

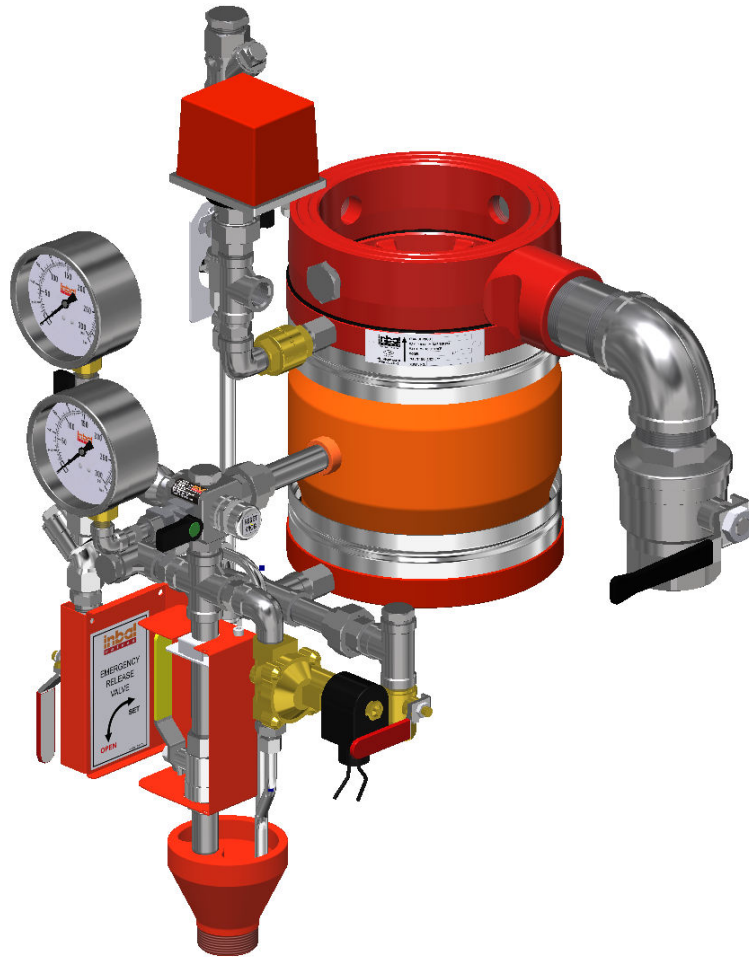
Inbal Preaction Valve, Single Interlock

Series 700D/DG/DX - 04/24I01

Electric Actuation Local Resetting



FM Approved



Model 799DX-04I01

General Description

The **Inbal** Electrically Actuated, Single Interlocked, Preaction Valve utilizes an **Inbal** Deluge Valve with an electric detection and release system. The sprinkler piping system is effectively supervised by pneumatic pressure. Loss of the supervising pneumatic pressure due to a damaged sprinkler or pipe line system will not cause water to flow through the **Inbal** Valve into the piping system; it will merely activate the low air alarm. The electric system consists of heat, smoke, or flame detectors, a control (fire alarm & releasing) panel, and a solenoid valve. The **Inbal** Automatic Water Control Valve, used in this preaction system, is a pressure operated, sleeve actuated, axial valve designed for use in fire protection systems.

The **Inbal** Preaction Valve is used for automatic or manual operation. When one (or two-if electrically arranged in such a pattern) detector senses the presence of fire and operates, the control panel activates the alarm devices and energizes the Solenoid Valve to open, causing the **Inbal** Preaction Valve to open. Water will flow into the sprinkler piping in readiness for possible subsequent opening of one or more sprinklers. Upon fusing of one or more sprinklers, water will start to spray instantaneously, thus the delay

caused by a pipe filling is eliminated. As soon as the releasing system and the sprinkler piping are reset, the **Inbal** Single Interlocked, Preaction Valve resetting is merely done by activating the reset knob.

The control trim includes pilot valves, actuators, accessories, fittings, and gauges to provide for proper operation in either vertical or horizontal installation. The standard material **Inbal** Preaction Valve is rated to 300 psi (21 bar), but actually is limited to the Solenoid Valve's pressure. It is available in sizes 1½" (40 mm) to 12" (300 mm) with threaded, flanged, grooved, or wafer inlet and outlet ends.

The only moving part in the **Inbal** Automatic Water Control Valve, when it operates, is the reinforced sleeve which forms a drip-tight seal with the corrosion resistant core. It has a smooth opening to prevent any water hammer in the piping system.

The unique design and variety of materials and coatings make the **Inbal** Single Interlocked Preaction Valve dependable for prolonged periods of service, unaffected by various water qualities.

Technical Data

Approvals

The **Inbal** Electrically Controlled Single Interlocked Preaction System model:

711D -24I01	733D -24I01	799D -24I01
711DX -24I01	733DX -24I01	799DX -24I01
711DX -04I01	733DX -04I01	799DX -04I01
711DG -24I01	733DG -24I01	799DG -24I01
711DG -04I01	733DG -04I01	799DG -04I01

are all FM approved to 300 psi (21 bar) in sizes 2", 3", 4", 6", 8", 10" and 12" (50, 80, 100, 150, 200, 250 and 300 mm), with threaded, flanged and wafer ends. Consult the FM Approval Guide for acceptable applications. **Inbal** Deluge Valves have Lloyd's, DNV-GL, TÜV and ABS Type Approvals for all sizes.

Model Numbers

Inlet End	Outlet End	Model No.
Threaded	Threaded	711DX-04I01
Threaded	Grooved	716DX-04I01
Flanged	Flanged	733DX-04I01
Flanged	Grooved	736DX-04I01
Grooved	Grooved	766DX-04I01
Wafer	Wafer	799DX-04I01

"DX" can be replaced with "D" or "DG" depends on the **Inbal** Automatic Water Control Valve series in use. See bulletins F02-01, F02-02, and F02-03.

The above model numbers refer to potable water trimmed valves. For sea / brackish water control trim replace "04" with "24". For example: 799D-24I01 is a wafer type valve with sea water, electrically actuated, local reset single interlocked, preaction trim.

Size:

Threaded Ends:

1½", 2", 2½" & 3" (40, 50, 65 & 80 mm).

Flanged and Grooved Ends:

1½", 2", 2½", 3", 4", 6", 8", 10" & 12" (40, 50, 65, 80, 100, 150, 200, 250 & 300 mm).

Wafer Ends:

3", 4", 6", 8", 10" & 12" (80, 100, 150, 200, 250 & 300 mm).

End Standards

Threaded End:

NPT or BSPT.

Flanged End:

ANSI B16.5 class 150 & 300;¹

ISO 7005 - PN10, 16 & 25;¹

BS 10 Table D & E;²

AS 2129 Table D & E;²

Jis B 2212, 2213, 2214.²

Wafer End:

Fits most of the above standards.

Grooved End:

ANSI/AWWA C606-87.

(1) - On standard

(2) - On special request

Pressure Rating

Maximum working pressure: 300 psi (21 bar) but depends on the solenoid valve pressure rating.

Temperature Range

Water: Max. +150°F (+65°C).

Installation Position

Vertical or horizontal.

Solenoid Valve

Standard

FM Approved models:

2 way, normally closed,

157-01A— Brass body; ½"; 24 V DC; IP 65; 9 Watt; to 290 psi (20 bar)¹

157-02A— Brass body; ½"; 24 V DC; NEMA 1,2,3,3S,4,4X; 10 Watt; to 290 psi (20 bar)²

157-12A— Brass body; ½"; 24 V DC; NEMA 3,3S,4,4X,7,9; 10 Watt; to 290 psi (20 bar)²

157-15A— Brass body; ½"; 24 V DC; EEx dm IIC T4, IP67, Flameproof; 8 Watt; to 290 psi (20 bar)³

157-42A— Brass body; ½"; 24 V DC; NEMA 1,2,3,3S,4,4X; 10 Watt; to 175 psi (12 bar)²

157-52A— Brass body; ½"; 24 V DC; NEMA 1,2,3,3S,4,4X; 10 Watt; to 175 psi (12 bar)²

157-54A— Brass body; ½"; 12-24 V DC; NEMA 1,2,3,3S,4,4X; 2 Watt; to 300 psi (21 bar)²

For further details see bulletin F30-11.

(1) - Din 43650A connector

(2) - ½" Conduit, 18" leads

(3) - M20x1.5

Optional

Energized to open, energized to close, and magnetic latch (impulse) types in various voltages, frequencies, enclosures, and pressure ratings.

See bulletins F30-10 and F30-12.

Materials

Standard

Valve Housing:

Forged Steel (SAE 1021).

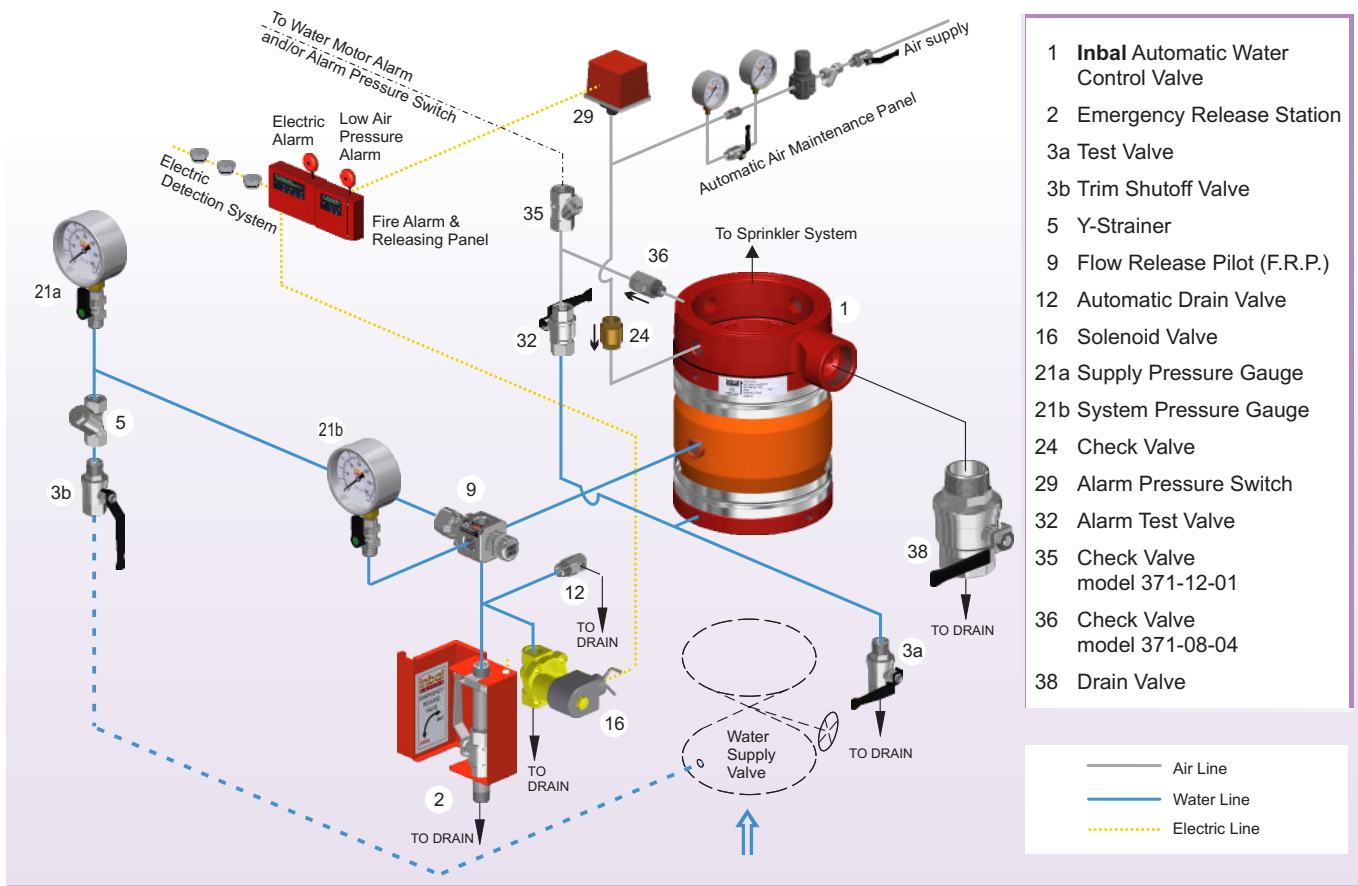
Valve Ends and Wafer Flow Test & Drain Ends:

Ductile Iron (ASTM A536 65-45-12).

Threaded, Flanged, and Grooved Flow Test & Drain Ends:

Carbon Steel (SAE 1020).

Schematic Control Diagram – 700DX-04I01



Sleeve:

SMR5 Elastomer reinforced with Poly-ester and Kevlar.

Control Trim:

Brass Nickel Chrome plated, Stainless Steel, and Galvanized Steel.

Optional

Cast Steel;

Bronze;

Nickel Aluminum Bronze;

Stainless Steel AISI 316;

Super Austenitic Stainless Steel;

Super Duplex Stainless Steel;

Titanium.

Coating

Standard

Powder epoxy coated. Thickness: 0.004" (0.1 mm) external and internal surfaces.

Optional

High built epoxy coated and polyurethane finish. Thickness: 0.01" (0.3 mm).

Halar® coated. Thickness: 0.02" (0.5 mm)

Halar® is a registered trade mark of Ausimont USA Inc.

Control Trim

On standard, the control trim is supplied preassembled in sections. If self-assembly is required, all the trim components are supplied in loose form. The Control Trim can be also supplied completely assembled on the Valve body when requested. See the applicable Trim Chart for complete components list.

- Solenoid Valve, 2 way.
- Flow Release Pilot (F.R.P) with a built-in check valve.
- Y-Strainer with a stainless steel screen.
- Alarm Test Valve — 2 way, quarter turn ball valve.
- Trim Shutoff Valve, Flow Test Valve, and Drain Valve are quarter turn ball valves.
- Supply and System Pressure Gauges, with dual scale (psi and bar).
- Pressure Gauge Valves — 3 way, quarter turn ball valves.
- Drain Cup and drain tubes.
- Automatic Drain Valves.
- Emergency Release Station.

Features

- Bubble tight sealing – eliminates the need for a check valve
- No Moving Mechanical Parts (N.M.M.P.) construction ensures a long life of dependable operation, reducing the cost of maintenance.
- Quick, yet soft opening performance – eliminates water hammer and consequent damages.
- Optional opening and/or closing speed control is available.
- Fast and easy reset by thumb activated knob.
- Supplied as standard preassembled in sections - saves the self-assembly cost.
- Can be installed vertically or horizontally
- Compact design – minimum space for valve and trim.
- Unique principle of operation prevents false operation due to water surges.
- Pressure rating to 300 psi (21 bar) provided compatible solenoid valve is used.
- Wide selection of solenoid valves to meet various requirements for type of operation, voltage, frequency, protection and enclosure.
- Wide range of sizes for an ideal system design.
- Control trim made of high grade materials as standard.
- Epoxy coating supplied as standard – ensures excellent corrosion resistance.
- Variety of available materials – to ensure corrosion-free service even under severe conditions.

Operation

The Control Chamber of the **Inbal** Automatic Water Control Valve is the annular space between the valve Housing and the Sleeve. The valve is held in a closed position as long as inlet pressure is maintained in the Control Chamber.

The electric actuation trim consists of a Solenoid Valve connected to the wet pilot line and is controlled by the detection system and the control (Fire Alarm & Releasing) panel.

In the set position, the water pressure is applied to the Control Chamber of the **Inbal** Valve and to the Solenoid Valve from the upstream of the Water Supply Valve. The de-energized Solenoid Valve is closed. Consequently, the **Inbal** Valve stays closed, keeping the piping system dry.

When the detection system operates, the Fire Alarm & Releasing Panel activates an alarm and energizes the Solenoid Valve to open. Pressure in the **Inbal** Valve Control Chamber is released. The **Inbal** Valve opens to allow water to flow into the piping system and to the Alarm Pressure Switch and/or Water Motor Alarm. When a sprinkler head opens, water will flow from the system.

The operation of the **Inbal** Preaction Valve and the flow released from the Control Chamber activate the Flow Release Pilot (F.R.P) to latch in an open position, isolating the Control Chamber from the inlet water supply. The F.R.P. operation prevents the **Inbal** Deluge Valve from closing even if the open releasing device closes. The **Inbal** Valve will close only when the Resetting procedure is followed.

If a sprinkler in the piping system opens prior to operation of the electric release system or if a sprinkler on the pipe line is damaged, the supervisory pressure in the sprinkler piping is lost, Low Air Pressure Alarm sounds, but the **Inbal** Valve stays closed.

The Emergency Release Valve is used for emergency actuation of the **Inbal** Preaction Valve and for routine testing.

Installation

Refer to the Trim Chart applicable to the specific **Inbal** Single Interlocked, Preaction Valve model in use.

1. When the **Inbal** Single Interlocked Preaction Valve is delivered, carefully unpack and visually check that there has been no damage to the operating components, piping and fittings.
2. Always flush the pipelines before installing the **Inbal** Valve.
3. Place the **Inbal** Valve in the piping at the outlet of the Water Supply Valve. Verify that the arrow on the valve Housing matches the actual flow direction. Determine which side the system will be accessed from and locate the **Inbal** Valve accordingly.
4. Install the **Inbal** Valve in the pipeline. Use gaskets, bolts, stud bolts, bolt sleeves, and nuts as required by the valve ends.
5. Complete the trim assembly by connecting the preassembled sections, or assemble the trim if ordered in loose component form. Refer to the applicable Trim Chart and Installation Guide.
6. The water pressure supply to the control trim must always be sourced from the inlet of the system's Water Supply Valve through a 1/2" pipe.
7. Assemble the Solenoid Valve according to the drawing, the applicable bulletin of the Solenoid Valve, and direction of flow. The Solenoid Valve must be wired in accordance with the requirements of the authorities having jurisdiction and/or NEC, IEC, or CENELEC standards and codes. Wiring should be done by a licensed electrician.
8. Connect the air supply through the **Inbal** Automatic Air Maintenance Panel to the sprinklers piping system. The air supply must be regulated and maintained

automatically. It is recommended to preset the Automatic Air Maintenance Panel to maintain a constant air supply of 15 psi (1.0 bar). The Air Pressure Supervisory Switch should be set to activate at a pressure drop of 5 psi (0.35 bar).

9. The air supply must be restricted to ensure that the automatic air supply cannot replace air as fast as it escapes when a sprinkler operates.
10. It is recommended to install an inspector's test valve on the sprinkler piping system. The inspector's test valve is a locked closed ball valve with an outlet end orifice equivalent to the smallest orifice of releasing device provided on the system. The inspector's test valve may be used to verify adequate loss of air pressure when the sprinkler piping system operates.
11. Set the **Inbal** Single Interlocked Preaction Valve by following the Resetting procedure.
12. Test the **Inbal** Valve, the trim, and the alarm according to the Testing procedure.

Resetting

The **Inbal** Single Interlocked Preaction Valve must be reset and restored to service as soon as possible after automatic, emergency, or manual actuation.

1. Close the Water Supply Valve. The water flow alarms are reset.
2. Close the Trim Shutoff Valve.
3. Close the air supply valve.
4. De-energize the Solenoid Valve by resetting the detection system and the Fire Alarm Releasing panel. Verify that the Solenoid Valve is in a closed position and the Electric Alarm is reset.
5. Open the Flow Test Valve, Drain Valve, and the Drain Cock on the Alarm Test Valve, allowing all the water to drain.
6. Inspect and replace any sprinklers that have operated, been damaged, or been exposed to fire conditions.
7. Inspect the trim and alarm Y-Strainers. Clean if necessary.
8. Verify that the Emergency Release Valve is in a closed position.
9. Close the inspector's test valve if it was in operation.
10. Open the Trim Shutoff Valve. Push and hold the reset knob on the Flow Release Pilot (F.R.P) and allow water pressure to build up in the trim and in the **Inbal** Valve Control Chamber. Verify that the pressure readings on both pressure gauges are equal.
11. Release the reset knob on the Flow Release Pilot.
12. Slightly open the Water Supply Valve, allow the air that

might be trapped in the section of pipe between the **Inbal** Valve and the Water Supply Valve to escape through the Flow Test Valve.

13. Close the Flow Test Valve.
14. Fully open the Water Supply Valve. Verify that there is no flow from the Drain Valve, downstream of the **Inbal** Valve.
15. Close the Drain Valve.
16. Open the air supply to fill the sprinkler piping system with air/gas. Use the air by-pass valve in the **Inbal** Automatic Air Maintenance Panel to accelerate the filling rate. Verify that the Supervisory Pressure Switch and Low Air Pressure Alarm are reset

Maintenance, Inspection, & Testing

It is recommended that periodic inspection and tests be conducted by qualified personnel to ensure that the **Inbal** Single Interlocked Preaction Valve and related equipment are in good operating condition. The inspection and testing activities should be done according to NFPA Standards, the guidelines and regulations of the authorities having jurisdiction, and the following instructions. It is recommended that the **Inbal** Valve be tested, operated, cleaned, and inspected at least on a routine basis.

Inspection

A *weekly* Inspection is recommended:

1. Verify that the Water Supply Valve and the air system valve are sealed in fully open position.
2. Verify that the required water and air pressures are being applied to the **Inbal** Valve inlet and trim.
3. Verify that the Trim Shutoff Valve, Alarm Test Valve, Emergency Release Valve, Pressure Gauge Valves, Condensate Valve (if in use), Flow Test Valve, and Drain Valve are in set position.
4. The Supply, System, and Air Pressure Gauges should be checked for accuracy.
5. Visually inspect for disconnected wires, broken or missing parts, or other evidence of impaired protection.

Strainer Cleaning

A *quarterly* Strainer Cleaning is recommended:

1. Close the Trim Shutoff Valve.
2. Remove the covers of the trim and alarm Y-Strainers. Clean if necessary.
3. Open the Trim Shutoff Valve.

Alarm Testing

A *quarterly* Alarm Testing is recommended:

Water Flow Alarm

1. Test the Water Motor Alarm or Alarm Pressure Switch by opening the Alarm Test Valve.

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2. Water Motor Alarm should be audible. Alarm Pressure Switch should activate.
3. Close the Alarm Test Valve. All local alarms should stop sounding and pressure switch is reset.
4. Verify that the supply piping to the alarm drains properly.

Low Air Pressure Alarm

1. Open the inspector's test valve on the sprinkler system. Verify that the Low Air Pressure Alarm operates properly.
2. Close the inspector's test valve. Verify that normal pneumatic pressure is re- stored and that the Low Air Pressure Alarm and Air Pressure Supervisory Switch are reset.

Preaction Trim Testing

A *semi-annual* Preaction Trim Testing is recommended. Testing of the control trim is conducted with no flow of water to the system.

1. Open the Flow Test Valve to flush away debris or foreign particles which may have accumulated in the **Inbal** Valve inlet.
2. Close the Flow Test Valve.
3. Close the Water Supply Valve installed in the inlet of the **Inbal** Valve.
4. Energize the Solenoid Valve by manually operating the Fire Alarm & Releasing Panel. The Electric Alarm should operate and a trickle of water should be drained from the deluge trim. Wait and verify that the pressure reading on the System Pressure Gauge drops to zero which simulates an open position of the **Inbal** Valve.
5. Reset the valve by performing the instructions in Resetting.

Trip Testing

By performing the Trip Test, the sprinkler piping system will be flooded with water, and water will flow from any open release in the system. The **Inbal** Preaction Valve should be trip tested *annually* with the Water Supply Valve partially open, and *every 3 years* with the Water Supply Valve fully open. The Trip Testing should be done during warm weather.

1. Open the Flow Test Valve to flush away debris or foreign particles which may have accumulated in the **Inbal** Valve inlet.
2. Close the Flow Test Valve.
3. Record water supply pressure and pneumatic system pressure.

4. Trip the **Inbal** Valve to open by operation of either:
 - a) The electric detection system according to the manufacturer's instructions.
 - b) Emergency Release Valve.
Opening of the inspector's test valve on the sprinkler's piping would be required to verify flow.
5. The **Inbal** Valve should open, filling the sprinkler system with water. Record the elapsed time for the development of a full flow of water from the inspector's test valve.
6. Verify that all the alarms operate properly.
7. Reset the valve by performing the instructions in Resetting.
8. Verify that the water supply pressure and pneumatic system pressure have restored to the level as recorded in (3) above.

Removal

To remove the **Inbal** Preaction Valve:

1. Close all the pressure supply valves:
 - a) Water Supply Valve.
 - b) Trim Shutoff Valve.
 - c) Air supply valve.
2. Disconnect the electric wires from the Solenoid Valve. The electric work should be done by a licensed electrician.
3. Open the Emergency Release Valve to release the water pressure from the **Inbal** Valve Control Chamber.
4. Open the Flow Test Valve and Drain Valve to allow all the water and air to drain.
5. Disconnect the union and remove the trim from the valve.
6. Remove the **Inbal** Valve from the line for inspection.
7. To reinstall, follow the Installation procedure (use new gaskets for flanged or wafer valve).

Inquiries/Orders

The Data Sheet for Inquiries/Orders (bulletin F01-05) should be submitted. ●