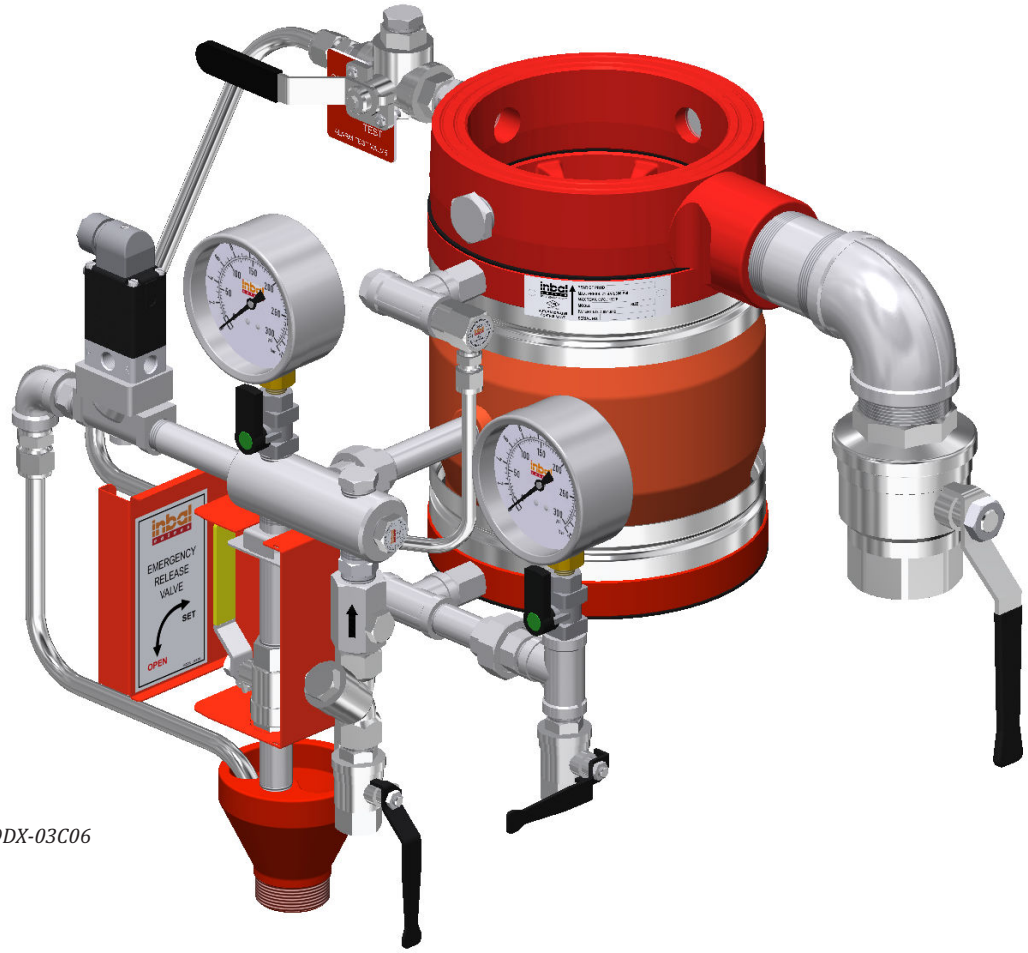
Inbal Deluge Valve, Electric Actuation

Series 700D/DX - 03/23C06 **Remote Resetting**

FM Approved; UL Listed



Model 799DX-03C06

General Description

The Remote Resetting, Electrically Actuated **Inbal** Deluge Valve is specifically designed for use in fire protection systems actuated by a remote resetting, 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 magnetic latch (impulse) solenoid valve controlled by a control (fire alarm & releasing) panel either manually or by heat, smoke, or flame detectors. When the detection system operates, the control panel energizes the Solenoid Valve to open. When the Solenoid Valve is actuated either automatically or manually, the solenoid valve is latched open and won't close unless a remote control reset is implemented. The **Inbal** Valve will open also when the manual release station is operated locally or by remote, the **Inbal** Deluge Valve opens to flow water from all open sprinklers and/or nozzles on the system.

After operation, the **Inbal** Valve can be reset by remote control, saving the need to approach the Deluge Valve for resetting.

The control trim includes all the pilot valves, accessories, fittings, and pressure gauge to provide for proper operation, either at vertical or horizontal installation. The **Inbal** series 700DX-03C06 includes a Drain Valve installed in the Drain End. The standard material **Inbal** Deluge Valve is rated to 300 psi (21 bar) working pressure.

The **Inbal** Remotely Resetting Deluge Valve is available in sizes 1½" (40 mm) to 12" (300 mm) with threaded, flanged, grooved 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 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 -23C06[2]	733D -23C06[2]	799D -23C06[2]
711DX-23C06[2]	733DX-23C06[2]	799DX-23C06[2]
711DX-03C06[2]	733DX-03C06[2]	799DX-03C06[2]
711DG-23C06[2]	733DG-23C06[2]	799DG-23C06[2]
711DG-03C06[2]	733DG-03C06[2]	799DG-03C06[2]

are all FM approved and UL Listed to 300 psi (21 bar)[3] in sizes 2"[1], 3", 4", 6", 8", 10" and 12" (50, 80, 100, 150, 200, 250 and 300 mm), with threaded, flanged and wafer ends. Consult the UL and FM Approval Guides for acceptable applications. **Inbal** Deluge Valves have Lloyd's, DNV▪GL, and ABS Type Approvals for all sizes.

Model Numbers

Inlet End	*Outlet End*	*Model No.*
Threaded	Threaded	711DX-03C06[2]
Threaded	Grooved	716DX-03C06[1]
Flanged	Flanged	733DX-03C06[2]
Flanged	Grooved	736DX-03C06[1]
Grooved	Grooved	766DX-03C06[1]
Wafer	Wafer	799DX-03C06[2]

"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 trim replace "03" with "23" ; "33" – for foam control trim. For example: 733D-23C06 is a flanged ends deluge valve with sea water, remote resetting, electrically actuated control trim.

(1) - UL listed
(2) - FM Approved and UL Listed
(3) - Provided it is the pressure rating of the solenoid valve in use

Sizes

Threaded and Grooved Ends:
1½", 2", 2½" & 3" (40, 50, 65 & 80 mm).
Flanged and Grooved Ends:
2", 2½", 3", 4", 6", 8", 10" & 12" (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;
ISO 7006 - PN10, 16* & 25;
BS 10 Table D & E;
AS 2129 Table D & E;
Jis B 2212; 2213, 2214.
Grooved End:
ANSI/AWWA C606-87.
Wafer End:
Fits most of the above standards.

** On standard*

Pressure Rating

Maximum working pressure: 230 psi (16 bar). Higher working pressure is available depends on the specific solenoid valve in use.

Temperature Range

Water: Max. +150°F (+65°C).

Installation Position

Vertical or horizontal.

Solenoid Valve

FM Approved models:

2 way, Magnetic latch (impulse) series 157 of which the following solenoid valves are FM approved:

157-93A – Brass body; ½"; 24 V DC; 11 Watt; IP 65; to 230 psi (16 bar)[1]

157-89A – St. St. 316 body; ½"; 24 V DC; 11 Watt; IP 65; to 230 psi (16 bar)[1]

UL Approved models:

2 way, NC (energized to open the Deluge Valve), series 157 of which the following solenoid valves are UL approved:

157-42A – Brass body; ½"; 24 V DC; 10 Watt; NEMA1,2,3,3S,4,4X; to 170 psi (12 bar)[4]

157-52A – Brass body; ½"; 24 V DC; 10 Watt; NEMA1,2,3,3S,4,4X; to 170 psi (12 bar)[4]

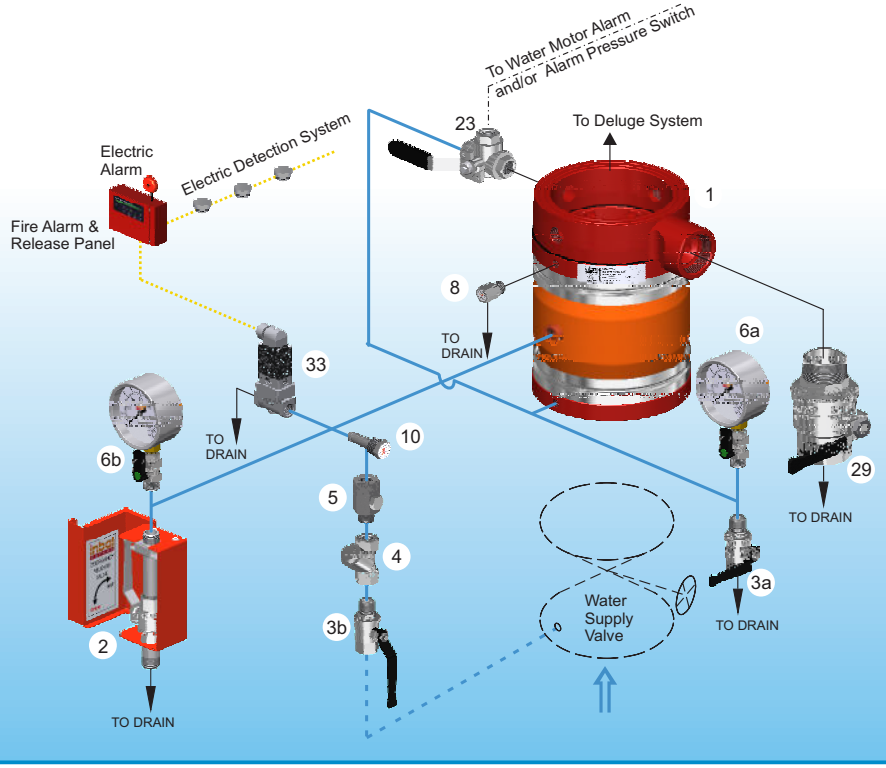
157-62A – St. St. 316 body; ½"; 24 V DC; 8 Watt; IP 65; to 230 psi (16 bar)[4]

See bulletin F30-01 for the complete list of solenoid valves.

(1) - Din 43650A connector
(4) - ½" NPTF

Allso available alternative voltages:
AC 50Hz: 24, 48, 110 & 220 volt;
AC 60Hz: 24, 120, & 240 volt;
DC: 12, 24, 48, 110, 120 & 220 volt.
Protection type Enclosure:
Conforms to NEMA (1 to 9), IEC (79 & 529), or CENELEC (50014 to 50019) standards.
See bulletins F30-01.

Schematic Control Diagram – 700DX-03C06



1 **Inbal** Automatic Water Control Valve
2 Emergency Release Station
3a Test Valve
3b Trim Shutoff Valve
4 Y-Strainer
5 Check Valve
6a Supply Pressure Gauge
6b System Pressure Gauge
8 Automatic Drain Valve
10 Restriction Orifice
23 Alarm Test Valve
29 Drain Valve
33 Solenoid Valve

Water Line
Electric Line

Materials

Standard

Valve Housing:
Carbon steel (SAE 1021).
Valve Ends and Wafer Drain End:
Ductile Iron (ASTM A536-65 45 12).
Threaded, *Flanged, and Grooved Drain Ends*:
Carbon steel (SAE 1020).
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: 0.06" (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. The complete control trim includes the following components:

- Solenoid Valve, 2 way.
- Trim Shutoff Valve*, Flow Test Valve and Drain Valve - quarter turn, ball valves.
- Y- Strainer with stainless steel screen*.
- Alarm Test Valve – 3 way, L-port, quarter turn ball valve.
- Check Valve – spring loaded, soft seat*.
- Supply and System Pressure Gauges with dual scale (psi and bar).
- Pressure Gauge Valves – 3 way, quarter turn ball valve.
- Drain Cup and Drain Tubes.
- Automatic Drain Valve.
- Emergency Release Station.

For Sea Water Control Trim:

* *The Trim Shutoff Valve, Y-Strainer and Check Valve are replaced with Water Supply Unit (see bulletin F40-10) .*

Features

- Remote Electric activation and reset enables efficient control of the whole area.
- The same deluge valve can be operated and reset from the control room as well as from field control Panel.
- No Moving Mechanical Part (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 – no need to approach the valve.
- When in operation the Deluge **Inbal** Valve is latched in an open position and wouldn't close unless Resetting is exercised.
- Supplied standard in almost complete preassembled form - 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 of 300 psi (21 bar) provided a 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.
- Compatible with electric, pneumatic, and/or hydraulic release with the same basic trim.
- 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 the inlet pressure is maintained in the Control Chamber of the **Inbal** valve. Electric actuation trim consists of a Solenoid Valve connected to the wet pilot line and controlled by the detection system and the control (Fire Alarm & Releasing) panel.

In the set position the water pressure is applied to the **Inbal** Valve Control Chamber and to the Solenoid Valve from the upstream of the Water Supply Valve. The de-energized Solenoid Valve is closed. Consequently, the Hydraulic Actuator and **Inbal** Deluge Valve stay closed.

The **Inbal** Deluge Valve opens wide when the detection system senses the presence of fire and an electrical signal to the control panel actuates the Solenoid Valve to open. The Solenoid Valve opens also when the manual emergency electric station is activated. The actuated Solenoid Valve releases water from the Control Chamber of the Actuator which opens wide to relieve the pressure from the **Inbal** Valve control space. 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 valve remains in a wide open position until the Resetting procedure is followed. Actually the **Inbal** Deluge Valve is reset by the mere retrieval of the release device to its set position.

The **Inbal** Deluge Valve series 700D-23C06 and 700DX-03C06 utilize only Magnetic Latch (impulse) type of solenoid valves.

Magnetic Latch type solenoid has two coils (Latch coil & De-Latch coil) with opposing windings and a permanent magnet. The coil has three terminals for latching and de-latching.

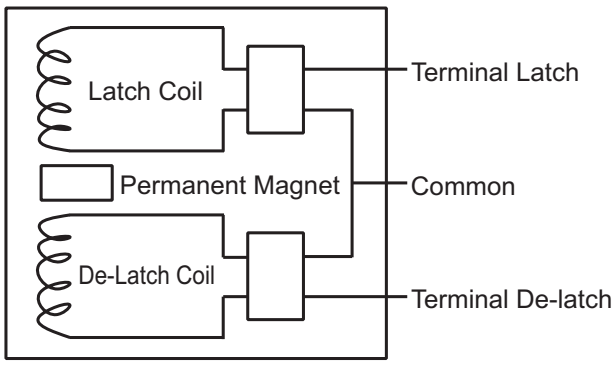
Thus, when the Latch coil of the solenoid valve is energized (either by momentary pulse of power (min 20 millisecond) or by continuous electrical power) it is latched and holds the **Inbal** Deluge Valve in an open position until resetting. Loss of power or switching off the Latch coil will not close the **Inbal** Deluge valve.

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** Valve on the piping system accordingly.
4. Install the **Inbal** Deluge Valve in the pipe line. 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 F30-01 and the 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. 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.

1. After automatic or manual electric operation - reset the detection system, Fire Alarm & Releasing Panel, and the Solenoid Valve.
   Resetting of the Solenoid Valve is provided by momentary pulse of power (min 50 millisecond) to the second (De-latch) coil of the solenoid valve. The **Inbal** Deluge Valve will close drip tight. Electric Alarm and water flow alarms are reset. Verify that the supply pressure has been restored to the normal level.
2. After manual emergency operation – close the Emergency Release Valve. The **Inbal** Deluge Valve will close drip tight. The water flow alarm is reset. Verify that the supply pressure has been restored to the normal level.
   In either one of the operations exercised, the system piping should be drained.

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 a full 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 Valve, and Drain Valve (if in use) are in set position.
4. The Supply Pressure Gauge 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- Strainer. 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 stop sounding and pressure switch is reset.
4. Verify that supply piping to 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. Close the Water Supply Valve installed in the inlet of the Deluge Valve.
2. Actuate the Solenoid Valve.
   Verify that water is drained from the deluge trim which simulates an open position of the **Inbal** Deluge Valve.
3. Reset the valve by performing the instructions in Resetting.
4. Open the Water Supply Valve.

Trip Testing

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

1. Trip the **Inbal** Deluge Valve to open by either:
   a) Actuation of the Solenoid Valve.
   b) Opening the Emergency Release Valve.
   The water in the **Inbal** Valve Control Chamber is allowed to vent to the atmosphere. The **Inbal** Deluge Valve will open and water will flow to the system.
2. All the alarms should operate. Verify that the whole system is working properly.
3. Reset the system by performing the instructions in Resetting.
4. Verify that water supply pressure is restored to the normal level.

Removal

To remove the **Inbal** Deluge Valve:

1. Close all the pressure supply valves:
   a) Water Supply Valves.
   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 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. ●