Electrically Actuated, Remote Reset, Economic Deluge Valve

FDV-3W-AE1

The FDV-3W-AE1 fire protection system, which is equipped with an electrically actuated control trim, is based on Raphael's FDV deluge valve.

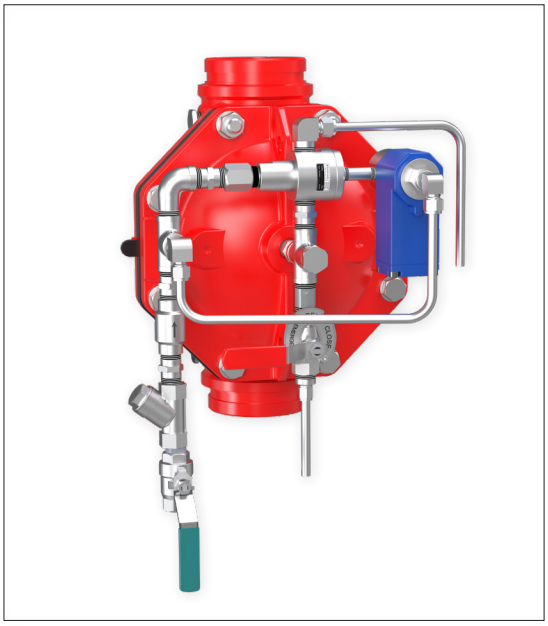
The FDV functions as a fire protection control valve for deluge sprinkler systems and is specifically designed for installation in hazardous environments.

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 FDV-3W-AE1 deluge system is electrically actuated and can be reset remotely.

An electric detection system activates a 3-way solenoid valve via a control panel, which in turn opens a 3-way actuator. As the actuator fully drains the deluge valve's control chamber, the valve delivers its full flow capacity with minimal head loss.

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



MARKETS

Commercial · Marine · Residential · Industry

Storage · Airports · Tunnel · P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

SIZE RANGE:
40 mm to 250 mm (1½" to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

SOV TYPE:
3/2 Direct Acting N.O. Standard or Latching (pulse) 24VDC, 110AC, 230AC.

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wetted metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the standby position without closing the OS&Y or other system valves.
- Open fail-safe valve, maintained in the standby closed position.
- Low maintenance cost: the valve can be serviced in-line, with only one replaceable part — the long-life elastomeric diaphragm.
- Complies with NFPA 25, the standard for the inspection, testing, and maintenance of water-based fire protection systems.

CHARACTERISTICS

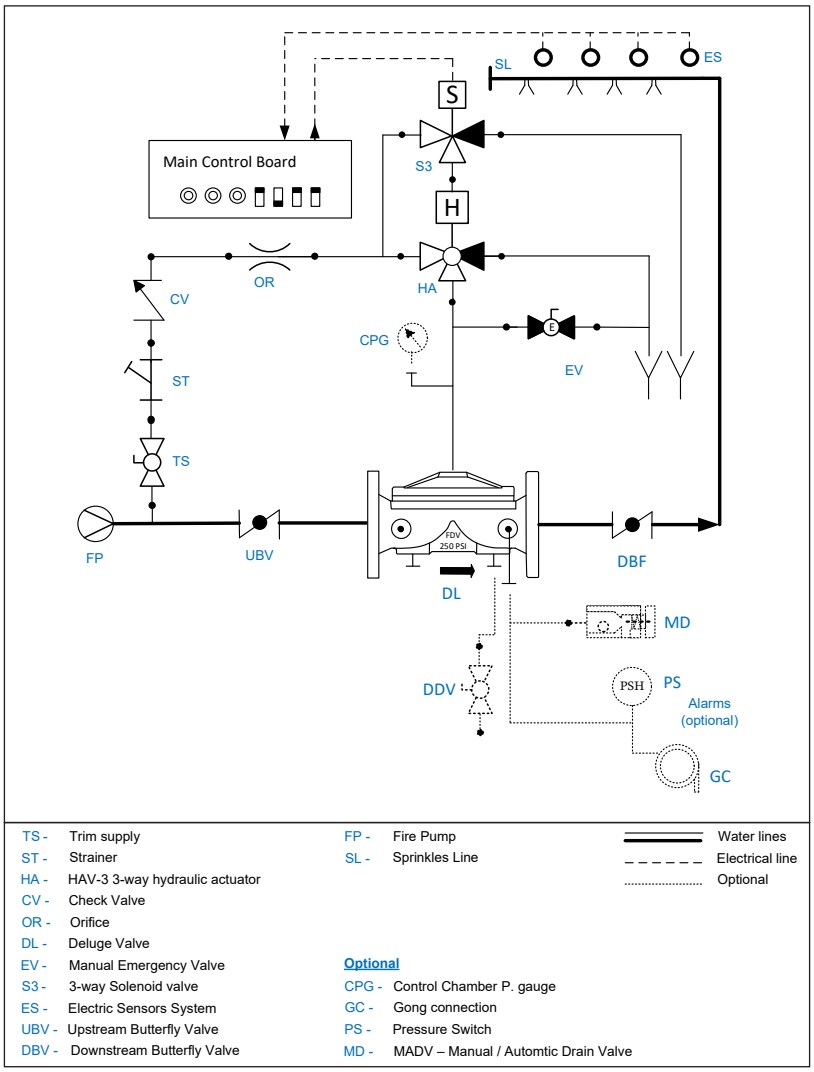
- Hydrodynamic pattern design ensures high flow rates with minimal head loss.
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The trip is actuated by an electric signal transmitted from the main control panel to the valve's solenoid, in response to heat or flame detected by the sensor system.
- Soft closing upon re-pressurization of the valve's control chamber—by line pressure or another independent water source—prevents surges.
- The FDV-3W-AE1 three-way control principle ensures full valve opening with maximum flow rate and minimal head loss.

The FDV-3W-AE1 resets to the standby closed position when the solenoid coil is de-energized through the main control board.

Schematic drawing:

FDV-3W-AE1

Set position



TS -	Trim supply	FP -	Fire Pump		Water lines
ST -	Strainer	SL -	Sprinkles Line		Electrical line
HA -	HAV-3 3-way hydraulic actuator				Optional
CV -	Check Valve				
OR -	Orifice				
DL -	Deluge Valve				
EV -	Manual Emergency Valve	**Optional**			
S3 -	3-way Solenoid valve	CPG -	Control Chamber P. gauge		
ES -	Electric Sensors System	GC -	Gong connection		
UBV -	Upstream Butterfly Valve	PS -	Pressure Switch		
DBV -	Downstream Butterfly Valve	MD -	MADV – Manual / Automtic Drain Valve		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the check valve (CV), the closed 3-way actuator HAV-3 (HA), and the closed emergency valve (EV), maintaining the FDV deluge valve in a closed state. The hydraulic actuator's control chamber is supplied by the 3-way solenoid (S3), which enables the upstream flow into the deluge valve's control chamber, keeping the valve closed.

FIRE SITUATION

When an electric detection system (ES) senses flame heat, it triggers the main control panel, which in turn, transmits an electric signal commanding the 3-way solenoid valve (S3). When the solenoid valve is energized, it changes state and pressurizes the actuator's control chamber. The actuator (HA) changes state, blocking the upstream flow to the deluge control chamber and fully draining this space. Consequently, the FDV Deluge valve opens and allows water to flow into the spray sprinkler line (SL).

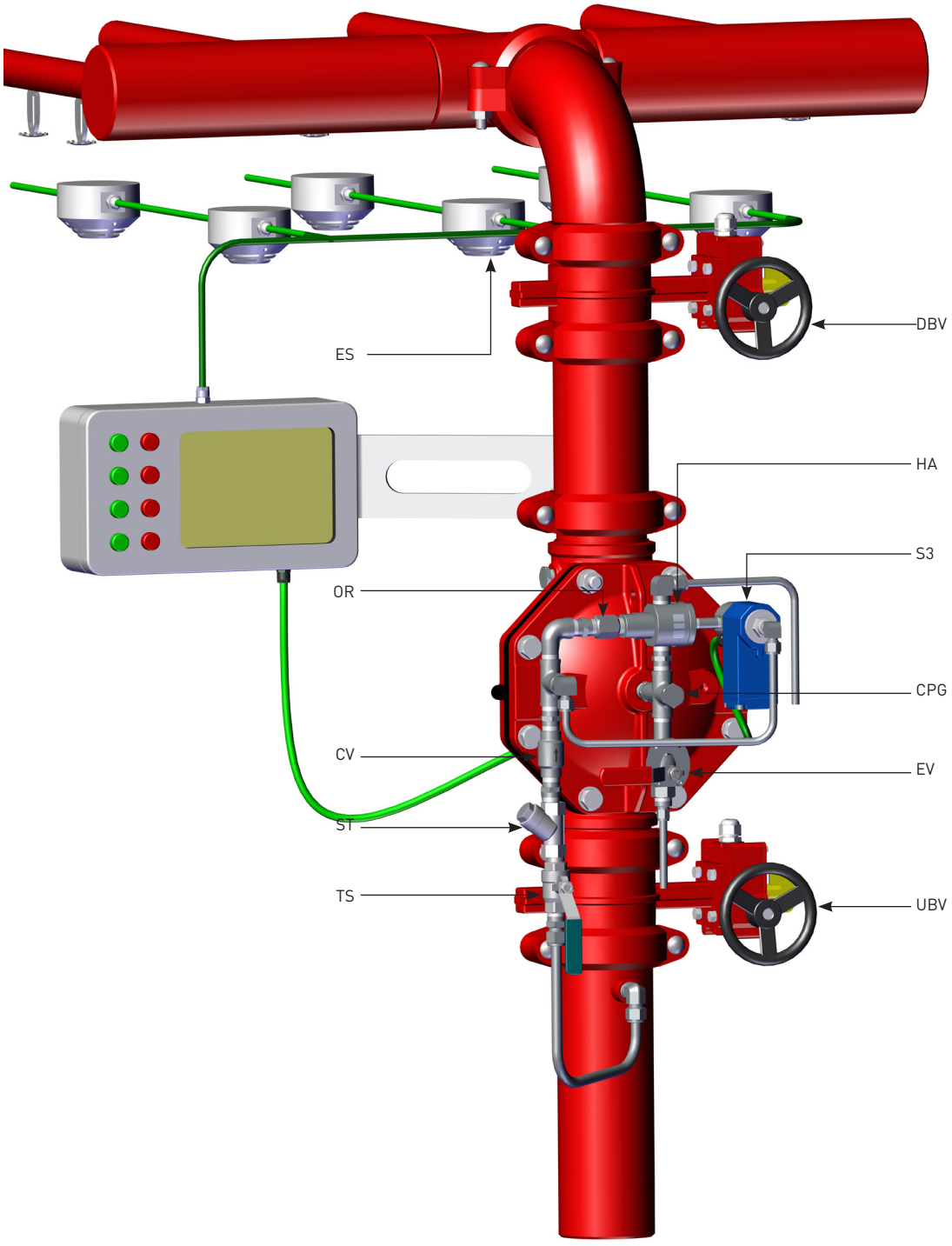
RESET POSITION

When the electric signal from the main control board to the solenoid's coil is interrupted, the solenoid changes state and pressurizes the actuator (HA) control chamber, which in turn, changes state as well. The actuator enables the flow from the trim pressure supply valve (TS), through the orifice (OR), into the deluge control chamber, which subsequently closes. As a result, the sprinkler spray flow stops.

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Typical installation

FDV-3W-AE1



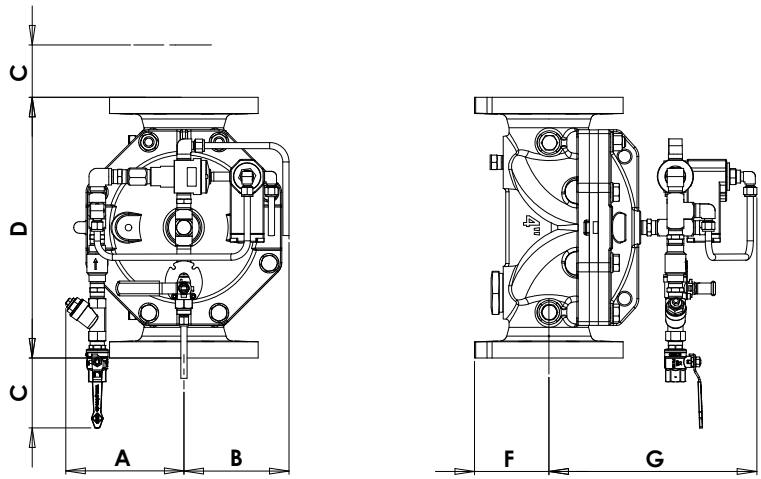
TS - Trim Supply
ST - "Y" Strainer
CV - Check Valve
OR - Orifice

ES - Electric Sensors system
DBV - Downstream Butterfly Valve
HA - HAV3 3-way Hydraulic actuator
S3 - 3-way solenoid valve

CPG - Connection - control chamber PG
EV - Emergency Valve
UBV - Upstream Butterfly Valve

Parametric drawing:

FDV-3W-AE1



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	181	7	181	7	181	7	181	7	197	7.7	250	9.8	308	12.1
B	161	6.3	161	6.3	161	6.3	161	6.3	177	7	231	9	308	12.1
C	35	1.3	27	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D	202	8.0	325	8.6	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	206	8.1	196	7.7	143	5.6	107	4.2	76	3	N/A	N/A	N/A	N/A
F	52	2	58	2.3	100	3.4	114	4.5	141	5.5	172	6.8	203	7.8
G	240	9.4	253	9.9	283	11.1	320	12.6	386	15.2	420	16.5	510	20
Kg/lb	7.8	17.2	9.6	21.2	26.8	59	42.5	93.7	53	116	98	216	227	500

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:

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

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Solenoid Voltage
- Solenoid Protection
- 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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