PRESSURE SUSTAINING, PRESSURE RELIEF, BACK PRESSURE
INBAL VALVE SERIES 500-S, 600-S, 700-S.

511-S		533-S		599-S	
611-S	Threaded		Flanged	699-S	Wafer
711-S		733-S		799-S	

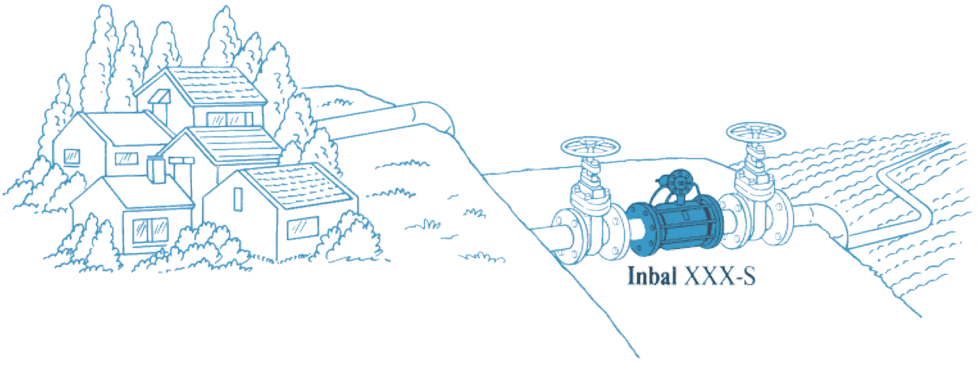
The **Inbal** Pressure Relief Valve, Model XXX-S, automatically maintains a maximum predetermined upstream pressure regardless of fluctuations in the upstream potential and/or changes in the flow rate. The valve can be installed either in a main line or in a by-pass system and will relieve excess pressure to downstream.

The pressure sustaining 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, pressure operated, diaphragm actuated, 3-way pilot valve and auxiliary accessories.

As long as the upstream pressure is below the pilot setting, the valve remains drop-tight closed. Once the upstream pressure exceeds the pilot setting, the **Inbal** valve opens quickly to maintain accurately a constant line pressure. Pressure adjustment is made simple with a single adjusting screw on the pilot control.

Typical Application



Pressure Sustaining Service
The **Inbal** XXX-S sustains the pressure in the upper system and allows water to flow to feed heavy demand in the lower system. This will only occur when the upstream pressure exceeds the preset level that has to be sustained.

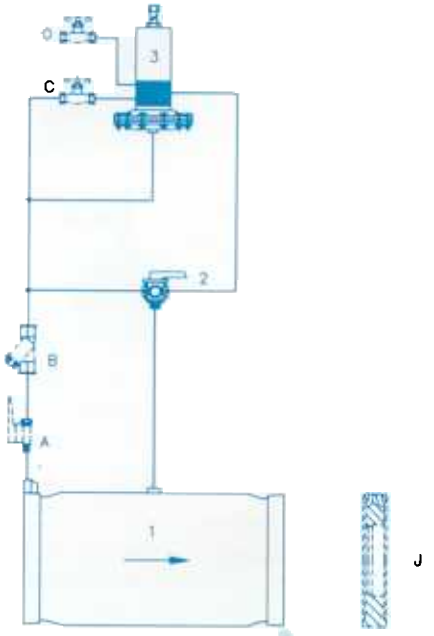
Pump By-pass Pressure Control
The **Inbal** XXX-S maintains a predetermined constant pressure at the HVAC system regardless of units in service by by-passing to the pump inlet.

Pump Discharge Pressure Control
The **Inbal** XXX-S prevents over load and over pumping of the pump and is also used to introduce water gradually into the system when starting up occurs.

Product Features

* The **Inbal** Valve contains no mechanical moving parts. The valve is epoxy coated as standard and is compact and lightweight. It can be installed at any angle, without affecting its performance.
* The **Inbal** Valve is of excellent regulating performance. It closes gradually to prevent pressure surges.
* A wide range of pressure sustaining pilot valves is available to meet the various requirements of pressure range.
* The "floating stem" design of the pilot valves ensures a dependable trouble free service.
* The advanced "no-flow" design of the pilot system reduces maintenance and the need for needle valves and large area strainers.
* A manual control override valve is fitted as standard, allowing the **Inbal** XXX-S to be operated as a manual control valve at any time.
* The valve comes complete with 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	Pressure Reducing Pilot Valve	LA3 or LB3*
	Optional Features:	
A	Shut-off cocks - isolates pilot system	351
B	Y Pattern Strainer	31
C	Flow Control - closing speed control	361
O	Flow Control - opening speed control	361
J	Orifice Plate	012

* 341 & LA3 are recommended for **Inbal** Valve up to size 100 mm (4").
345 & LB3 for sizes 150 mm (6") and larger. Request pilot valve catalogue.

Designation Data

X X X — S — X X

Inbal Valve Series* 5, 6, 7

Inlet End** 1, 3, 9

Outlet End** 1, 3, 9

Pressure Relief, Sustaining, or Back Pressure

Optional Items*** A, B, C, O, J

* Request catalog on each series

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

*** See optional features above.
Example: **Inbal** 533-S-C is a Pressure Relief, 500 series, flanged type valve with a closing speed control.

Purchase Specifications

This valve shall maintain a constant upstream pressure within a narrow pressure range regardless of change in the upstream potential and/or fluctuations in the flow rate. It shall be a hydraulically operated, pilot controlled, sleeve type, in-line axial valve.

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

The pilot contol shall be a direct acting, diaphragm actuated, pressure operated adjustable spring loaded 3-way valve. It shall be designed to permit water to flow out of the control space of the main valve when the control pressure exceeds the spring setting. When the upstream pressure is controlled, flow through the pilot control system will be stopped. Adjustment of the sustained pressure shall be easily accomplished using a threaded bolt located in the top of the pilot. Self cleaning strainers shall be used to protect the control system.

This valve shall be similar in all respects to a Pressure Relief **Inbal** Valve, Model 500-S; 600-S or 700-S as manufactured by Mil Limited or approved equal.

Capacity Chart

Inbal Valve Size		Minimum Flow Rate*						Maximum Normal Flow Rate** X00-S		Maximum Intermittent Flow Rate*** X00-S	
		500-S		600-S		700-S					
mm	inch	m³/h	gpm	m³/h	gpm	m³/h	gpm	m³/h	gpm	m³/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

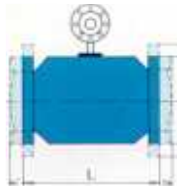
* Minimum flow rates are averages which may vary ±30% from tabulated values depending on system characteristics.

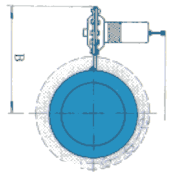
** Normal maximum flow rate based on pipe line velocity of 6 m/sec (20 fit/sec).

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

Dimensions & Weights

	Valve model	VALVE SIZE 40	1½"	50	2"	80	3"	100	4"	150	6"	200	8"	250	10"	300	12"
L mm /inch	5-6-711-S	190	7 1/2	190	7 1/2	200	7 7/8										
	5-733-S					158	6	190	7 1/2	245	9 5/8	308	12 1/8	363	14 9/32	451	17 3/4
	5-6-799-S					155	6 1/8	187	7 3/8	235	9 1/4	302	11 7/8	350	13 3/4	445	17 1/2
D mm /inch	5-6-711-S	162	6 3/8	162	6 3/8	181	7 1/8										
	5-733-S					200	7 7/8	220	8 11/16	285	11 1/4	340	13 3/8	405	15 15/16	460	18 1/8
	5-6-799-S					130	5 1/8	160	6 5/16	218	8 9/16	272	10 11/16	324	12 3/4	385	15 3/16
A mm /inch	5-6-711-S	190	7 1/2	190	7 1/2	190	7 1/2										
	5-733-S					190	7 1/2	190	7 1/2	190	7 1/2	270	10 5/8	270	10 5/8		
	5-6-799-S					190	7 1/2	190	7 1/2	190	7 1/2	270	10 5/8	270	10 5/8	270	10 5/8
B mm /inch	5-6-711-S	242	9 1/2	242	9 1/2	250	9 13/16										
	5-733-S					250	9 13/16	265	10 7/16	294	11 9/16	326	12 13/16	338	13 5/16	368	14 1/2
	5-6-799-S					250	9 13/16	265	10 7/16	294	11 9/16	326	12 13/16	338	13 5/16	368	14 1/2
Weight Kg /lb	711-S	11	24	12	26	13	29										
	733-S					15	33	19	42	37	82	57	126	90	198	106	234
	799-S					11	24	14	31	26	57	43	95	54	119	80	176
	599-S			7 1/2	17	9	20	11	24	21	46	34	75	47	104	60	132
	699-S					7	15	8 1/2	19	15	33	24	53				





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

Specifications:

Sizes:
40 thru 80 mm (1½"-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 listed 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:
5 bar (75 psi) max.
0.8 bar (12 psi) min.

Temperature Range:
Water to +65°C (150°F).

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 A48-40B; (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 CUZN 40)
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);
Bronze Aluminum 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 316.

Pilot valve:
Wetted parts: Stainless Steel 316L;
Al-Mg ASTM C 86300 (DIN 1725-2);
Bronze Aluminium ASTM B148 (CA 955).

Adjustment Ranges:
1 to 3.5 bar (15 to 50 psi)
3 to 8 bar (45 to 115 psi)
7 to 11 bar (100 to 160 psi)
9 to 16 bar (130 to 230 psi)
13 to 21 bar (190 to 300 psi)

Installation & Storage

* To protect the valve from cavitation damages when valve releases excess pressure to atmosphere, it is recommended to install an orifice plate at valve outlet. The orifice size calculated, thus the pressure loss produced at the maximum flow rate service should exceed 1.5 - 2 bar (20 - 30 psi).
* 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.
* Exhaust tube must be free of any back pressure. Provide an air gap between the exhaust tube and to the drain facility.
* 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.

When ordering please specify:
1) **Inbal** Control Valve Model No.
2) **Inbal** Valve Size.
3) Working Pressures (Inlet; Outlet; Adjustment range).
4) Flow rates (min; normal; max),
5) Fluid specifications.
6) Options desired.

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

REPRESENTED BY:

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MIL LTD
17 Moshe Beker St. Rishon Lezion 75359 P.O.Box 1786 Holon 58117, Israel.
Tel. 03-9664350-6, Fax: 03-9664320, Tlx: 381430 MIL-IL; 341284 BLASS