

Hydraulic Control Valve with Independent Lift Check

Model 700-2S

- Integral check valve
- “Y” or angle, wide body
- Easy addition of features
- In-line serviceable
- Drip tight sealing
- Simple retrofit

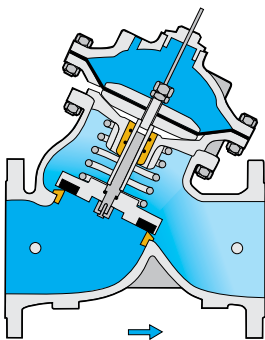


The BERMAD Model 700-2S Hydraulic Control Valve with Independent Lift Check is a hydraulically operated, diaphragm actuated control valve with an integral, lift type, spring loaded non return valve that opens to allow flow in the required direction and smoothly closes drip tight to prevent back flow.

Typical Applications

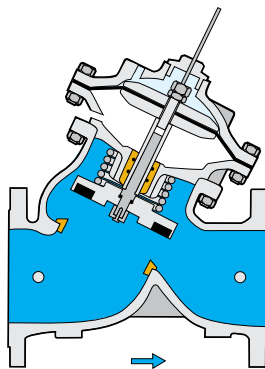
- Pump control valves
- One-way level control valve
- One-way zone backup
- Return flow prevention

Operation



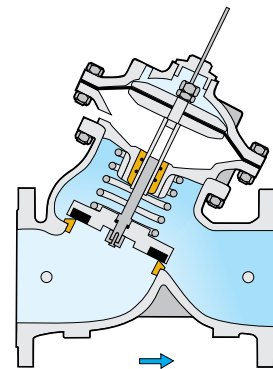
Closed Position

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 from 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.



Check Valve

The independent seal disc assembly closes as soon as differential pressure force across the valve is lower than the spring force, preventing reverse flow through the valve regardless of control chamber pressure and the position of the diaphragm.



Technical Data

Patterns, End Connections & Sizes

"Y" Pattern: Flanged – 1½"-24"; DN40-600

Grooved – 3"-8"; DN80-200

Threaded – 1½"-3"; DN40-80

Angle: Flanged – 1½"-18"; DN40-450

Threaded – 2"-3"; DN50-80

Standard Materials:

Main valve body and cover:

Ductile Iron, Carbon Steel, Stainless Steel

Main valve internal parts:

Stainless Steel, Bronze & Epoxy coated steel

Elastomers: Synthetic Rubber

Coating: Fusion Bonded Epoxy

Other materials are readily available

Water Temperature: Up to 80°C

Consult factory for higher temperature.

Operational Data

- For best performance, install the valve horizontally and upright
- Available position indications (visual, electric limit switch or 4-20mA position transmitter):
 - Diaphragm assembly position (standard)
 - Closure position (optional)
 - Closure position & Diaphragm assembly position (optional)

Pressure Ratings According to Body Materials

Body Material	Grade	End Connection Standard	Type	Max. Operating Pressure
Ductile Iron	ASTM A536 = EN 1563	Flanged ISO 7005-2	PN16	16 bar
			PN25	25 bar
		Grooved	PN25	25 bar
		Threaded ISO 7/1-RP (BSP)	PN25	25 bar
Cast Steel	ASTM A216-WCB = EN 10083-1	Flanged ISO 7005-2	PN16	16 bar
			PN25	25 bar
Stainless Steel 316	ASTM A351 CF8M = EN 10088-1	Flanged ISO 7005-2	PN16	16 bar
			PN25	25 bar

Other end connection standards available on request

Flow Properties

		DN	40	50	65	80	100	150	200	250	300	350	400	450	500	600
		Inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
700 Y-Pattern Flat Disc		Kv	42	50	55	115	200	460	815	1250	1850	1990	3,310	3,430	3,550	4,275
		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	11.1
		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	532.0
700 Angle Flat Disc		Kv	46	55	61	127	220	506	897	1,375	2,035	2,189	3,641	3,773	N/A	N/A
		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	N/A	N/A
		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	N/A	N/A

For V-Port Plug Kv multiply by 0.85

Differential Pressure Calculation

Valve flow coefficient $K_v = Q \sqrt{\frac{G_f}{\Delta P}}$

Where:

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

Q = Flow rate (m³/h)

ΔP = Differential pressure (bar)

Gf = Liquid specific gravity (Water = 1.0)

Practical formulas for water:

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

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)

V = Nominal size flow velocity (m/sec)

g = Acceleration of gravity (9.81 m/sec²)

Practical formula:

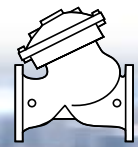
$$\Delta H = K \frac{V^2}{2g}$$

Equivalent Pipe Length - Leq

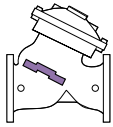
In order to simplify system head loss calculation, add the Leq value to the pipe length of the relevant size.

Note:

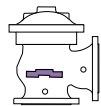
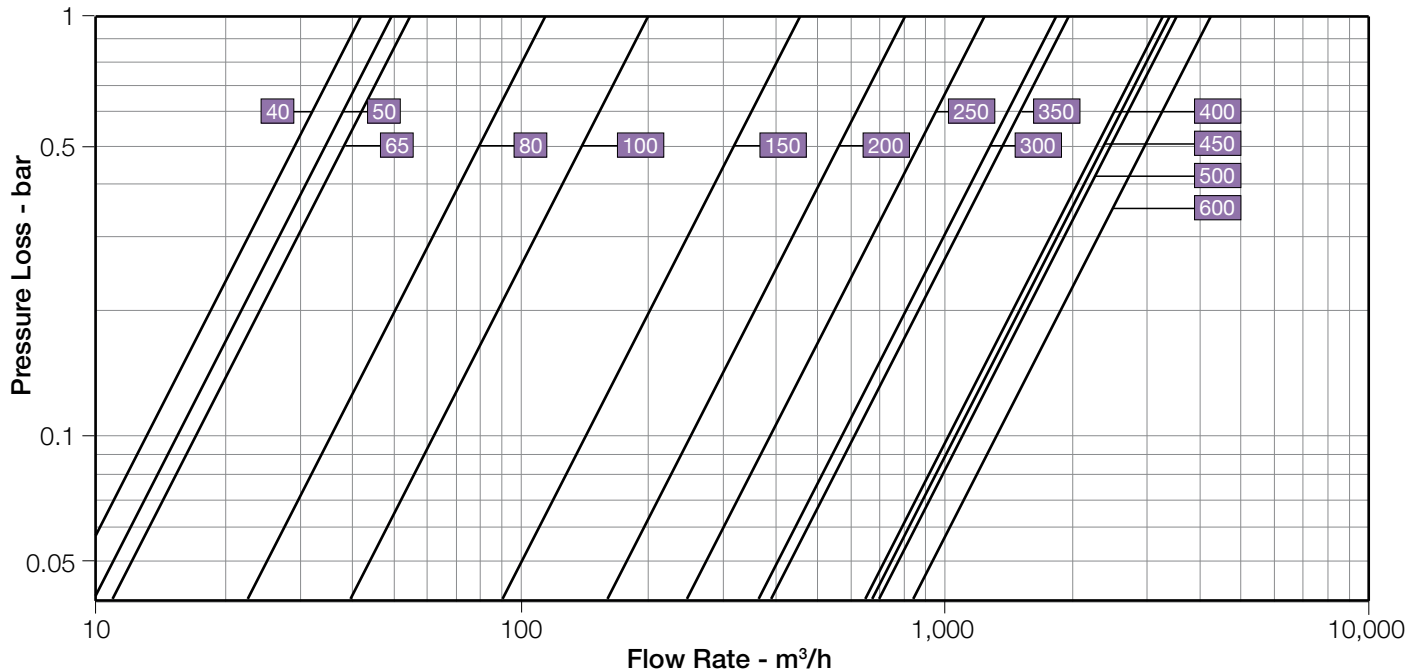
The Leq values given are for general consideration only. Actual Leq may vary somewhat with each of the valve sizes.



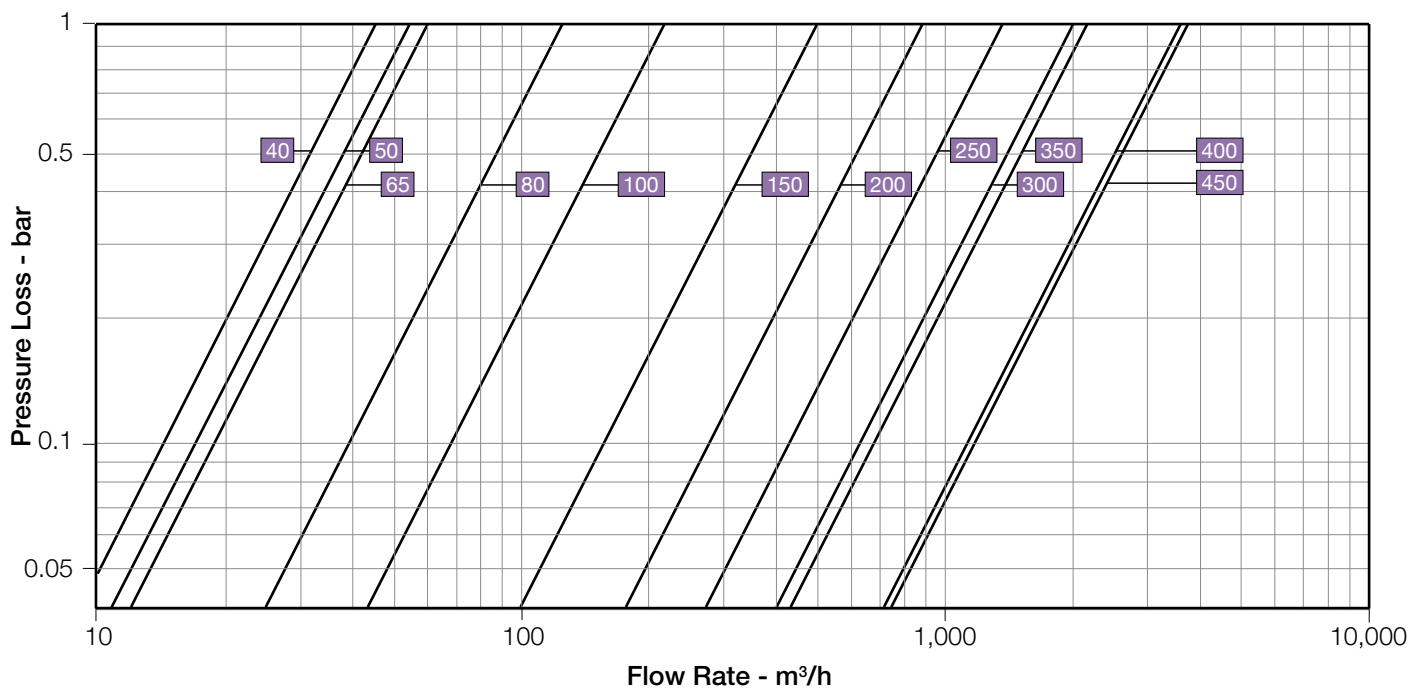
Flow Charts



Y Pattern, Flat Disc

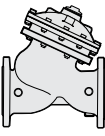
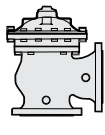
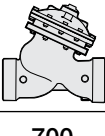
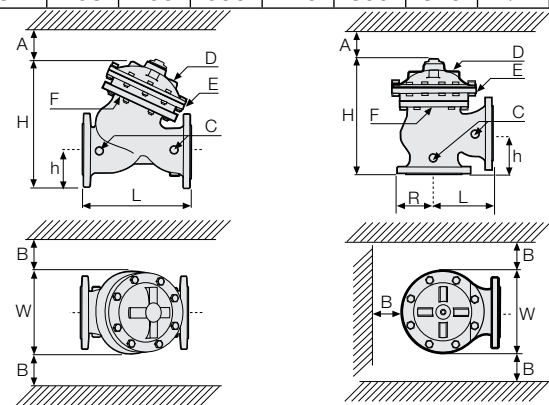
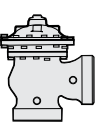


Angle Pattern, Flat Disc





Dimensions & Weights

		DN	40	50	65	80	100	150	200	250	300	350	400	450	500	600
		Inch	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
700 "Y" Pattern 	ISO PN 10; 16	L (mm)	205	210	222	250	320	415	500	605	725	733	990	1,000	1,100	1,450
		W (mm)	155	165	178	200	223	320	390	480	550	550	740	740	740	845
		h (mm)	78	83	95	100	115	143	172	204	242	268	300	319	358	435
		H (mm)	239	244	257	305	366	492	584	724	840	866	1,108	1,127	1,167	1,235
		Weight (Kg)	9.1	10.6	13	22	37	75	125	217	370	381	846	945	962	1,173
	ISO PN 20; 25	L (mm)	205	210	222	264	335	433	524	637	762	767	1,024	1,030	1,136	N/A
		W (mm)	155	165	185	207	250	320	390	480	550	570	740	740	750	N/A
		h (mm)	78	83	95	105	127	159	191	223	261	295	325	357	389	N/A
		H (mm)	239	244	257	314	378	508	602	742	859	893	1,133	1,165	1,197	N/A
		Weight (Kg)	10	12.2	15	25	43	85	146	245	410	434	900	967	986	N/A
700 Angle Pattern 	ISO PN 10 ; 16	L (mm)	124	124	149	152	190	225	265	320	396	400	450	450	N/A	N/A
		W (mm)	155	155	178	200	222	320	390	480	550	550	740	740	N/A	N/A
		R (mm)	78	83	95	100	115	143	172	204	248	264	299	320	N/A	N/A
		h (mm)	85	85	109	102	127	152	203	219	273	279	369	370	N/A	N/A
		H (mm)	227	227	251	281	342	441	545	633	777	781	1,082	1,082	N/A	N/A
		Weight (Kg)	9.5	10	12	21.5	35	71	118	205	350	370	800	820	N/A	N/A
	ISO PN 20; 25	L (mm)	124	124	149	159	200	234	277	336	415	419	467	467	N/A	N/A
		W (mm)	165	165	185	207	250	320	390	480	550	550	740	740	N/A	N/A
		R (mm)	78	85	95	105	127	159	191	223	261	293	325	358	N/A	N/A
		h (mm)	85	85	109	109	135	165	216	236	294	299	386	386	N/A	N/A
		H (mm)	227	227	251	287	350	454	558	649	796	801	1,099	1,099	N/A	N/A
		Weight (Kg)	11	11.5	13.5	23	41	81	138	233	390	425	855	870	N/A	N/A
700 "Y" Pattern 	BSP	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										
700 Angle Pattern 	BSP	L (mm)	N/A	121	140	159										
		W (mm)	N/A	122	122	163										
		R (mm)	N/A	40	48	55										
		h (mm)	N/A	83	102	115										
		H (mm)	N/A	225	242	294										
Weight (Kg)	N/A	5.5	7	15												
Pilot system and minimum service distance	A (mm)	200	200	200	250	320	420	530	620	790	790	1000	1000	1000	1000	
	B (mm)	350	350	350	370	400	430	480	520	550	550	650	650	650	650	
Body ports	C	1¼" NPT				¾" NPT				½" NPT			1" BSPT			
Cover ports	D (NPT)	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	½"	½"	½"	¾"	¾"	¾"	¾"	
Lower chamber ports	E (NPT)	1⁄8"	1⁄8"	1⁄8"	1⁄8"	1⁄8"	1⁄4"	1⁄4"	3⁄8"	3⁄8"	3⁄8"	¾"	¾"	¾"	¾"	
Internal single chamber ports	F (NPT)	1⁄8"	1⁄8"	1⁄8"	1⁄8"	1⁄8"	1⁄4"	1⁄4"	3⁄8"	3⁄8"	3⁄8"	¾"	¾"	¾"	¾"	
Control chamber displacement 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	29.8	29.8	
Stem travel	(mm)	16.5	16.5	16.5	23	28	50	60	80	100	100	135	135	135	135	

Note: For grooved valves dimensions, refer to flanged valves dimensions