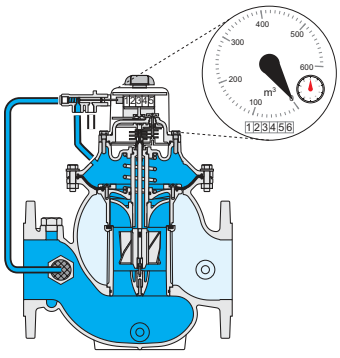
IR-900-D
Automatic Metering Valve (AMV)

The BERMAD Model IR-900-D is a unique product integrating both a vertical turbine Woltman-type water meter and a pilot operated, diaphragm actuated control valve, with a built-in auxiliary shut-off pilot for batch applications. When this unique assembly delivers a preset quantity of water, its control head mechanism mechanically shifts the shut-off pilot.
This automatically and smoothly closes the control valve, stopping the flow of water.
The IR-900-D provides the full spectrum of metering functions - from simple visual readout, through non-computerized dose control, to pulse output for computerized data capture and control - while simultaneously allowing for numerous control valve features such as pressure, level and flow control.
Ranging in size from 1 1/2"; DN40 through 10"; DN250, the 900-D Series is specifically designed for metering and control applications in agricultural and landscape irrigation as well as municipal and industrial water supply systems.

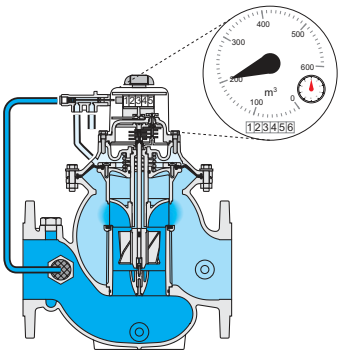
The flow metering unit is vertical to the pipeline and includes an impeller with integrated inlet and outlet flow straighteners. This internal design eliminates the need for straightening distances, enables vertical or horizontal installation, and ensures accuracy even when the valve is partially open during pressure or flow control tasks.
The impeller assembly shaft serves as the closure assembly guide, and for centralizing and tightening all internal parts both in their position and to one another.
The basic Model IR-900-D combines simple and reliable construction with superior performance, while at the same time being virtually free of the typical limitations associated with other single chambered valves. The relatively high impeller housing raises the location of the vulcanized seal seat above the valve body. This results in remarkable cavitation resistance and a smooth mushroom-shaped flow where the valve body is at maximum distance from the flow.

The closure assembly, combining a rugged radial disk harnessed to a flexible fiber reinforced diaphragm, slides on the guide along the full valve travel. The diaphragm is carefully balanced and peripherally supported to avoid distortion, resulting in long-life and controlled actuation even under harsh conditions. One diaphragm and spring fully meets the valve's operating pressure range requirements.
The cover is removable via fastening bolts for quick in-line inspection and service. All the internal assemblies can be easily removed from the valve body with no need for disassembling the valve from the line.

On-Off Modes, Automatic Metering Valves



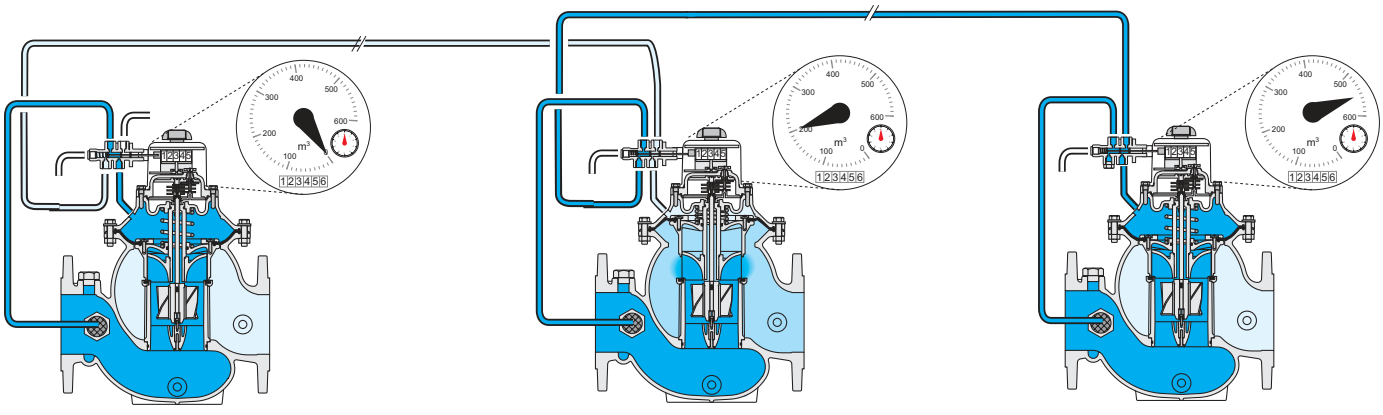
AMV Closed



AMV Open

The shut-off pilot hydraulically connects the AMV inlet pressure to the control chamber. Setting the AMV closes the shut-off pilot, thereby discharging pressure from the control chamber and opening the AMV. Upon delivering the preset water quantity, the shut-off pilot switches open to divert line pressure into the AMV control chamber. This causes the AMV to shut, stopping the flow of water.

On-Off Modes, Sequential Automatic Metering Valves



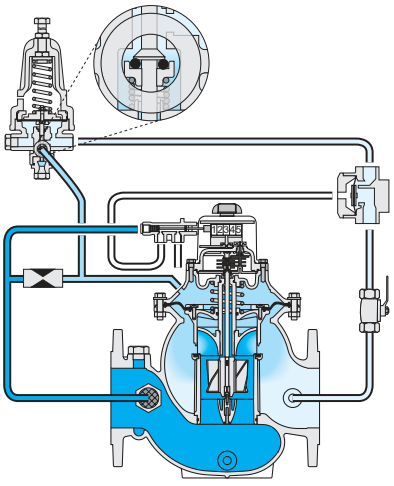
Previous AMV, Closed

Current AMV, Open

Next AMV, Set & Closed

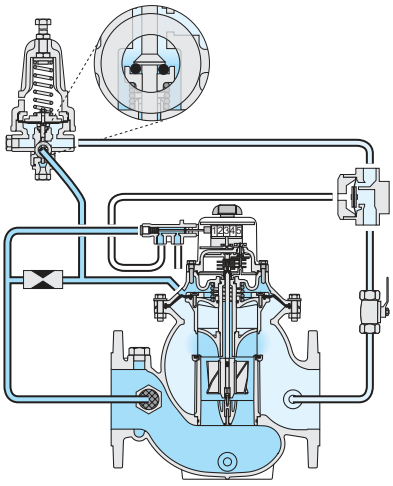
Each AMV is manually preset to deliver a desired quantity of water. As long as the **Previous AMV** is set & open, it transmits pressure that enters the **Current AMV** control chamber through its sequential shut-off pilot, closing it. When the **Previous AMV** shuts itself off, it drains the **Current AMV** control chamber through both AMV's sequential shut-off pilots, opening the **Current AMV**. The **Current AMV** inlet pressure is transmitted to the **Next AMV**, holding it closed until the **Current AMV** shuts itself off.

2-Way Modulating Modes, Pressure Reducing Pilot



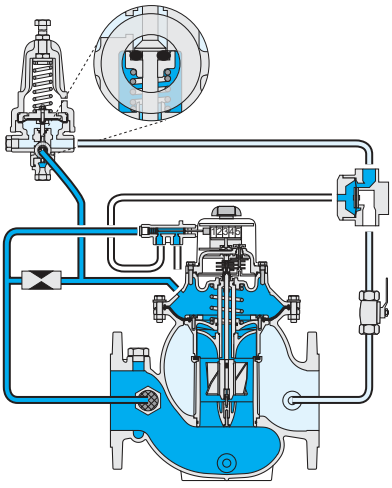
Modulating to Close

The restrictor continuously allows line pressure into the control chamber, while the pilot controls outflow from the control chamber. Throttling when it senses a pressure rise, the pilot causes pressure to accumulate in the control chamber, forcing the valve to modulate closed.



Modulating to Open

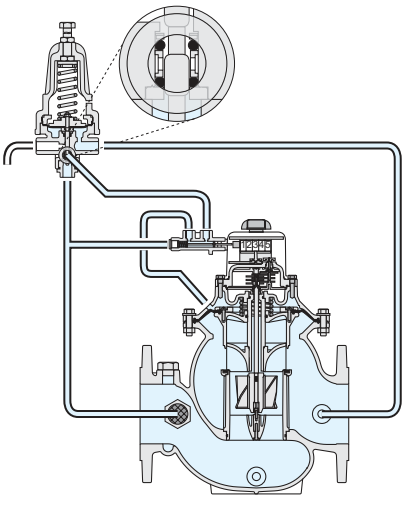
The pilot modulates open when it senses a pressure drop, releasing greater flow from the control chamber than the restrictor can allow in. This causes the accumulated pressure in the control chamber to drop, and the valve to modulate open.



Zero Flow Position

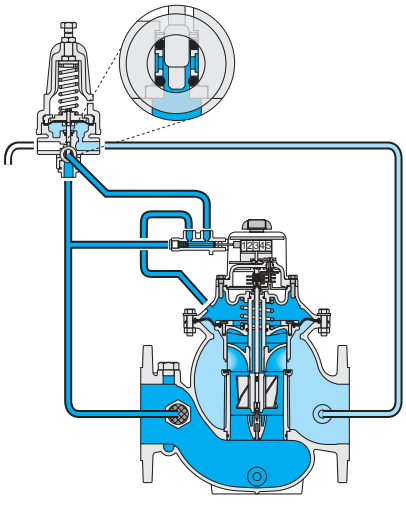
Upon delivering the preset quantity of water, the AMV shut-off pilot automatically switches, closing the hydraulic relay valve. This causes pressure to accumulate in the AMV control chamber, shutting the AMV.

3-Way Control Modes, Pressure Reducing



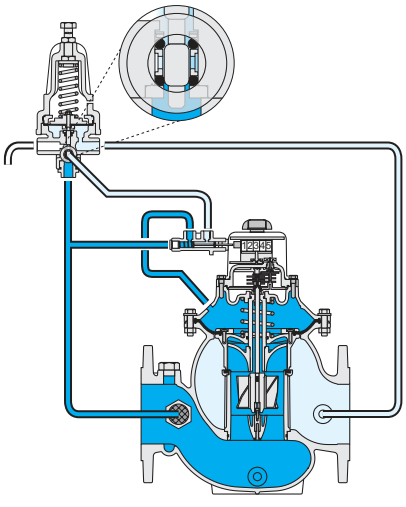
AMV Set, Fully Open Position

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



AMV Set, Modulating to Close

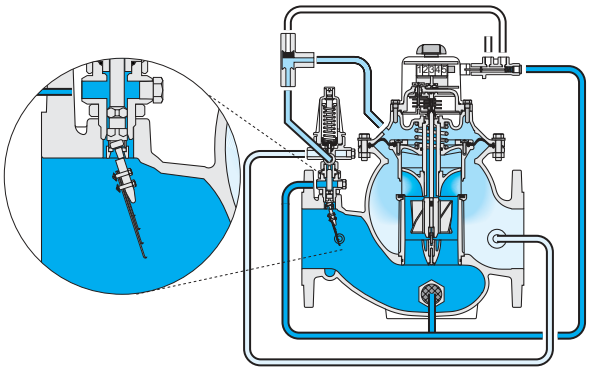
Upon pressure rise the pilot switches, blocking the drain port and opening the pressure port. This pressurizes the control chamber, forcing the valve to modulate closed.



Automatic Shut-Off

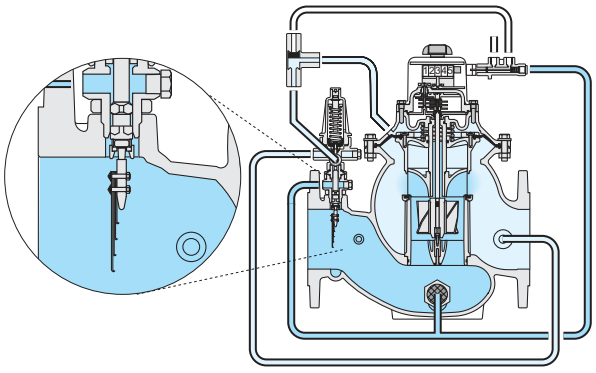
Upon delivering the preset quantity of water, the AMV shut-off pilot automatically switches, blocking the pilot while directing line pressure into the control chamber, thereby causing the AMV to shut.

2/3-Way Modulating Modes, Flow Control



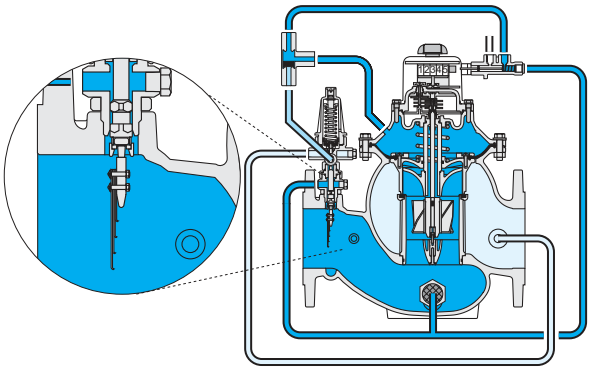
AMV Set, Modulating to Close

Should demand rise above setting, the increasing flow dynamic-force moves the paddle, which thereby pushes up the pilot trim, causing a negative ratio between water flow into and out of the control chamber. Pressure then accumulates in the control chamber, forcing the AMV to throttle closed.



AMV Set, Modulating to Open

When demand is below setting, the pilot's spring force pushes the pilot trim down, thereby causing a negative ratio between water flow into and out of the control chamber. Pressure is then released from the control chamber, enabling the AMV to modulate open



Automatic Shut-Off

Upon delivering the preset quantity of water, the AMV shut-off pilot automatically switches, directing line pressure through the shuttle valve into the control chamber, thereby causing the AMV to shut.

[1] Setting Knob

Easy "Push & Set" batch pre-setting

[2] Control Head

Includes: Flow totaling counter, visual flow rate indicator, non-computerized dose control and pulse output for computerized data capture and control.

[2.1] Shut-Off Pilot: Spring loaded pilot which is manually preset to divert line pressure into the AMV control chamber and automatically switches to drain pressure out of the control chamber.

Optional:
- ❑ Sequential Shut-Off Pilot
- ❑ Shut-Off Pilot with Pump Shut-Off Electrical Switch.

[3] Valve Cover

Locates, centralizes and fastens diaphragm, spring, and impeller assembly ensuring smooth and accurate performance. Simple and light construction enables quick in-line inspection and service.

[4] Auxiliary Closing Spring

One single spring fully meets valve requirements for operating pressure range, ensuring low opening pressure and secured closing.

[5] Closure Assembly

Combining a rugged radial disk harnessed to a flexible fiber reinforced diaphragm. The fully guided closure assembly and the carefully balanced and peripherally supported diaphragm prevent distortion and protect the elastomer, resulting in long-life and controlled actuation even under harsh conditions. One diaphragm and spring fully meet the valve's operating pressure range requirements.

[6] Impeller Assembly

[6.1] Guide – Carries the transmission shaft, guides the closure assembly, and centralizes and tightens all internal parts.

[6.2] Upper Flow Straightener – Tightens the seal seat in place, straightens outlet flow, and creates mushroom-shaped flow.

[6.3] Impeller – Woltman-type impeller with tungsten carbide shaft tips and bearings for high, long-term accuracy and negligible wear

[7] Impeller Housing

[7.1] Lower Flow Straightener – Straightens inlet flow, eliminating the need for straight upstream pipe required in standard water meters

[7.2] Seal Seat – Metal ring vulcanized with elastomeric seal, raised and remote from valve body to prevent cavitation damage.

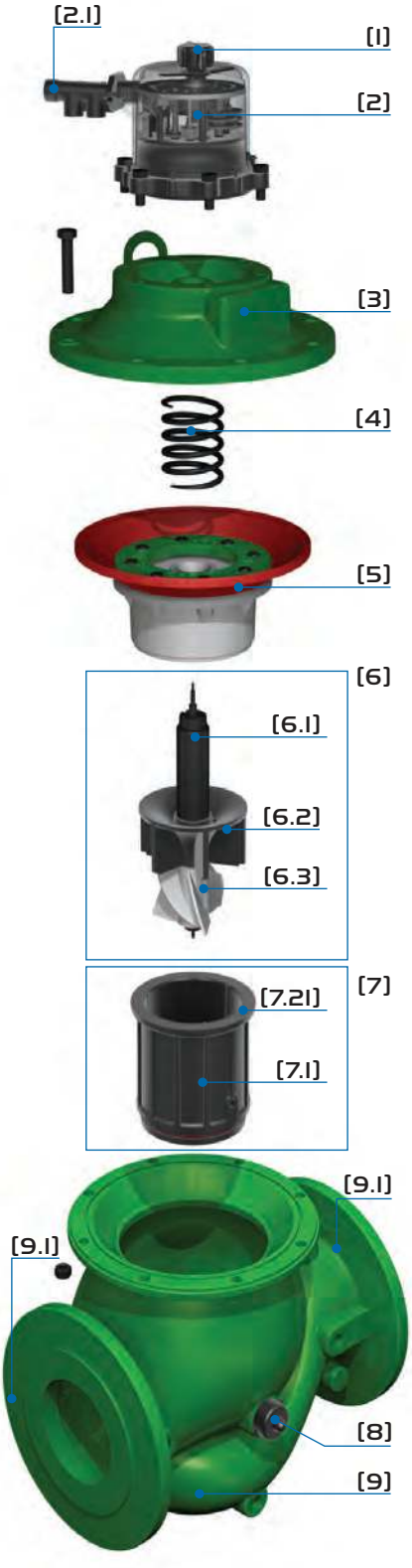
[8] Integrated Calibration Device

Enables recalibration instead of renovation when the recommended standard accuracy period has elapsed (The Calibration Device is stamped closed with a metal seal)

[9] Wide Body

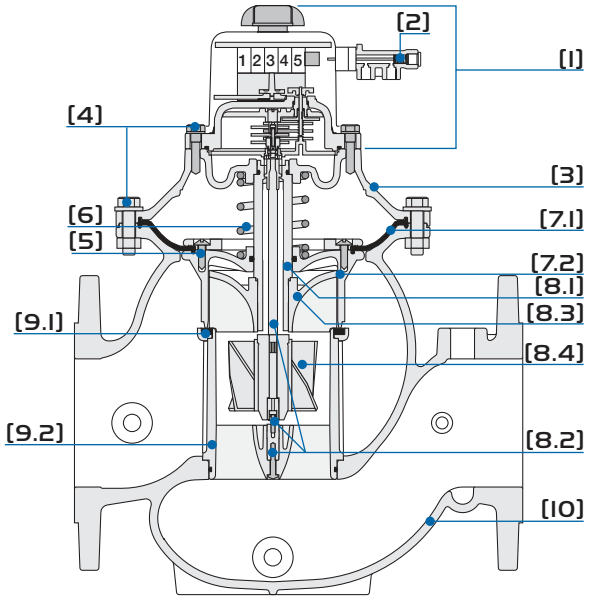
Hydro-dynamically designed for efficient flow with minimal pressure loss and excellent resistance to cavitation.

[9.1] End Connections conform to pressure ratings and standards: ISO, ANSI, JIS, BS, and others.



SI Metric

Construction Materials



[1] **Control Head:** Plastic, Stainless Steel and Brass

[2] **Shut-Off Pilot:** Nylon, Stainless Steel & NBR (Buna-N)

[3] **Cover:** Polyester Coated Ductile Iron to EN 1563

[4] **External Bolts / Nuts:** Zinc-Cobalt Plated Steel

[5] **Internal Bolts, Nuts and Washers:** Stainless Steel 304 and 316

[6] **Spring:** Stainless Steel 302

[7] **Closure Assembly:**

- **[7.1] Diaphragm:** Reinforced Natural Rubber (NR)
- **[7.2] Closure:** Glass Fiber Reinforced Nylon

[8] **Impeller Assembly:**

- **[8.1] Guide:** Stainless Steel 303
- **[8.2] Pivots, Bearings, and Thrust Bearings:** Tungsten Carbide
- **[8.3] Upper Flow Straightener:** Glass Fiber Reinforced Nylon
- **[8.4] Impeller:** Polypropylene

[9] **Impeller Housing Assembly:**

- **[9.1] Seal Seat:** NBR (Buna-N) Vulcanized Brass
- **[9.2] Impeller Housing and Lower Flow Straightener:** Glass Fiber Reinforced Nylon

[10] **Valve Body:** Polyester Coated Ductile Iron to EN 1563 or Cast Iron

O-Rings: NBR (Buna-N)

Coating: Electrostatic Powder Polyester Green RAL 6017, 150 mμ

Technical Specifications

Available Patterns, Sizes & End Connections:

Connections	DN40	DN50	DN65	DN80R	DN80	DN100	DN150	DN200	DN250
Threaded	G	G & A		G					
Threaded (Male)	G	G							
Flanged			H*	G	G & A	G, A & H	G & A	G & A	G
Flange Inlet \ Thread Outlet		A	H*	G		H			

G = Globe, A = Angle 90°, H= Hydrant (Angle 120°) * Triangle Flange Inlet

Connections Standard:
Flanged: ISO 7005-2 (PN10 & 16)
Triangle Flange (DN65 inlet only)
Threaded: Rp ISO 7/1 (PSP.P) or NPT

Pressure Ratings:
PN10 (Plastic Primary Gear Cover)
PN16 (Metal Primary Gear Cover)

Operating Pressure Ranges:
PN10: 0.5-10 bar
PN16: 0.5-16 bar
For lower pressure requirements, consult factory

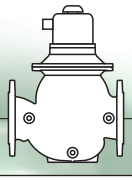
Temperature: Water up to 50°C

Dial Options

Dial Capacity (m^3)	3.8	12	40	80	120	150	200	350	600	800	1,200	2,100	3,500	6,000	8,000	12,000	21,000
Graduation (m^3)	0.1	0.2	1	1	2	2	5	10	10	10	20	50	100	100	100	200	500
DN40-DN80	■	■	■	■	■	■	■	■	■	■	■	■					
DN100-DN250				■	■	■	■	■	■	■	■	■	■	■	■	■	■

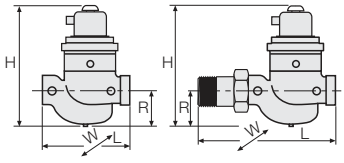
Pulse Options:
For Dials 3.8 through 2,100: 1 Pulse per 1 m^3
For Dials 3,500 through 21,000: 1 Pulse per 10 m^3

Pulse Electrical Data:
Switching Voltage: 48 VAC/DC max.
Switching Current: 0.2A max.
Switching Power: 4W max.



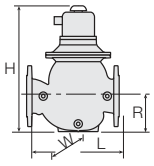
SI Metric

Globe Pattern



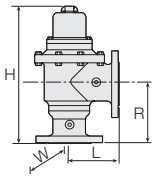
Connection Type	Threaded		
Size	DN40	DN50	DN80R
L (mm)	250	250	250
LM (mm)	67	77	N/A
W (mm)	137	137	137
H (mm)	293	300	300
R (mm)	95	95	79
Weight (kg)	7.2	7.3	7.3

Globe Pattern



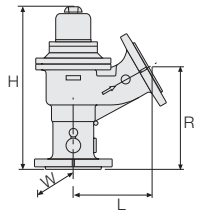
Connection Type	Flanged					
Size	DN80R	DN80	DN100	DN150	DN200	DN250
L (mm)	310	300	350	500	600	600
W (mm)	200	210	250	380	380	405
H (mm)	321	405	470	625	640	640
R (mm)	100	123	137	216	228	228
Weight (kg)	15.8	23	30	70	92	140

90° Angle Pattern



Connection Type	Threaded	Flanged			
Size	DN50-G	DN80-F	DN100	DN150	DN200
L (mm)	120	150	180	250	250
W (mm)	137	210	250	380	380
H (mm)	322	425	500	610	610
R (mm)	125	196	225	306	280
Weight (kg)	7.9	25.5	35.8	76.4	82.2

120° Angle Pattern

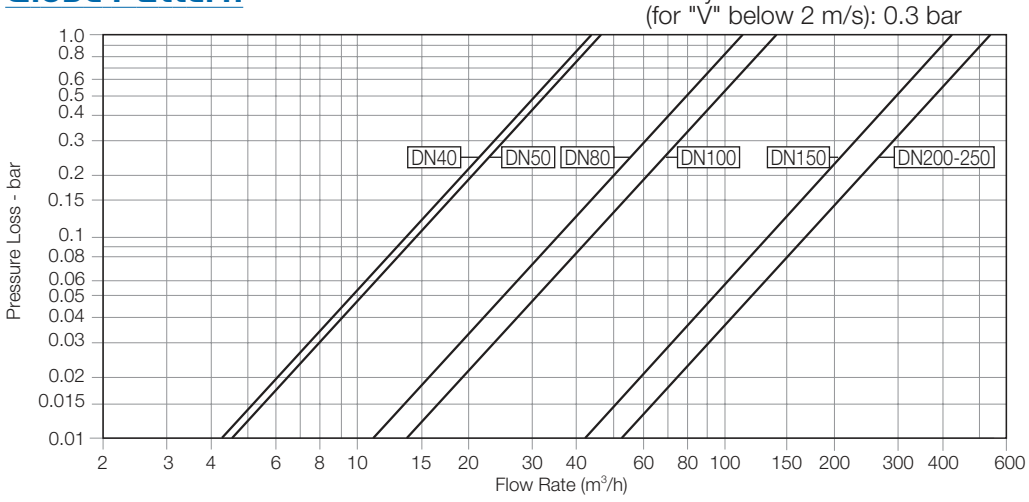


Connection Type	Flanged Inlet / Threaded Outlet		Flanged Inlet and Outlet	
Size	DN65	DN100	DN65	DN100
L (mm)	143	208	143	208
W (mm)	137	217	200	223
H (mm)	432	472	432	472
R (mm)	273	283	273	283
Weight (kg)	10.3	24.5	12.7	27.6

SI Metric

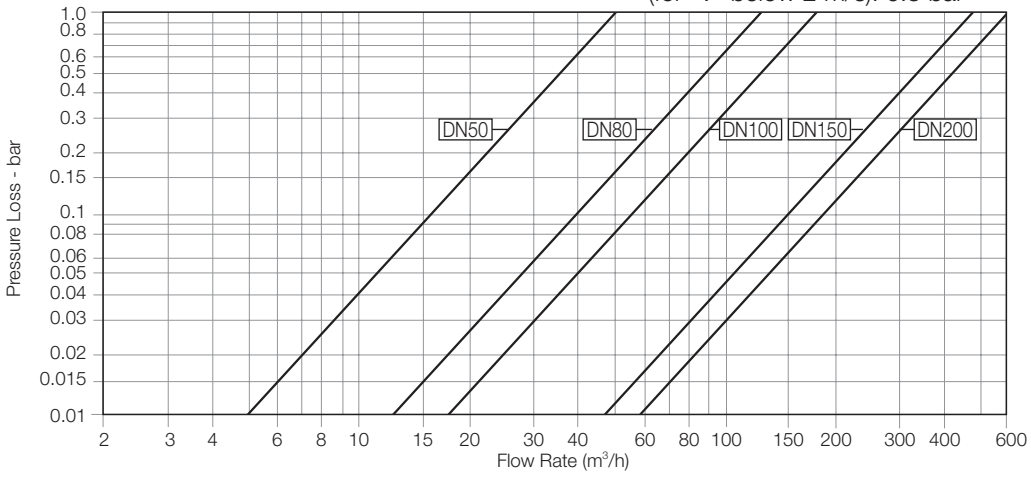
Globe Pattern

2-Way circuit "Added Head Loss"
(for "V" below 2 m/s): 0.3 bar



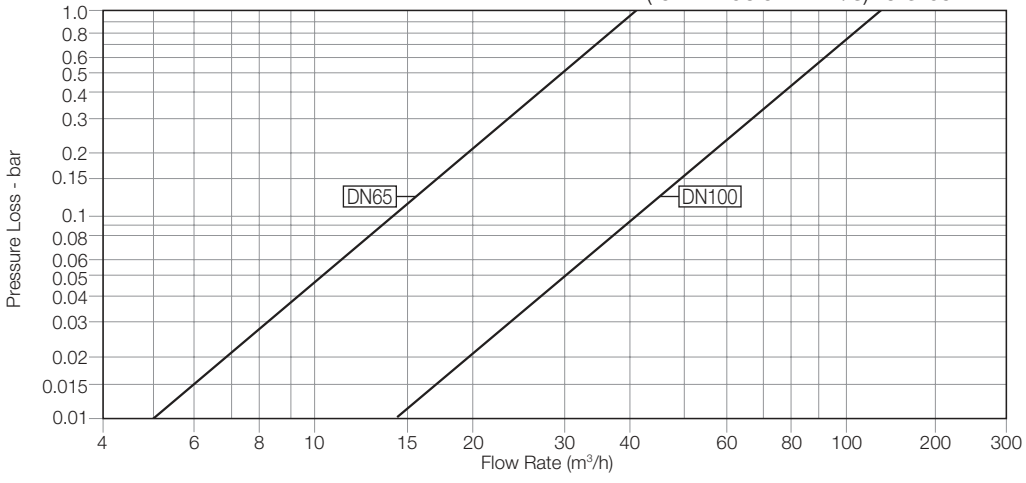
90° Angle Pattern

2-Way circuit "Added Head Loss"
(for "V" below 2 m/s): 0.3 bar

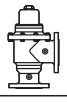


120° Angle Pattern

2-Way circuit "Added Head Loss"
(for "V" below 2 m/s): 0.3 bar



SI Metric

		Size	DN40	DN50	DN65	DN80R	DN80	DN100	DN150	DN200	DN250
Globe Pattern		Kv	41	46	N/A	50	115	147	430	550	550
		K	2.4	4.6	N/A	24.7	4.9	7.3	4.3	8.3	20.2
		Leq - m	4.8	12.9	N/A	109.7	21.6	42.7	42.9	110.5	337.2
90°Angle Pattern		Kv	N/A	51	N/A	N/A	126	180	473	605	N/A
		K	N/A	3.8	N/A	N/A	4.0	4.8	3.5	6.8	N/A
		Leq - m	N/A	10.5	N/A	N/A	18	28.4	35.5	91.3	N/A
120°Angle Pattern		Kv	N/A	N/A	51	N/A	N/A	147	N/A	N/A	N/A
		K	N/A	N/A	3.8	N/A	N/A	7.3	N/A	N/A	N/A
		Leq - m	N/A	N/A	10.5	N/A	N/A	42.7	N/A	N/A	N/A

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

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 (m^3/h ; gpm)
ΔP = Differential pressure (bar ; psi)
Gf = Liquid specific gravity (Water = 1.0)

Kv = 0.865 Cv

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 (m ; feet)
V = Nominal size flow velocity (m/sec ; feet/sec.)
g = Acceleration of gravity (9.81 m/sec^2 ; 32.18 $feet/sec^2$)

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

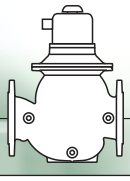
Where:
Leq = Equivalent nominal pipe length (m ; feet)
Lk = Equivalent length coefficient for turbulent flow in clean commercial steel pipe (SCH 40)
D = Nominal pipe diameter (m ; feet)

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

Accuracy Table

Flow Rate (m^3)	Accuracy	DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250
Q1 Minimum Flow (AMV)	±5%	1.5	2	2	3.2	4.8	10	12	12
Qn Nominal Flow	±2%	15	15	25	40	60	150	250	400
Q3 Permanent Flow	±2%	25	40	40	100	160	250	400	400
Q4 Maximum Flow (Short Time)	±2%	31	50	50	125	200	313	500	500
Q3/Q1	-	17	20	20	31	33	25	33	33

BERMAD Irrigation

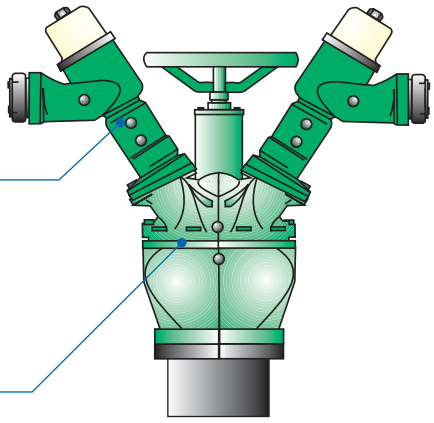


Irrigation Hydrant Valve

900-D Series

SI Metric

The Irrigation Hydrant is a unique valve assembly unit designed for irrigation and water supply distribution for multiple farm units.
The Irrigation Hydrant consists of two main parts: an Irrigation Hydrant Valve and a Automatic Metering Valve(s) Type H mounted on top of the Irrigation Hydrant Valve.



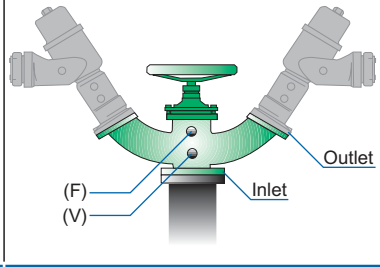
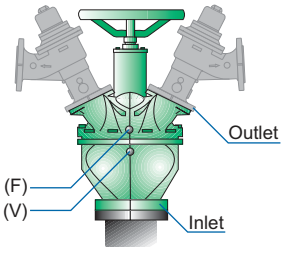
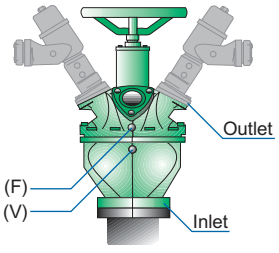
Automatic Metering Valve (AMV) Type H

The AMV Type H is a 120-degree elbow-shaped AMV that integrates both a vertical turbine Woltman-type water meter, with a diaphragm actuated hydraulic control valve. It meets the full range of applications of the BERMAD 900-D Series.
The AMV Type H is available in two sizes: DN: 65 & 100.

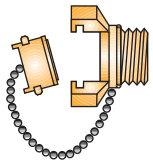
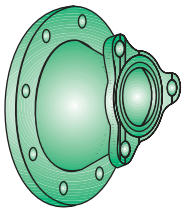
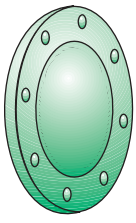
Irrigation Hydrant Valve

The Irrigation Hydrant Valve is available in three inlet sizes: DN: 80, 100 & 150. It is an on/off hand-wheel operated valve with a single flange inlet and one, two, three or four distribution outlets.

The Irrigation Hydrant Valve is available in three Model Types:

			
Description	**Type F-82**	**Type A-102**	**Type A-104**
Inlet Diameter	DN80 (Optional DN100)(1)	DN100(1)	DN100(1)
Outlets	2	2	4
Outlet Diameter	DN65 (Triangle)	DN100(1)	DN65 (Triangle)
Optional Type	F-81 with single outlet	A-152 with DN150 inlet	A-154 with DN150 inlet

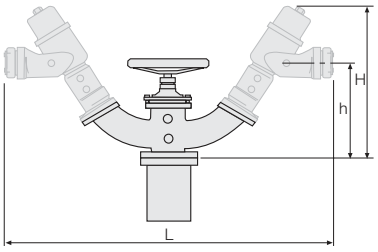
(1) Conforming to major standards
(F) Optional port for Automatic Anti-Freezing Cock Valve
(V) Optional port for Air Venting Cock Valve

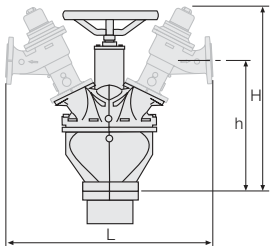
				
Description	**Quick Coupling & Plug (Guillemin Coupling)**	**Flange Adapter**	**Cover (Blind Triangle Flange)**	**Cover (Blind Flange)**
Size	DN65	DN100 X DN65	DN65	DN100
Note	For use on DN65 AMV with threaded outlet	For installing DN65 AMV on A-102 irrigation Hydrant Valve	For blocking unused F-82 and F-104 Irrigation Hydrant Valve outlets	For blocking unused DN100 flange outlets

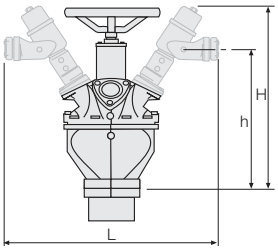
info@bermad.com • www.bermad.com

SI Metric

Dimensions & Weights





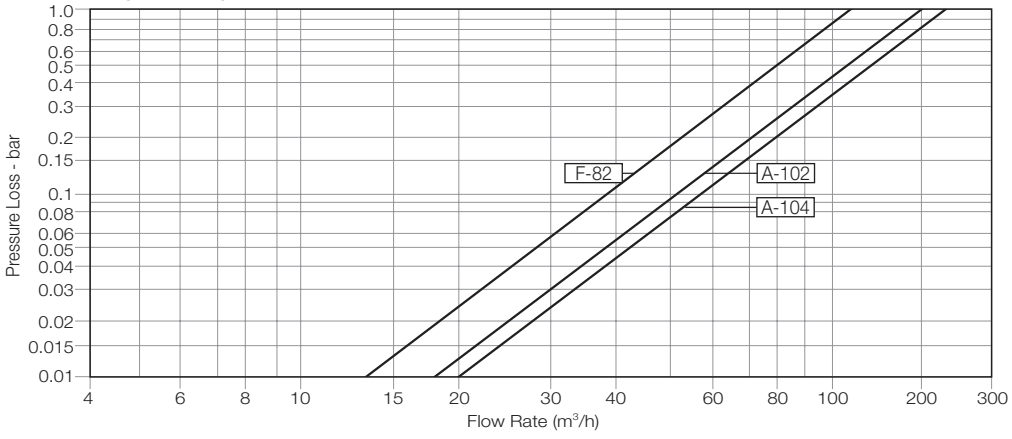


Type	F-82	F-102	F-104
L (mm)	1040	1100	970
H (mm)	600	730	700
h (mm)	360	580	510
Weight (kg)	27.0	65.5	51.5
Weight 1*(kg)	36.0	90.5	76.5
Weight 2*(kg)	45.0	115.5	101.5
Weight 3*(kg)	N/A	N/A	126.5
Weight 4*(kg)	N/A	N/A	151.5

* Number of AMV's installed.

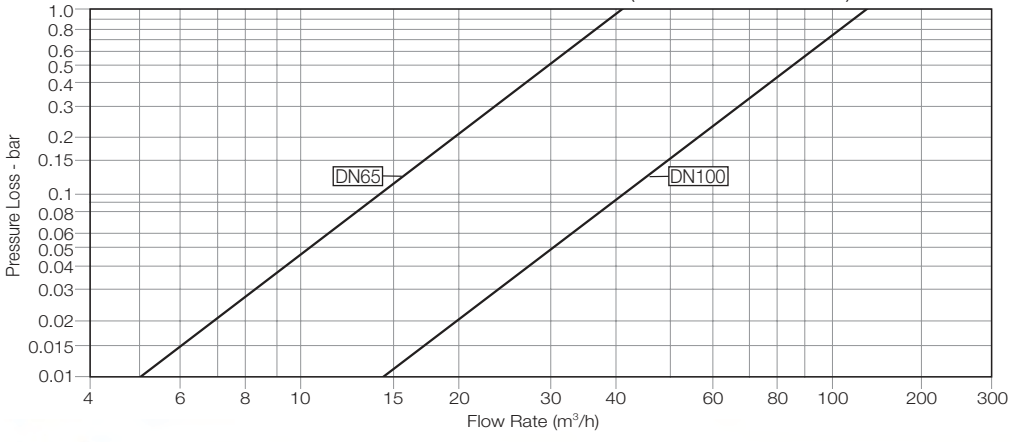
Flow Charts

Irrigation Hydrant Valves



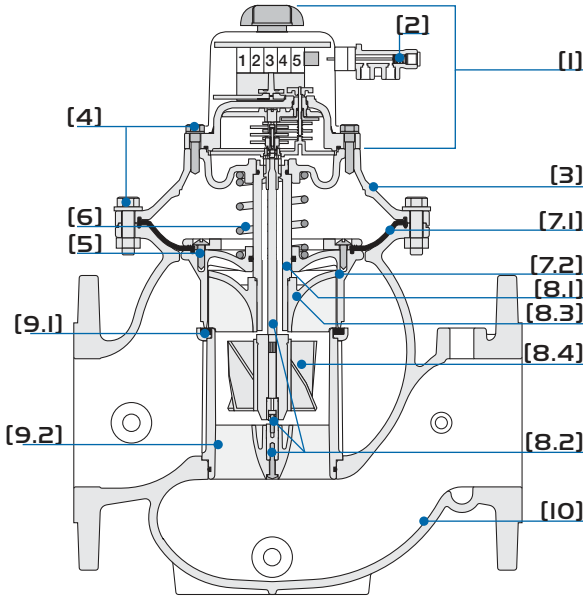
Automatic Metering Valves Type H

2-Way circuit "Added Head Loss" (for "V" below 2 m/s): 0.3 bar



US English

Construction Materials



[1] **Control Head:** Plastic, Stainless Steel and Brass

[2] **Shut-Off Pilot:** Nylon, Stainless Steel & NBR (Buna-N)

[3] **Cover:** Polyester Coated Ductile Iron to ASTM A536

[4] **External Bolts / Nuts:** Zinc-Cobalt Plated Steel

[5] **Internal Bolts, Nuts and Washers:** Stainless Steel 304 and 316

[6] **Spring:** Stainless Steel 302

[7] **Closure Assembly:**

- **[7.1] Diaphragm:** Reinforced Natural Rubber (NR)
- **[7.2] Closure:** Glass Fiber Reinforced Nylon

[8] **Impeller Assembly:**

- **[8.1] Guide:** Stainless Steel 303
- **[8.2] Pivots, Bearings, and Thrust Bearings:** Tungsten Carbide
- **[8.3] Upper Flow Straightener:** Glass Fiber Reinforced Nylon
- **[8.4] Impeller:** Polypropylene

[9] **Impeller Housing Assembly:**

- **[9.1] Seal Seat:** NBR (Buna-N) Vulcanized Brass
- **[9.2] Impeller Housing and Lower Flow Straightener:** Glass Fiber Reinforced Nylon

[10] **Valve Body:** Polyester Coated Ductile Iron to ASTM A-536 or Cast Iron to ASTM A-126 Class B

O-Rings: NBR (Buna-N)

Coating: Electrostatic Powder Polyester Green RAL 6017, 150 mμ

Technical Specifications

Available Patterns, Sizes & End Connections:

Connections\Size	DN40	DN50	DN65	DN80R	DN80	DN100	DN150	DN200	DN250
Threaded	G	G & A		G					
Threaded (Male)	G	G							
Flanged			H*	G	G & A	G, A & H	G & A	G & A	G
Flange Inlet \ Thread Outlet		A	H*	G		H			

G = Globe, A = Angle 90°, H= Hydrant (Angle 120°) * Triangle Flange Inlet

Connections Standard:

Flanged: ANSI B16.41 (Cast Iron)
ANSI B16.42 (Ductile Iron)
Triangle Flange (2 1/2" inlet only)
Threaded: NPT or Rp ISO 7/1 (BSP.P)

Pressure Rating Classes:

150 psi (Plastic Primary Gear Cover)
Cast Iron - #125; Ductil Iron - #150 (Metal Primary Gear Cover)

Operating Pressure Ranges:

150 psi: 7-150 psi
Class #125: 7-150 psi; Class #150: 7-250 psi
For lower pressure requirements, consult factory

Temperature: Water up to 122°F

Dial Options

Dial Capacity (gallon)	13,000	50,000	130,000	210,000	500,000	875,000	1,300,000	2,100,000
Graduation (gallon)	0.1	0.2	1	1	2	2	5	10
1 1/2"-3"	■	■	■	■				
6"-10"		■	■	■	■	■	■	■

Pulse Options:

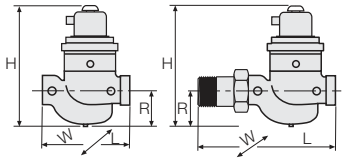
For Dials 13,000 through 210,000: 1 Pulse per 100 gallon
For Dials 500,000 through 2,100,000: 1 Pulse per 1000 gallon

Pulse Electrical Data:

Switching Voltage: 48 VAC/DC max.
Switching Current: 0.2A max.
Switching Power: 4W max.

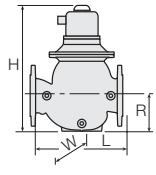
US English

Globe Pattern



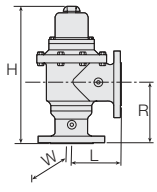
Connection Type	Threaded		
Size	1 1/2"	2"	3"R
L (inch)	9 13/16	9 13/16	9 13/16
LM (inch)	2 5/8	3	N/A
W (inch)	5 3/8	5 3/8	5 3/8
H (inch)	11 9/16	11 13/16	11 13/16
R (inch)	3 3/4	3 3/4	3 1/8
Weight (kg)	15.9	16.1	16.1

Globe Pattern



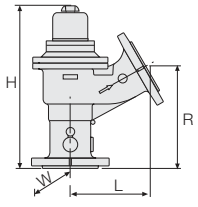
Connection Type	Flanged					
Size	3"R	3"	4"	6"	8"	10"
L (inch)	12 3/16	11 13/16	13 3/4	19 11/16	23 5/8	23 5/8
W (inch)	7 7/8	8 1/4	9 13/16	14 15/16	14 15/16	15 15/16
H (inch)	12 5/8	15 15/16	18 1/2	24 5/8	25 3/16	25 3/16
R (inch)	3 15/16	4 13/16	5 3/8	8 1/2	9	9
Weight (kg)	35.3	50.7	66.1	154.3	202.8	309.1

90° Angle Pattern



Connection Type	Threaded	Flanged			
Size	2"	3"	4"	6"	8"
L (inch)	4 3/4	5 15/16	7 1/16	9 13/16	9 13/16
W (inch)	5 3/8	8 1/4	9 13/16	14 15/16	14 15/16
H (inch)	12 11/16	16 3/4	19 11/16	24	24
R (inch)	4 15/16	7 3/4	8 7/8	12 1/16	11
Weight (kg)	17.4	56.2	78.9	168.4	181.2

120° Angle Pattern

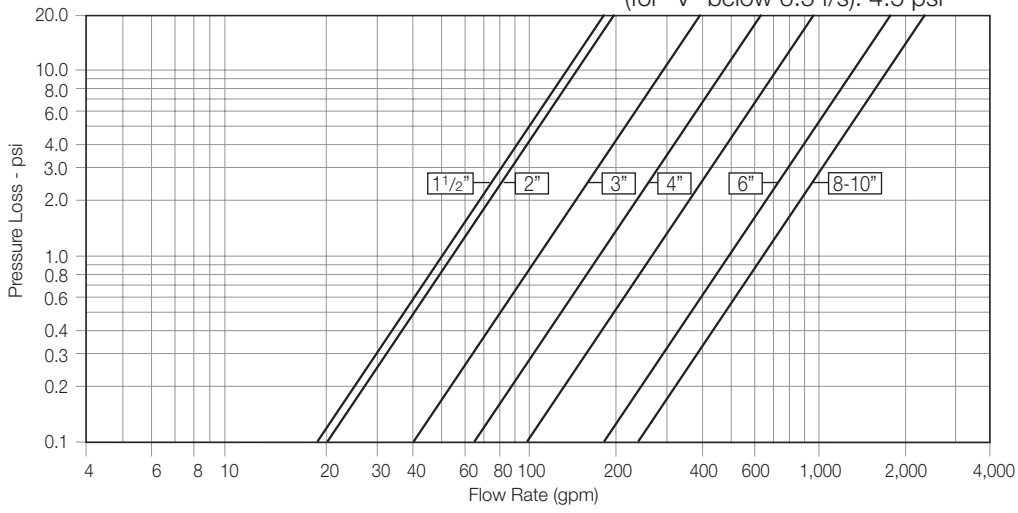


Connection Type	Flanged Inlet / Threaded Outlet		Flanged Inlet and Outlet	
Size	2 1/2"	4"	2 1/2"	4"
L (inch)	5 5/8	8 3/16	5 5/8	8 3/16
W (inch)	5 3/8	8 9/16	7 7/8	8 3/4
H (inch)	17	18 9/16	17	18 9/16
R (inch)	10 3/4	11 1/8	10 3/4	11 1/8
Weight (lb)	22.7	54.0	28.0	60.8

US English

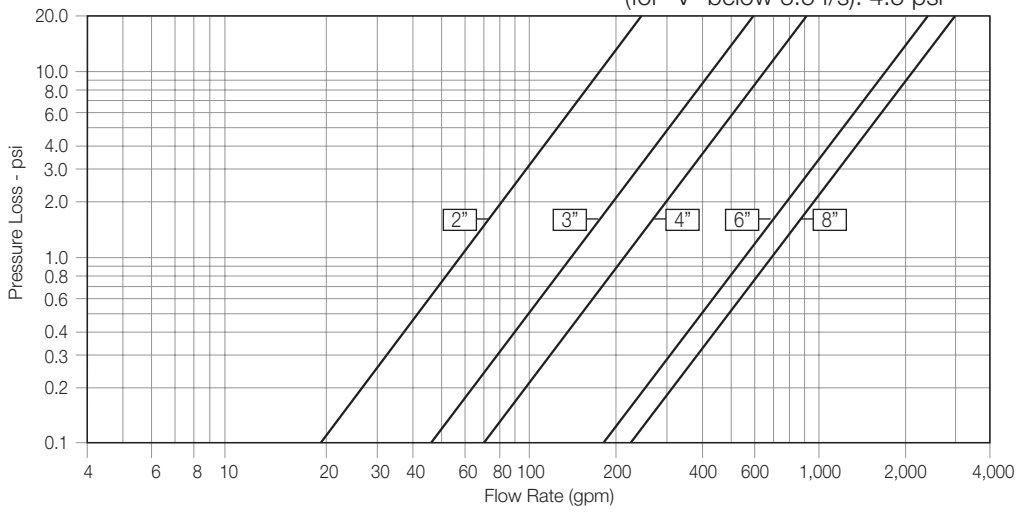
Globe Pattern

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



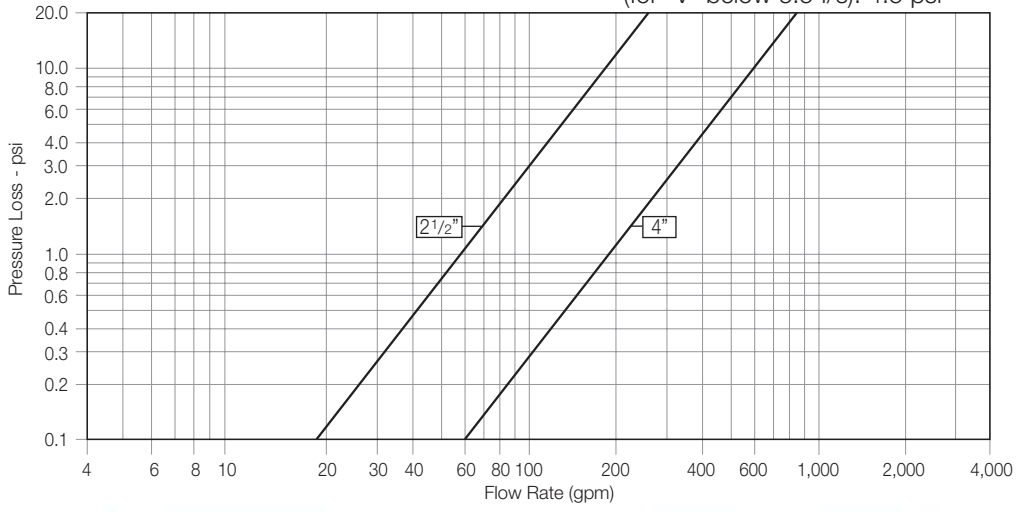
90° Angle Pattern

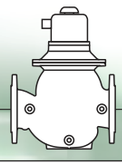
2-Way circuit "Added Head Loss"
(for "V" below 6.5 f/s): 4.5 psi



120° Angle Pattern

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





Flow Properties

900-D Series

US English

		Size	1 1/2"	2"	2 1/2"	3"R	3"	4"	6"	8"	10"
Globe Pattern		Cv	47	53	N/A	58	133	170	497	636	636
		K	2.4	4.6	N/A	24.7	4.9	7.3	4.3	8.3	20.2
		Leq - f	15.7	42.2	N/A	359.8	70.8	139.9	140.8	362.5	1106.4
90°Angle Pattern		Cv	N/A	59	N/A	N/A	146	208	547	699	N/A
		K	N/A	3.8	N/A	N/A	4.0	4.8	3.5	6.8	N/A
		Leq - f	N/A	34.3	N/A	N/A	58.9	93.3	116.3	299.6	N/A
120°Angle Pattern		Cv	N/A	N/A	59	N/A	N/A	170	N/A	N/A	N/A
		K	N/A	N/A	3.8	N/A	N/A	7.3	N/A	N/A	N/A
		Leq - f	N/A	N/A	34.3	N/A	N/A	139.9	N/A	N/A	N/A

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 $Leq = Lk \cdot D$

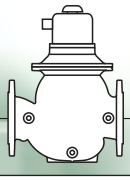
Where:
Leq = Equivalent nominal pipe length (feet ; m)
Lk = Equivalent length coefficient for turbulent flow in clean commercial steel pipe (SCH 40)
D = Nominal pipe diameter (feet ; m)

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

Accuracy Table

	Accuracy	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
Q1 Minimum Flow (AMV)	±5%	6.6	8.8	8.8	14.1	21.1	44	52.8	52.8
Qn Nominal Flow	±2%	66	66	110	176	264	660	1100	1761
Q3 Permanent Flow	±2%	110	176	176	440	704	1100	1761	1761
Q4 Maximum Flow (Short Time)	±2%	136	220	220	550	880	1378	2201	2201
Q3/Q1	-	17	20	20	31	33	25	33	33

BERMAD Irrigation

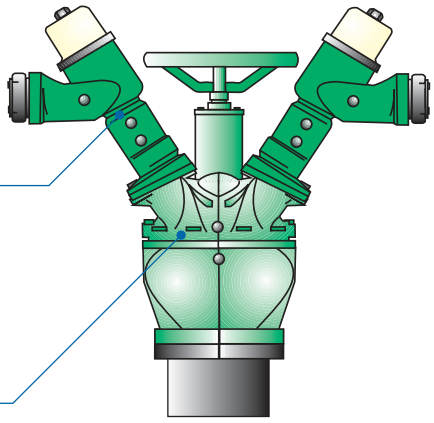


Irrigation Hydrant Valve

900-D Series

US English

The Irrigation Hydrant is a unique valve assembly unit designed for irrigation and water supply distribution for multiple farm units.
The Irrigation Hydrant consists of two main parts: an Irrigation Hydrant Valve and a Automatic Metering Valve(s) Type H mounted on top of the Irrigation Hydrant Valve.



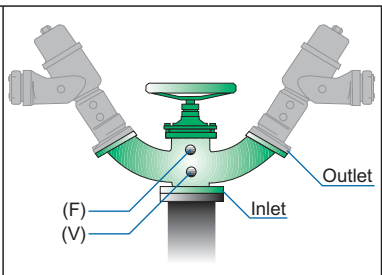
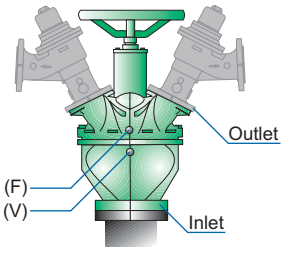
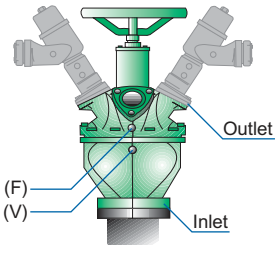
Automatic Metering Valve (AMV) Type H

The AMV Type H is a 120-degree elbow-shaped AMV that integrates both a vertical turbine Woltman-type water meter, with a diaphragm actuated hydraulic control valve. It meets the full range of applications of the BERMAD 900-D Series.
The AMV Type H is available in two sizes: 2 1/2" & 4".

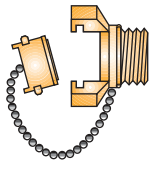
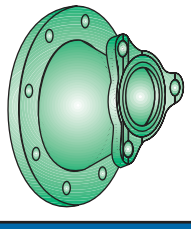
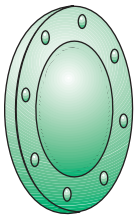
Irrigation Hydrant Valve

The Irrigation Hydrant Valve is available in three inlet sizes: 3", 4" & 6". It is an on/off hand-wheel operated valve with a single flange inlet and one, two, three or four distribution outlets.

The Irrigation Hydrant Valve is available in three Model Types:

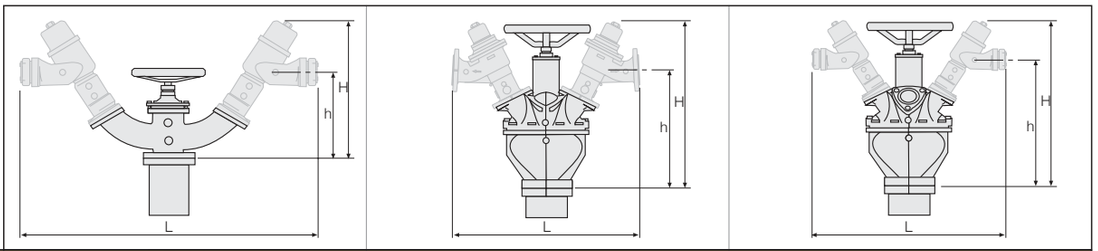
			
Description	**Type F-82**	**Type A-102**	**Type A-104**
Inlet Diameter	3" (Optional 4")(1)	4"(1)	4"(1)
Outlets	2	2	4
Outlet Diameter	2 1/2 " (Triangle)	4"(1)	2 1/2 " (Triangle)
Optional Type	F-81 with single outlet	A-152 with 6" inlet	A-154 with 6" inlet

(1) Conforming to major standards
(F) Optional port for Automatic Anti-Freezing Cock Valve
(V) Optional port for Air Venting Cock Valve

				
Description	**Quick Coupling & Plug (Guillemin Coupling)**	**Flange Adapter**	**Cover (Blind Triangle Flange)**	**Cover (Blind Flange)**
Size	2 1/2"	4" X 2 1/2"	2 1/2"	4"
Note	For use on 2 1/2" Hydrometer with threaded outlet	For installing 2 1/2" AMV on A-102 irrigation Hydrant Valve	For blocking unused F-82 and F-104 Irrigation Hydrant Valve outlets	For blocking unused 4" flange outlets

US English

Dimensions & Weights

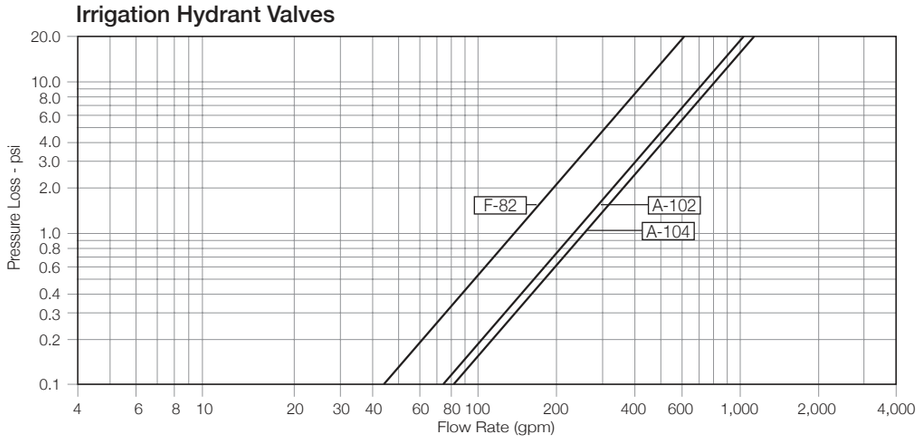


Type	F-82	F-102	F-104
L (inch)	$40^{15}/_{16}$	$43^{5}/_{16}$	$38^{3}/_{16}$
H (inch)	$23^{5}/_{8}$	$28^{3}/_{4}$	$27^{9}/_{16}$
h (inch)	$14^{3}/_{16}$	$22^{13}/_{16}$	$20^{1}/_{16}$
Weight (lb)	59.6	144.4	113.6
Weight 1* (lb)	79.4	199.5	168.7
Weight 2* (lb)	99.2	254.6	223.8
Weight 3* (lb)	N/A	N/A	278.9
Weight 4* (lb)	N/A	N/A	334.0

* Number of AMV's installed.

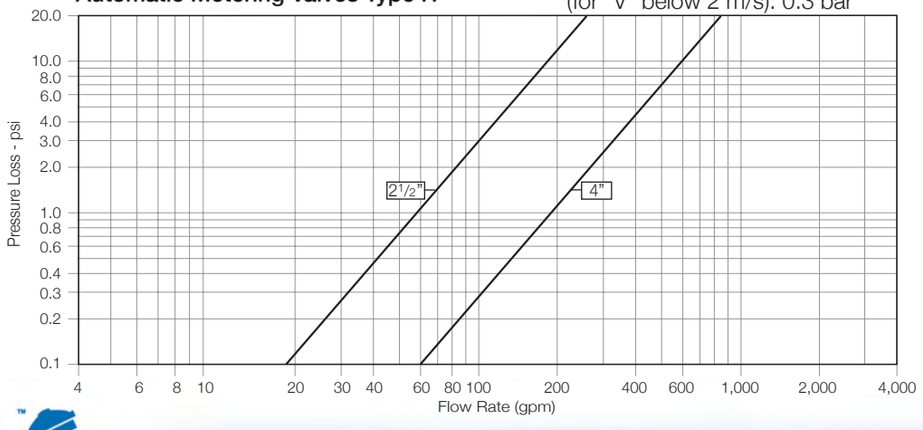
Flow Charts

Irrigation Hydrant Valves



Automatic Metering Valves Type H

2-Way circuit "Added Head Loss"
(for "V" below 2 m/s): 0.3 bar



Rev. 1 October 2015