# Hydraulically Actuated, Remote Reset, Pressure Reducing Deluge Valve FDV - PH1

The FDV is a fire protection control valve for deluge fire sprinkler systems, designed for installation in hazardous environments.

It is suitable for vertical or horizontal installation and features a globe-pattern, line-pressure-operated design with a direct elastomeric diaphragm seal. The valve contains no balancing spring or internal metallic components in the wetted space. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-PH1 is a hydraulically actuated, remotely reset, pressure-control deluge system. Its functional principle is as follows:

In a fire situation, a hydraulic detection system (a wet pilot line with automatic sprinklers) triggers a hydraulic actuator. The actuator then releases the pressurized water trapped in the FDV's control chamber, causing the valve to open.

The system includes an emergency manual override valve, which bypasses the fire detection system and enables manual activation when needed.

This system reduces upstream pressure to a set downstream value and maintains it at a steady level. It responds to downstream pressure fluctuations caused by changes in flow demand, ensuring stable output pressure.


## MARKETS

Commercial · Industry · Marine · P.O.G. · Storage · Residential · Airport

## TECHNICAL DATA

**FLUID:** Water, Brackish water, Sea water, Foam

**SIZE RANGE:**
40mm to 250mm (1½'' to 10'')

**AVAILABLE CONNECTIONS ENDS:**
Flange*Flange, Groove*Groove, Flange*Groove, Groove*Flange, Thread*Thread

**PRESSURE NOMINAL:**
250 psi (17.2 bar)

**REGULATION RATIO**: 5:1

**SENSITIVITY**:
1.45 psi (0.1 Bar)

## APPROVALS

## ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wet metal springs inside the control chamber.
- Full-bore, unobstructed flow.
- Simple manual reset to the standby position, without draining or opening the valve, and without closing the butterfly valve or other valves in the system.
- Fail-safe open valve design, normally maintained in the closed standby position.
- Low maintenance cost: the valve can be serviced in-line and contains only one replaceable part — a long-life elastomeric diaphragm.
- Complies with NFPA 25 — Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.

## CHARACTERISTICS

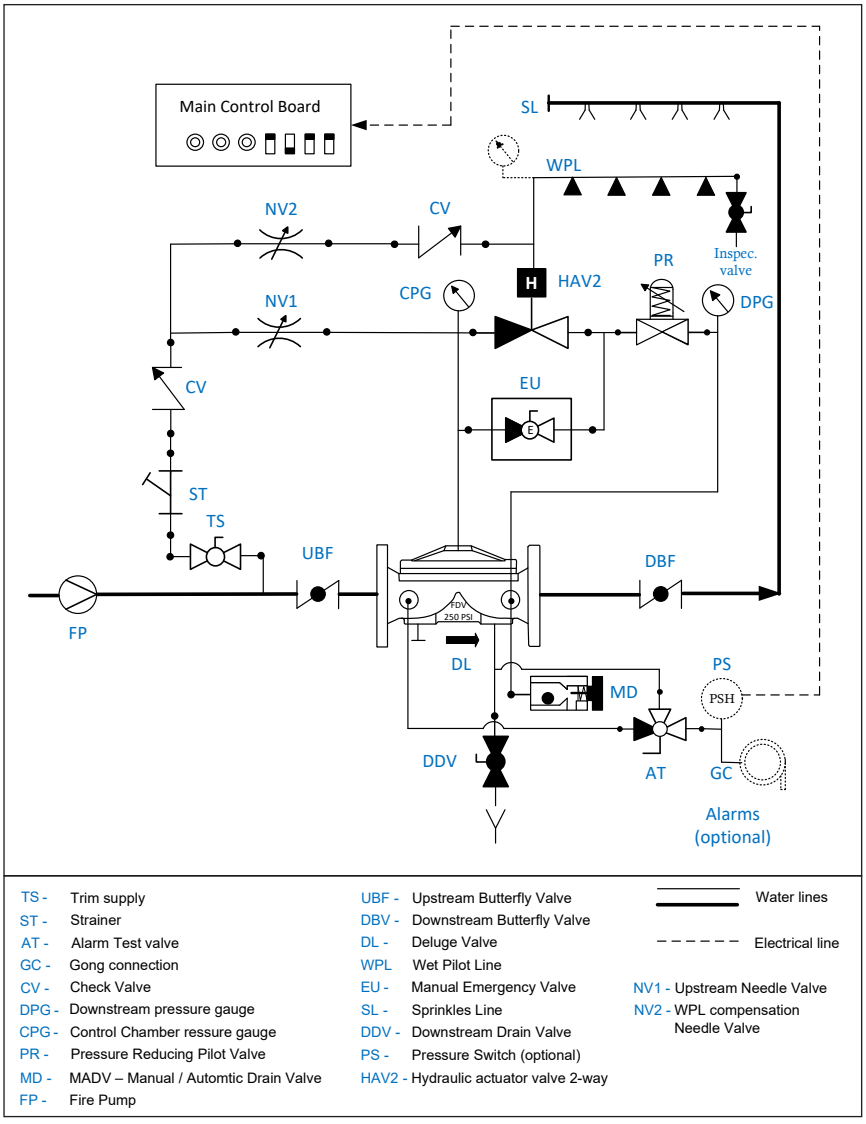
- Hydrodynamic pattern design ensures high flow rates with minimal head loss.
- The valve opens automatically upon a gradual release of water pressure from its control chamber. It is actuated by the hydraulic pressure release of a Wet Pilot Line, triggered by exposure to flame heat.
- Soft closing, achieved by pressurizing the valve's control chamber using line pressure or another independent water source, prevents surges.
- A pressure-reducing pilot allows full control over downstream pressure and ensures a stable setpoint across a wide pressure range.

The FDV-PH1 resets to the standby closed position by pressurizing the Dry Pilot Line.

## Schematic drawing:

FDV-PH1

### Set position




| | | | | | |
|---|---|---|---|---|---|
| TS - | Trim supply | UBF - | Upstream Butterfly Valve | | Water lines |
| ST - | Strainer | DBV - | Downstream Butterfly Valve | | Electrical line |
| AT - | Alarm Test valve | DL - | Deluge Valve | | |
| GC - | Gong connection | WPL | Wet Pilot Line | NV1 - | Upstream Needle Valve |
| CV - | Check Valve | EU - | Manual Emergency Valve | NV2 - | WPL compensation Needle Valve |
| DPG - | Downstream pressure gauge | SL - | Sprinkles Line | | |
| CPG - | Control Chamber ressure gauge | DDV - | Downstream Drain Valve | | |
| PR - | Pressure Reducing Pilot Valve | PS - | Pressure Switch (optional) | | |
| MD - | MADV – Manual / Automtic Drain Valve | HAV2 - | Hydraulic actuator valve 2-way | | |
| FP - | Fire Pump | | | | |

# OPERATION

### SET POSITION

Water is supplied by the trim supply valve (TS), passes through the "Y" strainer (ST) and the upstream check valve (CV), then flows through needle valve 1 (NV1) to fill the FDV's control chamber. In parallel, water flows through compensation needle valve 2 (NV2) and the compensation check valve (CV), pressurizing the pilot line (WPL). Pressurized water in the control chamber is retained by the check valve, the HAV-2 actuator (HAV2), and the closed emergency valve MEU (EU), keeping the deluge valve in the closed position. The pressurized water in the wet pilot line holds the HAV-2 i its closed state.

### FIRE SITUATION

When one or more automatic sprinklers along the wet pilot line (WPL) are exposed to flame heat and activate (blow open), the pilot line depressurizes. Consequently, the HAV-2 actuator opens, draining the FDV control chamber through the pressure-reducing pilot valve (PR).

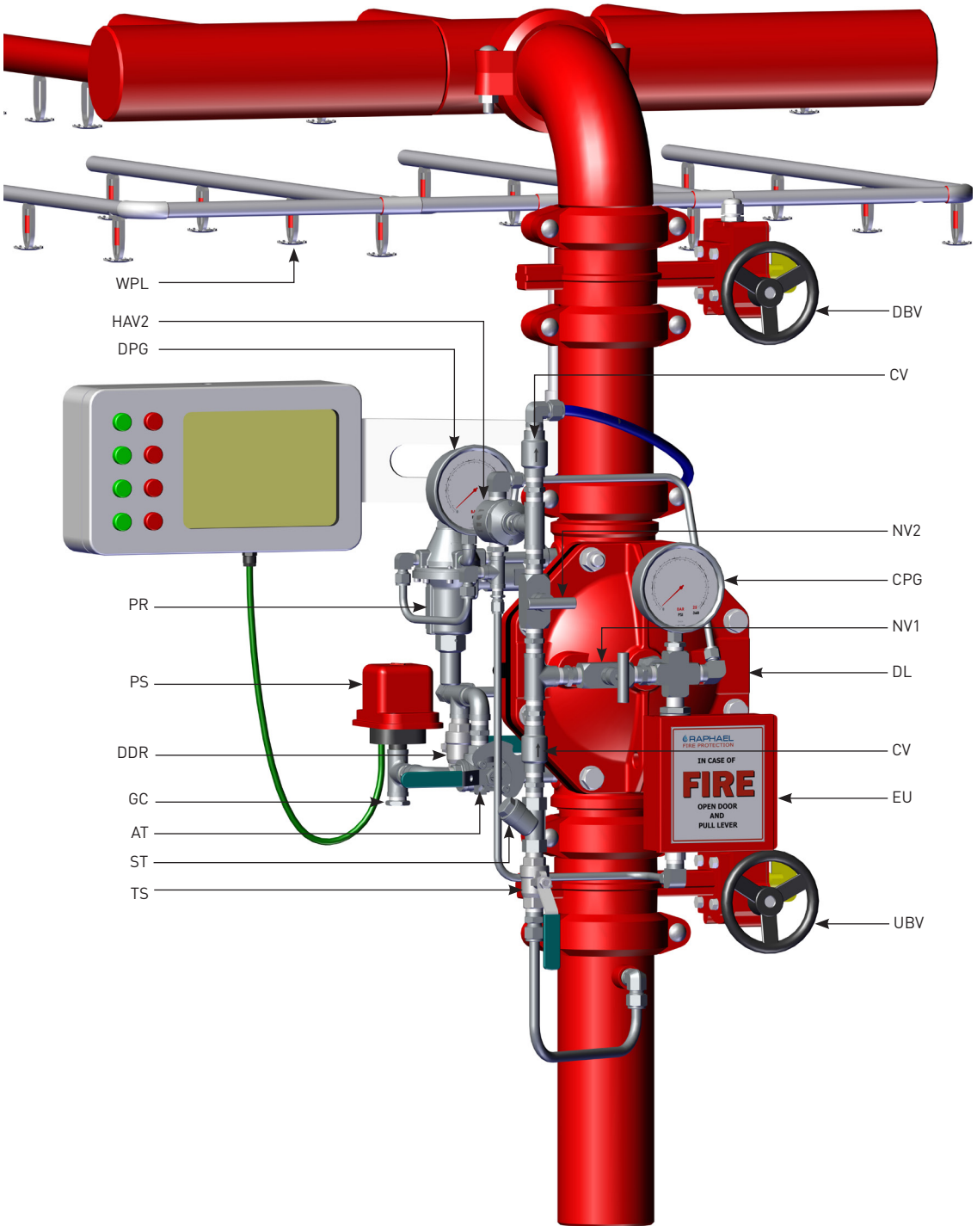
Once the FDV opens, water flows into the sprinkler piping. The PRPV pilot senses the downstream pressure and regulates the FDV opening, maintaining a steady preset downstream pressure. Opening the MEU door and pulling down the ball valve handle bypasses all control elements, drains the FDV control chamber, and immediately opens the valve.

### RESET POSITION

To reset, replace all activated (blown-open) sprinklers in the wet pilot line, then repressurize the pilot line. When pressurization is restored, the HAV-2 closes, blocking drainage from the FDV control chamber, while upstream water continuously refills it via the trim's needle valve (NV1). The FDV then closes, returning the system to the SET position. The sprinkler piping should be drained by opening the FDV downstream drain ball valve (DDV) or by pressing the MADV push button (MD).

## Typical installation

# FDV - PH1



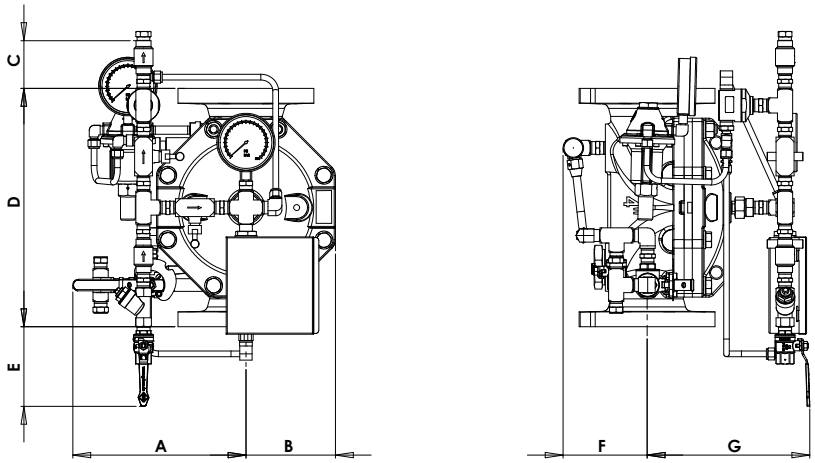

**TS** – Trim Supply
**ST** – Strainer
**AT** – Alarm Test valve
**GC** – Gong Connection
**DDR** – Downstream Drain Valve
**PS** – Pressure Switch

**PR** – Pressure Reducing Pilot Valve
**DPG** – Downstream Pressure Gauge
**HAV2** – Hydraulic actuator 2 way
**WPL** – Wet Pilot Line
**DBV** – Downstream Butterfly Valve
**CV** – Check Valve
**NV1** - Upstream Needle Valve

**NV2** – WPL compensation Needle Valve
**CPG** – Control chamber Pressure Gauge
**DL** – Deluge valve
**EU** – Emergence Valve
**UBV** – Upstream Butterfly Valve

## Parametric drawing:

FDV-PH1




## Dimensions Table

| Size | 1½", | | 2" | | 3" | | 4" | | 6" | | 8" | | 10" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| **A** | 255 | 10 | 290 | 11.4 | 300 | 11.8 | 290 | 11.4 | 315 | 12.4 | 338 | 13.3 | 193 | 7.6 |
| **B** | 122 | 4.8 | 122 | 4.8 | 122 | 4.8 | 150 | 5.9 | 178 | 7 | 230 | 9 | 306 | 12 |
| **C** | 180 | 7 | 172 | 6.8 | 117 | 4.6 | 80 | 3.1 | 52 | 2 | 48 | 1.9 | 45 | 1.77 |
| **D** | 204 | 8.0 | 220 | 8.6 | 324 | 12.7 | 400 | 15.7 | 464 | 18.2 | 570 | 22.4 | 766 | 30.1 |
| **E** | 232 | 9.1 | 218 | 8.6 | 170 | 6.7 | 132 | 5.1 | 93 | 3.6 | 48 | 1.9 | N/A | N/A |
| **F** | 156 | 6.1 | 128 | 5 | 128 | 5 | 141 | 5.5 | 158 | 6.2 | 191 | 7.5 | 203 | 8 |
| **G** | 193 | 7.5 | 206 | 8.1 | 237 | 9.3 | 273 | 10.7 | 335 | 13.1 | 374 | 14.7 | 487 | 19.1 |
| **Kg/lb** | 13.5 | 29.7 | 15.7 | 34.6 | 32.5 | 71.6 | 48.5 | 106 | 58.5 | 129 | 104 | 229 | 234 | 515 |

## Factory Standard

### MAIN VALVE

**BODY & COVER**

- Ductile iron
- Cast Steel WCB
- Stainless Steel CF8
- Stainless Steel CF8M
- Nickel Aluminum Bronze

**ELASTOMERS:**

- NR, fabric reinforced Natural Rubber
- EPDM, fabric reinforced
- NBR, fabric reinforced Nitrile Rubber

**COATING:**

- Base layer – high built Epoxy FBE
  Top layer – electrostatic Polyester powder RAL 3000
- Rilsan Polyamide based (Nylon 11)
- Internal – vitreous Enamel
  External – Epoxy/Polyester powder RAL 3000

### TRIM

**PIPING & TUBING:**

- Stainless Steel 316
- Copper/Brass
- Cupro-Nickel
- Monel®

**FITTINGS:**

- Stainless Steel 316
- Brass
- Super Duplex
- Cupro-Nickel
- Monel®

**ACCESSORIES:**

- Stainless steel CF8M / 316
- Brass
- Nickel Aluminum Bronze
- SMO-245
- Monel®

### PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Installation orientation
- Additional accessories needed
  Alarm pressure switch
  Gong

For more detailed technical information, please refer to chapter Engineering Data.