IR-100 hYflow Basic Valve

The BERMAD basic Model IR-100 hYflow diaphragm actuated, hydraulically operated valve is at the leading edge of control valve design. It combines simple and reliable construction with superior performance, while at the same time being virtually free of the typical limitations associated with standard control valves.
BERMAD's automatic water control valves are designed for vertical or horizontal installation and are available in sizes of 2", 2½", 3", 4" & 6"; DN: 50, 65, 80, 100 & 150.

The Model IR-100 hYflow, made from industrial durable glass-filled nylon, is engineered to meet rough service conditions with high chemical and cavitation resistance.

The hYflow 'Y' valve body design includes a full bore seat with unobstructed flow path, free of any in-line ribs, supporting cage, or shafts. Its unitized Flexible Super Travel (FST) diaphragm and guided plug provide a significantly 'look through' passage from end to end resulting in ultra-high flow capacity with minimal pressure loss. The combination of a long travel guided valve plug, peripherally supported diaphragm, and replaceable valve seal provides:

- No chattering or slamming closed
- Accurate and stable regulation with smooth motion
- Low operating pressure requirements
- No diaphragm erosion and distortion
- Diaphragm and spring fully meet the valve's operating pressure range requirements.

Designed for service under a wide range of pressure and flow conditions, from dripping to maximum flow, the IR-100 hYflow excels at being a user-friendly control valve:

- Simple design with few parts guarantees easy in-line inspection and service.
- Adaptable on-site to a wide range of end connection types and sizes.
- Articulated flange connections isolate the valve from pipeline bending and pressure stresses.

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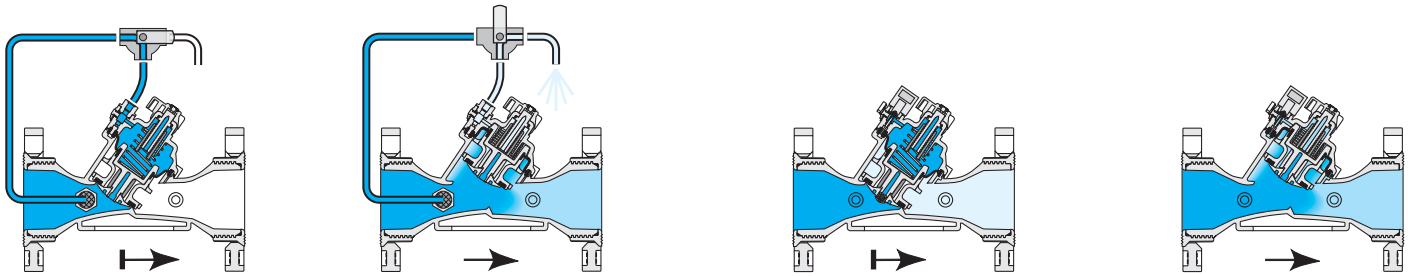
On-Off Modes



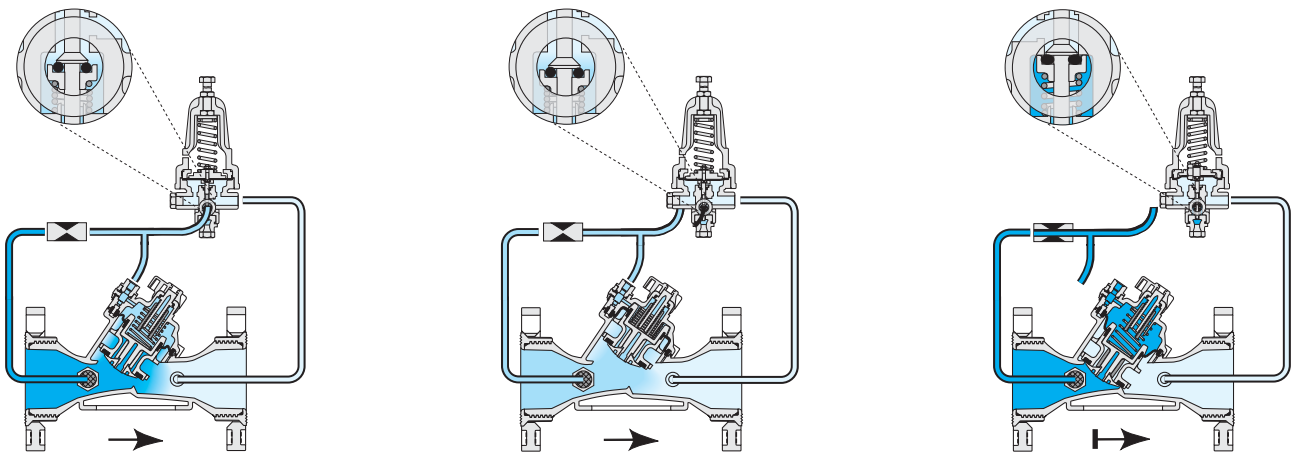
3-Way Control

Line pressure applied to the control chamber of the valve creates a hydraulic force that moves the valve to the closed position and provides drip tight sealing. Discharging pressure from the control chamber to the atmosphere causes the line pressure under the plug to open the valve.

2-Way Internal Control

Line pressure enters the control chamber through the internal restriction. The closed solenoid causes pressure to accumulate in the control chamber, thereby shutting the valve. Opening the Solenoid releases more flow from the control chamber than the restriction can allow in. This causes pressure in the control chamber to drop, allowing the valve to open.

2-Way Modulating Modes, Pressure Reducing Pilot



Modulating to Close

Line pressure enters the control chamber through the internal restriction. The pilot controls outflow from the control chamber. Throttling when it senses a pressure rise, it causes pressure to accumulate in the control chamber, thereby forcing the valve to modulate closed.

Modulating to Open

The pilot modulates open when it senses a pressure drop, releasing more flow from the control chamber than the restriction can allow in. This causes the accumulated pressure in the control chamber to drop and the valve modulates open.

Zero Flow Position

When demand drops to zero, downstream pressure begins to rise as the flow enters a closed line. The pilot closes, initiating the valve's irreversible closing process, eventually causing it to seal drip tight.

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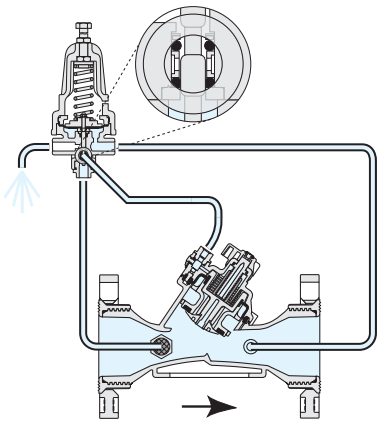
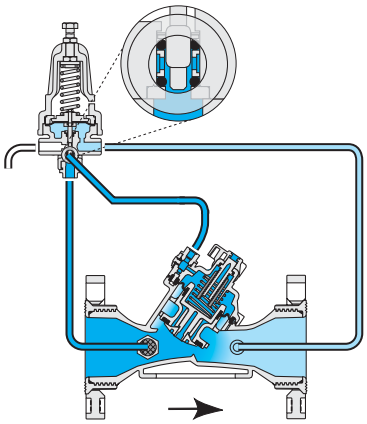
3-Way Control Modes, Pressure Reducing



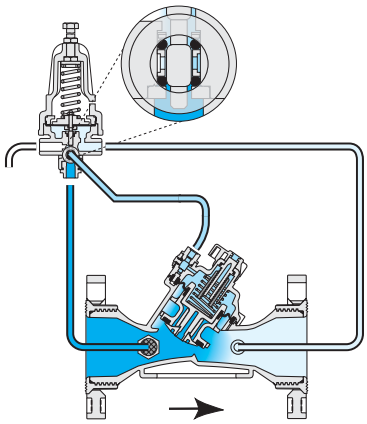
Fully Open Position

When upstream pressure drops, the pilot blocks the supply pressure port and opens the drain port, venting the control chamber to the atmosphere. This fully opens the valve, minimizing head loss.



Modulating to Close

The pilot switches upon pressure rise, blocking the drain port and opening the supply pressure port. This pressurizes the control chamber, forcing the valve to modulate closed.



Locked Position

When sensed pressure is equal to setting, the pilot blocks both the drain and the supply pressure ports. This locks the pressure in the control chamber, freezing valve opening in its last position until conditions change.

[1] Cover Ring

The cover ring fastens valve cover to body, stiffening and strengthening the valve body, enabling simple maintenance. A cover ring key is available.

[2] "Click-In" Bracket

For all BERMAD plastic accessories.

[3] Valve Cover

The cover's strong construction meets rough service conditions. Optional cover types (3"; DN80 and smaller valves) are capable of accepting a Flow Stem, a Flow Stem + Position Indicator, and a 2-Way Solenoid (2W-N1 Electric Type).

[4] Auxiliary Closing Spring

One single high grade stainless steel spring provides a wide operation range, ensuring low opening pressure and secured closing.

[5] Plug Assembly

The unitized Flexible Super Travel (FST) plug assembly combines a long travel guided valve plug, peripherally supported diaphragm, and replaceable diaphragm and valve seal. The diaphragm fully meets the valve's operating pressure range requirements.

- **[5.1]** Diaphragm Holder
- **[5.2]** Diaphragm
- **[5.3]** Plug
- **[5.4]** Plug Seal

[6] hYflow 'Y' Valve Body

Glass-filled nylon construction meets rough service conditions with high 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 pressure loss.

[7] End Connections

Adaptable on-site to a wide range of end connection types and sizes:

- **[7.1]** Flanges: Plastic or metal "Corona" with elongated slots enable meeting diverse flange standards ISO, ANSI and JIS.
- **[7.2]** Flange adaptor external thread
- **[7.3]** Internal threads

[8] Flange Adapter

Articulated flange connections isolate the valve from line bending and pressure stresses.

[9] Valve Legs

Stabilizing the valve and serve also as mounting brackets.

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Configuration Options

2"; DN50

2½"; DN65 - Male Thread
(for PVC Adapters)

3"; DN80

3"; DN 80 Angle

6"; DN 150 "Y-Boxer" - Flanged

6"; DN 150 "Y-Boxer" - Grooved (Vic)

End Connection Options

BSP.T; NPT Female Thread
2"; DN50

BSP.F Male Thread,
(for PVC Adapters)
2½"; DN65

Union PVC adaptor
2½"; DN65

BSP.T; NPT Female Thread
3"; DN80

Plastic Flange
3"; DN80

Plastic Flange
3"L & 4"; DN: 80L & 100

Metal Flange
3"L & 4"; DN: 80L & 100

PVC Adaptor
3"; DN80

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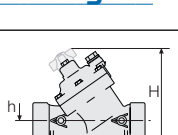
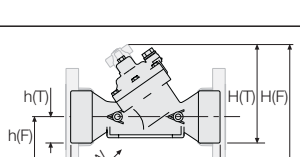
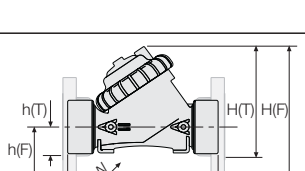
Dimensions & Weights



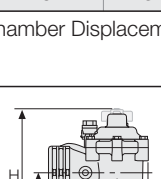


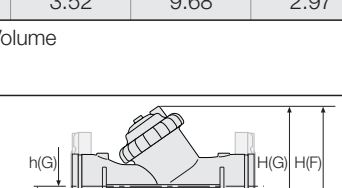


Size	2"	2½"	3"			3"L			4 "	
Connections	2" NPT	G 2½ BSP.F	3" NPT	Universal Flanges Metal	Universal Flanges Plastic	3" NPT	Universal Flanges Metal	Universal Flanges Plastic	Universal Flanges Metal	Universal Flanges Plastic
L (inch)	9 1/16	9 1/16	11 3/4	12 1/8	12 1/8	11 3/4	12 3/16	12 3/16	13 3/4	13 3/4
H (inch)	7 5/16	7 5/16	7 11/16	10 1/16	10 1/16	9 7/16	11	11	11 9/16	11 7/16
h (inch)	1 9/16	1 9/16	1 15/16	3 15/16	3 15/16	2 3/8	3 15/16	3 15/16	4 7/16	4 7/16
W (inch)	5 5/16	5 5/16	5 5/16	7 7/8	7 7/8	7 1/2	7 7/8	7 7/8	8 13/16	8 13/16
CCDV (gal)	0.05	0.05	0.05	0.05	0.05	0.18	0.18	0.18	0.18	0.18
Weight (lb)	2.97	3.08	3.52	9.68	2.97	6.60	12.98	8.80	16.72	10.78

CCDV = Control Chamber Displacement Volume

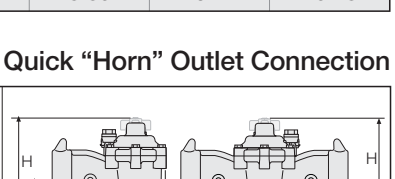
Quick "Horn" Outlet Connection





Size	3"	6"	
Pattern	Angle	Y "Boxer"	
End Connections	3" NPT	Grooved (Vic)	Universal Flanges*
L (inch)	7 3/8	18 7/8	18 7/8
L1 (inch)	5 1/8	N/A	N/A
H (inch)	9 5/8	7 11/16	11 1/4
h (inch)	4 5/8	3 15/16	5 11/16
W (inch)	5 3/8	15 3/16	15 3/16
CCDV (gal)	0.05	0.18	0.18
Weight (lb)	3.52	17.71	27.50

CCDV = Control Chamber Displacement Volume
*Reinforced Plastic Flanges



Size	3 "	
Pattern	Angle	T
Inlet Connection	3" NPT	3" NPT
L (inch)	8 11/16	12 13/16
L1 (inch)	6 1/2	6 1/2
H (inch)	9 5/8	9 5/8
h (inch)	4 5/8	4 5/8
W (inch)	5 5/16	5 5/16
CCDV (gal)	0.05	0.05
Weight (lb)	3.37	4.62

Technical Specifications

Available Sizes:
2", 2½", 3", 3"L, 4" & 6"

Connections Standard:
Threaded: Female NPT: 2", 3" & 3"L
Male BSP-F: 2½"
Flanged: 3", 3"L, 4" & 6"
Plastic or metal "Corona" with elongated slots enable meeting diverse flange standards ISO PN10, ANSI 125, JIS 10K

Pressure Rating: 145 psi
Operating Pressure Range: 5-145 psi
Temperature: Water up to 140°F

Standard Materials:
- Body, Cover and Plug: Glass-Filled Nylon
- Diaphragm: NR], Nylon Fabric Reinforced
- Seals: NR
- Spring: Stainless Steel
- Cover bolts (2", 2½" & 3" valves): Stainless Steel

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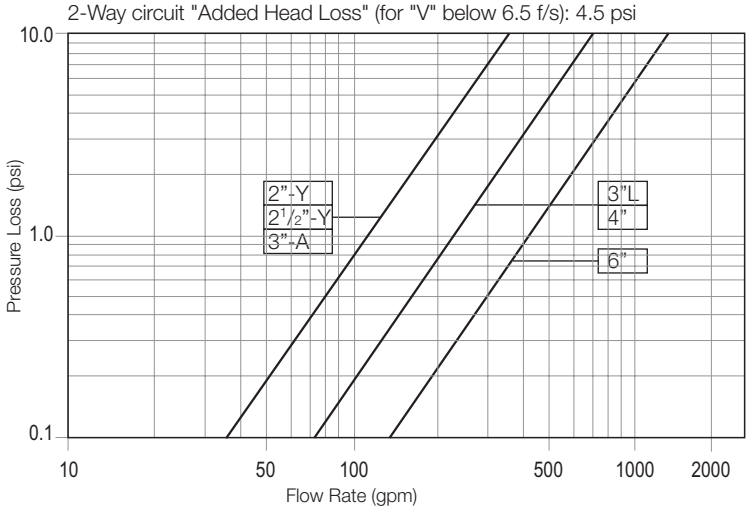
US English

Flow Chart

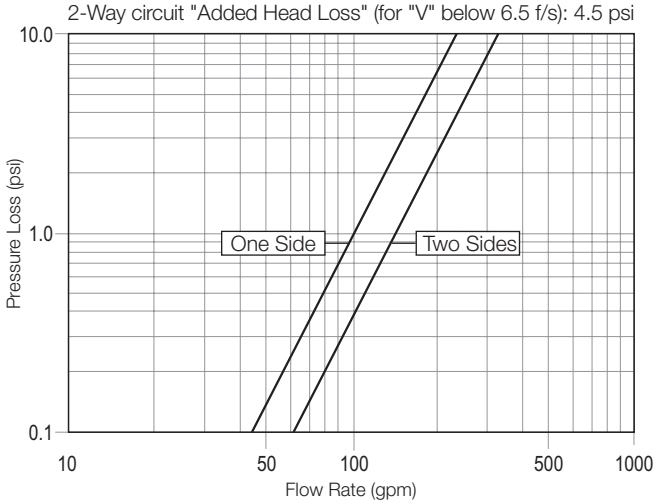
Y Pattern 2-6", Angle Pattern 3"

2-Way circuit "Added Head Loss" (for "V" below 6.5 f/s): 4.5 psi



T Pattern 3"

2-Way circuit "Added Head Loss" (for "V" below 6.5 f/s): 4.5 psi



Flow Properties

Y Pattern

Size	2"	2 1/2"	3"	3"L	4"	6"
Cv	115	115	115	230	230	460
K	1.0	2.8	6.4	1.6	3.9	5.0
Leq (ft)	8.0	29.8	84.2	21.1	64.3	122.0

A Pattern

3"
115
6.4
84.2

T Pattern 3"

One Side	Two Sides
115	160
6.4	3.3
84.2	43.0

Valve flow coefficient, Cv or Kv $Cv(Kv)=Q\sqrt{\frac{Gf}{\Delta P}}$

Where:
Kv = Valve flow coefficient (flow in m^3/h at 1bar Diff. Press.)
Cv = Valve flow coefficient (flow in gpm at Diff. Press. 1psi)
Q = Flow rate (gpm ; m^3/h)
ΔP = Differential pressure (psi ; bar)
Gf = Liquid specific gravity (Water = 1.0)

Cv = 1.155 Kv

Flow resistance or Head loss coefficient, $K = \Delta H \frac{2g}{V^2}$

Where:
K = Flow resistance or Head loss coefficient (dimensionless)
ΔH = Head loss (feet ; m)
V = Nominal size flow velocity (feet/sec ; m/sec.)
g = Acceleration of gravity (32.18 $feet/sec^2$; 9.81 m/sec^2)

Equivalent Pipe Length, Leq $Leq = Lk \cdot D$

Where:
Leq = Equivalent nominal pipe length (feet ; m)
Lk = Equivalent length coefficient for turbulent flow in clean commercial steel pipe (SCH 40)
D = Nominal pipe diameter (feet ; m)

Note:
The Leq values given are for general consideration only.

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