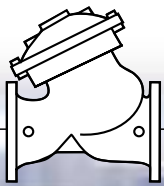




BERMAD

700 Series

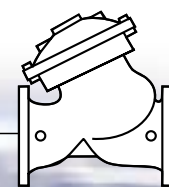
Hydraulic Control Valves Engineering Data



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700 Series - Engineering Data

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BERMAD 700 SERIES HYDRAULIC CONTROL VALVES

Overview

The 700 Series is the BERMAD flagship product line, especially for Waterworks applications.

This Engineering Guide will assist in the selection of the most appropriate BERMAD valves by presenting and organizing the necessary technical data into easy-to-read formats.

Basic Design Features

The basic body design (globe or angle) results in lower pressure loss, reduced weight, and higher resistance to cavitation damage compared to that of a conventional globe control valve.

Valves are available in sizes 1½ to 32 inch (40-800 mm), threaded or flanged, with pressure ratings up to ISO PN 25; ANSI Class 300 psi. The valves are hydraulically operated by means of diaphragm actuators, (except for high-pressure application piston actuators). Principally, the valves are constructed of ductile iron, cast iron or steel (other alloys are available) and are available with various protective coatings.

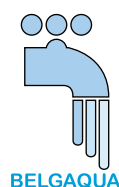
The double-chambered actuator provides a versatility not found in conventional control valves and achieves smooth drip-tight closing, accurate regulation and positive on/off control. The associated control trim provides all the necessary coordinated and complementary accessories for optimum valve operation. This actuator resists wear and tear from movement, prevents leakage due to dirt, is not sensitive to sediments, and has no need for lubrication. The life expectancy of its Nylon-reinforced diaphragm is virtually endless.

The standard flat sealing disk assembly includes a seal of NBR (Buna-N). Many special sealing materials are also available. The flat disc can be replaced by a throttling plug for applications with low flows and high pressure drops.

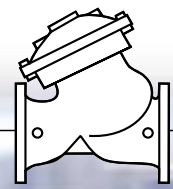
Optionally, the valve can be fitted with several accessories such as a valve position indicator, a mechanical closure and flow adjuster (for manual operation), limit switch assemblies (for position remote monitoring), and a lift spring assembly.

Standards

BERMAD is certified according to the ISO 9001 Quality Assurance Standard and each valve is certified as complying with NSF, WRAS, and other recognized international standards.



BERMAD 700 Series Catalog



Product Features

700 Series

[1] - **Double Chambered Actuator**

The entire actuator assembly (seal disk to top cover) can be easily removed from the valve body as one complete unit, providing ease of inspection and maintenance.

[2] - **Cover Plug**

Enables on-site retrofit of:

Indicator: For visual valve opening indication

Limit-switch: For signaling valve position to control system

Valve Position Transmitter: For analog transmission of valve position to control system

[3] - **Diaphragm Assembly**

The unshaped, nylon reinforced, diaphragm is supported by the cover and separation partition on its circumference while the diaphragm washers provide full support over the majority of the surface. It is centrally guided. Diaphragm load is limited to only stretching forces applied to the active area.

[4] - **Inherent Separation Partition**

The built-in separation partition includes the bearing which provides complete central guiding for the valve moving assembly. In the double chambered configuration, it isolates the lower control chamber from the flow. In the single chambered configuration, it separates the lower control chamber from the flow so that the diaphragm is protected and free from flow stresses.

[5] - **Spring**

Optional for single-chambered configurations or when the check feature is required.

Superfluous for double-chambered configurations.

[6] - **Seal Disc Assembly**

Self-aligning, seal disc assembly provides balanced, free movement and a resilient seal for perfect, drip-tight sealing. It enables using several variations of seals and plugs for a wide range of applications and working conditions.

[7] - **Seat**

Stainless steel, raised, replaceable in-line and on-site.

[8] - **Wide Body ("Y" or Angle pattern)**

Hydrodynamically designed for efficient flow with minimal pressure loss and excellent resistance to cavitation.

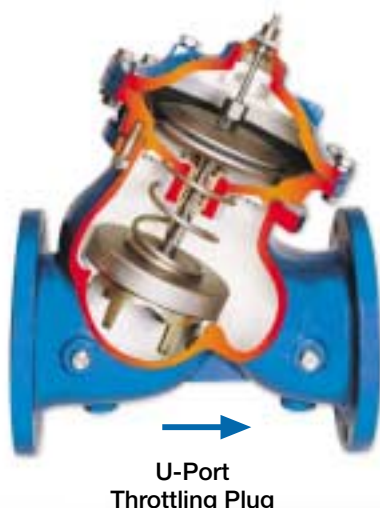
Full bore, valve port area clear of obstructions, no ribs or stem guides.

Increases capacity by 25% over ordinary globe valves. Also Angle pattern valve is available.

[9] - **End Connections**

Conforms to pressure ratings and standards of: ISO, ANSI, JIS, BS, and others.

Valve Plug Options



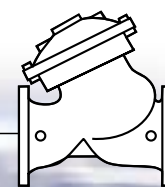
Flat disc:

"Quick opening plug": Standard plug provides high flow and quick response.

Throttling plugs:

A throttling plug is used in order to provide more accurate, stable and smooth response for pressure and flow regulation while reducing noise and vibration. Two types are available:

"U" contour (standard) and "V" contour.



[1]

[2]

[3]

[4]

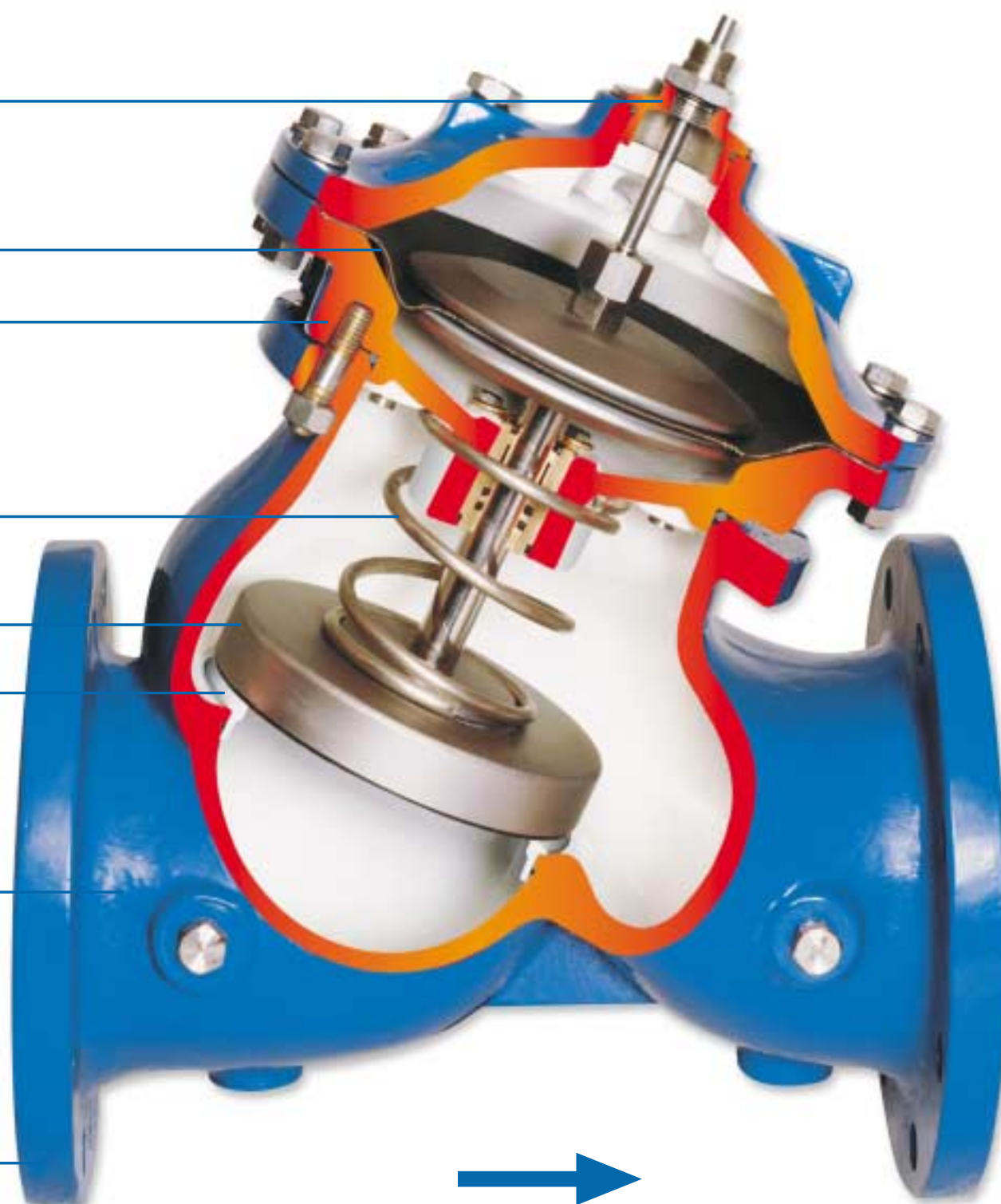
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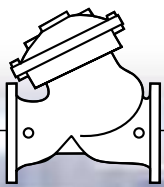
[6]

[7]

[8]

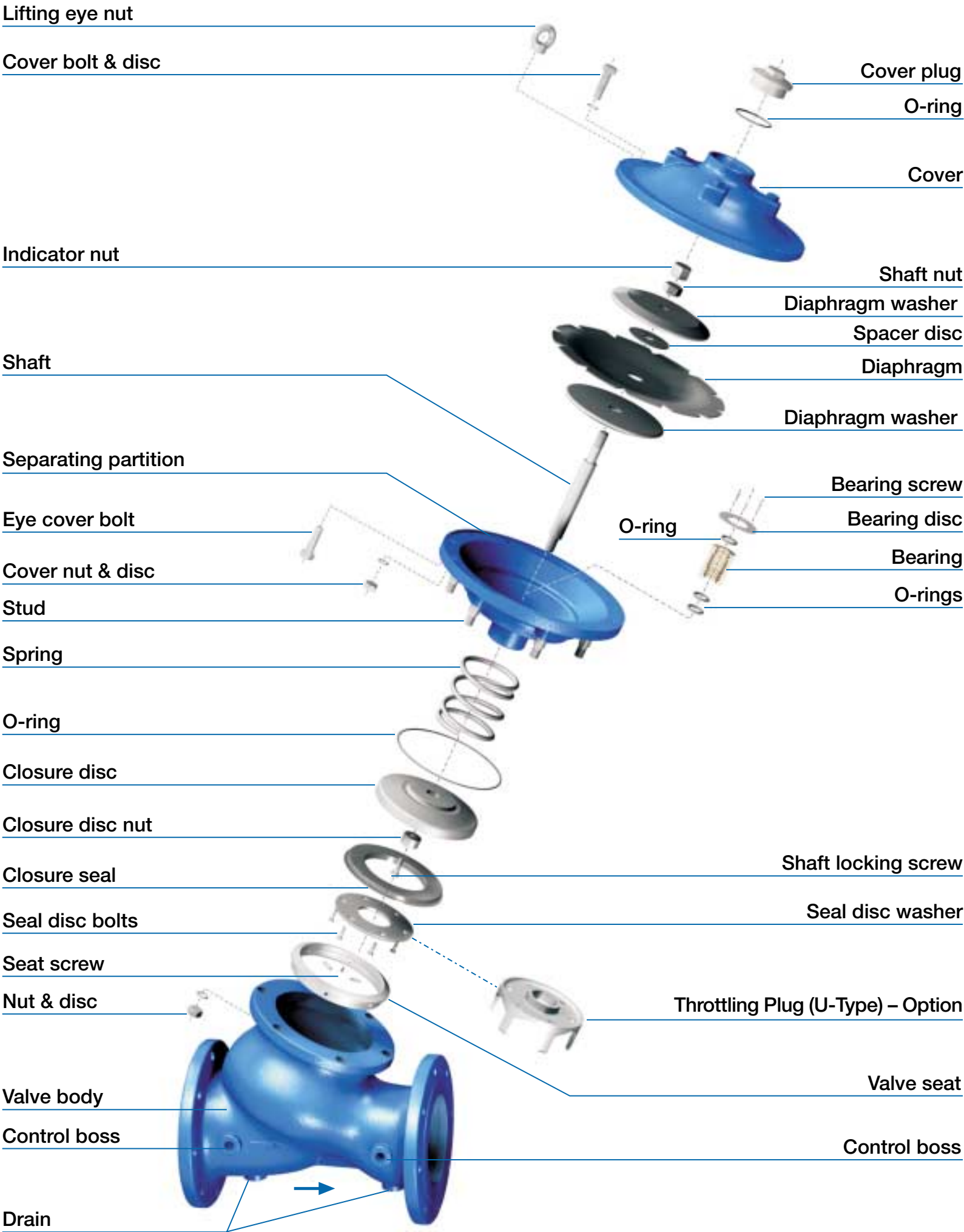
[9]



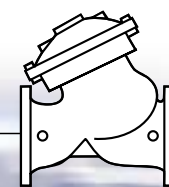


Valve - Exploded View

700 Series



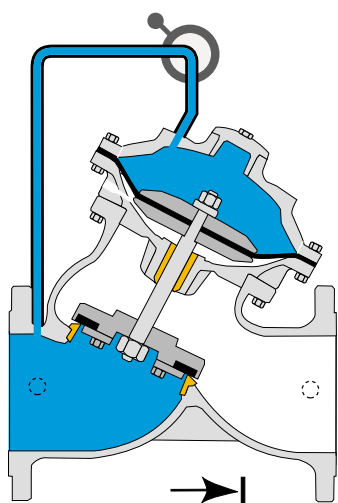
For spare parts ordering, Please use BERMAD "Spare Parts Ordering Guide"



Principles of Operation

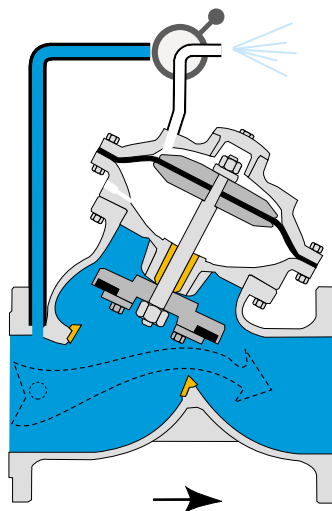
700 Series

On-Off Modes



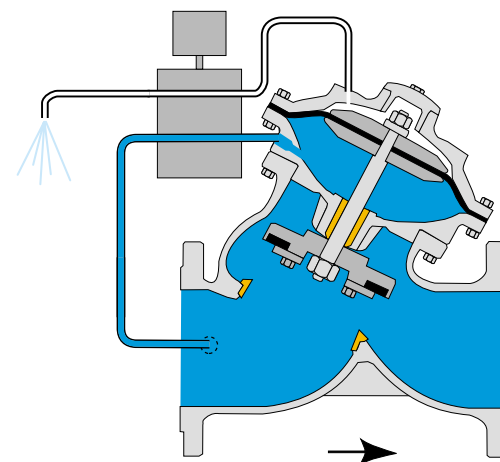
Closed Position

Line pressure applied to the upper control chamber of the valve creates a superior force that moves the valve to the closed position and provides drip tight sealing.



Open Position

Discharging the pressure in the upper control chamber to atmosphere or some other lower pressure zone causes the line pressure acting on the seal disc to move the valve to the open position.

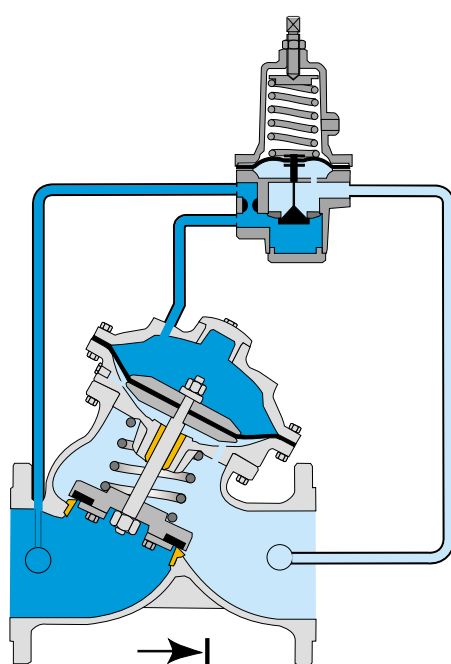


Powered Open Position

Pressure in the upper control chamber is discharged and line pressure is applied to both the lower control chamber and the seal disc. This creates a force that powers the valve to the open position.

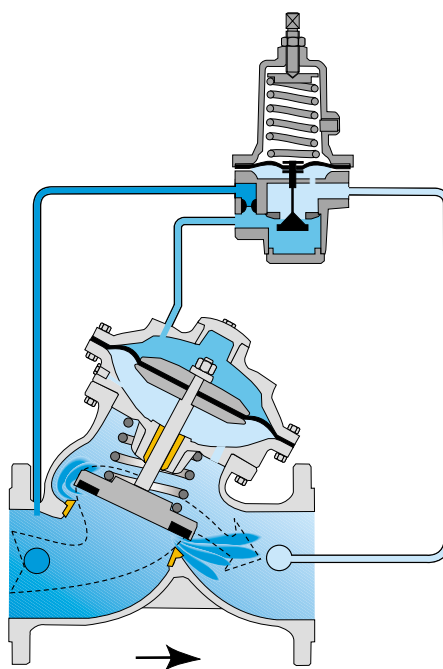
Modulating Mode

Pressure Reducing Models



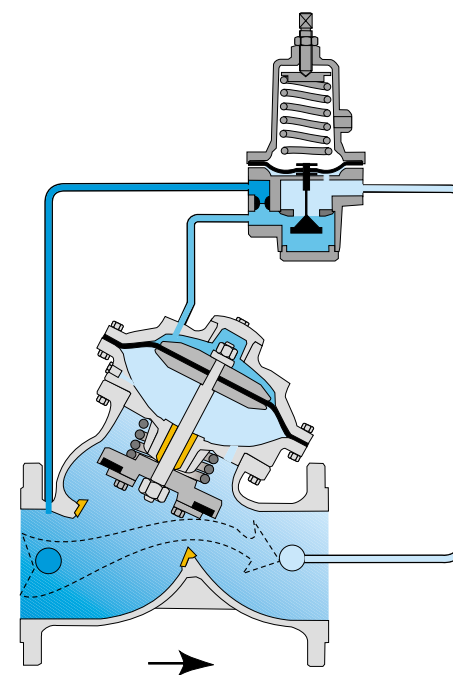
Closed Position

The closed adjustable pilot valve traps line pressure in the upper control chamber and the resulting force moves the valve to the fully closed position.



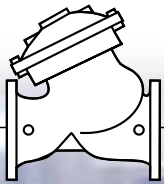
Modulating Position

The pilot valve senses and reacts to line pressure changes and opens or closes accordingly. The pilot valve controls the pressure in the upper control chamber of the valve causing the valve to modulate to an intermediate position between fully open and closed.



Modulating Open Position

The open pilot valve releases line pressure from the upper control chamber and the line pressure acting on the seal disc moves the valve to the open position.



Technical Specifications

700 Series

SI Metric

Connection Standard

- Flanged: ISO 700S-1 (Ductile iron),
- Threaded: NPT or BSP 40, 50, 65 & 80 mm

Water Temperature

- Up to 80°C

Available Sizes ("Y" & Angle)

- 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 750 and 800 mm

Working pressure

- ISO PN 16: 16 bar
- ISO PN 25: 25 bar

Standard Materials

- Main valve body and cover
 - Ductile iron EN 1563
- Main valve internals
 - Stainless steel, bronze and coated steel
- Control Trim
 - Brass Components/Accessories
 - Forged brass fittings & copper tubing
- Elastomers
 - NBR (Buna-N)
 - EPDM
 - Viton
- Coating
 - Fusion Bonded Epoxy, RAL 5005 (Blue)
 - NSF 61 and WRAS approved
 - or Electrostatic Polyester Powder, RAL 6017 (Green)

Optional Materials

- Main valve body/internals
 - Cast Carbon steel ASTM A-216-WCB
 - Cast Stainless steel 316 CF8M (316)
 - Aluminum
 - Ni.Al. bronze
 - Titanium
 - Alloy 20
 - Duplex
 - Hastalloy
 - Marine Bronze
 - SMO
- Control Trim
 - Stainless steel 316
 - Hastalloy C-276

US English

Connection Standard

- Flanged: ANSI B16.42 (Ductile iron),
- Threaded: NPT or BSP 1½, 2, 2½ & 3 inch

Water Temperature

- Up to 180°F

Available Sizes ("Y" & Angle)

- 1½, 2, 2½, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 30 and 32 inch

Working pressure

- Class #150: 250 psi
- Class #300: 400 psi

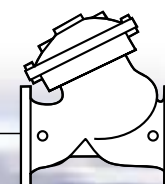
Manufacturers Standard Materials

- Main valve body and cover
 - Ductile iron ASTM A-536
- Main valve internals
 - Stainless steel, bronze and coated steel
- Control Trim
 - Brass Components/Accessories
 - Forged brass fittings & copper tubing
- Elastomers
 - NBR (Buna-N)
 - EPDM
 - Viton
- Coating
 - Fusion Bonded Epoxy, RAL 5005 (Blue)
 - NSF 61 and WRAS approved
 - or Electrostatic Polyester Powder, RAL 6017 (Green)

Optional Materials

- Main valve body/internals
 - Cast Carbon steel ASTM A-216-WCB
 - Cast Stainless steel CF8M (316)
 - Aluminum
 - Ni.Al. bronze
 - Titanium
 - Alloy 20
 - Duplex
 - Hastalloy
 - Marine Bronze
 - SMO
- Control Trim
 - Stainless steel 316
 - Hastalloy C-276





Pressure Rating

700 Series

Standard Operation Pressure – Materials Data

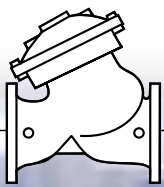
End Connections Standards / Pressure Ratings / Materials / Max. Operating Pressure

Bermad Code	End Connections Standard	Pressure Class	Cast Iron ASTM A-126 B	Bronze ASTM B 62	Ductile Iron ASTM A-536	Carbon Steel ASTM A-216 WCB	Stainless Steel ASTM A-531 CF 8M
10	ISO	PN 10	10 bar	+	+	+	+
16	ISO	PN 16	16 bar	16 bar	+	+	+
25	ISO	PN 25	–	25 bar	25 bar	25 bar	25 bar
A1	ANSI	# 125	175 psi	+	+	+	+
A2	ANSI	# 250	300 psi	+	+	+	+
A5	ANSI	# 150	–	225 psi	250 psi	285 psi	285 psi
A3	ANSI	# 300	–	400 psi	400 psi	400 psi	400 psi
BD	BS 10	Table D	100 psi	+	+	+	+
BS	BS 10	Table H	300 psi	400 psi	400 psi	400 psi	400 psi
J1	JIS	10 K	14 bar	+	+	+	+
J6	JIS	16 K	22 bar	27 bar	27 bar	27 bar	27 bar
J2	JIS	25 K	–	28 bar	28 bar	28 bar	28 bar
B1	ABNT	10	10 bar	+	+	+	+
B6	ABNT	16	16 bar	16 bar	+	+	+
B2	ABNT	25	–	25 bar	25 bar	25 bar	25 bar
	Threads						
BP	BSP		16 bar				
PH	BSP			25 bar	25 bar	25 bar	25 bar
NP	NPT		230 psi				
NH	NPT			400 psi	400 psi	400 psi	400 psi

+ Available, Not required by the standard pressure class
– Not available

Control Chamber Displacement Volume

Sizes	mm	40	50	60	80	100	150	200	250	300	350	400	450	500	600-800
	inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"-32"
Volume	Liter	0.125	0.125	0.125	0.3	0.45	2.15	4.5	8.5	12.4	12.4	29.8	29.8	29.9	98
	Gallon	0.03	0.03	0.03	0.03	0.12	0.57	1.19	2.25	3.28	3.28	7.88	7.88	7.88	25.9

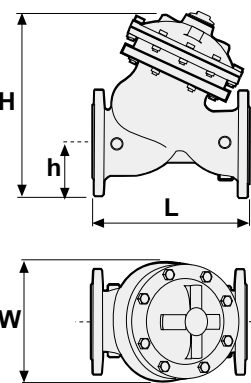


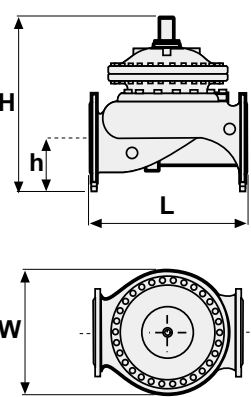
Dimensions & Weights

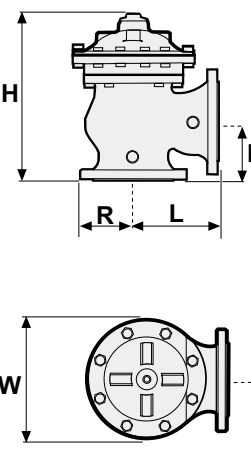
700 Series

SI Metric

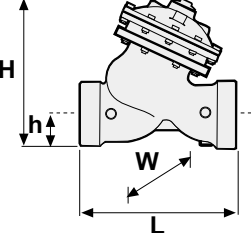
Flanged

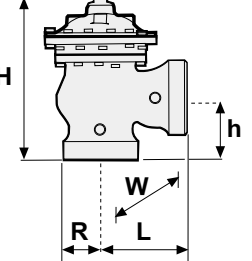
Y Pattern		mm	40	50	65	80	100	150	200	250	300	350	400	450	500
	ISO PN 10; 16	L	205	210	222	250	320	415	500	605	725	733	990	1000	1100
		W	155	165	178	200	223	320	390	480	550	550	740	740	740
		h	78	83	95	100	115	143	172	204	242	268	300	319	358
		H	239	244	257	305	366	492	584	724	840	866	1108	1127	1167
		Weight (Kg)	9.1	10.6	13	22	37	75	125	217	370	381	846	945	962
	ISO PN 20; 25	L	205	210	222	264	335	433	524	637	762	767	1024	1030	1136
		W	155	165	185	207	250	320	390	480	550	570	740	740	750
		h	78	83	95	105	127	159	191	223	261	295	325	357	389
		H	239	244	257	314	378	508	602	742	859	893	1133	1165	1197
		Weight (Kg)	10	12.2	15	25	43	85	146	245	410	434	900	967	986

G Pattern		mm	600	700	750	800
	ISO PN 10; 16	L	1450	1650	1750	1850
		W	1250	1250	1250	1250
		h	470	490	520	553
		H	1965	1985	2015	2048
		Weight (Kg)	3250	3700	3900	4100
	ISO PN 20; 25	L	1500	1650	1750	1850
		W	1250	1250	1250	1250
		h	470	490	520	553
		H	1965	1985	2015	2048
		Weight (Kg)	3500	3700	3900	4100

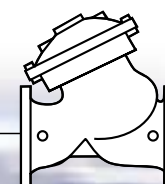
Angle Pattern		mm	40	50	65	80	100	150	200	250	300	350	400	450
	ISO PN 10; 16	L	124	124	149	152	190	225	265	320	396	400	450	450
		W	155	155	178	200	222	320	390	480	550	550	740	740
		R	78	83	95	100	115	143	172	204	248	264	299	320
		h	85	85	109	102	127	152	203	219	273	279	369	370
		H	227	227	251	281	342	441	545	633	777	781	1082	1082
		Weight (Kg)	9.5	10	20	21.5	35	71	118	205	350	370	800	820
	ISO PN 20; 25	L	124	124	149	159	200	234	277	336	415	419	467	467
		W	165	165	185	207	250	320	390	480	550	550	740	740
		R	78	85	95	105	127	159	191	223	261	293	325	358
		h	85	85	109	109	135	165	216	236	294	299	386	386
		H	227	227	251	287	350	454	558	649	796	801	1099	1099
		Weight (Kg)	11	11.5	13.5	23	41	81	138	233	390	245	855	870

Threaded

Y Pattern		mm	40	50	65	80
	BSP; NPT	L	155	155	212	250
		W	122	122	122	163
		h	40	40	48	56
		H	201	202	209	264
		Weight (Kg)	5.5	5.5	8	17

Angle Pattern		mm	50	65	80
	BSP; NPT	L	121	140	159
		W	122	122	163
		R	40	48	55
		h	83	102	115
		H	225	242	294
		Weight (Kg)	5.5	7	15





Dimensions & Weights

700 Series

US English

Flanged

Y Pattern		inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
	ANSI 125 ; 150	L	8.1	8.1	8.3	9.8	12.6	16.3	19.7	23.8	28.5	28.9	39.0	39.4	43.3
		W	6.1	6.1	7.0	7.9	8.8	12.6	15.4	18.9	21.7	21.7	29.1	29.1	29.1
		h	3.1	3.3	3.7	3.9	4.5	5.6	6.8	8.0	9.5	10.6	11.8	12.6	14.1
		H	9.4	9.6	10.1	12.0	14.4	19.4	23.0	28.5	33.1	34.1	43.6	44.4	45.9
		Weight (lb)	20	23	29	49	82	165	276	478	816	840	1865	2083	2121
	ANSI 250 ; 300	L	8.1	8.3	8.7	10.4	13.2	17.0	20.6	25.1	30.0	30.2	40.3	227.1	44.7
		W	6.1	6.5	7.3	8.1	9.8	12.6	15.4	18.9	21.7	22.4	29.1	29.1	29.5
		h	3.1	3.3	3.7	4.1	5.0	6.3	7.5	8.8	10.3	11.6	12.8	14.1	15.3
		H	9.4	9.6	10.1	12.4	14.9	20.0	23.7	29.2	33.8	35.2	44.6	45.9	47.1
		Weight (lb)	22	27	33	55	95	187	322	540	904	957	1984	2132	2174

G Pattern		inch	24"	28"	30"	32"
	ANSI 125 ; 150	L	57	65	70	73
		W	49	49	49	49
		h	18.5	19	20.5	21.8
		H	77	78	79.3	80.6
		Weight (lb)	7150	8140	8580	9020
	ANSI 250 ; 300	L	59	65	70	73
		W	49	49	49	49
		h	18.5	19	20.5	21.8
		H	77	78	79.3	80.6
		Weight (lb)	7700	8140	8580	9020

Angle Pattern		inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"
	ANSI 125 ; 150	L	4.9	4.9	5.9	6.0	7.5	8.9	10.4	12.6	15.6	15.7	17.7	17.7
		W	6.1	6.1	7.0	7.9	8.7	12.6	15.4	18.9	21.7	21.7	29.1	29.1
		R	3.1	3.3	3.7	3.9	4.5	5.6	6.8	8.0	9.8	10.4	11.8	12.6
		h	3.3	3.3	4.3	4.0	5.0	6.0	8.0	8.6	10.7	11.0	14.5	14.5
		H	8.9	8.9	9.9	11.1	13.5	17.4	21.5	24.9	30.6	30.7	42.6	42.6
		Weight (lb)	21	22	44	47	77	157	260	452	772	816	1764	1808
		Weight (lb)	21	22	44	47	77	157	260	452	772	816	1764	1808
	ANSI 250 ; 300	L	4.9	4.9	5.9	6.3	7.9	9.2	10.9	13.2	16.3	16.5	18.4	18.4
		W	6.5	6.5	7.3	8.1	9.8	12.6	15.4	18.9	21.7	21.7	29.1	29.1
		R	3.1	3.3	3.7	4.1	5.0	6.3	7.5	8.8	10.3	11.5	12.8	14
		h	3.3	3.3	4.3	4.3	5.3	6.5	8.5	9.3	11.6	11.8	15.2	15.2
		H	8.9	8.9	9.9	11.3	13.8	17.9	22.0	25.6	31.3	31.5	43.3	43.3
		Weight (lb)	24	25	30	51	90	179	304	514	860	540	1885	1918
		Weight (lb)	24	25	30	51	90	179	304	514	860	540	1885	1918

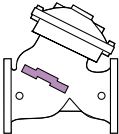
Threaded

Y Pattern		inch	1½"	2"	2½"	3"
	BSP ; NPT	L	6.1	6.1	8.3	9.8
		W	4.8	4.8	4.8	6.4
		h	1.6	1.6	8.2	2.2
		H	7.9	8.0	8.2	10.4
		Weight (lb)	12	12	18	37

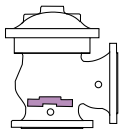
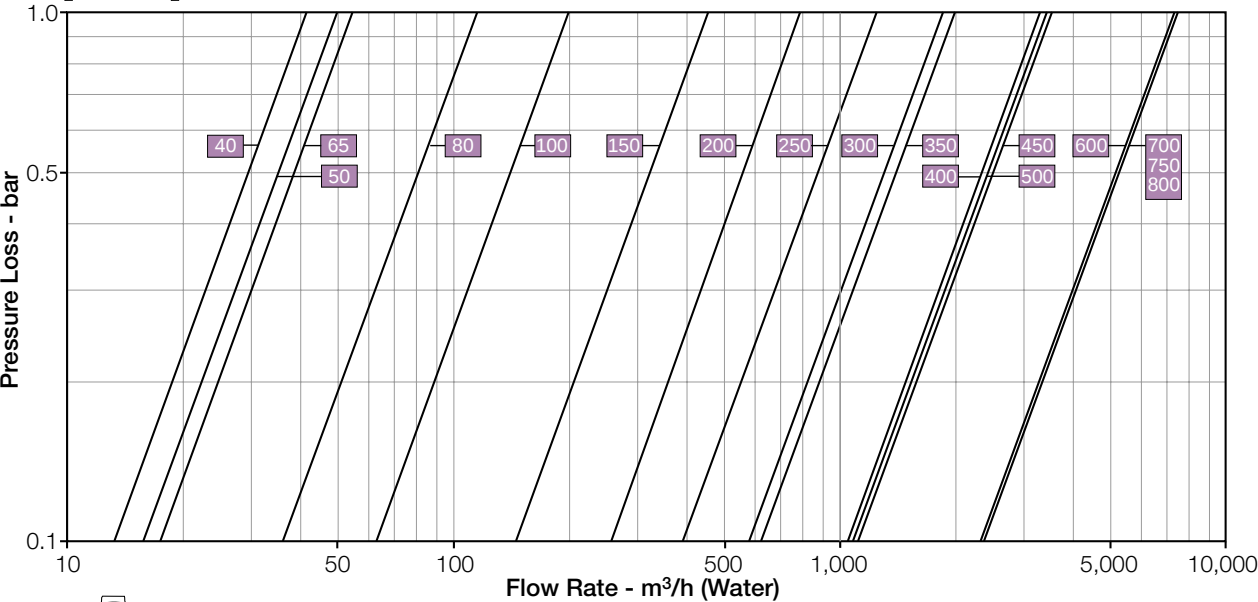
Angle Pattern		inch	2"	2½"	3"
	BSP ; NPT	L	4.8	5.5	6.3
		W	4.8	4.8	6.4
		R	1.6	1.9	2.2
		h	3.3	4.0	4.5
		H	8.9	9.5	11.6
		Weight (lb)	12	15	33



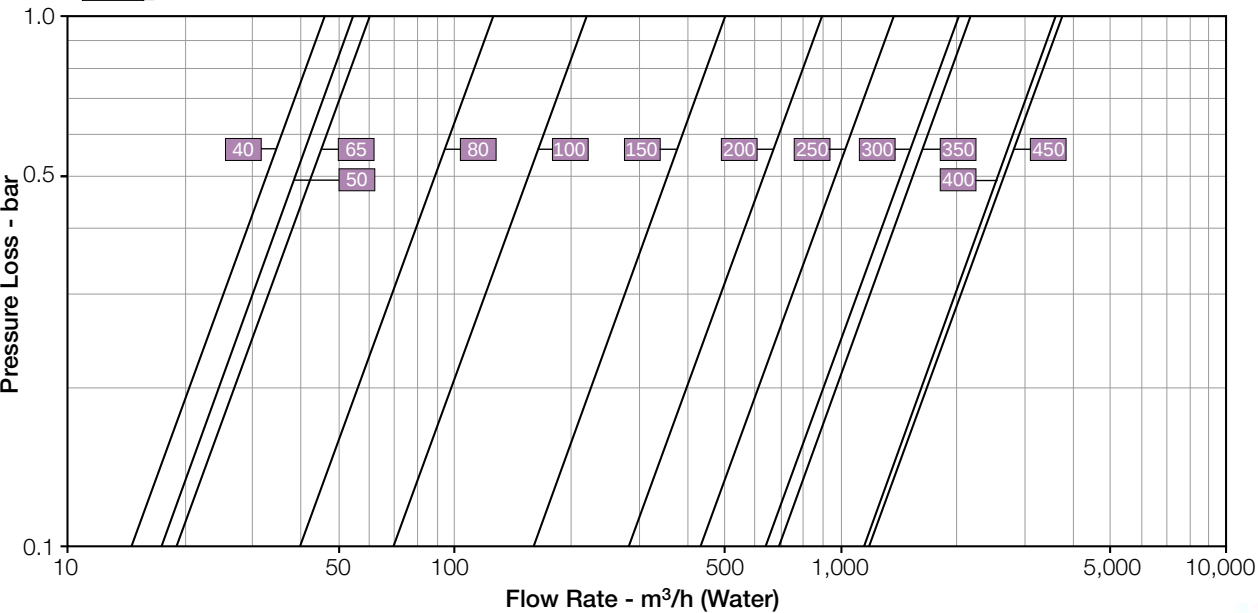
SI Metric



Y Pattern, Flat Disc

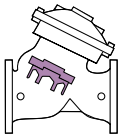


Angle Pattern, Flat Disc

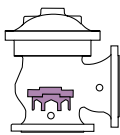
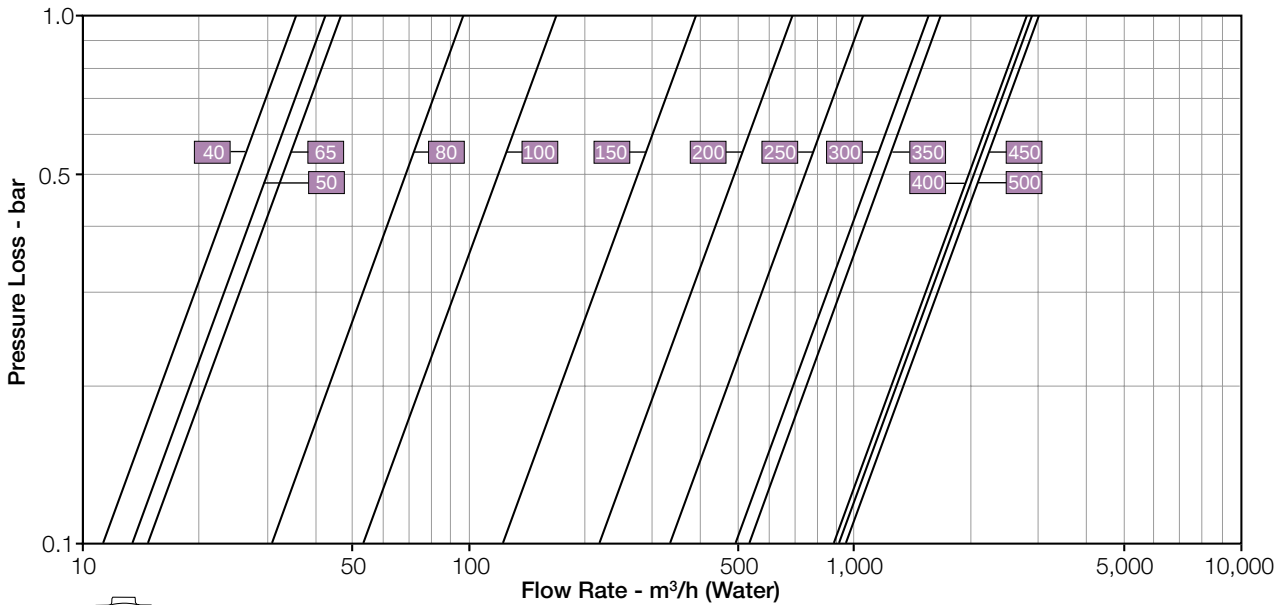




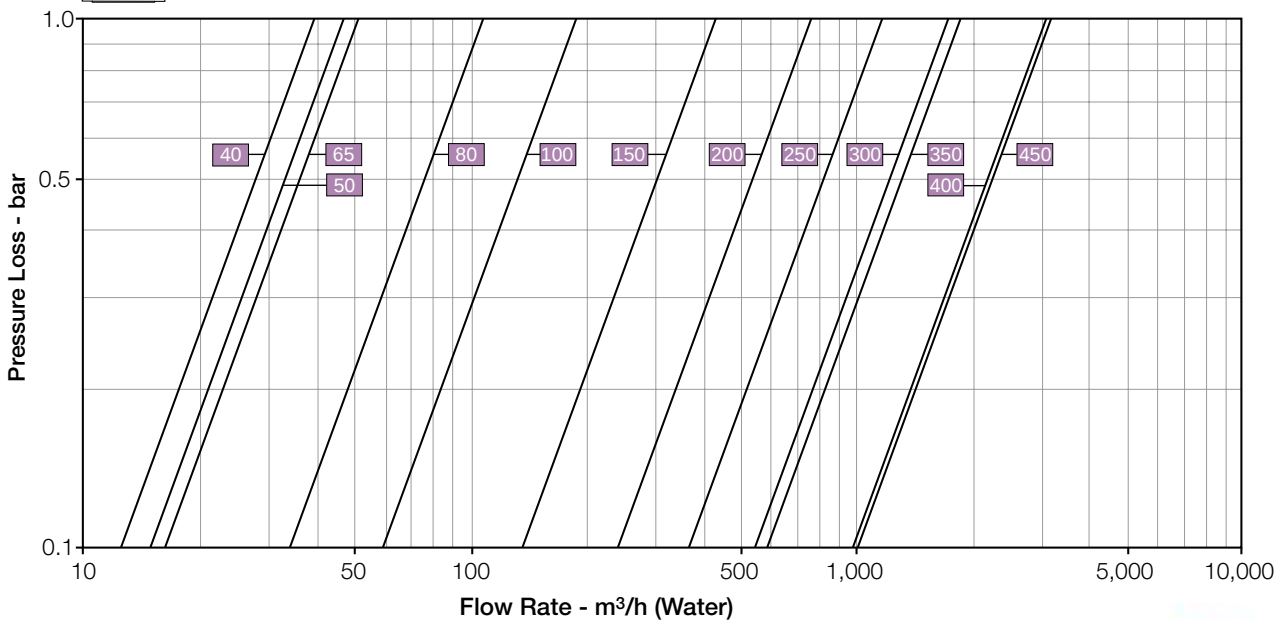
SI Metric

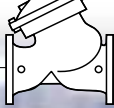


Y Pattern, Throttling Plug (U-Type)

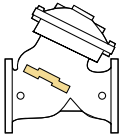


Angle Pattern, Throttling Plug (U-Type)

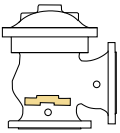
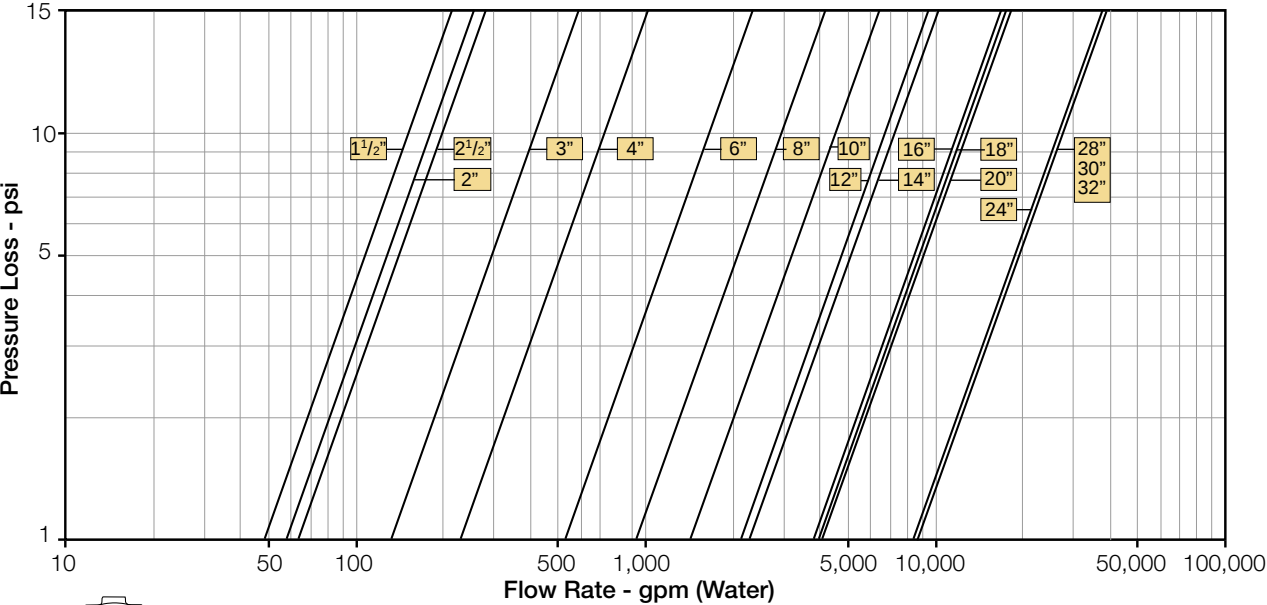




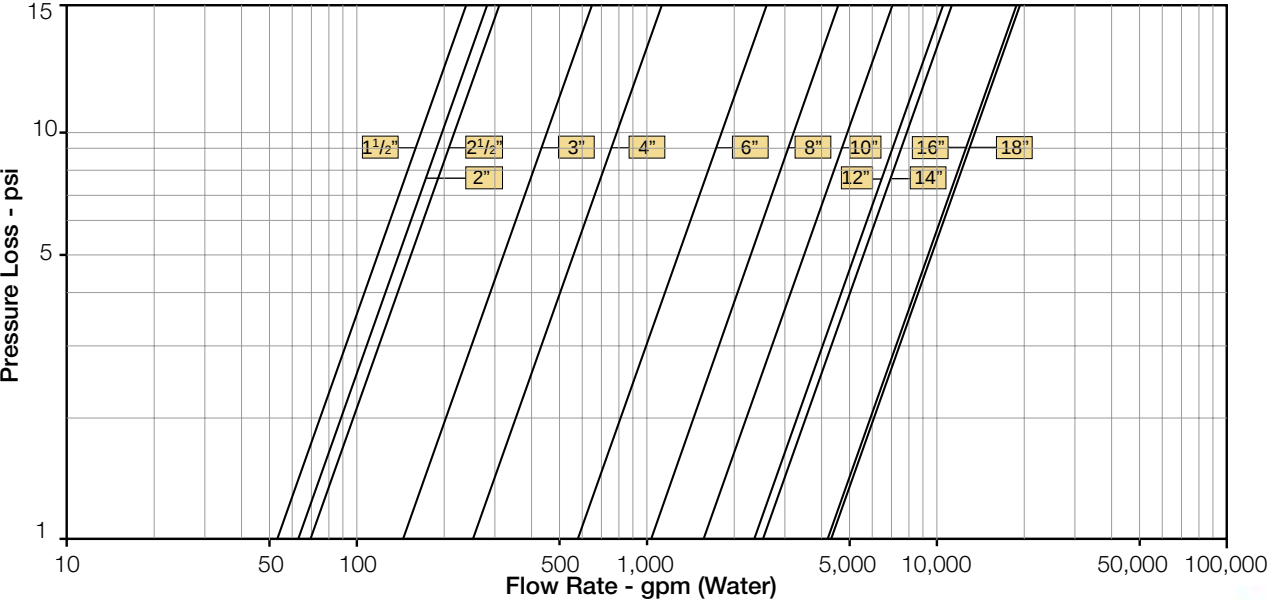
US English



Y Pattern, Flat Disc

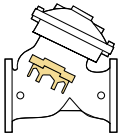


Angle Pattern, Flat Disc

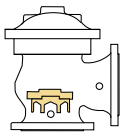
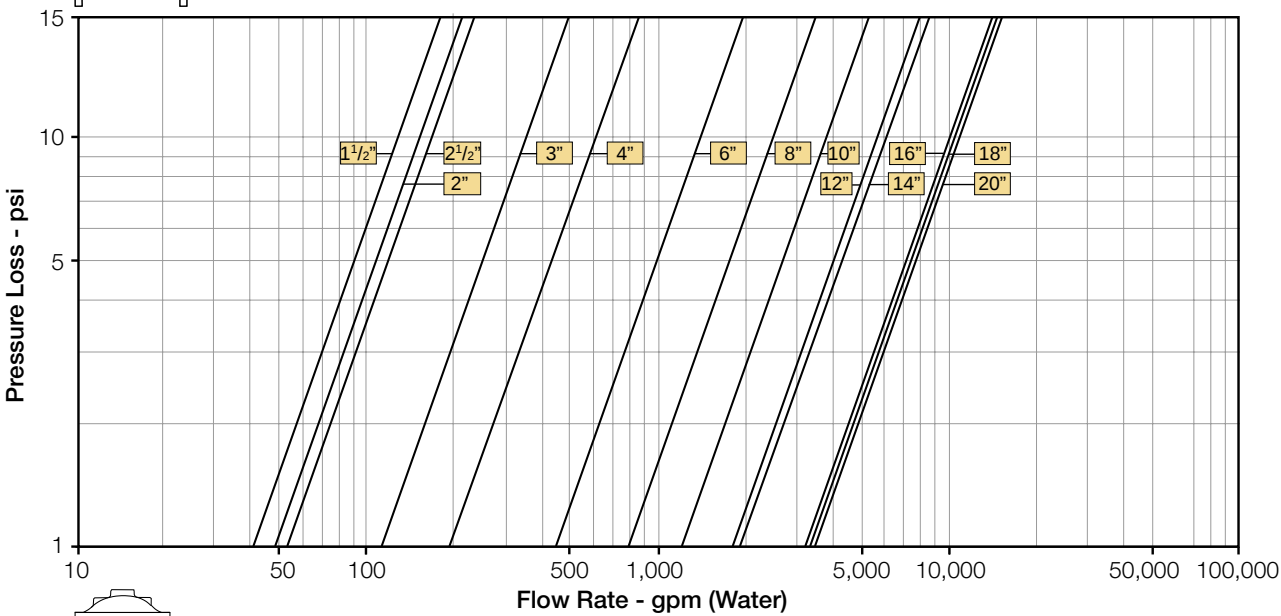




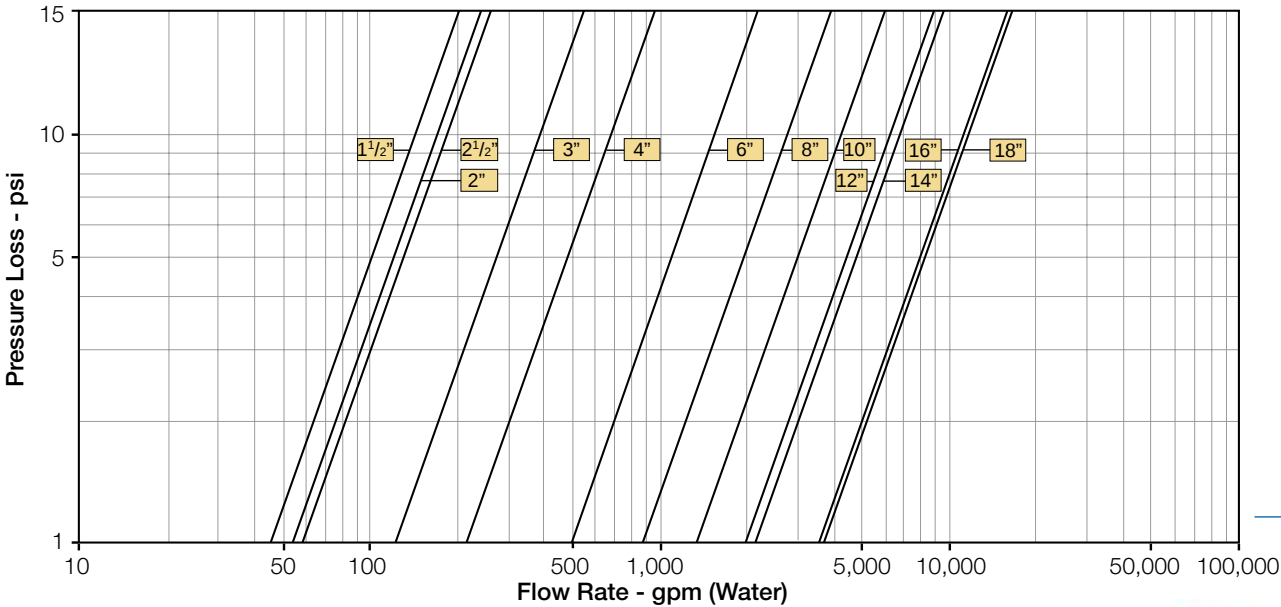
US English



Y Pattern, Throttling Plug (U-Type)



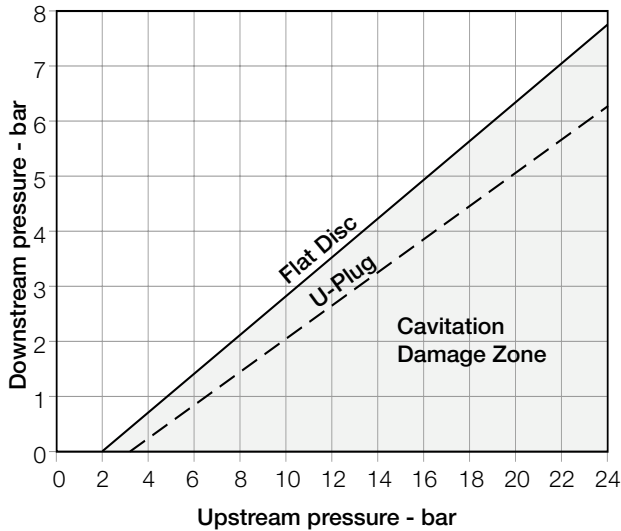
Angle Pattern, Throttling Plug (U-Type)





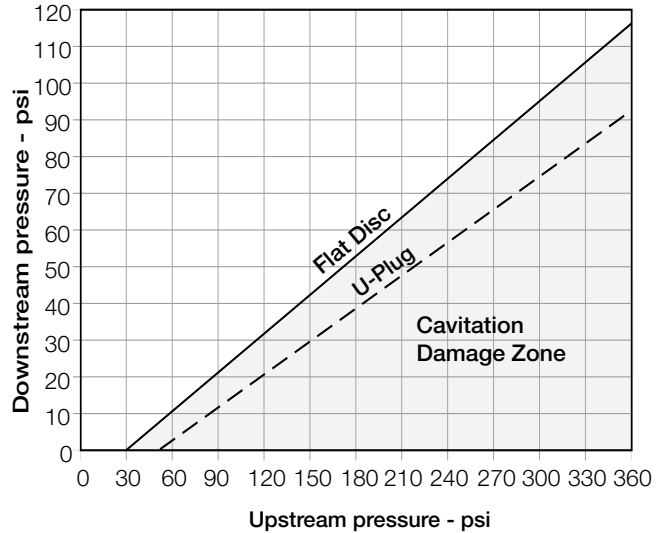
Cavitation Guide

SI Metric



Cavitation Guide

US English



Cavitation

The cavitation phenomenon has a significant affect on control valve and system performance.

Cavitation may damage the valve and piping by the affects of erosion and vibration. Cavitation also generates noise and may limit and ultimately choke the flow.

As the pressure differential across the valve increases, the static pressure of the flow passing through the throttling area of the valve (Vena Contracta) drops sharply.

When the fluid's static pressure reaches liquid vapor pressure, vapor cavities (bubbles) form and grow until they violently implode by the recovered pressure downstream to the valve seat.

The implosion of these cavities generates high-pressure surges, micro jets and intensive heat, which erode valve components and downstream piping. In its final stage, cavitation flashes and chokes the flow.

The above Cavitation Guides for Bermad 700 Series valves are based on the formula commonly used in the valve industry:

$$\sigma = (P_2 - P_v) / (P_1 - P_2)$$

Where:

σ = Sigma, cavitation index, dimensionless

P1 = Upstream pressure, absolute

P2 = Downstream pressure, absolute

Pv = Liquid vapor pressure, absolute

(Water, 18°C = 0.02 bar-a ; 65°F = 0.3 psi-a)

Use these guides and your applications upstream and downstream pressures to determine whether their intersection lies in or out of the cavitation damage zone.

Considerations to avoid cavitation damage:

- Reduce system pressure in stages designing each pressure stage to be above cavitation conditions.
- Consider using other valve selection criteria
 - Valve body and plug type
 - Valve size
 - Valve material

Notes:

- An alternate cavitation index formula introduced by ISA is:

$$\sigma_{ISA} = (P_1 - P_v) / (P_1 - P_2)$$
 which equals $\sigma + 1$
- The above charts should be considered only as a general guide.
- For optimum system and control valve application please consult Bermad.





Practical Hydraulic Data

700 Series

SI Metric

		mm	40	50	65	80	100	150	200	250	300	350	400	450	500
Y-Pattern Flat Disc 	Kv		42	50	55	115	200	460	815	1,250	1,850	1,990	3,310	3,430	3,550
	K		2.3	3.9	9.2	4.9	3.9	3.7	3.8	3.9	3.7	5.9	3.7	5.5	7.8
	Leq - m		4.3	10.3	33.4	21.6	23.0	37.5	53.9	70.0	85.6	159.9	112.7	204.8	323.8
Y-Pattern U-Plug 	Kv		36	43	47	98	170	391	693	1,063	1,573	1,692	2,814	2,916	3,018
	K		3.1	5.4	12.8	6.7	5.4	5.2	5.2	5.4	5.1	8.2	5.1	7.6	10.8
	Leq - m		6.0	14.3	46.2	29.9	31.9	51.9	74.6	96.8	118.4	221.3	155.9	283.5	448.1
Angle Pattern Flat Disc 	Kv		46	55	61	127	220	506	897	1,375	2,035	2,189	3,641	3,773	NA
	K		1.9	3.2	7.6	4.0	3.2	3.1	3.1	3.2	3.1	4.9	3.0	4.5	NA
	Leq - m		3.6	8.5	27.6	17.8	19.0	31.0	44.6	57.8	70.7	132.1	93.1	169.3	NA
Angle Pattern U-Plug 	Kv		39	47	51	108	187	430	762	1,169	1,730	1,861	3,095	3,207	NA
	K		2.6	4.5	10.6	5.6	4.5	4.3	4.3	4.5	4.2	6.8	4.2	6.2	NA
	Leq - m		5.0	11.8	38.2	24.7	26.4	42.9	61.7	80.0	97.9	182.9	128.9	234.3	NA

US English

		inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
Y-Pattern Flat Disc 	Cv		49	58	64	133	230	530	940	1,440	2,140	2,300	3,820	3,960	4,100
	K		2.3	3.9	9.2	4.9	3.9	3.7	3.8	3.9	3.7	5.9	3.7	5.5	7.8
	Leq-feet		14.2	33.8	109.5	70.8	75.6	123.0	176.9	229.5	280.8	524.5	369.6	671.9	1,062.3
Y-Pattern U-Plug 	Cv		41	49	54	113	200	450	800	1,230	1,820	1,950	3,250	3,370	3,490
	K		3.1	5.4	12.8	6.7	5.4	5.2	5.2	5.4	5.1	8.2	5.1	7.6	10.8
	Leq-feet		19.7	46.8	151.6	97.9	104.6	170.2	244.8	317.6	388.6	725.9	511.6	930.0	1,470.3
Angle Pattern Flat Disc 	Cv		53	64	70	146	250	580	1,040	1,590	2,350	2,530	4,210	4,360	NA
	K		1.9	3.2	7.6	4.0	3.2	3.1	3.1	3.2	3.1	4.9	3.0	4.5	NA
	Leq-feet		11.7	28.0	90.5	58.5	62.5	101.6	146.2	189.7	232.0	433.4	305.5	555.3	NA
Angle Pattern U-Plug 	Cv		45	54	59	124	220	500	880	1,350	2,000	2,150	3,580	3,710	NA
	K		2.6	4.5	10.6	5.6	4.5	4.3	4.3	4.5	4.2	6.8	4.2	6.2	NA
	Leq-feet		16.3	38.7	125.3	80.9	86.5	140.7	202.4	262.5	321.2	599.9	422.8	768.6	NA

SI Metric

		mm	600	700	750	800
G-Pattern Flat Disc 	Kv		7,350	7,500	7,500	7,500
	K		3.8	6.7	8.8	11.4
	Leq - m		188.0	390.1	550.9	760.7

US English

		inch	24"	28"	30"	32"
G-Pattern Flat Disc 	Cv		8,490	8,670	8,670	8,670
	K		3.8	6.7	8.8	11.4
	Leq-feet		616.6	1,280.0	1,807.3	2,495.6

Valve flow coefficient, Kv or Cv

$$Kv(Cv) = Q \sqrt{\frac{Gr}{\Delta P}}$$

Where:

Kv = Valve flow coefficient (flow in m³/h at 1bar Diff. Press.)

Cv = Valve flow coefficient (flow in gpm at Diff. Press. 1psi)

Q = Flow rate (m³/h ; gpm)

ΔP = Differential pressure (bar ; psi)

Gr = Liquid specific gravity (Water = 1.0)

$$Cv = 1.155 Kv$$

Flow resistance or Head loss coefficient, $K = \Delta H \frac{29}{V^2}$

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/sec² ; 32.18 feet/sec²)

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.

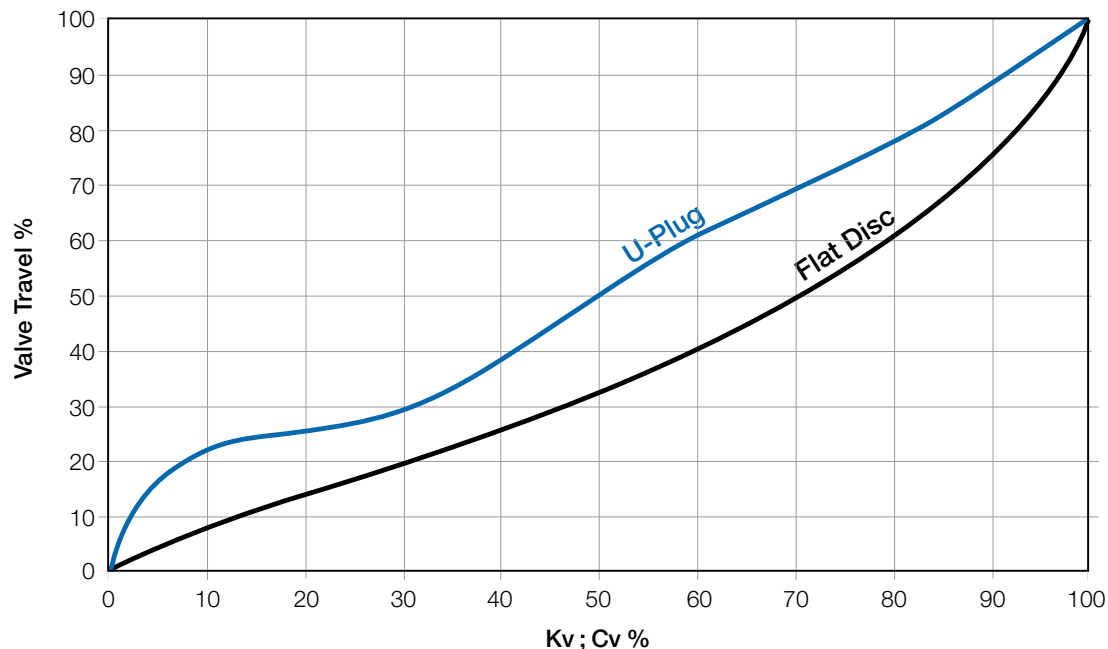
Actual Leq may vary somewhat with each of the valve sizes.





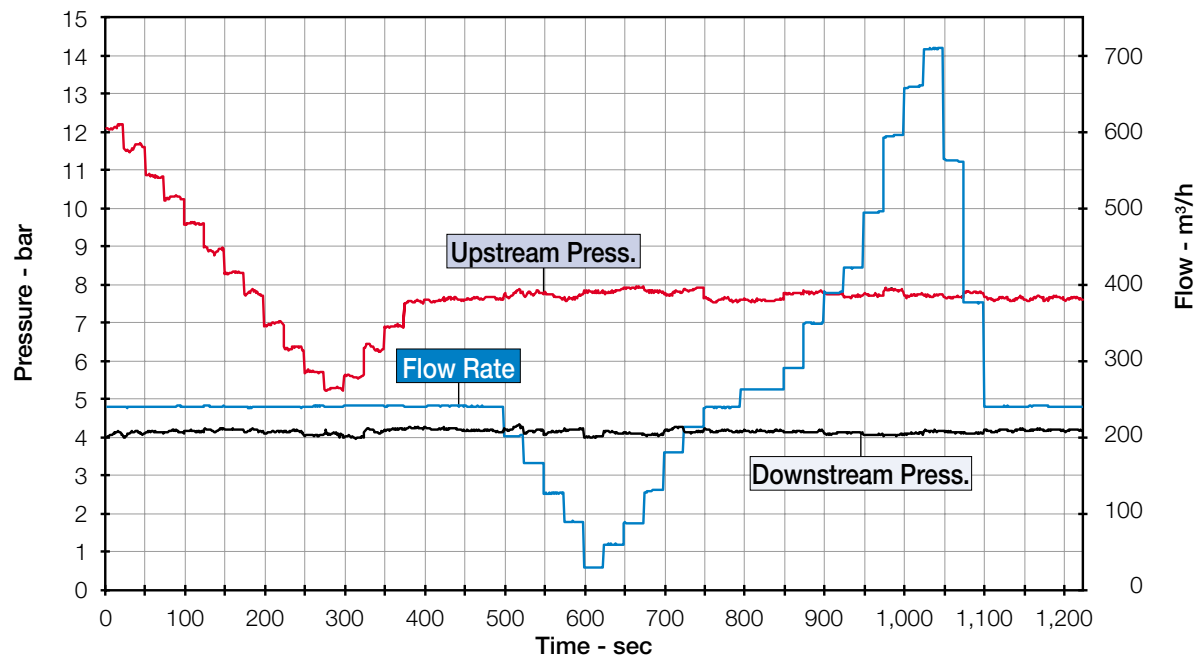
Valve Plugs Characteristics

Kv ; Cv to Valve Opening Chart



Typical Pressure Reducing Performance Chart

Actual Hydraulic Laboratory Results



Engineering

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