Electro-Pneumatically Actuated, Local Reset Deluge Valve

FDV - DC0

The FDV is a fire protection control valve for deluge sprinkler systems, specifically de-signed for installation in hazardous environments. It is suitable for both vertical and hori-zontal installations and features a globe-pattern, line-pressure-operated design with a di-rect 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-DC0 deluge system can be actuated both pneumatically and electrically and is locally resettable. In the event of a fire, when the pneumatic dry pilot detection line is ex-posed to heat, one or more automatic fire sprinklers shatter, releasing air pressure from the actuator and causing the deluge valve to open. Alternatively, when a sensor in the electrical detection system activates the main control board, a solenoid valve opens and vents the dry pilot line, thereby opening the deluge valve.

The system also incorporates an emergency valve that bypasses the fire detection sys-tems, enabling manual operation. In addition, the trim is equipped with a PSA device, which allows local system reset by pressurizing the control chamber and closing the FDV valve.

This system is suitable for use with automatic sprinklers on the dry pilot pipeline and with open nozzles on the main spray pipelines.



MARKETS

Commercial | Industry | Storage | P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS:
Air, Nitrogen

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

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

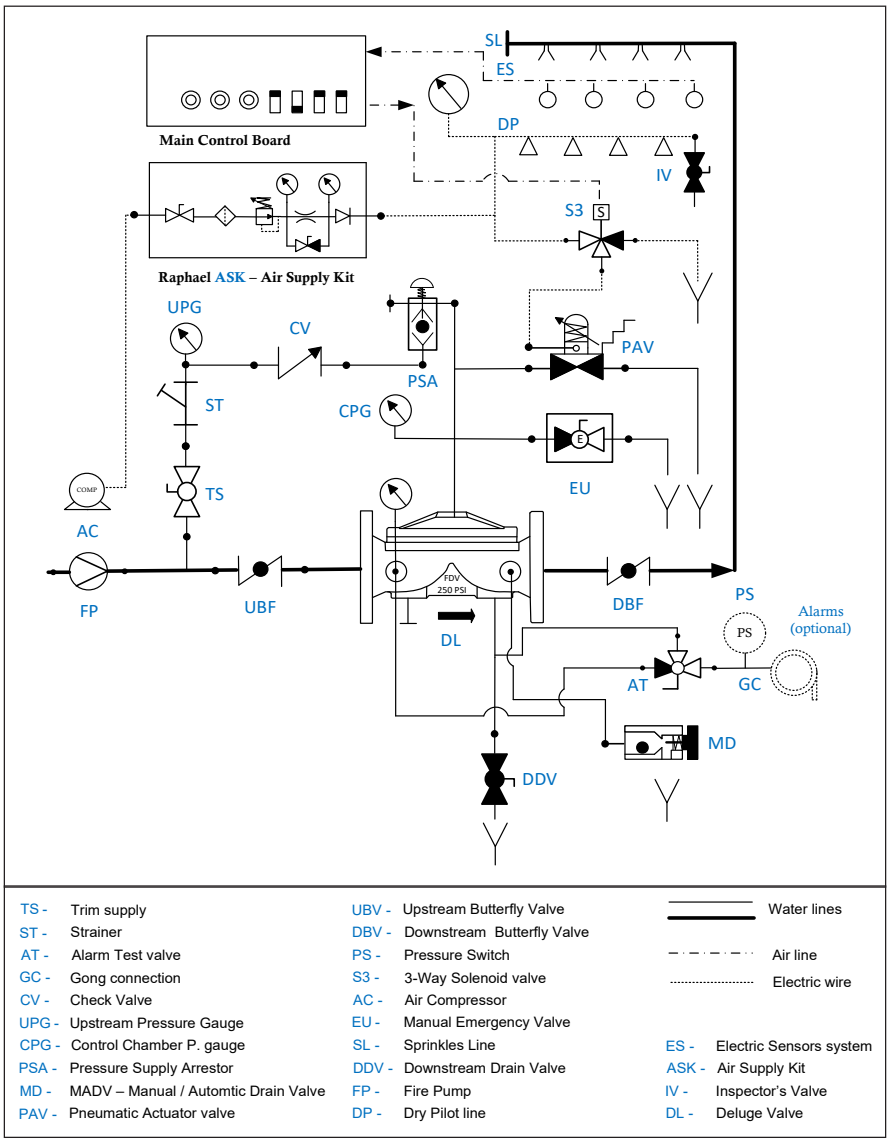
CHARACTERISTICS

- Hydro-dynamic 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 Dry Pilot Line's pneumatic pressure release due to its exposure to flame heat.
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges.

The FDV-DC0 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot Line and manually operating the PSA device.

Schematic drawing: FDV-DC0

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	PS -	Pressure Switch		Air line
GC -	Gong connection	S3 -	3-Way Solenoid valve		Electric wire
CV -	Check Valve	AC -	Air Compressor		
UPG -	Upstream Pressure Gauge	EU -	Manual Emergency Valve		
CPG -	Control Chamber P. gauge	SL -	Sprinkles Line	ES -	Electric Sensors system
PSA -	Pressure Supply Arrestor	DDV -	Downstream Drain Valve	ASK -	Air Supply Kit
MD -	MADV – Manual / Automtic Drain Valve	FP -	Fire Pump	IV -	Inspector's Valve
PAV -	Pneumatic Actuator valve	DP -	Dry Pilot line	DL -	Deluge Valve

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the check valve (CV), the closed pneumatic actuator (PAV), and the closed emergency valve (EU). The air pressure accumulated in the Dry Pilot detection line (DP) is conveyed to the actuator through a 3-way solenoid valve (S3), maintaining the Deluge valve (DL) closed.

FIRE SITUATION

When some of the Dry pilot detection line's automatic sprinklers are subjected to the heat of fire flames and shatter open, the pilot line depressurizes, tripping open the Actuator (PAV). Alternatively, an electric detection system senses heat and triggers the main control board, which in turn energizes the 3-way solenoid valve (S3). The solenoid valve bypasses the Dry pilot detection line, depressurizing the PAV and causing it to open. The FDV-DC0's control chamber then drains, and the Deluge valve opens.

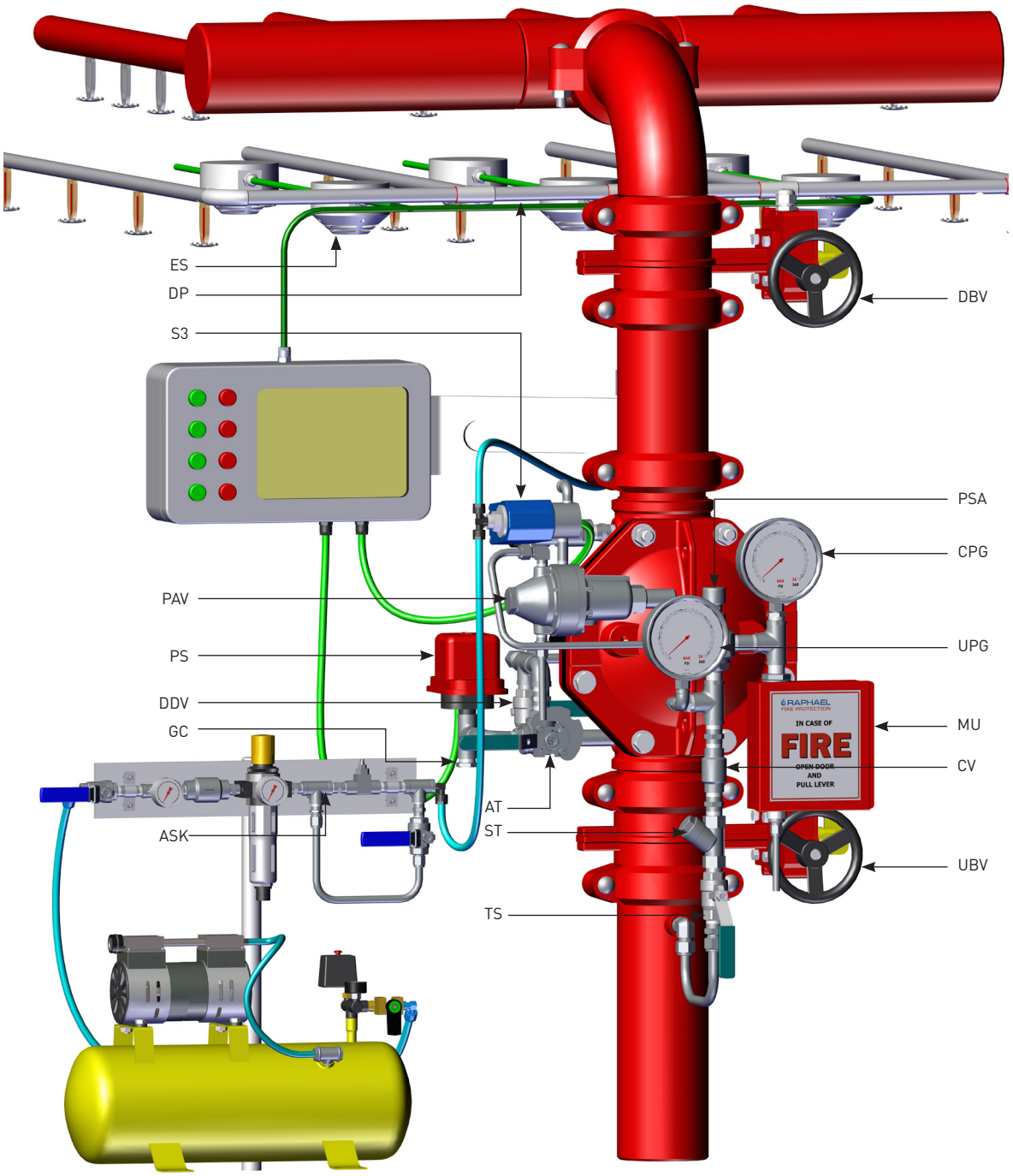
RESET POSITION

System reset requires the replacement of all shattered-open fire sprinklers in the Detection pilot line (DP). Alternatively, the electrical alarm system must be reset and the solenoid de-energized. The dry pilot line and the actuator's (PAV) control chamber must be pressurized by pushing the PSA (PSA) push button until the set pneumatic pressure is reached.

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FDV - DC0

Typical installation

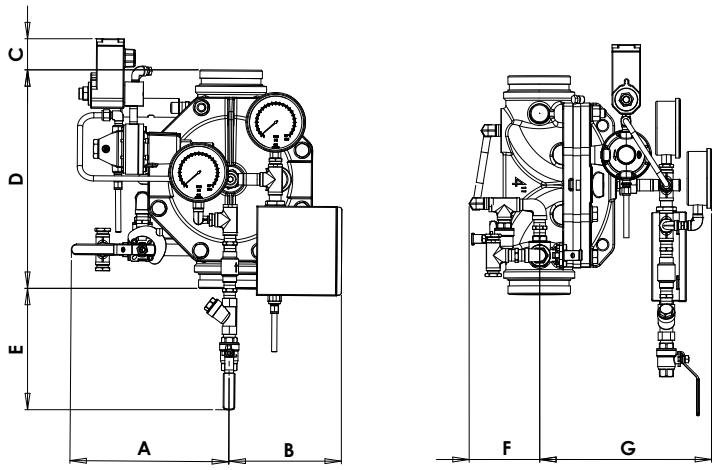


TS - Trim Supply
ST – Strainer
AT – Alarm Test valve
S3 – 3-way solenoid valve
CV – Check Valve
GC – Gong Connection

DP – Dry Pilot Line
DDV – Downstream Drain Valve
PS – Pressure Switch
PAV – Pneumatic Actuator Valve
MD – Manuel Automatic Drain Valve
PSA – Pressure Supply Arrestor

ASK – Air Supply Kit
ES – Electric Sensors
UPG – Upstream Pressure Gauge
CPG – Control chamber Pressure Gauge
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Parametric drawing:



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	260	10.2	260	10.2	275	10.8	280	11	315	12.4	340	13.4	373	14.6
B	204	8	204	8	204	8	204	8	204	8	231	9	308	12.1
C	97	3.8	46	1.8	18.5	0.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D	202	8	325	12.8	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	305	12	295	11.6	243	9.5	206	8.1	173	6.8	120	4.7	21	0.8
F	117	4.6	117	4.6	119	4.6	119	4.6	136	5.3	157	6.2	191	7.5
G	193	7.6	207	8.1	237	9.3	263	10.3	328	12.9	366	14.4	455	17.9
Kg/lb	12.6	27.6	14.3	31.5	31.5	69.5	47.2	104	58	128	103	227	232	511

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
- Pneumatic working pressure
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials.
- Solenoid voltage
- Additional accessories needed

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

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