



Potable Water



Fire Protection



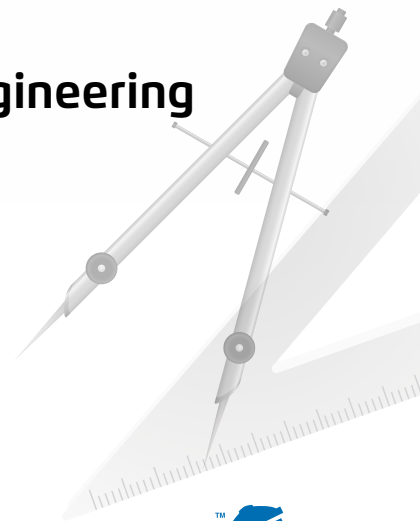
HVAC Systems

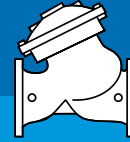


Treated Water

Buildings & Construction | 700 series

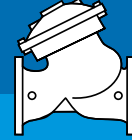
BERMAD Hydraulic Control Valves & Solution | Engineering





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700 SERIES FAMILY

BERMAD 700 series are hydraulically operated, oblique or angle pattern control valves with excellent flow capacity and double chamber unitized actuator, that can be disassembled from the body as a separate integral unit.

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

The 700 series meet all flange connection standards.

700 CLASSIC



With high flow capacity and double chamber actuator the 700 classic is the father of the family, available in a variety of construction materials and configurations.

700 SIGMA EN



Full port valve with high cavitation resistance and extraordinarily high flow capacity enabling optimized use of resources and minimizing energy costs.

700 SIGMA ES



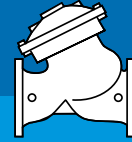
Designed mainly for regulating applications with high risk of cavitation, the valve achieves the optimal performance under variable flow velocities in pipes.



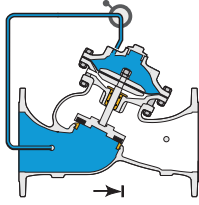
International Standards

	INTERNATIONAL	ISO 9001-2015 Certified Quality Assurance System
ISO 9001	INTERNATIONAL	ISO 9001-2015 Certified Quality Assurance System
	WRAS, UK	The product complies with the Water Regulation Advisory Scheme of UK and BS 6920
	DVGW, Germany	Compliance with the European Standard EN 1074 – Valves for water supply and German Standards KTW and W270
	ACS, France	Tests are based on the French Sanitary standard
	BELGAQUA, Belgium	The product complies with the Belgian Standards for materials in contact with drinking water
	NSF USA	The product complies with the NSF/ ANSI 61 Std. – Valves for Water Supply and NSF 372 low lead
	Bulgarcontrola, Bulgaria	Compliance of Bermad Automatic Control Valves with the sanitary requirements of Bulgaria and with the EN 1074 European Standard for Valves for Water Supply
	PZH, Poland	Compliance of Bermad Automatic Control Valves with the Polish sanitary requirements
	AUSTRALIA AS 5081 and water mark	Control valves for waterworks purposes
	RUSSIAN Customs Union	Valves For Water Supply
	KOREA	Valves For Water Supply

BERMAD valves comply with a wide range of international standards. Please consult with BERMAD about the compliance of a required model to a specific standard

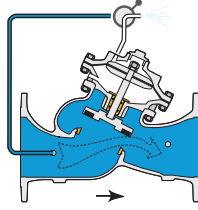


On-Off Modes



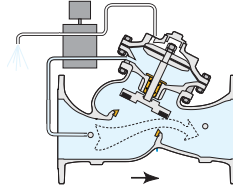
Closed Position

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

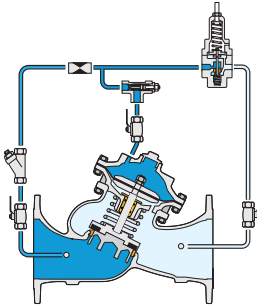
Discharging the pressure in the upper control chamber to atmosphere or some other lower pressure zone causes the line pressure acting on the seal-disk to move the valve to the open position.



Powered Open Position

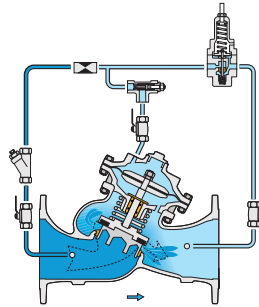
Line pressure is applied to the lower control chamber as pressure in the upper control chamber is vented. This, together with the line pressure acting on the seal-disk, creates a force that powers the valve to the open position.

2-Way Modulating Mode - Pressure Reducing



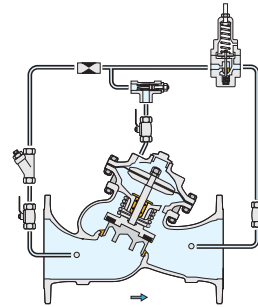
Closed Position

The closed adjustable pilot valve traps line pressure in the upper control chamber. The resulting superior force moves the valve to the fully closed position and provides drip-tight sealing.



Modulating Position

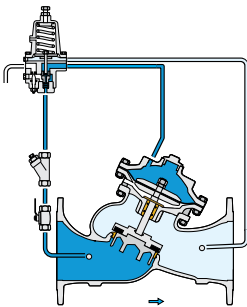
The pilot valve senses line pressure changes and opens or closes accordingly. It controls the accumulated pressure in the valve upper control chamber, causing main valve to modulate to an intermediate position and maintain the preset pressure value.



Open Position

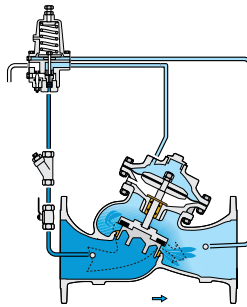
The open pilot valve releases line pressure from the upper control chamber. The line pressure acting on both the lower control chamber and the seal-disk, moves the valve to the open position.

3-Way Modulating Mode - Pressure Reducing



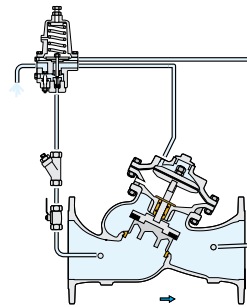
Closed Position

The pilot responds to high downstream pressure and introduces upstream pressure to the upper control chamber. The Double Chamber configuration ensures powered closing at zero flow.



Modulating Position

When the downstream pressure is equal to setting, the plunger in the pilot valve moves to block all passages and freezes the valve. The pilot valve responds to downstream pressure changes and moves the valve to maintain the setting by either venting or pressurizing the control chamber.



Open Position

When downstream pressure is lower than the setting, the plunger in the pilot valve moves to vent the pressure from the control chamber, allowing the valve to fully open. This minimizes pressure loss and ensures maximum possible downstream pressure. The 3-way control on the Double Chambered valves avoids the risk of a hydraulic lockout.



Plug Options

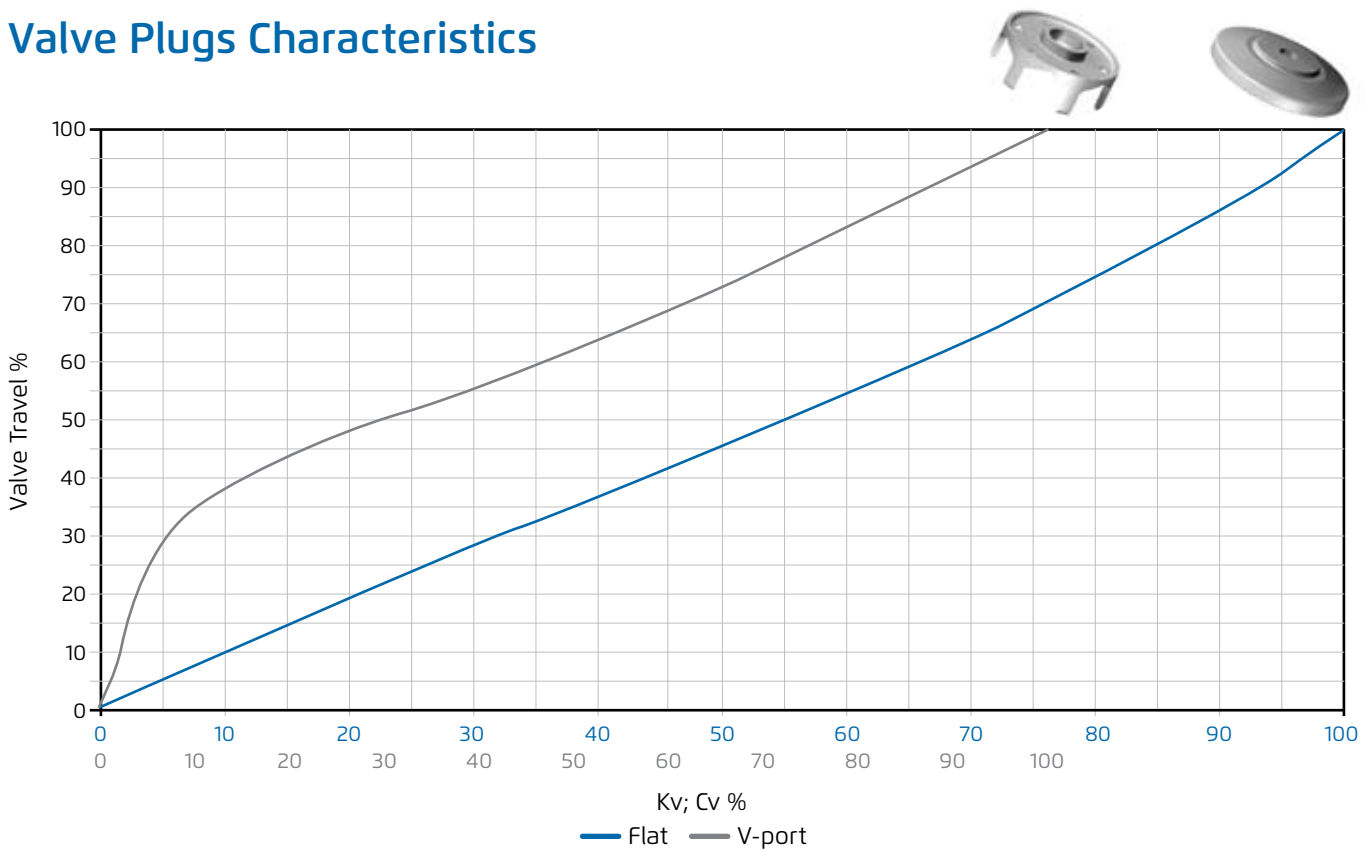
BERMAD's 700 series has various plug options to enable different valve characteristics.

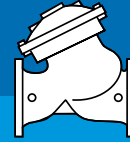
Flat plug - standard plug for on-off and high flow applications.

V-Port plug - uniquely designed throttling plug. It changes the ratio of flow to stem travel allowing very wide flow range with relatively high pressure reduction and provides more accurate, stable and smoother response during pressure and flow regulation, while reducing noise and vibration.

BERMAD's 700 series plugs can easily be change before or after valve installation on site

Valve Plugs Characteristics





Cavitation

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

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.

Noise constraints:

The imploding vapor bubbles in the cavitation phenomena create a sonic wave in the fluid that upon impact with the pipe wall create vibrations that can result in disturbing noise levels.

Many factors affect the noise level generated by pipe fixtures, such as pipe material and wall thickness, installation rigidness, acoustic conditions in the installation space, fluid physical and chemical characteristics and many more.

In terms of hydraulic conditions, working at σ values greater than 0.5 with control valve can significantly reduce noise generation.

The Cavitation Guide is based on the formula commonly used in the valve industry:

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

Where:

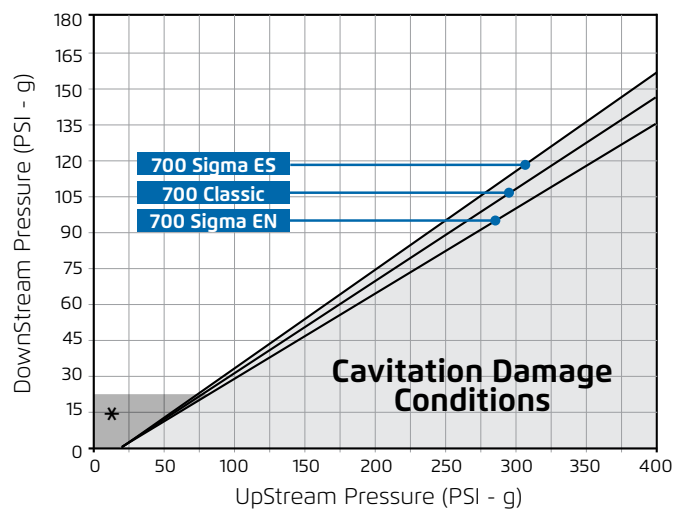
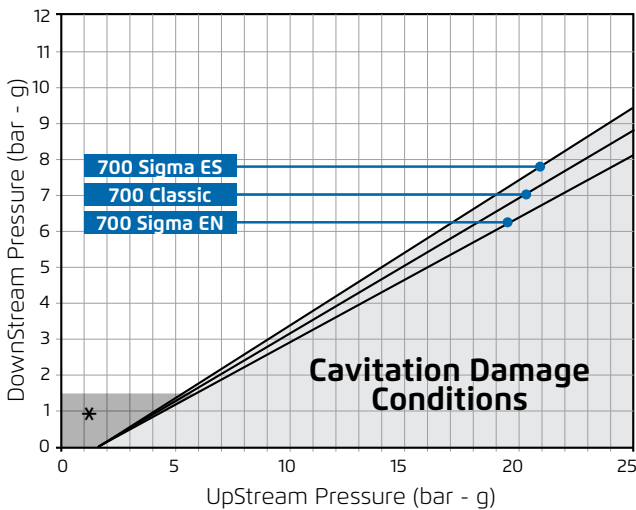
- σ = Sigma, cavitation index, dimensionless
- P1 = Upstream pressure, absolute
- P2 = Downstream pressure, absolute
- Pv = Liquid vapor pressure, absolute
(Water, 18°C = 0.02 bar-a ; 65°F = 0.3 psi-a)

Notes:

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

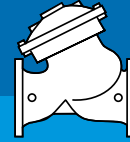
Cavitation Charts

The following charts represent cavitation conditions at 7 ft/s; 2 m/s with flat face plug



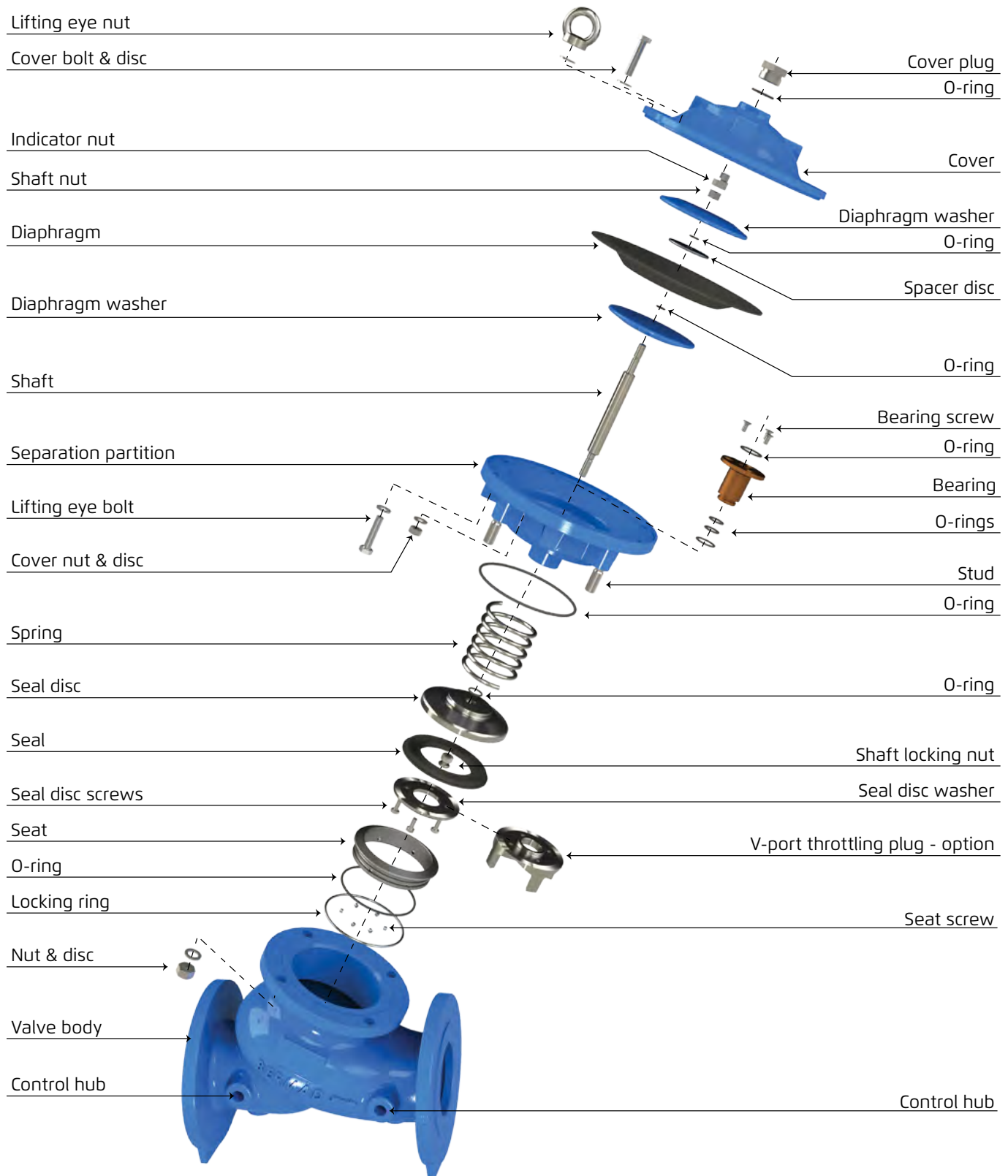
BERMAD can provide solutions for cavitation working conditions such as double stage reduction, cavitation cages and design support, contact the factory for more information.





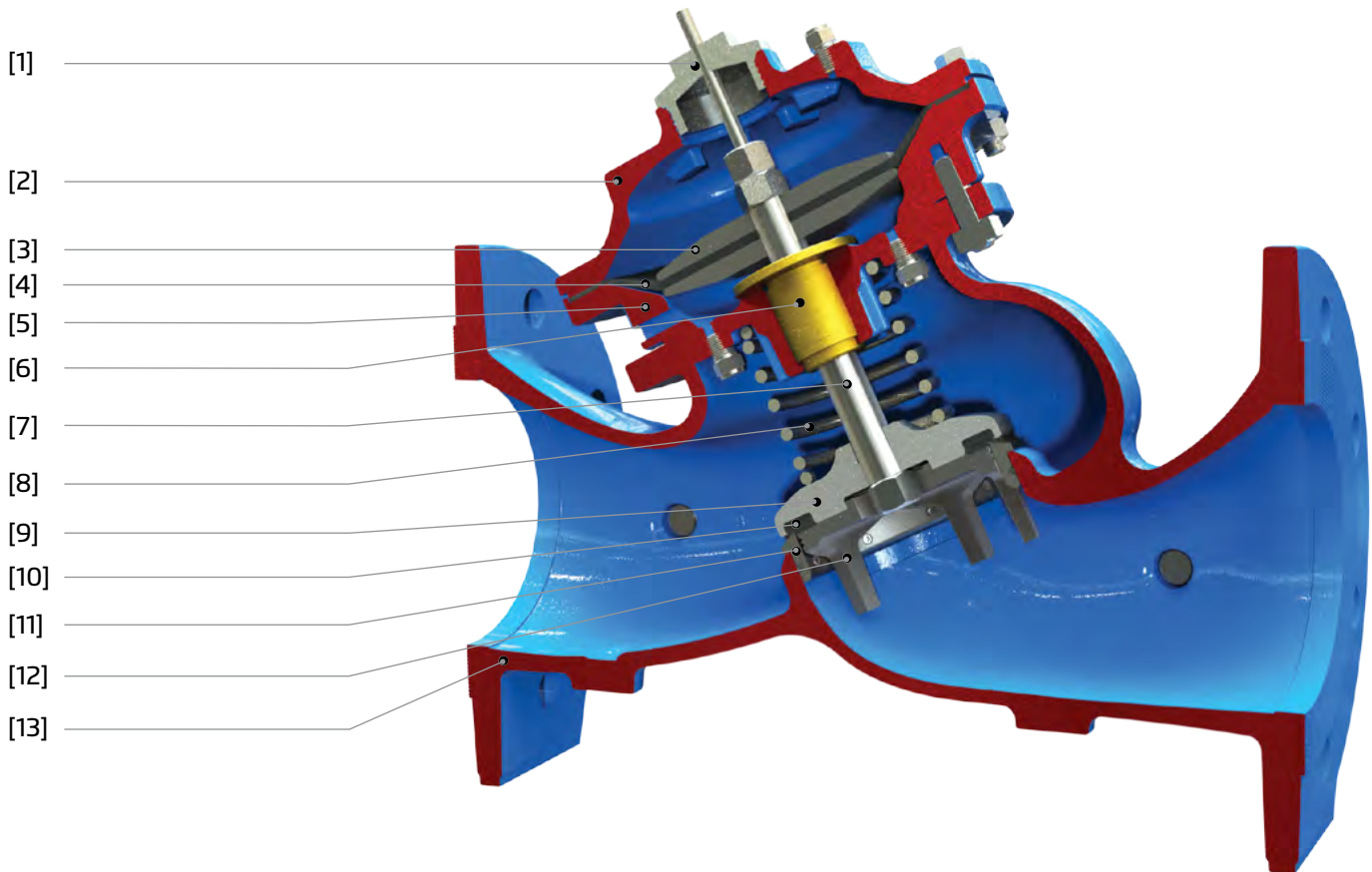
Exploded view

Exploded View



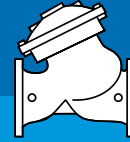


Material Specifications



Item Number	Description	Material (Standard) *	Material (Drinking Water) *
1	Indicator Assembly (optional)	Stainless steel	
2	Cover	Fusion bonded Epoxy Coated Ductile Iron, EN 1563 or ASTM A-536	
3	Diaphragm washer	Epoxy Coated Steel	
4	Diaphragm	Fabric-reinforced NBR	Fabric-reinforced EPDM
5	Separating Partition	Fusion bonded Epoxy Coated Ductile Iron, EN 1563 or ASTM A-536	
6	Bearing	Bronze	Tin Bronze
7	Shaft	Stainless Steel, AISI 303	
8	Spring	Stainless Steel, AISI 302	
9	Seal Disc	Stainless Steel, AISI 410	
10	Seal	NBR	EPDM / NBR
11	Seat	Stainless Steel, AISI 304	
12	V-Port	Tin Bronze, Stainless Steel 316, POM	
	Flat Disc	Stainless Steel, AISI 304	
13	Valve Body	Fusion bonded Epoxy Coated Ductile Iron, EN 1563 or ASTM A-536	
	O-Rings	NBR	EPDM
	Internal Bolts	Stainless Steel, AISI 316/304	
	External Bolts, Studs, Nuts & Disks	Stainless Steel, AISI 316	

* Other Materials Available on Request



700 SIGMA EN

Technical Data

Valve Patterns: "Y" (Globe)
Pressure Rating: 25 bar
End Connections: Flanged (all standards)
Plug Types: Flat disc, V-port, Cavitation cages
Temperature Rating: 60°C.
Optional higher temperature: Available on request

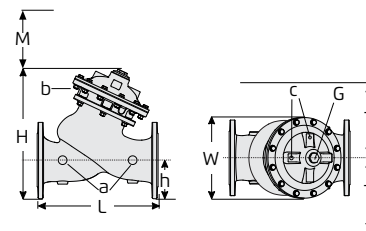
Standard Materials:
Body & actuator: Ductile Iron
Bolts, nuts & studs: Stainless Steel
Internals: Stainless Steel, Tin Bronze & Coated Steel, POM
Diaphragm: Fabric-reinforced synthetic rubber
Seals: Synthetic rubber
Coating: Dark blue Fusion bonded epoxy
For other materials contact BERMAD.

Dimensions & Weights

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
	mm	40	50	65	80	100	150	200	250	300	400
L	mm	230	230	290	310	350	480	600	730	850	1100
W	mm	155	165	190	210	255	320	400	480	570	815
h*	mm	81	86	97	108	130	163	193	227	272	334
H*	mm	234	246	294	333	396	514	618	725	881	1171
M	mm	98	98	108	144	175	314	392	507	615	825
T	mm	225	225	230	233	252	252	263	275	289	338
Weight*	kg	12	14	22	35	55	96	158	256	403	974
Control Chamber Volume	Liters	0.125	0.125	0.3	0.4	0.55	2.15	4.5	8.5	12.4	29.8
Valve travel	mm	16	16	22	26	33	50	62	70	100	134
a	inch	¼" NPT			⅜" NPT			½" NPT		1" BSP	
b	inch	⅛" NPT				¼" NPT		⅜" NPT		¾" BSP	
c	inch	¼" NPT					½" NPT			¾" BSP	
G	inch	¾" G				2" G				3" G	

* Maximum Dimensions

M - Actuator maintenance allowance
 T - Maximal control trim space for left or right side trim



Flow Factors

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
	mm	40	50	65	80	100	150	200	250	300	400
Flat Disc	Kv	57	62	98	130	200	540	905	1480	2140	3300
	K	1.2	2.6	2.9	3.8	3.9	2.7	3.1	2.8	2.8	2.7
V-Port	Kv	46	48	73	102	140	453	767	1310	1940	2970
	K	1.9	4.3	5.3	6.2	8	3.9	4.3	3.6	3.4	4.6

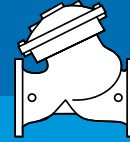
Differential Pressure & Flow Calculation

Kv=Valve flow coefficient (flow in m³/h at ΔP=1bar)

Q=Flow rate (m³/h)

ΔP=Differential pressure (bar)

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



700 SIGMA ES

Technical Data

Valve Patterns: "Y" (Globe)
Pressure Rating: 25 bar
End Connections: Flanged (all standards)
Plug Types: Flat disc, V-port, Cavitation cages
Temperature Rating: 60°C.
Optional higher temperature: Available on request

Standard Materials:
Body & actuator: Ductile Iron
Bolts, nuts & studs: Stainless Steel
Internals: Stainless Steel, Tin Bronze & Coated Steel, POM
Diaphragm: Fabric-reinforced synthetic rubber
Seals: Synthetic rubber
Coating: Dark blue Fusion bonded epoxy
For other materials contact BERMAD.

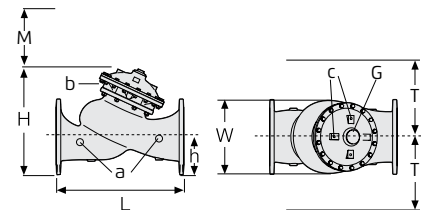
Dimensions & Weights

Nominal Diameter	inch	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	mm	65	80	100	125	150	200	250	300	350	400	450	500	600	
L	mm	290	310	350	400	480	600	730	850	980	1100	1200	1250	1450	
W	mm	190	210	255	270	320	380	450	540	585	660	815	815	920	
h*	mm	98	108	131	140	163	193	227	265	299	334	361	398	490	
H*	mm	242	305	355	375	411	506	600	721	909	943	1195	1220	1240	
M	mm	98	108	144	144	175	314	392	507	615	615	825	825	825	
T	mm	230	230	239	239	251	265	282	293	323	323	323	368	368	
Weight*	kg	18	32	45	62	78	125	198	306	457	515	1024	1085	1290	
Control Chamber Volume	Liters	0.125	0.3	0.4	0.4	0.5	2.15	4.5	8.5	12.4	12.4	29.8	29.8	29.8	
Valve travel	mm	16	22	26	26	41	50	62	70	100	100	134	134	134	
a	inch	¼" NPT	¾" NPT				½" NPT				1" BSP				
b	inch	½" NPT				¼" NPT			¾" NPT			¾" BSP			
c	inch	¼" NPT				½" NPT				¾" BSP					
G	inch	¾" G				2" G				3" G					

* Maximum Dimensions ** For 24", the dimensions is without the sizes of cradle

M - Actuator maintenance allowance

T - Maximal control trim space for left or right side trim



Flow Factors

Nominal Diameter	inch	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	mm	65	80	100	125	150	200	250	300	350	400	450	500	600
Flat Disc	Kv	60	65	143	215	395	610	905	1520	2140	2250	3300	3300	3300
	K	7.8	15.2	7.7	8.3	5.1	6.7	7.5	5.5	5.1	7.9	5.9	9	18.7
V-Port	Kv	51	55	123	183	336	519	769	1292	1857	2027	2970	2970	2970
	K	10.8	21.2	10.4	11.4	7	9.3	10.4	7.6	6.8	9.8	7.3	11.1	23

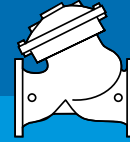
Differential Pressure & Flow Calculation

Kv=Valve flow coefficient (flow in m³/h at ΔP=1bar)

Q=Flow rate (m³/h)

ΔP=Differential pressure (bar)

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



700 Classic

Technical Data

Valve Patterns: "Y" (Globe); "A" (Angle)

Pressure Rating: 16 bar; 25 bar

End Connections: Flanged (all standards), Grooved, Threaded

Plug Types: Flat disc, V-port, Cavitation cages

Temperature Rating: 60°C.

Optional higher temperature: Available on request

Standard Materials:

Body & actuator: Ductile Iron

Bolts, nuts & studs: Stainless Steel

Internals: Stainless Steel, Bronze & Coated Steel, POM

Diaphragm: Fabric-reinforced synthetic rubber

Seals: Synthetic rubber

Coating: Dark blue Fusion bonded epoxy

Optional Body & actuator Materials:





Carbon Steel to EN 10083-1

Stainless Steel 316 to EN 10088-1

Nickel Aluminum Bronze to BS-EN 1400 AB-2

For other materials contact BERMAD.

Flow Factors

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
	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	1250	1850	1990	3310	3430	3550
	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
Y-Pattern V-Port 	Kv	36	43	47	98	170	391	693	1063	1573	1692	2814	2916	3018
	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
Angle Flat Disc 	Kv	46	55	61	127	220	506	897	1375	2035	2189	3641	3773	N/A
	K	1.9	3.2	7.6	4	3.2	3.1	3.1	3.2	3.1	4.9	3	4.5	N/A
Angle V-Port 	Kv	39	47	51	108	187	430	762	1169	1730	1861	3095	3207	N/A
	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	N/A

Differential Pressure Calculation

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

Where:

Kv = Valve flow coefficient (flow in m³/h at 1bar ΔP)

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

(Cv = 1.155 Kv)

Q = Flow rate (m³/h ; gpm)

ΔP = Differential pressure (bar ; psi)

Gf = Liquid specific gravity (Water = 1.0)

Practical formulas for water:

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

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

Where:

K = Flow resistance or Head loss coefficient (dimensionless)

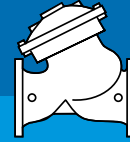
ΔH = Head loss (m ; feet)

V = Nominal size flow velocity (m/sec ; feet/sec.)

g = Acceleration of gravity (9.81 m/sec² ; 32.18 feet/sec²)

Practical formula:

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

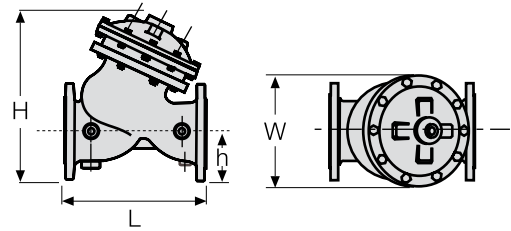


Dimensions & Weights 700 - Classic

700, Y-Pattern, Flanged

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
	mm	40	50	65	80	100	150	200	250	300	350	400	450	500
PN10; PN16														
L	mm	205	205	215	250	320	415	500	605	725	733	990	1000	1100
W	mm	155	165	178	200	223	320	390	480	557	557	740	740	740
h*	mm	78	83	89	100	111	143	172	207	242	268	300	356	358
H*	mm	239	244	250	309	361	512	584	696	822	847	1095	1152	1153
Weight*	kg	9.1	10.6	13	22	37	75	125	217	370	381	846	945	962
PN25														
L	mm	205	210	222	264	335	433	524	637	762	767	1024	1030	1136
W	mm	155	165	190	210	254	320	390	472	557	585	740	740	777
h*	mm	78	83	95	105	127	159	191	223	261	295	325	357	389
H*	mm	239	244	257	314	378	528	602	711	845	873	1122	1154	1186
Weight*	kg	10	12.2	15	25	43	85	146	245	410	434	900	967	986

* Maximum Dimensions



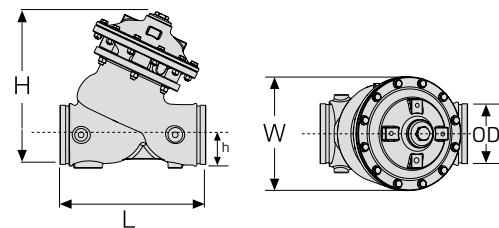
700, Y-Pattern, Grooved

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
OD	mm	48.3	60.3	73.0	88.9	114.3	168.3	219.1
	mm	-	-	76.1	-	-	165.1	-
L	mm	205	210	215	250	320	415	500
W	mm	122	122	122	168	200	320	390
h*	mm	33	40	40	60	74	95	125
H*	mm	194	201	201	265	325	465	529
Weight*	kg	6	6.2	6.5	17	29	58	102

* Maximum Dimensions

Ordering Code		Pipe
PN16	PN25	
VI	V2	IPS (AWWA C606-87)
VB	VD	BS 1387 / EN 10255

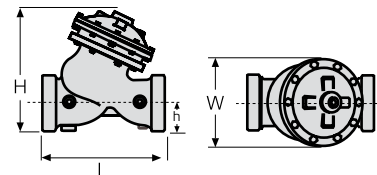
Groove dimensions according to ISO-6182-12



700, Y-Pattern, Threaded

Nominal Diameter	inch	1.5"	2"	2.5"	3"
	mm	40	50	65	80
L	mm	155	155	212	250
W	mm	129	129	129	163
h*	mm	37	40	48	56
H*	mm	201	203	209	264
Weight*	kg	5.5	5.5	8	17

* Maximum Dimensions





Dimensions & Weights 700 - Classic

700, Angle, Flanged

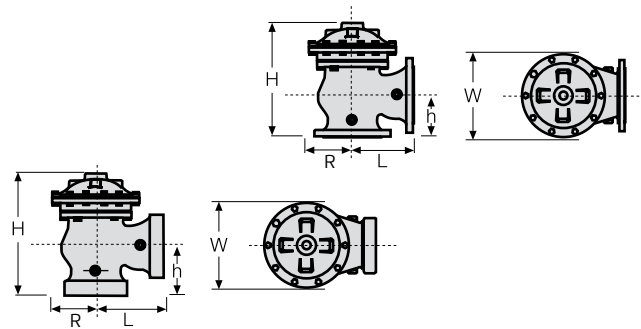
Size	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"
	mm	40	50	65	80	100	150	200	250	300	350	400	450
PN10; PN16													
L	mm	124	124	149	152	191	225	265	320	396	400	450	450
R	mm	83	83	95	100	115	160	195	203	279	264	320	320
W	mm	165	165	178	200	229	320	390	480	558	558	740	740
h*	mm	85	85	109	102	127	152	203	222	275	279	370	370
H*	mm	227	227	251	281	340	440	549	633	778	781	1084	1084
Weight*	kg	9.5	10	12	21.5	35	71	118	205	350	370	800	820
PN25													
L	mm	124	124	149	159	200	234	277	336	415	419	467	467
R	mm	78	83	95	105	127	159	191	223	261	293	325	358
W	mm	155	165	190	210	254	320	381	445	521	585	650	711
h*	mm	85	85	109	109	135	165	216	236	294	299	386	386
H*	mm	227	227	251	287	350	453	558	649	796	801	1099	1099
Weight*	kg	11	11.5	13.5	23	41	81	138	233	390	425	855	870

* Maximum Dimensions

700, Angle, Threaded

Size	inch	1.5"	2"	2.5"	3"
	mm	40	50	65	80
L	mm	-	121	140	159
R	mm	-	62	62	80
W	mm	-	123	123	163
h*	mm	-	83	102	115
H*	mm	-	225	242	294
Weight*	kg	-	5.5	7	15

* Maximum Dimensions

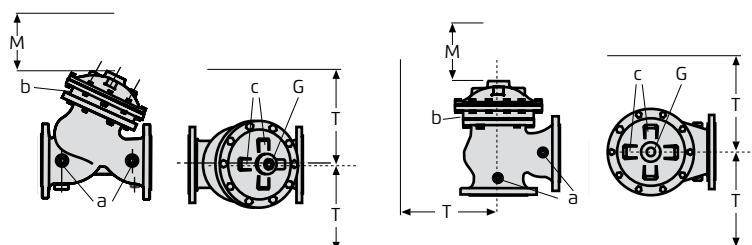


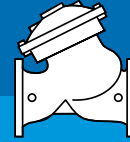
Actuator, Trim Ports and Maintenance

Size	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	
	mm	40	50	65	80	100	150	200	250	300	350	400	450	500	
Control Chamber Volume	Liters	0.125	0.125	0.3	0.3	0.55	2.15	4.5	8.5	12.4	12.4	29.8	29.8	29.8	
Valve travel	mm	16	16	22	25	33	50	62	70	100	100	134	134	134	
M	mm	98	98	98	144	175	314	392	507	615	615	825	825	825	
T	mm	215	222	222	230	236	251	263	276	293	293	311	311	355	
a	inch	1/4" NPT			3/8" NPT			1/2" NPT			1" BSP				
b	inch	1/8" NPT				1/4" NPT			3/8" NPT			3/4" BSP			
c	inch	1/4" NPT						1/2" NPT			3/4" BSP				
G	inch	3/4" G					2" G					3" G			

M - Actuator maintenance allowance

T - Maximal control trim space for left or right side trim



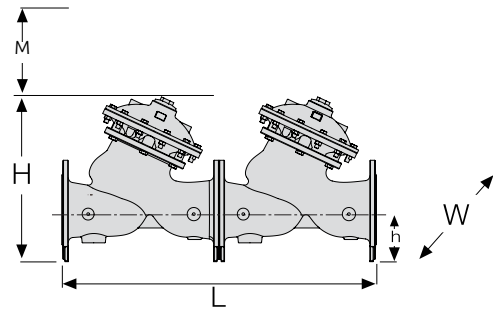


Dimensions & Weights Systems

700EN, Y-Pattern, Flanged

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
L	mm	463	463	583	623	703	963	1203
W	mm	155	165	190	210	255	320	400
h*	mm	81	86	97	108	130	163	193
H*	mm	234	246	294	333	396	514	618
M	mm	98	98	108	144	175	314	392
Weight*	kg	25	29	55	71	111	193	317

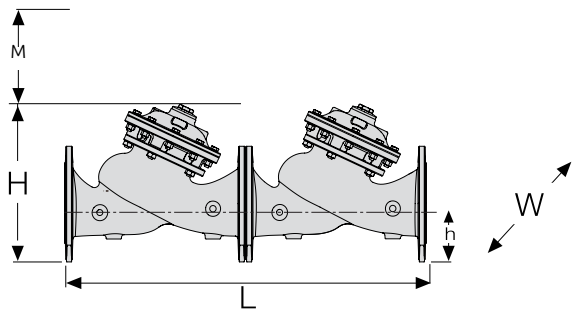
* Maximum Dimensions
Width refers to basic valve, for trim dimensions consult factory



700ES, Y-Pattern, Flanged

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
L	mm	-	-	583	623	703	963	1203
W	mm	-	-	190	210	255	320	380
h*	mm	-	-	98	108	131	163	193
H*	mm	-	-	242	305	355	411	506
M	mm	-	-	98	108	114	175	314
Weight*	kg	-	-	37	65	91	157	251

* Maximum Dimensions
Width refers to basic valve, for trim dimensions consult factory



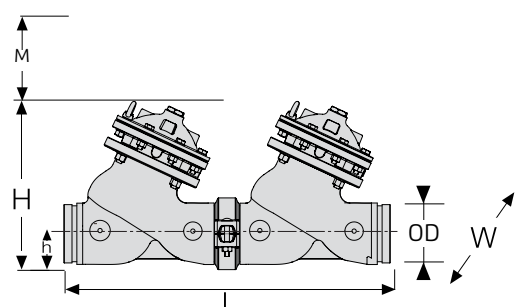
700, Y-Pattern, Grooved

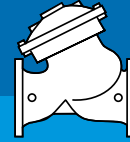
Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
OD	mm	48.3	60.3	73.0	88.9	114.3	168.3	219.1
	mm	-	-	76.1	-	-	165.1	-
L	mm	411	424	434	504	644	834	1005
W	mm	122	122	122	168	200	320	390
h*	mm	33	40	40	60	74	95	125
H*	mm	194	201	201	265	325	465	529
M	mm	98	98	106	144	175	314	392
Weight*	kg	14	14.4	15	36	60	120	208

* Maximum Dimensions
Width refers to basic valve, for trim dimensions consult factory

Ordering Code		Pipe
PN16	PN25	
VI	V2	IPS (AWWA C606-87)
VB	VD	BS 1387 / EN 10255

Groove dimensions according to ISO-6182-12





700 SIGMA EN

Technical Data

Valve Patterns: "Y" (Globe)
Pressure Rating: 400 psi
End Connections: Flanged (all standards)
Plug Types: Flat disc, V-port, Cavitation cages
Temperature Rating: 140°F.
Optional higher temperature: Available on request

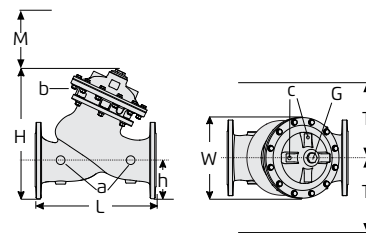
Standard Materials:
Body & actuator: Ductile Iron
Bolts, nuts & studs: Stainless Steel
Internals: Stainless Steel, Tin Bronze & Coated Steel, POM
Diaphragm: Fabric-reinforced synthetic rubber
Seals: Synthetic rubber
Coating: Dark blue Fusion bonded epoxy
For other materials contact BERMAD.

Dimensions & Weights

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
	mm	40	50	65	80	100	150	200	250	300	400
L	inch	9.06	9.06	11.42	12.20	13.78	18.90	23.62	28.74	33.46	43.31
W	inch	6.10	6.50	7.48	8.27	10.04	12.60	15.75	18.90	22.44	32.09
h*	inch	3.19	3.39	3.82	4.25	5.12	6.42	7.60	8.94	10.71	13.15
H*	inch	9.21	9.69	11.57	13.11	15.59	20.24	24.33	28.54	34.69	46.10
M	inch	4	4	4	6	7	12	15	20	24	32
T	inch	9	9	9	9	10	10	10	11	11	13
Weight*	lbs	26	31	60	77	121	212	348	564	888	2147
Control Chamber Volume	Gallons	0.03	0.03	0.07	0.09	0.12	0.47	0.99	1.87	2.73	6.56
Valve travel	inch	0.63	0.63	0.87	1.02	1.30	1.97	2.44	2.76	3.94	5.28
a	inch	¼" NPT			⅜" NPT			½" NPT		1" BSP	
b	inch	⅛" NPT				¼" NPT		⅜" NPT		¾" BSP	
c	inch	¼" NPT					½" NPT			¾" BSP	
G	inch	¾" G				2" G				3" G	

* Maximum Dimensions

M - Actuator maintenance allowance
 T - Maximal control trim space for left or right side trim



Flow Factors

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
	mm	40	50	65	80	100	150	200	250	300	400
Flat Disc	Cv	66	72	113	150	231	624	1045	1709	2472	3812
	K	1.2	2.6	2.9	3.8	3.9	2.7	3.1	2.8	2.8	2.7
V-Port	Cv	53	55	84	118	162	523	886	1513	2241	3430
	K	1.9	4.3	5.3	6.2	8	3.9	4.3	3.6	3.4	4.6

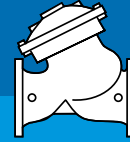
Differential Pressure & Flow Calculation

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

Q=Flow rate (gpm)

ΔP=Differential pressure (psi)

$$\Delta P = \left(\frac{Q}{Cv} \right)^2 \quad Q = Cv \cdot \sqrt{\Delta P} \quad Cv = \frac{Q}{\sqrt{\Delta P}}$$



700 SIGMA ES

Technical Data

Valve Patterns: "Y" (Globe)
Pressure Rating: 400 psi
End Connections: Flanged (all standards)
Plug Types: Flat disc, V-port, Cavitation cages
Temperature Rating: 140°F.
Optional higher temperature: Available on request

Standard Materials:
Body & actuator: Ductile Iron
Bolts, nuts & studs: Stainless Steel
Internals: Stainless Steel, Tin Bronze & Coated Steel, POM
Diaphragm: Fabric-reinforced synthetic rubber
Seals: Synthetic rubber
Coating: Dark blue Fusion bonded epoxy
For other materials contact BERMAD.

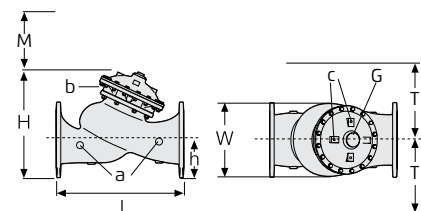
Dimensions & Weights

Nominal Diameter	inch	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"			
	mm	65	80	100	125	150	200	250	300	350	400	450	500	600			
L	inch	11.42	12.20	13.78	15.75	18.90	23.62	28.74	33.46	38.58	43.31	47.24	49.21	57.09			
W	inch	7.48	8.27	10.04	10.63	12.60	14.96	17.72	21.26	23.03	25.98	32.09	32.09	36.22			
h*	inch	3.86	4.25	5.16	5.51	6.42	7.60	8.94	10.43	11.77	13.15	14.21	15.67	19.29			
H*	inch	9.53	12.01	13.98	14.76	16.18	19.92	23.62	28.39	35.79	37.13	47.05	48.03	48.82			
M	inch	4	4	6	6	7	12	15	20	24	24	32	32	32			
T	inch	9	9	9	9	10	10	11	12	13	13	13	14	14			
Weight*	lbs	40	71	99	137	172	276	437	675	1008	1135	2258	2392	2844			
Control Chamber Volume	Gallons	0.03	0.07	0.09	0.09	0.11	0.47	0.99	1.87	2.73	2.73	6.56	6.56	6.56			
Valve travel	inch	0.63	0.87	1.02	1.02	1.61	1.97	2.44	2.76	3.94	3.94	5.28	5.28	5.28			
a	inch	¼" NPT	¾" NPT				½" NPT				1" BSP						
b	inch	½" NPT				¼" NPT				¾" NPT				¾" BSP			
c	inch	¼" NPT				½" NPT				¾" BSP							
G	inch	¾" G				2" G				3" G							

* Maximum Dimensions ** For 24", the dimensions is without the sizes of cradle

M - Actuator maintenance allowance

T - Maximal control trim space for left or right side trim



Flow Factors

Nominal Diameter	inch	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	mm	65	80	100	125	150	200	250	300	350	400	450	500	600
Flat Disc	Cv	69	75	165	248	456	705	1045	1756	2472	2599	3812	3812	3812
	K	7.8	15.2	7.7	8.3	5.1	6.7	7.5	5.5	5.1	7.9	5.9	9	18.7
V-Port	Cv	59	64	142	211	388	599	888	1492	2145	2341	3430	3430	3430
	K	10.8	21.2	10.4	11.4	7	9.3	10.4	7.6	6.8	9.8	7.3	11.1	23

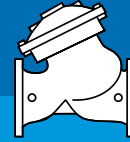
Differential Pressure & Flow Calculation

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

Q=Flow rate (gpm)

ΔP=Differential pressure (psi)

$$\Delta P = \left(\frac{Q}{Cv} \right)^2 \quad Q = Cv * \sqrt{\Delta P} \quad Cv = \frac{Q}{\sqrt{\Delta P}}$$



700 Classic

Technical Data

Valve Patterns: "Y" (Globe); "A" (Angle)

Pressure Rating: 250 psi; 400 psi

End Connections: Flanged (all standards), Grooved, Threaded

Plug Types: Flat disc, V-port, Cavitation cages

Temperature Rating: 140°F.

Optional higher temperature: Available on request

Standard Materials:

Body & actuator: Ductile Iron

Bolts, nuts & studs: Stainless Steel

Internals: Stainless Steel, Bronze & Coated Steel, POM

Diaphragm: Fabric-reinforced synthetic rubber

Seals: Synthetic rubber

Coating: Dark blue Fusion bonded epoxy

Optional Body & actuator Materials:





Carbon Steel to EN 10083-1

Stainless Steel 316 to EN 10088-1

Nickel Aluminum Bronze to BS-EN 1400 AB-2

For other materials contact BERMAD.

Flow Factors

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
	mm	40	50	65	80	100	150	200	250	300	350	400	450	500
Y-Pattern Flat Disc 	Cv	49	58	64	133	231	531	941	1444	2137	2298	3823	3962	4100
	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
Y-Pattern V-Port 	Cv	42	50	54	113	196	452	800	1228	1817	1954	3250	3368	3486
	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
Angle Flat Disc 	Cv	53	64	70	147	254	584	1036	1588	2350	2528	4205	4358	N/A
	K	1.9	3.2	7.6	4	3.2	3.1	3.1	3.2	3.1	4.9	3	4.5	N/A
Angle V-Port 	Cv	45	54	59	125	216	497	880	1350	1998	2149	3575	3704	N/A
	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	N/A

Differential Pressure Calculation

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

Where:

Kv = Valve flow coefficient (flow in m³/h at 1bar ΔP)

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

(Cv = 1.155 Kv)

Q = Flow rate (m³/h ; gpm)

ΔP = Differential pressure (bar ; psi)

Gf = Liquid specific gravity (Water = 1.0)

Practical formulas for water:

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

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

Where:

K = Flow resistance or Head loss coefficient (dimensionless)

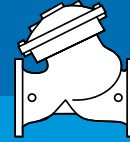
ΔH = Head loss (m ; feet)

V = Nominal size flow velocity (m/sec ; feet/sec.)

g = Acceleration of gravity (9.81 m/sec² ; 32.18 feet/sec²)

Practical formula:

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

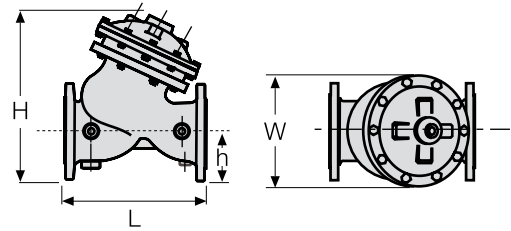


Dimensions & Weights 700 - Classic

700, Y-Pattern, Flanged

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
	mm	40	50	65	80	100	150	200	250	300	350	400	450	500
ANSI #150 (250 psi; PN16)														
L	inch	8.07	8.07	8.46	9.84	12.60	16.34	19.69	23.82	28.54	28.86	38.98	39.37	43.31
W	inch	6.10	6.50	7.01	7.87	8.78	12.60	15.35	18.90	21.93	21.93	29.13	29.13	29.13
h*	inch	3.07	3.27	3.50	3.94	4.37	5.63	6.77	8.15	9.53	10.55	11.81	14.02	14.09
H*	inch	9.41	9.61	9.84	12.17	14.21	20.16	22.99	27.40	32.36	33.35	43.11	45.35	45.39
Weight*	lbs	20	23	29	49	82	165	276	478	816	840	1865	2083	2121
ANSI #300 (400 psi; PN25)														
L	inch	8.07	8.27	8.74	10.39	13.19	17.05	20.63	25.08	30.00	30.20	40.31	40.55	44.72
W	inch	6.10	6.50	7.48	8.27	10.00	12.60	15.35	18.58	21.93	33.78	29.13	29.13	30.59
h*	inch	3.07	3.27	3.74	4.13	5.00	6.26	7.52	8.78	10.28	11.61	12.80	14.06	15.31
H*	inch	9.41	9.61	10.12	12.36	14.88	20.79	23.70	27.99	33.27	34.37	44.17	45.43	46.69
Weight*	lbs	22	27	33	55	95	187	322	540	904	957	1984	2132	2174

* Maximum Dimensions



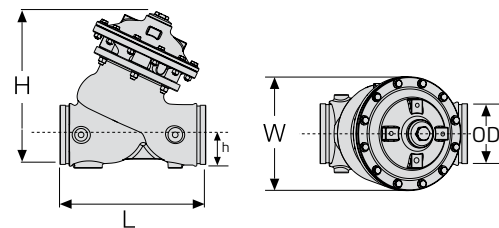
700, Y-Pattern, Grooved

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
OD	inch	1.90	2.37	2.87	3.50	4.50	6.63	8.63
	inch	-	-	3.00	-	-	6.50	-
L	inch	8.07	8.27	8.46	9.84	12.60	16.34	19.69
W	inch	4.80	4.80	4.8	6.61	7.87	12.60	15.35
h*	inch	1.30	1.57	1.57	2.36	2.91	3.74	4.92
H*	inch	7.64	7.91	7.91	10.43	12.80	18.31	20.83
Weight*	lbs	13	14	14	37	64	128	225

* Maximum Dimensions

Ordering Code		Pipe
250 psi	400 psi	
VI	V2	IPS (AWWA C606-87)
VB	VD	BS 1387 / EN 10255

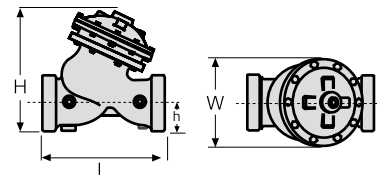
Groove dimensions according to ISO-6182-12

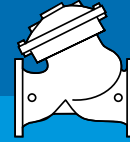


700, Y-Pattern, Threaded

Nominal Diameter	inch	1.5"	2"	2.5"	3"
	mm	40	50	65	80
L	inch	6.10	6.10	8.35	9.84
W	inch	5.08	5.08	5.08	6.42
h*	inch	1.46	1.57	1.89	2.20
H*	inch	7.91	7.99	8.23	10.39
Weight*	lbs	12	12	18	37

* Maximum Dimensions





Dimensions & Weights 700 - Classic

700, Angle, Flanged

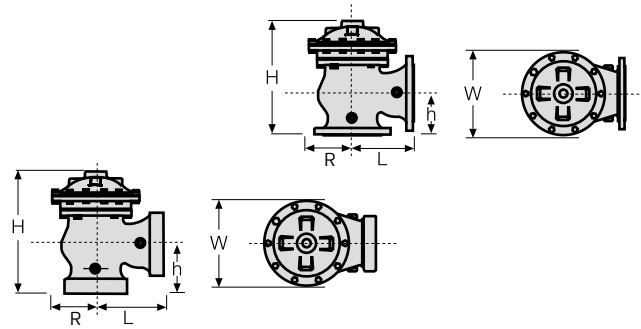
Size	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"
	mm	40	50	65	80	100	150	200	250	300	350	400	450
ANSI #150 (250 psi; PN16)													
L	inch	4.88	4.88	5.87	5.98	7.52	8.86	10.43	12.60	15.59	15.75	17.72	17.72
R	inch	3.27	3.27	3.74	3.94	4.53	6.30	7.68	7.99	10.98	10.39	12.60	12.60
W	inch	6.50	6.50	7.01	7.87	9.02	12.60	15.35	18.90	21.97	21.97	29.13	29.13
h*	inch	3.35	3.35	4.29	4.02	5.00	5.98	7.99	8.74	10.83	10.98	14.57	14.57
H*	inch	8.94	8.94	9.88	11.06	13.39	17.32	21.61	24.92	30.63	30.75	42.68	42.68
Weight*	lbs	21	22	26	47	77	157	260	452	772	816	1764	1808
ANSI #300 (400 psi; PN25)													
L	inch	4.88	4.88	5.87	6.26	7.87	9.21	10.91	13.23	16.34	16.50	18.39	18.39
R	inch	3.07	3.27	3.74	4.13	5.00	6.26	7.52	8.78	10.28	11.54	12.76	14.09
W	inch	6.50	6.50	7.48	8.27	10.00	12.60	15.00	17.52	20.51	23.03	25.59	27.99
h*	inch	3.35	3.35	4.29	4.29	5.31	6.50	8.50	9.29	11.57	11.77	15.20	15.20
H*	inch	8.94	8.94	9.88	11.30	13.78	17.83	21.97	25.55	31.34	31.54	43.27	43.27
Weight*	lbs	24	25	30	51	90	179	304	514	860	937	1885	1918

* Maximum Dimensions

700, Angle, Threaded

Size	inch	1.5"	2"	2.5"	3"
	mm	40	50	65	80
L	inch	-	4.76	5.51	6.26
R	inch	-	2.44	2.44	3.15
W	inch	-	4.84	4.84	6.42
h*	inch	-	3.27	4.02	4.53
H*	inch	-	8.86	9.53	11.57
Weight*	lbs	-	12	15	33

* Maximum Dimensions

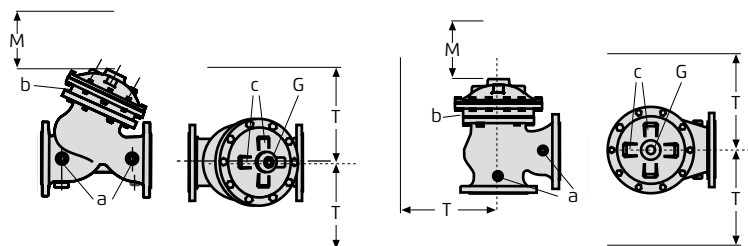


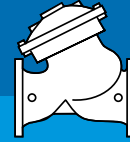
Actuator, Trim Ports and Maintenance

Size	inch	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	
	mm	40	50	65	80	100	150	200	250	300	350	400	450	500	
Control Chamber Volume	Gallons	0.03	0.03	0.07	0.07	0.12	0.47	0.99	1.87	2.73	2.73	6.56	6.56	6.56	
Valve travel	inch	0.63	0.63	0.87	0.98	1.30	1.97	2.44	2.76	3.94	3.94	5.28	5.28	5.28	
M	inch	4	4	4	6	7	12	15	20	24	24	32	32	32	
T	inch	8	9	9	9	9	10	10	11	12	12	12	12	13	
a	inch	¼" NPT			¾" NPT			½" NPT			1" BSP				
b	inch	⅛" NPT				¼" NPT			⅜" NPT			¾" BSP			
c	inch	¼" NPT						½" NPT			¾" BSP				
G	inch	¾" G					2" G					3" G			

M - Actuator maintenance allowance

T - Maximal control trim space for left or right side trim



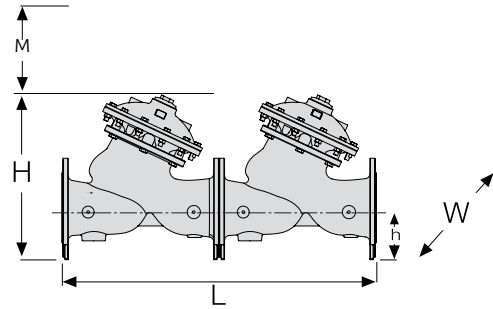


Dimensions & Weights Systems

700EN, Y-Pattern, Flanged

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
L	inch	18.23	18.23	22.95	24.53	27.68	37.91	47.36
W	inch	6.10	6.50	7.48	8.27	10.04	12.60	15.75
h*	inch	3.19	3.39	3.82	4.25	5.12	6.42	7.60
H*	inch	9.21	9.69	11.57	13.11	15.59	20.24	24.33
M	inch	4	4	4	6	7	12	15
Weight*	lbs	54	63	120	155	244	424	698

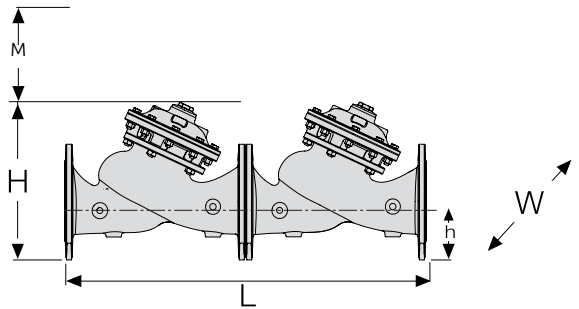
* Maximum Dimensions
Width refers to basic valve, for trim dimensions consult factory



700ES, Y-Pattern, Flanged

Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
L	inch	-	-	22.95	24.53	27.68	37.91	47.36
W	inch	-	-	7.48	8.27	10.04	12.60	14.96
h*	inch	-	-	3.86	4.25	5.16	6.42	7.60
H*	inch	-	-	9.53	12.01	13.98	16.18	19.92
M	inch	-	-	4	4	6	7	12
Weight*	lbs	-	-	80	142	200	345	552

* Maximum Dimensions
Width refers to basic valve, for trim dimensions consult factory



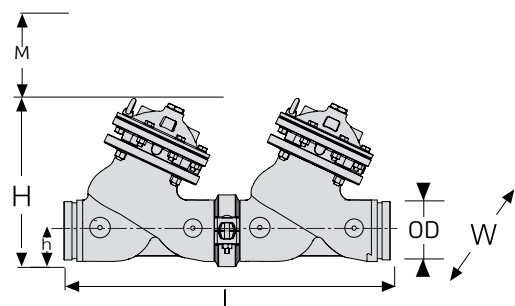
700, Y-Pattern, Grooved

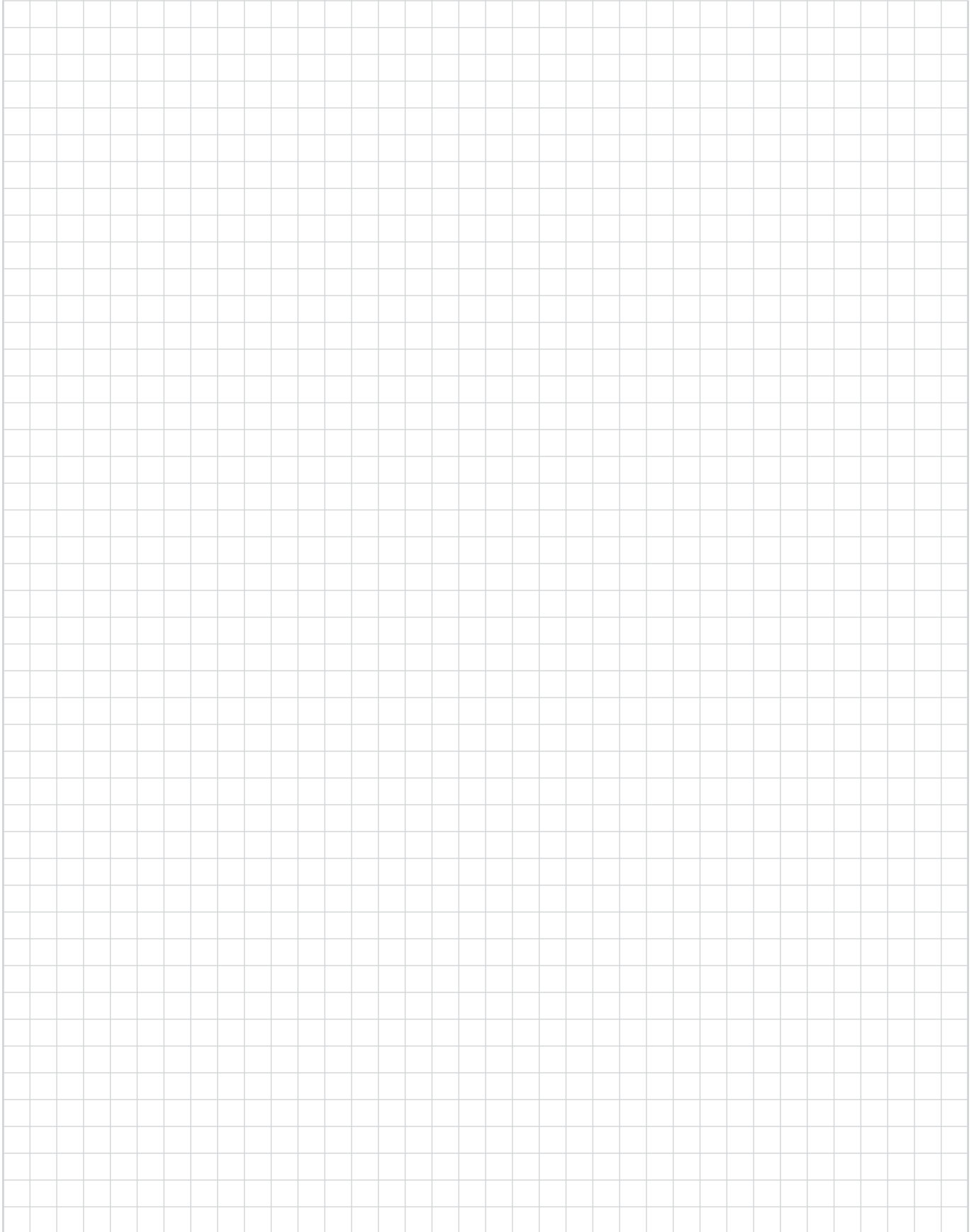
Nominal Diameter	inch	1.5"	2"	2.5"	3"	4"	6"	8"
	mm	40	50	65	80	100	150	200
OD	inch	1.90	2.37	2.87	3.50	4.50	6.63	8.63
	inch	-	-	3.00	-	-	6.50	-
L	inch	16.19	16.69	17.08	19.83	25.35	32.83	39.57
W	inch	4.80	4.80	4.80	6.61	7.87	12.60	15.35
h*	inch	1.30	1.57	1.57	2.36	2.91	3.74	4.92
H*	inch	7.64	7.91	7.91	10.43	12.80	18.31	20.83
M	inch	4	4	4	6	7	12	15
Weight*	lbs	31	32	33	79	132	263	457

* Maximum Dimensions
Width refers to basic valve, for trim dimensions consult factory

Ordering Code		Pipe
250 psi	400 psi	
VI	V2	IPS (AWWA C606-87)
VB	VD	BS 1387 / EN 10255

Groove dimensions according to ISO-6182-12





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September 2019