

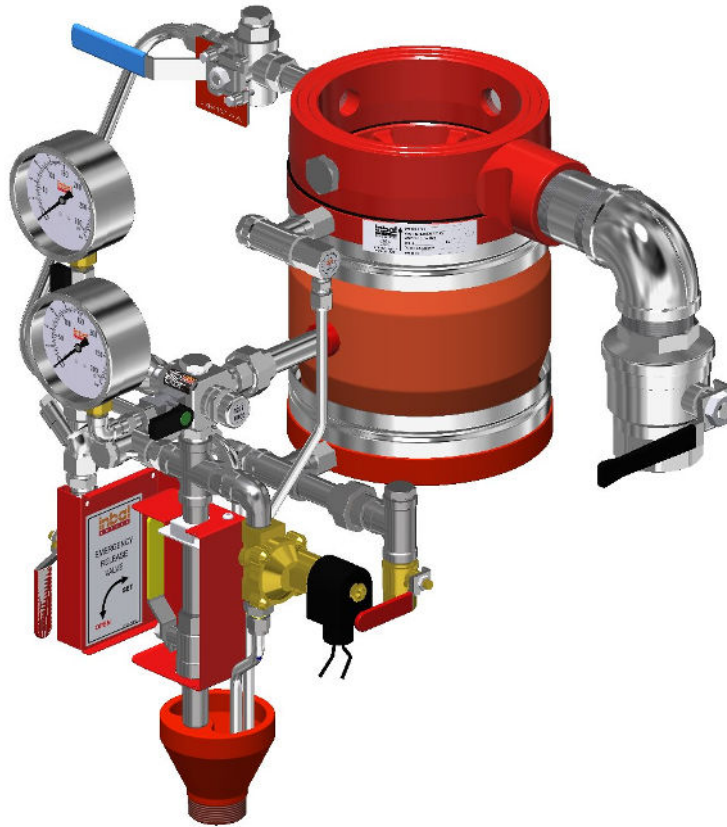
# Inbal Deluge Valve, Electric Actuation

Series 700D/DG/DX - 04/24C01

Local Resetting



*FM Approved*



Model 799DX-04C01

## General Description

The **Inbal** Deluge Valve with Electric Actuation Trim is specifically designed for fire protection systems actuated by an electric detection and release system. The **Inbal** Automatic Water Control Valve used in this deluge system is a pressure operated, sleeve actuated, axial valve designed for use in fire protection systems.

The **Inbal** Electrically Actuated Deluge Valve is used for automatic or manual operation. Electric activation of the **Inbal** Deluge system requires a solenoid valve actuated by a control panel with heat, smoke, or flame detectors. When the detection system operates, the control (fire alarm & releasing) panel energizes the Solenoid Valve to open. When the Solenoid Valve is actuated either automatically or manually, or when a manual release station is operated locally or remotely, the **Inbal** Deluge Valve opens and water flows from all open sprinklers and/or nozzles on the system. As soon as the releasing system and the sprinkler piping are reset, the **Inbal** Deluge Valve resetting is merely done by activating the reset knob.

The control trim includes all the pilot valves, accessories, fittings, and gauges to provide for proper operation in either vertical or horizontal installation. The **Inbal** Deluge Valve is rated to 300 psi (21 bar) working pressure, but actually is limited to the Solenoid Valve's pressure rating (see Solenoid Valves in Technical Data). 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** Deluge 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** Deluge Valve ideally suitable for use with brackish or sea water, similar to those found in chemical and petrochemical facilities or in offshore platforms.

## Technical Data

### Approvals

The **Inbal** Electrically Controlled Deluge System models:

711D -24C01	733D -24C01	799D -24C01
711DX -24C01	733DX -24C01	799DX -24C01
711DX -04C01	733DX -04C01	799DX -04C01
711DG -24C01	733DG -24C01	799DG -24C01
711DG -04C01	733DG -04C01	799DG -04C01

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, and ABS Type Approvals for all sizes.

\* Provided it is the pressure rating of the solenoid valve in use

### Model Numbers

Inlet End	Outlet End	Model No.
Threaded	Threaded	711DX-04C01
Threaded	Grooved	716DX-04C01
Flanged	Flanged	733DX-04C01
Flanged	Grooved	736DX-04C01
Grooved	Grooved	766DX-04C01
Wafer	Wafer	799DX-04C01

"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"; "34" – for foam control trim. For example: 736DX-24C01 is an inlet flanged end, outlet grooved end deluge valve with sea water, electrically actuated trim.

### Sizes

**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).

**Grooved Ends:**

2", 3", 4", 6" & 8" (50, 80, 100, 150 & 200 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;<sup>1</sup>

ISO 7005 - PN10, 16 & 25;<sup>1</sup>

BS 10 Table D & E;<sup>2</sup>

AS 2129 Table D & E;<sup>2</sup>

Jibs B 2212, 2213, 2214.<sup>2</sup>

**Grooved End:**

ANSI/AWWA C606-87.

**Wafer End:**

Fits most of the above standards.

(1) - On standard

(2) - On special request

### Pressure Rating

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

### 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)<sup>1</sup>

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

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

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

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

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

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

For further details see bulletin F30-01.

(1) - Din 43650A connector

(2) - ½" Conduit, 18" leads

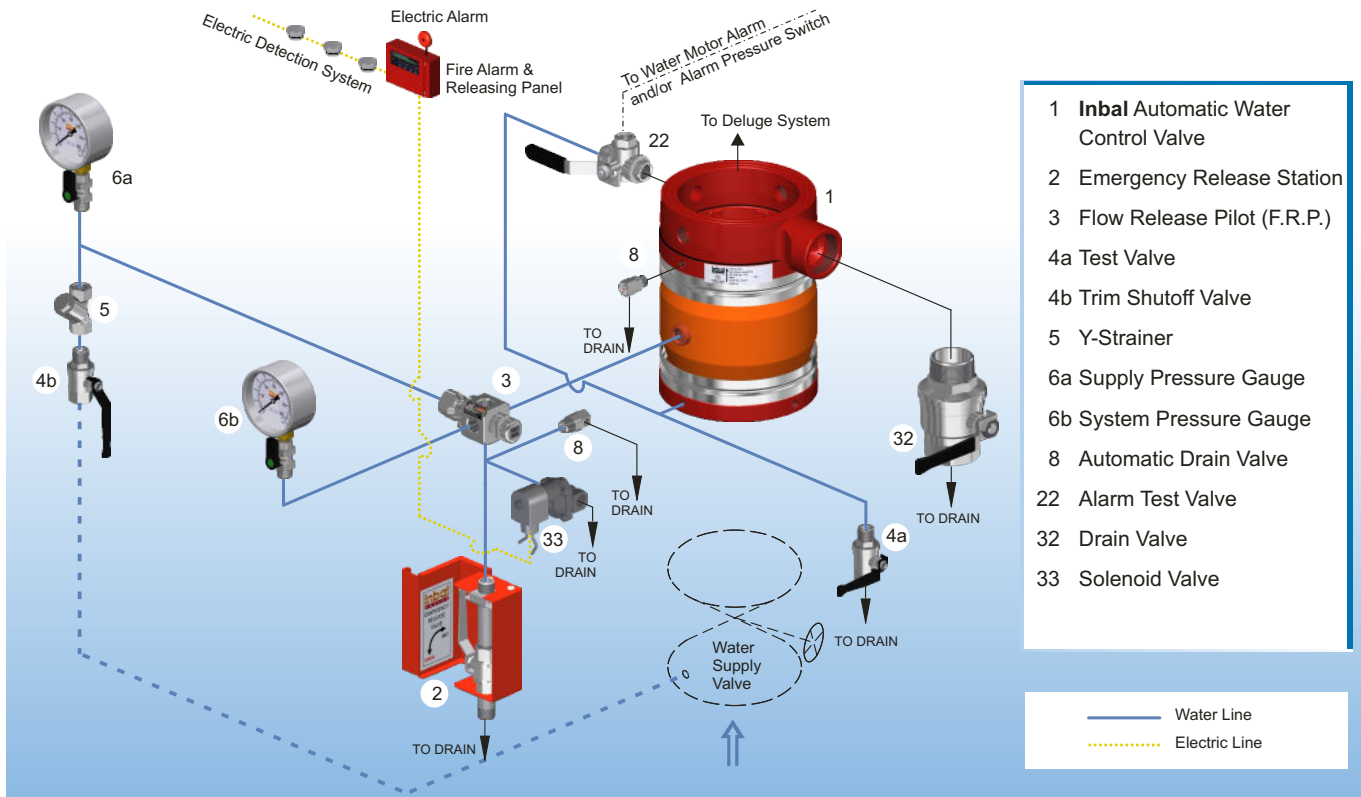
(3) - M20x1.5

#### 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.

## Schematic Control Diagram – 700DX-04C01



### 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).

##### Sleeve:

SMR5 Elastomer reinforced with Polyester 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 trademark 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. The complete control trim includes the following components:

- Solenoid Valve.
- Flow Release Pilot (F.R.P.) with a built-in check valve.
- Y-Strainer with a stainless steel screen.
- Alarm Test Valve – 3 way, L-port, 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.

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## Features

- 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.
- The line pressure is sufficient to close the **Inbal** Valve tightly. Can perform also, when water supply valve is not in use.
- 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 a compatible solenoid valve is used.
- 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.
- The same basic trim is compatible with electric, pneumatic, and/or hydraulic release.
- Additional functions such as pressure control or another release system could be added on the same valve body.

## 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 hydraulic line, and is controlled by the detection system and the control (Fire Alarm & Releasing) panel. A manual emergency electric station and an alarm bell are incorporated electrically into the control panel and detector circuits. The control panel includes a battery charging circuit. In the event of a power failure, the control panel automatically switches to battery power.

In the set position, the water pressure is applied to the Control Chamber of the **Inbal** Deluge Valve and to the Solenoid Valve from the upstream of the Water Supply

Valve. The de-energized Solenoid Valve is closed. Consequently, the **Inbal** Deluge Valve stays closed.

The **Inbal** Deluge Valve opens wide when the detection system senses the presence of fire, and an electrical signal to the control panel activates the Solenoid Valve. The Solenoid Valve opens also when the manual emergency electric station is activated. The energized Solenoid Valve releases water from the **Inbal** Valve Control Chamber. The **Inbal** Deluge Valve opens fully introducing a flow of water to the system while activating the alarm devices. Water will flow from any open sprinklers and/or spray nozzles on the system. The operation of the **Inbal** Deluge 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 Solenoid Valve closes. The **Inbal** Valve will close only when the Resetting procedure is followed.

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

## Installation

Refer to the Trim Chart applicable to the specific **Inbal** Deluge Valve model in use.

1. When the **Inbal** Deluge Valve is delivered, carefully unpack and 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** Deluge Valve accordingly.
4. Install the **Inbal** Deluge 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 Water Supply Valve through a ½" pipe.
7. Assemble the Solenoid Valve according to the drawing, the applicable solenoid valve bulletin, and the direction of

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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. Set the **Inbal** Deluge Valve by following the Resetting procedure.
9. Test the **Inbal** Valve, the trim, and the alarms according to the Testing procedure.

## Resetting

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

The procedure is as follows:

1. Close the Water Supply Valve. Water flow alarms are reset.
2. Close the Trim Shutoff Valve.
3. 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.
4. Open the Flow Test Valve and Drain Valve, allowing all the water to drain.
5. Inspect and replace any portion of the detection system subjected to fire conditions.
6. Inspect the trim and alarm Y-Strainers. Clean if necessary.
7. Verify that the Emergency Release Valve is in a closed position.
8. Open the Trim Shutoff Valve. Push and hold the reset knob on the F.R.P. and allow water pressure to build up in the trim and in the **Inbal** Valve Control Chamber. Wait and verify that the pressure readings on both pressure gauges are equal.
9. Release the reset knob on the Flow Release Pilot (F.R.P.).
10. Close the Flow Test Valve.
11. Fully open the Water Supply Valve. Verify that there is no flow from the Drain Valve, downstream of the **Inbal** Valve.
12. Close the Drain valve.

## Maintenance, Inspection, & Testing

It is recommended that periodic inspections and tests be conducted by qualified personnel to ensure that the **Inbal** Deluge 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 Deluge 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 is sealed in fully open position.
2. Verify that the required water pressure is being applied to the **Inbal** Deluge Valve inlet and trim.
3. Verify that the Trim Shutoff Valve, Alarm Test Valve, Emergency Release Valve, Pressure Gauge Valves, Flow Test Valve, and Drain Valve are in set position.
4. The Supply and System 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:

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

### Deluge Trim Testing

A *semi-annual* Deluge 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** Deluge Valve inlet.
2. Close the Flow Test Valve.
3. Close the Water Supply Valve installed in the inlet of the **Inbal** Deluge 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

An *annual* Trip Testing is recommended. Performing the Trip Testing will cause water to flow from all open sprinklers and nozzles. Prevent damage by taking necessary precautions.

1. Open the Flow Test Valve to flush away any debris or foreign particles which may have accumulated in the **Inbal** Deluge Valve inlet.
2. Close the Flow Test Valve.
3. Trip the **Inbal** Valve to open by either:
  - a) Actuating the Solenoid Valve.
  - b) Opening the Emergency Release Valve.

The water in the **Inbal** Valve Control Chamber is released to the atmosphere. The **Inbal** Deluge Valve will open wide and water will flow to the system. All the alarms should operate. Verify that the whole system is working properly.

4. Reset the valve by performing the instructions in Resetting.

### Removal

To remove the **Inbal** Deluge Valve:

1. Close all the pressure supplies:
  - a) Water Supply Valve.
  - b) Trim Shutoff 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 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. ●

