

700 Series

# Level and Flow Control Valve with Bi-Level Vertical Float

#### Model 757-66-U

- Reservoir level control
- Prioritizing consumers over reservoir filling
- Backup for reservoir supply valves
- Integral valve cavitation protection

The Model 757-66-U Level and Flow Control Valve with Bi-Level Vertical Float is a hydraulically operated, diaphragm actuated control valve that controls reservoir filling. The valve hydraulically opens at pre-set low level and shuts off at pre-set high level. During filling, it limits the flow to preset maximum, regardless of fluctuating upstream pressure or reservoir level.



## Features and Benefits

- Line pressure driven Independent operation
- Bi-Level hydraulic float control
  - On/Off service
  - Low cavitation damage
  - Reservoir inherent refreshing
- Hydraulic flow sensor (downstream installation)
  - No moving parts
  - No electronic components
  - Wide flow setting range
  - Cavitation damage protection
- Double chamber design
  - Moderated valve reaction
  - Protected diaphragm
- External installation
  - Easy access to valve and float
  - Easy level setting
- In-line serviceable Easy maintenance
- Flexible design Easy addition of features

# **Major Additional Features**

- Closing surge prevention **757-66-49-U**
- Hydraulic float backup **757-66-65-U**
- Altitude pilot backup 757-66-80-U

See relevant BERMAD publications.



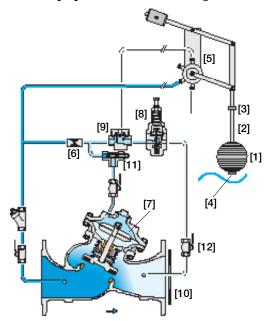


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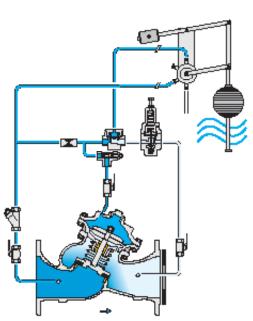
# **Operation**

The Model 757-66-U is a float and pilot controlled valve.

The float [1] slides along the rod [2]. When the float reaches either the adjustable high [3] or low [4] level stoppers, it pushes the rod assembly up or pulls it down, switching the float pilot [5] position. When the float is between the adjustable stoppers, the main valve remains in its last position. The restriction [6] continuously allows flow from valve inlet into the upper control chamber [7]. The Pressure Reducing (PR) pilot [8], and the Hydraulic Relay Valve (HRV) [9], together control outflow from the upper control chamber. At high level, the float pilot applies pressure to the HRV control chamber closing it and causing the main valve to shut off. At low level, the HRV opens, leaving the PR pilot to modulate the main valve open according to orifice [10] upstream pressure. Should this pressure rise above pilot setting, the PR pilot throttles, causing the main valve to throttle closed. Orifice upstream pressure is reduced to pilot setting, limiting the flow. The one-way flow control needle valve [11] stabilizes the valve's reaction in hard regulation conditions, by restricting the flow out of the control chamber. The downstream cock valve [12] enables manual closing.



Low Level - Flow Control Mode



High Level - Valve Closed

## Pilot System Specifications

## **Standard Materials:**

### Pilot:

Body: Stainless Steel 316 or Bronze Elastomers: Synthetic Rubber Spring: Stainless Steel

# Float Pilot:

Body: Brass or Stainless Steel 316 Elastomers: Synthetic rubber

Internal parts: Stainless Steel 316 & Brass Lever system: Brass or Stainless Steel 316

Float: Plastic

Float rod: Stainless Steel

Base plate: Fusion bonded epoxy coated Steel or

Stainless Steel 316

Tubing & Fittings:

Stainless Steel 316 or Copper & Brass

#### Accessories:

Stainless Steel 316, Brass and Synthetic

**Rubber Elastomers** 

## Pilot Adjustment Range:

0.5 to 3.0 bar; 7 to 40 psi 0.8 to 6.5 bar; 11 to 95 psi 1 to 16 bar; 15 to 230 psi

#### Orifice Plate:

Standard material: Stainless Steel

O.D machined according to flange standard

I.D. machined according to required flow rate for optimal sizing and cavitation analysis

#### Notes:

- Minimum level differential: 15 cm (6")Maximum level differential: 54 cm (21")
- Each extension rod adds 56 cm (22"). One extension rod supplied
- Extra counterweight required if second extension rod used
- Recommended continuous flow velocity: 0.3-6.0 m/sec; 1-20 ft/sec
- Inlet pressure, outlet pressure and flow rate are required
- See BERMAD float installation recommendations





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# **Typical Applications**

# **Gravity Fed Lines**

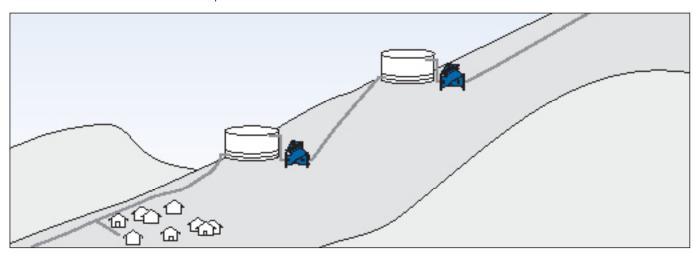
Alternative solutions to accommodate the obvious pressure reducing requirements associated with high elevation differential pipelines are:

- Pressure-reducing valves in series (see BERMAD's publication: Proportional Pressure Reducing Valve, Model 720-PD)
- Sequential pressure breaking reservoirs

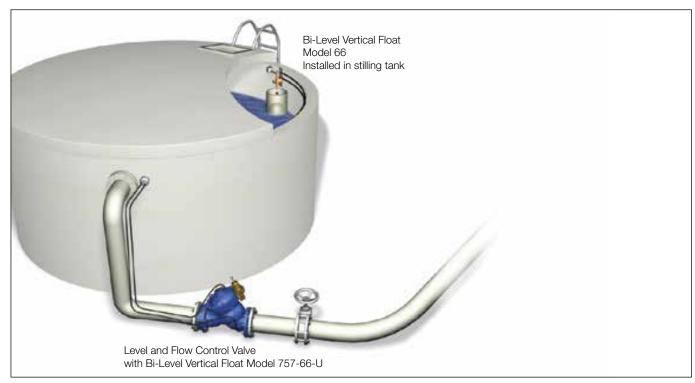
Where pressure breaking reservoirs already exist or are specified, some issues to consider are:

- Pipeline problems associated with line emptying and filling
- Valve cavitation damage
- Reservoir high pressure flow jets

The Model 757-66-U is well suited to provide the solutions to these issues.



# **Typical Installation**







700 Series

# **Technical Data**

Size Range: DN40-900; 11/2-36" End Connections (Pressure Ratings):

Flanged: ISO PN16, PN25 (ANSI Class 150, 300)

Threaded: BSP or NPT Others: Available on request

Valve Patterns: "Y" (globe) & angle, globe (DN600-900; 24"-36")

Working Temperature: Water up to 80°C; 180°F

Standard Materials:

Body & Actuator: Ductile Iron

Internals: Stainless Steel, Bronze & coated Steel Diaphragm: Synthetic Rubber Nylon fabric-reinforced

Seals: Synthetic Rubber

Coating: Fusion Bonded Epoxy, RAL 5005 (Blue) approved for drinking water or Electrostatic Polyester Powder

# Differential Pressure Calculation

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

 $\Delta P$  = Differential Pressure for fully open valve (bar; psi)

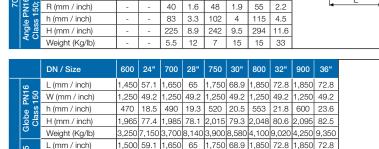
Q = Flow rate (m<sup>3</sup>/h; gpm)

**Kv** = Metric system - valve flow coefficient (flow in m³/h at 1 bar ΔP with 15°C water)

Cv = US system - Valve flow coefficient (flow in gpm at 1 psi ΔP with 60°F water) Cv = 1.155 Kv

# Flow Data & Dimensions Table

		DN / Size	40	1.5"	50	2"	65	2.5"	80	3"	100	4"	150	6"	200	8"	250	10"	300	12"	350	14"	400	16"	450	18"	500	20"
Flow Data	ES	Kv / Cv - Flat	54	62	57	66	60	69	65	75	145	167	395	456	610	705	905	1,045	1,520	1,756	-	-	2,250	2,599	-	-	4,070	4,701
	700ES	Kv / Cv - V-Port	46	53	48	56	51	59	55	64	123	142	336	388	519	599	769	888	1,292	1,492	-	-	1,913	2,209	-	-	3,460	3,996
	700 & 700EN	Kv / Cv - "Y" Flat	42	49	50	58	55	64	115	133	200	230	460	530	815	940	1,250	1,440	1,850	2,140	1,990	2,300	3,310	3,820	3,430	3,960	3,550	4,100
	00 Z	Kv / Cv - "Y" V-Port	36	41	43	49	47	54	98	113	170	200	391	450	693	800	1,063	1,230	1,573	1,820	1,692	1,950	2,814	3,250	2,916	3,370	3,018	3,490
700-ES		L (mm / inch)	230	9.1	230	9.1	290	11.4	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	1,100	43.3	1	-	1,250	49.2
	25	W (mm / inch)	150	5.9	165	6.5	185	7.3	200	7.9	235	9.3	300	11.8	360	14.2	425	16.7	530	20.9	-	-	626	24.6	-	-	838	33
	PN16;	h (mm / inch)	80	3.1	90	3.5	100	3.9	105	4.1	125	4.9	155	6.1	190	7.5	220	8.7	250	9.8	-	-	320	12.6	1	-	385	15.2
	Æ	H (mm / inch)	240	9.4	250	9.8	250	9.8	260	10.2	320	12.6	420	16.5	510	20.1	605	23.8	725	28.5	-	-	895	35.2	1	-	1,185	46.7
		Weight (Kg/lb)	10	22	10.8	23.8	13.2	29	15	33	26	57.2	55	121	95	209	148	326	255	561	-	-	437	960	-	-	1,061	2,334
700-EN	PN16; 25	L (mm / inch)	-	-	-	-	-	-	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	-	-	-	-	-	-
		W (mm / inch)	-	-	-	-	-	-	200	7.9	235	9.3	320	12.6	390	15.4	480	18.9	550	21.7	-	-	-	-	-	-	-	-
		h (mm / inch)	-	-	-	-	-	-	100	3.9	118	4.6	150	5.9	180	7.1	213	8.4	243	9.6	-	-	-	-	-	-	-	-
		H (mm / inch)	-	-	-	-	-	-	305	12	369	14.5	500	19.7	592	23.3	733	28.9	841	33.1	-	-	-	-	-	-	-	-
		Weight (Kg/lb)	-	-	-	-	-	-	21	46.2	31	68.2	70	154	115	253	198	436	337	741	-	-	-	-	-	-	-	-
700 Flanged	N16 150	L (mm / inch)	205	8.1	210	8.3	222	8.7	250	9.8	320	12.6	415	16.3	500	19.7	605	23.8	725	28.5	733	28.9	990	39	1,000	39.4	1,100	43.3
		W (mm / inch)	155	6.1	165	6.5	178	7	200	7.9	223	8.8	320	12.6	390	15.4	480	18.9	550	21.7	550	21.7	740	29.1	740	29.1	740	29.1
	<u>Б</u> 8	h (mm / inch)	78	3.1	83	3.3	95	3.7	100	3.9	115	4.5	143	5.6	172	6.8	204	8	242	9.5	268	10.6	300	11.8	319	12.6	358	14.1
	₽ S	H (mm / inch)	239	9.4	244	9.6	257	10.1	305	12	366	14.4	492	19.4	584	23	724	28.5	840	33.1	866	34.1	1,108	43.6	1,127	44.4	1,167	45.9
		Weight (Kg/lb)	9.1	20	10.6	23	13	29	22	49	37	82	75	165	125	276	217	478	370	816	381	840	846	1,865	945	2,083	962	2,121
	PN25 ss 300	L (mm / inch)	205	8.1	210	8.3	222	8.7	264	10.4	335	13.2	433	17	524	20.6	637	25.1	762	30	767	30.2	1,024	40.3	1,030	40.6	1,136	44.7
		W (mm / inch)	155	6.1	165	6.5	185	7.3	207	8.1	250	9.8	320	12.6	390	15.4	480	18.9	550	21.7	570	22.4	740	29.1	740	29.1	750	29.5
	R SS	h (mm / inch)	78	3.1	83	3.3	95	3.7	105	4.1	127	5	159	6.3	191	7.5	223	8.8	261	10.3	295	11.6	325	12.8	357	14.1	389	15.3
	Clas	H (mm / inch)	239	9.4	244	9.6	257	10.1	314	12.4	378	14.9	508	20	602	23.7	742	29.2	859	33.8	893	35.2	1,133	44.6	1,165	45.9	1,197	47.1
		Weight (Kg/lb)	10	22	12.2	27	15	33	25	55	43	95	85	187	146	322	245	540	410	904	434	957	900	1984	967	2,132	986	2,174
	20	L (mm / inch)	155	6.1	155	6.1	212	8.3	250	9.8																		



122 4.8 122 4.8 163 6.4

18 17 37

6.3

163 6.4

209 8.2 264 10.4

4.8 122 4.8

12 8

4.8 140 5.5 159

121

122

122 4.8

1 250 49 2

470 18.5 490

7.9 202 8

40 1.6 40 1.6 48 1.9 56 2.2

201

5.5 12 5.5

W (mm / inch) h (mm / inch)

H (mm / inch)

Weight (Kg/lb)

L (mm / inch)

W (mm / inch)

W (mm / inch) h (mm / inch)

H (mm / inch)

Weight (Kg/lb)







#### Reservoir level data Settings

Flow data

Size

Main model

Body material

End connection

Pattern

Coating

Pressure data

Additional features

Use Bermad's Waterworks Ordering Guide

Specify when ordering:

Voltage & main valve position

Operational data (according to model)

Tubing & Fittings materials



1,250 49.2 1,250 49.2 1,250 49.2 1,250 49.2

19.3 520 20.5

1,965 77.4 1,985 78.1 2,015 79.3 2,048 80.6 2,095 82.5

3,500 7,700 3,700 8,140 3,900 8,580 4,100 9,020 4,250 9.370

553 21.8 600 23.6