

Deluge Valve, Hydraulic Actuation

Series 700D/DG/DX - 04/14A 01

Local Resetting

inbal
v a l v e s



Model 799DG-04A01

General Description

The **Inbal** Deluge Valve with Hydraulic Actuation Trim is specifically designed for fire protection systems actuated by a fire detection and release system of wet pilot sprinklers and/or hydraulic manual control. The **Inbal** Automatic Water Control Valve, which is used in this deluge system, is a pressure operated, sleeve actuated, axial valve designed for use in fire protection systems.

The **Inbal** Hydraulically actuated Deluge Valve is used for automatic or manual operation. The wet pilot line functions as a thermal detector equipped with a fixed temperature release. When one or more of the sprinkler heads, located on the pilot line, fuses, 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 standard material **Inbal** Deluge Valve is rated to 300 psi (21 bar) and is available in sizes 1½" (40 mm) to 12" (300 mm). The valves have 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 in brackish or sea water, similar to those found in chemical and petrochemical facilities or in offshore platforms. The **Inbal** can also be used as a foam concentrate control valve in foam/water systems.

Technical Data

Approvals

The **Inbal** Hydraulically Controlled Deluge Valve series 700DG-04A is FM approved to 300 psi (21 bar) in sizes 3", 4", 6", and 8" (80, 100, 150, and 200 mm). Consult the FM Approval Guide for acceptable applications. **Inbal** Deluge Valves have Lloyd's, DNV, and ABS Type Approvals for all sizes.

Model Numbers

Inlet End	Outlet End	Model no.
Threaded	Threaded	711DG-04A01
Threaded	Grooved	716DG-04A01
Flanged	Flanged	733DG-04A01
Flanged	Grooved	736DG-04A01
Grooved	Grooved	766DG-04A01
Wafer	Wafer	799DG-04A01

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

The above model numbers refer to fully trimmed valves. For basic trim, replace "04" with "14". (See also bulletin F01-03-01 for control trims "24" & "34"). For example: 711DG-14A01 is a threaded ends deluge valve with basic, hydraulically actuated trim.

Sizes

Threaded End:

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 End:

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 7005 - PN10, 16 & 25;

BS 10 Table D & E;

AS 2129 Table D & E;

Jis B 2212, 2213, 2214.

Wafer End:

Fits most of the above standards.

Grooved End:

ANSI/AWWA C606-87.

Pressure Rating

Maximum working pressure*: 300 psi (21 bar).

*standard material valve.

Temperature Range

Water: Max. +150°F (+65°C).

Installation Position

Vertical or horizontal.

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 Aluminium 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 AusimontUSA 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 complete control trim includes the following components :

- 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 .

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.
- Anticolumning device is available for long or high elevation wet pilot line.
- Fast and easy reset by thumb activated knob.
- Supplied as standard preassembled in sections - saves the self assembly cost.
- Remote emergency release stations can be used for manual operation.
- 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) for standard material valve.
- 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 wet pilot line, equipped with closed sprinkler heads, is pressurized through the valve trim and located over the protected area. The wet pilot line serves the dual purpose of thermal detection and release system.

In the set position, water pressure is applied to the Control Chamber of the **Inbal** Deluge Valve and to the hydraulic release system from the upstream of the Water Supply Valve. Consequently, the **Inbal** Deluge Valve stays closed.

The **Inbal** Deluge Valve opens wide when one or more of the sprinklers installed on the wet pilot line fuses and water pressure is allowed to vent, or when a hydraulic manual release opens. Either one of these operations releases water from the **Inbal** Control Chamber. The **Inbal** Deluge Valve opens fully introducing a flow of water to the system while activating the system 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 wet pilot line closes. The **Inbal** Valve will close only when the Resetting procedure is followed.

The maximum elevations in which the wet pilot sprinklers or manual release stations can be installed are shown on Graph (1). They are presented in relation to the various lengths of pilot lines and to the water supply pressure.

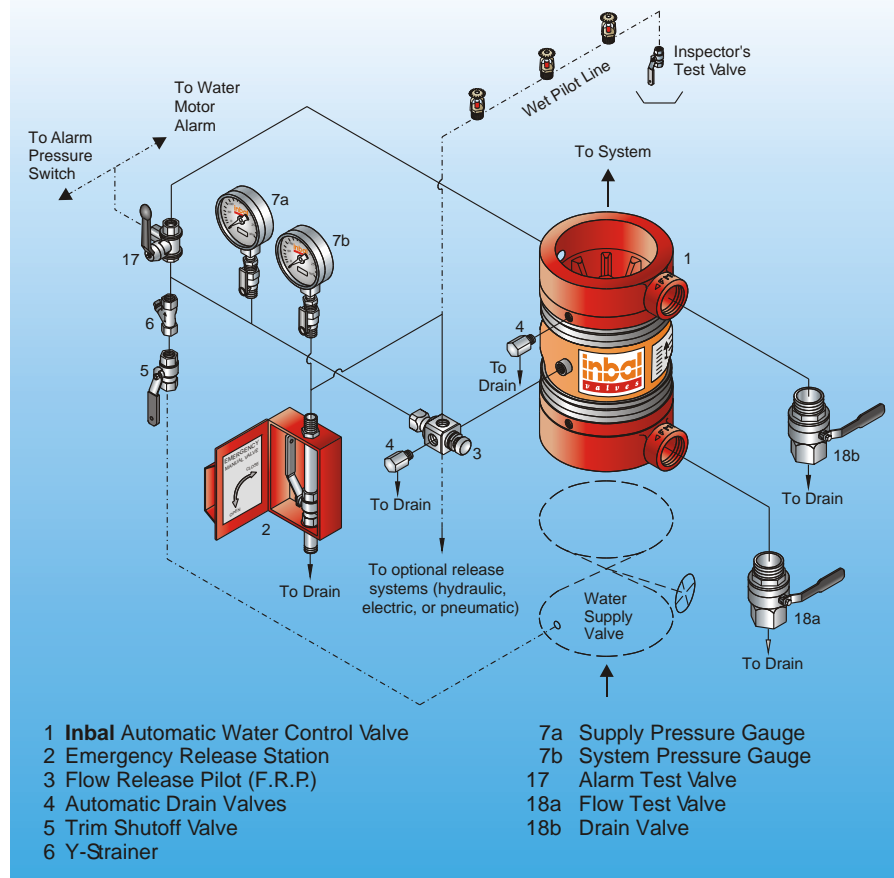
The Emergency Release Valve is used for emergency actuation of the **Inbal** Deluge Valve and for routine testing.

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 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** 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 1/2" pipe.
7. Connect the wet pilot line to the Flow Release Pilot (F.R.P.). Refer to Graph (1) which shows the maximum elevations above the Deluge Valve at which the release line (pilot sprinklers or manual release) should be installed. An Anticolumning Device is required when the release line elevation exceeds the figure corresponding to the minimum water supply system pressure in which the **Inbal** Deluge Valve is planned to perform.
8. It is recommended to install an inspector's test valve on the hydraulic release system. The inspector's test valve is a locked closed ball valve with an outlet end orifice equivalent to the smallest orifice of the releasing device provided on the system. The inspector's test valve may be used to verify adequate operation of the deluge system when a releasing device operates.
9. Set the **Inbal** Deluge Valve by following the Resetting procedure.
10. Test the **Inbal** Valve, the trim, and the alarms according to the Testing procedure.

Schematic Control Diagram – 700DG-04A01



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. Open the Flow Test Valve and Drain Valve, allowing all the water to drain.
4. Inspect and replace any portion of the detection system subjected to fire conditions.
5. Inspect the trim and alarm Y-Strainers. Clean if necessary.
6. Verify that the Emergency Release Valve is in a closed position.
7. 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.
8. Release the reset knob on the Flow Release Pilot (F.R.P.).
9. Close the Flow Test Valve.

10. Fully open the Water Supply Valve. Verify that there is no flow from the Drain Valve, downstream of the **Inbal** Valve.

11. 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:

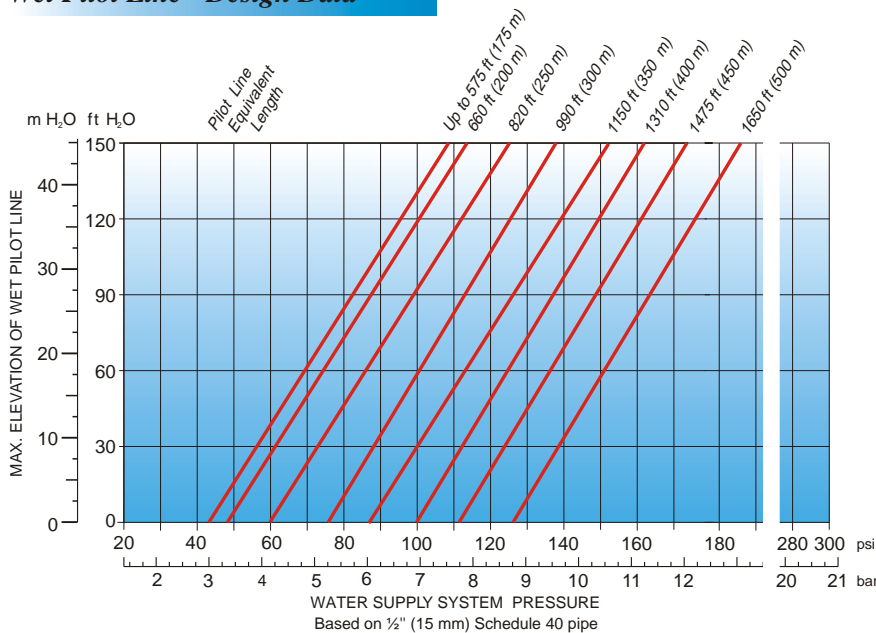
1. Verify that the Water Supply Valve is sealed in fully open position.
2. Verify that the required water pressure is being applied to the **Inbal** Deluge Valve inlet and trim.

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Wet Pilot Line - Design Data



If the maximum elevation of hydraulic release piping exceeds the limits shown on the graph, use anticolumning device model 395-08 (see bulletin F40-14-01).

Graph (1)

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 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. Open the inspector's test valve in the hydraulic release system. Water should be drained from the deluge trim. Verify that the pressure reading on the System Pressure Gauge drops to zero which simulates an open position of the **Inbal** Deluge 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/or 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) Opening the inspector's test 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 water flow alarms should operate. Verify that the whole system is working properly.

4. Close the inspector's test valve or the Emergency Release Valve.
5. 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. Open the Emergency Release Valve to release the water pressure from the **Inbal** Valve Control Chamber.
3. Open the Flow Test Valve and Drain Valve to allow all the water to drain.
4. Disconnect the union and remove the trim from the valve.
5. Remove the **Inbal** Valve from the line for inspection.
6. To reinstall, follow the Installation procedure (use new gaskets for flanged or wafer valve).

Inquiries/Orders

The Data Sheet For Inquiries/Orders (bulletin F01-05-01) should be submitted.