranges	30 - 430	2 - 30
	30 - 650	2 - 45

Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Maximum intermittent flow velocity: 7.5m/sec-23ft/sec.
- Minimum operating pressure: 0.2 bar / 30 PSI. For lower pressure requirements consult factory.





Quick Pressure Relief Valve

Model MN-73Q

Quick Pressure Relief control valve hydraulically operated, that relieves excessive system pressure when this pressure rises above the pre-set value. It immediately, accurately, and with high repeatability responds to system pressure rise by fully opening.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator, that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Moderated valve closing (no surges)
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Obstacle free flow path
- Balanced seal disc - High relief flow capacity
- Manual test valve - No setting change required

List of Components:

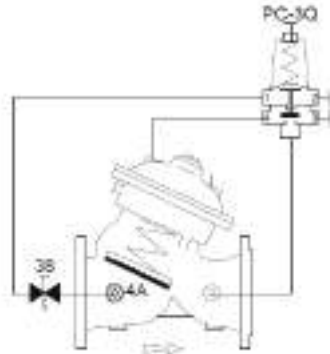
- [1] Pressure Reducing Valve MN-720
- [2] Quick Pressure Relief Valve MN-73Q
- [3] Combination Air Valve C70
- [4] Strainer MN-70F

Typical Installation





Control Schematic (*)



Standard Configuration

- 4A Control Filter
- 38 Manometer Insulation Valve
- PC-3Q Relief Pilot

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- The Model 73Q is a pilot controlled valve equipped with an adjustable 2-Way pressure relief pilot.
- The pilot internal restriction continuously allows flow from the main valve inlet into the upper control chamber. The pilot [PC-3Q] senses upstream pressure.
- Should this pressure abruptly rise above pilot setting, the pilot opens, and pressure in the upper control chamber is vented, causing the main valve to immediately open, thereby relieving excessive system pressure.
- When upstream pressure decreases to below pilot setting, the pilot closes, enabling pressure to accumulate in the upper control chamber, causing the main valve to smoothly close.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure relief pilots product page.



Adjustment Ranges	PSI	Bar
	15-145	1-10
	15-230	1-16
30-430	2-30	

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Full system data is required for optimal valve sizing.
- Recommended maximum intermittent flow velocity: 15m/sec; 50ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Quick Pressure Relief Valve

Model MN-83Q (For High Pressure Applications)

Quick Pressure Relief control valve hydraulically operated, that relieves excessive system pressure when this pressure rises above the pre-set value. It immediately, accurately, and with high repeatability responds to system pressure rise by fully opening.

Bermad 800 Series valves are hydraulic, pilot operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 800 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining solutions



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Wide flow range
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Moderated valve closing (no surges)
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Obstacle free flow path
- Balanced seal disc - High relief flow capacity
- Manual test valve - No setting change required

List of Components:

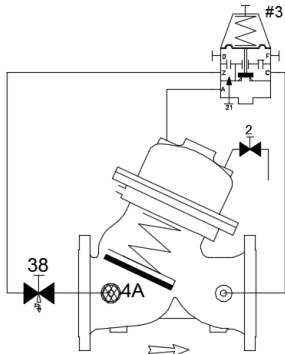
- [1] Pressure Reducing Valve MN-820
- [2] Quick Pressure Relief Valve MN-83Q
- [3] Combination Air Valve C70
- [4] Strainer MN-80F

Typical Installation





Control Schematic (*)



Standard Configuration

- 2 2W Isolation Valve
- 4A Control Filter
- #3 Relief Pilot, Quick Type
- 38 Manometer Isolation Valve
- 21 Needle Valve

(*) As a reference only. Components may vary based on valve’s size and class.

Operation

- The Model 83Q is a pilot controlled valve equipped with an adjustable 2-Way pressure relief pilot.
- The pilot internal restriction continuously allows flow from the main valve inlet into the upper control chamber. The pilot [#3] senses upstream pressure.
- Should this pressure abruptly rise above pilot setting, the pilot opens, and pressure in the upper control chamber is vented, causing the main valve to immediately open, thereby relieving excessive system pressure.
- When upstream pressure decreases to below pilot setting, the pilot closes, enabling pressure to accumulate in the upper control chamber, causing the main valve to smoothly close.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure relief pilots product page.



Adjustment Ranges	PSI	Bar
	30 - 430	2 - 30
	30 - 650	2 - 45

Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-M0. Others by request.

Notes:

- Full system data is required for optimal valve sizing.
- Recommended maximum intermittent flow velocity: 15m/sec; 50ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Booster Pump Control Valve

Quick Active Check Valve

Model MN-740

Hydraulically operated, active check pump control valve that opens fully or shuts off in response to electric signals. The valve isolates the pump from the system during pump startup and shutdown, thereby preventing pipeline surges.

The Bermad 700 Series valves are hydraulic operated, diaphragm actuated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities.

The valves are available in the standard configuration or with an independent flow check (code "2S"). They are made of the highest quality materials, suitable for different mining applications.



Features and Benefits

- Self-operated valves that can work without an external source of power, just a command is needed
- Electric controlled
 - Low power consumption
 - Normally Open or Normally Closed main valve
- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
- Check feature (spring loaded type)
 - Replaces line sized check valve
 - Fail-safe mechanical closure
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design
 - Full powered opening and closing (option "B")
 - Protected diaphragm
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

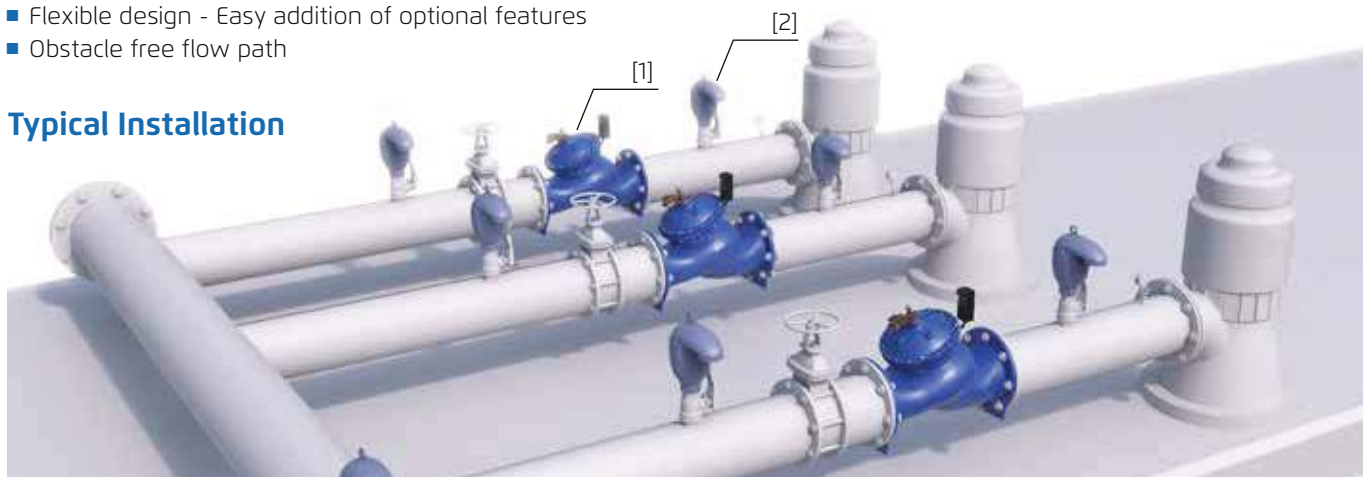
Major Additional Features

- Full powered opening & closing - **740 - B**
 - Independent flow check - **740Q - 2S**
 - Pressure sustaining - **743**
 - Pressure reducing - **742**
 - Flow control - **747 - U**
 - Pump circulation control - **748**
 - Electronic control - **740 - 18**
- See relevant BERMAD publications

List of Components:

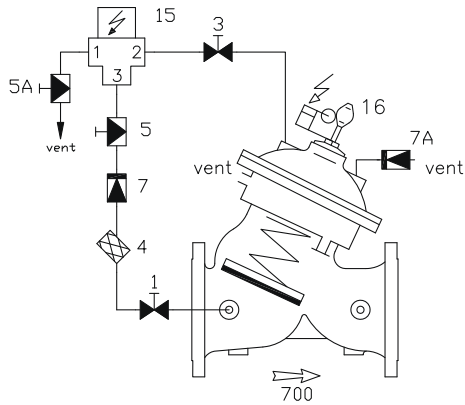
- [1] Pump Control Valve 740
- [2] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1/3 2W Isolation Valve
- 4 Control Filter
- 5 Closing Needle Valve
- 5A Opening Needle Valve
- 7/7A Check Valve
- 15 Solenoid / Motorized Ball Valve
- 16 Limit Switch

Additional features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter

(*) As a reference only. Components may vary based on valve's size and class. For poor quality fluids, motorized ball valve option is highly recommended

Sequence of Operation

Pump Starting Procedure

- When pump starts, valve upstream pressure rises above the system static pressure, allowing the valve to open gradually.

Pump Stopping Procedure

- While the pump is still working, and the shut-down command is issued, first, the solenoid - or the motorized ball valve MVB - applies pumped pressure to the upper control chamber. Then, the main valve starts to close isolating the running pump from the system.
- When valve is almost closed, its limit switch is activated and it shuts down the pump.

Power Failure

- If electric power fails during pumping, valve works immediately as a check valve, closing before the flow can change direction.

Electrical Data

Solenoid Data:

Voltages: (AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:

(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W

Motorized Ball Valve Data:

Voltages: (AC): 24, 110, 220
(DC): 24

Power Consumption:

(AC/DC): 45W

Limit Switch Data:

Switch Type: SPDT
Electrical Rating: 10A, type gl or gG
Enclosure Rating: IP66



Pressure Rating & End Connections

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Brass	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
Elastomers		Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
Motorized Ball Valve	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
Control Loop Accessories		Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings		Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Pump pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Booster Pump Control Valve Quick Active Check Valve

Model MN-840-03 (For High Pressure Applications)

Hydraulic active check pump control valve that opens fully or shuts off in response to electric signals. The valve isolates the pump from the system during pump startup and shutdown, thereby preventing pipeline surges.

The Bermad 800 Series valves are hydraulic operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Self-operated valves that can work without an external source of power, just a command is needed
- Electric controlled
 - Low power consumption
 - Normally Open or Normally Closed main valve
- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
- Check feature (spring loaded type)
 - Replaces line sized check valve
 - Fail-safe mechanical closure
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design
 - Full powered opening and closing (option "B")
 - Non-slam opening and closing characteristics
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

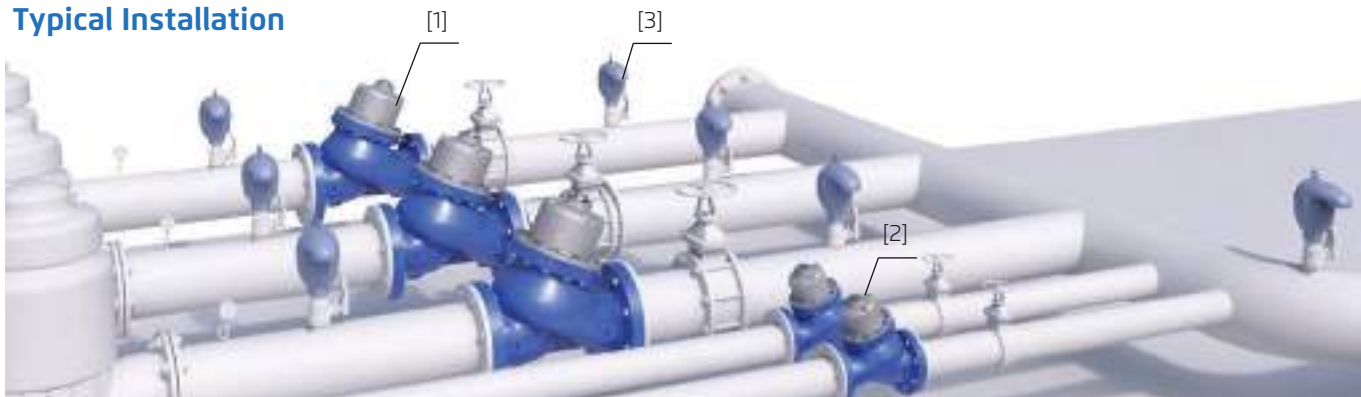
Major Additional Features

- Full powered opening & closing - **840 - B**
- Pressure reducing - **842**
- Pressure sustaining - **843**
- Pressure sustaining & reducing - **843 - 2Q**
- Flow control - **847 - U**
- Pump circulation control - **848**
- Electronic control - **840 - 18**

List of Components:

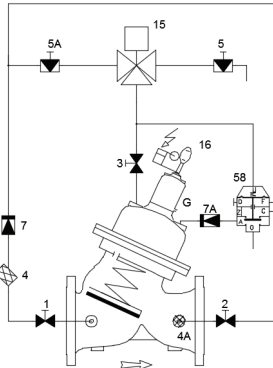
- [1] Pump Control Valve MN-840-03
- [2] Surge Anticipating Valve MN-835-M
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1/2/3 2W Isolation Valve
- 4 Control Filter
- 5/5A Needle Valve
- 7/7A Check Valve
- 15 Solenoid / Motorized Ball Valve
- 16 Limit Switch
- 58 3W D/Chamber Hydraulic Relay
- G Top Guide

Additional Features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter

(*) As a reference only. Components may vary based on valve's size and class. For poor quality solutions, motorized ball valve option is highly recommended.

Operation

Pump Starting Procedure

- Prior to pump start, valve is hydraulic closed
- When pump starts, valve upstream pressure builds and rises above the system static pressure, allowing the valve to open gradually.

Pump Stopping Procedure

- While the pump is still working, and the shut down command is issued, first, the solenoid - or the motorized ball valve MBV - applies pumped pressure to the upper control chamber. Then, the main valve starts to close isolating the running pump from the system.
- When valve is almost closed, its limit switch is activated and it shuts down the pump.

Power Failure

- If electric power fails during pumping, valve works immediately

Pilot Options

Solenoid Data:

Voltages: (AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:

(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W

Motorized Ball Valve Data:

Voltages: (AC): 24, 110, 220
(DC): 24

Power Consumption:

(AC/DC): 45W

Limit Switch Data:

Switch Type: SPDT
Electrical Rating: 10A, type gl or gG
Enclosure Rating: IP66



Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Stainless Steel 316	Brass	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel 316	Stainless Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Motorized Ball Valve	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 2 bar / 30 PSI.



Booster Pump Control and Pressure Sustaining Valve

Active Check Valve

Model MN-743

Hydraulic active check pump control valve that opens or shuts off in response to electric signals. The valve isolates the pump from the system during pump startup and shutdown, thereby preventing pipeline surges. While open, it sustains minimum discharge pressure regardless of fluctuating flow.

Bermad 700 Series valves are hydraulic pilot operated, oblique pattern, globe valves with a seat assembly and double chambered unitized actuator that can be disassembled from the body as a separate integral unit.

The valves hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Self-operated valves that work without an external power source, just a command is needed
- Electric controlled
 - Low power consumption
- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
- Check feature (spring loaded type)
 - Replaces line sized check valve
 - Fail-safe mechanical closure
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

Major Additional Features

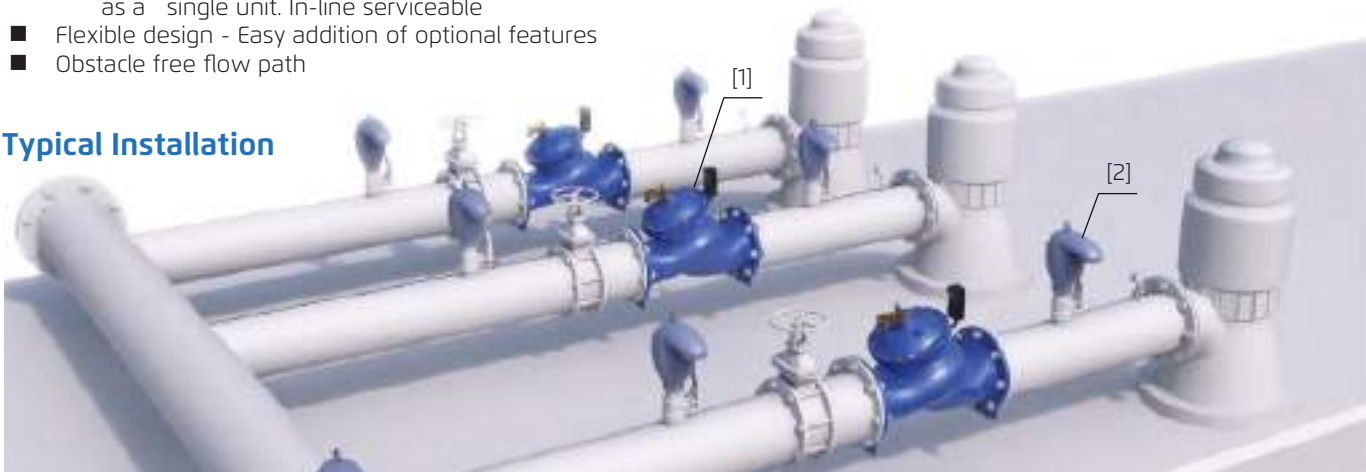
- Booster Pump Control Valve and Pressure Sustaining Valve with Independent Lift Check – **743-25**
- Pump differential pressure sustaining – **743-06**
- Electronic control – **743-18**
- Pressure sustaining & Pressure reducing – **743-2Q**

See relevant BERMAD publications.

List of Components:

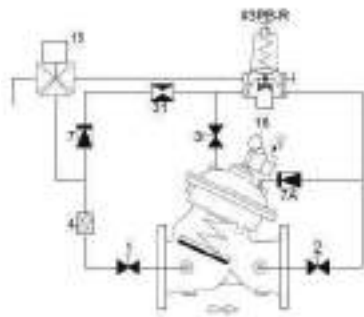
1. Pump Control and Pressure Sustaining Valve MN-743
2. Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 7/7A Check Valve
- 15 Solenoid / Motorized Ball Valve
- 16 Limit Switch
- 31 Restriction Orifice
- #3PB-R 2W Pressure Sustaining Pilot

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- Q Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class.

Operation

Pump Starting Procedure

- When pump starts, valve upstream pressure rises above the system static pressure, allowing the valve to open gradually.
- The upper control chamber pressure is released to valve outlet through the pilot sustaining pilot, allowing the valve to gradually open.
- If as a result of valve opening, the pump discharge pressure drops to pilot setting, the pressure sustaining pilot throttles causing the main valve to throttle, and sustaining upstream pressure at pilot setting.

Pump Stopping Procedure

- While the pump is still working, and the shut-down command is issued, first the solenoid - or the motorized ball valve MBV - closes the pilot and applies pumped pressure to the upper control chamber. Then, the main valve starts to close isolating the running pump from the system.
- When valve is almost closed, its limit switch is activated and it shuts down the pump.

Power Failure

- If electric power fails during pumping, valve works immediately as a check valve, closing before the flow can change direction.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure sustaining pilots product page.

Adjustment Ranges	PSI	Bar
	11-150	0.7-10
	15-230	1-16
	30-430	2-30



Electrical Data

Solenoid Data:

Voltages:
(AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:
(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W

Motorized Ball Valve Data:

Voltages:
(AC): 24, 110, 220
(DC): 24

Power Consumption:
(AC/DC): 45W

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Stainless Steel 316	Brass	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel 316	Stainless Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Motorized Ball Valve	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

- Notes:
- Inlet pressure, outlet pressure and flow rate are required for optimal sizing.
 - Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
 - Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Booster Pump Control and Pressure Sustaining Valve

Active Check Valve

Model MN-843 (For High Pressure Applications)

Hydraulic active check pump control valve that opens or shuts off in response to electrical signals. The valve isolates the pump from the system during pump startup and shutdown, thereby preventing pipeline surges. While open, it sustain minimum discharge pressure regardless of fluctuating flow.

The Bermad 800 Series valves are hydraulic operated, piston actuated, oblique pattern, globe valves with seat assembly and double chambered unitized actuator.

The valves hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Self-operated valves that can work without an external source of power, just a command is needed
- Electric controlled
 - Low power consumption
 - Normally Open or Normally Closed main valve
- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
- Check feature (spring loaded type)
 - Replaces line sized check valve
 - Fail-safe mechanical closure
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design
 - Non-slam opening and closing characteristics
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

Major Additional Features

- Pump differential pressure sustaining – **843-06**
- Electronic control – **843-18**
- Pressure sustaining & Pressure reducing – **843-20**

See relevant BERMAD publications.

List of Components:

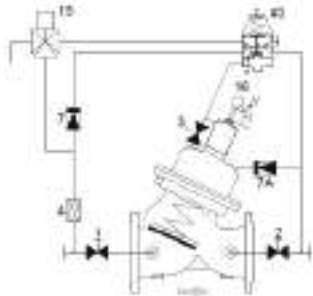
- [1] Pump Control & Pressure Sustaining Valve MN-843
- [2] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 7/7A Check Valve
- 15 Solenoid / Motorized Ball Valve
- 16 Limit Switch
- #3 2W Pressure Sustaining Pilot

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- Q Position Transmitter 4-20 mA
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class

Operation

Pump Starting Procedure

- When pump starts, valve upstream pressure rises above the system static pressure, allowing the valve to open gradually.
- The upper control chamber pressure is released to valve outlet through the pilot sustaining pilot, allowing the valve to gradually open.
- If as a result of valve opening, the pump discharge pressure drops to pilot setting, the pressure sustaining pilot throttles causing the main valve to throttle, and sustaining upstream pressure at pilot setting.

Pump Stopping Procedure

- While the pump is still working, and the shut-down command is issued, first the solenoid - or the motorized ball valve MBV - closes the pilot and applies pumped pressure to the upper control chamber. Then, the main valve starts to close isolating the running pump from the system.
- When valve is almost closed, its limit switch is activated and it shuts down the pump.

Power Failure

- If electric power fails during pumping, valve works immediately as a check valve, closing before the flow can change direction.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure sustaining pilots product page.



Adjustment Ranges	PSI	Bar
	30 - 430	2 - 30
30 - 650	2 - 45	

Solenoid Data:

Voltages:
 (AC): 24, 110, 220
 (DC): 12, 24, 110, 220
Power Consumption:
 (AC): 30VA, inrush; 15VA (8W) holding

Motorized Ball Valve Data:

Voltages:
 (AC): 24, 110, 220
 (DC): 24
Power Consumption:
 (AC/DC): 45W

Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel/Brass	Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Solenoid	Body	Brass	Stainless Steel 316	Brass	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel 316	Stainless Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Motorized Ball Valve	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 2 bar / 30 PSI.





Surge Anticipating Valve

Model MN-735

Hydraulically operated, diaphragm actuated, off-line surge anticipating valve that immediately opens in response to the pressure drop associated with an abrupt pump stoppage. The pre-opened valve dissipates the returning high pressure wave; thereby, eliminating the surge. The valve smoothly closes drip tight as quickly as the relief feature allows; thereby, preventing closing surge. The valve also relieves excessive system pressure.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operating conditions with minimal cavitation and noise. They are made of the highest quality materials, suitable for different mining applications.



Features and Benefits

- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Obstacle free flow path
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

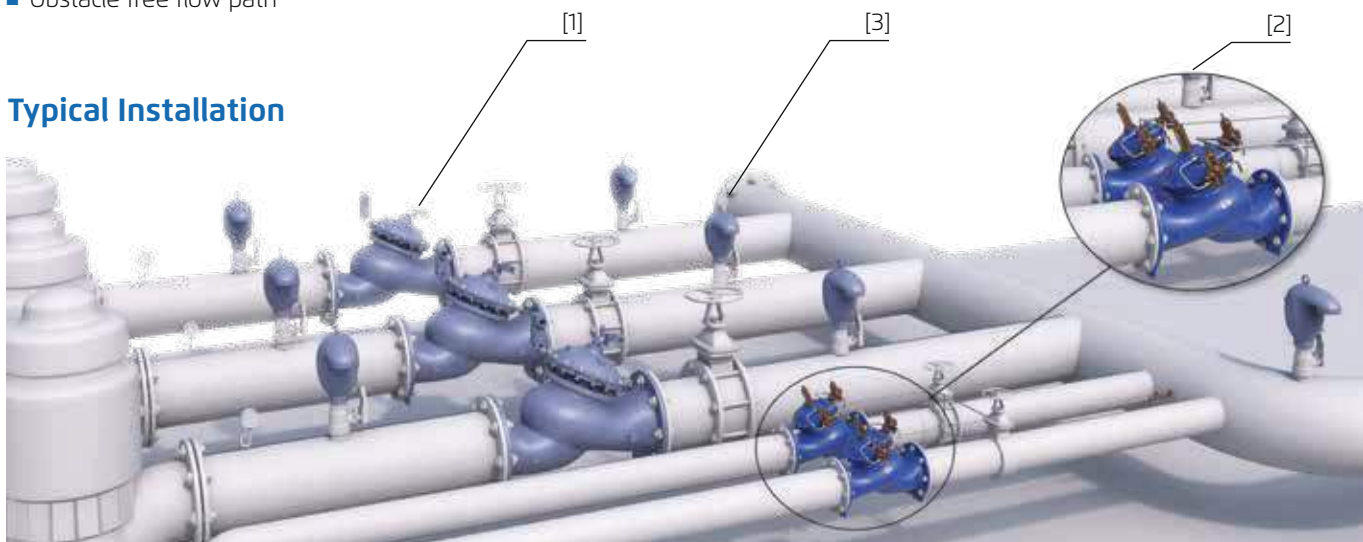
- Solenoid Control - **735 - 55 - M**
- Hydraulic/Electric override - **735 - 55 - 09 - M**

See relevant BERMAD publications

List of Components:

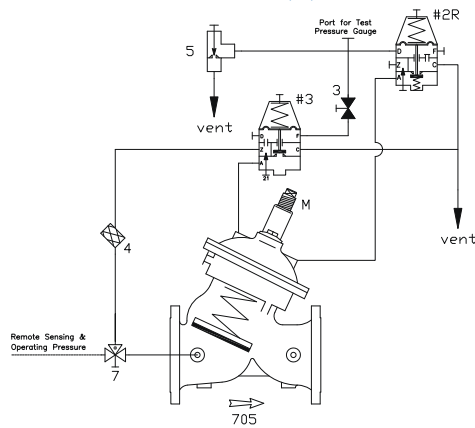
- [1] Pump Control Valve 740
- [2] Surge Anticipating Valve 735
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 3 2W Isolation Valve
- 4 Control Filter
- 5 Needle Valve
- 7 3W ball valve
- #2R 2W Press. Reducing Pilot
- #3 2W Press. Sustaining Pilot
- M Flow Stem

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch
- U Orifice Plate
- 6 Pressure Gauge

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Low pressure pilot #2R senses the initial pressure drop at down surge and opens. This immediate reaction allows the remaining line pressure to quickly open the main valve. The already opened 735-M releases the returning water column minimizing the line pressure rise.
- Should the relief rate be insufficient, and the pressure exceeds the high pressure pilot #3 setting, it immediately opens; thereby, further opening the main valve.
- As system pressure stabilizes again at static pressure, both pilots close and the main valve begins closing.
- The flow stem limits the relief flow to prevent column separation and preserve closing pressure.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing and pressure sustaining pilots product page.



	PSI	Bar
Adjustment	11-150	0.7-10
Ranges	15-230	1-16
	30-430	2-30

Pressure Rating & End Connections

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilots	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass	Brass		
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Full system data is required for surge analysis and optimal valve sizing.
- A flow stem enables limiting valve opening stroke, adjusting precisely the required flow through the valve.
- Recommended maximum intermittent flow velocity: 15m/sec; 50ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Surge Anticipating Valve

Model MN-835-M (For High Pressure Applications)

Hydraulically operated, piston actuated, off-line surge anticipating valve that immediately opens in response to the pressure drop associate with abrupt pump stoppage. The pre-opened valve dissipates the returning high pressure wave; thereby, eliminating the surge. The valve smoothly closes drip tight as quickly as the relief feature allows; thereby, preventing closing surge. The valve also relieves excessive system pressure.

Bermad 800 Series valves are hydraulic, pilot operated, piston actuated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 800 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Robust structure, piston actuated
 - High pressure service
- Replaces surge air vessels
 - Relieves surge, fail-safe open
 - Lower investment & minimal maintenance costs
 - Economy of space
 - Especially economic for high pressure ratings
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - Drip tight sealing
- Double chamber actuator design
 - Moderate valve closing (no surges)
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Obstacle free flow path - Uncompromising reliability
- Balanced seal disc - High flow capacity

Major Additional Features

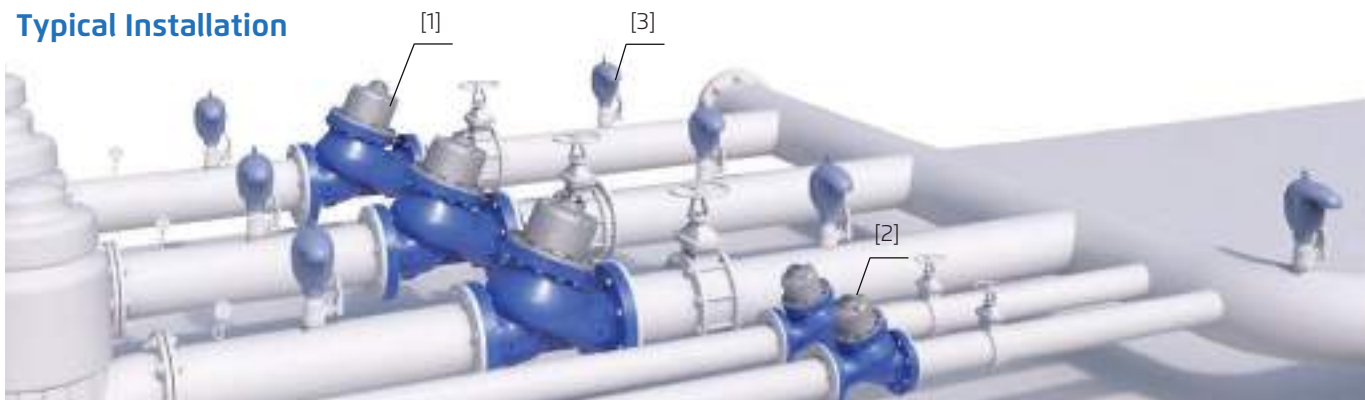
- Solenoid Control - **835 - 55 - M**
- Hydraulic/Electric override - **835 - 55 - 09 - M**

See relevant BERMAD publication

List of Components:

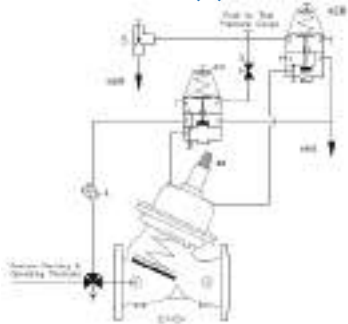
- [1] Pump Control Valve MN-840
- [2] Surge Anticipating Valve MN-835-M
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 3 2W Isolation Valve
- 4 Control Filter
- 5 Needle Valve
- 7 3W ball valve
- #2R 2W Press. Reducing Pilot
- #3 2W Press. Sustaining Pilot
- M Flow Stem

Additional Features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter
- I2 Visual Position Indicator (side)
- S2 Electric Limit Switch (side)
- U Orifice Plate
- 25 Pressure Gauge

(*) As a reference only. Components may vary based on valve's size and class

Operation

- When pump stops abruptly, a pressure drop is produced due to the inherent moment of the water column, which continue to travel along the pipe, generating the down surge. When water column loses its momentum, it travels back towards the pump. Should it hit the closed check valve, a very high pressure surge is created and travels through the system, generating the up surge.
- Low pressure pilot #2R senses the initial pressure drop at down surge and opens. This immediately reaction allows the remaining line pressure to quickly open the main valve. The already opened 835-M releases the returning water column minimizing the line pressure rise.
- Should the relief rate be insufficient, and the pressure exceeds the high pressure pilot #3 setting, it immediately opens; thereby, further opening the main valve.
- As system pressure stabilizes again at static pressure, both pilots close and the main valve begin closing.
- The flow stem limits the relief flow to prevent column separation and preserve closing pressure.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing pilots product page.



Adjustment Ranges	PSI	Bar
	30 - 430	2 - 30
	30 - 650	2 - 45

Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-M0. Others by request.

Notes:

- Full system data is required for surge analysis and optimal valve sizing.
- A flow stem enables limiting valve opening stroke, adjusting precisely the required flow through the valve.
- Recommended maximum intermittent flow velocity: 15m/sec; 50ft/sec.
- Minimum operating pressure: 2 bar / 30 PSI. For lower pressure requirements consult factory.





Level Control Valve with Bi-Level Electric Float

Model MN-750-65

Hydraulically operated, diaphragm actuated, control valve that controls reservoir filling and level. Reservoir filling occurs in response to an electric float switch signal, opening at a pre-set low level and shutting off at a pre-set high level.

Bermad 700 Series valves are hydraulic, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit. Its double chamber actuator allows the valve to be powered to fully open and close even at very low pressure.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Bi-level electric float switch
 - No hydraulic sensing tubes
 - ON/OFF Service
 - No cavitation damage
 - Simplified float installation and setting
- Electric controlled
 - Low power consumption
 - Normally Open or Normally Closed main valve
- Designed to - stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design
 - Full powered opening and closing (option "B")
 - Protected diaphragm
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

Major Additional Features

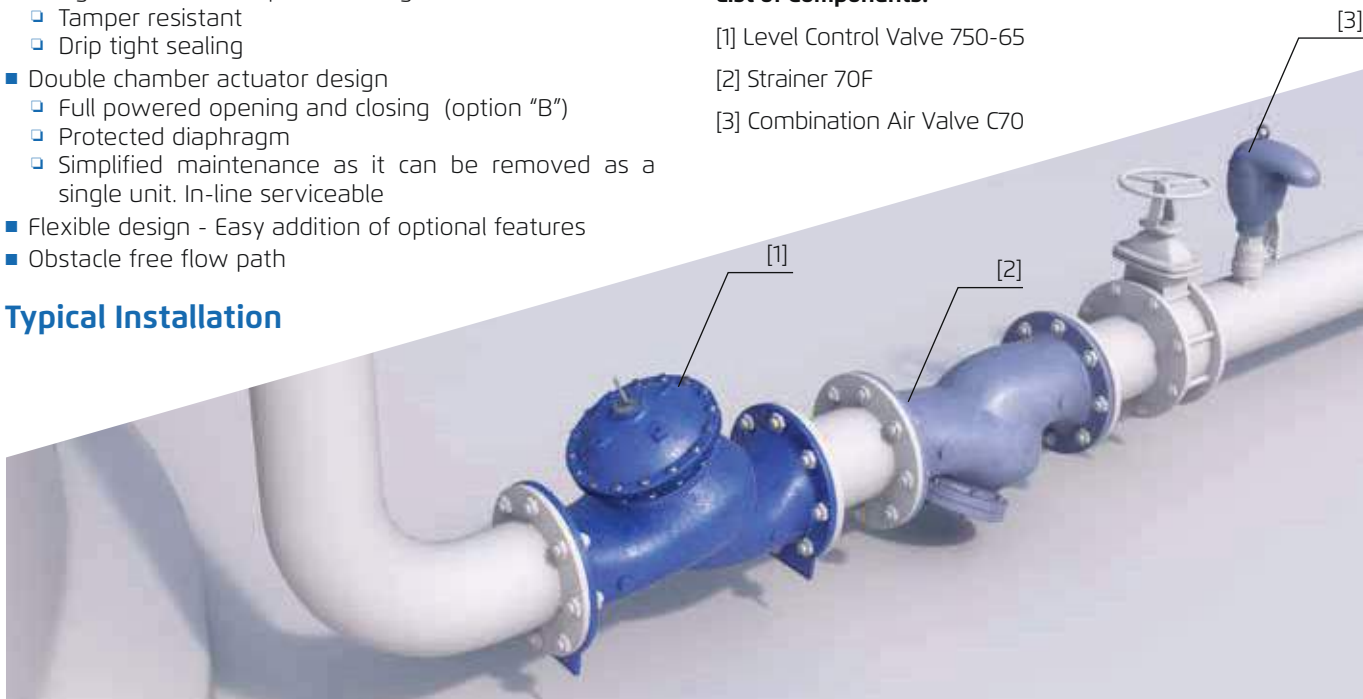
- Pressure Sustaining - **753 - 65**
- Flow Control - **757 - 65 - U**
- Full powered opening & closing - **750 - 65 - B**
- Hydraulic float backup - **750 - 65 - 66**
- Altitude pilot backup - **750 - 65 - 80**

See relevant BERMAD publications

List of Components:

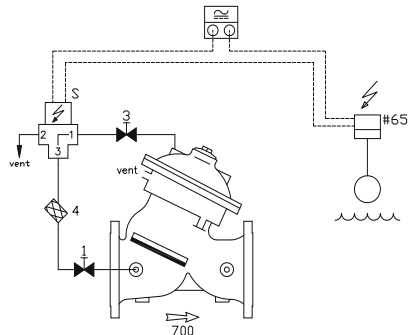
- [1] Level Control Valve 750-65
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- S Solenoid/Motorized Ball Valve
- #65 Bi-level electric float switch

Additional features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve’s size and class. For poor quality fluids, motorized ball valve option is highly recommended

Operation

- The bi-level float switch closes at a pre-set low level, and opens at a pre-set high level, activating the solenoid - motorized ball valve MBV - in both cases.
- Should the level drop, the solenoid - MBV - vents the upper control chamber, opening the main valve.
- Should the level rise, the solenoid - MBV - applies the upstream pressure to the upper control chamber to close the main valve.

Electrical Data

Solenoid Data:

Voltages: (AC): 24, 110, 220
(DC): 12, 24, 110, 220

Power Consumption:

(AC): 30VA, inrush; 15VA (8W) holding
(DC): 8W

Motorized Ball Valve Data:

Voltages: (AC): 24, 110, 220
(DC): 24

Power Consumption:

(AC/DC): 45W



Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Solenoid	Body	Brass	Brass	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Motorized Ball Valve	Body/Internals	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Level Control Valve with Bi-Level Vertical Float

Model MN-750-66-B

Hydraulically operated, diaphragm actuated, control valve that controls reservoir filling and level. Reservoir filling occurs in response to a hydraulically controlled non-modulating bi-level vertical float that opens at a pre-set reservoir low level, and shuts off drip-tight at a pre-set high level.

Bermad 700 Series valves are hydraulic, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit. Its double chamber actuator allows the valve to be powered to fully open and closed even at very low pressure.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Bi-level hydraulic float control
 - ON/OFF Service
 - No cavitation damage
 - Suitable for low quality fluids
 - Inherent reservoir refreshing
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design
 - Full powered opening and closing
 - Protected diaphragm
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Obstacle free flow path

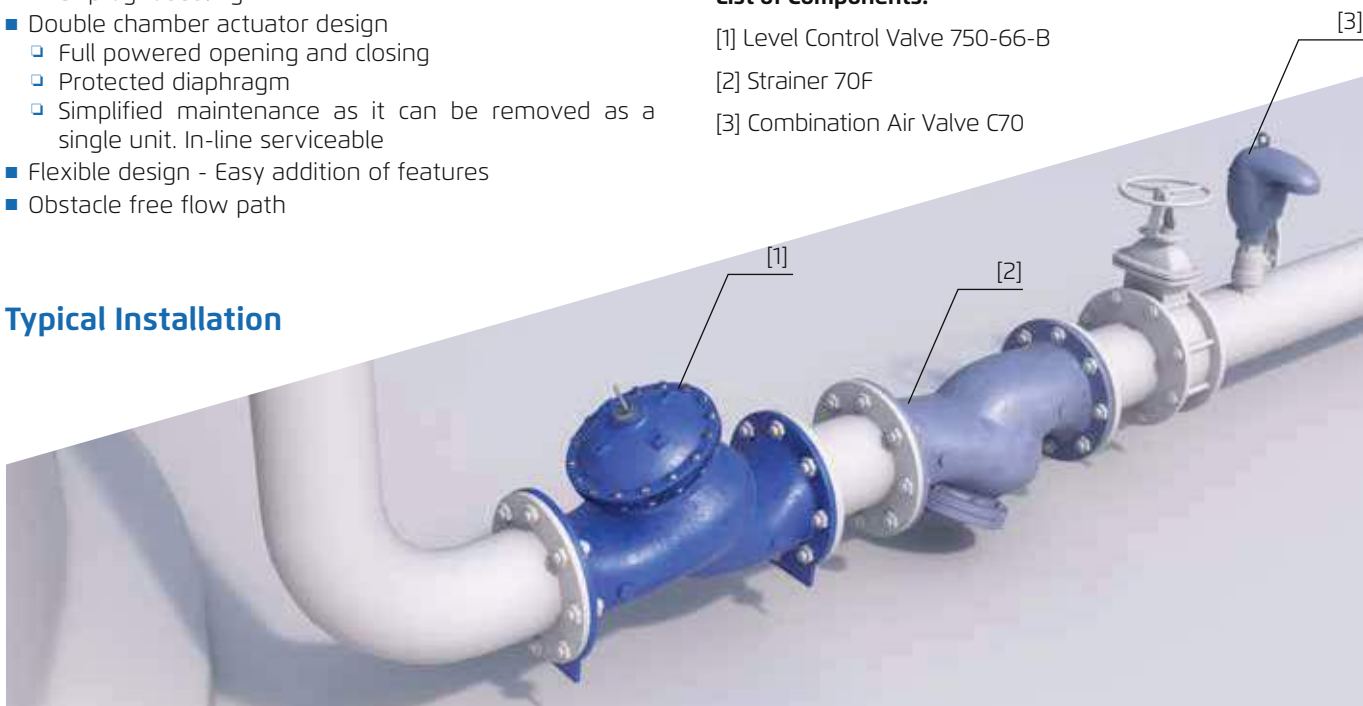
Major Additional Features

- Pressure Sustaining - **753 - 66 - B**
 - Flow Control - **757 - 66 - U - B**
 - Electric float backup - **750 - 66 - 55 - B**
- See relevant BERMAD publications

List of Components:

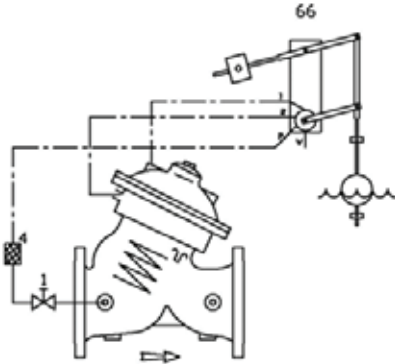
- [1] Level Control Valve 750-66-B
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



- Standard Configuration**
- 1 2W Isolation Valve
 - 4 Control Filter
 - #66 Bi-level float

- Additional features (OPTIONAL)**
- F Large Control Filter
 - F1 Extra Large Control Filter
 - I Visual Position Indicator
 - S Electric Limit Switch

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- The float #66 slides along its rod. When the float reaches either the adjustable high or low level stoppers, it either pushes the rod assembly up or pulls it down, switching the float pilot position. When the float is between the adjustable stoppers, the main valve remains in the last position.
- At high level, the float pilot applies pressure to the upper control chamber, and vents the lower control chamber; thereby shutting off the main valve.
- At low level, the float pilot applies pressure to the lower control chamber, and vents the upper control chamber; thereby opening the main valve.



Float Options:

- Minimum level differential: 6"; 150 mm.
- Maximum level differential: 21"; 540 mm.
- Each extension rod adds: 22"; 560 mm.
- One extension rod is supplied
- Extra counterweight is required if second extension rod is used.
- If inlet pressure is below 7 psi/0.5 bar, or above 150 psi

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Float Assy.	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Brass/Stainless Steel	Brass/Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Rod	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Float	Plastic	Plastic	Plastic	Plastic
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Level Control Valve with Modulating Vertical Float

Model MN-750-67

Hydraulically operated, diaphragm actuated, control valve that controls reservoir filling and level. Reservoir filling occurs in response to a hydraulically controlled modulating vertical float which maintains a constant water level, regardless of fluctuating demand.

Bermad 700 Series valves are hydraulic, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operating conditions with minimal cavitation and noise. They are made of the highest quality materials, suitable for different mining applications.



Features and Benefits

- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

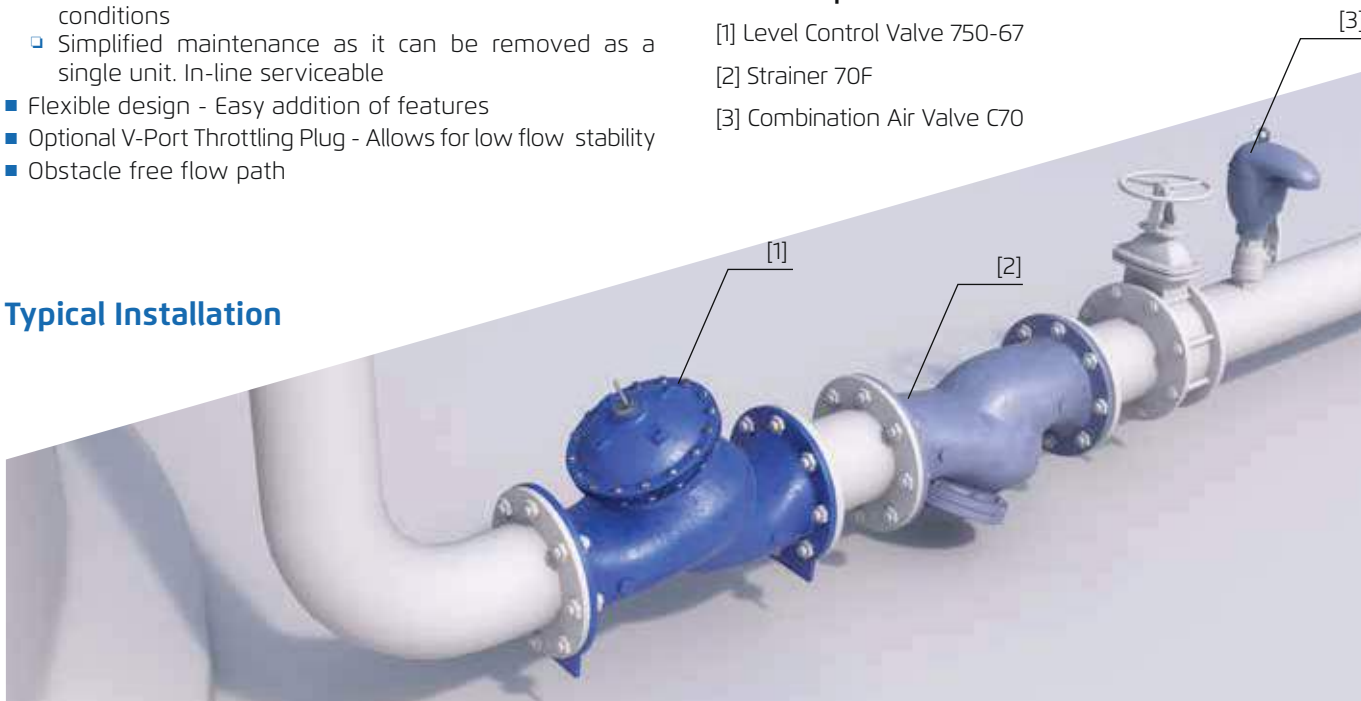
Major Additional Features

- Pressure Sustaining - **753 - 67**
 - Flow Control - **757 - 67 - U**
 - Electric float backup - **750 - 67 - 55**
- See relevant BERMAD publications

List of Components:

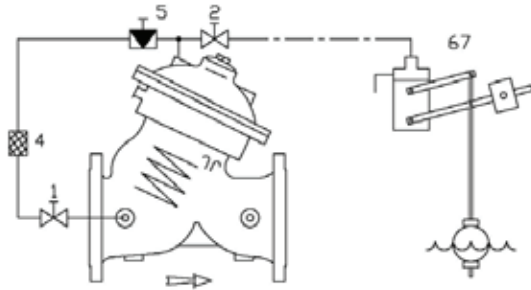
- [1] Level Control Valve 750-67
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 4 Control Filter
- 5 Needle valve
- #67 Modulating float

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch
- U Orifice Plate

(*) As a reference only. Components may vary based on valve's size and class

Operation

- The needle valve continuously allows flow from the valve inlet into the upper control chamber.
- The float is locked on the float assembly rod between its two adjustable stoppers at the desired level.
- Should the level rise towards setting, the float pilot throttles, pressure in the upper control chamber accumulates causing the main valve to throttle closed, reducing filling rate, and eventually closing drip tight.
- Should the level fall, the float pilot releases pressure from the upper control chamber causing the main valve to modulate open.
- The needle valve controls the closing speed.



Float Options:

- Rod length: 21"; 540 mm.
- Each extension rod adds: 22"; 560 mm.
- One extension rod is supplied.
- Extra counterweight might be required according to rod length and high operating pressure.
- If inlet pressure is below 7 psi/0.5 bar, or above 150 psi/10 bar, consult factory.

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel Brass/Coated Steel	Stainless Steel Brass/Coated Steel	Stainless Steel Coated Steel	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated
Float Assy.	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Brass/Stainless Steel	Brass/Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Rod	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
	Float	Plastic	Plastic	Plastic	Plastic
Control Loop Accessories	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-M0. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec-23ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Level Control Valve with Altitude Pilot

Model MN-750-80

Hydraulically operated, diaphragm actuated, control valve that controls reservoir filling and level in response to a hydraulically controlled 3-way altitude pilot, which shuts off the valve at a pre-set reservoir high level, and fully opens the valve when the level drops approximately three foot (one meter).

Bermad 700 Series valves are hydraulic, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Bi-level altitude pilot
 - No float, simple installation
 - ON/OFF Service
 - No cavitation damage
 - Suitable for low quality fluids
 - Reservoir inherent refreshing
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Drip tight sealing
- Double chamber actuator design
 - Full powered opening and closing (option "B")
 - Protected diaphragm
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

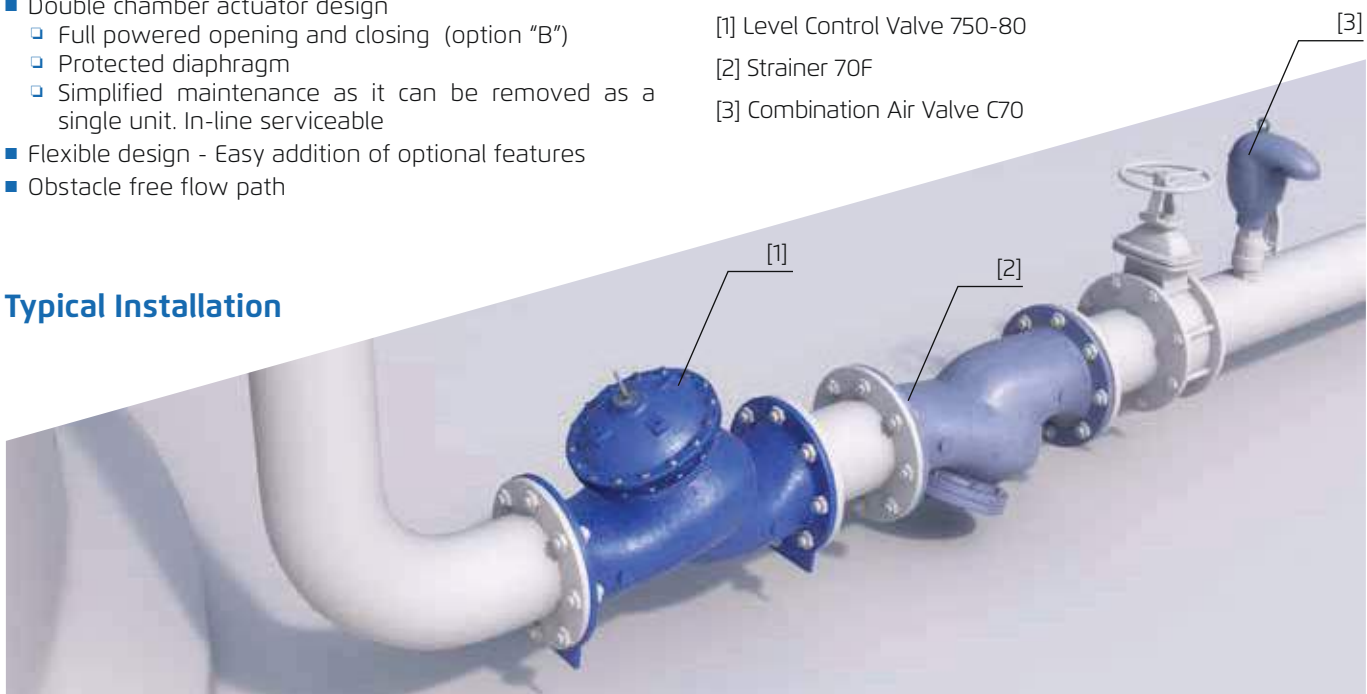
Major Additional Features

- Pressure sustaining - **753 - 80**
 - Bi-directional flow - **750 - 87**
 - Full powered opening & closing - **750 - 80 - B**
- See relevant BERMAD publications

List of Components:

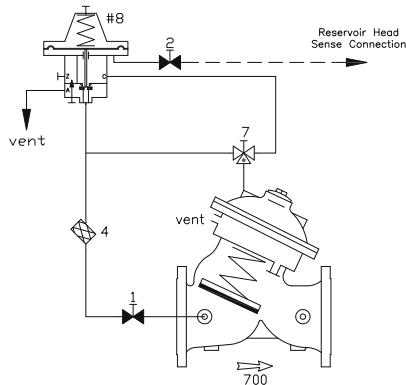
- [1] Level Control Valve 750-80
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 4 Control Filter
- 7 3-Way Cock Valve
- #8 3-Way Altitude Pilot

Additional features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve’s size and class

Operation

- The main valve is equipped with an adjustable 3-Way altitude pilot. The pilot senses the static head of the reservoir level.
- Should static head rise to the pilot setting, the pilot applies upstream pressure to the upper control chamber, powering the main valve to shut off.
- Should the static head falls below the pilot setting approximately 5 feet (1.5m.), the pilot vents the upper control chamber, causing the main valve to full open.

Altitude Pilot Options:

- Altitude Adjustment Range:

Pilot Code	feet	meter
M6	7-46	2-14
M5	17-72	5-22
M4	49-115	15-35
M8	82-230	25-70



- Shut-off level repeatability: 4" (10 cm.)
- Re-opening level: aprox. 5 ft. (1.5m.) below shut-off level

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass	Brass		
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Flow Control Valve

Model MN-770-U

Hydraulically operated, flow control valve that maintains a pre-set maximum flow, regardless of fluctuating demand or varying system pressure.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operating conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Hydraulic flow sensor
 - No moving parts. No electronic components.
 - No need for flow straightening
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

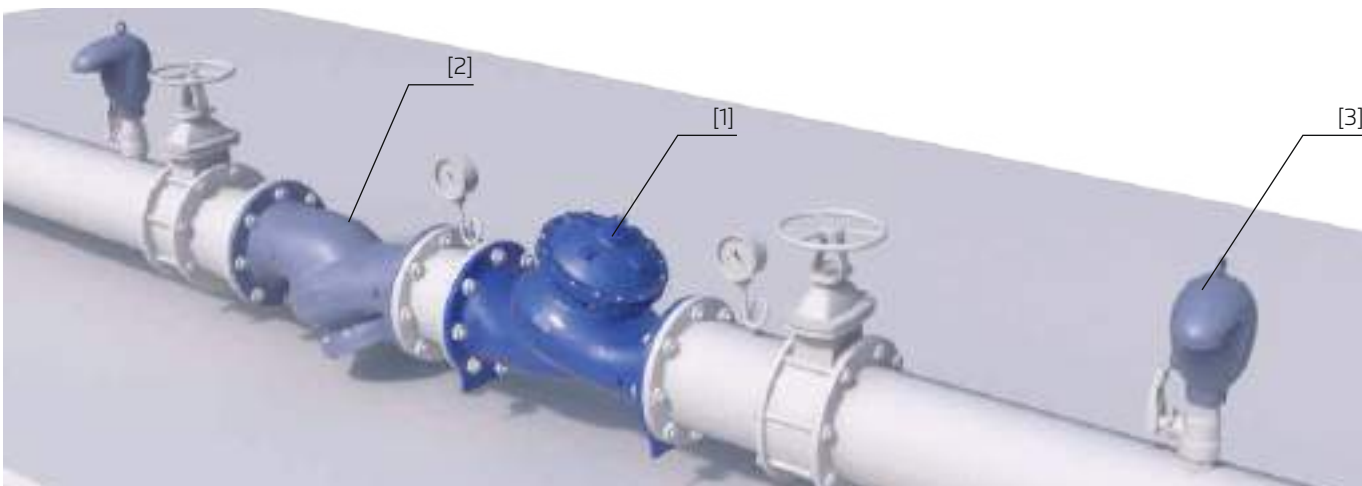
- ON/OFF Solenoid control - **770 - 55 - U**
- Solenoid control & check feature - **770 - 25**
- Independent flow check - **770 - 25**
- Hydraulic check valve - **770 - 20**
- High sensitive pilot - **770 - 12 - U**
- Pressure Reducing - **772 - U**
- Level & flow control valve - **757 - U**
- Pump & flow control valve - **747 - U**
- Pump recirculation & flow control valve - **749 - U**

See relevant BERMAD publications

List of Components:

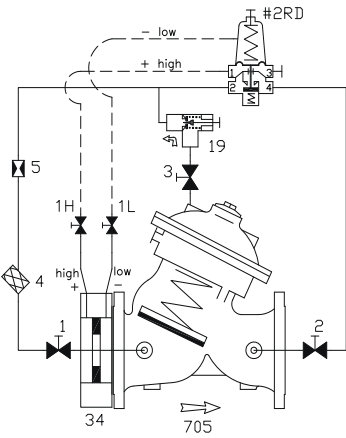
- [1] Flow Controlled Valve 770
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 1L/1H 2W Isolation Valve
- 2 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Control Filter
- 5 Restriction Orifice
- 19 Speed Control
- 34 Orifice Plate
- #2RD 2W Flow Control Pilot

Additional features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Model MN-770 is equipped with an adjustable flow pilot and an orifice assembly.
- The pilot senses the differential pressure across the orifice plate.
- Should this differential pressure rise above the pilot setting, the pilot throttles enabling pressure in the control chamber to accumulate, causing the main valve to throttle closed; thereby, limiting flow to the pilot setting.
- Should orifice differential pressure fall below the pilot setting, the pilot releases accumulated pressure and the main valve modulates open.
- Opening and/or closing speed can be set hydraulically using an opening and/or closing needle valve (optional)

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check flow pilots (pressure reducing modified to differential sensing) product pages.



Adjustment Ranges	PSI	Bar
	3-25	0.2-1.7
	11-150	0.8-6.5

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass	Brass		
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Orifice Plate	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec-23ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Flow Control and Pressure Reducing Valve

Model MN-772-U

Hydraulically operated, Flow Control and Pressure Reducing control valve with two independent functions. It maintains both pre-set maximum flow and reduces higher upstream pressure to lower constant downstream pressure, regardless of varying demand or upstream pressure.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator, that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Hydraulic flow sensor
 - No moving parts. No electronic components.
 - No need for flow straightening
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - Excellent anti-cavitation properties
 - High stability and accuracy
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Provide rapid response to sudden changes in system conditions
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of features
- Optional V-Port Throttling Plug - Allows for low flow stability
- Obstacle free flow path

Major Additional Features

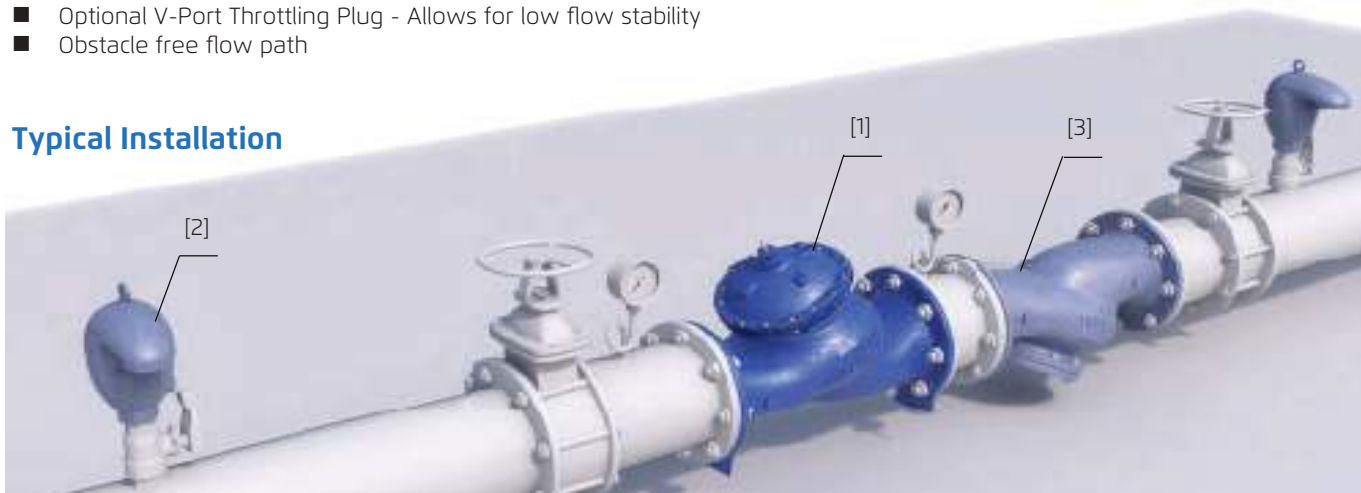
- Solenoid control – 772-55-U
- Check feature – 772-20-U
- Solenoid control & check feature – 772-25-U
- Downstream over pressure guard – 772-48-U

See relevant BERMAD publications.

List of Components:

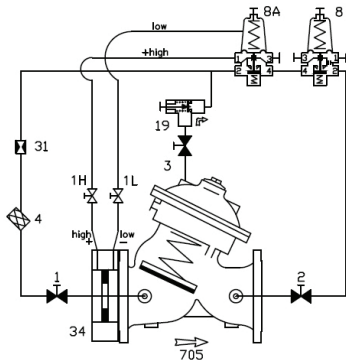
1. Flow Control and Pressure Reducing Valve MN-772
2. Combination Air Valve C70
3. Strainer 70F

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 2 2W Isolation Valve
- 1H 2W Isolation Valve
- 1L 2W Isolation Valve
- 3 2W Isolation Valve
- 4 Y - Control Filter
- 8 Pressure Reducing Pilot
- 8A Flow Control Pilot
- 19 Needle Valve, Opening Speed Control
- 31 Restriction Orifice
- 34 Orifice Assembly

Additional Features (OPTIONAL)

- V V-Port Plug
- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch
- Q Position Transmitter 4-20 mA

(*) As a reference only. Components may vary based on valve's size and class

Operation

- The Model 772-U is a pilot controlled valve equipped with an orifice assembly and two adjustable, 2-Way pilots for Flow Control (FC) and Pressure Reducing (PR), operating independently in series.
- The restriction orifice [31] continuously allows flow from valve inlet into the upper control chamber.
- Should orifice plate [34] differential pressure rise above FC pilot [8A] setting, the pilot throttles causing pressure to accumulate in the upper control chamber. The main valve throttles closed maintaining maximum flow at pilot setting.
- Should this differential pressure fall below FC pilot setting, the pilot releases accumulated pressure to the main valve outlet through the held open PR pilot [8] causing the main valve to modulate open.
- Should opening the main valve cause downstream pressure to rise above PR pilot setting, the pilot closes, causing the main valve to throttle closed, reducing downstream pressure.
- The needle valve controls the opening speed.

Pilot Options

Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check flow pilots and pressure reducing pilots (pressure reducing modified to differential sensing) product pages.

Pressure Reducing Pilots	PSI	Bar
Adjustment Ranges	11-150	0.7-10
	15-230	1-16
	30-430	2-30

Flow Pilots	PSI	Bar
Adjustment Ranges	15-145	1-10
	15-230	1-16



Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass			
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Orifice Plate	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-MO. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended average flow velocity: 0.1-3.5m/sec; 0.3-11ft/sec. Intermittent flow velocity: 7.5m/sec-23ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Burst Control Valve

Excessive Flow

Model MN-790-M

Hydraulically operated, flow control valve that upon sensing flow in excess of setting, shuts off and locks drip tight, until it is manually reset. As long as the flow is lower than the setting, the valve remains fully open, minimizing head loss.

Bermad 700 Series valves are hydraulic, pilot operated, oblique pattern, globe valves with a seat assembly and double chamber unitized actuator that can be disassembled from the body as a separate integral unit.

The valve's hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities.

The 700 Series operate under difficult operation conditions with minimal cavitation and noise. They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Hydraulic flow sensor
 - No moving parts. No electronic components.
 - No need for flow straightening
- Designed to stand up to the toughest conditions
 - Tamper resistant
 - High sensitive pilot requires minimal valve - ΔP
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - No spring - full opening
 - Simplified maintenance as it can be removed as a single unit. In-line serviceable
- Flexible design - Easy addition of optional features
- Obstacle free flow path

Major Additional Features

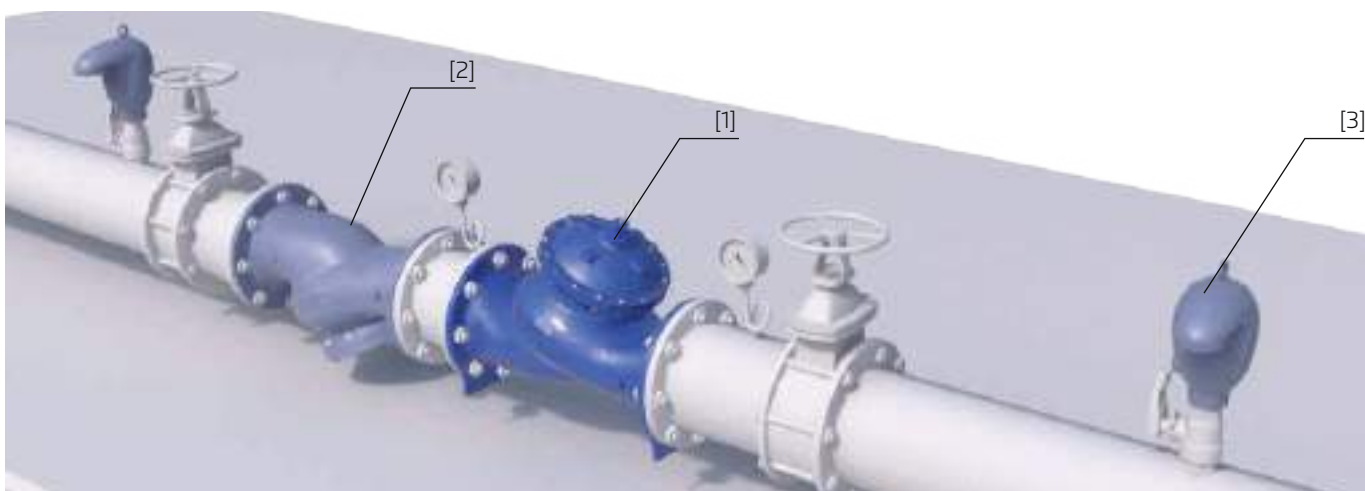
- Closing at pressure drop - **790 - 91**
- Solenoid control - **790 - 55 - M**
- Pressure Reducing - **792 - U**
- Electric override - **790 - 59 - M**

See relevant BERMAD publications

List of Components:

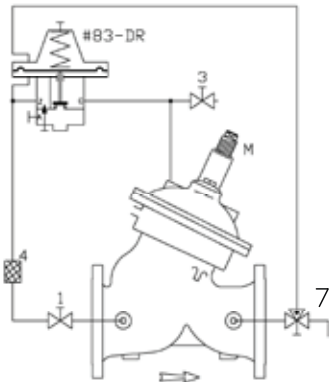
- [1] Burst Control Valve 790
- [2] Strainer 70F
- [3] Combination Air Valve C70

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 3 2W Manual Reset Valve
- 4 Control Filter
- 7 3W Manual Test Valve
- #83-DR 2W High Sensitivity Press. Sustaining Pilot
- M Flow Stem

Additional features (OPTIONAL)

- F Large Control Filter
- F1 Extra Large Control Filter
- 6 Pressure Gauge
- I Visual Position Indicator
- S Electric Limit Switch

(*) As a reference only. Components may vary based on valve's size and class.

Operation

- Model MN-790-M is equipped with an adjustable, high sensitivity, differential pressure sustaining pilot. The pilot senses valve differential pressure.
- Should this differential pressure rise above the pilot setting, it opens, introducing upstream pressure into the upper chamber, causing the main valve to begin an irreversible "close & lock" process.
- Once the valve is closed, it only can be opened manually through the manual reset valve. When differential pressure is below the pilot setting, the pilot blocks upstream pressure from the control chamber, and the main valve remains fully open.
- Manual test valve enables simulation of burst conditions and valve response. The Mechanical Flow Stem enables adjustment of the closing point to meet various flow regimes.

Altitude Pilot Options:

- Various pilots and calibration springs are available. Select according to valve size and operation conditions. For more details check pressure sustaining pilots (modified to differential sensing and high sensitivity) product pages.
- Pilot Adjustment Range:



Pilot Code	feet	meter
M6	7-46	2-14
M5	17-72	5-22
M4	49-115	15-35
M8	82-230	25-70

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Pilot	Body	Brass/Bronze	Brass/Bronze	Stainless Steel 316	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316
		Brass	Brass		
Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton	
Control Loop Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
	Tubing & Fittings	Brass	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-MO. Others by request.

Notes:

- Inlet pressure and flow rate are required for optimal sizing.
- Maximum recommended flow velocity: 6m/sec; 18ft/sec. Intermittent: 7.5m/sec; 21ft/sec.
- Minimum operating pressure: 0.7 bar / 10 PSI. For lower pressure requirements consult factory.





Check Valve (Lift Type)

Model MN-70N

The Check Valve is a non-slam, lift type, non return valve that opens to allow flow in the required direction, and smoothly closes drip tight to prevent back flow.

They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Non-slam closing – Eliminates system surges
- In-line serviceable – Easy maintenance
- Flexible design – Convertible to hydraulic valve
- "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

Major Additional Features

- Valve position indicator – 70N-I
- Electric limit switch – 70N-S
- Double check valve – 72N

List of Components:

- [1] Check Valve 70N
- [2] Combination Air Valve C70

Typical Installation



Pressure Rating

	Class 150			Class 300		
	Max. Recommended Pressure	250 PSI			400 PSI	
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

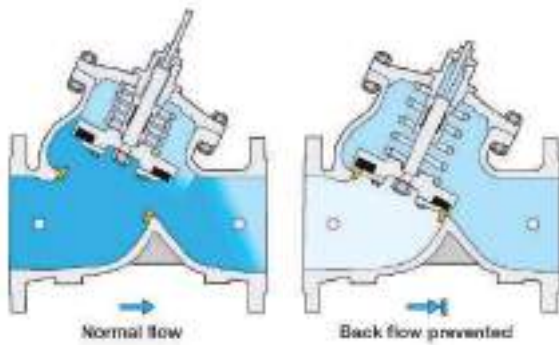
Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Strainer	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Steel	Steel	Steel	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.



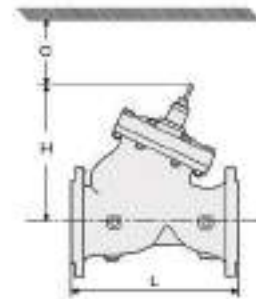
Operation

- The Model 70N is built on a standard 700 Series body assembly and reacts to differential pressure across its seal disk. It opens and closes in a non-slam manner according to the flow.
- A spring provides additional closing force.

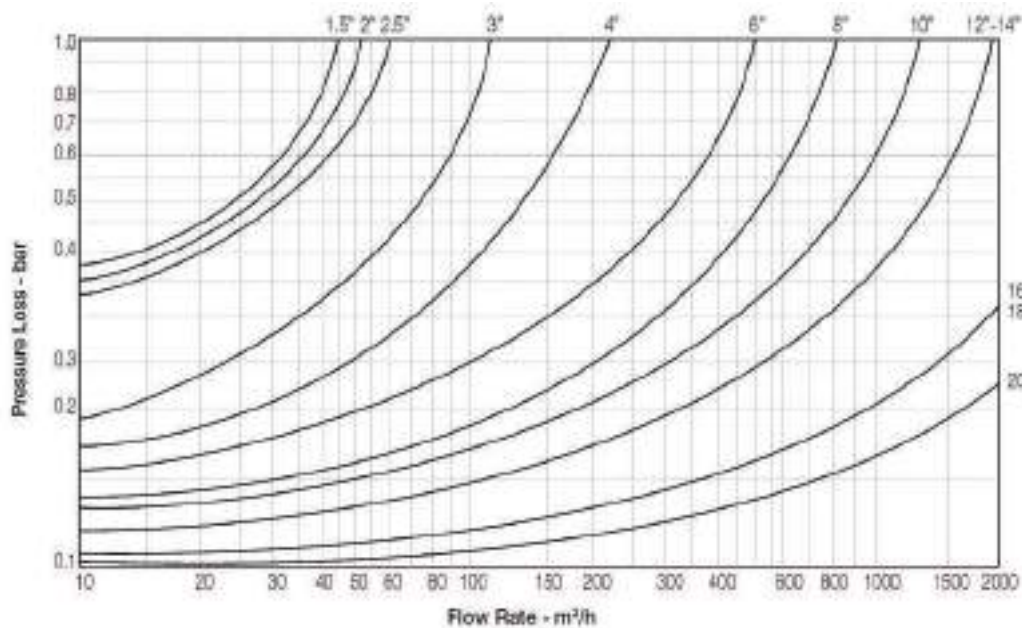


Technical Data

Size	L		L1		H		C		W		W1		
	mm	inch	mm	inch	mm	inch	mm	inch	Kg	lbs	Kg	lbs	
40	1 1/2"	205	8.1	205	8.1	125	4.9	180	7	6.5	14.3	7.8	17.2
50	2	210	8.3	210	8.3	125	4.9	180	7	8.0	17.6	10	22.0
65	2 1/2"	222	8.7	222	8.7	125	4.9	180	7	10.4	22.9	12.8	28.2
80	3"	250	9.8	264	10.4	170	6.7	230	9	17	37.5	20	44
100	4"	320	12.6	335	13.2	210	8.3	275	11	28	61.7	34	75
150	6"	415	16.3	433	17.0	270	10.6	385	15	48	106	58	128
200	8"	500	19.7	524	20.6	330	13.0	460	18	75	165	95	210
250	10"	605	23.8	637	25.1	420	16.5	580	23	125	276	153	337
300	12"	725	28.5	762	30.0	480	18.9	685	27	225	496	266	586
350	14"	733	28.9	767	30.2	480	18.9	685	27	235	518	288	635
400	16"	990	39.0	1024	40.3	620	24.4	965	38	535	1180	590	1300
450	18"	1000	39.4	1030	40.5	620	24.4	965	38	670	1477	735	1620
500	20"	1100	43.3	1136	44.7	620	24.4	965	38	760	1675	835	1840



Flow Chart



Notes:

- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec
- Minimum operating pressure: 0.7 bar ; 10 psi.





Check Valve (Lift Type)

Model MN-80N (For High Pressure Applications)

The Check Valve is a non-slam, lift type, non return valve that opens to allow flow in the required direction, and smoothly closes drip tight to prevent back flow.

They are made of the highest quality materials suitable for different mining applications.



Features and Benefits

- Non-slam closing – Eliminates system surges
- In-line serviceable – Easy maintenance
- Flexible design – Convertible to hydraulic valve
- "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

Major Additional Features

- Valve position indicator – 80N-I
- Electric limit switch – 80N-S
- Double check valve – 82N

List of Components:

- [1] Check Valve 80N
- [2] Combination Air Valve C70

Typical Installation



Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

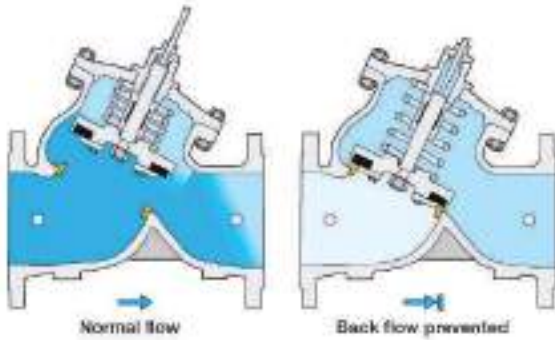
Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Strainer	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Steel	Steel	Steel	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Brass/Coated Steel	Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.



Operation

- The Model 80N is built on a standard 800 Series body assembly and reacts to differential pressure across its seal disk. It opens and closes in a non-slam manner according to the flow.
- A spring provides additional closing force.

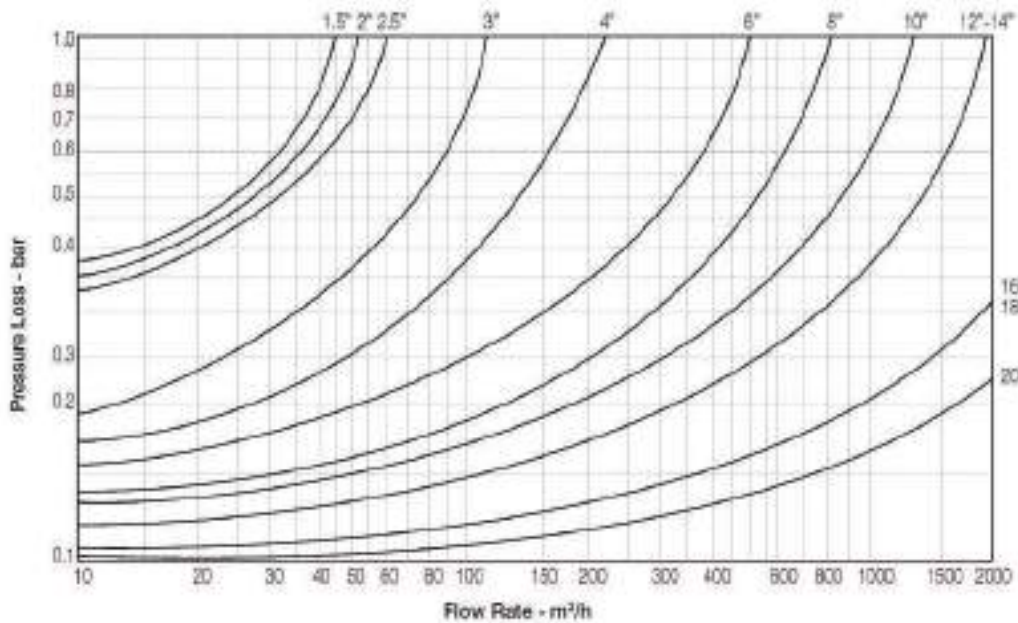


Technical Data

Size		L ISO 25; ANSI 300		H		C		W ISO 25; ANSI 300	
mm	inch	mm	inch	mm	inch	mm	inch	Kg	lbs
40	1 1/2"	205	8.1	125	4.9	180	7	7.8	17.2
50	2	210	8.3	125	4.9	180	7	10	22.0
65	2 1/2"	222	8.7	125	4.9	180	7	12.8	28.2
80	3"	264	10.4	170	6.7	230	9	20	44
100	4"	335	13.2	210	8.3	275	11	34	75
150	6"	433	17.0	270	10.6	385	15	58	128
200	8"	524	20.6	330	13.0	460	18	95	210
250	10"	637	25.1	420	16.5	580	23	153	337
300	12"	762	30.0	480	18.9	685	27	266	586
350	14"	767	30.2	480	18.9	685	27	288	635
400	16"	1024	40.3	620	24.4	965	38	590	1300
450	18"	1030	40.5	620	24.4	965	38	735	1620
500	20"	1136	44.7	620	24.4	965	38	835	1840



Flow Chart



Notes:

- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec
- Minimum operating pressure: 0.7 bar ; 10 psi.



Strainer

Model MN-70F

The Strainer is designed to remove foreign matter such as stones, sticks etc. from the pipeline. It is recommended to install the Strainer upstream from control valves, flow meters and other system appliances.

The 70F Series operate under difficult operation conditions. They are made of the highest quality materials suitable for different mining applications.



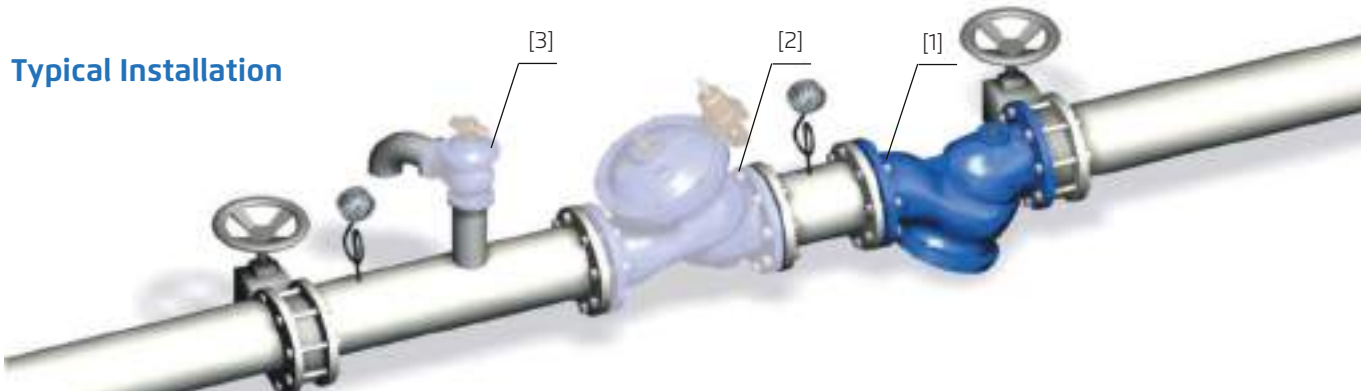
Features and Benefits

- Large trap capacity
- Low Pressure loss
- Blow-off port for easy cleaning

List of Components:

- [1] Strainer MN-70F
- [2] Pressure Reducing Valve MN-720
- [3] Relief Valve MN-73Q

Typical Installation



Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	250 PSI			400 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)
Strainer	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Steel	Steel	Steel	Stainless Steel 316
	Basket	Stainless Steel 304	Stainless Steel 304	Stainless Steel 304	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-M0. Others by request.

Notes:

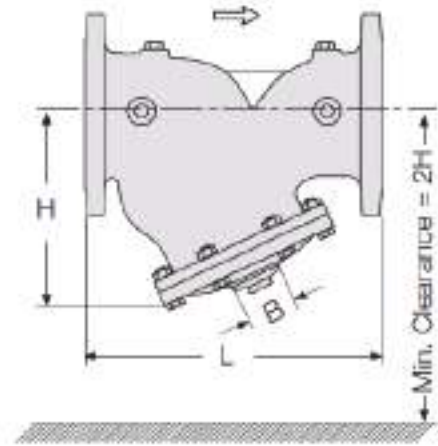
- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec





Technical Data

Size		L ISO 10 & 16; ANSI 150		L1 ISO 25; ANSI 300		H		W ISO 10 & 16; ANSI 150		W 1 ISO 25; ANSI 300		B Blow-off port
mm	inch	mm	inch	mm	inch	mm	inch	Kg	lbs	Kg	lbs	mm
40	1 1/2"	205	8.1	205	8.1	125	4.9	6.5	14.3	7.8	17.2	3/4"
50	2	210	8.3	210	8.3	125	4.9	8.0	17.6	10	22.0	
65	2 1/2"	222	8.7	222	8.7	125	4.9	10.4	22.9	12.8	28.2	
80	3"	250	9.8	264	10.4	170	6.7	17	37.5	20	44	1 1/2"
100	4"	320	12.6	335	13.2	210	8.3	28	61.7	34	75	
150	6"	415	16.3	433	17.0	270	10.6	48	106	58	128	2"
200	8"	500	19.7	524	20.6	330	13.0	75	165	95	210	
250	10"	605	23.8	637	25.1	420	16.5	125	276	153	337	
300	12"	725	28.5	762	30.0	480	18.9	225	496	266	586	
350	14"	733	28.9	767	30.2	480	18.9	235	518	288	635	
400	16"	990	39.0	1024	40.3	620	24.4	535	1180	590	1300	3"
450	18"	1000	39.4	1030	40.5	620	24.4	670	1477	735	1620	
500	20"	1100	43.3	1136	44.7	620	24.4	760	1675	835	1840	



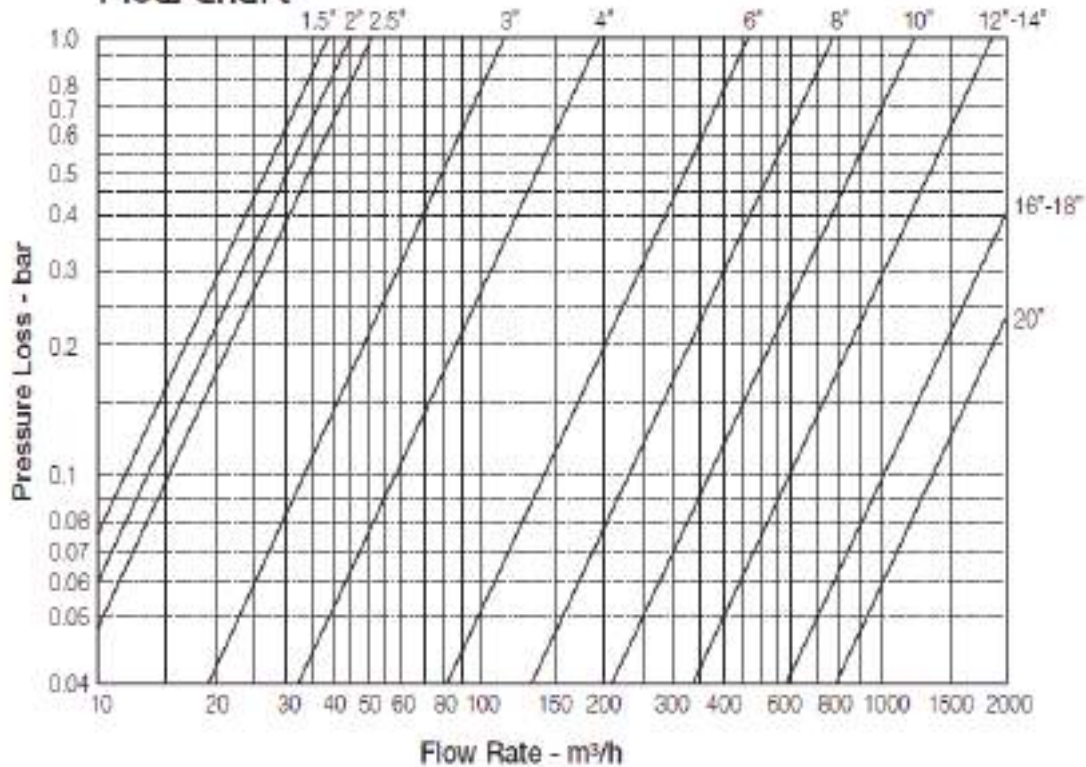
Basket Hole Diameter (mm)
Stainless Steel 304 (Standard)

2"	3-4"	6-20"
1.5	3.0	5.0

Stainless Steel 316 (Optional)

2-6"	8-20"
2.0	3.0

Flow Chart





Strainer

Model MN-80F (For High Pressure Applications)

The Strainer is designed to remove foreign matter such as stones, sticks etc. from the pipeline. It is recommended to install the Strainer upstream from control valves, flow meters and other system appliances.

The 80F Series operate under difficult operation conditions. They are made of the highest quality materials suitable for different mining applications.



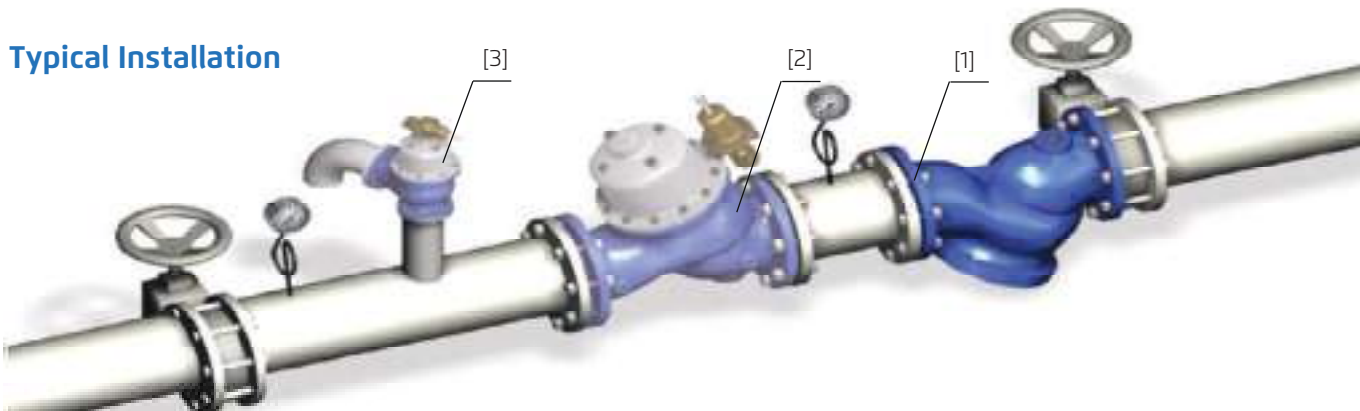
Features and Benefits

- Large trap capacity
- Low Pressure loss
- Blow-off port for easy cleaning

List of Components:

- [1] Strainer MN-80F
- [2] Pressure Reducing Valve MN-820
- [3] Relief Valve MN-83Q

Typical Installation



Pressure Rating

	Class 300		
Max. Recommended Pressure	600 PSI		
Available End Connection	Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components	Water Applications	Thermal Shock Applications	Base Solutions Applications	Acid Solutions Applications (**)	
Strainer	Body	Ductile Iron	Carbon Steel	Ductile Iron	Stainless Steel 316
	Cover	Steel	Steel	Steel	Stainless Steel 316
	Basket	Stainless Steel 304	Stainless Steel 304	Stainless Steel 304	Stainless Steel 316
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
	Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SM0-254 6-MO. Others by request.

Notes:

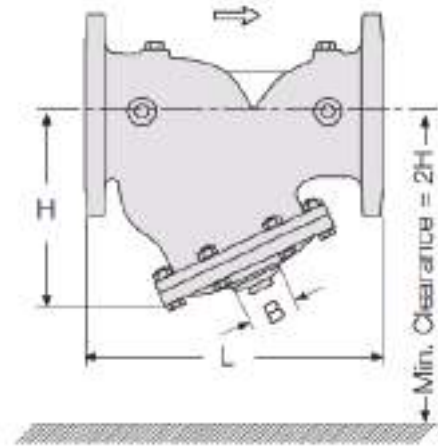
- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec





Technical Data

Size		L ISO 25; ANSI 300		H		W ISO 25; ANSI 300		B Blow-off port
mm	inch	mm	inch	mm	inch	Kg	lbs	mm
40	1 1/2"	205	8.1	125	4.9	7.8	17.2	3/4"
50	2	210	8.3	125	4.9	10	22.0	
65	2 1/2"	222	8.7	125	4.9	12.8	28.2	
80	3"	264	10.4	170	6.7	20	44	1 1/2"
100	4"	335	13.2	210	8.3	34	75	
150	6"	433	17.0	270	10.6	58	128	2"
200	8"	524	20.6	330	13.0	95	210	
250	10"	637	25.1	420	16.5	153	337	
300	12"	762	30.0	480	18.9	266	586	
350	14"	767	30.2	480	18.9	288	635	
400	16"	1024	40.3	620	24.4	590	1300	3"
450	18"	1030	40.5	620	24.4	735	1620	
500	20"	1136	44.7	620	24.4	835	1840	



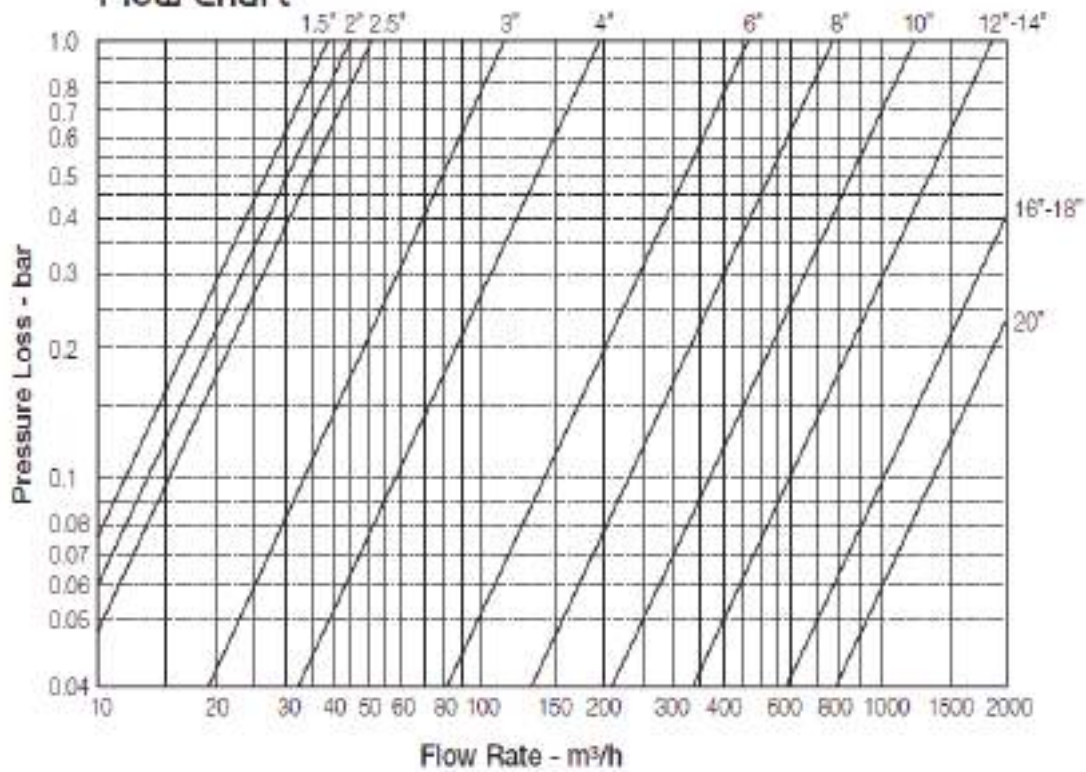
Basket Hole Diameter (mm)
Stainless Steel 304 (Standard)

2"	3-4"	6-20"
1.5	3.0	5.0

Stainless Steel 316 (Optional)

2-6"	8-20"
2.0	3.0

Flow Chart





Manual Throttling & Check Valve

Model MN-700-M

Mechanically operated, "Y" pattern globe valve, which stroke can be adjusted in order to manually control any hydraulic parameter. In addition, it includes an unique inherent check feature to prevent backflow.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.



Features and Benefits

- Hydrodynamic wide globe valve body provides:
 - Higher flow (Kv;Cv) than standard globe valves
- Designed to - stand up to the toughest conditions
 - Tamper resistant, as valve position is locked to avoid unauthorized adjustment
 - Excellent anti-cavitation properties
 - Wide flow range
 - Drip tight sealing
- Double chamber actuator design
 - Protected diaphragm
 - Ability to add independent opening & closing speed control loops.
- Flexible design - Easy addition of optional features:
 - Tapping ports for easy installation of pressure gauges
 - Visual position indicator (side)
 - Limit switches (side)
 - V-Port Throttling Plug - Allows for low flow stability
 - Easily modified at later date to an automatic control valve if required.
- Obstacle free flow path
- In-line serviceable - Easy maintenance

Major Additional Features

- Opening and closing speed control **700-M-03**

Typical Application

- As replacement of line size check valve
- One way zonal back-up



List of Components (*)



Standard Configuration

700 Main Body
M Flow Stem

Additional Features (OPTIONAL)

6 Pressure Gauge
S2 Limit Switch (side)
I2 Position Indicator (side)

(*) As a reference only. Components may vary based on valve's size and class

Operation

- The main valve is equipped with a flow stem installed on the top of the valve.
- To close the main valve, turn the flow stem clockwise in order to reduce valve's stroke. Stop when desired pressure or flow is reached. Lock the flow stem locking nut when finished.
- To open the main valve, turn the flow stem counter clockwise in order to increase valve's stroke. Stop when desired pressure or flow is reached. Lock the flow stem locking nut when finished.
- To fully open the main valve, the solenoid S9 - vents control chamber pressure.

Pressure Rating

	Class 150			Class 300		
Max. Recommended Pressure	16 bar / 250 PSI			25 bar / 400 PSI		
Available End Connection	Flanged AS2129 Table E Flanged ANSI #150	Grooved ANSI/AWWA C606	Threaded	Flanged AS2129 Table F Flanged ANSI #300	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Water Applications	Base Solutions Applications	Thermal Shock Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Ductile Iron	Ductile Iron	Carbon Steel	Stainless Steel 316
	Internals	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel 316
		Brass/Coated Steel	Coated Steel	Brass/Coated Steel	
	Elastomers	Synthetic rubber	Synthetic rubber	Synthetic rubber	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	
Accessories	Accessories	Brass/Bronze	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316

(**) For highly aggressive acid solutions: Super Duplex, Hastelloy C-276, SMO-254 6-MO. Others by request.

Notes:

- Inlet pressure, back pressure (if any) and flow rate are required for optimal sizing and cavitation analysis.
- Recommended continuous flow velocity: 0.1-5m/sec; 0.3-15ft/sec





Insertion Flow Meter Device

Integrated flow meter for BERMAD control valves

Model IFM

The IFM device is an in-valve electromagnetic insertion flow meter that adds an accurate flow measurement functionality to any BERMAD control valve.

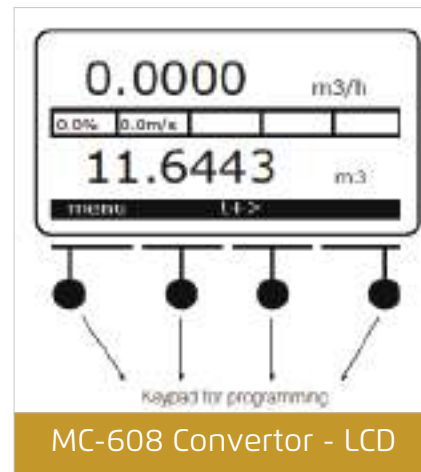
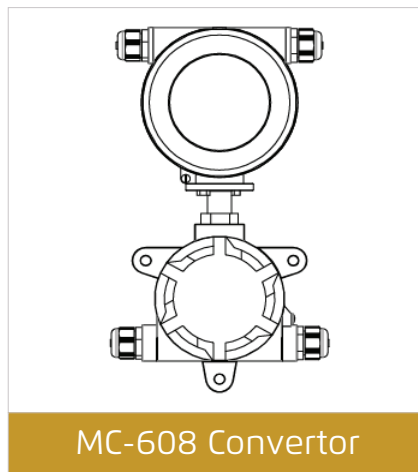
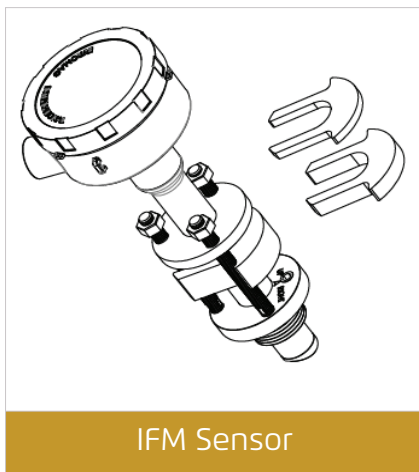
Perfectly suitable for flow measurement of fluid management systems in mining, it's easy to install and operate. IFM enhances the control valve functionality by adding a flow measuring capability, in many cases eliminating the need for full size water meter installation.



How it Works

Using Faraday's law, the sensor produces a magnetic field. As fluid moves through this field a voltage is generated which is proportional to flow rate. This voltage reading is then converted to a flow value by the processor.

General View





Features and Benefits

- Designed for use with BERMAD control valves
- Fits a wide range of valve sizes
- Cost saving.
- No need for flow meter.
- No additional pressure drop.
- Compact design reduces space needed for installation
- Suitable for clean and non-clean fluids used in mining.
- Electromagnetic operation.
 - Flow measurement accuracy (based on velocity):
 - 1 m/s: $\pm 5\%$
 - 10.0 m/s: $\pm 7.5\%$
 - No moving parts.
 - Suitable for flow measurement of fluids with suspended solids
- Electronic converter.
 - Wide range of output outputs to control applications.
 - Local flow rate & totalizer display.
 - Can also be battery powered, usable up to 6 years (replaceable on site)
 - in data logger.
 - Pressure data logging is available by adding external pressure transmitter
 - Various communication options.
 - GSM option available including data transmission of flow, pressure and temperature

Recommended Measurement Flow Table

Valve size	Metric Units	
	Min. Flow - m ³ /h	Max. Flow - m ³ /h
	(V=0.5 m/s)	(V=10 m/s)
DN80	9	180
DN100	14	280
DN150	32	634
DN200	57	1128
DN250	89	1762
DN300	127	2538
DN400	226	4512
DN500	353	7050
DN600	508	10152
DN700	691	13818
DN750	793	15862
DN800	902	18049
DN900	1142	22842
DN1000	1410	28200

Valve size	US Units	
	Min. Flow - m ³ /h	Max. Flow - m ³ /h
	(V=0.5 m/s)	(V=10 m/s)
3"	35	725
4"	62	1288
6"	140	2898
8"	250	5153
10"	390	8052
12"	562	11595
16"	999	20613
20"	1561	32207
24"	2249	46379
28"	3060	63127
30"	3513	72467
32"	3997	82451
36"	5060	104352
40"	4246	128830



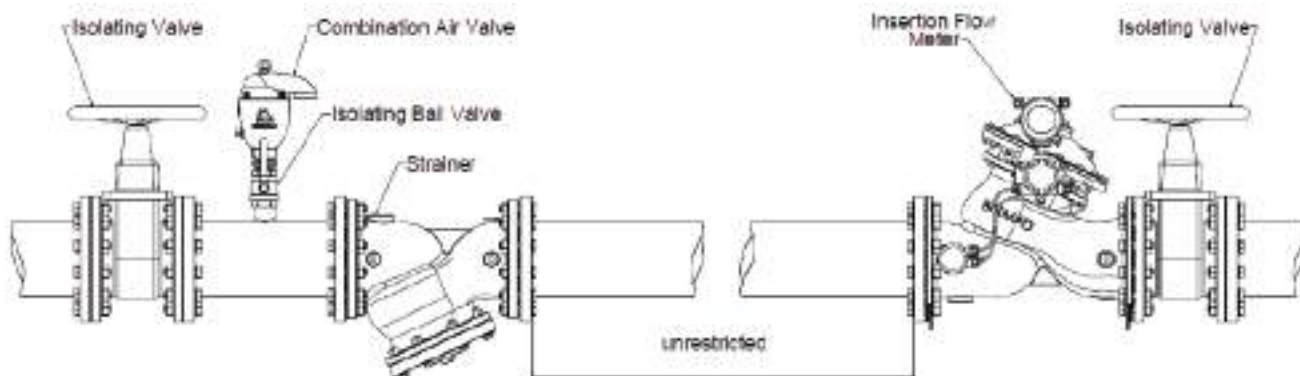
Technical Specifications

CONVERTER INSTALLATION	Installed on wave or remote version. Cable Length up to 30 meters
CONVERTER CASE	Aluminum epoxy painted IP 67/68, with front window in toughened glass Or Plastic
ELECTRICAL CONNECTIONS	Cable glands plastic or metal. Suitable for wire diameters between 7-13mm
POWER SUPPLY	<ul style="list-style-type: none"> • MC608A 12/24 VAC/DC, 90...264 VAC + MC608E Battery powered supply or 12/24 VAC/DC + MC608F Rechargeable battery + solar panel
OUTPUT SIGNALS	<ul style="list-style-type: none"> • Active analogue output 4-20 mA; + Digital output for pulses, maximum 1000 Hz duty cycle max 50% for instant load, positive only, positive and negative; + Digital output in active frequency 0-10 KHz. All outputs are opto-isolated. Pulse outputs with a maximum capacity of $\pm 35VDC$ 50 mA.
SERIAL COMMUNICATION	<ul style="list-style-type: none"> • IrCOMM interface for communicating with laptop or hand held communication device, and dedicated SW for programming, displaying and downloading data. • MODBUS RTU interface on RS 485.
TEMPERATURE RANGE	Process » -10°C to 70°C
PRESSURE RATING	16 bar/230 psi. For higher pressure please consult factory
ACCURACY	<ul style="list-style-type: none"> + MC608A: $\pm 0.5\%$ from (0.5-10 m/s) (1.6 - 33 ft/s) + MC608B/R: $\pm 5\%$ from (0.5-10 m/s) (1.6 - 33 ft/s)
REPEATABILITY	0.5% of the read value (minimum 0.5 m/s, 1.6 ft/s)
SAMPLING FREQUENCY	Programmable 5 UP TO 1/480 Hz.
DISPLAY	Graphic LCD - 128x64 pixels, 50x25mm visual area
MEASUREMENT UNITS	Selectable volume units: ml, l, m ³ , in ³ , ft ³ , gal, US gal
PROCESS DATA LOGGER	200,000 lines of data (approx. 6 years of logging on factory settings)
ELECTRICAL CONDUCTIVITY	<ul style="list-style-type: none"> • MC608A: 5 $\mu S/cm$ minimum + MC608B/R: 20 $\mu S/cm$ minimum
APPROVALS AND CERTIFICATIONS	<ul style="list-style-type: none"> • The MC 508 converter meets all the requirements by the EC directives + Electromagnetic compatibility » Directive 89/336/EEC, EN 61326-1:200 + Low voltage directive » Directive 2006/95/EC

Recommended Installation

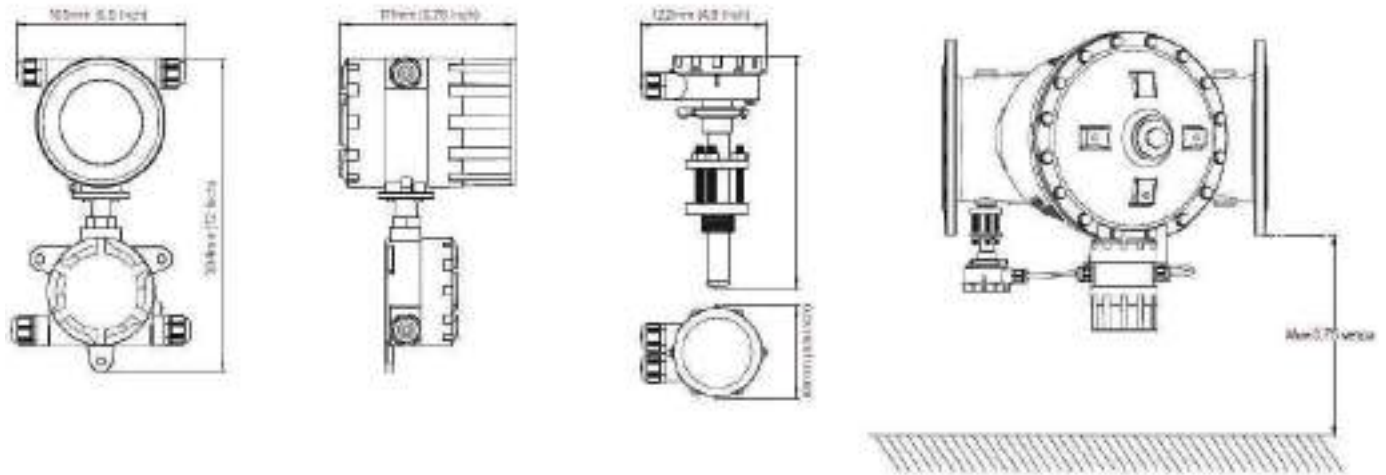
Recommend installation to ensure accuracy according to the table

- For special installation requirements, please contact BERMAD
- The pipe must be totally filled with water for reliable flow measurement





Dimensions



IrCOM Application

Interface for communicating with laptop communicator. Includes a special USB cable and software that can be downloaded for free.

For:

- Communication with the MC608 converter is Via PC or laptop computer using the IrCOM module.
- Using the IrCOM simplifies changing the operating configurations.
- Downloading data from the logger.



Ordering Guide

1. Select full valve code using BERMAD 400/700/800 Ordering Guides.
2. Select the MT feature from the additional features list.
3. Select power supply option:
 - 3.1. Standard - 12-24V ac/dc
 - 3.2. Optional – 90-264Vac
 - 3.3. Optional –Battery (consult factory)
 - 3.4. Optional –Solar (consult factory)
4. Select convertor case material:
 - 4.1. Standard - Metal
 - 4.2. Optional – Plastic (consult factory)

Example – MN-6"-718-MT-03-Y-C-16-EB-4AP-NN-F (12-24V dc, with plastic convertor case).



Automatic Filtration KIT

For ON/OFF Applications in BERMAD control valves

Model AFK

The automatically operated Control Loop Filtration Kit is used for the filtration of dirty control fluid that could quickly block the standard, or even large control filters used mainly in recovery water and dirty fluid applications with relevant suspended solids.

The Automatic Control Loop Filtration Kit functions under difficult operation conditions, reducing significantly the maintenance frequency, and increasing the reliability of the control valve system, while minimizing faulty operation.



Features and Benefits

- Designed to stand up to the toughest conditions:
 - ❑ With two extra large control filters for higher reliability and longer time between maintenance.
 - ❑ Motorized ball valves - full ports with no obstructions - are used for cleaning the filters.
 - ❑ Leak free.
- Clogging indicator (Pressure Differential Gauge) which senses the differential of pressure across the extra large control filters and advises when maintenance is required:
 - ❑ Visual indicator.
 - ❑ Dry contacts (relay) connected to controller.
- BIC-F controller with multiple cleaning triggers:
 - ❑ By Time. Defined locally.
 - ❑ By Pressure Differential. Across the filters.
 - ❑ Sequential cleaning process. One filter at a time.
- Assembled on any control valve when ordered.
- Easy installation when used in any previously installed valve:
 - ❑ Just connect valve's upstream pressure to the kit inlet connection, and the outlet kit connection to the valve's control loop.

Operation

- A three way valve, installed at the top of the kit, defines the operation mode:
 - ❑ NORMAL OPERATION: Three way ball valve pointing to the front. Both filters operate, and BIC-F Controller automatically clean the filters based on its configuration: time or pressure, whatever is first.
 - Filters are automatically cleaned sequentially: only after the cleaning cycle of the first filter has been finished, the second one is started.
 - If BIC-F Controller is disabled, filters can be cleaned manually trough the manual activation of the motorized ball valves.
 - ❑ MAINTENANCE MODE: Three way valve ball pointing to one of the filters. Only that filter is in operation, and the other is disabled for maintenance.
- The visual indicator senses the pressure differential across the extra large control filters advising when maintenance must be performed.



Technical Data

KIT

Total Weight: 30 kg (66 lbs.)

Extra Large Control Filters

Filter Elements: Screen Type, 300 um (50 Mesh)

Pressure Rating: 350 PSI (Standard)

600 PSI (High Pressure model)

Motorized Ball Valves

Power Source: 24V AC

Power Consumption: 45W

Electrical Rating: 10A, type gL or gG

Enclosure Rating: IP66

Differential Pressure Gauge

Accuracy: +/- 1.6% Full Scale

Dial Size: 4" (100 mm.)

Range: 0 - 1 bar (0 - 15 PSI)

Static Pressure: 1450 PSI

Output: 2 dry contacts for DP information

BIC-F Controller

Power Source: 220V or 110V AC

Output: 24V AC

Differential of Pressure: External dry contact DP sensor

Operating Temperature: 0 - 60°C

Alarm: Endless Looping Type

Materials (*)

		Water Applications	Corrosive Application
Extra Large Control Filter	Body	Carbon Steel	Stainless Steel 316
	Cover	Brass	Stainless Steel 316
	Stem/Nut	Stainless Steel	Stainless Steel 316
	Filter Element	Polypropylene	Polypropylene
	Seals	NBR	Viton
Differential Pressure Gauge	Body	Stainless Steel 316	Stainless Steel 316
	Seals	NBR	Viton

(*) Special Materials for highly corrosive applications are available. Consult factory for more details.

Typical Installation

Pump Control Valve with Large Control Filter
(standard solution for non-clean water applications)



Pump Control Valve updated with Automatic Filtration Kit
for dirty fluids with suspended solids applications





Solenoid Controlled Valve

Model MN-110

Hydraulically self-operated, diaphragm actuated, solenoid controlled valve that either opens fully or shuts off in response to an electric signal.

The valves hydrodynamic body is designed for unobstructed flow path and provides high flow capabilities.



Features and Benefits

- Hydraulic Control Valve with Solenoid Control
 - Line pressure driven.
 - Electrically controlled On/Off.
- Designed to - stand up to the toughest conditions
 - Drip tight sealing.
- hYflow "Y" Valve Body
 - Meets rough service conditions with high UV, chemical and cavitation resistance.
 - End-to-end "look-through" design and full bore seat with unobstructed flow path.
 - Free of any in-line ribs, supporting cage or shafts.
 - Enables ultra-high flow capacity with minimal head loss.
- In-line serviceable - Easy maintenance
 - No bolts in the cover. Its cover ring fastens valve cover to body, stiffening and strengthening the valve body.
- Unitized Flexible Super Travel (FST) Diaphragm and Guided Plug Assembly
 - Smooth closing.
 - Requires low actuation pressure.
 - Prevents diaphragm erosion and distortion.
- Flexible design - Easy addition of features
 - Simple in-line inspection and service.

Typical Application

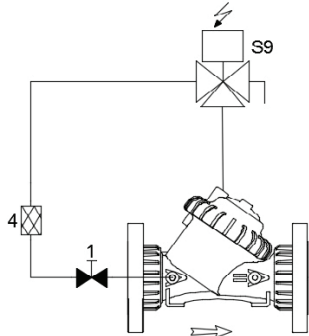
- Flushing in Leaching. In order to:
 - Increase leaching efficiency.
 - Increase longevity of leaching equipment.
 - Prevent mechanical damage of drips.
 - Prevent clogging of drips.

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 2W Isolation Valve
- 4 Control Filter
- S9 Solenoid

Additional Features (OPTIONAL)

- 6 Pressure Gauge
- F Large Control Filter

(*) As a reference only. Components may vary based on valve's size and class

Operation

- The main valve is equipped with a 3-way solenoid pilot.
- To close the main valve, the solenoid S9 - applies upstream pressure to the upper control chamber, harnessing valve differential pressure to power the diaphragm actuator.
- To fully open the main valve, the solenoid S9 - vents control chamber pressure.

Electrical Data

Solenoid Data:

Voltage: (DC): 12 **Power Consumption:** (DC): 8W

BEC PM1 Controller Data:

Power Supply:
9 Volt Alkaline Battery

Control Options (for flushing)

- Single Valve Controller: BEC - PM1 (battery operated)
- Multiple Valve Controller: RTU BIC 2500 (solar panel operated)

Pressure Rating

	NYLON Body			Polypropylene Body		
Max. Recommended Pressure	150 PSI			90 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Nylon 6, Glass Filled	Polypropylene
	Internals	Stainless Steel 316	Stainless Steel 316
	Elastomers	NBR	Viton
Pilot	Body	Nylon 6, Glass Filled	Polypropylene
	Internals	Stainless Steel	Stainless Steel 316
	Elastomers	NBR	Viton
Control Loop Accessories	Accessories	PVC / Stainless Steel 316	PVC / Stainless Steel 316
	Tubing & Fittings	Polypropylene / Stainless Steel 316	Polypropylene / Stainless Steel 316

(**) For highly aggressive acid solutions: Hastelloy C-276 internal parts (instead of St.St.316) is optional. Others by request.

Notes:

- Inlet pressure, back pressure (if any) and flow rate are required for optimal sizing.
- Recommended maximum intermittent flow velocity: 7.5m/sec; 21ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI

Pressure Reducing Valve

Model MN-120

Hydraulically self-operated, pressure reducing control valve which uses the hydraulic forces of the line pressure to reduce upstream pressure to lower constant downstream pressure, regardless of varying upstream pressure.

The valve's hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.

The valve controls the pressure to be applied to the module leaching system in order to control a constant leaching rate inside the module. The local control of each module results in significant leaching solution savings.



Features and Benefits

- Designed to - stand up to the toughest conditions
 - High stability and accuracy
 - Drip tight sealing.
- hYflow "Y" Valve Body
 - Meets rough service conditions with high UV, chemical and cavitation resistance.
 - End-to-end "look-through" design and full bore seat with unobstructed flow path.
 - Free of any in-line ribs, supporting cage or shafts.
 - Enables ultra-high flow capacity with minimal head loss.
- In-line serviceable - Easy maintenance
 - No bolts in the cover. Its cover ring fastens valve cover to body, stiffening and strengthening the valve body.
- Unitized Flexible Super Travel (FST) Diaphragm and Guided Plug Assembly
 - Smooth closing.
 - Requires low actuation pressure.
 - Prevents diaphragm erosion and distortion.
- Flexible design - Easy addition of features
 - Simple in-line inspection and service.

Major Additional Features

- 3 - Way control - **120 - X**
- ON/OFF Solenoid Control - **120 - 55**
- Electrically selected multi-level setting - **120 - 45**
- See relevant BERMAD publication

Typical Application

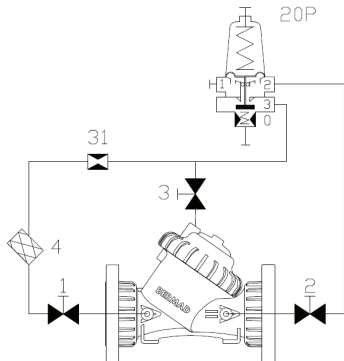
- Leaching rate control in heap leach systems.

Typical Installation





Control Schematic (*)



Standard Configuration

- 1 Upstream Isolation Valve
- 2 Downstream Isolation Valve
- 3 Control Chamber Isolation Valve
- 4 Large Control Filter
- 31 Restriction Orifice
- 20P 2W Pressure Reducing Pilot

Additional Features (OPTIONAL)

- 6 Pressure Gauge

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Model MN-120 is equipped with an adjustable pressure reducing pilot, which senses downstream pressure.
- Should this pressure rises above pilot setting, pilot throttles, enabling pressure in the control chamber to accumulate, causing the main valve to throttle closed, decreasing downstream pressure to pilot setting.
- Should downstream pressure falls below pilot setting, the pilot releases accumulated pressure, and the main valve modulates open.

Pilot Options

Various calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing pilots product page.



Spring	Setting Range	
	bar	Psi
L	0.8 - 6	12 - 85
U/Y	0.5 - 3	7 - 43

Standard

Pressure Rating

	NYLON Body			Polypropylene Body		
Max. Recommended Pressure	150 PSI			90 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Nylon 6, Glass Filled	Polypropylene
	Internals	Stainless Steel 316	Stainless Steel 316
	Elastomers	NBR	Viton
Pilot	Body	Nylon 6, Glass Filled	Polypropylene
	Internals	Stainless Steel	Stainless Steel 316
	Elastomers	NBR	Viton
Control Loop Accessories	Accessories	PVC / Stainless Steel 316	PVC / Stainless Steel 316
	Tubing & Fittings	Polypropylene / Stainless Steel 316	Polypropylene / Stainless Steel 316

(**) For highly aggressive acid solutions: Hastelloy C-276 internal parts (instead of St.St.316) is optional. Others by request.

Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis.
- Recommended continuous flow velocity: 0.1-3.5m/sec; 0.3-10ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI



Quick Pressure Relief Valve

Model MN-13Q

Quick Pressure Relief control valve, hydraulically operated, that reliefs excessive system pressure when this pressure rises above pre-set maximum value. It, immediately, accurately and with high repeatability, responds to system pressure by fully opening.

The valves hydrodynamic body is designed for unobstructed flow path and provides excellent and highly effective modulation capacity for high differential pressure applications.



Features and Benefits

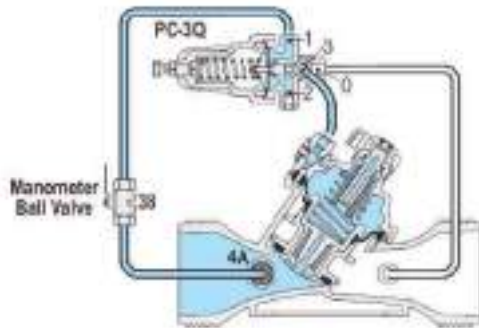
- Designed to - stand up to the toughest conditions
 - High stability and accuracy
 - Drip tight sealing.
- hYflow "Y" Valve Body
 - Meets rough service conditions with high UV, chemical and cavitation resistance.
 - End-to-end "look-through" design and full bore seat with unobstructed flow path.
 - Free of any in-line ribs, supporting cage or shafts.
 - Enables ultra-high flow capacity with minimal head loss.
- In-line serviceable - Easy maintenance
 - No bolts in the cover. Its cover ring fastens valve cover to body, stiffening and strengthening the valve body.
- Unitized Flexible Super Travel (FST) Diaphragm and Guided Plug Assembly
 - Smooth closing.
 - Requires low actuation pressure.
 - Prevents diaphragm erosion and distortion.
- Flexible design - Easy addition of features
 - Simple in-line inspection and service.

Typical Application

- System Burst Protection
- Momentary Pressure Peak Elimination
- System Failure Visual Indication
- Filter Burst Protection



Control Schematic (*)



Standard Configuration

- 38 Upstream Isolation Valve
- 4A In-Line Filter
- PC-3Q 2W Pressure Relief Pilot

Additional Features (OPTIONAL)

- 6 Pressure Gauge

(*) As a reference only. Components may vary based on valve's size and class

Operation

- Model MN-130 is equipped with an adjustable 2W pressure relief pilot (PC-3Q) which senses upstream pressure.
- The pilot internal restriction continuously allows flow from the main valve inlet into the upper control chamber.
- Should upstream pressure abruptly rises above pilot setting, the pilot opens, and pressure in the upper control chamber is vented, causing the main valve to immediately open, thereby relieving excessive system pressure.
- When upstream pressure decreases to below pilot setting, the pilot closes, enabling pressure to accumulate in the control chamber, causing the main valve to smoothly close.

Pilot Options

Various calibration springs are available. Select according to valve size and operation conditions. For more details check pressure reducing pilots product page.



Spring	Setting Range	
	bar	Psi
L	0.8 - 6	12 - 85
U/Y	0.5 - 3	7 - 43

Standard

Pressure Rating

	NYLON Body			Polypropylene Body		
Max. Recommended Pressure	150 PSI			90 PSI		
Available End Connection	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded	Flanged ANSI#150	Grooved ANSI/AWWA C606	Threaded

Materials

Components		Base Solutions Applications	Acid Solutions Applications (**)
Main Valve	Body & Cover	Nylon 6, Glass Filled	Polypropylene
	Internals	Stainless Steel 316	Stainless Steel 316
	Elastomers	NBR	Viton
Pilot	Body	Nylon 6, Glass Filled	Polypropylene
	Internals	Stainless Steel	Stainless Steel 316
	Elastomers	NBR	Viton
Control Loop Accessories	Accessories	PVC / Stainless Steel 316	PVC / Stainless Steel 316
	Tubing & Fittings	Polypropylene / Stainless Steel 316	Polypropylene / Stainless Steel 316

(**) For highly aggressive acid solutions: Hastelloy C-276 internal parts (instead of St.St.316) is optional. Others by request.

Notes:

- Inlet pressure, back pressure (if any) and flow rate are required for optimal sizing and cavitation analysis.
- Recommended maximum intermittent flow velocity: 15m/sec; 50ft/sec
- Minimum operating pressure: 0.7 bar / 10 PSI



Combination Air Valve

Model C70

BERMAD C70 is a high quality combination air valve for a variety of mining piping systems and operating conditions. It evacuates air during pipeline filling, allows efficient release of air pockets from pressurized pipes, and enables large volume air intake in the event of network draining.

With its advanced aerodynamic design, double orifice and Surge Protection (Anti-slam / slow closing) device, this valve provides excellent protection against air accumulation, vacuum formation and pressure surges, with improved sealing in low pressure conditions. The valve minimizes fluid spraying during air release.



Features and Benefits

- Straight flow body with nominal (equal) inlet and outlet size: Higher than usual flow rates.
- Aerodynamic full-body kinetic shield: Prevents premature closing without disturbing air discharge.
- Dynamic sealing: Prevents leakage under low pressure conditions (1.5 psi; 0.1 bar).
- Minimizes fluid spraying during air release: Innovative 2-step function, automatic orifice (Patent Pending).
- Compact, simple, robust and reliable structure with fully corrosion-resistant parts: Lower maintenance and increased life span.
- Designed in compliance with functional standards and water service standards.
- Factory approval and Quality Control: Performance and specification tested and measured with specialized test bench, including vacuum pressure conditions.

Additional Features & Accessories

- Built in Surge Protection **C70-SP, C70-AC, C70-AS**
 - Anti-Slam feature for smoother operation, preventing damage to the valve and the system. **C70 - SP**
 - Adjustable "Switching Value" (pressure at which the kinetic orifice is partially closed) according to the specific system requirements. **C70-AS**
- Inflow Prevention **C70-IP**
 - Prevents intake of atmospheric air in cases where this could lead to damaged pumps, required re-priming, or disruption of siphons. It also prevents intake of any flooding or contaminated fluid into the piping system.
- Service Port fitted with ¼"; DN6 plug (codes **P, U**)
- Drainage Valve (code **Z**)

Operational Data

- Minimum operating pressure: 1.5 psi; 0.1 bar
- Media & operating temperature: Water 33-140°F, 1-60° C
- Available outlet connections:
 - 2"-3" Female threaded
 - 4"-8": Grooved

Pressure Rating

Class	PN 16		PN 25		PN 40	
Max. Recommended Pressure	250 PSI		400 PSI		600 PSI	
Available Connection (Inlet)	Flanged ANSI#150	Threaded NPT	Flanged ANSI#300	Threaded NPT	Flanged ANSI#400	Threaded NPT
Available Sizes (inlet)	2" - 8"		2" - 8"		2" - 8"	

Materials

Main Components	Water / Base Solutions Applications	Thermal Shock Applications	Acid Solutions Applications (**)
Body & Cover	Ductile Iron	Carbon Steel	Stainless Steel 316
Top Plate	Stainless Steel	Stainless Steel	Stainless Steel 316
Float Assembly	Polypropylene Nylon	Polypropylene Nylon	Polypropylene
Automatic Orifice	Stainless Steel	Stainless Steel	Stainless Steel 316
Elastomers	EPDM	EPDM	Viton
Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated

(**) For highly aggressive acid solutions consult factory.

Typical Applications

- Pumping stations: air relief, vacuum protection and surge protection.
- Pipelines: protection against air accumulation and vacuum formation at: peaks and slope change points.
- Water hammer: protection against vacuum formation during down-surge stage in systems affected by water hammer phenomena.
- Suitable for almost all the fluids used in mining such RAFF, ILS & PLS solutions for copper leaching; cyanide barren and pregnant solutions for gold mining.





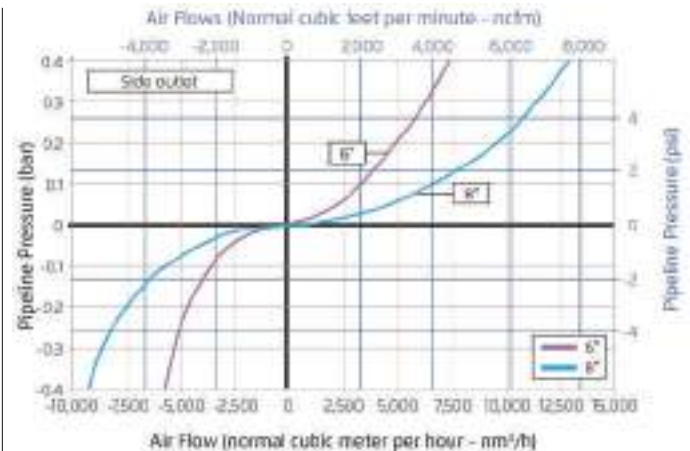
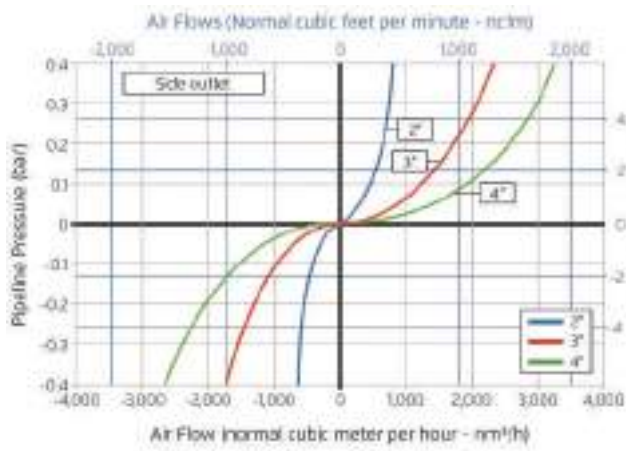
Orifice Specifications - Standard Configuration

Inlet Size		Automatic Orifice Area						Kinetic Orifice							
		250 psi PN16		400 psi PN25		600 psi PN40		Diameter		Area		Air Intake @ -6 psi; -0.4 bar		Air Relief @ 6 psi; 0.4 bar	
Inch	mm	Sq inch	Sq mm	Sq inch	Sq mm	Sq inch	Sq mm	inch	mm	Sq inch	Sq mm	ncfm	nm ³ /h	ncfm	nm ³ /h
2"	DN50	0.002	1.1	0.001	0.6	0.001	0.4	2.0	50	3.142	1,963	385	650	470	800
3"	DN80	0.004	2.5	0.002	1.5	0.002	1	3.0	80	7.069	5,027	1020	1730	1300	2200
4"	DN100	0.005	3.1	0.003	2	0.002	1.3	4.0	100	12.566	7,854	1560	2650	1890	3200
6"	DN150	0.014	9.1	0.009	5.7	0.005	3.5	6.0	150	28.274	17,671	3360	5700	4300	7300
8"	DN200	0.034	22.1	0.022	14.5	0.012	8	8.0	200	50.265	31,416	6650	11130	8710	14800

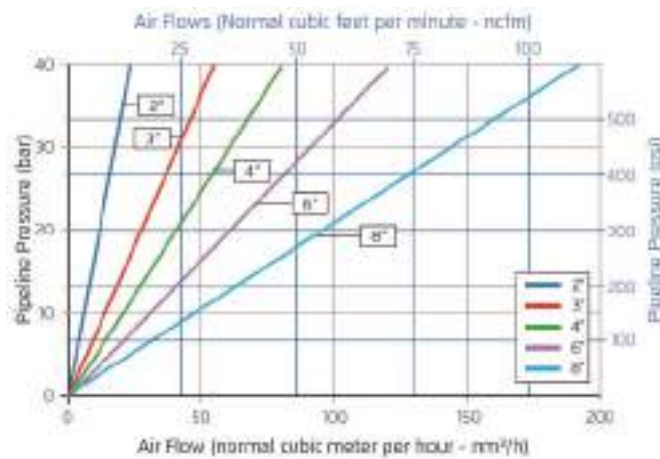
Note:
Shown data is for side outlet. For other outlet options consult factory.

Air Flow Performance Charts - Standard Configuration

Air Relief and Intake (Pipeline Filling, Drainage and Vacuum Conditions)



Air Release (Pressurized Operation)



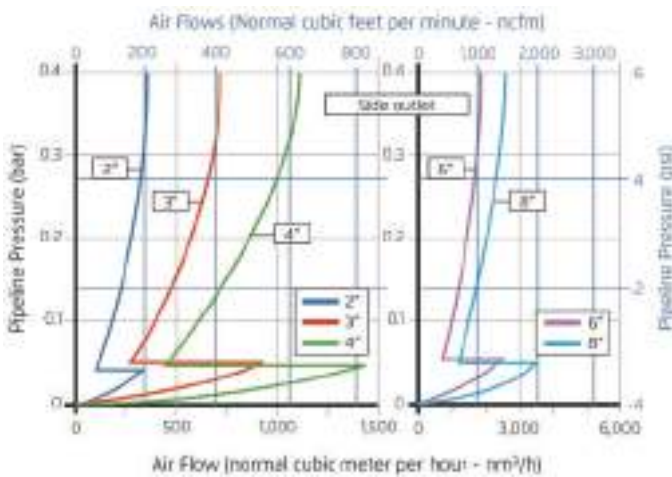


Data for Surge Protection Features

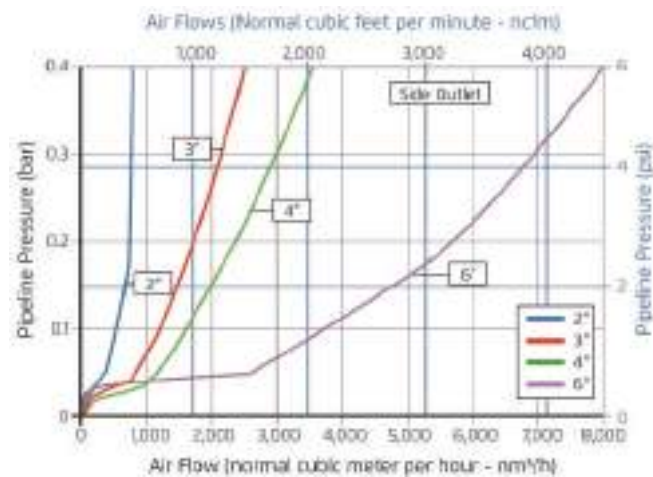
Inlet Size		Surge Protection					C70-SP Switching Value		C70-SP/AC/AS Air Relief @ 6 psi; 0.4 bar	
		Number Of holes	Hole Diameter		Total Area		psi	Bar	ncfm	nm3/h
Inch	mm	---	inch	mm	Sq inch	Sq mm				
2"	DN50	4	0.197	5	0.122	79	0.57	0.04	200	350
3"	DN80	4	0.315	8	0.312	201	0.78	0.05	399	700
4"	DN100	4	0.394	10	0.487	314	0.71	0.05	627	1100
6"	DN150	4	0.591	15	1.096	707	0.64	0.04	958	1680
8"	DN200	4	0.787	20	1.947	1257	0.73	0.05	1471	2580

Note:
Shown data is for side outlet. For other outlet options consult factory.

Air Relief with Surge Protection (Pipeline Filling)

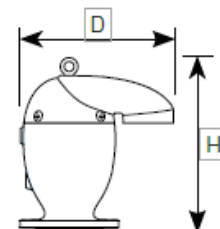


Air Relief with Inflow Prevention (Pipeline Filling)



Dimensions & Weights

Inlet Size		Connection	Width (D)		Height (H)		Weight	
Inch	mm		inch	mm	inch	mm	lbs	Kg
2"	DN50	Threaded	7.126	181	11.181	284	17.2	7.8
2"	DN50	Flanged	7.362	187	11.890	302	22	10
3"	DN80	Flanged	9.646	245	14.016	356	37	16.8
4"	DN100	Flanged	11.142	283	16.142	410	49.1	22.3
6"	DN150	Flanged	14.488	368	22.480	571	110.2	50
8"	DN200	Flanged	18.701	475	30.315	770	266.7	121

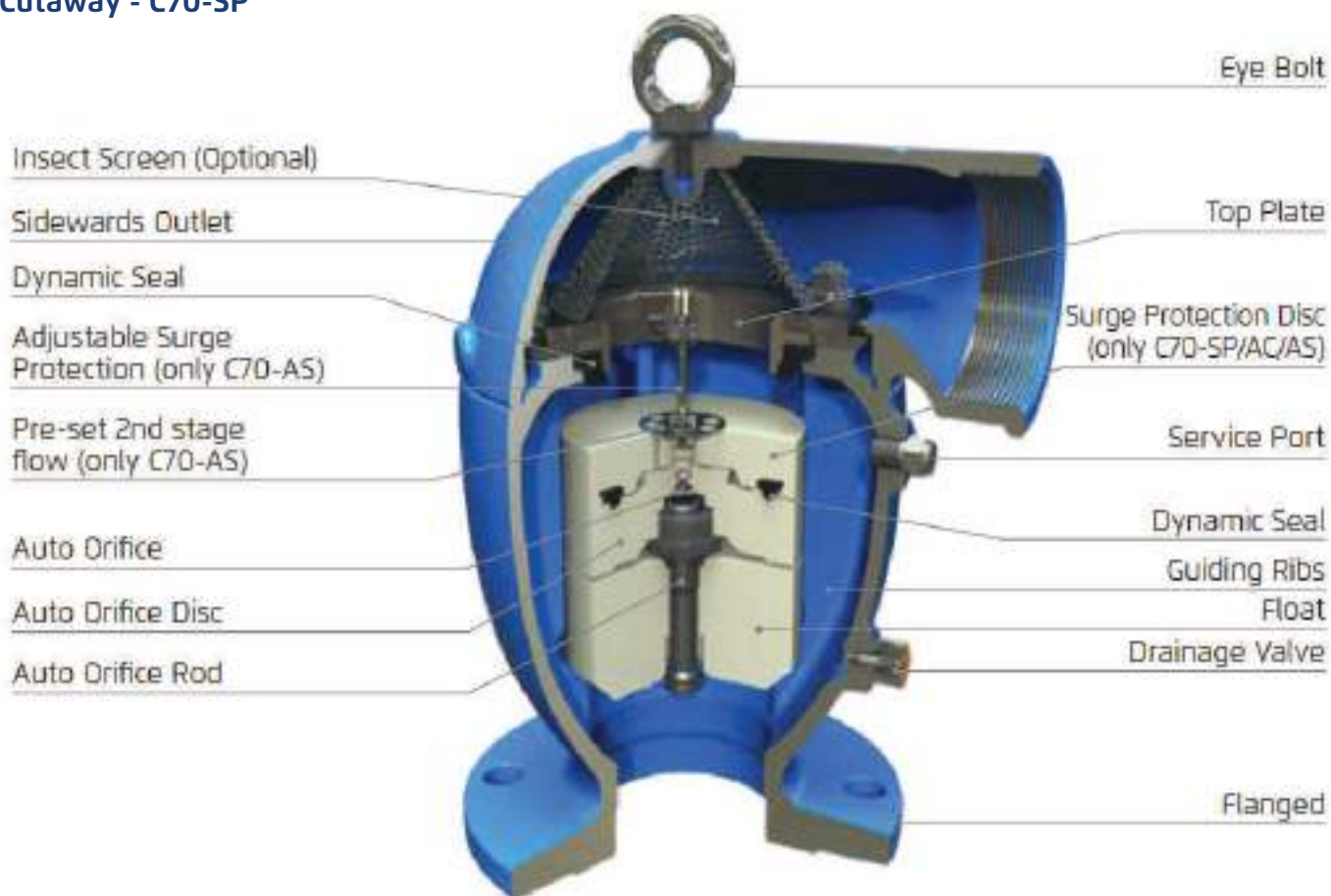


Note:
Shown data is for side outlet. For other outlet options consult factory.





Cutaway - C70-SP



Without Surge Protection (C70)



With Inflow Prevention (C70-IP)



Combination Air Valve

Model C50 (For Non-Clean Fluids)

BERMAD C50 is a high quality combination air valve for a variety of non-clean mining piping systems and operating conditions. It evacuates air during pipeline filling, allows efficient release of air pockets from pressurized pipes, and enables large volume air intake in the event of network draining.

The elongated body and lower float prevent the fluid to be in contact with the upper mechanism.

With its advanced aerodynamic design, double orifice and Surge Protection (Anti-slam / slow closing) device, this valve provides excellent protection against air accumulation and vacuum formation with improved sealing in low pressure conditions.



C50-P

Features and Benefits

- Straight flow body with large diameter automatic orifice: Higher than standard air valves.
- Aerodynamic full-body kinetic shield: Prevents premature closing without disturbing air discharge.
- Dynamic sealing: Prevents leakage under low pressure conditions (0.8 psi; 0.05 bar).
- Elongated body design: Prevents solids from making contact with valve's operating parts.
- Compact, simple, robust and reliable structure with fully corrosion-resistant parts: Lower maintenance and increased life span.
- Two service ports: Enabling back flushing and drainage.
- Threaded side outlet (2", DN50) for connection of Surge Protection (SP) or Inflow Prevention (IP) devices.
- Factory approval and Quality Control: Performance and specification tested and measured with specialized test bench, including vacuum pressure conditions.



C50-N



C50-G

Additional Features & Accessories

- Surge Protection: Anti-Slam feature for smoother operation, preventing damage to the valve and the system. **C50 - SP**
- Inflow Prevention: Prevents intake of atmospheric air in cases where this could lead to damaged pumps, required re-priming, or disruption of siphons. **C70-IP**
- Drainage Valve (code **Z**)

Typical Applications

- Specially designed for non-clean - or with suspended solids - fluids used in mining such RAFF, ILS & PLS solutions for copper leaching; cyanide barren and pregnant solutions for gold mining; seawater for desalination plants; slurry, pulp and concentrate lines.
- Pumping stations: air relief, vacuum protection and surge protection.
- Pipelines: protection against air accumulation and vacuum formation at: peaks and slope change points.
- Water hammer: protection against vacuum formation during down-surge stage in systems affected by water hammer phenomena.



C50-C



C50-J



Pressure Rating & Available Sizes and Connections

Model	C50-P		C50-C		C50-J		C50-N		C50-G	
Max. Recommended Pressure	150 PSI (PN10)		250 PSI (PN16)		250 PSI (PN16)		250 PSI (PN16)		250 PSI (PN16)	
Available Connection (Inlet)	Flanged ANSI#150	Threaded NPT	Flanged ANSI#150	Threaded NPT	Flanged ANSI#150	Threaded NPT	Flanged ANSI#150	Threaded NPT	Flanged ANSI#150	Threaded NPT
Available Sizes (inlet)	2" - 4"	2"-3"	2"-3"	2"	2"-3"	2"	2"-3"	2"-3"	2"-3"	2"-3"

Materials

Main Components	C50-P	C50-C	C50-J	C50-N	C50-G
Body	Glass-Reinforced Nylon	Ductile Iron	Ductile Iron	Stainless Steel 316	Stainless Steel 316
Neck & Cover	Glass Reinforced Nylon	Ductile Iron	Glass Reinforced Nylon	Stainless Steel 316	Glass Reinforced Nylon
Upper Float Assembly	Polypropylene Glass Reinforced Nylon	Polypropylene Glass Reinforced Nylon	Polypropylene Glass Reinforced Nylon	Polypropylene	Polypropylene Glass Reinforced Nylon
Lower Float Assembly	Polypropylene Stainless Steel 316 (Opt)	Polypropylene Stainless Steel 316 (Opt)	Polypropylene Stainless Steel 316 (Opt)	Polypropylene Stainless Steel 316 (Opt)	Polypropylene Stainless Steel 316 (Opt)
Float Rod	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316
Elastomers	EPDM, NBR, Viton (Opt.)	EPDM, NBR, Viton (Opt.)	EPDM, NBR, Viton (Opt.)	Viton	EPDM, NBR, Viton (Opt.)
Coating	Uncoated	Fusion Bonded Epoxy	Fusion Bonded Epoxy	Uncoated	Uncoated

Orifice Specifications

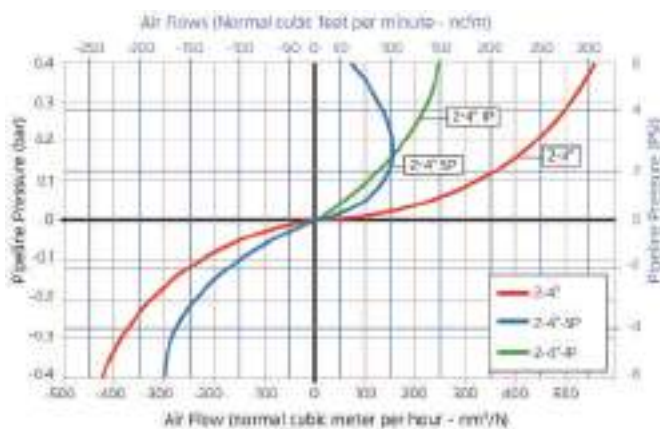
Inlet Size		Automatic Orifice		Kinetic Orifice				Surge Protection				
		Area		Diameter		Area		Number of Holes		Hole Diameter		Total Area
Inch	mm	Sq inch	Sq mm	inch	mm	Sq inch	Sq mm	---	inch	mm	Sq inch	Sq mm
2"-4"	DN50-DN100	0.019	12.2	1.772	45.0	2.465	1590	4	0.157	4	0.078	50

Operational Data

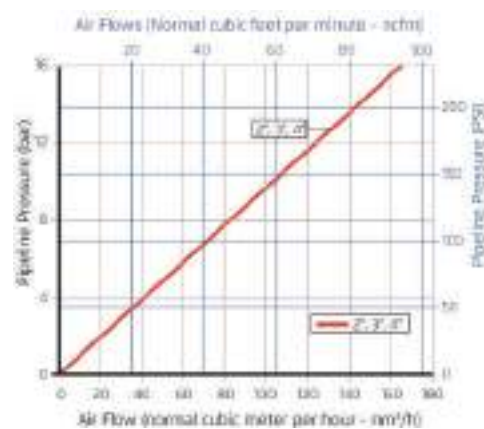
- Minimum operating pressure: 1.5 psi; 0.1 bar
- Media & operating temperature: Water 33-140°F, 1-60° C
- Available outlet connection: Sideway, female threaded 2"; DN50

Air Flow Performance Charts

Air Relief and Intake (Pipeline Filling, Drainage and Vacuum Conditions)



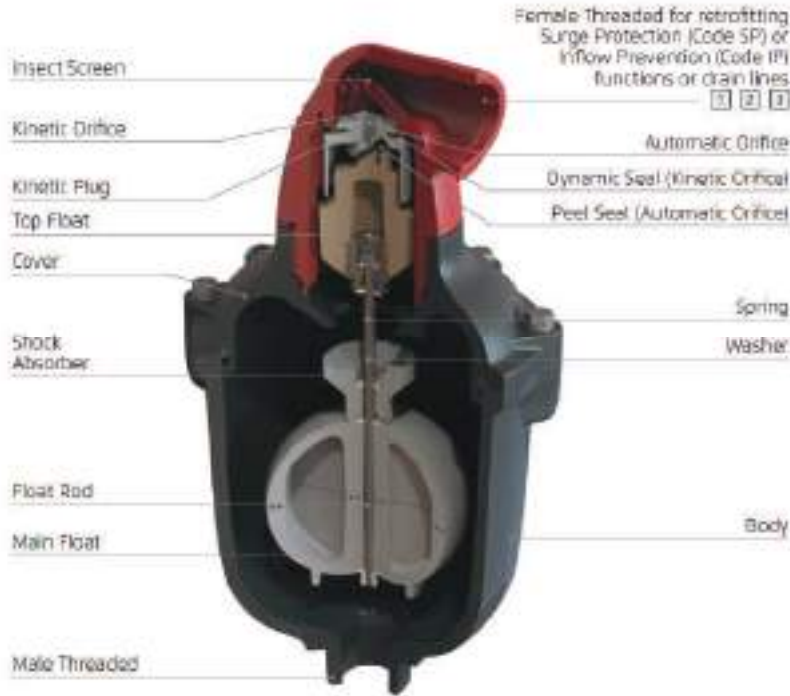
Air Release (Pressurized Operation)



Air relief and intake charts are based on actual measurements, measured in Bermad Air Flow test bench, according to EN-1074/4 standard and refer to Side outlet. Use Bermad Air software for optimized Sizing & Positioning of Air Valves.



Cutaway - C50-P Glass Reinforced Nylon Body



Surge Protection (code C50-SP)

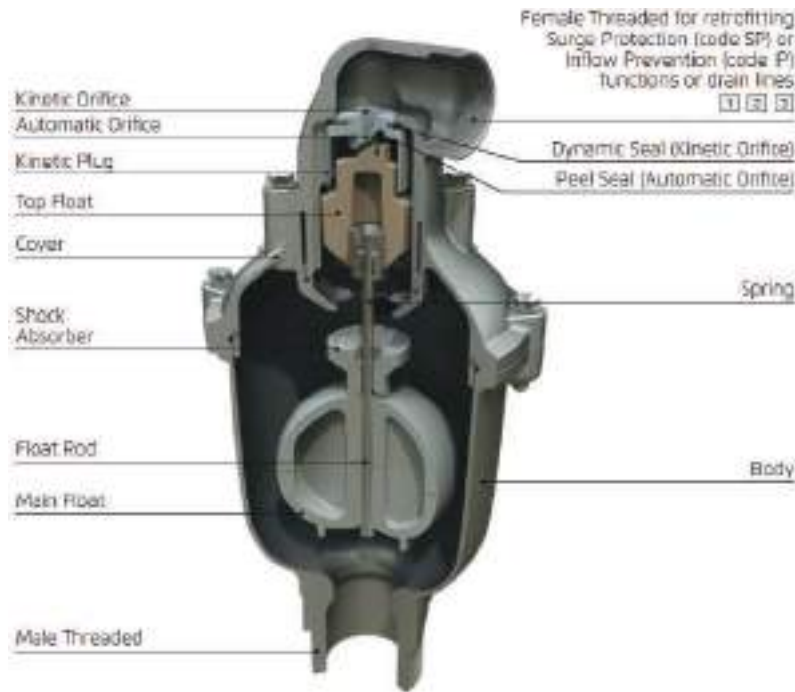


Inflow Prevention (code C50-IP)



Extension with downwards outlet

Cutaway - C50-N Glass Reinforced Nylon Body





Dimensions & Weight

		 Glass Reinforced Nylon (C50-P)			 Ductile Iron (C50-C)			 Ductile Iron & Glass Reinforced Nylon (C50-J)		
		Width (D)	Height (H)	Weight	Width (D)	Height (H)	Weight	Width (D)	Height (H)	Weight
Inlet Size	Connection	inch	inch	lbs	inch	inch	lbs	inch	inch	lbs
		mm	mm	Kg	mm	mm	Kg	mm	mm	Kg
2" DN50	Threaded	13.740 349	17.638 446	12.78 5.8	9.449 240	19.291 490	45.2 20.5	9.449 240	19.094 485	26.4 12.0
	Flanged	13.740 349	19.134 486	14.11 6.4	9.449 240	19.035 484	49.1 22.3	9.449 240	18.937 481	30.2 13.7
3" DN80	Threaded	13.740 349	20.157 512	13.00 5.9	---	---	---	---	---	---
	Flanged	13.740 349	19.409 493	14.83 6.7	9.449 240	19.291 490	52.5 23.8	9.449 240	19.291 490	33.5 15.2
4" DN100	Flanged	13.740 349	19.409 493	15.32 7.0	---	---	---	---	---	---

		 Stainless Steel & Glass Reinforced Nylon (C50-G)			 Stainless Steel (C50-N)		
		Width (D)	Height (H)	Weight	Width (D)	Height (H)	Weight
Inlet Size	Connection	inch	inch	lbs	inch	inch	lbs
		mm	mm	Kg	mm	mm	Kg
2" DN50	Threaded	13.740 349	19.134 486	23.36 10.6	11.654 296	19.252 489	37.03 16.8
	Flanged	13.740 349	19.134 486	23.09 10.5	11.654 296	19.370 492	41.66 18.9
3" DN80	Threaded	13.740 349	20.197 513	28.65 13.0	11.654 296	20.197 513	41.88 19.0
	Flanged	13.740 349	19.409 493	35.70 16.2	11.654 296	19.843 504	48.27 21.9
4" DN100	Flanged	---	---	---	---	---	---



Combination Air Valve

Model VEC-313 (For Non-Clean Fluids)

BERMAD MN-VEC 313 is a high quality combination air valve for a variety of non-clean fluids used in mining piping systems and operating conditions. It evacuates air during pipeline filling, allows efficient release of air pockets from pressurized pipes, and enables large volume air intake in the event of network draining.

The elongated body prevents the fluid to be in contact with the upper mechanism.

With its advanced aerodynamic design, double orifice and Surge Protection (Anti-slam / slow closing) device, this valve provides excellent protection against air accumulation and vacuum formation.

Features and Benefits

- Elongated body design: Prevents solids from making contact with valve's operating parts.
- Straight flow body with large diameter automatic orifice: Higher than standard air valves.
- Aerodynamic body design: Prevents premature closing without disturbing air discharge.
- Dynamic sealing: Prevents leakage under low pressure conditions (1.5 psi; 0.1 bar).
- Compact, simple, robust and reliable structure with fully corrosion-resistant parts: Lower maintenance and increased life span.
- Factory approval and Quality Control: Performance and specification tested and measured with specialized test bench, including vacuum pressure conditions.

Additional Features & Accessories

- Surge Protection: Anti-Slam feature for smoother operation, preventing damage to the valve and the system. **VEC-313 - SP**
- Drainage Valve (code **Z**)

Typical Applications

- Specially designed for non-clean - or with suspended solids - fluids used in mining such RAFF, ILS & PLS solutions for copper leaching; cyanide barren and pregnant solutions for gold mining; seawater for desalination plants; slurry, pulp and concentrate lines.
- Pumping stations: air relief, vacuum protection and surge protection.
- Pipelines: protection against air accumulation and vacuum formation at: peaks and slope change points.
- Water hammer: protection against vacuum formation during down-surge stage in systems affected by water hammer phenomena.



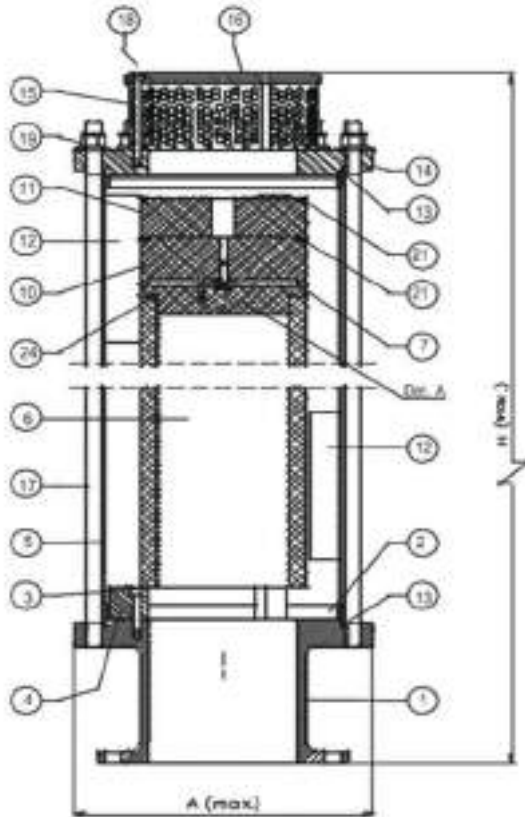
Operational Data

- Available Sizes: 3" - 8"
- Available End Connections:
 - Flanged ANSI 150
 - Flanged ANSI 300
- Minimum operating pressure: 1.5 psi; 0.1 bar
- Maximum operating pressure:
 - ANSI 150: 250 PSI
 - ANSI 300: 300 PSI
- Media & operating temperature:
 - Water 33 - 140°F, 1 - 60° C
- Outlet: Mushroom Type





Material Specifications

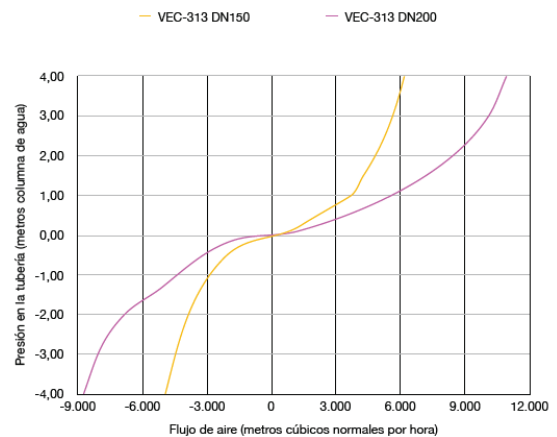
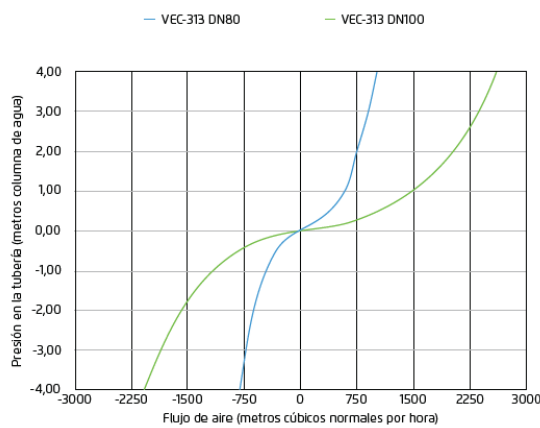


Item	Description	Material	QTY
1	Lower Flange Assembly	Stainless Steel ASTM A-351 CF8	1
2	Barrel Reinforcement	Stainless Steel AISI 316	2
3	Support Screw	Stainless Steel AISI 316	3
4	Baffle Spacer	Stainless Steel AISI 316	3
5	Barrel	Stainless Steel AISI 316	1
6	Lower Float	High Density Polyethylene	1
7	Top Float	High Density Polyethylene	1
8	Nozzle Seat	EPDM/Viton	1
9	Nozzle	Stainless Steel AISI 316	1
10	Top Float	High Density Polyethylene	1
11	Anti Schok Orifice Float	High Density Polyethylene	1
12	Float Guide	Stainless Steel AISI 316	6
13	O Ring -- Top	EPDM/Viton	2
14	Top Flange	Stainless Steel ASTM A-351 CF8	1
15	Top Baffle	Stainless Steel AISI 316	1
16	Top Cover	Stainless Steel AISI 316	1
17	Tie Rods	Stainless Steel AISI 316	--
18	Assembly Screws	Stainless Steel AISI 316	3
19	Nuts	Stainless Steel AISI 316	--
20	Washer	Stainless Steel AISI 316	--
21	O Ring	EPDM/Viton	2
22	Nozzle Support	Stainless Steel AISI 316	1
23	Assembly Screws	Stainless Steel AISI 316	3
24	O Ring	EPDM/Viton	1

Dimensions & Weight

DN	INCH	A (mm)	H (mm)	Weigth (kg)
80	3"	180	920	30
100	4"	250	914	36
150	6"	395	1156	112
200	8"	430	1275	155

Air Flow Performance Charts





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