

ONE WAY FLOW ALTITUDE INBAL VALVE

SERIES 500-L1; 600-L1; 700-L1

511-L1
611-L1
711-L1

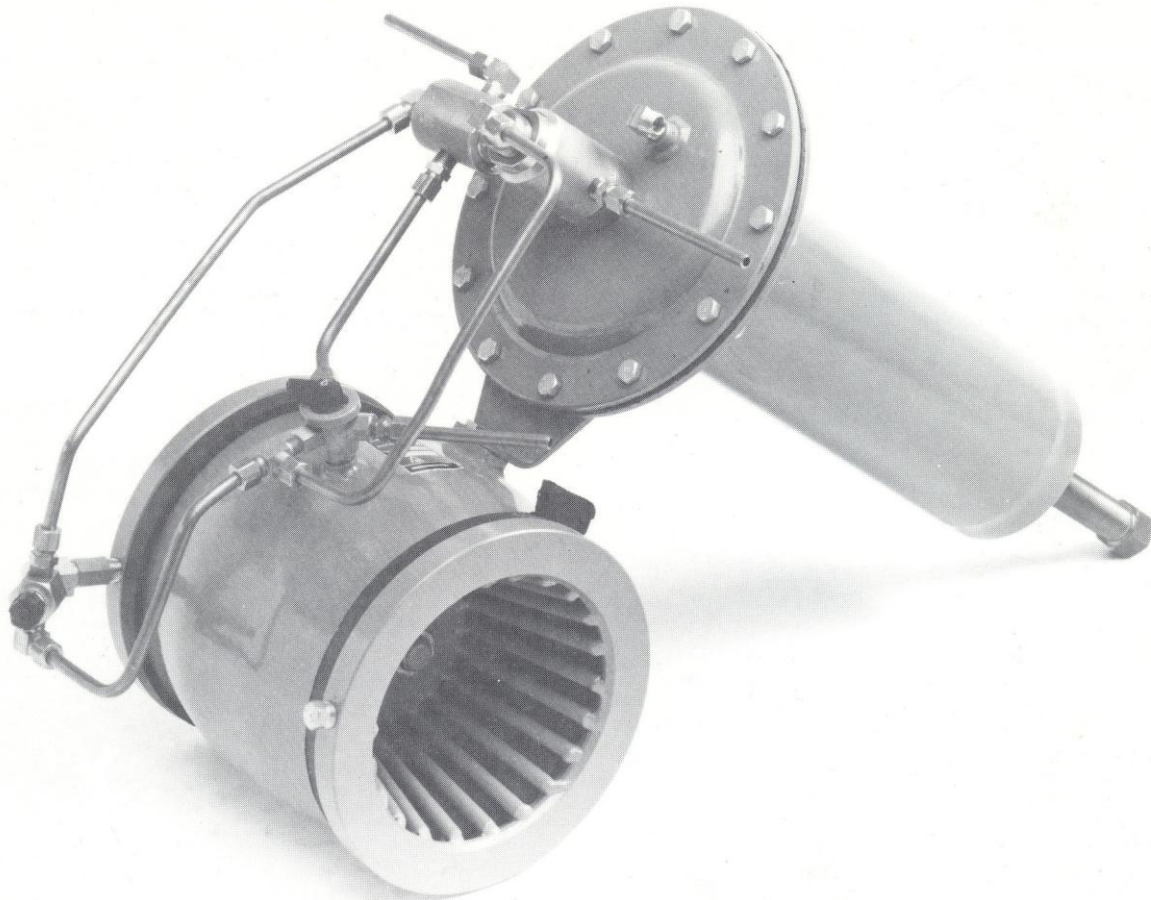
Threaded

533-L1
733-L1

Flanged

599-L1
699-L1
799-L1

Wafer



The **Inbal** one-way flow altitude valve, Model XXX-L1, automatically controls the high water level in tanks, towers or storage reservoirs. It prevents overflow without the use of floats or other devices. The **Inbal** XXX-L1 remains fully open until a predetermined high shut-off point is reached, it will then close drop-tight. It reopens when the level has dropped to a predetermined point.

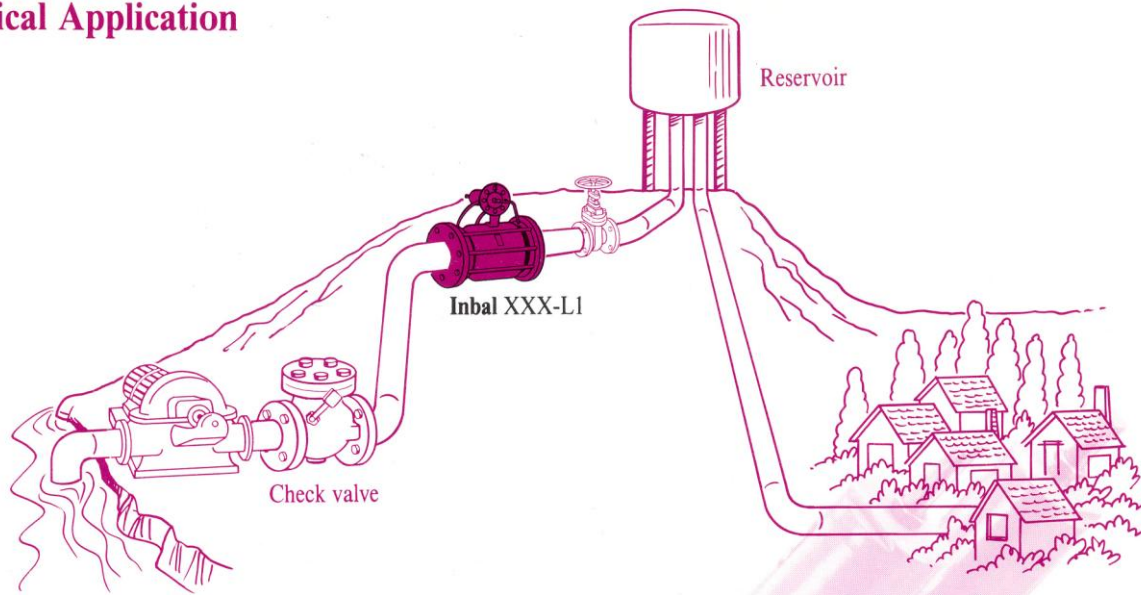
The One Way Flow Altitude Valve consists of **Inbal** Valve series 500, 600 or 700 and pilot control system.

The **Inbal** is a line pressure operated, in-line, sleeve type, axial valve. The control system consists of a spring loaded, hydraulically operated,

diaphragm actuated, 3-way pilot valve and auxiliary accessories.

The pilot control operates on the differential in force between the water head in the reservoir and an adjustable spring load. The pilot accurately controls at the predetermined levels and either supplies pressure to the control space of the **Inbal** valve in order to close fully, or exhausts pressure from the control space in order to open the valve fully. The difference between the high level shut-off and the low level opening may be adjusted from 0.3 Meter (1 ft) to 5 Meter (15 ft). The adjustment of the high level shut-off point is made with a single adjusting screw on the pilot control.

Typical Application



The **Inbal XXX-LI** is installed to provide an effective level control. The pressure sensing line should slope upward to avoid any air pocket. A separate discharge line is used to remove the reservoir water. The valve

opens to refill the reservoir when the water falls to a preset level and will close drop tight when a high level preset shut-off point is reached.



The **Inbal XXX-LIS** is used to sustain pressure in the system to a preset minimum and allow the excess pressure to fill the reservoir. The valve

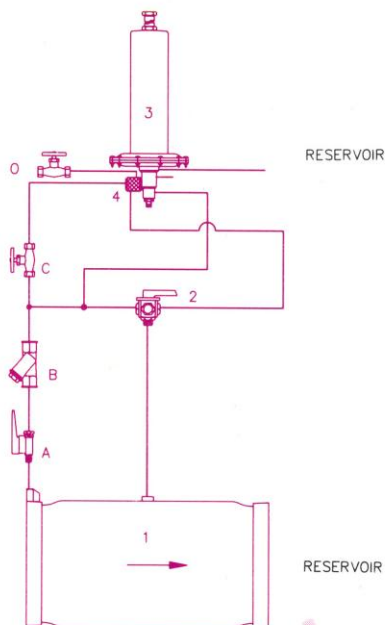
will close when the water reaches the shut-off point and will open when the water drops to the preadjusted lower level.

Product Features

- * The **Inbal** valve contains no mechanical moving parts. It is epoxy coated as standard, and is compact and lightweight. The valve can be installed at any angle, without affecting its performance.
- * The valve operates on the water column principle so that there are no mechanical or electrical parts on, or in the reservoir itself.
- * All adjustment and maintenance of the valve is at ground level.
- * A hydraulic amplifier is installed to give a very precise operation.
- * A selection of springs ensure a high degree of accuracy for

- the shut-off point throughout a wide range of pressures.
- * There is differential control adjustment to delay the opening of the valve when the water level falls.
- * The advanced “no-flow” design of the pilot control system does not permit the flow of water when the **Inbal** valve is not activated to open or close.
- * A manual control override valve is fitted as standard allowing the **Inbal XXX-LI** to be manually operated either as a fully open or drop-tight closed valve at any time.
- * The valve comes complete with a self cleaning 100 mesh strainer as a standard fitting.

Schematic Control Diagram



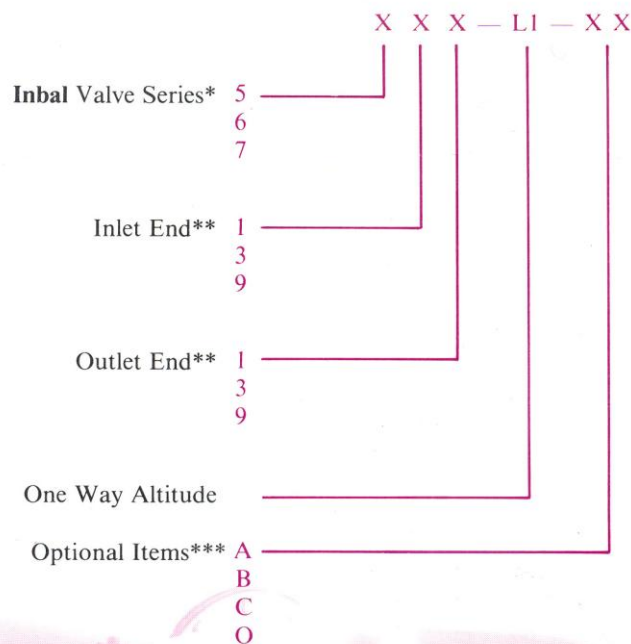
Item	Description	Model
1	Inbal Valve & Self Cleaning strainers	500; 600 or 700
2	Manual Control Valve	341 or 345*
3	Altitude Pilot Valve	PC4
4	Hydraulic Amplifier	283

Optional Features:

A	Shut-off Cock - Isolates Pilot System	351
B	Y Pattern Strainer	31
C	Flow Control - Closing Speed Control	361
O	Flow Control - Opening Speed Control	361

* 341 is recommended for Inbal Valve up to size 150 mm (6").
345 is for sizes 200 mm (8") and larger.

Designation Data



* Request catalog on each series

** Ends: 1-threaded
3-flanged
9-wafer

*** See optional features on the left hand column.

Example: Inbal 799-L1-A is a one way altitude, 700 series, wafer type with shut-off cock.

Purchase Specifications

This valve shall automatically control the high water level in the reservoir. It shall remain fully open until the preset water level in the reservoir is reached and shall remain drip-tight closed until the preset water level drops to a preset low level. It shall be a hydraulically operated, pilot controlled, sleeve type, in-line, axial valve.

The main, in-line valve, shall have only one moving part which is the resilient sleeve. No stem, diaphragm assembly or spring are permitted at the main valve. There shall be no other sealing facilities apart from the sleeve itself.

The pilot control shall be a direct acting, diaphragm actuated, water column head operated, adjustable spring loaded, 3-way valve. It shall be designed to supply alternatively pressure to the control space of the main valve to close it drop-tight, or exhaust pressure to allow the valve to open fully.

The high level shut-off point and the differential control, for opening on a falling level, shall be adjustable. Self cleaning strainers shall be used to protect the control system.

This valve shall be similar in all respects to an Inbal One-way flow altitude valve, model 500-L1, 600-L1 or 700-L1, as manufactured by Mil Limited or approved equal.

Capacity Chart

Inbal Valve Size		Minimum Flow Rate*						Maximum Normal Flow Rate** X00-L1		Maximum Intermittent Flow Rate** X00-L1	
		500-L1		600-L1		700-L1					
mm	inch	m ³ /h	gpm	m ³ /h	gpm	m ³ /h	gpm	m ³ /h	gpm	m ³ /h	gpm
40	1½	1	4.4	0.6	2.7	0.5	2.2	40	175	50	220
50	2	1	4.4	0.6	2.7	0.5	2.2	45	200	60	265
80	3	5	22	3	13	1.5	6.6	105	460	130	570
100	4	10	44	5	22	3	13	180	790	230	1010
150	6	25	110	15	66	10	44	400	1760	560	2460
200	8	40	175	20	88	15	66	700	3080	880	3870
250	10	50	220	-	-	20	88	1100	4840	1350	5940
300	12	80	350	-	-	25	110	1600	7040	1950	8580

* Minimum flow rates are averages which may vary $\pm 30\%$ from tabulated values depending on system characteristics.

** Normal maximum flow rate based on pipe line velocity of 6 m/sec (20 ft/sec).

*** Maximum intermittent flow rate based on pipe line velocity of 8 m/sec (25 ft/sec).

Dimensions & Weights

	Valve model	VALVE SIZE															
		40	1 1/2"	50	2"	80	3"	100	4"	150	6"	200	8"	250	10"	300	12"
L mm/inch	5-6-711-L1	190	7 1/2	190	7 1/2	200	7 7/8	100	4"	150	6"	200	8"	250	10"	300	12"
	5-733-L1					158	6 1/4	190	7 1/2	245	9 9/16	308	12 1/4	363	14 9/32	451	17 3/4
	5-6-799-L1					155	6 1/8	187	7 1/8	235	9 1/4	302	11 7/8	350	13 3/4	445	17 1/2
D mm/inch	5-6-711-L1	162	6 3/8	162	6 3/8	181	7 1/8	100	4"	150	6"	200	8"	250	10"	300	12"
	5-733-L1					200	7 7/8	220	8 11/16	285	11 1/4	340	13 3/8	405	15 5/16	460	18 1/8
	5-6-799-L1					128	5 1/16	160	6 5/16	218	8 9/16	272	10 11/16	324	12 1/4	385	15 1/16
A mm/inch	5-6-711-L1	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16
	5-733-L1					640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16
	5-6-799-L1					640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16	640	25 1/16
B mm/inch	5-6-711-L1	347	13 5/8	347	13 5/8	355	14	370	14 9/16	390	15 3/8	422	16 5/8	444	17 1/2	474	18 5/8
	5-733-L1					355	14	370	14 9/16	390	15 3/8	422	16 5/8	444	17 1/2	474	18 5/8
	5-6-799-L1					355	14	370	14 9/16	390	15 3/8	422	16 5/8	444	17 1/2	474	18 5/8
Weight Kg/lb	711-L1	23	51	23	51	24 1/2	54										
	733-L1					26 1/2	58	30 1/2	67	48	106	68	150	101	222	117	257
	799-L1					22 1/2	50	25 1/2	56	37	81	54	119	65	143	91	200
	511-L1	22	49	22 1/2	50	24 1/2	54										
	533-L1					26	57	28 1/2	63	47 1/2	105	63 1/2	140	87 1/2	193	98 1/2	217
	599-L1					21	46	22 1/2	50	33 1/2	74	45 1/2	100	58 1/2	129	71 1/2	157
	699-L1					19	42	20	44	27 1/2	61	36	79				

The outside dimensions (D) comply with flange standard dimension. Figures demonstrated comply with DIN PN16 standard. Figures are varied according to the flange standard diameter.

Specifications:

Sizes:

40 thru 80 mm (1 1/2"-3") screwed.
50 thru 300 mm (2"-12") flanged.
50 thru 300 mm (2" - 12") wafer
(2"-500 series only)

End details:

Threading: B.S.P; N.P.T standards.
Flanged: ANSI B16.1 Class 125 and 250;
DIN PN 10, 16 & 25 (BS 4504).
BS 10 Table D & E.
JIS B 2212, 2213 & 2214.

Wafer:

Mounts between all standard flanges as detailed above.

Pressure Ratings:

Grade A Sleeve:
21 Bar (300 psi) max (700 series).
16 Bar (235 psi) max (500, 600 series).
1.5 Bar (20 psi) min.
Grade F Sleeve: (500 & 600 series)
5 bar (75 psi) max.
0.8 bar (12 psi) min.

Temperature Range:

Water to +65°C (150°F).

Installation & Storage

- * It is recommended that the control be mounted with the spring assembly up.
- * The sensing line should be 3/4" size cooper tubing. Galvanized pipe is not recommended.
- * The sensing line should slope upward toward the reservoir to self purge air out of the line. Note that the slope of the sensing line should not have high points that would entrap air.
- * The sensing line should not be installed into the flowing line between the valve and reservoir but to 0.3 meter (12") above the bottom of the reservoir.
- * Exhaust tube must be free of any back pressure. Provide an air gap between exhaust tube and to drain facility.
- * Always flush the pipelines to clean before installation of the valve.
- * Arrow on the valve housing must match the actual flow direction.
- * Tighten bolts to the recommended torque values for the specific size and model of valve. Do not over torque.
- * Tighten bolts alternately 180° apart.
- * If the valve is for use in ambient or fluid temperature below freezing consult your nearest **Inbal** distributor. If shut down during cold weather the valve control space and the control system must be drained.

Materials:

Inbal Valve:

Threaded ends: Cast Iron ASTM A48-40B
(DIN 1691 GG-25) Epoxy coated.

Flanges and Ribs: Cast Iron ASTM A48-40B (DIN 1691 GG-25) Epoxy coated.

Housing: Carbon Steel ASTM G 10200
(DIN C22) Epoxy coated.

Sealing disc: PP, PVC.

Sleeve: SMR 5; EDPM.

Control ports: Stainless Steel 303.

Self cleaning strainers and pressure ports: Brass ASTM B21
(DIN CUZn40).

Self cleaning screen: Stainless Steel 316.

Pilot Valve:

Body: Brass ASTM B21 (DIN CUZn40).

Stem: Stainless Steel 303.

Chambers: Carbon Steel ASTM G 10200 (DIN C22)
Epoxy coated.

Diaphragm: Neoprene, nylon fabric reinforced.

Seals: Buna N or Neoprene.

Bracket: Steel Epoxy coated.

Optional Materials:

Inbal Valves:

Threaded ends: Cast Stainless Steel 303 or 316L.

Flanges and Ribs: Carbon Steel ASTM

A-216 WCB (DIN GS-45), Epoxy coated.

Stainless Steel 303 or 316L;

Cast Bronze ASTM B62;

Cast Aluminium QQ-A-601 (A356-T6);

Al-Mg ASTM C 86300 (DIN 1725-2);

Bronze Aluminium ASTM B148 (CA 955),

Cast Iron Rubber lined.

Housing: Cast Iron ASTM A48-40B, (DIN 1691 GG-25)
Epoxy coated.

Cast Aluminium QQ-A-601 (A356-T6);

Al-Mg ASTM C 86300 (DIN 1725-2);

Stainless Steel 303 or 316L.

Pilot valve wetted parts:

Stainless Steel 316L;

Al-Mg ASTM C 86300 (DIN 1725-2);

Bronze Aluminium ASTM B148 (CA955).

Adjustment Range:

Water column:

1 to 25 meter (3 to 80 ft)

15 to 40 meter (50 to 130 ft)

30 to 75 meter (100 to 245 ft)

Differential adjustment range:

(Water column): 0.5 to 7 meter (1.5 to 23 ft).

When ordering please specify:

- 1) Inbal Control Valve Model No.
- 2) Inbal Valve Size
- 3) Line Pressure (min; max).
- 4) High and Low level adjustment range
- 5) Flow rate (min; max).
- 7) Fluid Specifications.
- 8) Options desired.

MIL LTD reserves the right to make such alterations in design, dimensions, specifications and manufacture as are deemed necessary to ensure continued improvement.

REPRESENTED BY:



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