SI 700 Metric

Series Patterns and Sizes

- 700-ES Series – "Y" Pattern – DN40-500
- 700-EN Series – "Y" Pattern – DN50-300
- 700 Series – "Y" Pattern – DN40-500
- 700 Series – Angle – DN40-450
- 700-M6 Series – Globe – DN600-900

Connection Standard

- Flanged: ISO 7005-2 (ISO 10, 16 & 25)
- Threaded: BSP (Rp ISO 7/1) or NPT (DN 40 - DN 80)

Water Temperature

- Up to 80ºC

Working pressure

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

Standard Materials

- **Main valve body and cover**
  Ductile Iron to EN 1563
- **Main valve internals**
  Stainless Steel, Bronze & Epoxy coated Steel
- **Control Trim**
  Brass, Bronze accessories
  Stainless Steel 316 fittings & tubing
  or forged Brass fittings & Copper tubing
- **Elastomers**
  NBR
- **Coating**
  Blue fusion bonded Epoxy

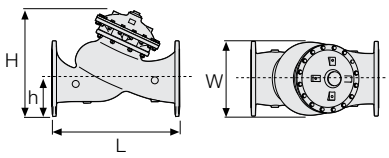
Optional Materials

- **Main valve body and cover**
  Carbon Steel to EN 10083-1
  Stainless Steel 316 to EN 10088-1
  Nickel Aluminum Bronze to BS-EN 1400 AB-2
  Other materials on request
- **Control Trim**
  Stainless Steel 316, Nickel Aluminum Bronze,
  Hastalloy C-276 accessories
  Monel fittings & tubing
- **Elastomers**
  EPDM
  FPM

SI 700 Metric

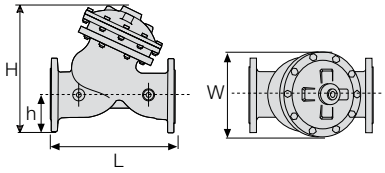
Flanged

700-ES



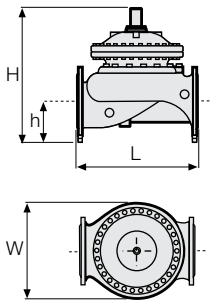
	DN	40	50	65	80	100	125	150	200	250	300	400	500
PN 10; 16; 25	L (mm)	230	230	290	310	350	400	480	600	730	850	1,100	1,250
	W (mm)	150	165	185	200	235	270	300	360	425	530	626	838
	h (mm)	80	90	100	105	125	142	155	190	220	250	320	385
	H (mm)	240	250	250	260	320	375	420	510	605	725	895	1,185
	Weight (Kg)	10	10.8	13.2	15	26	40	55	95	148	255	436	1,061

700-EN



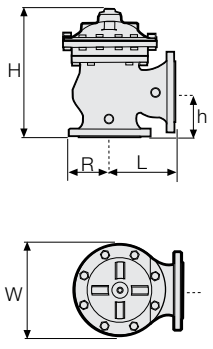
	DN	50	80	100	150	200	250	300
PN 10; 16; 25	L (mm)	230	310	350	480	600	730	850
	W (mm)	165	200	235	320	390	480	550
	h (mm)	82.5	100	118	150	180	213	243
	H (mm)	244	305	369	500	592	733	841
	Weight (Kg)	9.7	21	31	70	115	198	337

700-M6



	DN	600	700	750	800	900
ISO PN 10 ; 16	L (mm)	1,450	1,650	1,750	1,850	1,850
	W (mm)	1,250	1,250	1,250	1,250	1,250
	h (mm)	470	490	520	553	600
	H (mm)	1,965	1,985	2,015	2,048	2,095
	Weight (Kg)	3,250	3,700	3,900	4,100	4,250
ISO PN 20 ; 25	L (mm)	1,500	1,650	1,750	1,850	1,850
	W (mm)	1,250	1,250	1,250	1,250	1,250
	h (mm)	470	490	520	553	600
	H (mm)	1,965	1,985	2,015	2,048	2,095
	Weight (Kg)	3,500	3,700	3,900	4,100	4,250

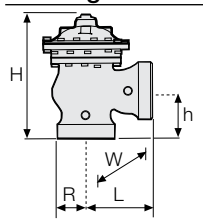
700 Angle



	DN	40	50	65	80	100	150	200	250	300	350	400	450
PN 10 ; 16	L (mm)	124	124	149	152	190	225	265	320	396	400	450	450
	W (mm)	155	155	178	200	222	320	390	480	550	550	740	740
	R (mm)	78	83	95	100	115	143	172	204	248	264	299	320
	h (mm)	85	85	109	102	127	152	203	219	273	279	369	370
	H (mm)	227	227	251	281	342	441	545	633	777	781	1,082	1,082
	Weight (Kg)	9.5	10	12	21.5	35	71	118	205	350	370	800	820
PN 25	L (mm)	124	124	149	159	200	234	277	336	415	419	467	467
	W (mm)	165	165	185	207	250	320	390	480	550	550	740	740
	R (mm)	78	85	95	105	127	159	191	223	261	293	325	358
	h (mm)	85	85	109	109	135	165	216	236	294	299	386	386
	H (mm)	227	227	251	287	350	454	558	649	796	801	1,099	1,099
	Weight (Kg)	11	11.5	13.5	23	41	81	138	233	390	425	855	870

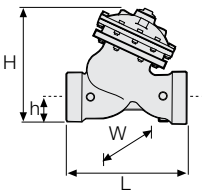
Threaded

700 Angle



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

700 "Y" Pattern

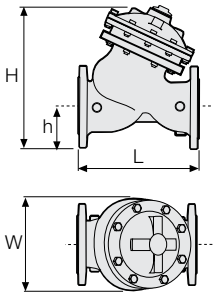


	DN	40	50	65	80
BSP ; NPT	L (mm)	155	155	212	250
	W (mm)	122	122	122	163
	h (mm)	40	40	48	56
	H (mm)	201	202	209	264
	Weight (Kg)	5.5	5.5	8	17

SI 700 Metric

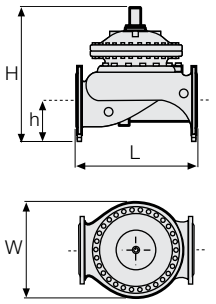
Flanged

700 Y Pattern



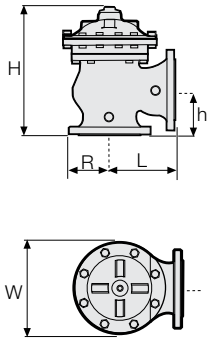
	DN	40	50	65	80	100	150	200	250	300	350	400	450	500
ISO PN 10 ; 16	L (mm)	205	210	222	250	320	415	500	605	725	733	990	1,000	1,100
	W (mm)	155	165	178	200	223	320	390	480	550	550	740	740	740
	h (mm)	78	83	95	100	115	143	172	204	242	268	300	319	358
	H (mm)	239	244	257	305	366	492	584	724	840	866	1,108	1,127	1,167
	Weight (Kg)	9.1	10.6	13	22	37	75	125	217	370	381	846	945	962
ISO PN 20 ; 25	L (mm)	205	210	222	264	335	433	524	637	762	767	1,024	1,030	1,136
	W (mm)	155	165	185	207	250	320	390	480	550	570	740	740	750
	h (mm)	78	83	95	105	127	159	191	223	261	295	325	357	389
	H (mm)	239	244	257	314	378	508	602	742	859	893	1,133	1,165	1,197
	Weight (Kg)	10	12.2	15	25	43	85	146	245	410	434	900	967	986

700-M6



	DN	600	700	750	800	900
ISO PN 10 ; 16	L (mm)	1,450	1,650	1,750	1,850	1,850
	W (mm)	1,250	1,250	1,250	1,250	1,250
	h (mm)	470	490	520	553	600
	H (mm)	1,965	1,985	2,015	2,048	2,095
	Weight (Kg)	3,250	3,700	3,900	4,100	4,250
ISO PN 20 ; 25	L (mm)	1,500	1,650	1,750	1,850	1,850
	W (mm)	1,250	1,250	1,250	1,250	1,250
	h (mm)	470	490	520	553	600
	H (mm)	1,965	1,985	2,015	2,048	2,095
	Weight (Kg)	3,500	3,700	3,900	4,100	4,250

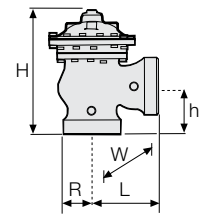
700 Angle



	DN	40	50	65	80	100	150	200	250	300	350	400	450
ISO PN 10 ; 16	L (mm)	124	124	149	152	190	225	265	320	396	400	450	450
	W (mm)	155	155	178	200	222	320	390	480	550	550	740	740
	R (mm)	78	83	95	100	115	143	172	204	248	264	299	320
	h (mm)	85	85	109	102	127	152	203	219	273	279	369	370
	H (mm)	227	227	251	281	342	441	545	633	777	781	1,082	1,082
	Weight (Kg)	9.5	10	12	21.5	35	71	118	205	350	370	800	820
ISO PN 10 ; 16	L (mm)	124	124	149	159	200	234	277	336	415	419	467	467
	W (mm)	165	165	185	207	250	320	390	480	550	550	740	740
	R (mm)	78	85	95	105	127	159	191	223	261	293	325	358
	h (mm)	85	85	109	109	135	165	216	236	294	299	386	386
	H (mm)	227	227	251	287	350	454	558	649	796	801	1,099	1,099
	Weight (Kg)	11	11.5	13.5	23	41	81	138	233	390	425	855	870

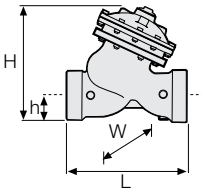
Threaded

700 Angle



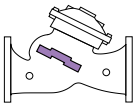
	DN	50	65	80
BSP ; NPT	L (mm)	121	140	159
	W (mm)	122	122	163
	R (mm)	40	48	55
	h (mm)	83	102	115
	H (mm)	225	242	294
	Weight (Kg)	5.5	7	15

700 Y Pattern

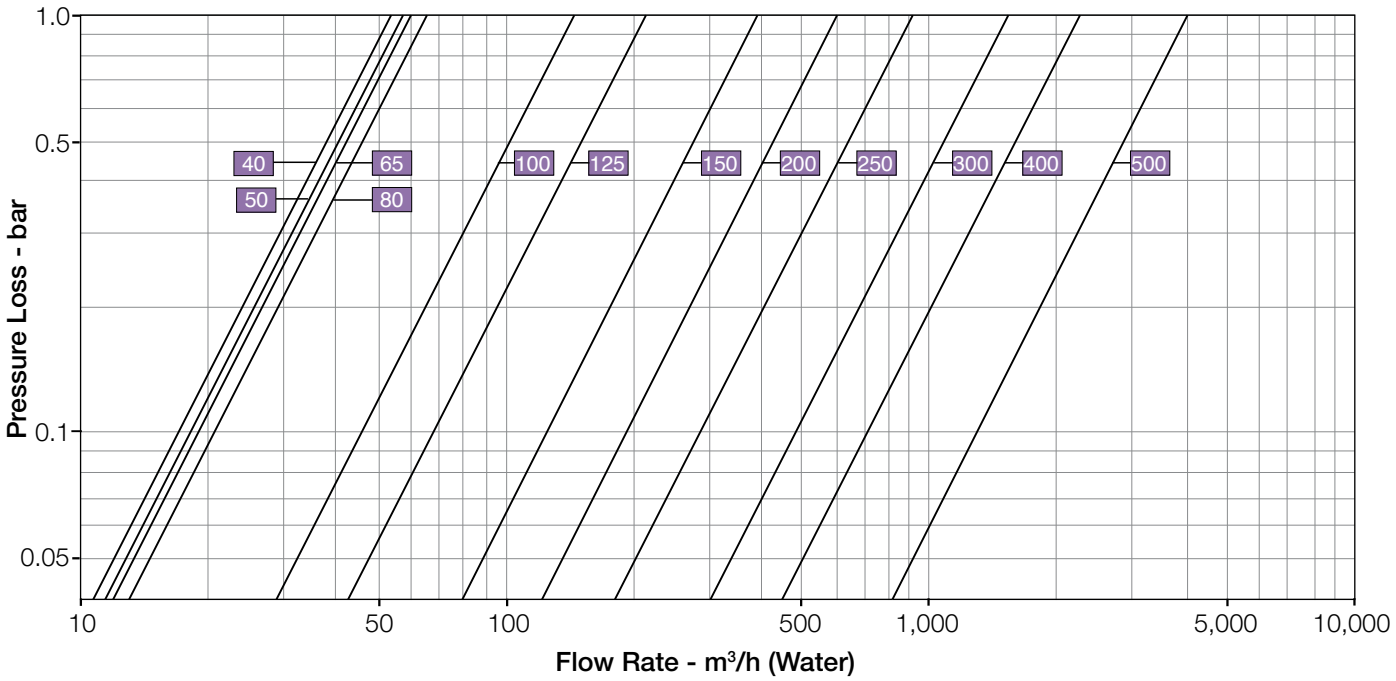


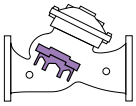
	DN	40	50	65	80
BSP ; NPT	L (mm)	155	155	212	250
	W (mm)	122	122	122	163
	h (mm)	40	40	48	56
	H (mm)	201	202	209	264
	Weight (Kg)	5.5	5.5	8	17

SI 700-ES Metric

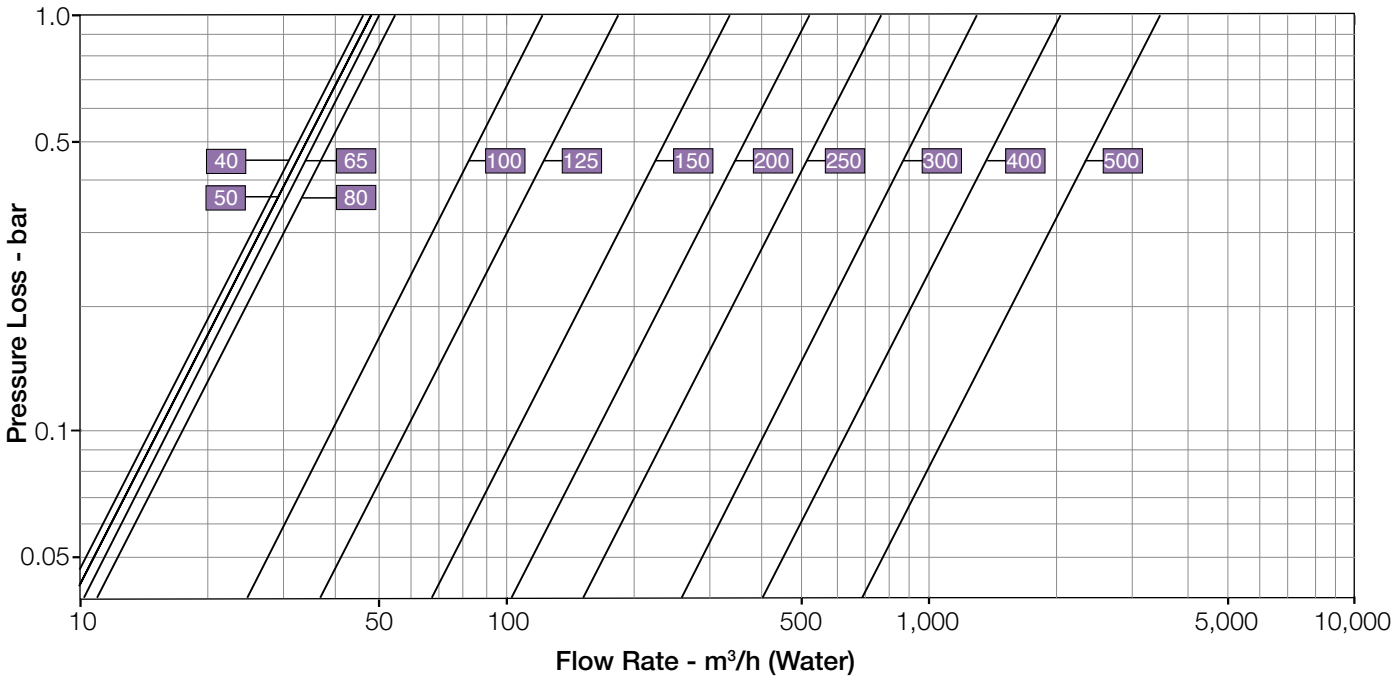


"Y" Pattern, Flat Disc



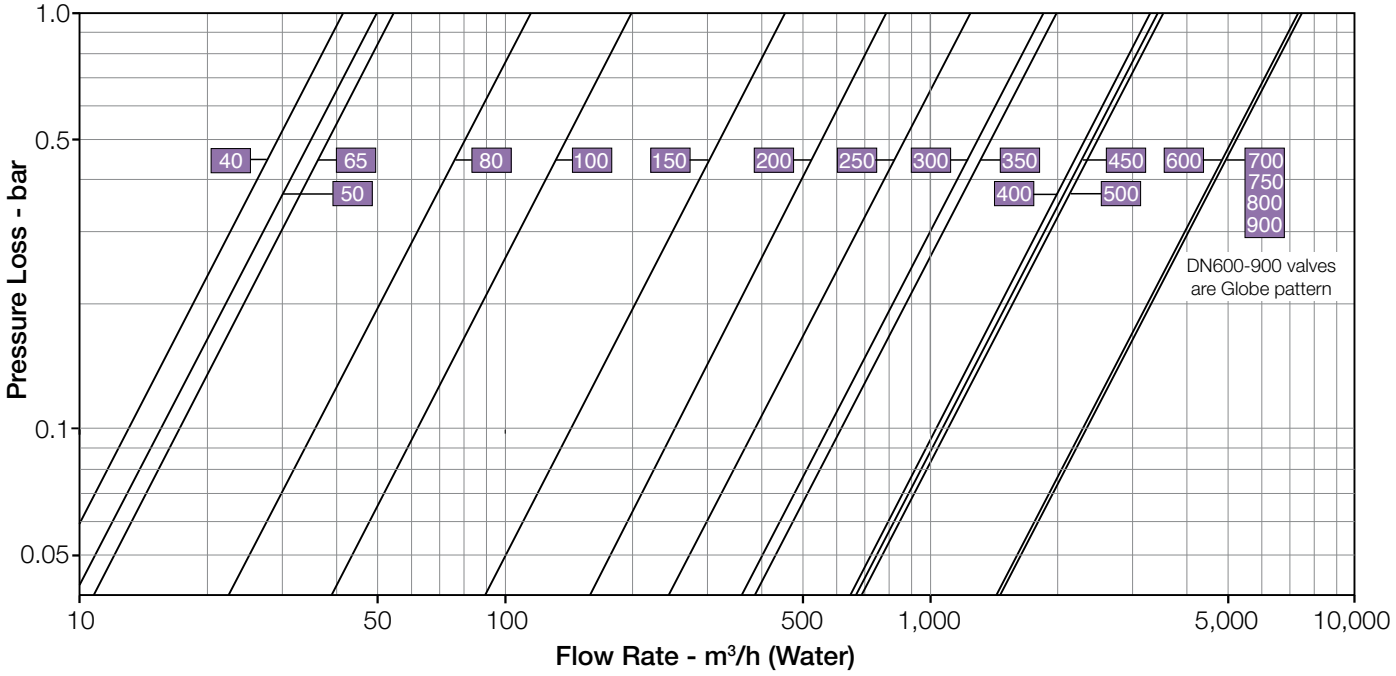


"Y" Pattern, Throttling Plug (V-Port)

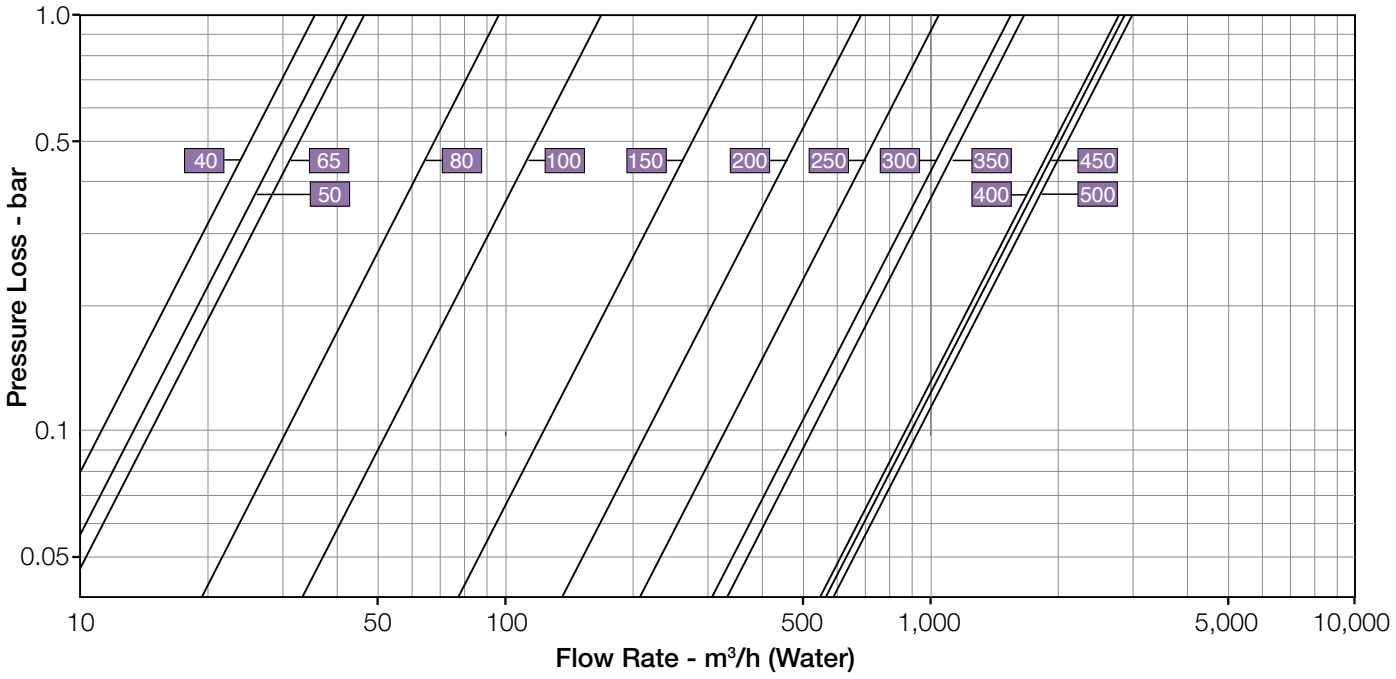


SI 700 Metric

Y Pattern, Flat Disc

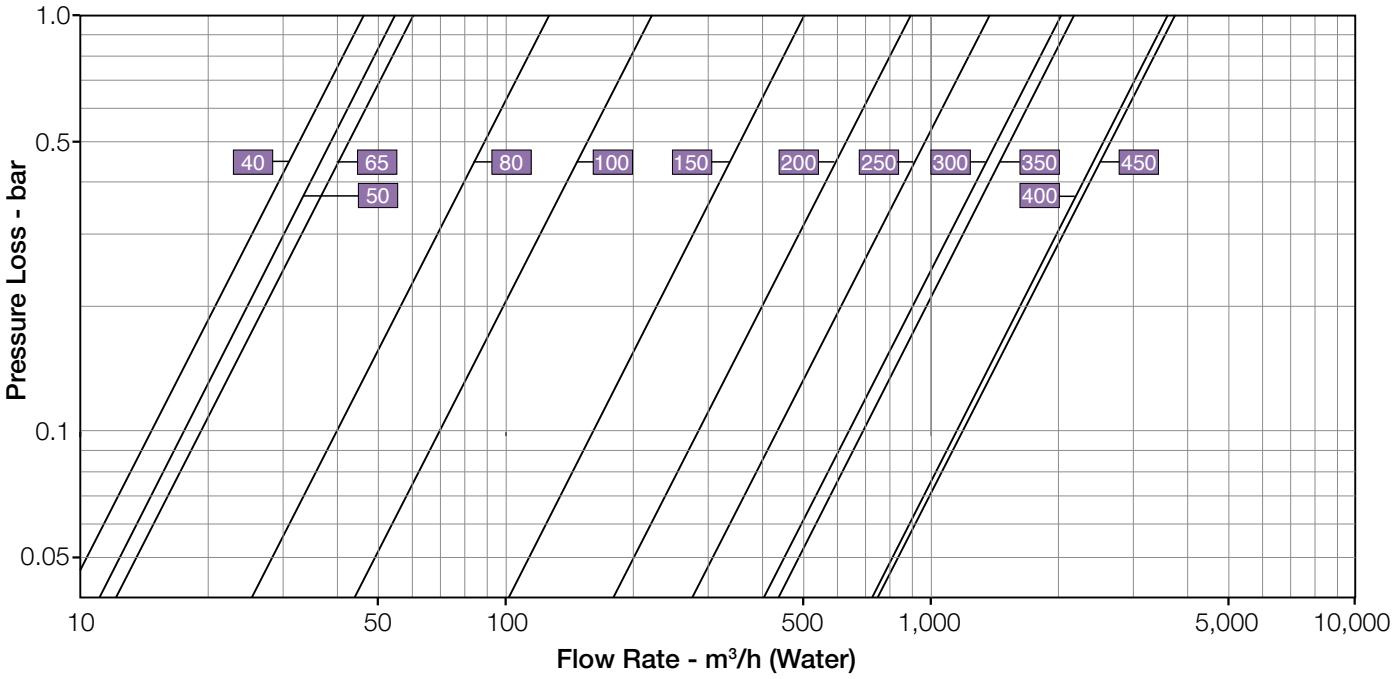


Y Pattern, Throttling Plug (V-Port)

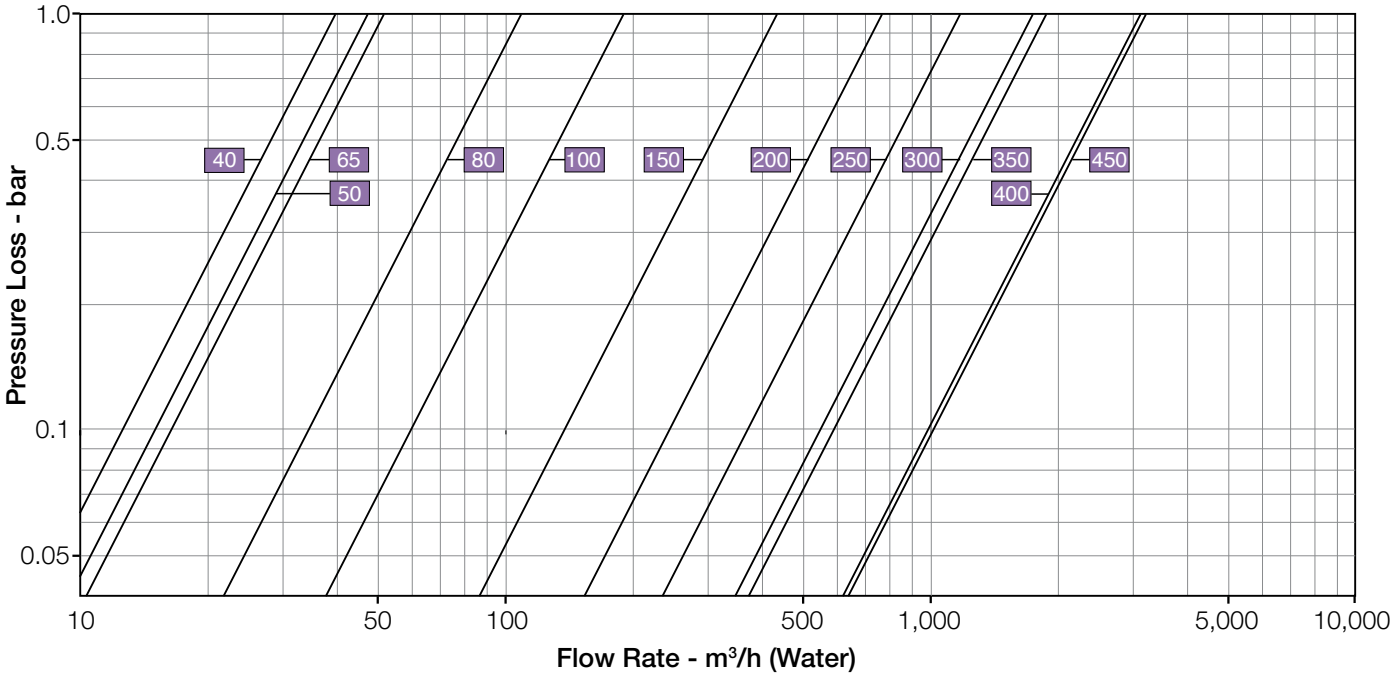


SI 700 Metric

Angle Pattern, Flat Disc



Angle Pattern, Throttling Plug (V-Port)



SI 700 Metric

	DN	40	50	65	80	100	125	150	200	250	300	350	400	450	500
700 Y-Pattern Flat Disc 	Kv	42	50	55	115	200	N/A	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	N/A	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	N/A	37.5	53.9	70	85.6	159.9	112.7	204.8	323.8
700 Y-Pattern V-Port 	Kv	36	43	47	98	170	N/A	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	N/A	5.2	5.2	5.4	5.1	8.2	5.1	7.6	10.8
	Leq - m	6	14.3	46.2	29.9	31.9	N/A	51.9	74.6	96.8	118.4	221.3	155.9	283.5	448.1
700-ES Y-Pattern Flat Disc 	Kv	54	57	60	65	145	215	395	610	905	1,520	N/A	2,250	N/A	4,070
	K	1.4	3.0	7.8	15.2	7.5	8.3	5.1	6.7	7.5	5.5	N/A	7.9	N/A	5.9
	Leq - m	2.8	7.5	25.3	60.8	37.3	51.7	38.1	96.3	138.4	126.8	N/A	253.6	N/A	246.3
700-ES Y-Pattern V-Port 	Kv	46	48	51	55	123	183	336	519	769	1,292	N/A	2,027	N/A	3,460
	K	1.9	4.3	10.8	21.2	10.4	11.4	7.0	9.3	10.4	7.6	N/A	9.8	N/A	8.2
	Leq - m	3.8	10.6	34.9	84.9	51.8	71.4	52.7	133.0	191.7	175.5	N/A	312.4	N/A	340.8
700 Angle Flat Disc 	Kv	46	55	61	127	220	N/A	506	897	1,375	2,035	2,189	3,641	3,773	N/A
	K	1.9	3.2	7.6	4	3.2	N/A	3.1	3.1	3.2	3.1	4.9	3	4.5	N/A
	Leq - m	3.6	8.5	27.6	17.8	19	N/A	31	44.6	57.8	70.7	132.1	93.1	169.3	N/A
700 Angle V-Port 	Kv	39	47	51	108	187	N/A	430	762	1,169	1,730	1,861	3,095	3,207	N/A
	K	2.6	4.5	10.6	5.6	4.5	N/A	4.3	4.3	4.5	4.2	6.8	4.2	6.2	N/A
	Leq - m	5	11.8	38.2	24.7	26.4	N/A	42.9	61.7	80	97.9	182.9	128.9	234.3	NA

	DN	600	700	750	800	900
700-M6 G-Pattern Flat Disc 	Kv	7,350	7,500	7,500	7,500	7,500
	K	3.8	6.7	8.8	11.4	17.1
	Leq - m	188	390.1	550.9	760.7	1,261

Differential Pressure Calculation

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

Where:

Kv = Valve flow coefficient (flow in m^3/h at 1bar ΔP)

Cv = Valve flow coefficient (flow in gpm at 1psi ΔP)
(Cv = 1.155 Kv)

Q = Flow rate (m^3/h ; gpm)

ΔP = Differential pressure (bar ; psi)

Gf = Liquid specific gravity (Water = 1.0)

Practical formulas for water:

$$Q = Kv\sqrt{\Delta P} \qquad \Delta P = \left(\frac{Q}{Kv}\right)^2$$

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/sec2 ; 32.18 feet/sec^2)

Practical formula:

$$\Delta H = K\frac{V^2}{2g}$$

Equivalent Pipe Length - Leq

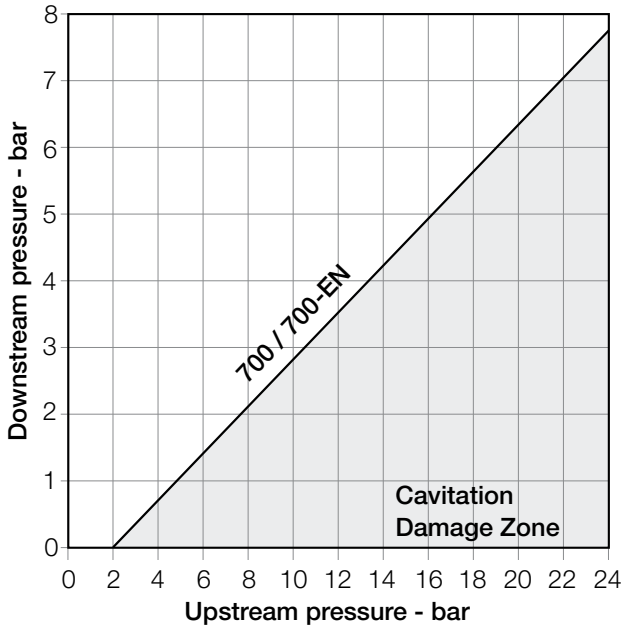
In order to simplify system head loss calculation,
add the Leq value to the pipe length of the relevant size

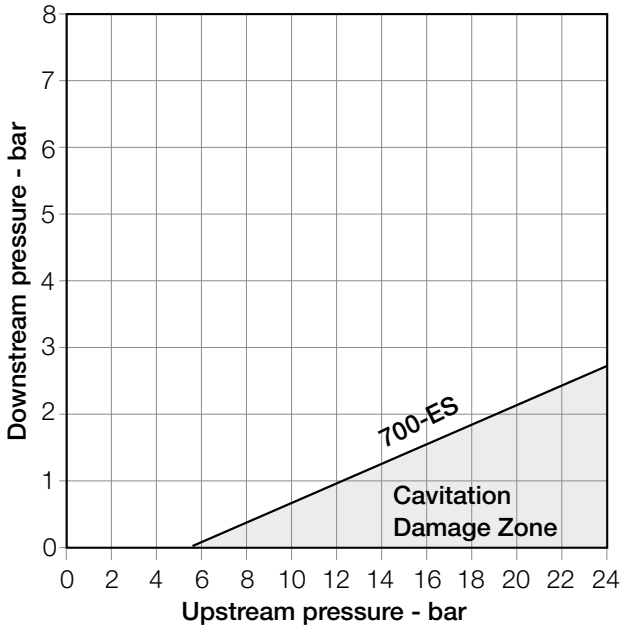
Note:

The Leq values given are for general consideration only.
Actual Leq may vary somewhat with each of the valve sizes.

SI Metric

Cavitation Guide





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:

σ = (P2-Pv) / (P1-P2)

Where:

σ = Sigma, cavitation index, dimensionless
P1 = Upstream pressure, absolute
P2 = Downstream pressure, absolute
Pv = Liquid vapor pressure, absolute
(Water, 18ºC = 0.02 bar-a ; 65ºF = 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:

A) Reduce system pressure in stages designing each pressure stage to be above cavitation conditions.
B) Consider using other valve selection criteria
   a. Valve body and plug type
   b. Valve size
   c. Valve material

Notes:

1. An alternate cavitation index formula introduced by ISA is:
   σISA = (P1-Pv) / (P1-P2) which equals σ+1
2. The above charts should be considered only as a general guide.
3. For optimum system and control valve application please consult Bermad.

US 700 English

Series Patterns and Sizes

- 700 Series – Y Pattern – 1½"-20"
- 700 Series – Angle – 1½"-18"
- 700-M6 Series – Globe – 24"-36"

Connection Standard

- Flanged: ANSI B16.42 (Ductile Iron)
- Threaded: NPT or BSP (1½" -3")

Water Temperature

- Up to 180ºF

Working pressure

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

Standard Materials

- **Main valve body and cover**
  Ductile Iron to ASTM A-536
- **Main valve internals**
  Stainless Steel, Bronze & Epoxy coated Steel
- **Control Trim**
  Brass, Bronze accessories
  Stainless Steel 316 fittings & tubing
  or forged Brass fittings & Copper tubing
- **Elastomers**
  NBR
- **Coating**
  Blue fusion bonded Epoxy

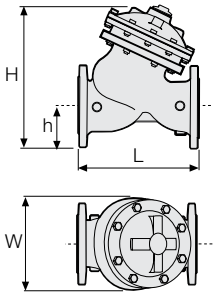
Optional Materials

- **Main valve body and cover**
  Carbon Steel to ASTM A-216-WCB
  Stainless Steel 316 to ASTM A-743 CF8M
  Nickel Aluminum Bronze to ASTM B-148 C 95800
  Other materials on request
- **Control Trim**
  Stainless Steel 316, Nickel Aluminum Bronze,
  Hastalloy C-276 accessories
  Monel fittings & tubing
- **Elastomers**
  EPDM
  FPM

US 700 English

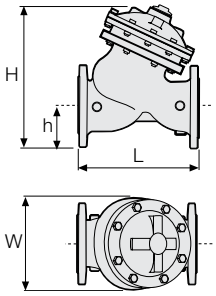
Flanged

Y Pattern



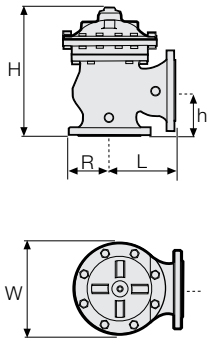
	inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
ANSI 150	L	8.1	8.3	8.7	9.8	12.6	16.3	19.7	23.8	28.5	28.9	39	39.4	43.3
	W	6.1	6.5	7	7.9	8.8	12.6	15.4	18.9	21.7	21.7	29.1	29.1	29.1
	h	3.1	3.3	3.7	3.9	4.5	5.6	6.8	8	9.5	10.6	11.8	12.6	14.1
	H	9.4	9.6	10.1	12	14.4	19.4	23	28.5	33.1	34.1	43.6	44.4	45.9
	Weight (lb)	20	23	29	49	82	165	276	478	816	840	1,865	2,083	2,121
ANSI 300	L	8.1	8.3	8.7	10.4	13.2	17	20.6	25.1	30	30.2	40.3	40.6	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	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	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	1,984	2,132	2,174

Globe Pattern



	inch	24"	28"	30"	32"	36"
ANSI 150	L	57	65	70	73	73
	W	49	49	49	49	49
	h	18.5	19	20.5	21.8	23.6
	H	77	78	79.3	80.6	82.5
	Weight (lb)	7,150	8,140	8,580	9,020	9,350
ANSI 300	L	59	65	70	73	73
	W	49	49	49	49	49
	h	18.5	19	20.5	21.8	23.6
	H	77	78	79.3	80.6	82.5
	Weight (lb)	7,700	8,140	8,580	9,020	9,370

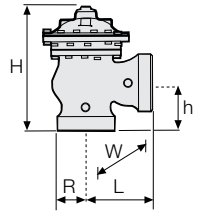
Angle Pattern



	inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"
ANSI 150	L	4.9	4.9	5.9	6	7.5	8.9	10.4	12.6	15.6	15.7	17.7	17.7
	W	6.1	6.1	7	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	9.8	10.4	11.8	12.6
	h	3.3	3.3	4.3	4	5	6	8	8.6	10.7	11	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	27	47	77	157	260	452	772	816	1,764	1,808
ANSI 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	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	17.9	304	514	860	937	1,885	1,918

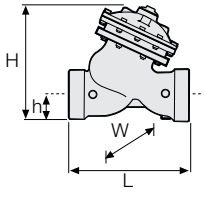
Threaded

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	4.5
	H	8.9	9.5	11.6
	Weight (lb)	12	15	33

Y Pattern



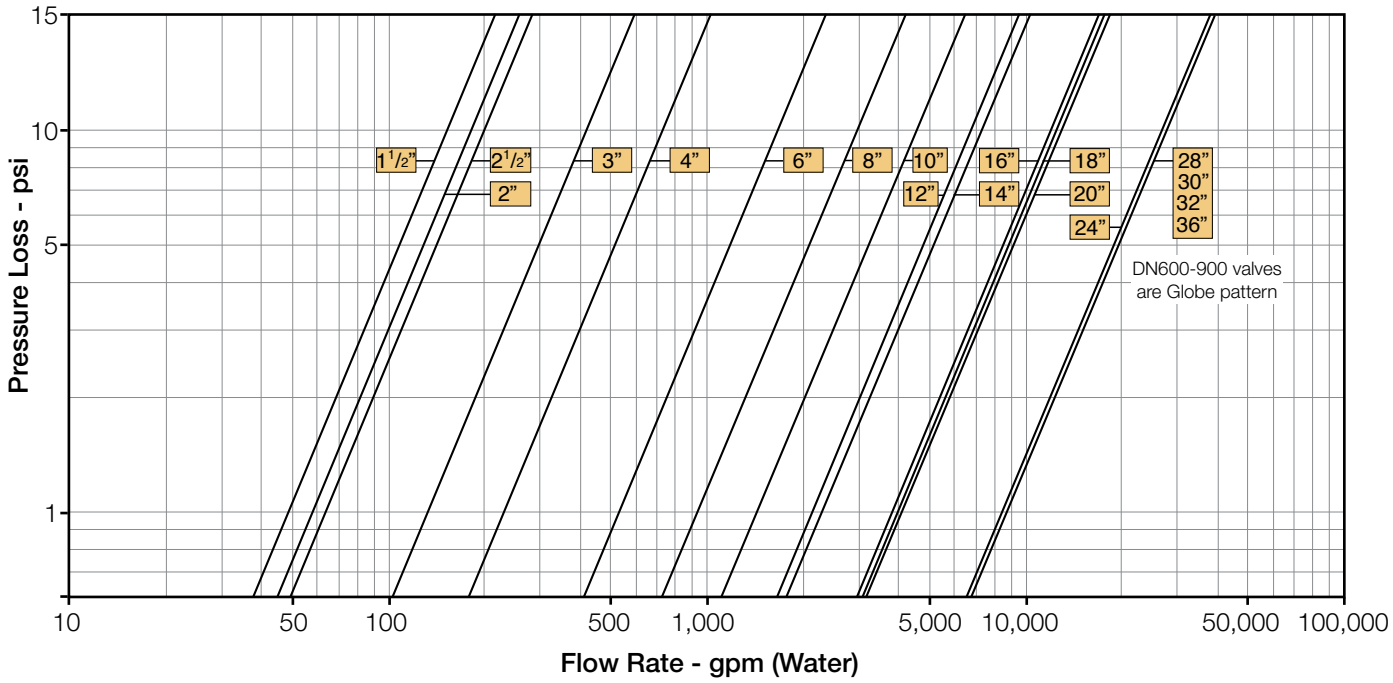
	inch	1½"	2"	2½"	3"
BSP ; NPT	L	6.1	6.1	8.3	9.8
	W	4.8	4.8	4.8	6.4
	h	1.6	1.6	1.9	2.2
	H	7.9	8	8.2	10.4
	Weight (lb)	12	12	18	37

Control Chamber Displacement Volume (gallon)

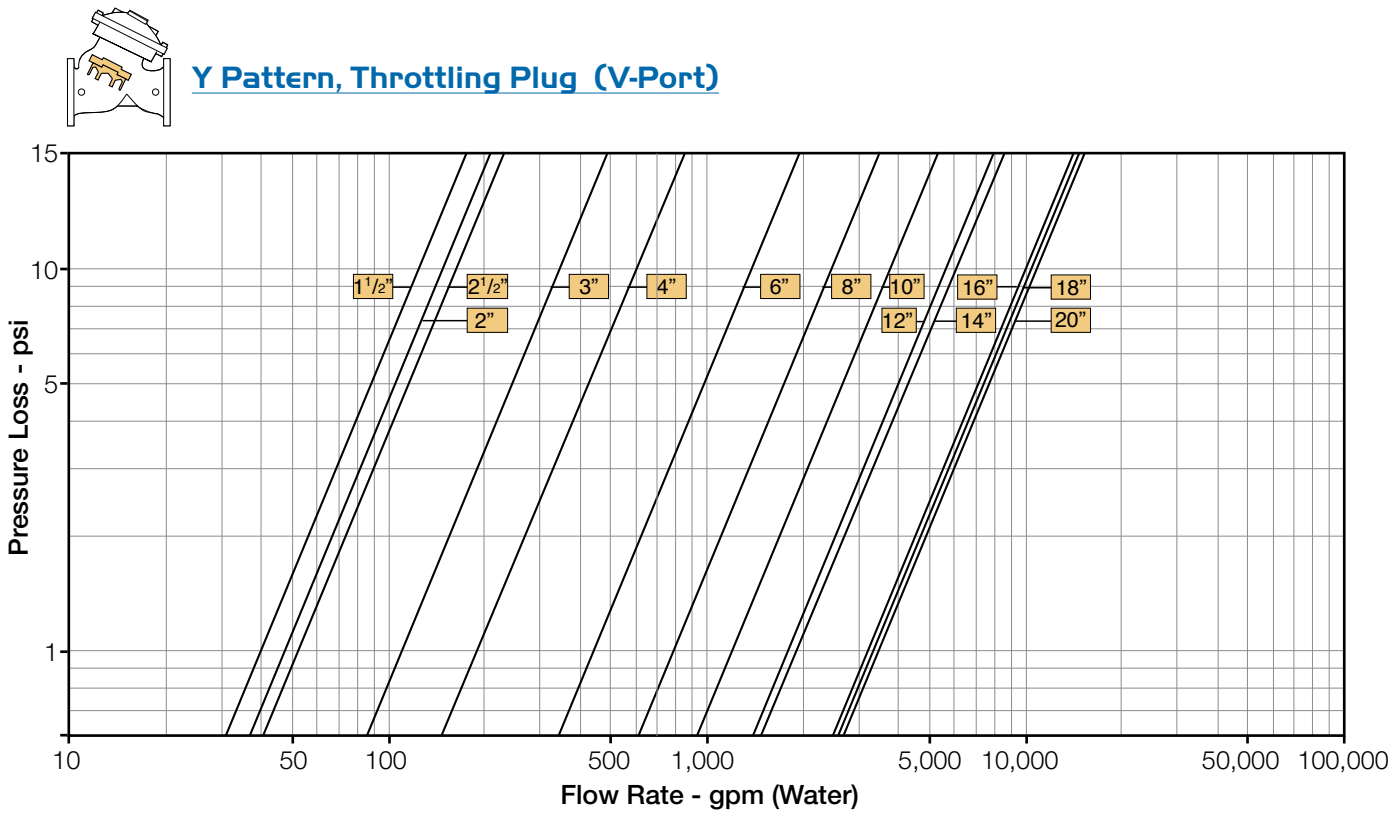
Sizes	1½"-2½"	3"	4"	6"	8"	10"	12"-14"	16"-20"	24"-36"
700 Series	0.04	0.08	0.12	0.57	1.19	2.25	3.28	7.88	25.9
800 Series	0.01	0.03	0.08	0.29	0.61	1.06	2.12	4.95	-

US 700 English

Y Pattern, Flat Disc

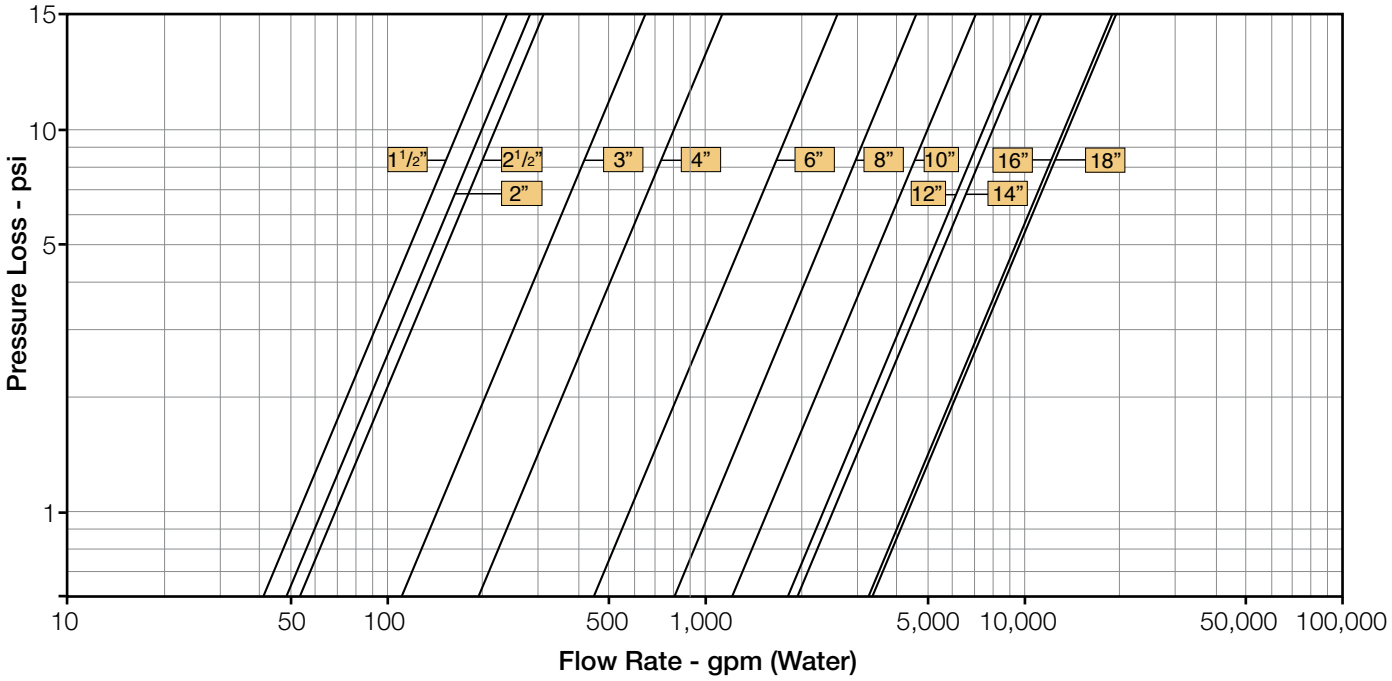


Y Pattern, Throttling Plug (V-Port)

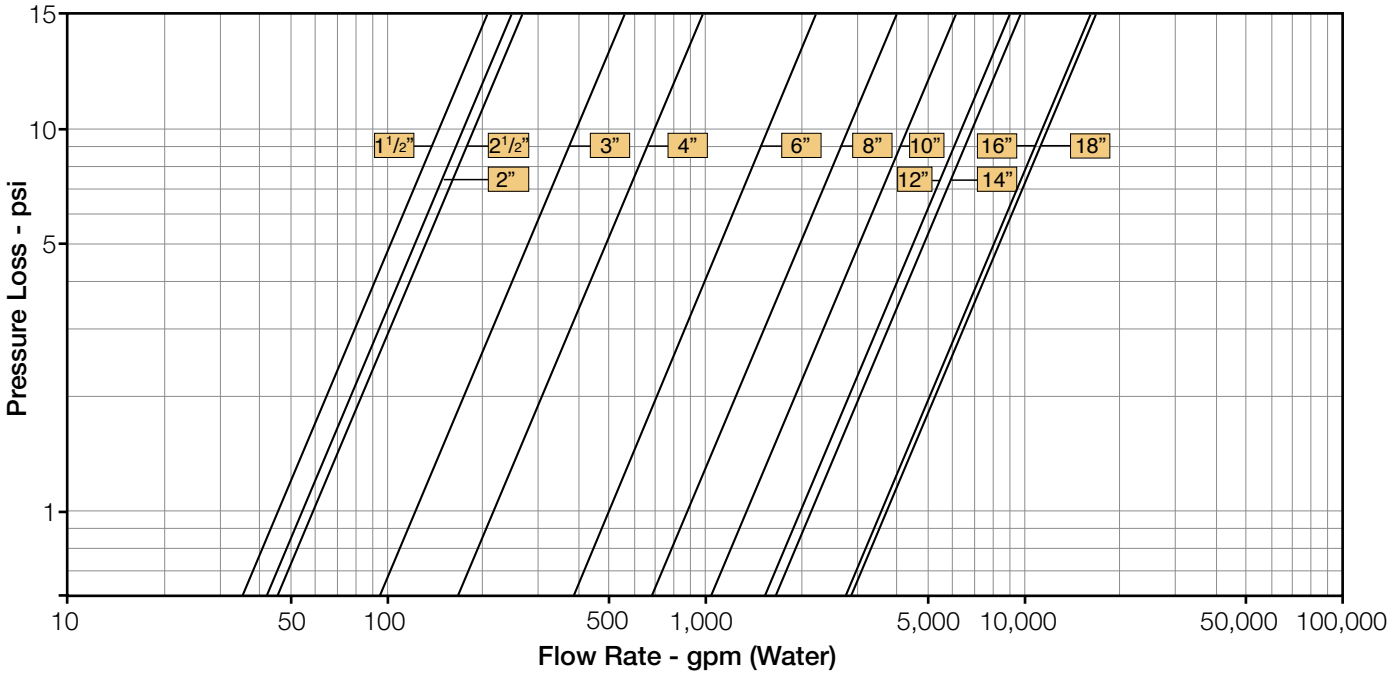


US 700 English

Angle Pattern, Flat Disc



Angle Pattern, Throttling Plug (V-Port)



US 700 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 V-Port		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 V-Port		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

		inch	24"	28"	30"	32"	36"
G-Pattern Flat Disc		Cv	8,490	8,670	8,670	8,670	8,670
		K	3.8	6.7	8.8	11.4	17.1
		Leq-feet	616.6	1,280.0	1,807.3	2,495.6	4,136.5

Differential Pressure Calculation

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

Where:

Kv = Valve flow coefficient (flow in m^3/h at 1bar ΔP)

Cv = Valve flow coefficient (flow in gpm at 1psi ΔP)
(Cv = 1.155 Kv)

Q = Flow rate (m^3/h ; gpm)

P = Differential pressure (bar ; psi)

Gf = Liquid specific gravity (Water = 1.0)

Practical formulas for water:

$$Q = Kv\sqrt{\Delta P} \qquad \Delta P = \left(\frac{Q}{Kv}\right)^2$$

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/sec2 ; 32.18 feet/sec^2)

Practical formula:

$$\Delta H = K\frac{V^2}{2g}$$

Equivalent Pipe Length - Leq

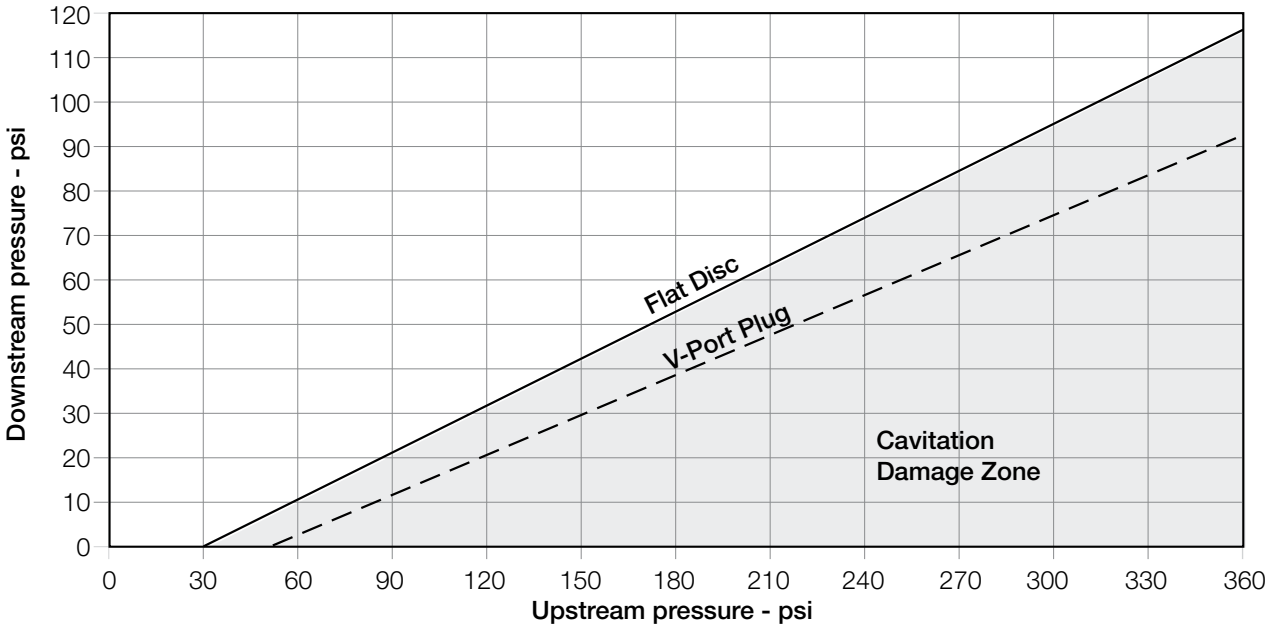
In order to simplify system head loss calculation,
add the Leq value to the pipe length of the relevant size

Note:

The Leq values given are for general consideration only.
Actual Leq may vary somewhat with each of the valve sizes.

US English

Cavitation Guide



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 Guide for Bermad 700 Series valves are based on the formula commonly used in the valve industry:

$\sigma = (P2-Pv) / (P1-P2)$

Where:

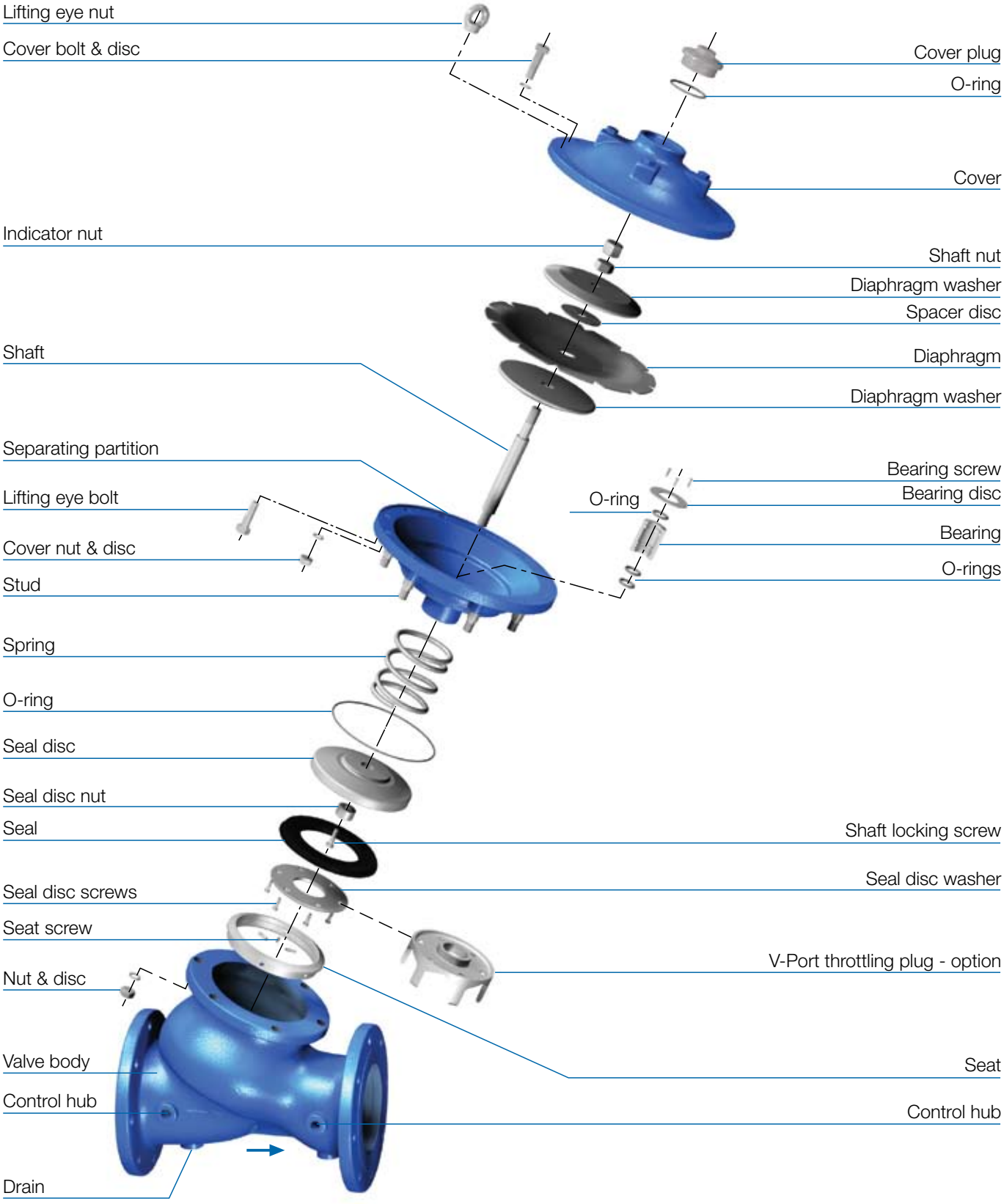
σ = Sigma, cavitation index, dimensionless
P1 = Upstream pressure, absolute
P2 = Downstream pressure, absolute
Pv = Liquid vapor pressure, absolute
(Water, 18ºC = 0.02 bar-a ; 65ºF = 0.3 psi-a)

Use these guide 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:

A) Reduce system pressure in stages designing each pressure stage to be above cavitation conditions.
B) Consider using other valve selection criteria
   a. Valve body and plug type
   b. Valve size
   c. Valve material

Notes:

1. An alternate cavitation index formula introduced by ISA is:
   $\sigma ISA = (P1-Pv) / (P1-P2)$ which equals $\sigma+1$
2. The above charts should be considered only as a general guide.
3. For optimum system and control valve application please consult Bermad.



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

Standard Operation Pressure – Materials Data

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

Bermad Code	End Connections Standard	Pressure Class	Ductile Iron to ASTM A-536 or EN 1563	Carbon Steel to ASTM A-216-WCB or EN 10083-1	Stainless Steel 316 to ASTM A-743 CF8M or EN 10088-1	Nickel Aluminum Bronze to ASTM B-148 C 95800 or BS-EN 1400 AB-2
10 or E1	I S O	PN 10	+	+	+	+
16 or E6	I S O	PN 16	+	+	+	16 bar
25 or E5	I S O	PN 25	25 bar	25 bar	25 bar	25 bar
40	I S O	PN 40 *	–	40 bar	40 bar	–
A5	A N S I	# 150	250 psi	285 psi	285 psi	250 psi
A3	A N S I	# 300	400 psi	400 psi	400 psi	400 psi
A4	A N S I	# 400 *	–	600 psi	600 psi	–
BD	BS 10	Table D	+	+	+	+
BH	BS 10	Table H	400 psi	400 psi	400 psi	400 psi
J1	J I S	10 K	+	+	+	+
J6	J I S	16 K	27 bar	27 bar	27 bar	27 bar
J2	J I S	20 K	28 bar	28 bar	28 bar	28 bar
J3	J I S	30 K *	–	40 bar	40 bar	–
B1	A B N T	10	+	+	+	+
B6	A B N T	16	+	+	+	16 bar
B2	A B N T	25	25 bar	25 bar	25 bar	25 bar
	Threads					
BP	B S P (Rp ISO 7/1)					
PH	B S P (Rp ISO 7/1)		25 bar	25 bar	25 bar	25 bar
NP	N P T					
NH	N P T		400 psi	400 psi	400 psi	400 psi

External flange diameter might vary from the standard.

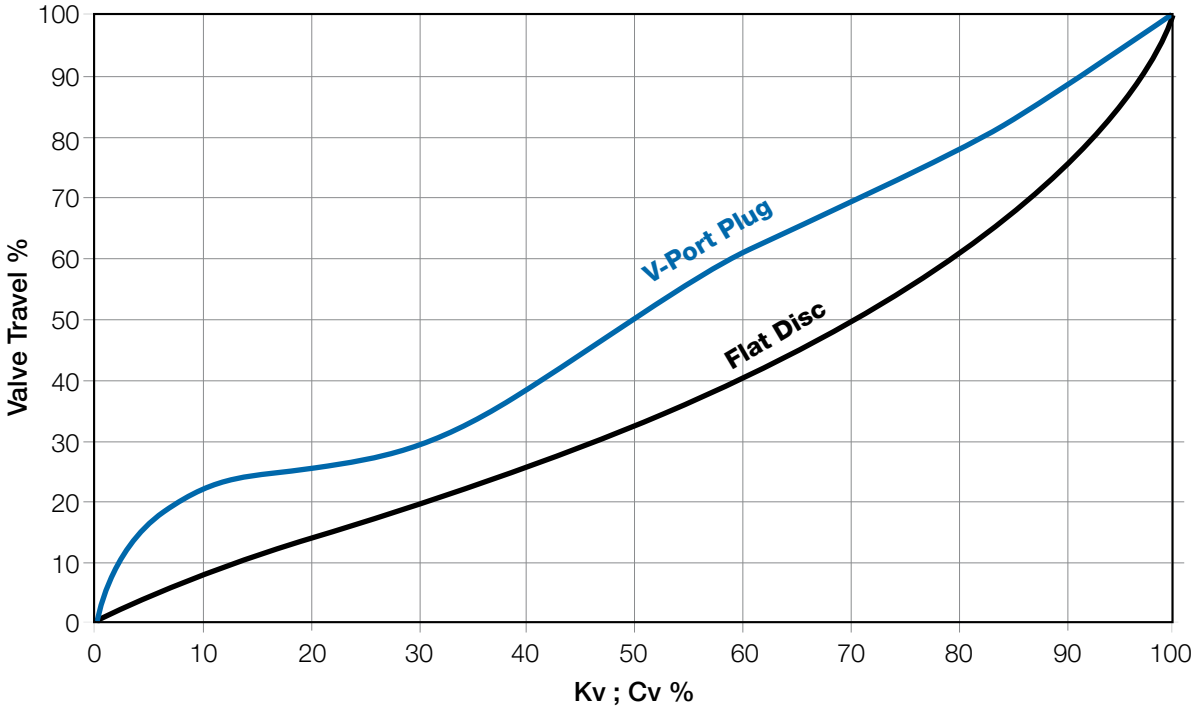
* Can be used in 800 series only.

\+ Available, Not required by the standard pressure class

– Not available

Valve Plugs Characteristics

Kv ; Cv to Valve Opening Chart



Typical Pressure Reducing Performance Chart

Actual Hydraulic Laboratory Results