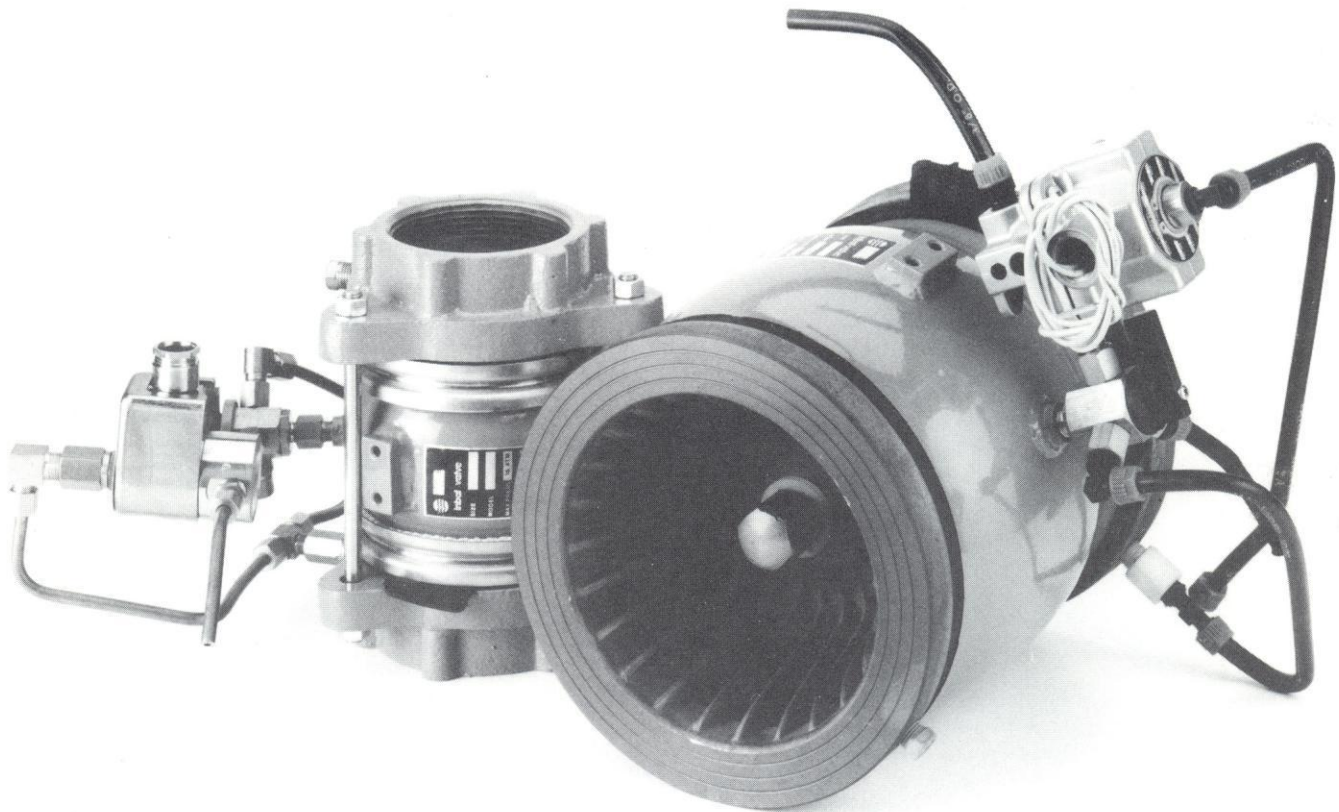


SOLENOID CONTROL INBAL VALVE SERIES

500-E, 600-E, 700-E.

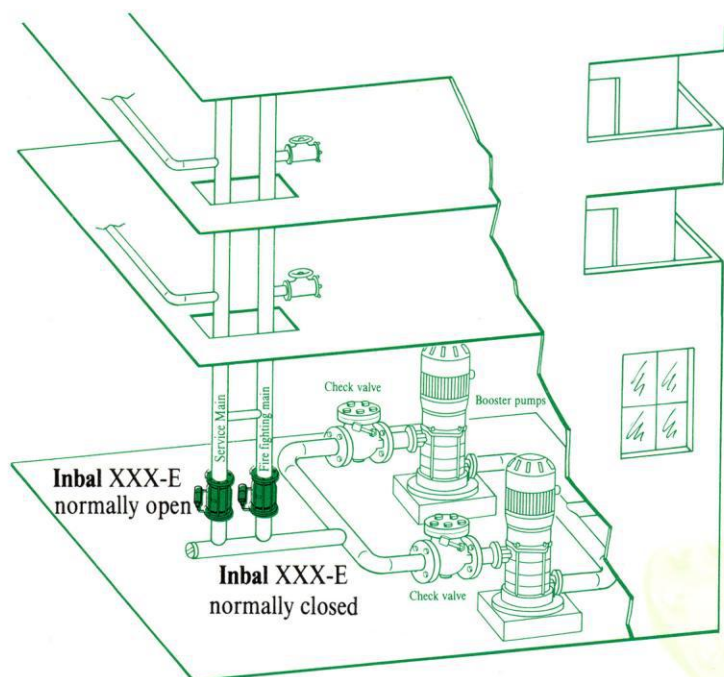
511-E		533-E		599-E
611-E	Threaded		Flanged	699-E Wafer
711-E		733-E		799-E



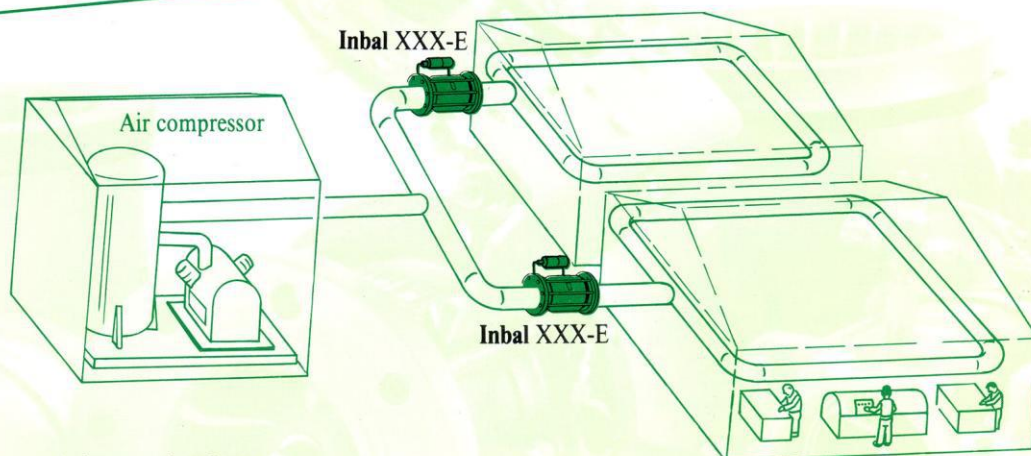
The **Inbal** Solenoid Control Valve, model XXX-E provides an operation by means of an electrical remote control. The valve has two positions, either it is open fully or it is closed drop-tight. The Solenoid Control Valve consists of **Inbal** Valve series 500, 600 or 700 and pilot control system.

The **Inbal** is a line pressure operated, in-line, sleeve type, axial valve. The control system is a 3-way packless solenoid valve which alternately supplies pressure to, or exhausts pressure from the control space of the **Inbal** valve. The **Inbal** XXX-E is available either as a normally open type (solenoid energized to close) or a normally closed type (solenoid energized to open).

Typical Application



In this high rise building there are two **Inbal** Valves XXX-E. In the distributing system the **Inbal** XXX-E is a normally open type and in the fire fighting system is a normally closed type. Once an hydrant is in use the pressure switch signals the pump to start up and at the same time the “normally open” **Inbal** XXX-E closes and the “normally closed” XXX-E opens thus all pressure is diverted to the Fire Fighting system only.



Inbal Valves XXX-E used in the compressed air system in a factory. Activated by a timed programmer, the valves close at these sections which do not operate and decrease leakages of air there. Consequently, total consumption of air in the factory decreases significantly.

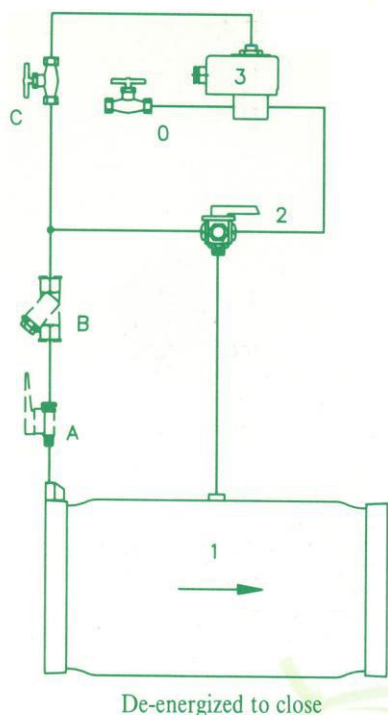
Product Features

- * 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 **Inbal** Valve is symmetrical. By simply adding a shuttle valve it allows flow in either direction with the same characteristics, pressure losses and performance.
- * Smooth opening and closing action.
- * At all line pressures it has positive drip-tight closure.
- * Very low pressure loss due to streamlined flow.
- * An auxiliary amplifier enables quicker opening and

closing speeds.

- * Additional controls for the opening and closing speeds of the valve are available on request.
- * The use of a high quality solenoid valve assures reliable operation and a high resistance to corrosion.
- * A manual control override valve is fitted as standard, allowing the **Inbal** XXX-E to be manually operated as a fully open or fully closed valve at any time.
- * The valve comes complete with self-cleaning 100 mesh strainer as a standard fitting.

Schematic Control Diagram



Item Description

Item	Description	Model
1	Inbal Valve & Self Cleaning strainers	500; 600 or 700
2	Manual Control Valve	341 or 345*
3	3-Way Solenoid Valve	151; 157; PJ2 or PK2

Optional Features:

A	Shut-off cocks - isolates pilot system	351
B	Y Pattern Strainer	31
C	Flow control - closing speed control	361
O	Flor control - opening speed control	361

* 341, 151 & PJ2 are recommended for Inbal Valve up to size 150 mm (6"). 345, 157 & PK2 for sizes 200 mm (8") and larger. Request pilot valve catalogue.

Purchase Specifications

This valve shall open fully and close drop-tight in response to an electrical remote control. The operation of the valve shall be controlled by a solenoid pilot valve. For the normally closed service the main valve shall open fully when the solenoid pilot is energized and close drop-tight when the solenoid is de-energized. (The description is reversed for the operation of the normally open service). It shall be a hydraulically operated, solenoid controlled, sleeve type, in-line, axial valve.

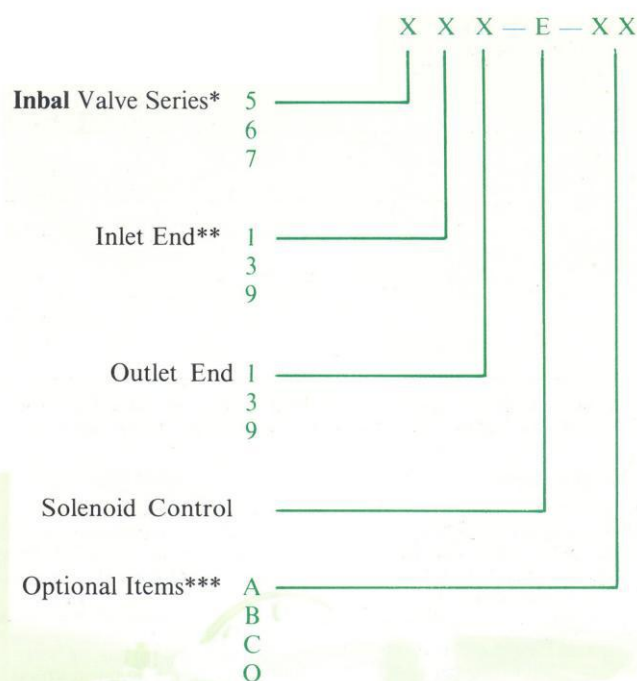
Options (if required please add to the above).

- The opening and/or closing response of the main valve shall be adjusted to a desired rate by means of a needle valve.
- An auxiliary amplifier shall be installed to give a faster response in both the opening and closing speeds.

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. Self cleaning strainers shall be used to protect the control system.

The valve shall be similar in all respects to an Inbal Solenoid Control Valve, model 500-E; 600-E or 700-E as manufactured by Mil Limited, or approved equal.

Designation Data



* Request catalog on each series

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

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

Example: Inbal 611-E-CO is solenoid control 600 series, threaded valve with closing & opening speed controls.

Discharge capacity from control space

Size	series 500		series 600		series 700	
	mm	inch	litre	gal	litre	gal
50	2	0.45	0.12	0.45	0.12	0.03
80	3	0.60	0.16	0.6	0.16	0.08
100	4	1.05	0.28	1.05	0.28	0.13
150	6	2.1	0.55	2.1	0.55	0.45
200	8	4.3	1.14	4.3	1.14	0.92
250	10	8.7	2.3		8.1	2.1
300	12	15.8	4.2		12.7	3.4

Flow Characteristics

Inbal Valve Size		500-E		Flow Factor 600-E		700-E		Maximum Continuous Flow Rate*	
mm	inch	Kv	Cv	Kv	Cv	Kv	Cv	M ³ /h	gpm
40	1½"	45	52	45	52	54	63	40	175
50	2	75	87	75	87	90	104	45	200
80	3	180	209	180	209	140	162	105	460
100	4	290	336	290	336	330	383	180	790
150	6	650	754	650	754	610	708	400	1760
200	8	1150	1334	1150	1334	1150	1334	700	3080
250	10	1425	1653			1630	1891	1100	4840
300	12	2055	2384			2365	2743	1600	7040

* Based on pipe line velocity of 6 m/sec (20 ft/sec).

To define the head loss through a specific Inbal Valve series at a given flow rate, use the following equation (for water only):

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

When:

ΔP = Pressure drop in Kg/cm²

Q = Flow rate in m³/h

Kv = Flow factor (use table above).

$$\Delta P = \left(\frac{Q}{C_v} \right)^2$$

When:

ΔP = Pressure drop in psi

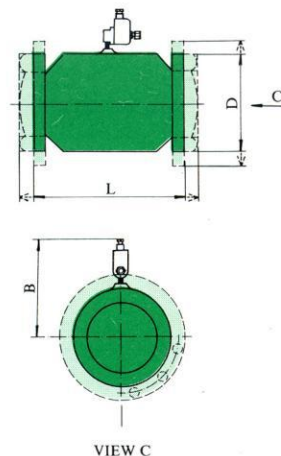
Q = Flow rate in U.S. gpm

Cv = Flow factor (use table above)

Dimensions & Weights

		Valve model	40	1½"	50	2"	80	3"	VALVE SIZE								
									4"	150	6"	200	8"	250	10"	300	12"
L mm/inch		5-6-711-E	190	7½	190	7½	200	7⅞									
		5-733-E					158	6	7½	245	95/8	308	12⅞	363	14⅞ ₃₂	451	17⅞ ₄
		5-6-799-E					155	6⅛	7⅞	235	9¼	302	11⅞	350	13⅞ ₄	445	17½
D mm/inch		5-6-711-E	162	6⅞	162	6⅞	181	7⅞									
		5-733-E					200	7⅞	8⅞ ₁₆	285	11¼	340	13⅞	405	15⅞ ₁₆	460	18⅞ ₈
		5-6-799-E					130	5⅞	6⅞ ₁₆	218	8⅞ ₁₆	272	10⅞ ₁₆	324	12⅞ ₄	385	15⅞ ₁₆
B mm/inch		5-6-711-E	195	7⅞	195	7⅞	203	8									
		5-733-E					203	8	8⅞ ₁₆	247	9¾	279	11	301	11⅞	331	13
		5-6-799-E					203	8	8⅞ ₁₆	247	9¾	279	11	301	11⅞	331	13
Weight Kg/lb		711-E	7½	16	7½	16	9	20									
		733-E					11	24	33	32½	71	52½	115	85½	188	101½	223
		799-E					7	15	22	21½	47	38½	84	49½	109	75½	165
		511-E	6½	14	7	15	9	20									
		533-E					10½	23	29	31½	68	47½	104	71½	157	82½	181
		599-E					5½	12	15	17½	37	29½	65	42½	93	55½	122
		699-E					3½	8	10	11½	25	20	44				

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:

Inbal Valve:

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

Solenoid Control:

Model 151:
16 bar (225 psi) orifice 3/64"
10 bar (150 psi) orifice 1/16"
Model 157:
17 bar (250 psi) orifice 3/32"
12 bar (175 psi) orifice 1/8"
Higher pressure rates available on request.

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.

Solenoid Control:

Body: Stainless Steel (standard for 2" through 4")
Die-cast zinc (standard for 6" through 12")
Plunger: Stainless Steel with molded soft synthetic Buna-N inserts.
Spring: Stainless Steel.
Coil: Precision molded and are completely encapsulated with an Epoxy resin.

Pilot Amplifier (when required):

Body: Bronze ASTM B61
Stem: Stainless Steel 303.
Chambers: Bronze ASTM B62
Diaphragm: Neoprene, nylon fabric reinforced.
Seals: Buna N or Neoprene.
Bracket: Steel, 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);

Al-Mg ASTM C86300 (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 amplifier:

Wetted parts: Stainless Steel 316L;

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

Bronze Aluminium ASTM B148 (CA 955).

Solenoid control details:

Pipe size: 1/8" N.P.T. (2" thru 4")

1/4" N.P.T. (6" thru 12")

Coil: waterproof class A (105 C).

Operation: multi-purpose (N.O. and N.C)

Electrical rating voltage: DC: 6; 12; 24; 32; 74; 120; 240.

50Hz: 24; 115; 220; 240; 380.

60Hz: 12; 24; 120; 240; 480.

Latching voltage: 60Hz; 24; 120; 240.

V DC: 6; 12; 24.

Power consumption: 10 watts (2" thru 4")

16 watts (6" thru 12")

2; 5 and 7.5 watts (on request).

Inrush current: 1.4 Amp at 24VAC (2" thru 4")

3.6 Amp at 24VAC (6" thru 12")

Holding current: 0.8 Amp at 24VAC (6" thru 12")

Nema classifications: General purpose Nema Type 1

Hazardous locations Nema Type 7; 9; 9A explosion

proof Water-tight Nema Type 4

Weather resistant Nema Type 3.

Installation & Storage

- * 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 drain facility.
- * If the valve is for use in ambient or fluid temperatures 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.
- 4) Flow Rates (min; max).
- 5) Fluid specifications.
- 6) Energized or de-energized to open.
- 7) Voltage & Hertz.
- 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:



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