Hydraulically Actuated, Remote Reset Deluge Valve

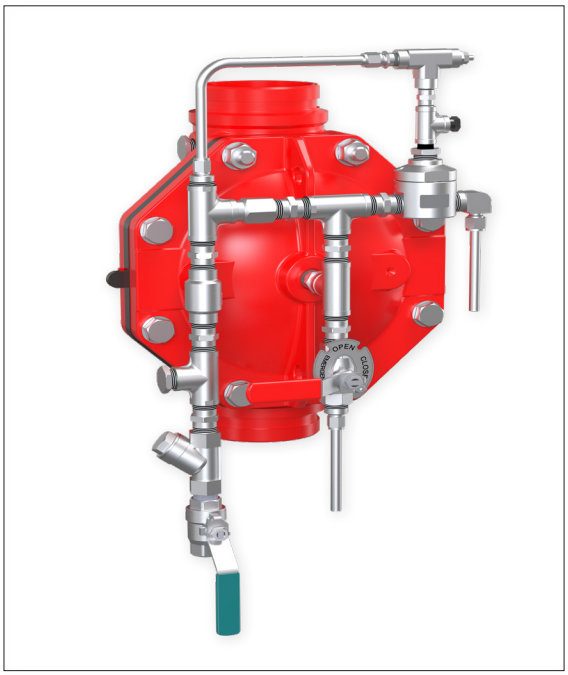
FDV - AH1

The FDV-AH1 fire protection system is based on Raphael's FDV deluge valve and is equipped with a hydraulically actuated control trim. The FDV serves as a fire protection control valve for deluge sprinkler systems, specifically designed for installation in hazardous environments. It is suitable for both vertical and horizontal installations and features a globe-pattern, line-pressure-operated design with a direct elastomeric diaphragm seal.

The valve contains no balancing spring and no internal metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-AH1 deluge system is hydraulically actuated and remotely resettable. In the event of a fire, when the wet pilot detection line is exposed to heat from flames, one or more automatic sprinklers shatter, releasing water pressure from the actuator control chamber and causing the deluge valve to open.

The system includes an emergency valve that bypasses the fire detection system for manual operation. It is suitable for use with automatic sprinklers on the dry pilot pipeline and with open nozzles on the main spraying pipelines.



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)

APPROVALS

ADVANTAGES

- Consists of only three parts: body, diaphragm, and cover plate – no wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to standby position without draining or opening the valve, and without closing the OS&Y or other valves in the system.
- Low maintenance cost: serviced in-line with only one replaceable part – the long-life elastomeric diaphragm.
- Conforms to the Inspection, Testing, and Maintenance Standard for Water-Based Fire Protection Systems (NFPA 25).

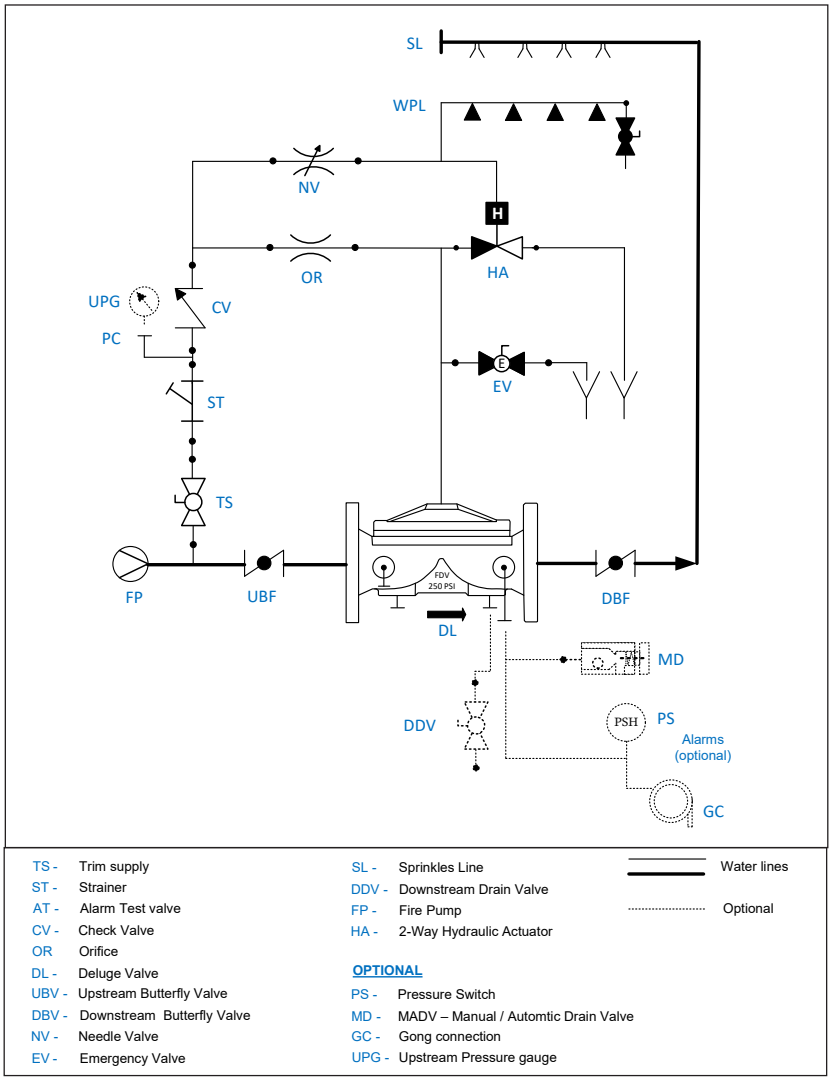
CHARACTERISTICS

- Hydrodynamic pattern design ensures high flow rates with minimum head loss.
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The trip is actuated by the hydraulic pressure release of the wet Pilot Line, caused by its exposure to flame heat.
- Soft closing, upon pressurization of the valve's control chamber - by line pressure or another independent water source - prevents surges.

The FDV-AH1 resets to the stand-by closed position by pressurizing the wet Pilot Line.

Schematic drawing: FDV-AH1

Set position



TS -	Trim supply	SL -	Sprinkles Line		Water lines
ST -	Strainer	DDV -	Downstream Drain Valve		Optional
AT -	Alarm Test valve	FP -	Fire Pump		
CV -	Check Valve	HA -	2-Way Hydraulic Actuator		
OR	Orifice				
DL -	Deluge Valve	**OPTIONAL**			
UBV -	Upstream Butterfly Valve	PS -	Pressure Switch		
DBV -	Downstream Butterfly Valve	MD -	MADV – Manual / Automtic Drain Valve		
NV -	Needle Valve	GC -	Gong connection		
EV -	Emergency Valve	UPG -	Upstream Pressure gauge		

OPERATION

SET position

Pressurized water in the FDV (DL) control chamber is trapped by the check valve (CV), the closed HAV-2 actuator (HA), and the closed emergency valve (EV).

The hydraulic pressure in the Wet Pilot Detection Line (WPL) keeps the HAV-2 actuator in the closed position, thereby maintaining the FDV deluge valve closed.

FIRE situation

When one or more automatic fire sprinklers in the Wet Pilot Detection Line (WPL) are exposed to the predetermined temperature, they shatter open, causing the pilot detection line to depressurize. This opens the HAV-2 actuator (HA), which in turn drains the deluge valve's control chamber, causing the FDV deluge valve to open and admit water into the spray sprinkler line (SL).

RESET position

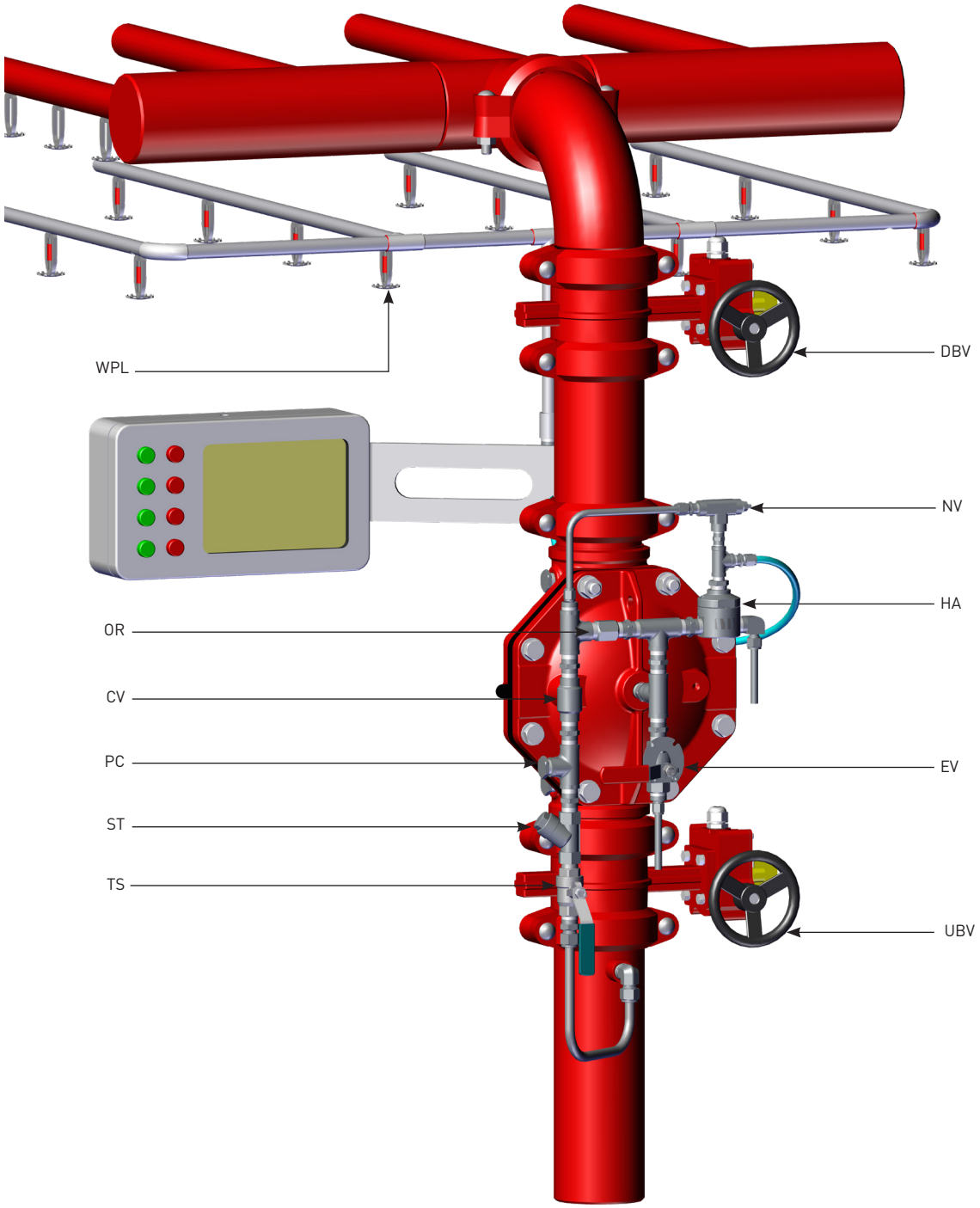
System reset requires replacement of all shattered-open fire sprinklers in the Wet Pilot Detection Line (WPL).

The Wet Pilot Detection Line is then repressurized, which resets the HAV-2 actuator (HA) and causes the FDV deluge valve to close.

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FDV - AH1

Typical installation



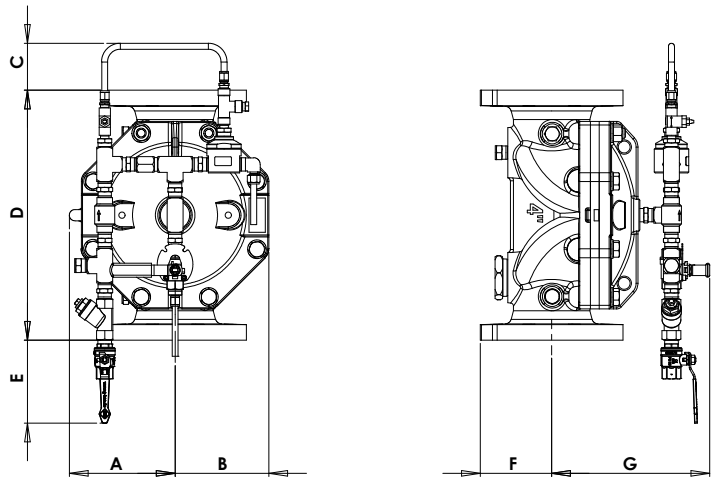
UBF - Upstream Butterfly valve
DBF - Downstream Butterfly valve
TS - Trim supply valve
SR - Y strainer

CV - Check valve
OR - Orifice
PC- Pressure gauge connection
NV - Needle valve

EV - Emergency Valve
HA - HAV-2 – Hydraulic Actuator
WPL - Wet Pilot Line

Parametric drawing:

FDV-AH1



Dimensions Table

Size	1.5"		2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	160	6.3	160	6.3	160	6.3	169	6.6	197	7.7	248	9.7	324	12.7
B	136	5.3	136	5.3	136	5.3	150	5.9	177	6.7	232	9.1	308	12.1
C	174	6.8	165	6.8	112	4.4	75	2.9	43	1.7	N/A	N/A	N/A	N/A
D	204	8.0	220	8.6	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	230	9	221	8.7	170	6.7	132	5.2	100	3.9	47	1.8	N/A	N/A
F	51	2	58	2.3	100	3.9	115	4.5	142	5.6	172	6.7	203	8
G	177	6.9	190	7.5	220	8.6	252	9.9	323	12.7	358	14	447	17.6
Kg/lb	6.6	14.5	8.4	18.5	25.6	56.4	41.2	90	54	119	97	213	225	496

Factory Standard

MAIN VALVE

BODY & COVER

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

ELASTOMERS:

- NBR, 3-layered reinforced Natural Rubber
- EPDM, 3-layered reinforced

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:

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

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Working pressure
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Additional accessories needed:
  Pressure gauge
  Pressure switch
  Drain valve (manual or automatic)
  Gong

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

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