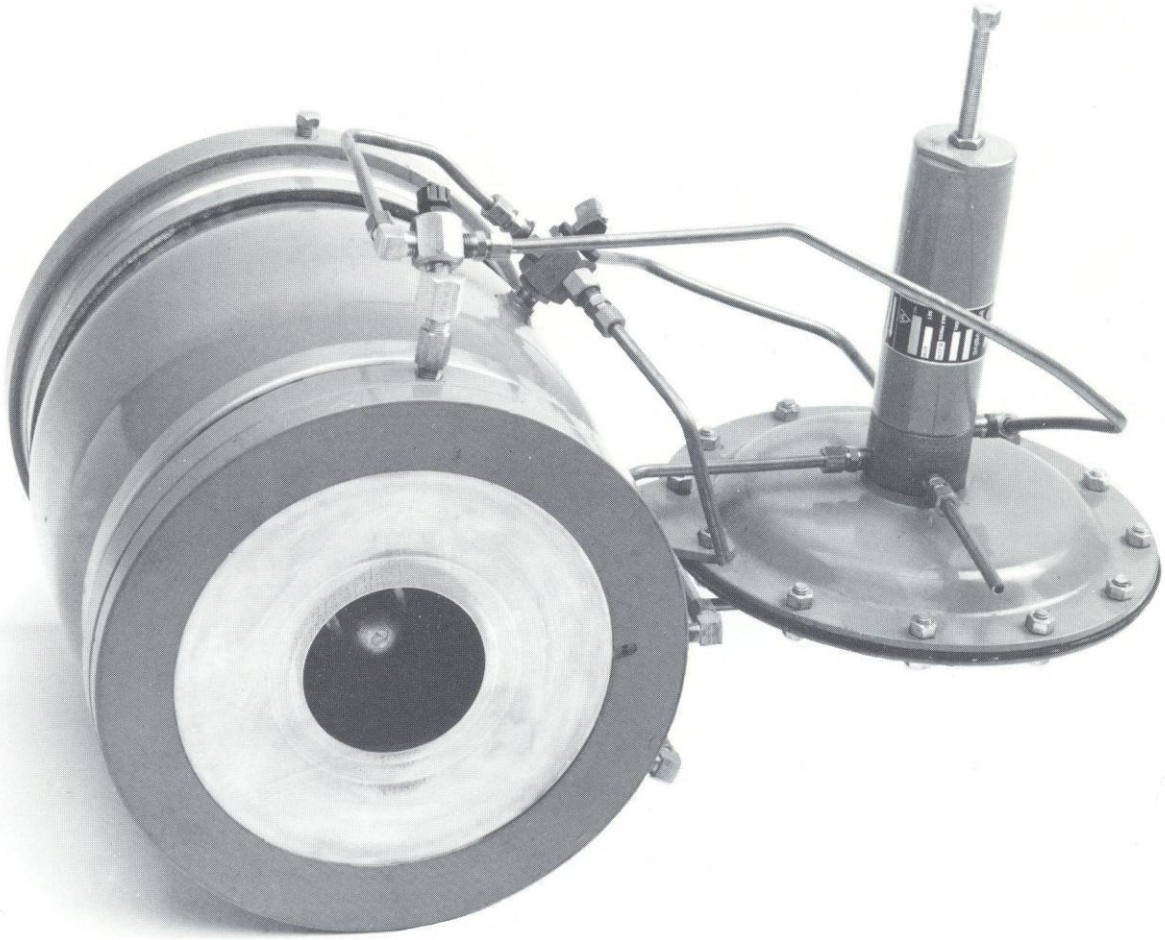
RATE OF FLOW CONTROL INBAL VALVE SERIES 500-T, 600-T, 700-T.

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



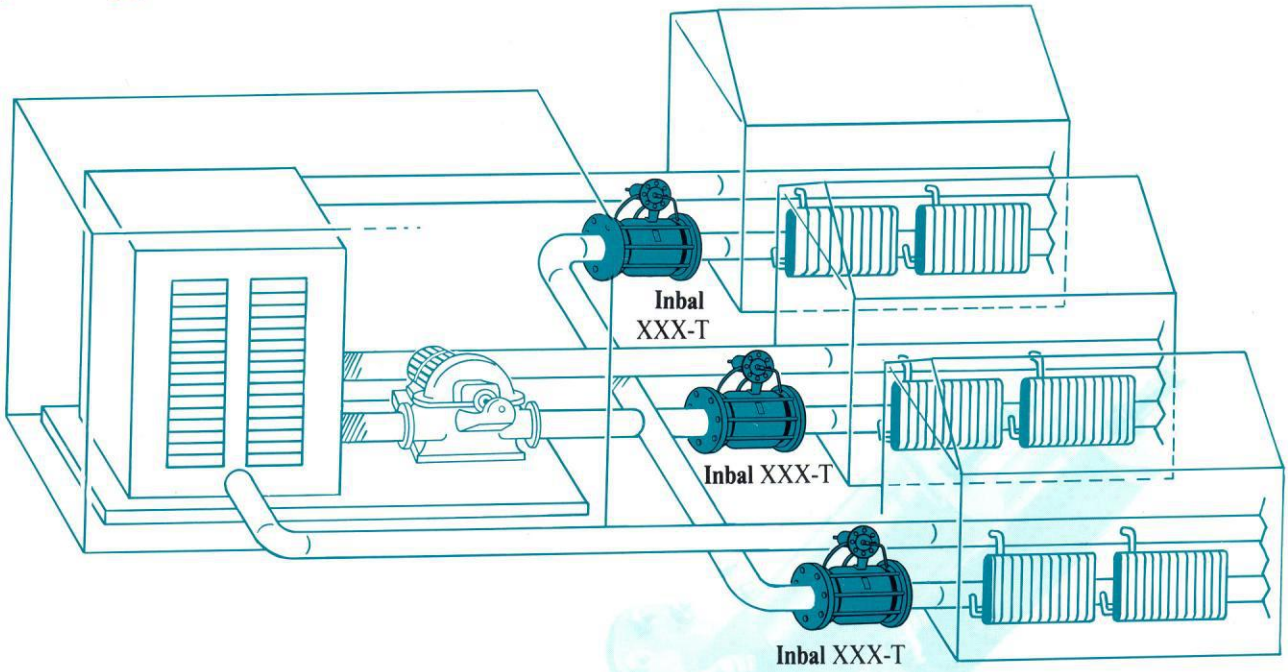
The **Inbal** Rate of Flow Control Valve model XXX-T automatically maintains a constant preset flow rate regardless of fluctuations in the inlet pressure or changes in demand.

The Rate of Flow control valve consists of **Inbal** valve series 500, 600 or 700 and pilot control system.

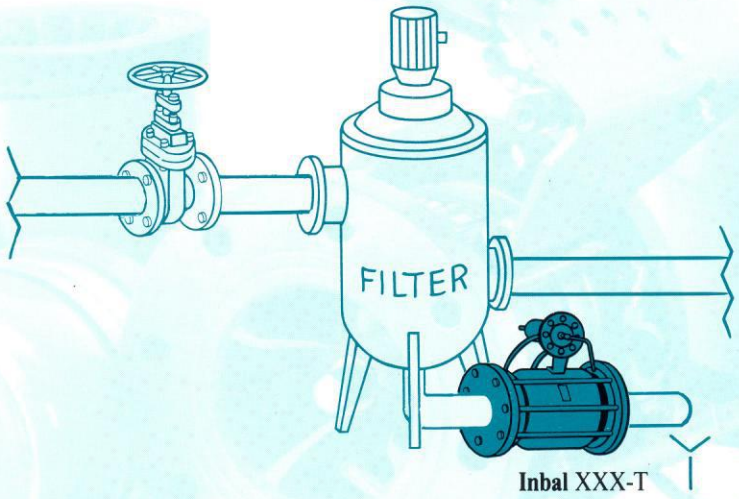
The **Inbal** is a line pressure operated, in-line, sleeve type, axial valve. The control system consists of a spring loaded, pressure operated, differential pressure operated, diaphragm actuated, 3-way pilot valve, a calibrated orifice plate, mounted on the inlet side of the valve and auxiliary accessories.

The pilot control is actuated by the differential pressure produced across the orifice plate. The pilot responds instantly to any slight changes in the flow rate shown as a change in the differential pressure, and actuates the **Inbal** Valve to correct the flow to its preset level. The rate of flow adjustment is made with a single adjusting screw on the pilot control within a range determined by the orifice plate.

Typical Application



The **Inbal** Valve XXX-T maintains a predetermined flow rate at each of the controlled HVAC zones regardless of number of zones in service and variations in line pressure.

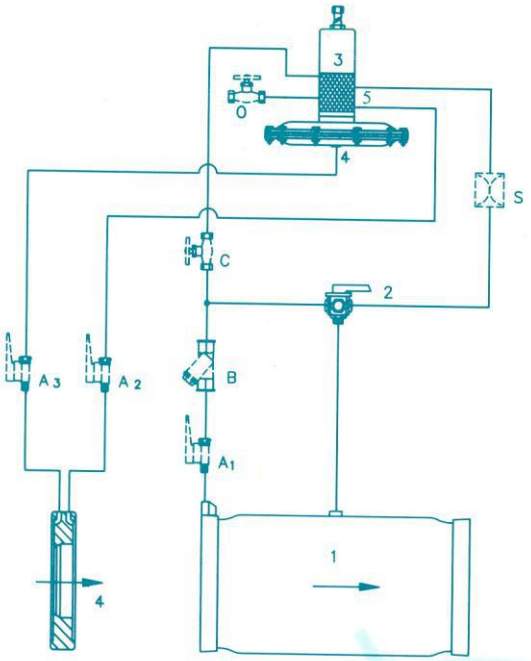


The **Inbal** Valve XXX-T maintains a steady preset flow rate through the filtering unit, prevents washing away sand or gravel.

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 capable to handle a wide range of flow rates.
* A wide selection of pressure differential control pilot valves are available to ensure an ideal service in various requirements of flow rates.
* A large diameter pilot actuator for accurate flow rate control operation at a minimum orifice plate pressure loss.
* The "floating stem" design of the pilot valve ensures dependable trouble free service.
* The advanced "no-flow" design of the pilot system reduces maintenance and the need for needle valves and eliminates the need for large area strainers.
* A manual control override valve is fitted as standard, allowing the **Inbal** XXX-T 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



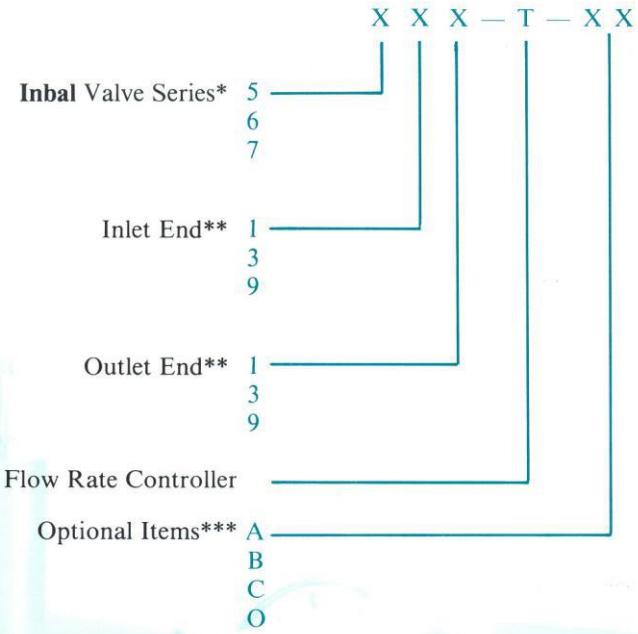
Item	Description	Model
1	**Inbal** Valve & Self Cleaning strainers	500; 600 or 700
2	Manual Control Valve	341 or 345*
3	Pressure Differential Pilot Valve	LA4; LA5; LB4 or LB5
4	Orifice Plate Assembly	012

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
S	Flow Stabilizer - reduces low flow fluctuations	365

341; LA4 & LA5 are recommended for **Inbal** Valve up to size 150 mm (6"). 345; LB4 & LB5 for sizes 200 mm (8") and larger. Request Pilot Valve catalogue.

Designation Data



* Request catalog on each series

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

*** See optional features in the left and column.
Example: **Inbal** 799-T-ACO is a Flow Rate Controller 700 series, wafer type with shut-off cocks and opening and closing speed controls.

Purchase Specifications

The Rate of Flow Control valve shall automatically maintain a constant pre-determined rate of flow regardless of changes in the line pressure. 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 are to be no other sealing facilities apart from the sleeve itself.
The pilot control shall be a direct-acting, diaphragm actuated, differential pressure operated, adjustable spring loaded, 3-way valve. When the flow rate is precisely at the pre-adjusted rate, flow through the pilot control system will be stopped. Adjustment of the flow rate (within the orifice plate limits) shall be easily accomplished by using a threaded bolt located in the top of the pilot. A thin edge orifice plate and its carrier shall be installed at the inlet to the valve.
This valve shall be similar in all respects to a Rate of Flow Control **Inbal** Valve, model 500-T, 600-T or 700-T as manufactured by Mil Limited or approved equal.

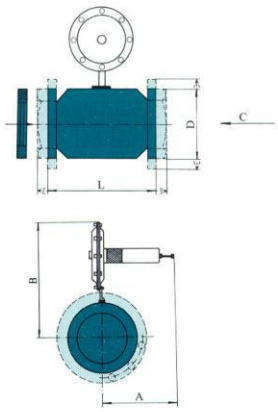
Capacity Chart

Inbal Valve Size		Minimum Flow Rate*						Maximum Normal Flow Rate** X00-T		Maximum Intermittent Flow Rate*** X00-T	
		500-T		600-T		700-T					
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 way may vary ± 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	1½"	50	2"	80	3"	100	4"	150	6"	200	8"	250	10"	300	12"
L mm/inch	5-6-711-T	190	7 1/2	190	7 1/2	200	7 7/8										
	5-733-T					138	6	190	7 1/2	245	9 5/8	308	12 1/8	363	14 9/32	451	17 3/4
	5-6-799-T					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-T	162	6 3/8	162	6 3/8	181	7 1/8										
	5-733-T					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-T					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-T	190	7 1/2	190	7 1/2	190	7 1/2										
	5-733-T					190	7 1/2	190	7 1/2	190	7 1/2	270	10 5/8	270	10 5/8	270	10 5/8
	5-6-799-T					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-T	387	15 1/4	387	15 9/16	395	15 1/4										
	5-733-T					395	15 9/16	410	16 1/8	440	17 5/16	466	18 3/8	492	19 3/8	524	20 5/8
	5-6-799-T					395	15 9/16	410	16 1/8	440	17 5/16	466	18 3/8	492	19 3/8	524	20 5/8
Weight /lb	711-T	18 1/2	41	18 1/2	41	20	44										
	733-T					22	48	26	57	43 1/2	96	63 1/2	140	96 1/2	212	112 1/2	247
	799-T					18	40	21	46	32 1/2	71	49 1/2	109	60 1/2	133	84 1/2	186
	511-T	17 1/2	39	18	40	20	44										
	533-T					21 1/2	54	24	53	42 1/2	93	58 1/2	129	82 1/2	182	93 1/2	206
	599-T					16 1/2	36	18	40	28 1/2	63	40 1/2	89	53 1/2	117	66 1/2	146
	699-T					14 1/2	32	15 3/4	35	22 1/2	50	31	68				



VIEW C

For the orifice plate dimensions and selection please request Bulletin no. 120.

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 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).

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 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.

Orifice:

Orifice Plate: Stainless Steel 316 L.
Orifice Carrier: Carbon Steel ASTM G 10200 Epoxy coated.

Optional Materials:

Inbal Valve:

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);
Al-Mg ASTM C86300 (DIN 1725-2);
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 Ranges:

Max/Min ratio of flow rate is 4:1 for any sized orifice.

Installation & Storage

* Orifice plate assembly may be attached to the **Inbal** Valve inlet end. However, a straight line of at least 5 pipe diameter (preferably 10 p.d) is required at orifice plate upstream with no flow restrictions (valve; elbow; tee; etc) installed on it.
* Always flush the pipelines to clean before installation of the valve.
* Arrows on the valve housing and orifice carrier 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 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 (see sizing of valve).
3) Working Pressures (min; max).
4) Flow Adjustment Range.
5) Degree of Accuracy required
6) Maximum Allowable Headloss
7) Fluid Specifications
8) 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:

March 1988 Bulletin 138

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