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RAPHAEL
IN CASE OF
FIRE
OPEN DOOR
AND
PULL LEVER

Electrically Actuated, Local Reset, Deluge Valve

FDV - DE0

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 area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-DE0 deluge system is electrically actuated and can be reset locally.

An electric detection system activates a solenoid valve through a control panel, which in turn opens the FDV deluge valve.

The system includes an emergency manual override valve that bypasses the fire detection system, enabling manual activation when required.

In addition, the FDV-DE0 system is equipped with a PSA device that manually and locally pressurizes the deluge control chamber, keeping it closed, preventing re-pressurization during actuation (when the control chamber must be drained), and compensating for minor leakage-related pressure losses.

This configuration is suitable for open-nozzle water spray pipelines.

MARKETS

Commercial | Marine | Residential | Industry

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)

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 valve is actuated by an electric signal transmitted to the valve's solenoid from the main control panel, due to a flame heat exposure of a sensors detection system.
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges part which is long life elastomeric diaphragm.

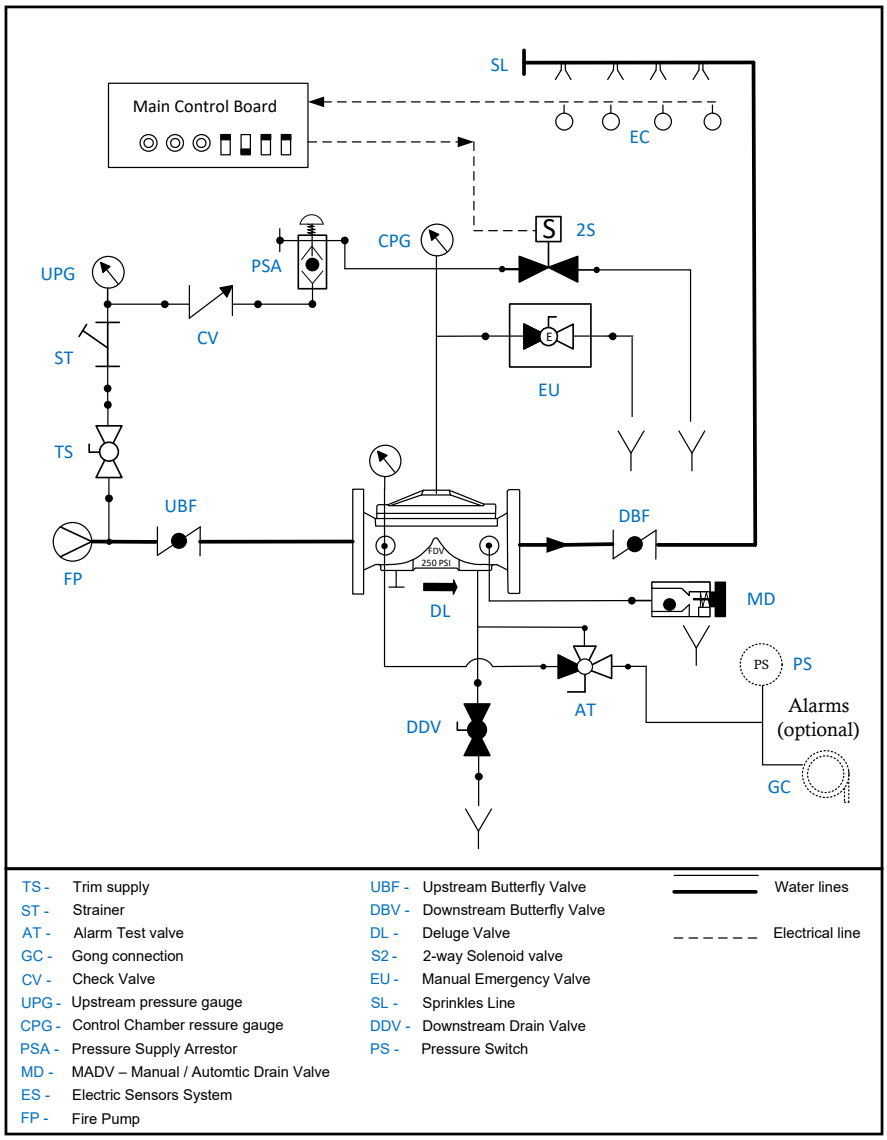
The FDV-DE0 resets to stand-by close position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-DEO

Set position



OPERATION

SET POSITION:

Pressurized water in the valve's control chamber (DL) is trapped by the closed PSA (PSA), the closed 2-way solenoid valve (S2) and by the closed emergency valve (EU), maintaining the FDV deluge valve (DL) closed.

FIRE SITUATION:

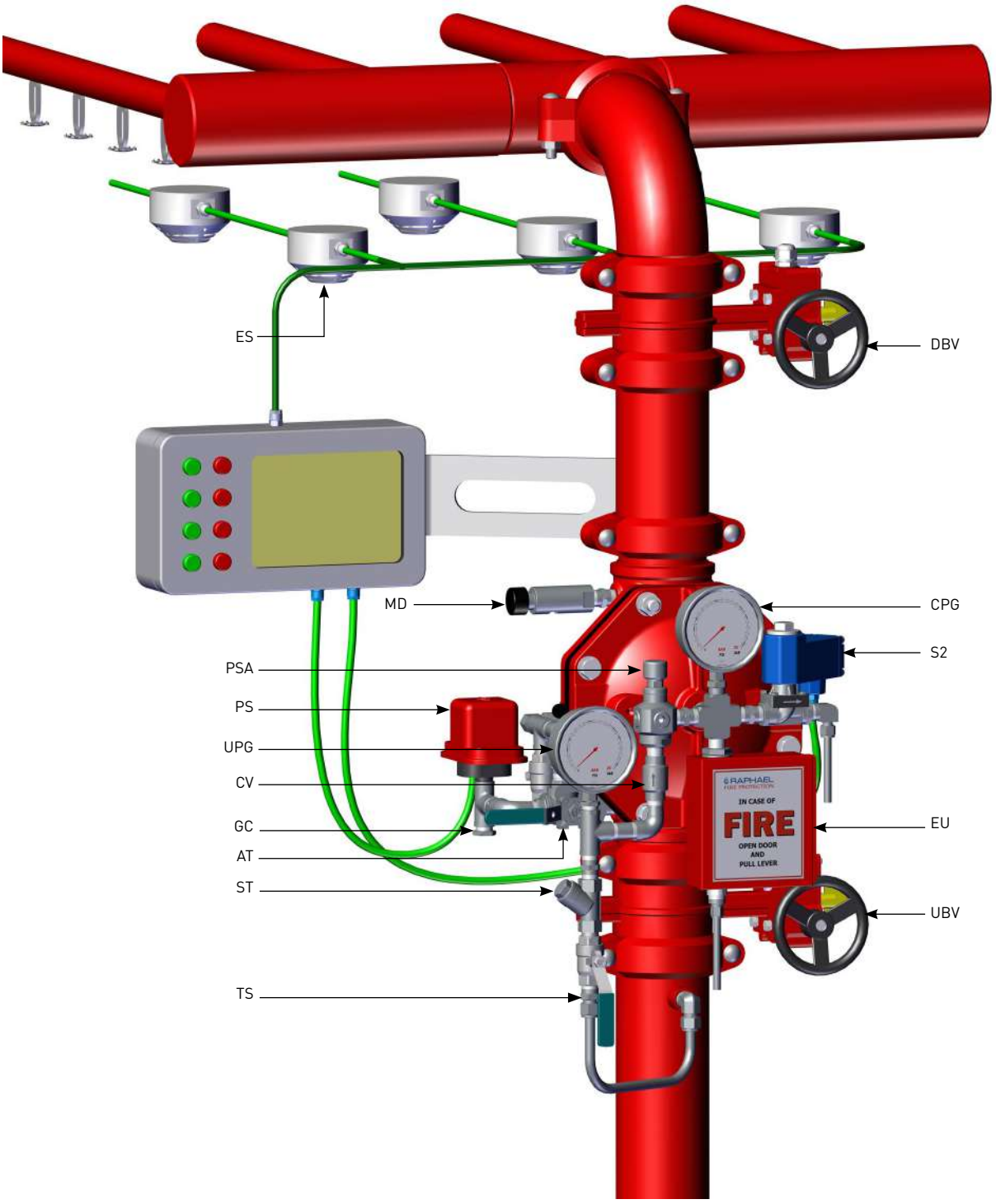
When the electric detection system (ES) senses flame heat, it triggers the main control panel, which then transmits an electric signal, commanding the 2-way solenoid valve (S2) to open and drain the deluge valve's control chamber. Consequently, the FDV Deluge valve opens, allowing water to flow to the spray sprinklers line.

RESET POSITION

To reset the system, the electrical alarm system must be reset to de-energize and close the solenoid valve. This action stops the drainage of the FDV control chamber. The PSA (PSA) push button should then be pressed to allow upstream pressure to pass, pressurizing the control chamber and closing the FDV deluge valve.

Typical installation

FDV - DE0



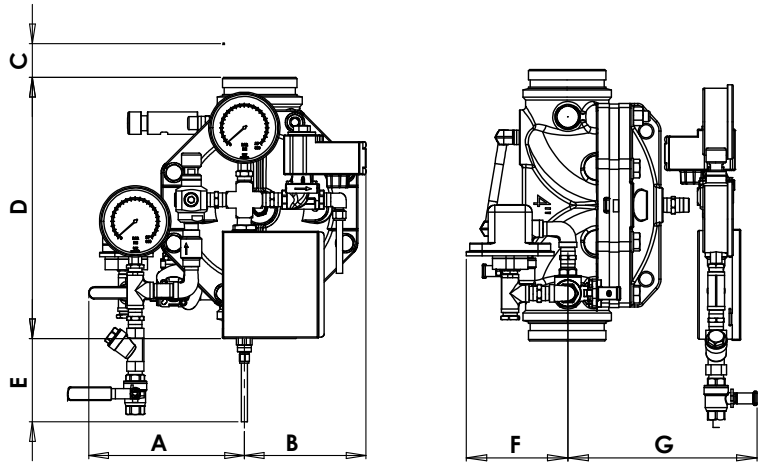
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
GC – Gong Connection
CV – Check Valve
EU – Emergency Unit

DDV – Downstream Drain Valve
PS – Pressure Switch
S2 – 2 way Solenoid
PSA – Pressure Supply Arrestor
MD – Manual Automatic Drain Valve
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:

FDV-DE0



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	255	10	263	10.3	270	10.6	290	11.4	315	12.4	340	13.3	353	3.8
B	155	6.1	150	5.9	162	6.3	211	8.3	178	7	230	9	308	12.1
C	55	2.1	46	1.8	N/A	N/A	N/A	N/A	N/A	N/A	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	295	11.6	213	8.4	147	5.8	112	4.4	80	3.1	74	2.9	N/A	N/A
F	145	5.7	144	5.6	119	4.6	115	4.5	159	6.2	172	6.8	203	7.9
G	150	5.9	170	6.6	193	7.5	225	8.8	295	11.6	330	12.9	420	16.5
Kg/lb	10.2	22.5	12	26.4	30	66.1	35	77.1	55	121	101	223	230	

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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed

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

Electrically Actuated, Remote Reset, Deluge Valve

FDV - DE1

The FDV is a fire protection control valve for deluge fire sprinkler systems, designed for installations in hazardous environments. Suitable for both vertical and horizontal installation, the globe-pattern, line-pressure-operated FDV valve features a direct elastomeric diaphragm seal, with no balancing spring or internal metallic wet components in the valve body. The hydrodynamic pattern design ensures high flow rates with minimal head loss.

The FDV-DE1 deluge system is electrically actuated and can be reset remotely.

An electric detection system activates a solenoid valve through a control panel, which opens the FDV deluge valve.

The deluge system incorporates an emergency valve that bypasses the fire detection systems for manual operation. This system is suitable for water spray pipelines with open nozzles.

MARKETS

Commercial | Marine | Residential | Industry

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS
Air, Nitrogen

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)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm & cover plate. No wet metal spring inside the control chamber
- Full-bore, unobstructed design
- Simple reset of the valve to standby position without draining or opening the valve itself.
- 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 valve is actuated by an electric signal transmitted to the valve's solenoid from the main control panel, due to a flame heat exposure of a sensors detection system.
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges part which is long life elastomeric diaphragm.

The FDV-DE1 resets to stand-by close position, by de-energizing the alarm system solenoid's coil through the main control panel.

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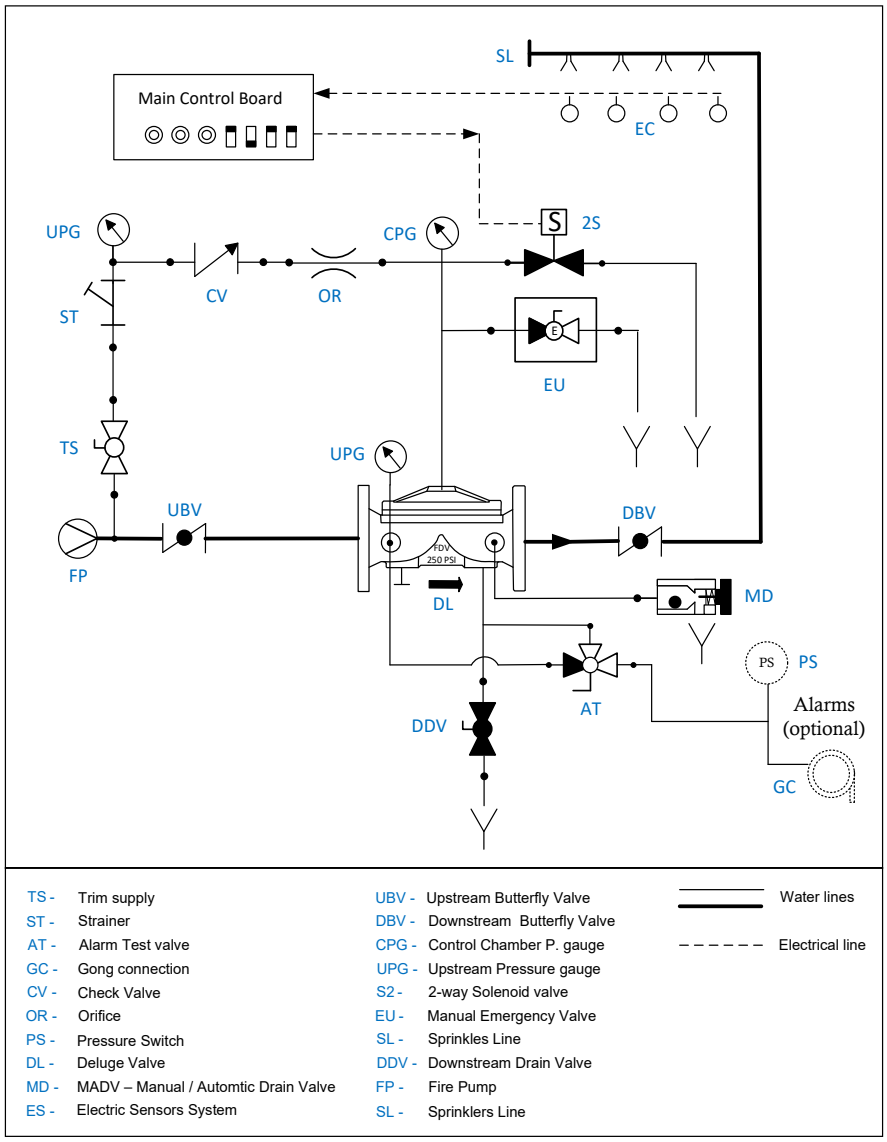
Schematic drawing:

FDV-DE1

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	CPG -	Control Chamber P. gauge	- - - - - -	Electrical line
GC -	Gong connection	UPG -	Upstream Pressure gauge		
CV -	Check Valve	S2 -	2-way Solenoid valve		
OR -	Orifice	EU -	Manual Emergency Valve		
PS -	Pressure Switch	SL -	Sprinkles Line		
DL -	Deluge Valve	DDV -	Downstream Drain Valve		
MD -	MADV – Manual / Automtic Drain Valve	FP -	Fire Pump		
ES -	Electric Sensors System	SL -	Sprinklers Line		

OPERATION

SET POSITION:

Pressurized water in the valve's control chamber is trapped by the check valve (CV), the closed 2-way solenoid valve (S2), and the closed emergency valve (EU), maintaining the FDV deluge valve (DL) in a closed state.

FIRE SITUATIONS:

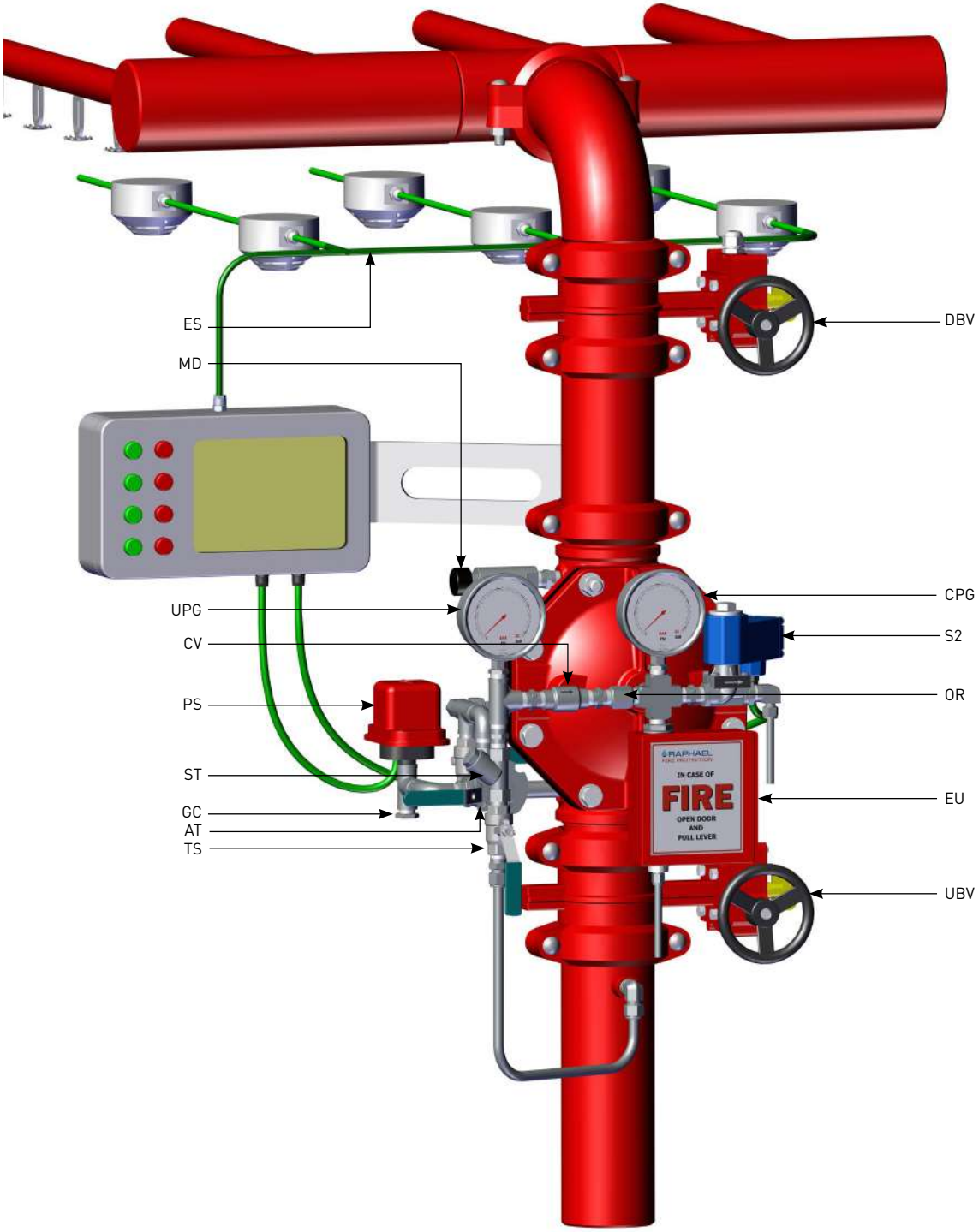
When the electric detection system (ES) senses flame heat, it triggers the main control panel, which transmits an electric signal, commanding the 2-way solenoid valve (S2) to open and drain the deluge valve's control chamber. Consequently, the FDV deluge valve opens, allowing water to flow to the spray sprinklers line.

RESET POSITION

System reset requires the electrical alarm system to be reset to de-energize and close the solenoid valve, preventing the FDV control chamber from draining. Upstream water enters the FDV deluge control chamber through the orifice (OR), closing the valve.

Typical installation

FDV - DE1



TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
GC – Gong Connection
CV – Check Valves
DDV – Downstream Drain Valve

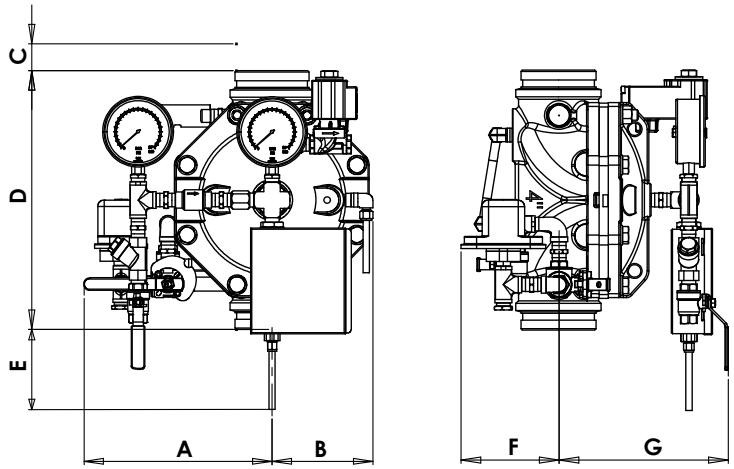
PS – Pressure Switch
OR – Orifice
S2 – 2-way Solenoid
MD – Manual Automatic Drain Valve
ES – Electric Sensors
UPG – Upstream Pressure Gauge

CPG – Control chamber Pressure Gauge
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Parametric drawing:

FDV-DE1



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	247	9.7	263	10.3	296	11.6	290	11.4	316	14.1	340	13.4	372	6.7
B	150	5.9	150	5.9	150	5.9	180	7	166	6.5	231	9	308	12.1
C	57	2.2	49	1.9	N/A	N/A	N/A	N/A	N/A	N/A	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	226	8.9	220	8.6	170	6.6	110	4.3	95	3.7	32	1.3	N/A	N/A
F	147	5.8	115	4.5	119	4.6	147	5.8	152	6	154	6	192	7.5
G	159	6.2	174	6.8	204	8	234	9.2	300	11.9	334	13.1	423	17
Kg/lb	9.1	20	10.9	24	28.4	62.6	44.2	97.4	54.6	120.	100	200	228	502

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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed

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

3-Way Electrically Actuated, Remote Reset, Deluge Valve

FDV-3W- DE1

The FDV-3W-DE1 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 valve contains no balancing spring and no metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-3W-DE1 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

Marine
Storage
P.O.G.
Tunnels
Airports

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS
Air, Nitrogen

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)

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

- 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-DE1 three-way control principle ensures full valve opening with maximum flow rate and minimal head loss.

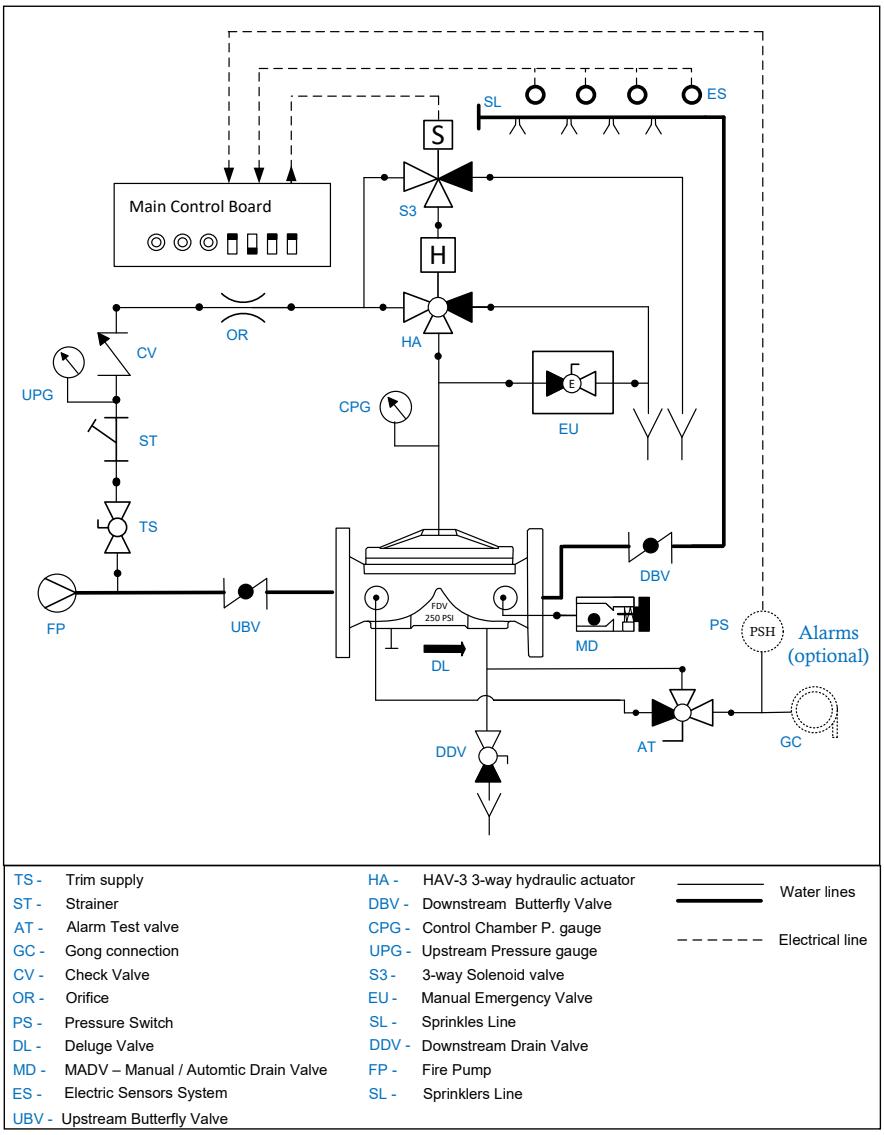
The FDV-3W-DE1 resets to the standby closed position when the solenoid coil is de-energized through the main control board.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-3W-DE1

Set position



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 (EU), 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

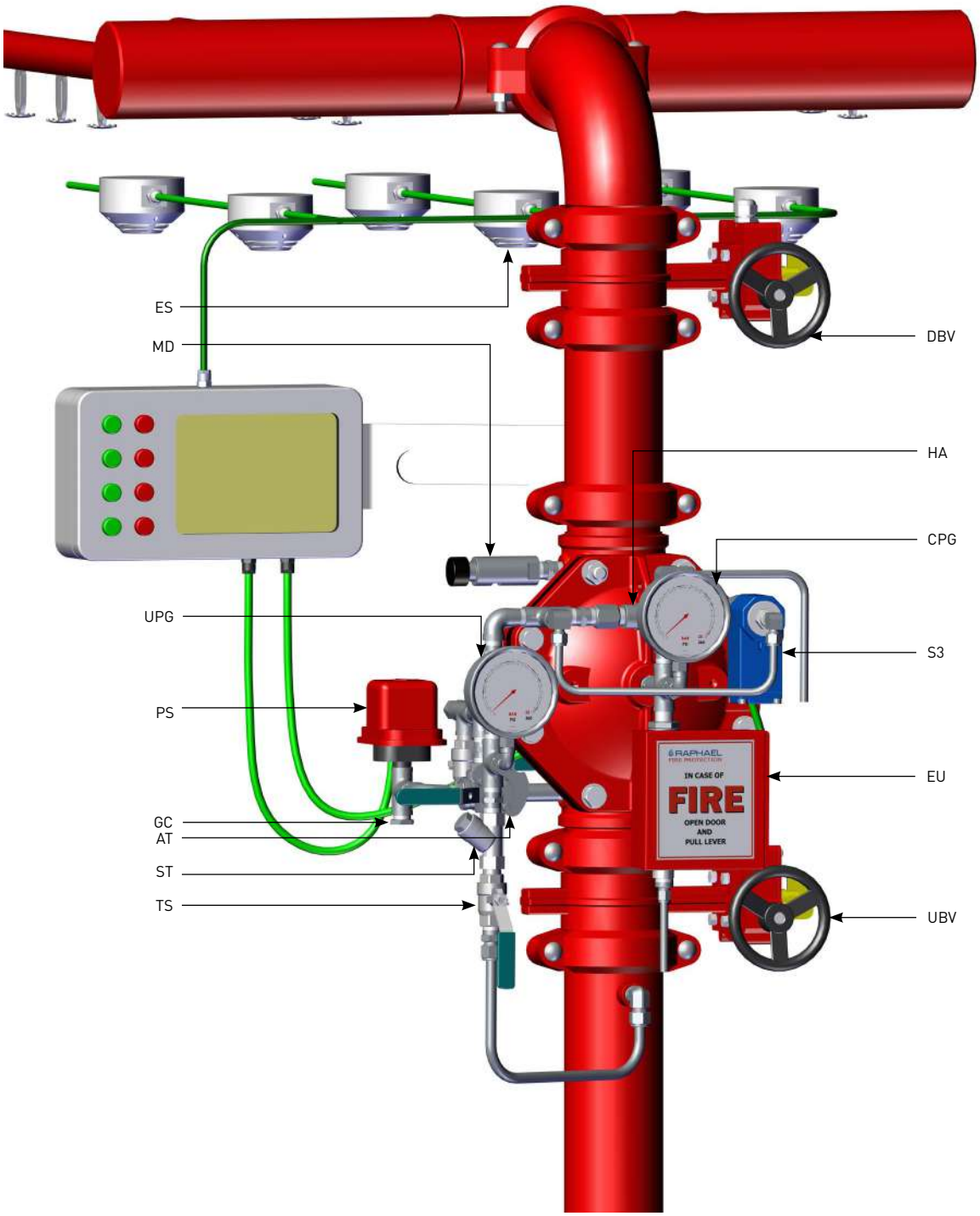
When an electric detection system (ES) senses flame heat, it triggers the main control panel, which in turn, transmits an electric signal commanding the 3-way solenoid valve (S3). When the solenoid valve is energized, it changes state and pressurizes the actuator's control chamber. The actuator (HA) 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.

Typical installation

FDV-3W- DE1



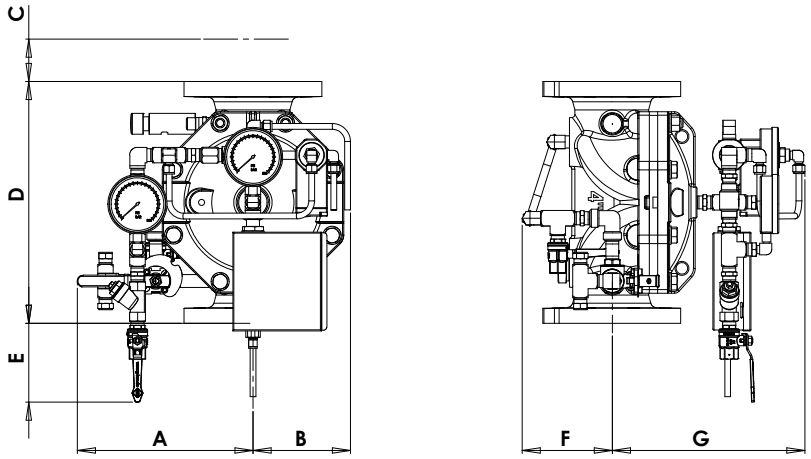
TS - Trim Supply
ST - "Y" Strainer
AT - Alarms Test Valve
GC - Pressure Gauge Connection
AL - Alarm Pressure Switch

DDV - Downstream Drain Valve
UPG - Upstream Pressure gauge
MD - Manual Automatic Drain Valve
ES - Electric Sensors system
DBV - Downstream Butterfly Valve

HA - HAV3 3-way Hydraulic actuator
CPG - Cont. chamber Pressure Gauge
S3 - 3-way Solenoid
EU - Emergency Unit
UBV - Upstream Butterfly Valve

Parametric drawing:

FDV-3W-DE1



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	255	10	263	10	297	11.7	290	11.4	316	12.4	340	13.4	373	14.7
B	161	6.3	161	6.3	161	6.3	161	6.3	176	6.9	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	230	9	218	8.5	166	6.5	130	5.1	98	3.8	44	1.7	N/A	N/A
F	127	5	127	5	128	5	148	5.8	150	5.9	172	6.8	203	8
G	240	9.4	254	10	283	11.1	319	12.5	387	15.2	421	16.5	210	8.3
Kg/lb	11.3	25	13	28.6	30	66	46	101	56	123	102	224	230	507

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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed

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

Pneumatically Actuated, Local Reset, Deluge Valve

FDV-DP0

The FDV-DP0 fire protection system is based on Raphael's FDV deluge valve and is equipped with a pneumatically actuated control trim. The FDV is 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-DP0 deluge system is pneumatically actuated and locally resettable. In a fire situation, when the pneumatic dry pilot detection line is exposed to flame heat, one or more automatic sprinklers shatter, venting air pressure from the actuator and causing the deluge valve to open.

The system incorporates an emergency valve that bypasses the fire detection system for manual operation. Additionally, the trim is equipped with a PSA - a device that enables local system reset, i.e., closing the FDV valve by repressurizing its control chamber.

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

MARKETS

Commercial · Marine · Residential · Industry · 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)

PNEUMATIC PRESSURE:
29-58 psi (2- 4 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

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

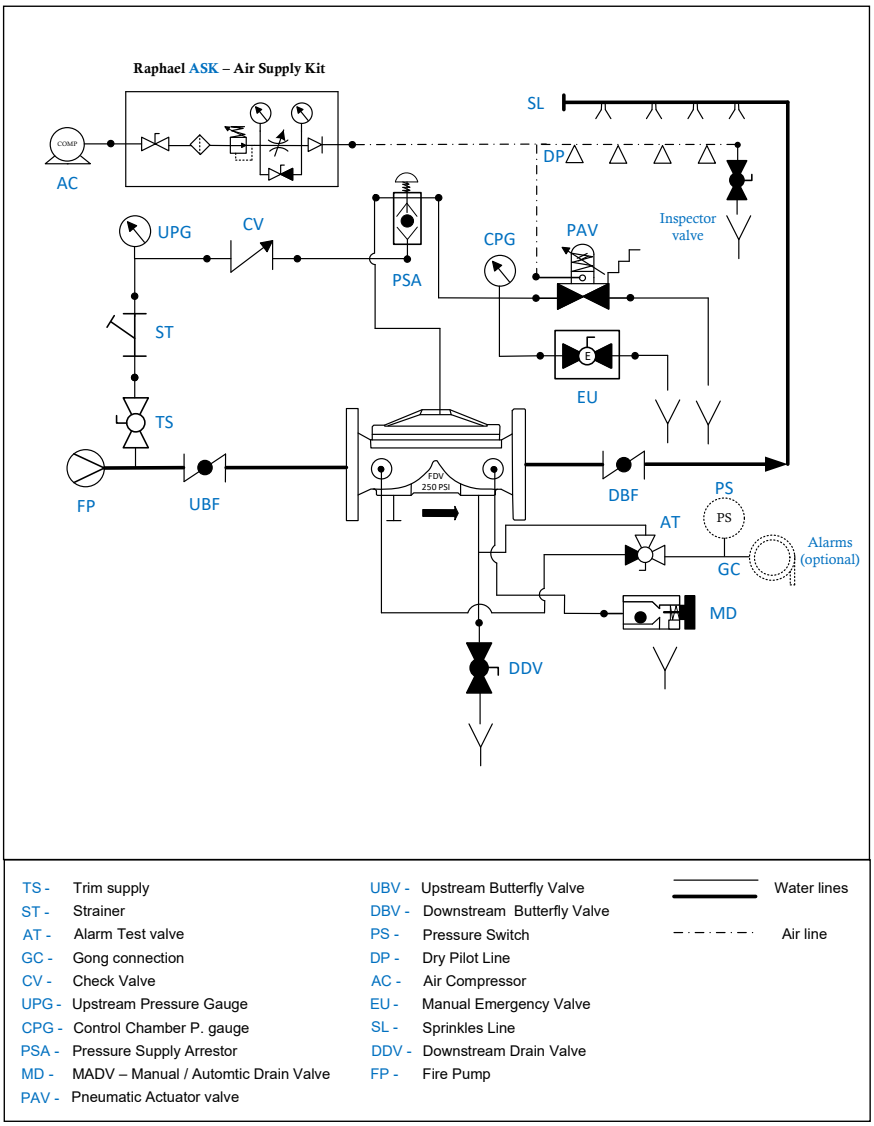
The FDV-DP0 resets to the standby closed position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-DP0

Set position



OPERATION

SET POSITION

The pneumatic pressure accumulated in the Dry pilot line maintains the pneumatic actuator (PAV) close. Pressurized water in the valve's control chamber (DL) is trapped by the check valve (CV), the closed PSA [PSA], the closed emergency valve (EU) and by the closed actuator (PAV), maintains the FDV Deluge valve close.

FIRE SITUATION

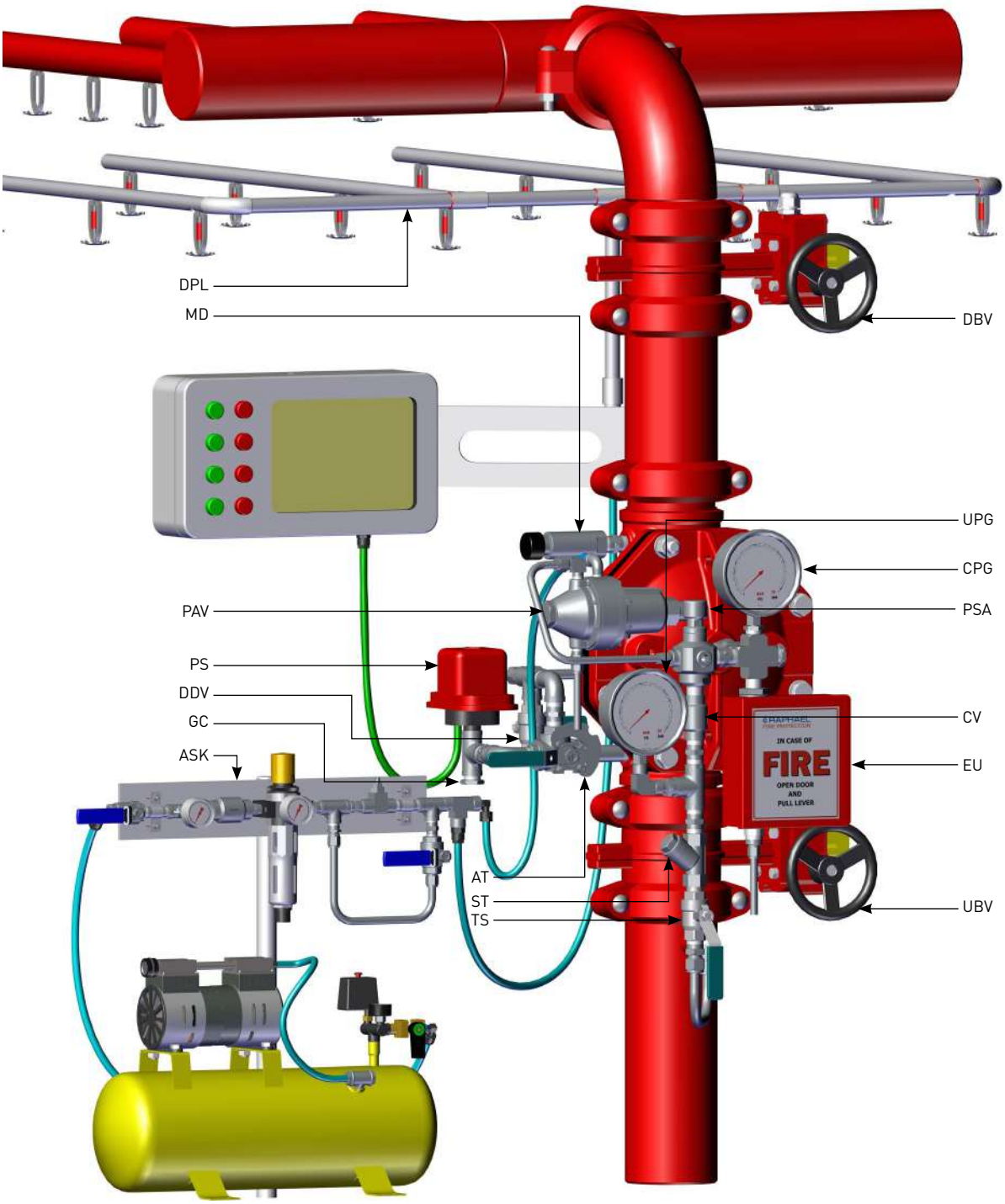
When some of the Dry Pilot detection line's automatic fire sprinklers are subjected to flames heat and shatter-open, the pilot detection line depressurizes the actuator [PAV] control chamber. Consequently, the actuator opens and drains the deluge valve's control chamber. The FDV deluge valve [DL] opens and admits water to the spray sprinklers line.

RESET POSITION

System reset requires the replacement of all the shattered-open automatic fire sprinklers in the Dry Pilot detection line. The detection line is then pressurized together with the PAV actuator control chamber to reset it to the closed position. Pressurizing is performed by pushing the PSA push button [PSA]. Consequently, the FDV deluge valve's control chamber will be filled and pressurized, causing the valve to close.

Typical installation

FDV-DP0



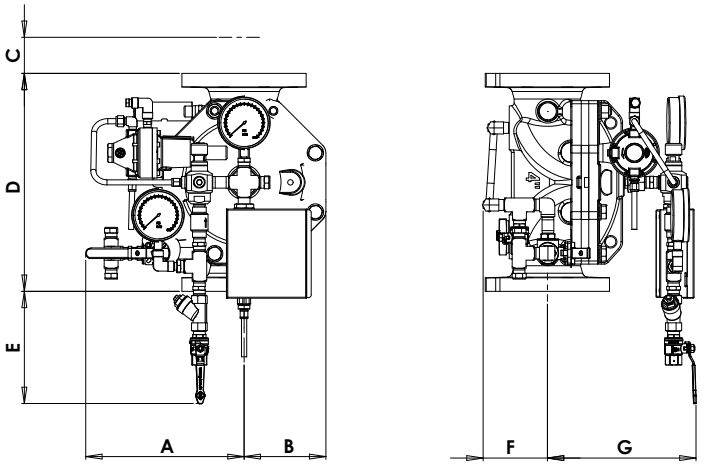
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
CV – Check Valve
GC – Gong Connection
DDV – Downstream Drain Valve

PS – Pressure Switch
PAV – Pneumatic Actuator Valve
PSA – Pressure Supply Arrestor
MD – Manual Automatic Drain Valve
ASK – Air Supply Kit
DPL – Dry Pilot Line

UPG – Upstream Pressure Gauge
CPG – Control chamber Pressure Gauge
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Parametric drawing:

FDV-DP0



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	122	4.8	122	4.8	122	4.8	150	8.9	177	6.9	232	9.1	300	11.8
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.
- Additional accessories needed

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

Pneumatically Actuated, Remote Reset, Deluge Valve

FDV-DP1

The FDV-DP1 fire protection system is based on Raphael's FDV Deluge valve and is equipped with a pneumatically actuated control trim. The installed FDV valve offers a range of optional materials and coatings, designed for installations in hazardous environments.

The FDV-DP1 deluge system is actuated pneumatically and resets remotely: In a fire situation, when the pneumatic dry pilot detection line is exposed to flame heat, one or more of its automatic fire sprinklers shatter open, venting the air pressure from an actuator and commanding the deluge valve to open.

The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation. This system is suitable for automatic sprinklers at the dry pilot pipeline and with open nozzles at the main spraying pipelines.

MARKETS

Marine | Storage | P.O.G. | Tunnels | Airports | Industry

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS:
Air, Nitrogen

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)

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.

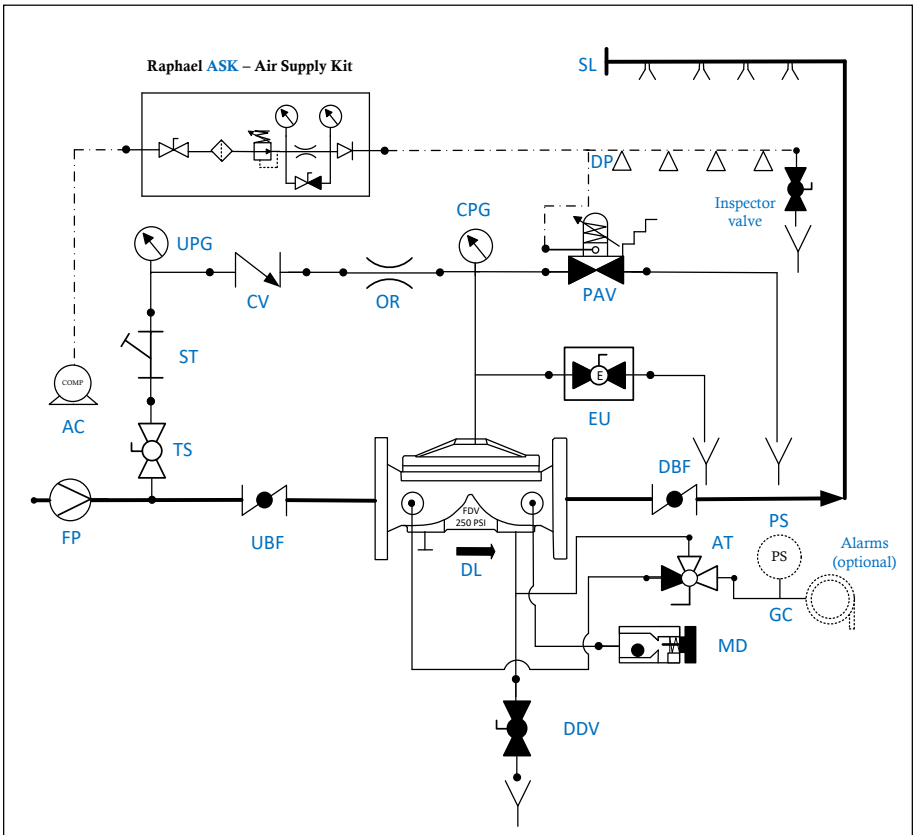
The FDV-DP1 resets to the standby closed position by pressurizing the Dry Pilot Line.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-DP1

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	DP -	Dry Pilot Line		
CV -	Check Valve	AC -	Air Compressor		
UPG -	Upstream Pressure Gauge	EU -	Manual Emergency Valve		
CPG -	Control Chamber P. gauge	SL -	Sprinkles Line		
OR	Orifice	DDV -	Downstream Drain Valve		
MD -	MADV – Manual / Automtic Drain Valve	FP -	Fire Pump		
PAV -	Pneumatic Actuator valve				

OPERATION

SET POSITION

The pneumatic pressure accumulated in the Dry pilot line maintains the pneumatic actuator (PAV) close. Pressurized water in the valve's control chamber (DL) is trapped by the check valve (CV), the closed emergency valve (EU) and by the closed actuator (PAV), maintains the FDV Deluge valve close.

FIRE SITUATION

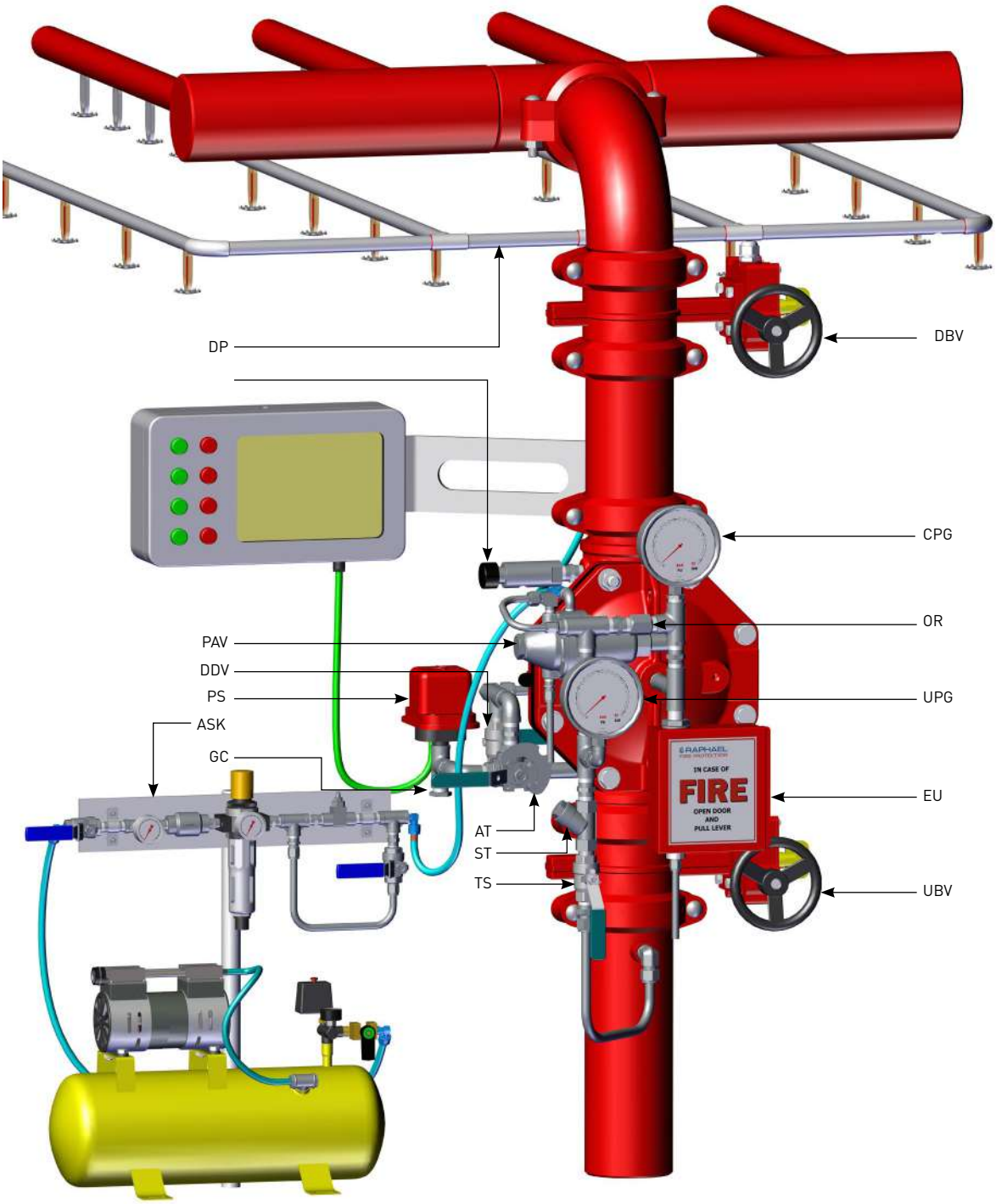
When some of the Dry Pilot detection line's automatic fire sprinklers are subjected to flames heat and shatter-open, the pilot detection line depressurizes the actuator [PAV] control chamber. Consequently, the actuator opens and drains the deluge valve's control chamber. The FDV deluge valve opens and admits water to the spray sprinklers line.

RESET POSITION

System reset requires the replacement of all the shattered-open automatic fire sprinklers in the Dry Pilot detection line. The detection line is then pressurized as well as the PAV actuator control chamber to reset it to the closed position. The FDV deluge valve's control chamber will be filled and pressurized through the orifice, causing the valve (DL) to close.

Typical installation

FDV-DP1



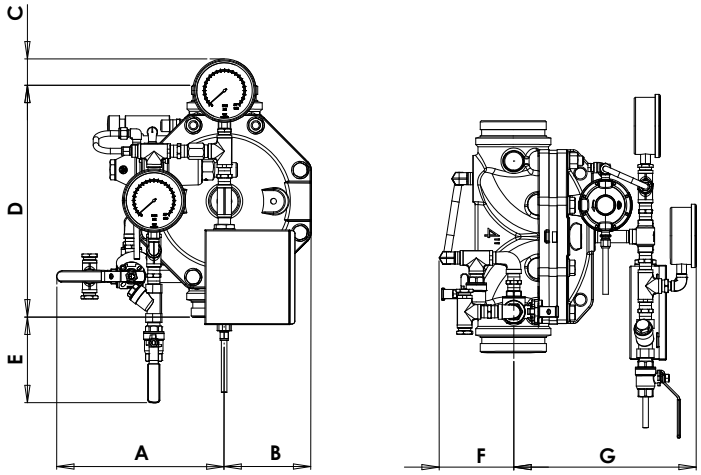
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
DP – Dry Pilot line
GC – Gong Connection
DDV – Downstream Drain Valve

PS – Pressure Switch
PAV – Pneumatic Actuator Valve
MD – Manual Automatic Drain Valve
ASK – Air Supply Kit
OR - Oriffice

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

Parametric drawing:

FDV-DP1



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	254	10	254	10	275	10.8	290	11.4	194	7.6	225	8.8	373	14.6
B	122	4.8	122	4.8	122	4.8	150	5.9	293	11.5	346	13.6	308	12.1
C	135	5.3	130	5.1	76	3	36	1.4	10	0.4	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	267	10.5	257	10.1	171	6.7	135	5.3	100	3.9	47	1.8	N/A	N/A
F	117	4.6	118	4.6	120	4.7	120	4.7	158	6.2	158	6.2	192	7.5
G	260	10.2	275	10.8	304	11.9	310	12.2	380	14.9	415	16.3	505	19.9
Kg/lb	12	26.4	13.8	30.4	31	68.3	46.7	103	57.7	127	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.
- Additional accessories needed

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

Electro-Pneumatically Actuated, Local Reset, Deluge Valve

FDV-DC0

The FDV is 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-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 exposed 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 systems, 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:
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)

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.

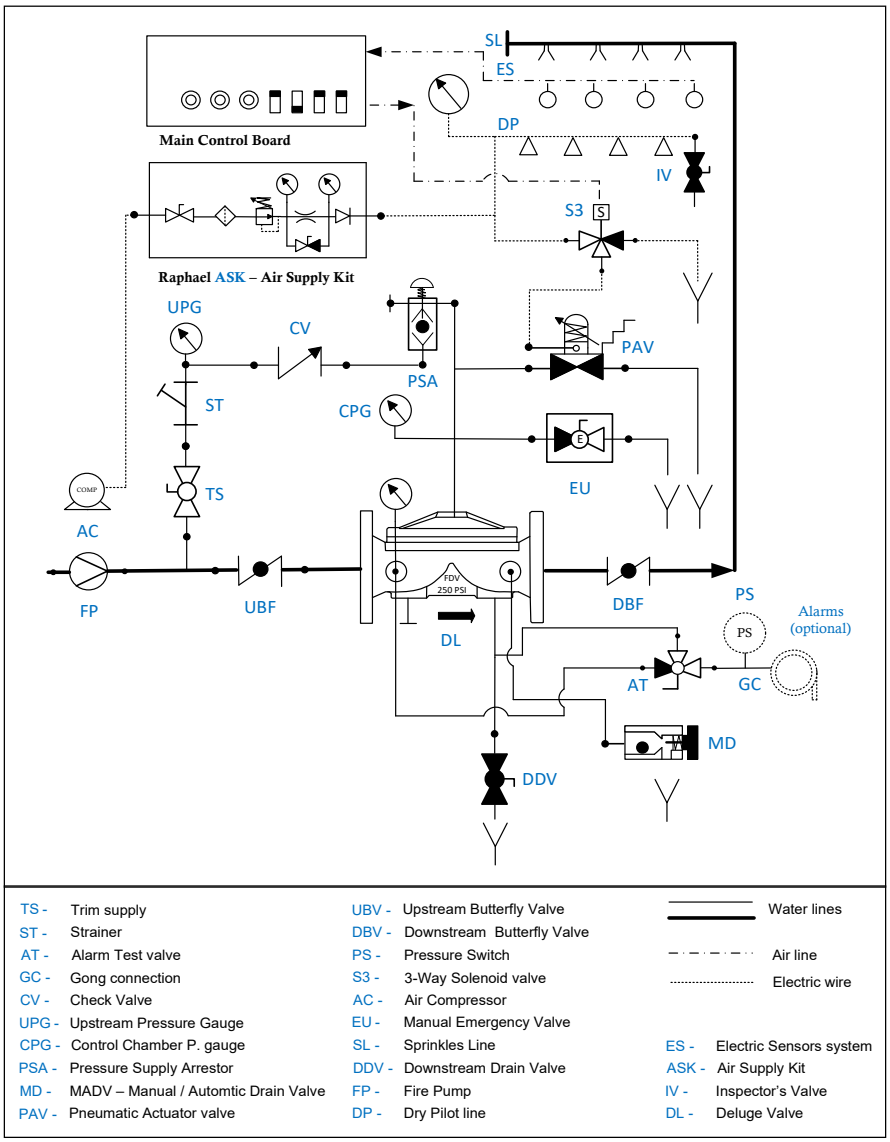
The FDV-DC0 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-DC0

Set position



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

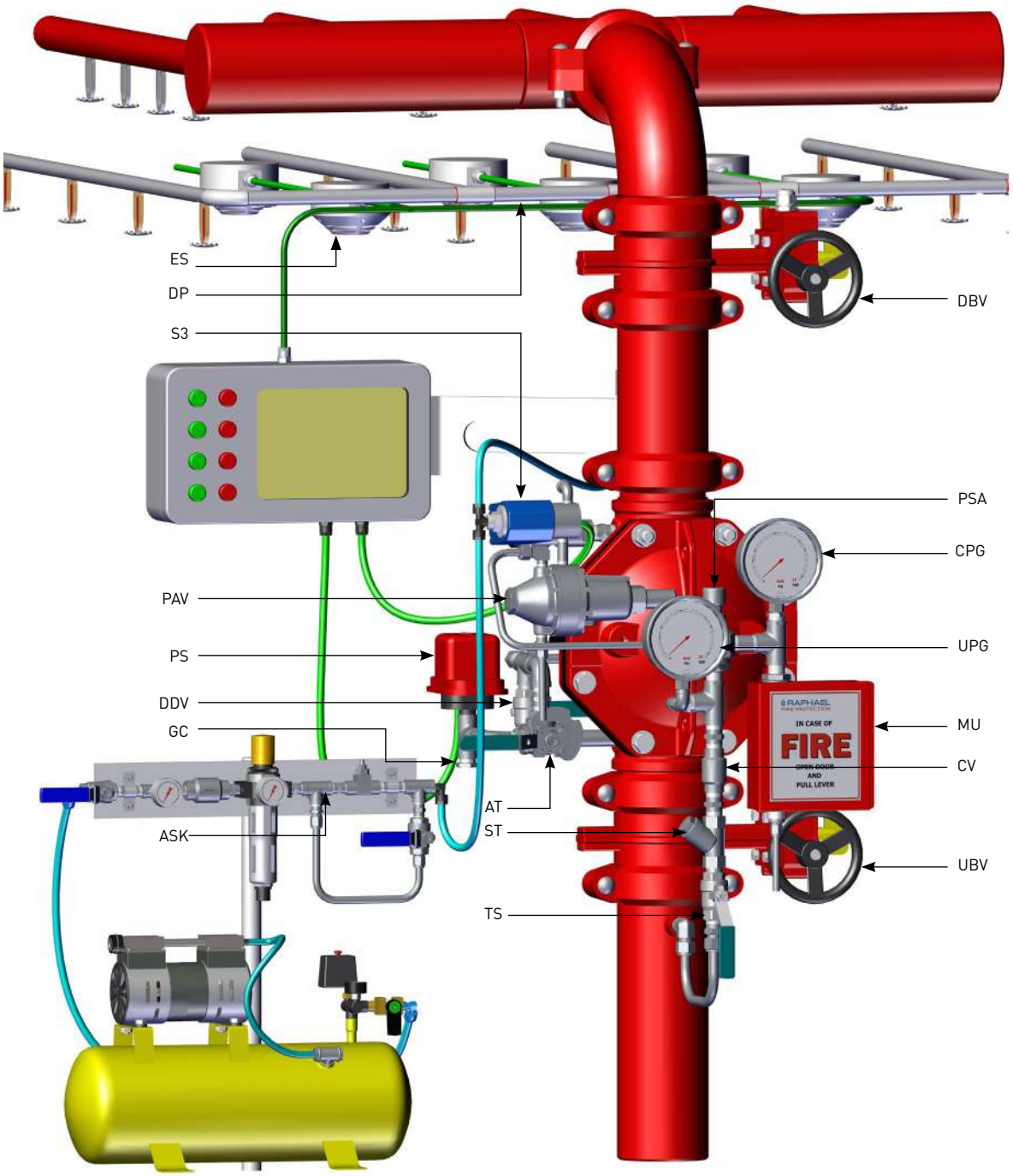
When some of the Dry pilot detection line's automatic sprinklers are subjected to the heat of fire flames and shatter open, the pilot line depressurizes, tripping open the Actuator (PAV). Alternatively, an electric detection system senses heat and triggers the main control board, which in turn energizes 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.

Typical installation

FDV-DC0



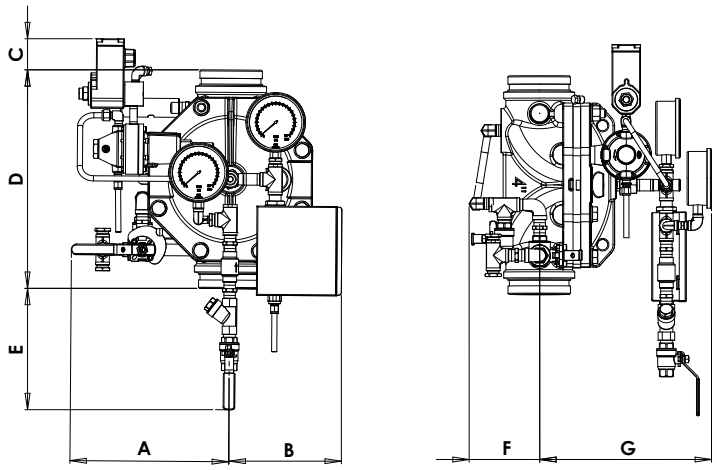
TS - Trim Supply
ST – Strainer
AT – Alarm Test valve
S3 – 3-way solenoid valve
CV – Check Valve
GC – Gong Connection

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:

FDV-DC0



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.

Electro-Pneumatically Actuated, Remote Reset, Deluge Valve

FDV-DC1

The FDV-DC1 fire protection system is based on Raphael's FDV deluge valve and is equipped with both pneumatically and electrically actuated control trim. The installed FDV valve is available in a variety of optional materials and coatings, making it suitable for installations in hazardous environments.

The FDV-DC1 deluge system is pneumatically actuated and supports remote resetting.

In the event of a fire, when the pneumatic dry pilot detection line is exposed to heat from flames, one or more of its automatic fire sprinklers shatter, venting air pressure from both the dry pilot line and the pneumatic actuator. This pressure drop activates the pneumatic actuator, causing the deluge valve to open.

Alternatively, if an electrical detection sensor signals the main control board, it activates a solenoid valve, which vents the dry pilot line, activates the pneumatic actuator, and opens the deluge valve.

The system includes an emergency valve that allows manual activation by bypassing both the fire detection systems and the solenoid valve. It is compatible with automatic sprinklers on the dry pilot line and open nozzles on the main spray pipelines.

MARKETS

Marine
Industry
Storage
P.O.G.
Airports

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS:
Air, Nitrogen

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)

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.

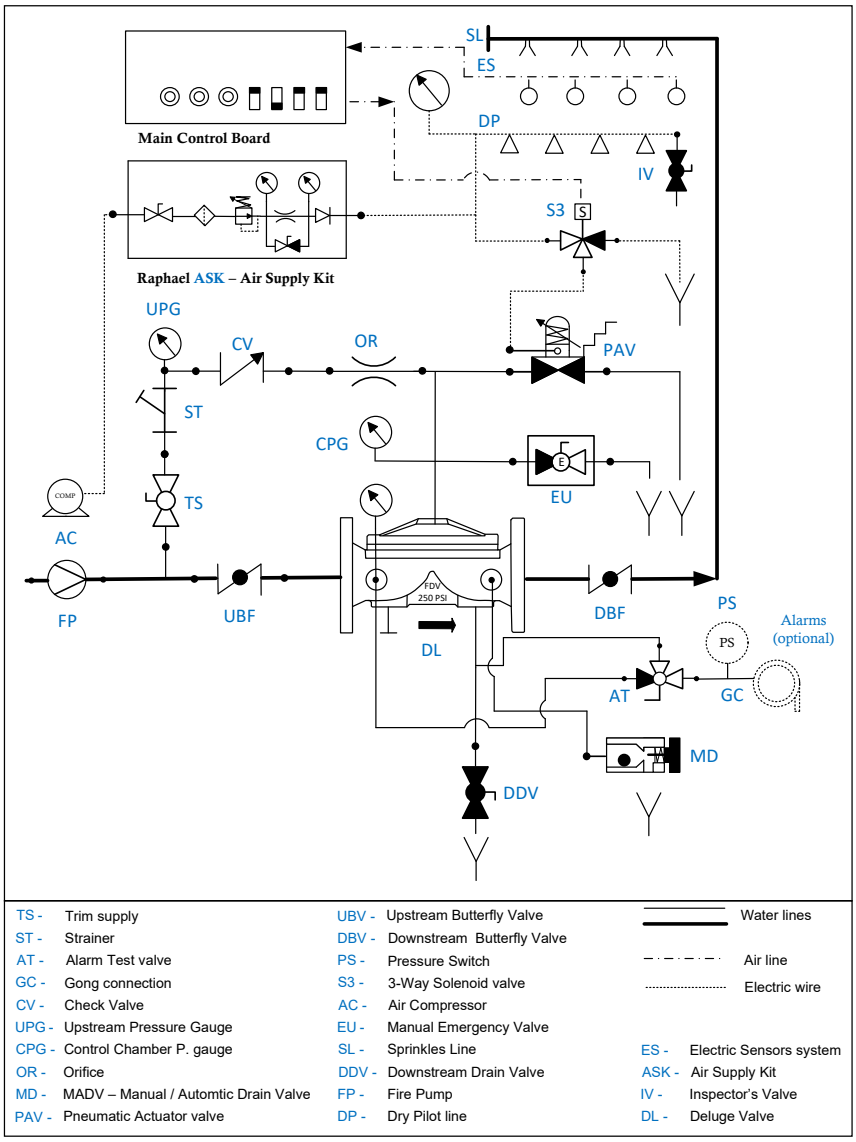
The FDV-DC1 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot line.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-DC1

Set position



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

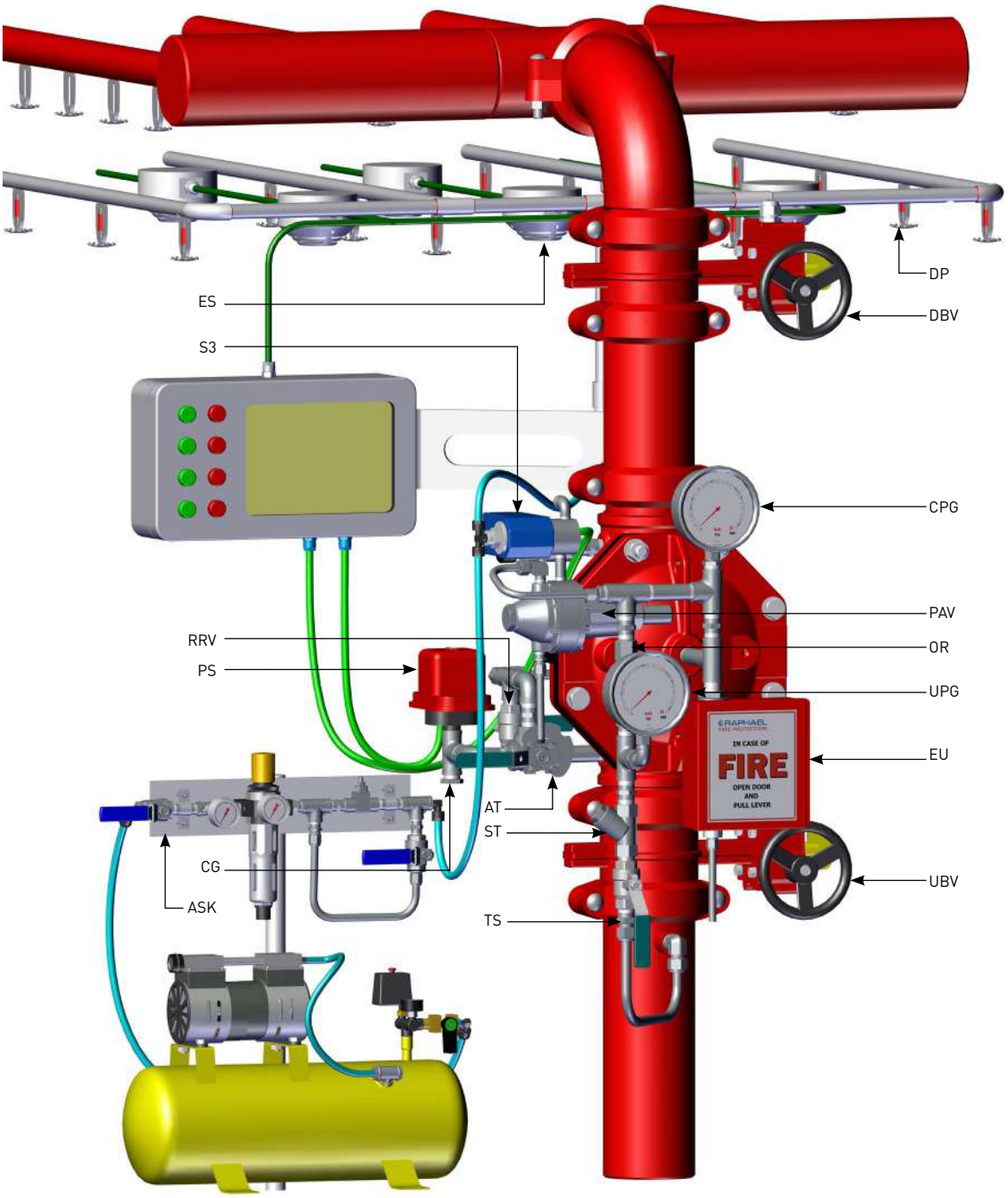
When some of the Dry pilot detection line's automatic sprinklers are subjected to the heat of fire flames and shatter open, the pilot line depressurizes, tripping open the Actuator (PAV). Alternatively, an electric detection system senses heat and triggers the main control board, which in turn energizes the 3-way solenoid valve (S3). The solenoid valve bypasses the Dry pilot detection line, depressurizes the actuator (PAV) control chamber and open it. The open actuator drains the FDV-DC1's control chamber and the Deluge valve opens.

RESET POSITION

The upstream butterfly valve must be closed. The 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. After pressurizing the dry pilot line and by that – closing the pneumatic actuator, the upstream butterfly valve must open. The Deluge control chamber gets pressurized by the constant upstream pressure and the Deluge valve closes (DL).

Typical installation

FDV-DC1



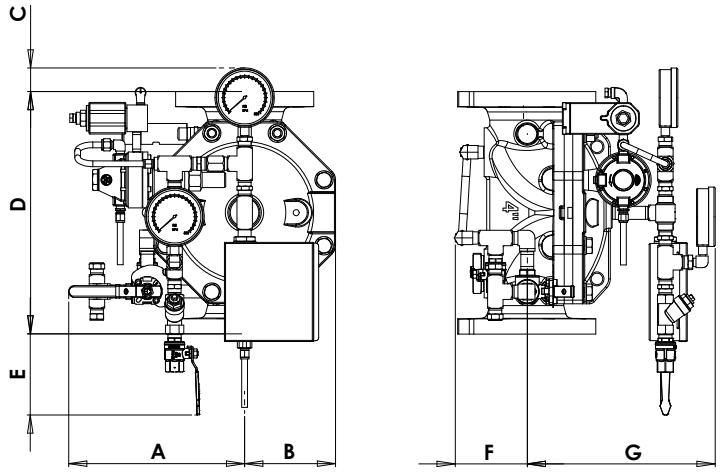
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
S3 – 3-way solenoid valve
CV – Check Valve
GC – Gong Connection

DP – Dry Pilot Line
DDV – Downstream Drain Valve
PS – Pressure Switch
PAV – Pneumatic Actuator Valve
OR – Orifice
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:

FDV-DC1



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.

Hydraulically Actuated, Local Reset, Deluge Valve

FDV-DH0

The FDV-DH0 fire protection system is based on Raphael's FDV deluge valve and is equipped with a hydraulically controlled trim. The FDV is 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 has no internal metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-DH0 deluge system is hydraulically actuated and can be locally reset. In a fire situation, when the wet pilot detection line is exposed to flame heat, one or more automatic sprinklers shatter, releasing pressure from the deluge control chamber and causing the deluge valve to open.

The system incorporates an emergency valve that bypasses the fire detection system for manual operation. Additionally, the trim is equipped with a PSA - a device that enables local system reset by repressurizing the control chamber and closing the FDV valve.

The system is suitable for use with automatic sprinklers on the wet pilot pipeline and with open nozzles on the main spraying pipelines.

MARKETS

Marine · Commercial · Residential · P.O.G. · Airports

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)

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 a Wet Pilot Line's hydraulic 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 to prevent surges.

The FDV-DH0 resets to stand-by close position by ressurizing the Dry Pilot line and manually operating the PSA device.

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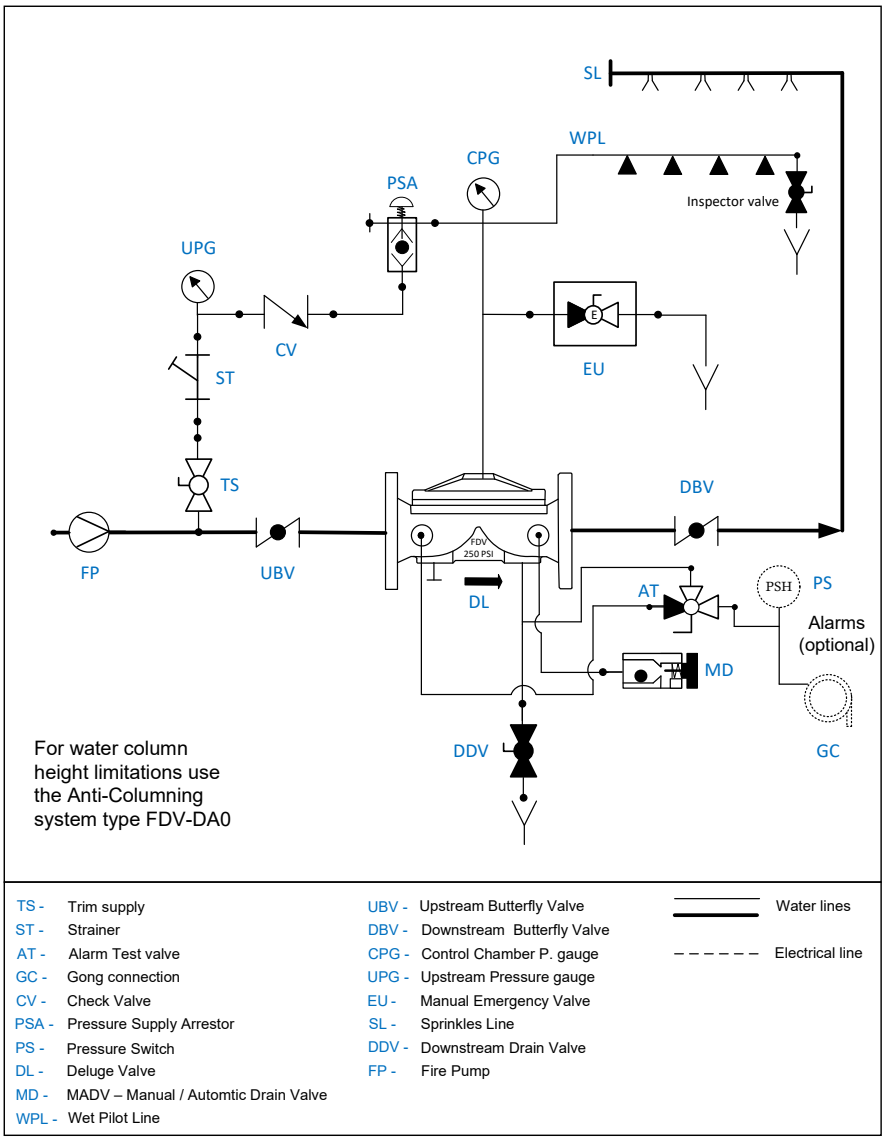
Schematic drawing:

FDV-DH0

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	CPG -	Control Chamber P. gauge	- - - - - -	Electrical line
GC -	Gong connection	UPG -	Upstream Pressure gauge		
CV -	Check Valve	EU -	Manual Emergency Valve		
PSA -	Pressure Supply Arrestor	SL -	Sprinkles Line		
PS -	Pressure Switch	DDV -	Downstream Drain Valve		
DL -	Deluge Valve	FP -	Fire Pump		
MD -	MADV – Manual / Automtic Drain Valve				
WPL -	Wet Pilot Line				

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the closed PSA [PSA], the closed emergency valve [EU] and by the closed automatic Wet Pilot detection Line [WPL]. The hydraulic pressure accumulated in the Wet pilot detection line, maintains the FDV deluge valve [DL] closed.

FIRE SITUATION

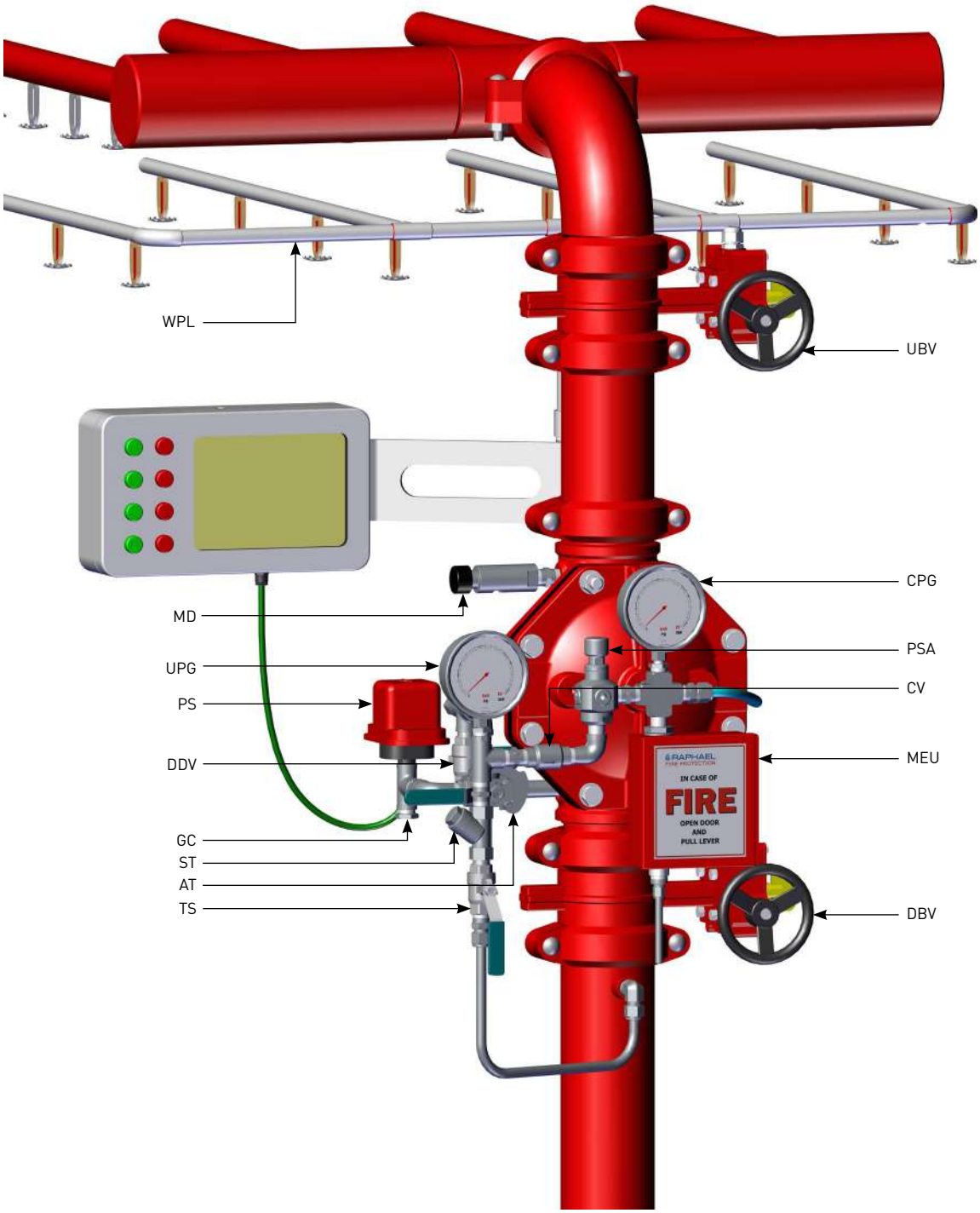
When the Wet pilot detection line's [WPL] automatic fire sprinklers are subjected to flame heat and shatter-open, it enables the FDV control chamber to drain and de-pressurize. Consequently, the deluge valve will open admitting water into the spray sprinkler system. The Deluge system incorporates an emergency valve, bypassing the fire detection system for manual operation.

RESET POSITION

System reset requires a replacement of all shattered-open wet pilot detection line's automatic fire sprinklers. The wet pilot line is then pressurized by the upstream pressure. The PSA [PSA] push button should be pressed to enable upstream pressure passage to pressurize the Pilot line and close the FDV's main valve.

Typical installation

FDV - DH0



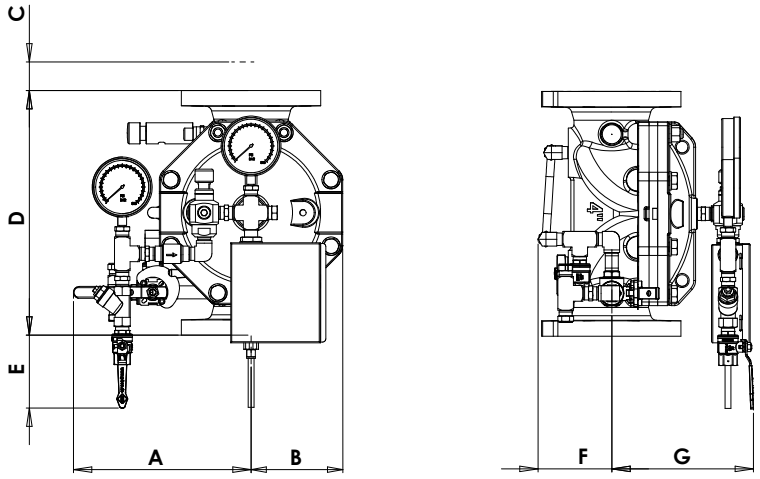
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
GC – Gong Connection
DDV – Downstream Drain Valve

PS – Pressure Switch
UPG – Upstream Pressure Gauge
MD – Manual Automatic Drain Valve
WPL – Wet Pilot line
UBV – Upstream Butterfly Valve

CPG – Control chamber Pressure Gauge
PSA – Pressure Supply Arrestor
CV – Check Valve
EU – Emergency Unit
DBV – Downstream Butterfly Valve

Parametric drawing:

FDV-DH0



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	255	10	263	10.3	270	10.6	290	11.4	315	12.4	340	13.3	353	3.8
B	122	4.8	122	4.8	122	4.8	150	5.9	178	7	231	9	308	12.1
C	55	2.1	46	1.8	N/A	N/A	N/A	N/A	N/A	N/A	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	295	11.6	213	8.4	147	5.8	112	4.4	80	3.1	74	2.9	N/A	N/A
F	145	5.7	144	5.6	119	4.6	115	4.5	159	6.2	172	6.8	203	7.9
G	150	5.9	170	6.6	193	7.5	225	8.8	295	11.6	330	12.9	420	16.5
Kg/lb	10.2	22.5	12	26.4	30	66.1	35	77.1	55	121	101	223	230	

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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Pilot line installation height
- Additional accessories needed

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

Hydraulically Actuated, Remote Reset Deluge Valve

FDV - DH1

The FDV is a Fire Protection control valve for Deluge fire sprinkler systems, designed for installations in hazardous environments.

The FDV-DH1 Deluge system is actuated hydraulically and resets remotely.

When the Wet pilot detection line's automatic fire sprinklers are subjected to flame heat and shatter-open, it enables the FDV control chamber to drain and de-pressurize, opening of the deluge valve and admitting water into the spray sprinkler system. The Deluge system incorporates an emergency valve, bypassing the fire detection system for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DH1 valve features a direct elastomeric diaphragm seal. It has no balancing spring or internal metallic wet components in the valve body. The hydrodynamic pattern design, ensures high flow rates with minimum head loss.

MARKETS

Marine P.O.G. Airports

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)

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 a Wet Pilot Line's hydraulic 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 surge.

The FDV-DH1 resets to stand-by close position by pressurizing the Wet Pilot Line.

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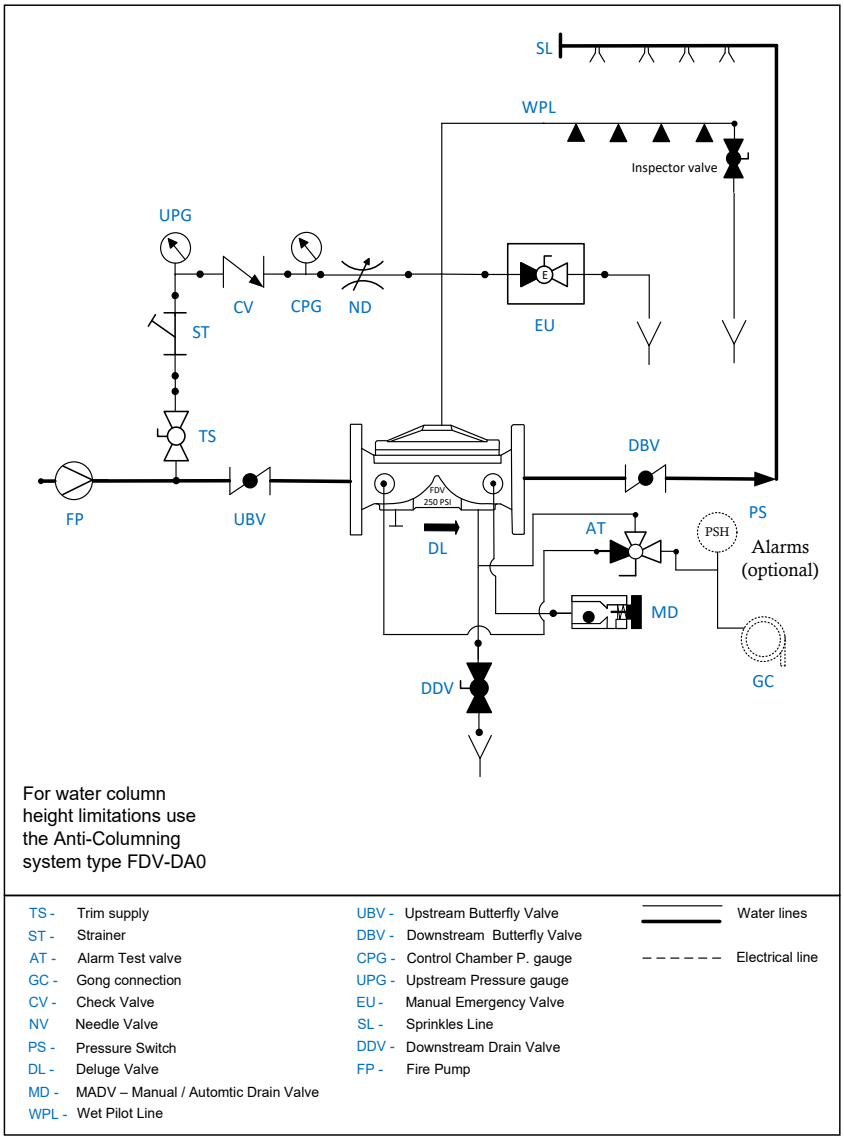
Schematic drawing:

FDV-DH1

Set position



OPERATION

SET POSITION

Pressurized water in the valve's control chamber (DL) is trapped by check valve (CV), The closed emergency valve (EU) and by the automatic springers on the wet pilot line (WPL), maintaining the FDV deluge valve (DL) closed.

FIRE SITUATION

When some of the Wet pilot detection line's automatic fire sprinklers are subjected to flames heat and shatter-open, it depressurizes and the FDV deluge valve (DL) control chamber. Consequently, The FDV deluge valve opens and admits water to the spray sprinklers line.

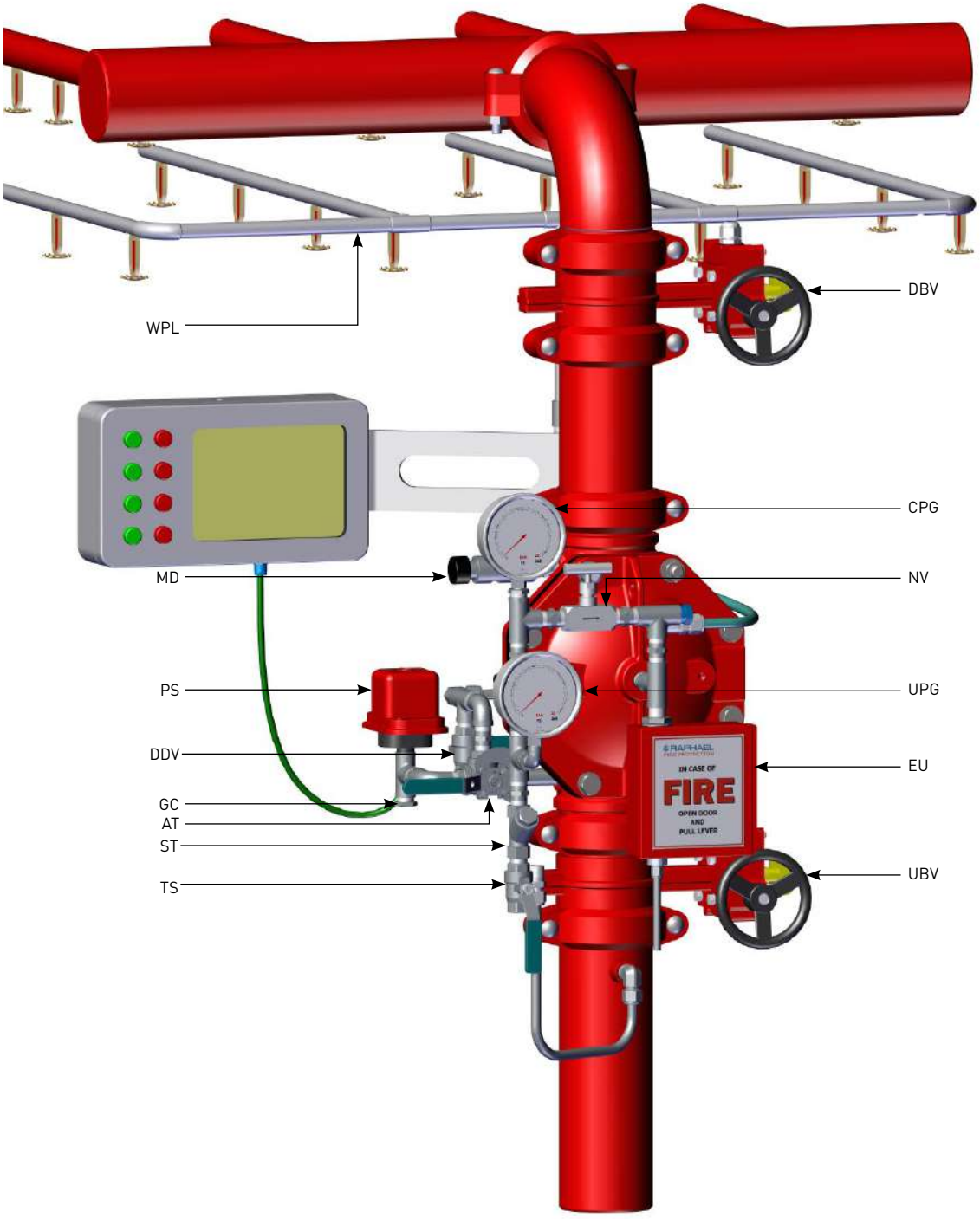
RESET POSITION

System reset requires the replacement of all the wet pilot line (WPL) detection Line's shattered-open automatic fire sprinklers.

The detection line need to be pressurized, and consequently. The FDV valve control chamber is pressurizes as well and the valve closes.

Typical installation

FDV - DH1



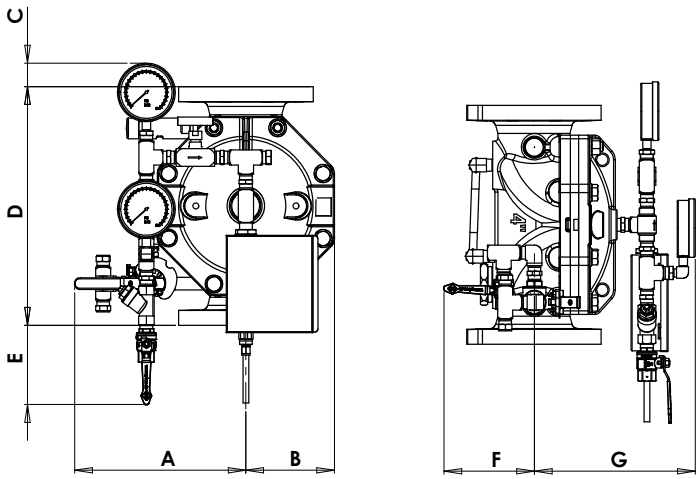
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
GC – Gong Connection
DDV – Downstream Drain Valve

PS – Pressure Switch
NV – Needle Valve
MD – Manual Automatic Drain Valve
WPL – Wet Pilot line
UPG – Upstream Pressure Gauge

CPG – Control chamber Pressure Gauge
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve
EU – Emergency Unit

Parametric drawing:

FDV-DH1



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	246	11.8	268	10.5	280	11	305	12	332	13	365	14.4
B	250	9.8	330	13	284	11.2	404	16	431	17	308	12
C	97	3.8	87	3.4	75.5	2.9	67	2.6	67	2.6	NA	NA
D	202	7.9	325	12.8	396	15.5	464	18.3	567	22.3	768.5	30.2
E	208	8	160	6.3	93	3.6	98	3.8	91	3.6	NA	NA
F	98	3.8	116	4.5	198	7.8	233	9	246	9.7	203	8
G	243	9.5	233	9.2	263	10.3	326	12.8	361	14.2	472	18.6
Kg/lb	9	20	22	48	44	97	66	145	107	236	227	500.5

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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Pilot line installation height
- Additional accessories needed

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

3 Way Hydraulically Actuated, Remote Reset Deluge Valve

FDV- 3W-DH1

The FDV-3W-DH1 fire protection system is based on Raphael's FDV deluge valve and is equipped with a hydraulically actuated control trim. 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 valve contains no balancing spring and no metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-3W-DH1 deluge system is hydraulically actuated and can be reset remotely. When one or more automatic sprinklers in the wet pilot detection line are exposed to flame heat and shatter open, the pressure in the detection line decreases. This pressure drop also reduces the pressure in the three-way actuator's control chamber, causing the actuator to change its state. In this state, the actuator drains the deluge valve's control chamber, allowing the valve to open fully and admit water into the spray sprinkler system.

When the detection line is re-pressurized, the actuator returns to its initial state. This allows upstream pressure to flow into the deluge valve's control chamber, re-pressurizing it and closing the valve. Consequently, water flow to the spray sprinkler system stops.

The deluge 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 line and with open nozzles on the main spray pipelines.

MARKETS

Marine · Industry · Storage · P.O.G. · Airports

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)

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

- Hydrodynamic pattern design ensures high flow rates with minimal head loss.
- The valve automatically trips open when water pressure in its control chamber is gradually released. The trip is actuated by a pressure drop in the pilot line caused by flame heat that triggers one or more automatic sprinklers to open.
- Soft closing upon re-pressurization of the valve's control chamber—by line pressure or another independent water source—prevents surges.

The FDV-3W-DH1 three-way control principle ensures full valve opening with maximum flow rate and minimal head loss.

This system resets to stand-by close position by shutter open sprinkler replacement, and re-pressurizing the pilot line.

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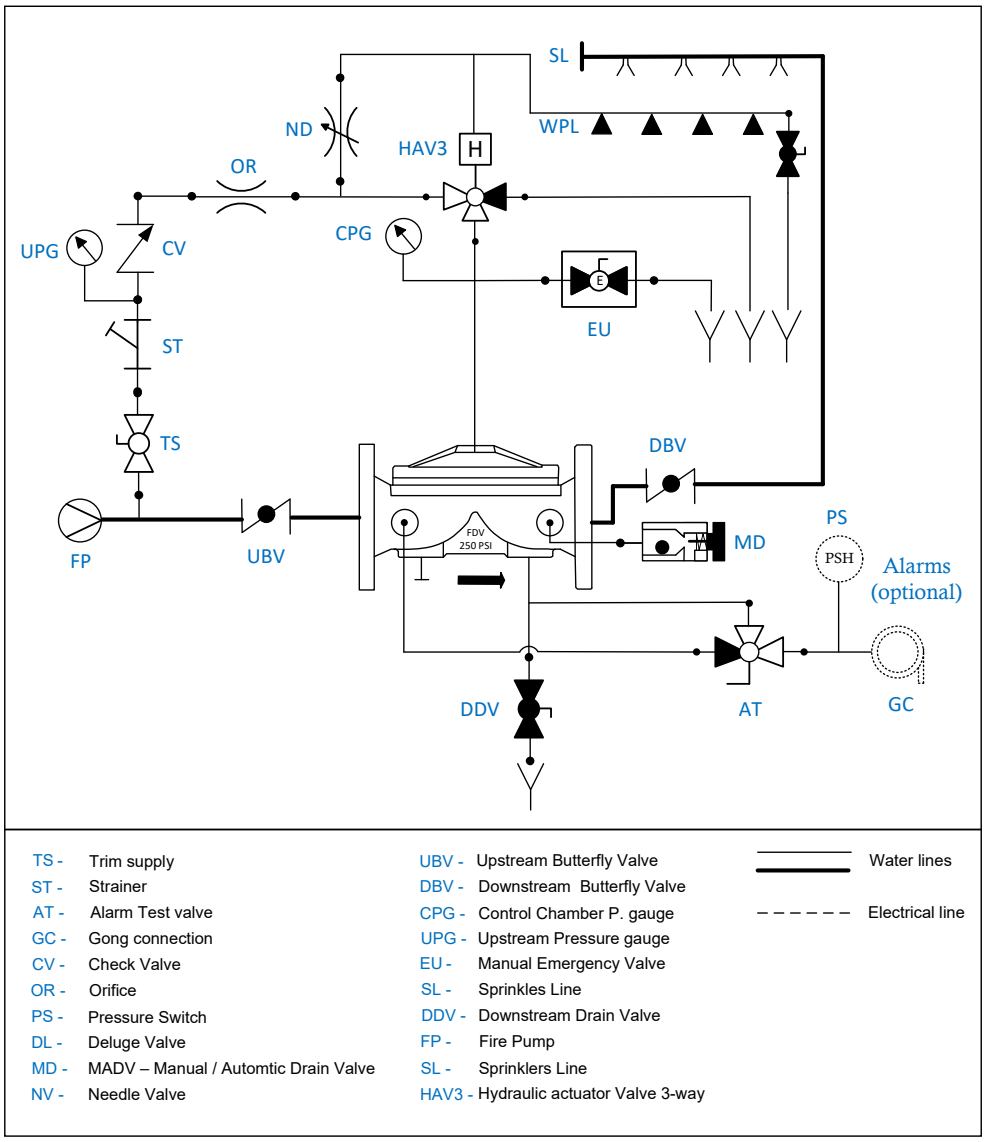
Schematic drawing:

FDV-3W-DH1

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	CPG -	Control Chamber P. gauge	- - - - - -	Electrical line
GC -	Gong connection	UPG -	Upstream Pressure gauge		
CV -	Check Valve	EU -	Manual Emergency Valve		
OR -	Orifice	SL -	Sprinkles Line		
PS -	Pressure Switch	DDV -	Downstream Drain Valve		
DL -	Deluge Valve	FP -	Fire Pump		
MD -	MADV – Manual / Automtic Drain Valve	SL -	Sprinklers Line		
NV -	Needle Valve	HAV3 -	Hydraulic actuator Valve 3-way		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the check valve (CV) and the closed emergency valve (EU), keeping the FDV deluge valve closed. The hydraulic actuator's (HAV3) control chamber is pressurized by the Wet Pilot Line (WPL). This pressure holds the actuator in an open position, allowing upstream flow into the deluge valve's control chamber and thereby maintaining the valve in its closed state.

FIRE SITUATION

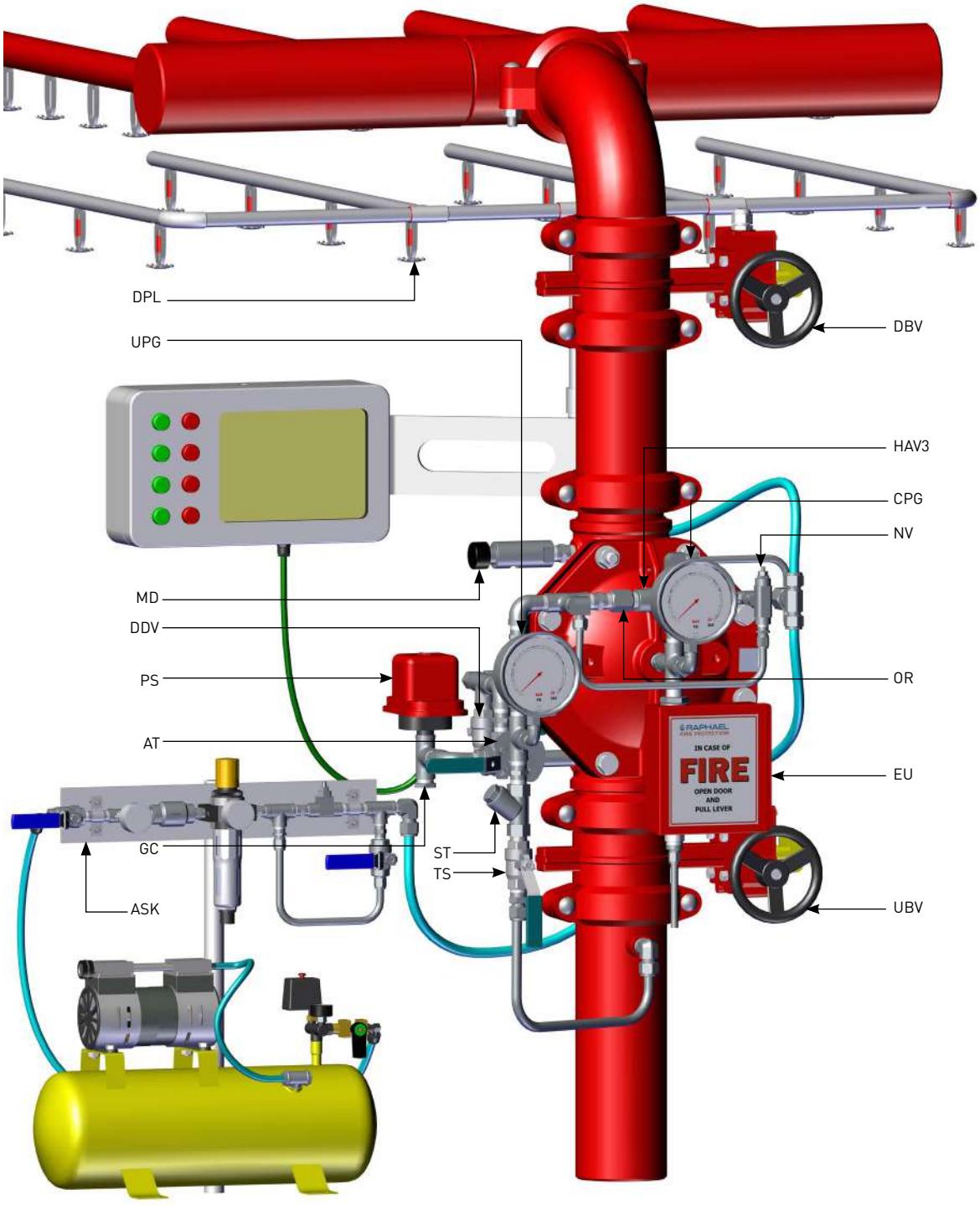
When one or more automatic sprinklers in the Wet Pilot Detection Line (WPL) are exposed to fire heat and shatter open, the line pressure drops. Consequently, the pressure in the three-way actuator's (HAV3) control chamber also decreases, causing the actuator to change state. In this new state, the actuator drains the deluge valve's control chamber, which opens the deluge valve and allows water to flow into the sprinkler system.

RESET POSITION

When one or more automatic sprinklers in the Wet Pilot Detection Line (WPL) are exposed to fire heat and shatter open, the line pressure drops. Consequently, the pressure in the three-way actuator's (HAV3) control chamber also decreases, causing the actuator to change state. In this new state, the actuator drains the deluge valve's control chamber, which opens the deluge valve and allows water to flow into the sprinkler system.

Typical installation

FDV- 3W-DH1



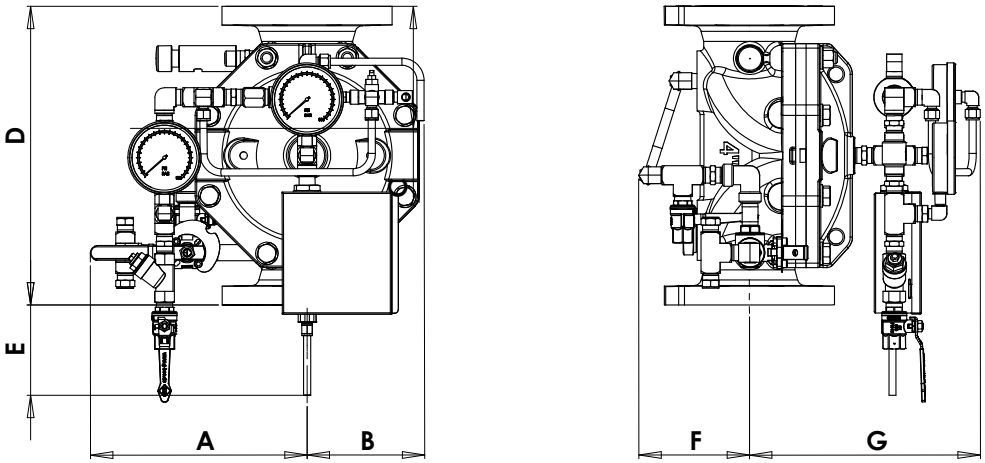
PS - Pressure Switch
HA - HAV-3 Hydraulic actuator 3 way
EU - Emergency Unit
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve
UPG - Upstream Pressure Gauge

CPG - Control Chamber Pressure Gauge
GC - Gong connection
DPL - Dry Pilot Line
MD - Manual Automatic Drain Valve
CV - Check Valve
NV - Needle valve

OR - Orifice
DDV - Downstream Drain Valve
AT - Alarms Test Valve
ST - "Y" Strainer
TS - Trim Supply

Parametric drawing:

FDV-3W-DH1



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	267	10.3	268	10.5	276	10.8	290	11.4	316	12.4	340	13.4	373	14.7
B	156	6.1	156	6.1	156	6.1	156	6.1	177	7	232	9.1	308	12.1
C	135	5.3	135	5.3	74	2.9	36	1.4	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	220	8.66	224	8.8	158	6.2	121	4.7	89	3.4	36	1.4	N/A	N/A
F	127	5	127	5	128	5	150	5.9	151	5.9	171	6.7	203	8
G	230	10.6	230	10.6	274	10.8	310	12.2	376	14.8	415	16.2	500	19.6
Kg/lb	10.3	22.7	12.0	26.4	29.2	64.3	45.2	99.6	55.5	123	121	266	230	507

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
- System working pressure
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Pilot line installation height
- Additional accessories needed

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

Hydraulically Actuated & Anti-Columning, Local Reset Deluge Valve

FDV - DA0

The FDV is a fire protection control valve for deluge fire sprinkler systems, 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 or internal metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-DA0 deluge system is actuated hydraulically and reset locally.

When a hydraulic detection system - a Wet Pilot Detection Line - is exposed to a predetermined temperature, the automatic fire sprinklers shatter open, causing a pressure drop that activates a pilot valve, which in turn commands the FDV-DA0 deluge valve to open. The Anti-Columning feature ensures reliable system operation regardless of the detection line's height or its distance from the control valve. The deluge system also incorporates an emergency valve that bypasses the fire detection system for manual operation.

In addition, the FDV-DA0 system is equipped with a PSA device that manually and locally pressurizes the deluge control chamber and the wet pilot line. This keeps the valve closed, prevents re-pressurization during actuation (when the control chamber must be drained), and compensates for minor leakage-related pressure losses. This configuration is suitable for open-nozzle water spray pipelines.

MARKETS

Marine | Commercial | Residential | Industry | Airports

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)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm & cover plate, no wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple reset of the valve to standby position without draining or opening the valve itself, neither closing OS&Y or other valves in the system.
- Full Anti Columning property enables a nearly unlimited pilot line height.
- Open fail safe valve, maintained in stand-by closed position by the PSA.
- 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

- The hydro-dynamic pattern design ensures high flowrates 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 a Wet Pilot Line's hydraulic pressure release due to its exposure to flame heat.
- The Anti-Columning properties guarantee an immediate system trip, regardless of the Wet Pilot height.
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges.

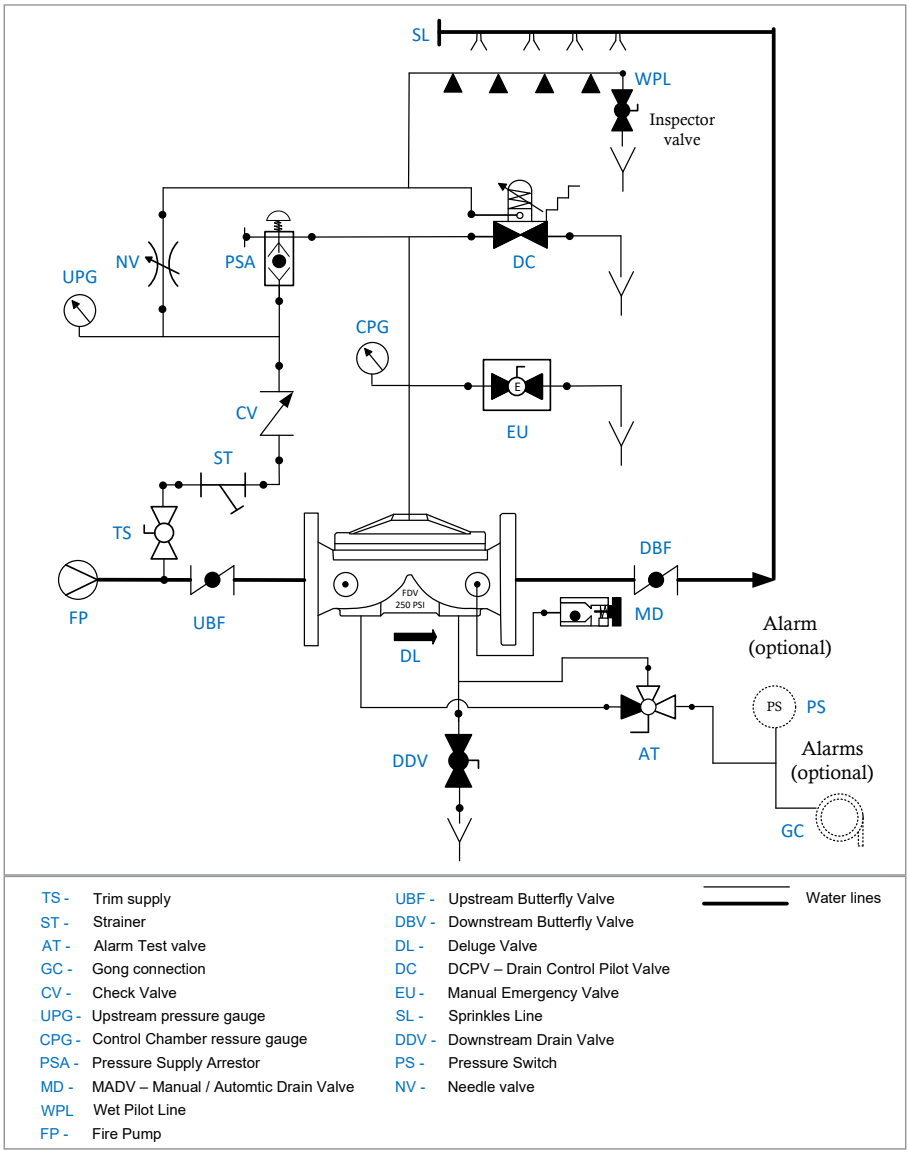
The FDV-DA0 resets to stand-by close position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-DA0

Set position



TS -	Trim supply	UBF -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	DL -	Deluge Valve		
GC -	Gong connection	DC	DCPV – Drain Control Pilot Valve		
CV -	Check Valve	EU -	Manual Emergency Valve		
UPG -	Upstream pressure gauge	SL -	Sprinkles Line		
CPG -	Control Chamber ressure gauge	DDV -	Downstream Drain Valve		
PSA -	Pressure Supply Arrestor	PS -	Pressure Switch		
MD -	MADV – Manual / Automtic Drain Valve	NV -	Needle valve		
WPL	Wet Pilot Line				
FP -	Fire Pump				

OPERATION

SET POSITION

After pressing the PSA push button and releasing, pressurized water in the valve's control chamber is trapped by the closed PSA (PSA), the closed emergency valve (EM) and by the closed DCPV drain pilot valve (DC). The hydraulic pressure accumulated in the Wet pilot line keeps this device in its close position, maintaining the FDV deluge valve closed.

FIRE SITUATION

When some of the Wet pilot detection line's automatic fire sprinklers are subjected to the predetermined temperature levels and shutter-open, the pilot line pressure drops and the DCPV (DC) opens. Consequently, the DCPV opens its drain port, regardless of the residual column pressure.

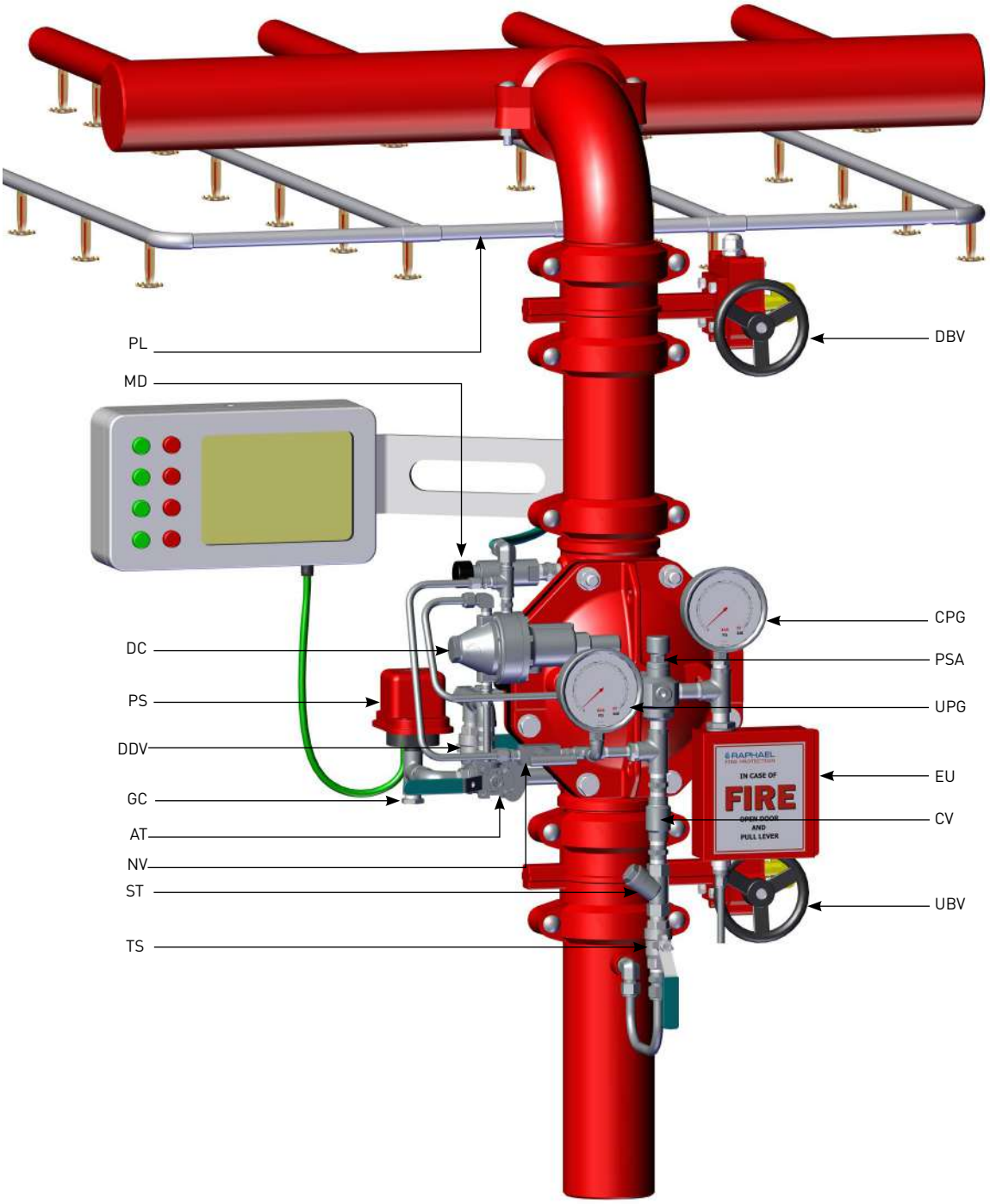
When it opens, the DCPV releases the FDV control chamber pressure causing the valve to open and admit water into the spray sprinklers pipeline.

RESET POSITION

System reset requires the replacement of all Shattered-open Fire sprinklers in the Detection pilot line (PL). The PSA push button needs to be pressed. When pushed down, upstream water pressurizes the Pilot line, resets the DCPV to closed position and pressurizes the control chamber. Consequently, the FDV deluge valve close.

Typical installation

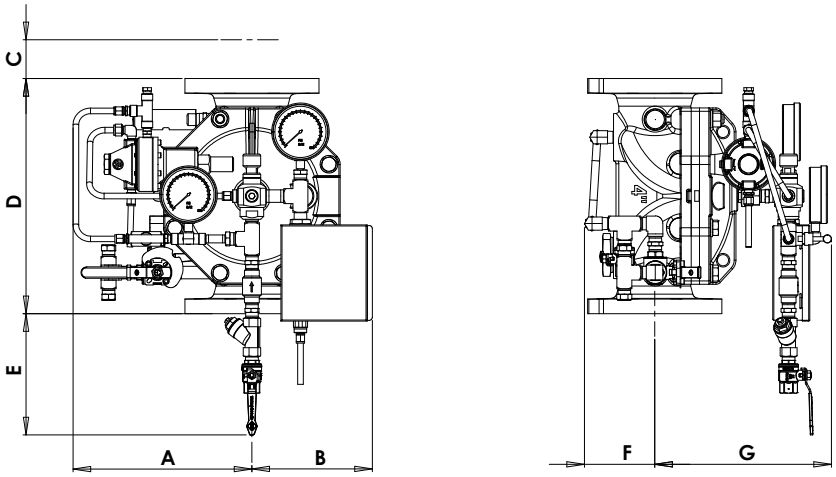
FDV - DA0



TS - Trim Supply
ST - Strainer
AT - Alarm Test valve
GC - Gong Connection
DDV - Downstream Drain Valve
PS - Pressure Switch
NV - Needle Valve
DC - Drain Control Pilot Valve
PSA - Pressure Supply Arrestor
MD - Manual Automatic Drain Valve
PL - Pilot line
UPG - Upstream Pressure Gauge
CPG - Control chamber Pressure Gauge
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve
EU - Emergency Unit

Parametric drawing:

FDV-DA0



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	204	8	204	8	204	8	204	8	316	12.4	377	14.8	406	15.9
B	272	10.7	272	10.7	272	10.7	290	11.4	204	8	231	9	308	9.1
C	65	2.55	61	2.4	41	N/A	N/A	N/A	N/A	N/A	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	305	12	295	11.6	245	9.6	206	8.1	173	6.8	120	4.7	N/A	N/A
F	118	4.6	91	3.6	120	4.7	120	4.7	158	6.2	160	6.3	203	8
G	220	8.66	233	9.2	265	10.4	294	11.6	360	14.2	395	15.5	484	19
Kg/lb	13.1	28.8	15.1	33.2	32.5	71.6	48.2	106	59	130	93	205	233	513

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

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
- Trim materials
- Pilot line installation height
- Additional accessories needed

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

Electrically Actuated, Local Reset, Economic Deluge Valve

FDV - AE0

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 area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-AE0 deluge system is electrically actuated and can be reset locally.

An electric detection system activates a solenoid valve through a control panel, which in turn opens the FDV deluge valve.

The system includes an emergency manual override valve that bypasses the fire detection system, enabling manual activation when required.

In addition, the FDV-AE0 system is equipped with a PSA device that manually and locally pressurizes the deluge control chamber, keeping it closed, preventing re-pressurization during actuation (when the control chamber must be drained), and compensating for minor leakage-related pressure losses.

This configuration is suitable for open-nozzle water spray pipelines.

MARKETS

Commercial · Industry · Marine · Storage · Residential · Airport

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)

REGULATION RATIO: up to 5.1

SENSITIVITY: 1.4 spi (0.1 bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate — with no wetted metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple reset to standby position without draining or opening the valve.
- 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 automatically opens when water pressure in its control chamber is gradually released by an electric signal conveyed to the solenoid.
- Soft closing occurs when the control chamber is pressurized — either by line pressure or an independent water source — preventing surges.

The FDV-AE0 resets to its stand-by closed position by pressurizing the Dry Pilot Line and manually operating the PSA device.

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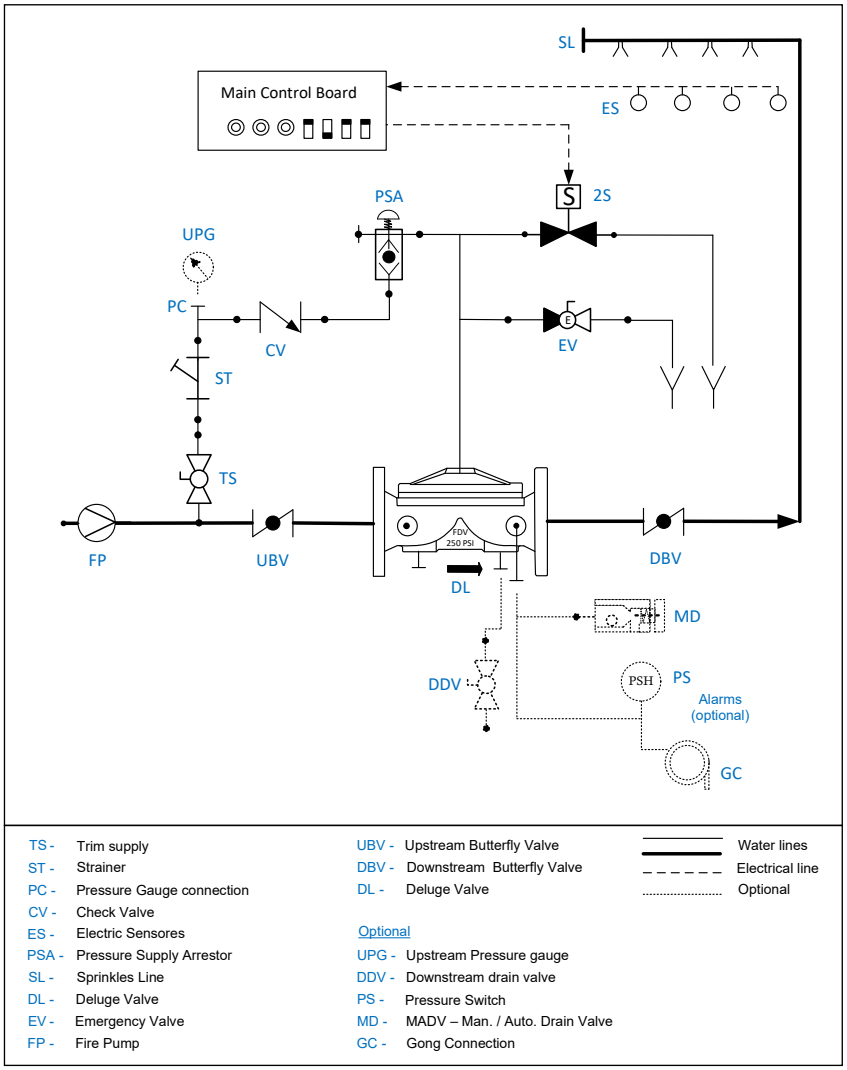
Schematic drawing:

FDV-AE0

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		Electrical line
PC -	Pressure Gauge connection	DL -	Deluge Valve		Optional
CV -	Check Valve				
ES -	Electric Sensores	Optional			
PSA -	Pressure Supply Arrestor	UPG -	Upstream Pressure gauge		
SL -	Sprinkles Line	DDV -	Downstream drain valve		
DL -	Deluge Valve	PS -	Pressure Switch		
EV -	Emergency Valve	MD -	MADV – Man. / Auto. Drain Valve		
FP -	Fire Pump	GC -	Gong Connection		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber (DL) is retained by the closed PSA (PSA), the closed 2-way solenoid valve (S2), and the closed emergency valve (EV), thereby keeping the FDV deluge valve shut.

FIRE SITUATION

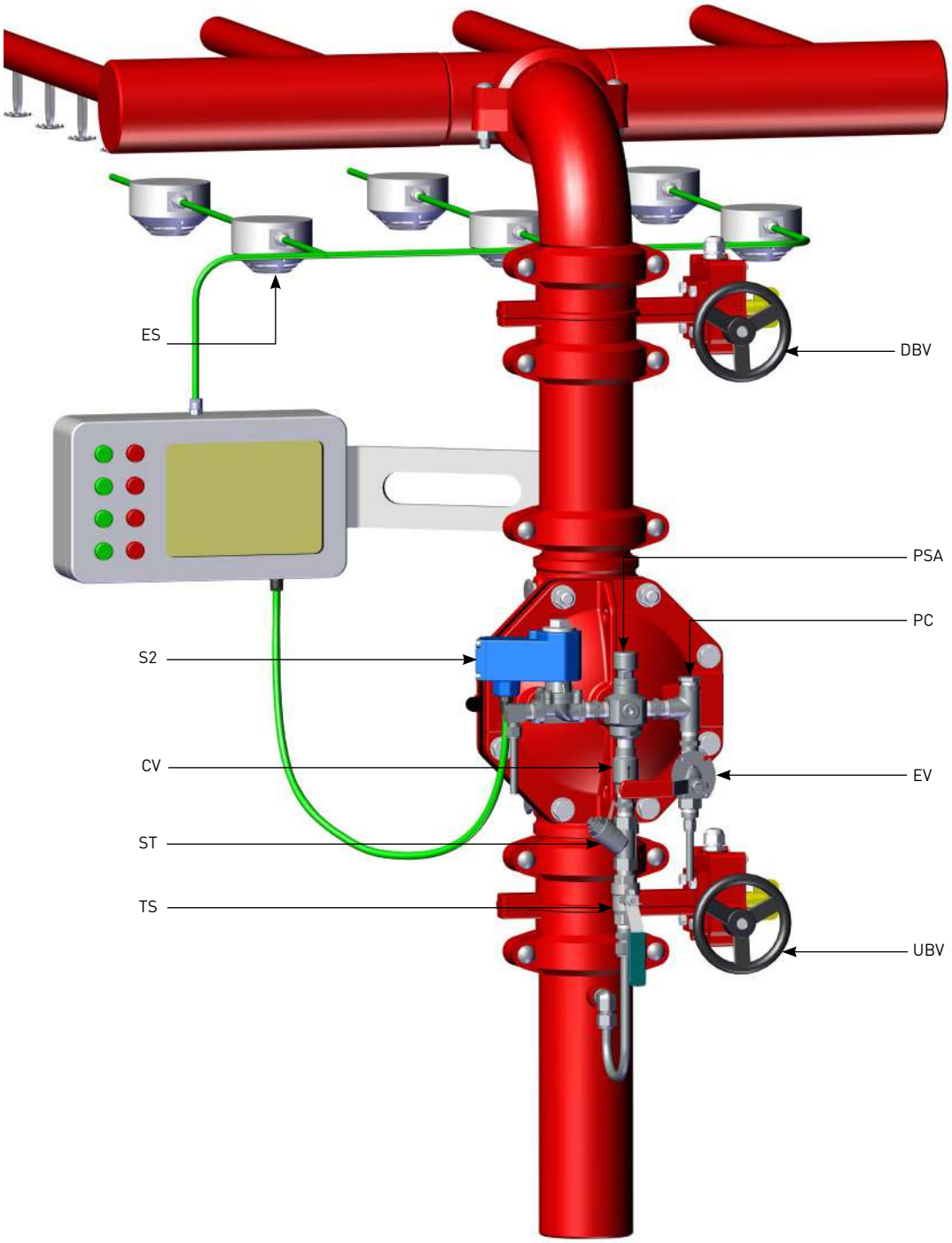
When the electric detection system (ES) senses heat or flames, it activates the main control panel, which then transmits an electric signal commanding the 2-way solenoid valve (S2) to open and drain the deluge valve's control chamber. Consequently, the FDV deluge valve opens, allowing water to flow into the spray sprinkler line.

RESET POSITION

To reset the system, the electrical alarm system must first be reset to de-energize and close the solenoid valve. This action stops the drainage of the FDV control chamber. Next, the PSA push button should be pressed to allow upstream pressure to enter and re-pressurize the control chamber, thereby closing the FDV deluge valve.

Typical installation

FDV - AE0

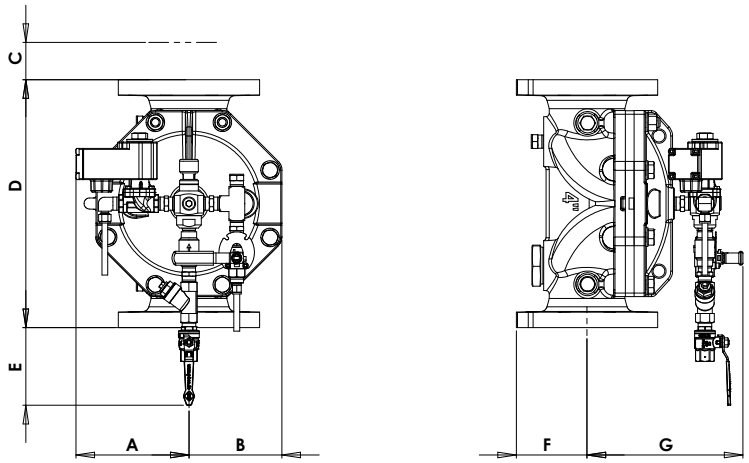


TS – Trim Supply
ST – Strainer
CV – Check Valve
EV – Emergency Valve
PC – Pressure gauge Connection
PSA – Pressure Surge Arrestor
S2 – 2-way Solenoid
ES – Electric Sensors
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Parametric drawing:

FDV-AE0



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	182	7.1	182	7.1	182	7.1	184	7.2	197	7.8	250	9.8	324	12.7
B	105	4.1	105	4.1	115	4.5	150	5.9	177	7	231	98.5	308	12.1
C	13	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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	224	8.9	214	8.4	163	6.4	125	6	93	3.6	40	1.6	N/A	N/A
F	52	2	58	2.3	100	3.9	114	4.5	143	5.6	172	6.8	203	8
G	172	6.7	186	7.3	215	8.5	232	9.1	300	11.8	333	13.1	442	17.4
Kg/lb	7	15.4	9	19.8	27	59.2	42	92.6	53	117	98	216	226	498

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
- SMO-245
- 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
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed:
  Pressure gauge
  Pressure switch
  Drain valve (manual or automatic)
  Gong

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

Electrically Actuated, Remote Reset Deluge Valve

FDV - AE1

The FDV is a deluge fire sprinkler system, designed for installation in hazardous environments. Suitable for both vertical and horizontal installation, the globe-pattern, line-pressure-operated FDV valve features a direct elastomeric diaphragm seal, with no balancing spring or internal metallic components in the wetted area. Its hydrodynamic design ensures high flow rates with minimal head loss.

The FDV-AE1 fire protection deluge system is electrically actuated and can be reset remotely.

An electric detection system activates a solenoid valve through a control panel, opening the FDV deluge valve.

The deluge system also incorporates an emergency valve that bypasses the fire detection system for manual operation. This system is suitable for water spray pipelines with open nozzles.

MARKETS

Commercial | Industry | Marine

Storage | Residential | Airport

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)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate - with no wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple reset of the valve to standby position without draining or opening the valve itself.
- 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 automatically trips open upon gradual release of water pressure from its control chamber, when an electric signal is conveyed to the valve's solenoid.
- Soft closing occurs upon pressurization of the valve's control chamber — by line pressure or an independent water source — preventing surges.

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

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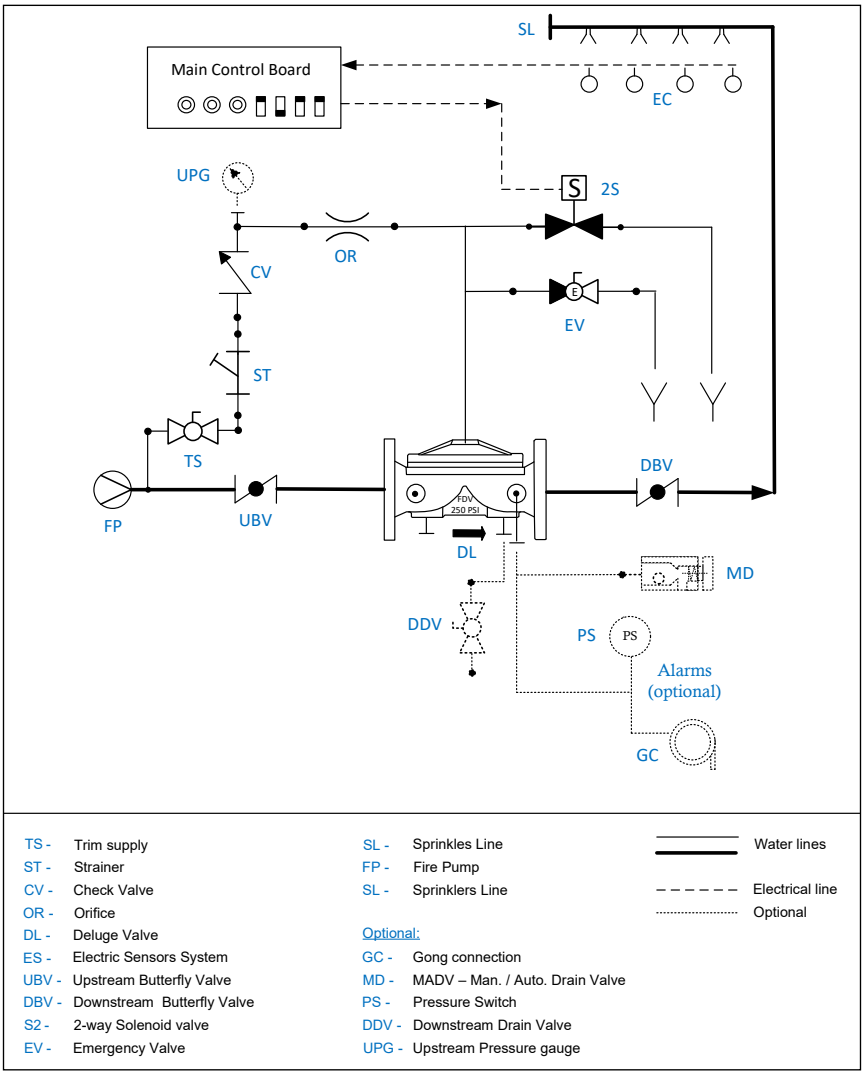
Schematic drawing:

FDV-AE1

Set position



TS -	Trim supply	SL -	Sprinkles Line		Water lines
ST -	Strainer	FP -	Fire Pump		
CV -	Check Valve	SL -	Sprinklers Line		Electrical line
OR -	Orifice				Optional
DL -	Deluge Valve	Optional:			
ES -	Electric Sensors System	GC -	Gong connection		
UBV -	Upstream Butterfly Valve	MD -	MADV – Man. / Auto. Drain Valve		
DBV -	Downstream Butterfly Valve	PS -	Pressure Switch		
S2 -	2-way Solenoid valve	DDV -	Downstream Drain Valve		
EV -	Emergency Valve	UPG -	Upstream Pressure gauge		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the check valve (CV), the closed 2-way solenoid valve (S2), and the closed emergency valve (EU), maintaining the FDV deluge valve (DL) in a closed state.

FIRE SITUATION

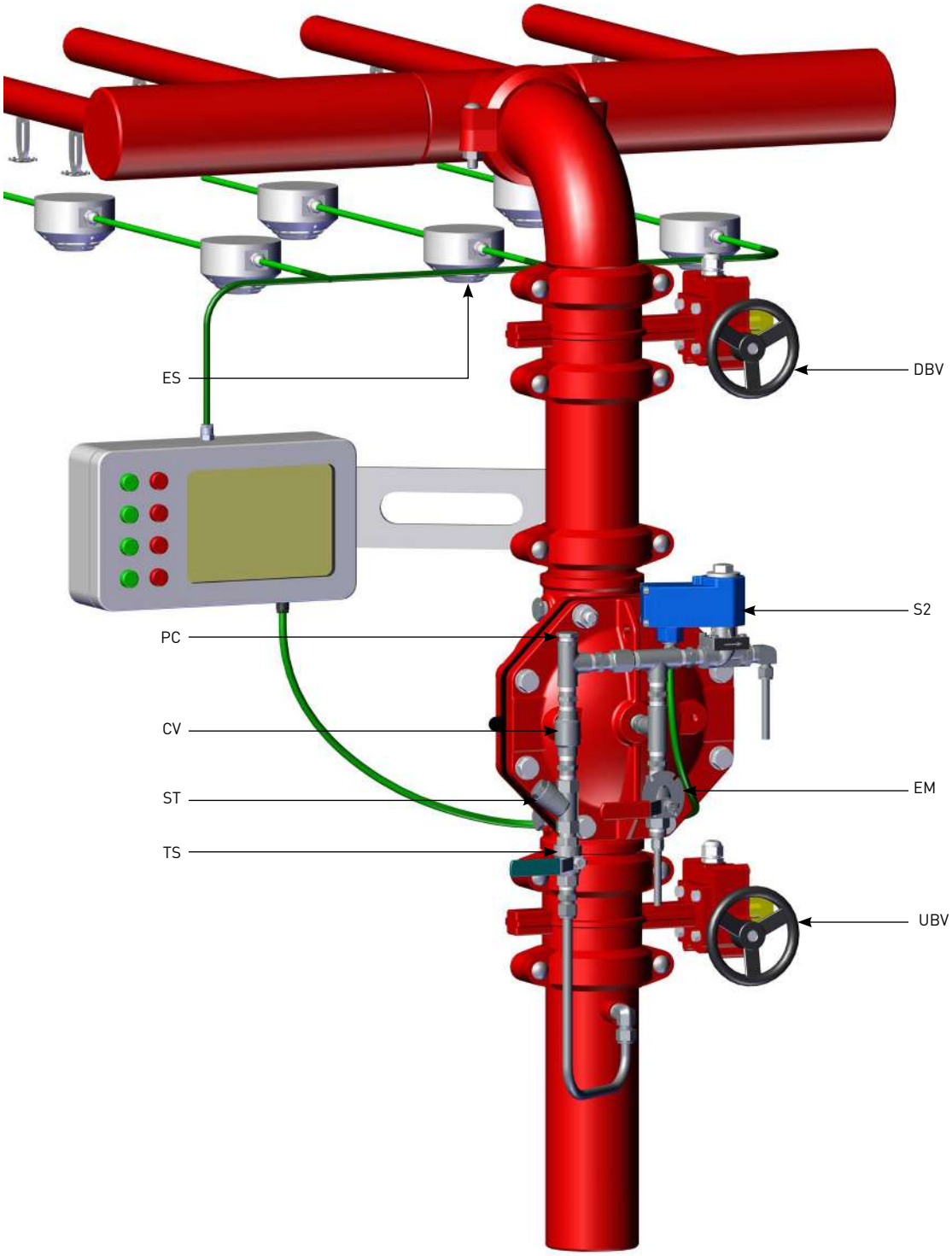
When the electric detection system (ES) senses flame heat, it triggers the main control panel, which transmits an electric signal, commanding the 2-way solenoid valve (S2) to open and drain the deluge valve's control chamber. Consequently, the FDV deluge valve opens, allowing water to flow to the spray sprinklers line.

RESET POSITION

System reset requires the electrical alarm system to be reset to de-energize and close the solenoid valve, preventing the FDV control chamber from draining. Upstream water enters the FDV deluge control chamber through the orifice (OR), closing the valve.

Typical installation

FDV - AE1

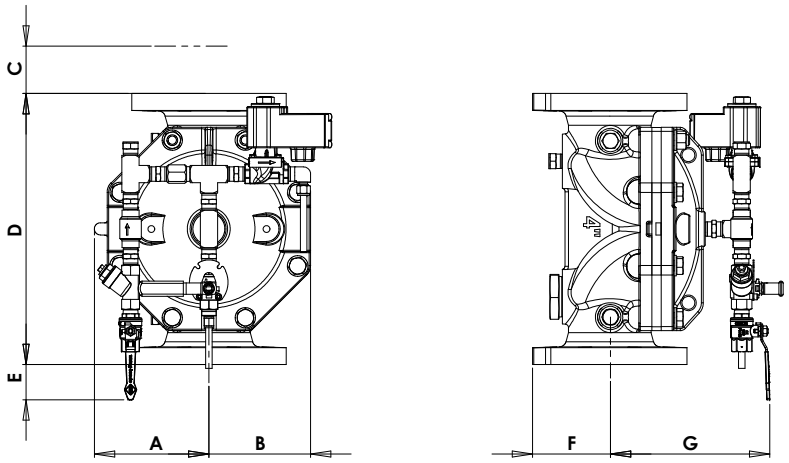


TS – Trim Supply
ST – Strainer
CP – Pressure Gauge Connection
CV – Check Valves
OR – Orifice
S2 – 2-way Solenoid
ES – Electric Sensors
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Parametric drawing:

FDV-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	163	6.4	163	6.4	163	6.4	169	6.6	196	7.7	248	9.8	325	12.8
B	150	5.9	150	5.9	150	5.9	181	7.1	178	7	232	9.1	308	12.1
C	90	3.5	82	.2	32	1.2	N/A	N/A	N/A	N/A	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	155	6.1	142	56	88	3.5	52	2	N/A	N/A	N/A	N/A	N/A	N/A
F	21	0.8	58	2.3	100	3.9	114	4.5	143	5.6	172	6.8	203	8
G	176	7	190	7.5	220	87	256	10	302	11.9	355	13.9	442	17.4
Kg/lb	6.9	15.2	8.6	20	25.8	56.8	42	92.6	52	115	97	214	226	498

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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed:
  Pressure gauge
  Pressure switch
  Drain valve (manual or automatic)
  Gong

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

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.

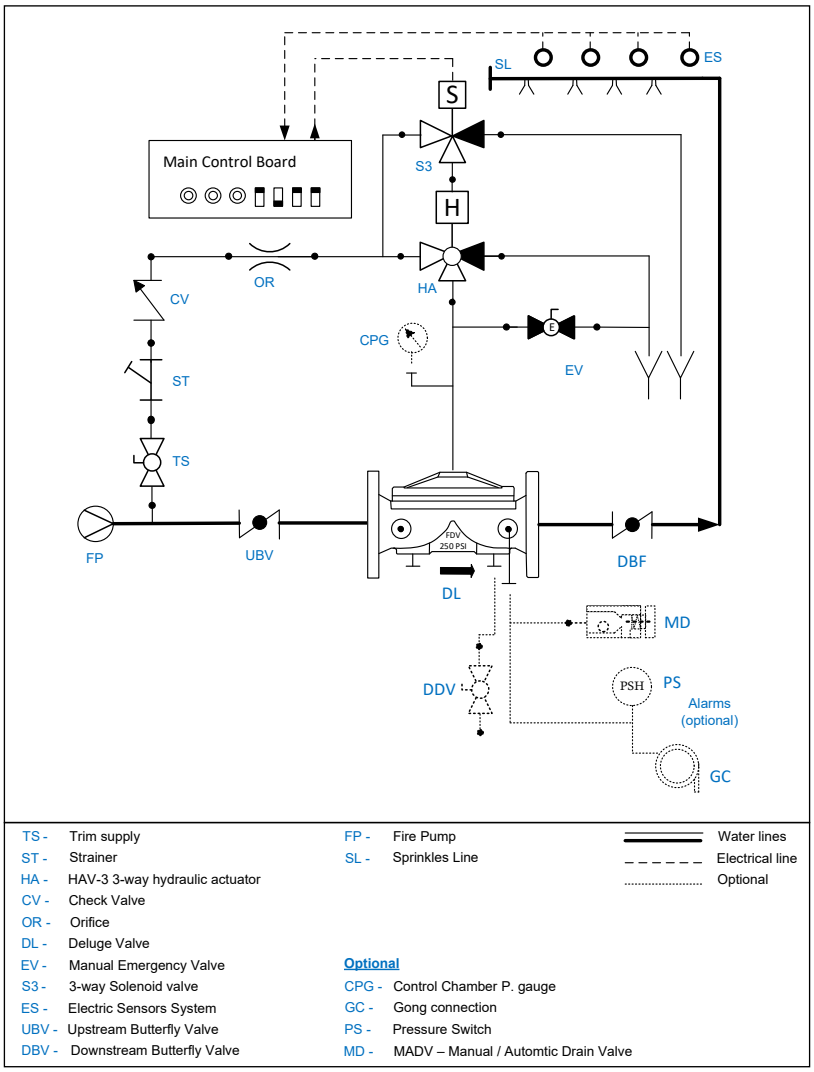
The FDV-3W-AE1 resets to the standby closed position when the solenoid coil is de-energized through the main control board.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

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

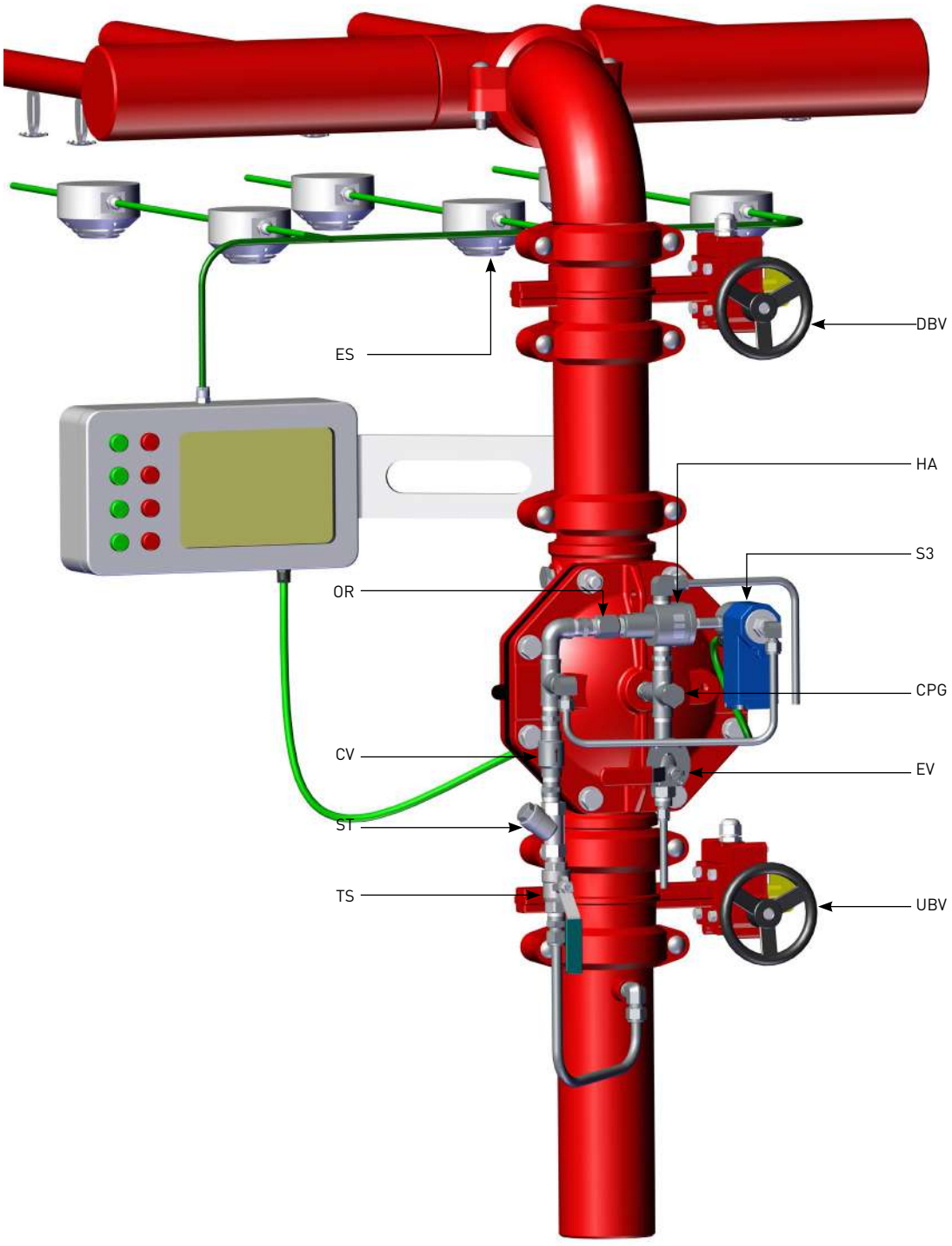
When an electric detection system (ES) senses flame heat, it triggers the main control panel, which in turn, transmits an electric signal commanding the 3-way solenoid valve (S3). When the solenoid valve is energized, it changes state and pressurizes the actuator's control chamber. The actuator (HA) 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.

Typical installation

FDV-3W-AE1



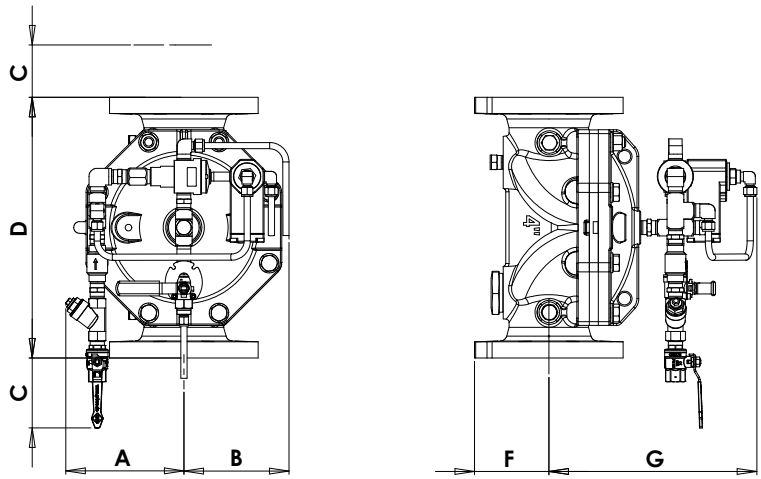
TS - Trim Supply
ST - "Y" Strainer
CV - Check Valve
OR - Orifice

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.

Pneumatically Actuated, Local Reset, Economic Deluge Valve

FDV-AP0

The FDV-AP0 fire protection system is based on Raphael's FDV deluge valve and is equipped with a pneumatically actuated control trim. The FDV is 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-AP0 deluge system is pneumatically actuated and locally resettable. In a fire situation, when the pneumatic dry pilot detection line is exposed to flame heat, one or more automatic sprinklers shatter, venting air pressure from the actuator and causing the deluge valve to open.

The system incorporates an emergency valve that bypasses the fire detection system for manual operation. Additionally, the trim is equipped with a PSA - a device that enables local system reset, i.e., closing the FDV valve by repressurizing its control chamber.

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

MARKETS

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

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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)

PNEUMATIC PRESSURE:
29-58 psi (2-4 bar)

APPROVALS

FM APPROVED

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.
- Full anti-columning property allows for virtually unlimited pilot line height.
- Fail-safe, open-type valve maintained in the standby closed position by the PSA.
- 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 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 pneumatic pressure release of the Dry 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

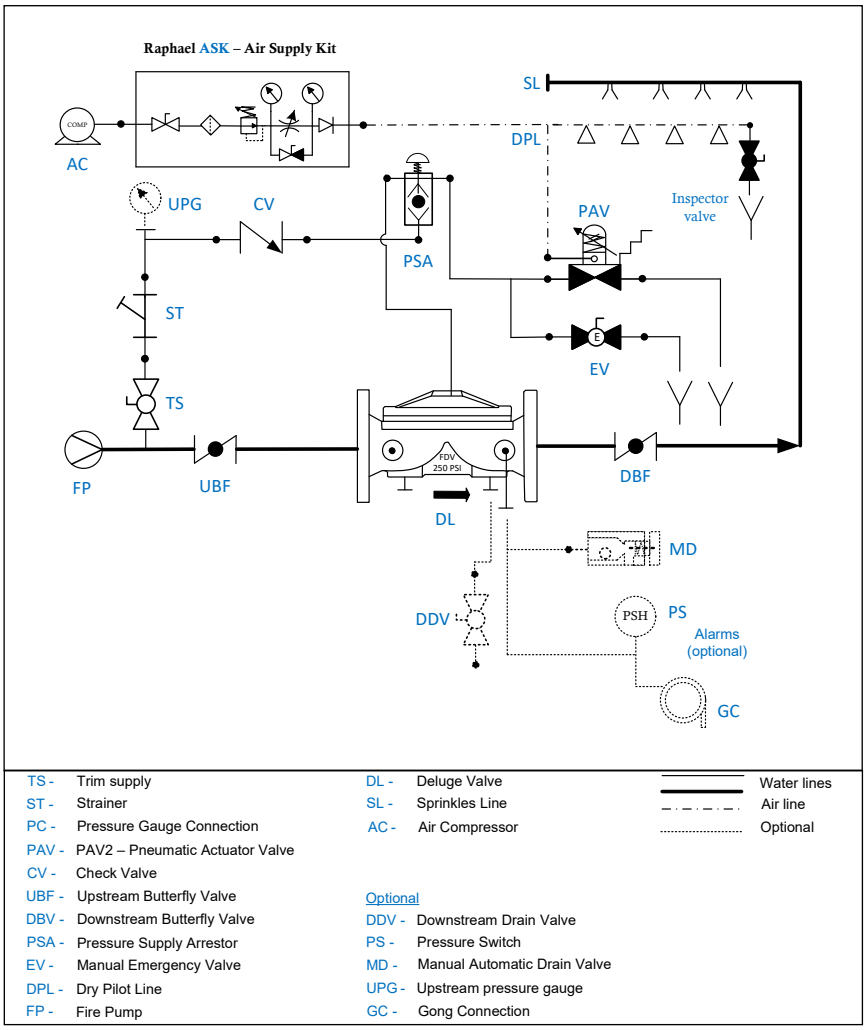
The FDV-AP0 resets to the stand-by closed position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-AP0

Set position



OPERATION

SET POSITION

The pneumatic pressure in the Dry Pilot line keeps the pneumatic actuator (PAV) closed. Pressurized water in the deluge valve control chamber (DL) is retained by the check valve (CV), the closed PSA (PSA), the closed emergency valve (EV), and the closed pneumatic actuator (PAV). As a result, the FDV deluge valve (DL) remains closed.

FIRE SITUATION

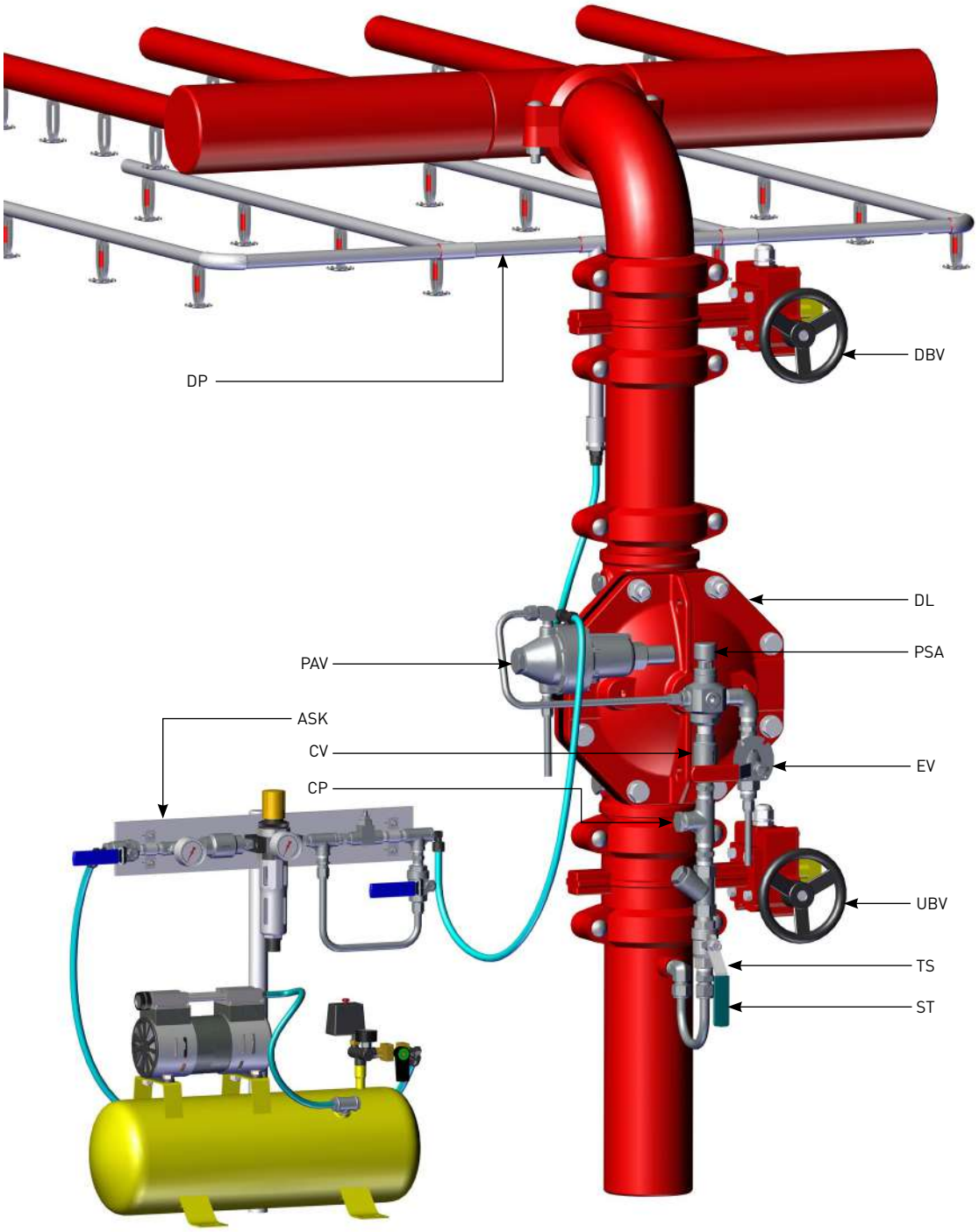
When one or more automatic sprinklers in the Dry Pilot detection line (DP) are exposed to fire heat and open, the detection line depressurizes the actuator (PAV) control chamber. The actuator then opens and drains the deluge valve control chamber. Consequently, the FDV deluge valve (DL) opens and supplies water to the sprinkler line.

RESET POSITION

Resetting the system requires replacing all open sprinklers in the Dry Pilot detection line. The Dry Pilot line and the PAV actuator control chamber are then repressurized by the ASK to return the actuator to the closed position. Re-pressurization is performed by pressing the PSA push button. This action refills and pressurizes the FDV deluge valve control chamber, causing the valve to close.

Typical installation

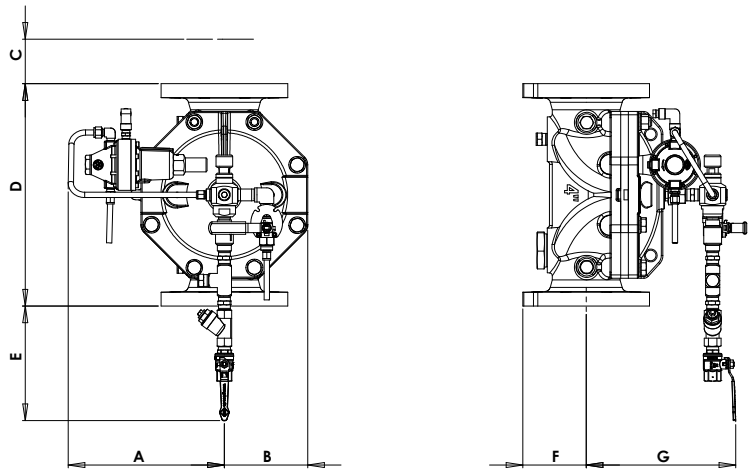
FDV-AP0



TS – Trim Supply
DL – Deluge valve
ST – Strainer
CV – Check Valve
EV – Emergency Valve
CP – Pressure gauge Connection
PAV – Pneumatic Actuator Valve
PSA – Pressure Supply Arrestor
ASK – Air Supply Kit
DP – Dry Pilot line
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Parametric drawing:

FDV-AP0



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	195	7.6	206	8.1	238	9.4	280	11	305	12	306	12	390	15.3
B	105	4.1	105	4.1	116	4.6	150	5.9	177	6.7	231	9	308	12.1
C	46	1.8	42	1.6	22	0.8	45	1.7	N/A	N/A	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	305	12	295	10.1	243	9.6	206	81	174	6.8	117	4.6	22	0.8
F	52	2	58	2.3	74	2.9	114	4.5	141	5.5	172	6.7	203	8
G	227	8.9	223	8.8	252	9.9	288	11.3	356	14	387	15	479	1.6
Kg/lb	10	22	11.3	25	20	44	45	99	55	121	100	220	230	507

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
- Pneumatic 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.

Pneumatically Actuated, Remote Reset, Economic Deluge Valve

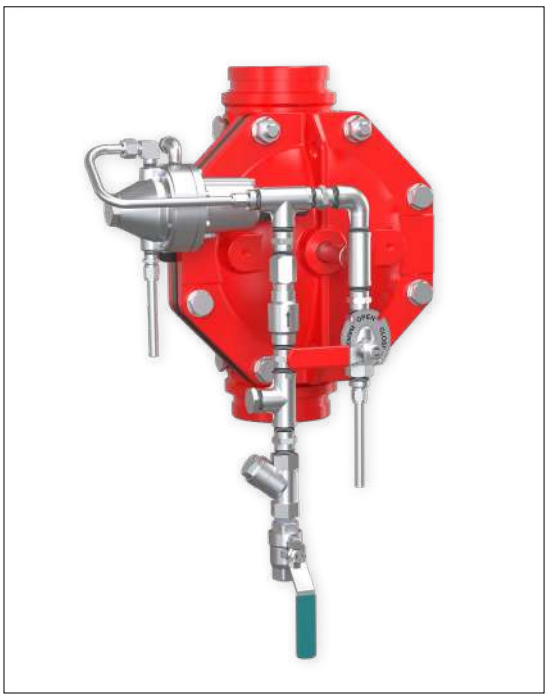
FDV-AP1

The FDV-AP1 fire protection system is based on Raphael's FDV deluge valve and is equipped with a pneumatically actuated control trim. The FDV is a fire protection control valve designed for deluge sprinkler systems, specifically intended 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-AP1 deluge system is pneumatically actuated and can be reset remotely. When the Dry Pilot Detection Line, which is pressurized with air, is exposed to a predetermined temperature, the automatic fire sprinklers open (shatter), venting the air pressure from the detection line. The resulting pressure drop actuates the pneumatic operator, which in turn commands the deluge valve to open.

The system incorporates an emergency manual valve, allowing operation bypassing the fire detection system.

The system 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, Storage, Residential, Airport, P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS:
Air, Nitrogen

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)

MIN. PNEUMATIC PRESSURE:
16 psi (1.1 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: 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

- 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 pneumatic pressure release of the Dry 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.

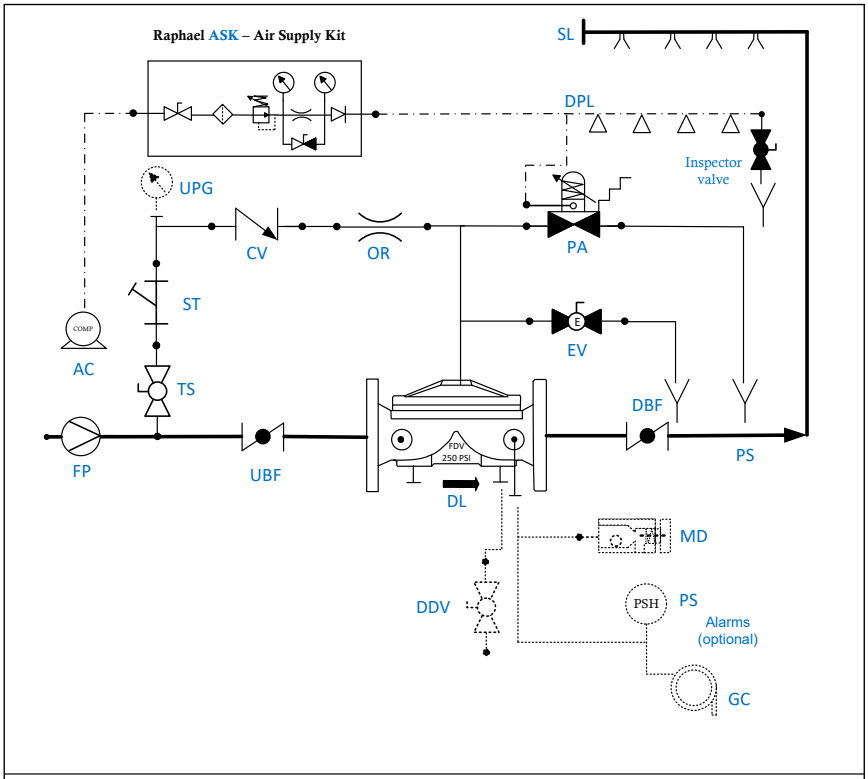
The FDV-AP1 resets to the stand-by closed position by pressurizing the Dry Pilot Line.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-AP1

Set position



TS -	Trim supply	SL -	Sprinkles Line		Water lines
ST -	Strainer	FP -	Fire Pump		Pneumatic lines
AT -	Alarm Test valve	DPL -	Dry Pilot Line		Optional
CV -	Check Valve	AC -	Air Compressor		
OR	Orifice				
DL -	Deluge Valve	**OPTIONAL**			
UBV -	Upstream Butterfly Valve	PS -	Pressure Switch		
DBV -	Downstream Butterfly Valve	MD -	MADV – Manual / Automtic Drain Valve		
PA -	2-Way Pneumatic Actuator	GC -	Gong connection		
EV -	Emergency Valve	UPG -	Upstream Pressure gauge		
PC -	Pressure gauge Connection	DDV -	Downstream Drain Valve		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the check valve (CV), the closed pneumatic actuator PAV-2 (PA), and the closed emergency valve (EV).

The air pressure accumulated in the dry pilot detection (DPL) line keeps the pneumatic actuator in the closed position, thereby maintaining the deluge valve closed.

FIRE SITUATION

When one or more of the dry pilot detection line (DPL) automatic sprinklers are exposed to the predetermined temperature and shatter open, the detection line depressurizes, causing the pneumatic actuator (PA) to open.

The opening of the pneumatic actuator drains the deluge valve's control chamber. Consequently, the FDV deluge valve opens, allowing water to flow into the spray sprinkler line.

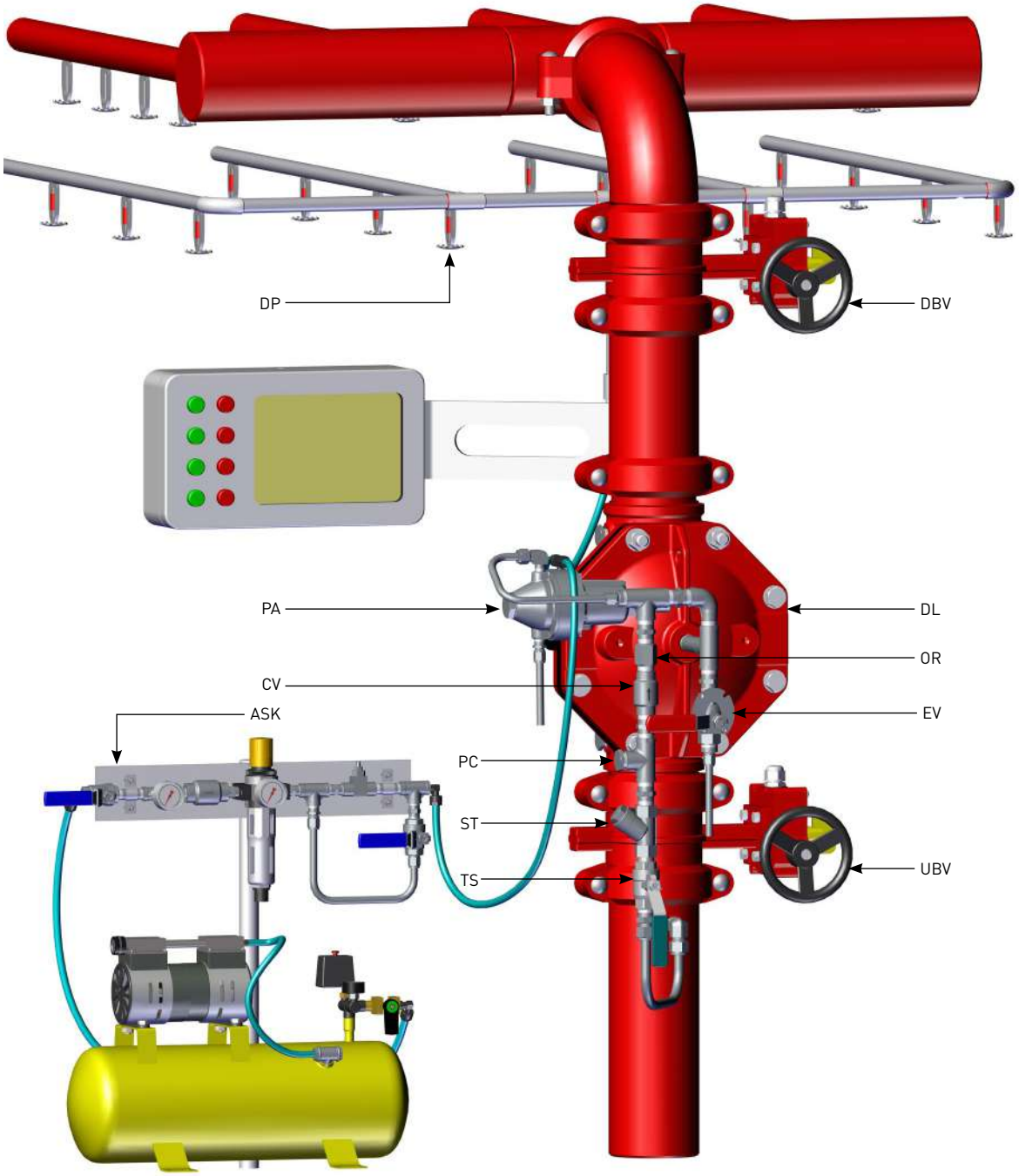
RESET POSITION

System reset requires replacing all shattered-open automatic fire sprinklers in the dry pilot detection line. The detection line is then re-pressurized to its set pressure.

The restored air pressure closes the pneumatic actuator (PA), which in turn closes the FDV deluge valve.

Typical installation

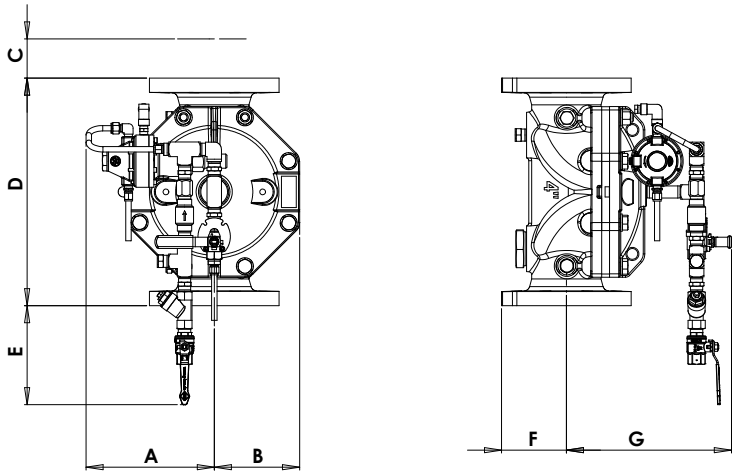
FDV-AP1



UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve
DL - FDV Deluge valve
TS - Trim supply valve
ST - "Y" strainer
CV - Check valve
PC - Pressure gauge Connection
OR - Orifice
EV - Emergency Valve
PA - PAV-2 Pneumatic Actuator
DP - Dry Pilot Line
ASK - Air Supply Kit

Parametric drawing:

FDV-AP1



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	194	7.6	200	7.8	180	7	225	8.8	253	9.9	305	12	324	12.7
B	58	2.2	70	2.7	116	4.5	148	5.8	177	6.9	231	9	308	12.1
C	45	1.8	42	1.6	21	0.8	N/A	N/A	N/A	N/A	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	273	10.7	263	10.3	211	8.3	173	6.8	141	5.5	88	3.5	N/A	N/A
F	52	2	58	2.2	100	3.9	114	4.5	142	5.6	172	6.8	203	8
G	232	9.1	246	9.6	276	10.8	290	11.4	357	14.	363	14.3	453	17.8
Kg/lb	9.2	20.2	11	24	28.2	62.2	44	97	54.6	120	100	220	228	502

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
- Pneumatic 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.

Electro-Pneumatically Actuated, Local Reset, Economic Deluge Valve

FDV-AC0

The FDV-AC0 fire protection system is based on Raphael's FDV deluge valve and is equipped with a pneumatically and electrically actuated control trim.

The FDV is 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-AC0 Deluge system can be actuated both pneumatically and electrically, and it resets locally. In the event of a fire, when the pneumatic dry pilot detection line is exposed to heat, one or more of its automatic fire sprinklers shatter, releasing the air pressure from an actuator and causing the deluge valve to open. Alternatively, when a sensor of the electrical detection system activates the main control board, it opens a solenoid valve that vents the dry pilot line, thereby opening the deluge valve.

The system also incorporates an emergency valve that bypasses the fire detection systems for manual operation. Additionally, the trim is equipped with a PSA device, which enables local reset of the system—that is, closing the FDV valve locally by pressurizing its control chamber.

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

MARKETS

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

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)

PNEUMATIC PRESSURE:
29-58 psi (2-4 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 to the standby position without draining or opening the valve, and without closing the OS&Y or other system valves.
- Full anti-columning capability allows virtually unlimited pilot line height.
- Fail-safe, open-type valve maintained in the standby closed position by the PSA.
- 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

- Hydrodynamic flow-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 the pneumatic pressure release of the Dry Pilot Line, caused by exposure to flame heat or by an electric sensor tripped by the fire heat.
- Soft closing, achieved by pressurizing the valve's control chamber with line pressure or another independent water source, prevents surges.

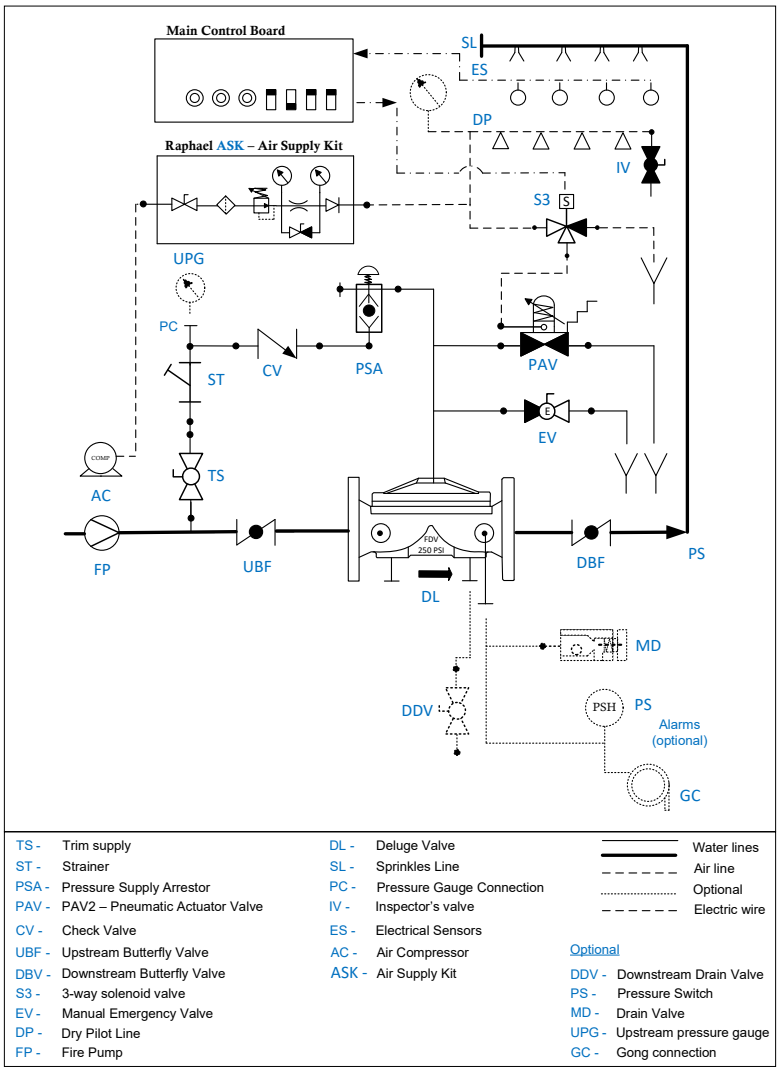
The FDV-AC0 resets to the standby closed position by pressurizing the Dry Pilot Line, de-energizing the solenoid valve through the control bord and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-AC0

Set position



TS -	Trim supply	DL -	Deluge Valve		Water lines
ST -	Strainer	SL -	Sprinkles Line		Air line
PSA -	Pressure Supply Arrestor	PC -	Pressure Gauge Connection		Optional
PAV -	PAV2 – Pneumatic Actuator Valve	IV -	Inspector's valve		Electric wire
CV -	Check Valve	ES -	Electrical Sensors		
UBF -	Upstream Butterfly Valve	AC -	Air Compressor	Optional	
DBV -	Downstream Butterfly Valve	ASK -	Air Supply Kit	DDV -	Downstream Drain Valve
S3 -	3-way solenoid valve			PS -	Pressure Switch
EV -	Manual Emergency Valve			MD -	Drain Valve
DP -	Dry Pilot Line			UPG -	Upstream pressure gauge
FP -	Fire Pump			GC -	Gong connection

OPERATION

SET POSITION

Pressurized water in the valve control chamber is retained by the check valve (CV), the closed pneumatic actuator (PAV), and the closed emergency valve (EV). Air pressure accumulated in the Dry Pilot detection line (DP) is transferred to the actuator through the 3-way solenoid valve (S3), the Deluge Valve (DL) closed.

FIRE SITUATION

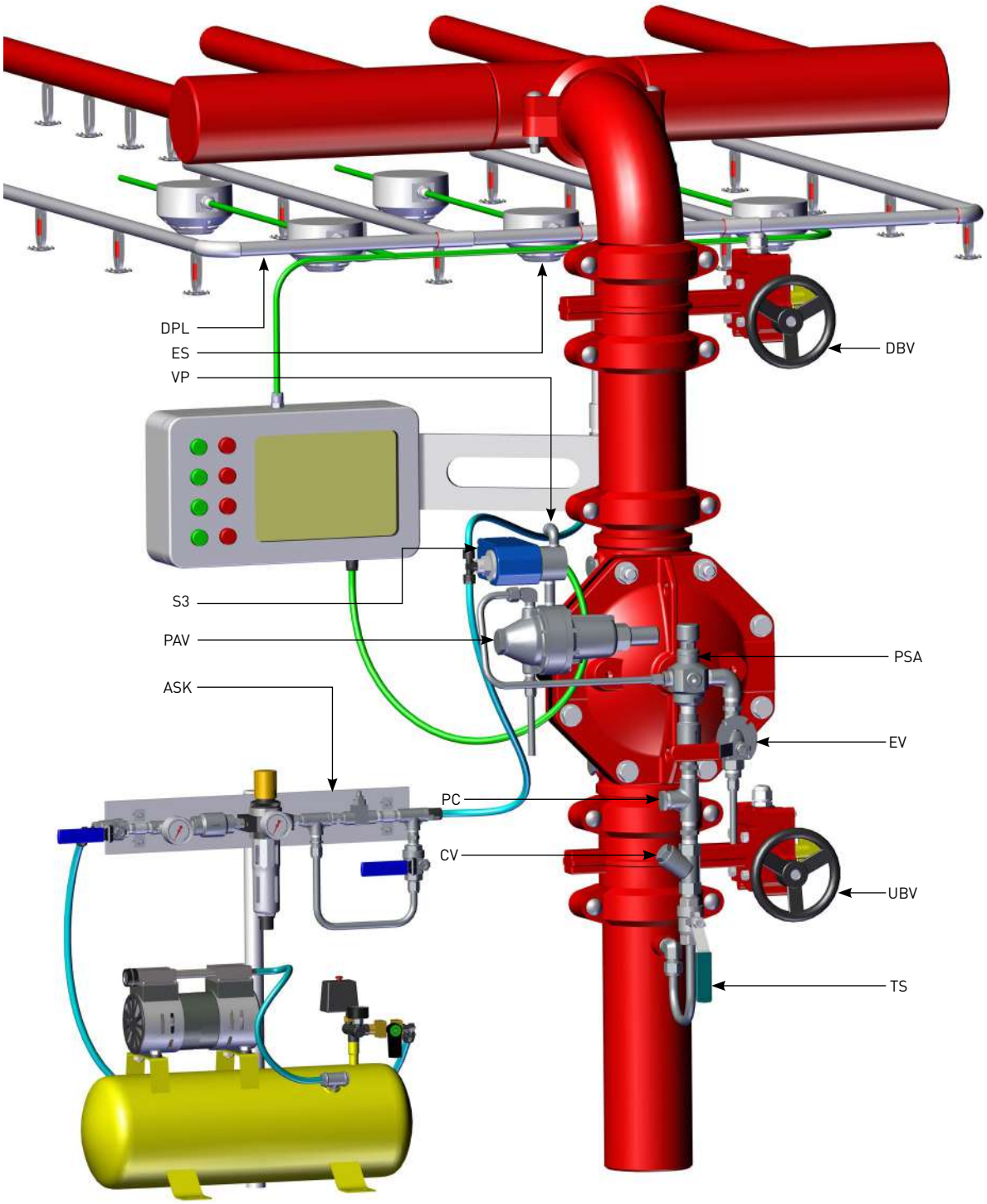
When automatic sprinklers in the Dry Pilot detection line (DP) are exposed to fire and operate, the pilot line depressurizes, opening the actuator (PAV). Alternatively, the electrical detection system (ES) signals the main control board, which energizes the 3-way solenoid valve (S3). The solenoid valve bypasses the pilot line, depressurizes the actuator (PAV), and causes it to open. The FDV-AC0 control chamber drains, and the Deluge Valve (DL) opens.

RESET POSITION

System reset requires replacement of all operated sprinklers in the detection pilot line (DP). If the electrical alarm system was activated, it must be reset and the solenoid de-energized. The Dry Pilot line and the actuator control chamber (PAV) must then be re-pressurized by operating the PSA push button until the set pneumatic pressure is restored.

Typical installation

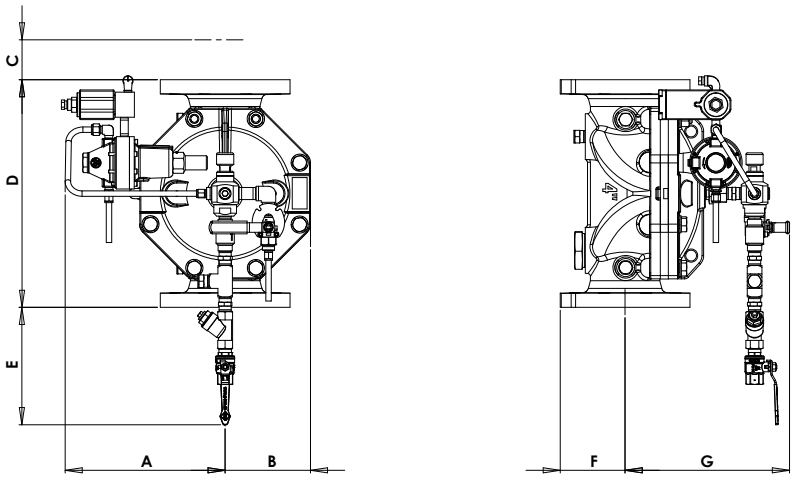
FDV-AC0



TS – Trim Supply
ST – Strainer
CV – Check Valve
S3 – 3-way solenoid valve
EV – Emergency Valve
VP – Venting Port
CP – Pressure gauge Connection
PAV – Pneumatic Actuator Valve
PSA – Pressure Supply Arrestor
ASK – Air Supply Kit
DPL – Dry Pilot line
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Parametric drawing:

FDV-AC0



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	195	7.6	206	8.1	238	9.4	280	11	305	12	306	12	390	15.3
B	105	4.1	105	4.1	116	4.6	150	5.9	177	6.7	231	9	308	12.1
C	96	3.8	92	3.6	72	2.8	7	0.3	N/A	N/A	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	305	12	295	10.1	243	9.6	206	81	174	6.8	117	4.6	22	0.8
F	52	2	58	2.3	74	2.9	114	4.5	141	5.5	172	6.7	203	8
G	227	8.9	223	8.8	252	9.9	288	11.3	356	14	387	15	479	1.6
Kg/lb	10.3	22.7	12.2	26.9	29.5	65	45.3	100	56	123	101	222	230	507

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
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

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

Electro-Pneumatically Actuated, Remote Reset, Economic Deluge Valve

FDV-AC1

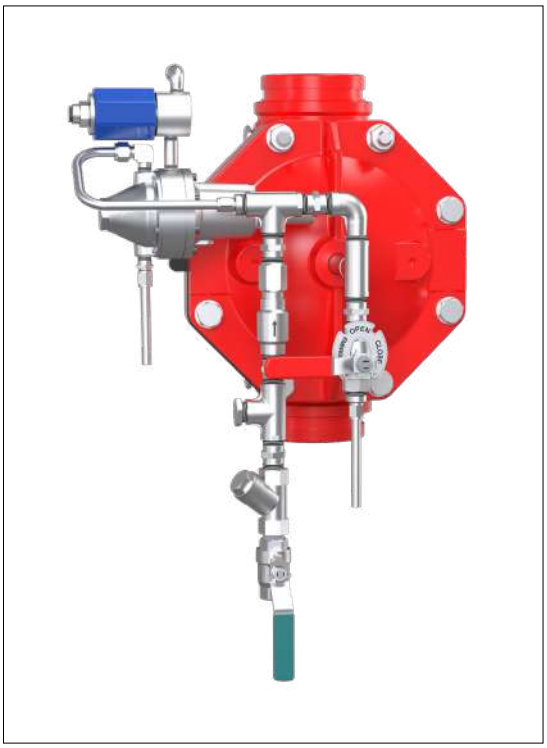
The FDV-AC1 fire protection system is based on Raphael's FDV deluge valve and is equipped with both pneumatically and electrically actuated control trim. The installed FDV valve is available in a variety of optional materials and coatings, making it suitable for installations in hazardous environments.

The FDV-AC1 deluge system is pneumatically actuated and supports remote resetting.

In the event of a fire, when the pneumatic dry pilot detection line is exposed to heat from flames, one or more of its automatic fire sprinklers shatter, venting air pressure from both the dry pilot line and the pneumatic actuator. This pressure drop activates the pneumatic actuator, causing the deluge valve to open.

Alternatively, if an electrical detection sensor signals the main control board, it activates a solenoid valve, which vents the dry pilot line, activates the pneumatic actuator, and opens the deluge valve.

The system includes an emergency valve that allows manual activation by bypassing both the fire detection systems and the solenoid valve. It is compatible with automatic sprinklers on the dry pilot line and open nozzles on the main spray pipelines.



MARKETS

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

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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)

MIN. PNEUMATIC PRESSURE:
29 psi (2 bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate - with no wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple valve reset to standby position without draining or opening the valve, and without closing the OS&Y or other system valves.
- Fail-safe open valve, maintained in a normally closed standby 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 minimal head loss.
- The valve trips open automatically upon the gradual release of water pressure from its control chamber. The trip is actuated either by an electric signal sent to the valve's solenoid or by a pneumatic pressure drop in the dry pilot line caused by one or more open sprinklers.
- Soft closing, upon pressurization of the valve's control chamber by line pressure or an independent water source, prevents surges.

The FDV-AC1 resets to its standby closed position either by de-energizing the alarm system solenoid coil through the main control panel or by re-pressurizing the dry pilot line.

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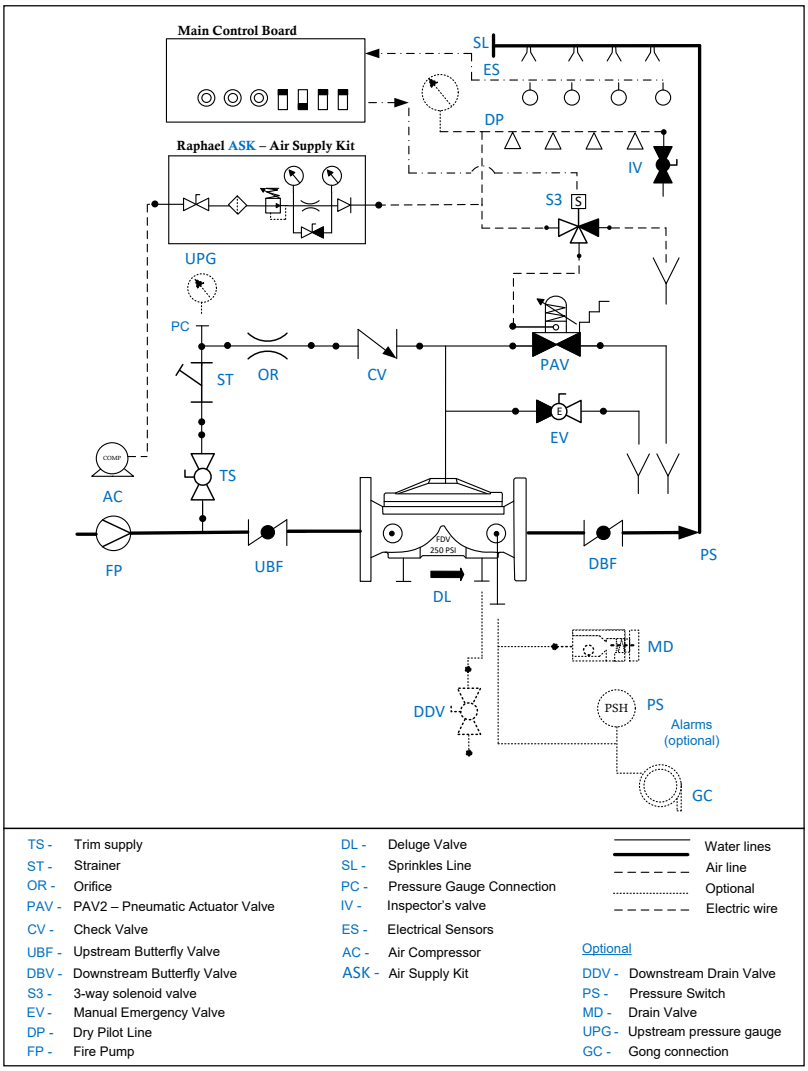
Schematic drawing:

FDV-AC1

Set position



TS -	Trim supply	DL -	Deluge Valve		Water lines
ST -	Strainer	SL -	Sprinkles Line		Air line
OR -	Orifice	PC -	Pressure Gauge Connection		Optional
PAV -	PAV2 – Pneumatic Actuator Valve	IV -	Inspector's valve		Electric wire
CV -	Check Valve	ES -	Electrical Sensors		
UBF -	Upstream Butterfly Valve	AC -	Air Compressor	Optional	
DBV -	Downstream Butterfly Valve	ASK -	Air Supply Kit	DDV -	Downstream Drain Valve
S3 -	3-way solenoid valve			PS -	Pressure Switch
EV -	Manual Emergency Valve			MD -	Drain Valve
DP -	Dry Pilot Line			UPG -	Upstream pressure gauge
FP -	Fire Pump			GC -	Gong connection

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the check valve (CV), the closed pneumatic 2-way actuator (PAV), and the closed emergency valve (EV). Air pressure accumulated in the Dry Pilot detection line (DP) is conveyed to the actuator through the 3-way solenoid valve (S3), thereby keeping the Deluge valve (DL) closed.

FIRE SITUATION

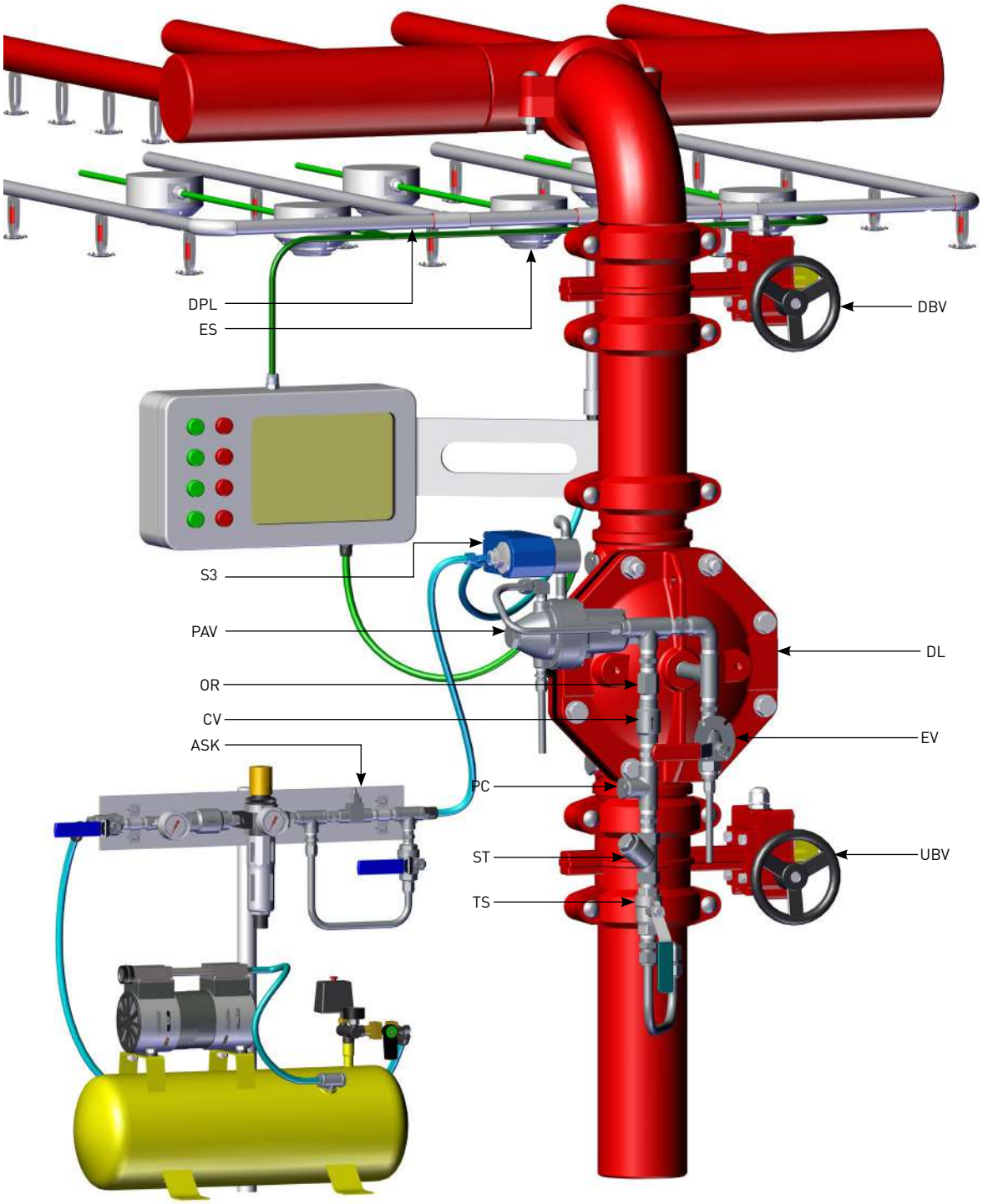
When some of the Dry Pilot detection line's (DP) automatic sprinklers are exposed to the heat of flames and shatter open, the pilot line depressurizes, releasing the actuator (PAV). Alternatively, an electric detection system senses the heat and triggers the main control board, which energizes the 3-way solenoid valve (S3). The solenoid valve bypasses the Dry Pilot detection line, depressurizes the actuator (PAV) control chamber, and opens it. The open actuator drains the FDV-DC1 control chamber, causing the Deluge valve (DL) to open.

RESET POSITION

The upstream butterfly valve must be closed. Resetting the system requires replacing all shattered fire sprinklers in the detection pilot line (DP). Alternatively, the electrical alarm system must be reset and the solenoid de-energized. After the Dry Pilot line is re-pressurized, thereby closing the pneumatic actuator, the upstream butterfly valve must be reopened. The Deluge control chamber is then pressurized by the constant upstream pressure, and the Deluge valve (DL) closes.

Typical installation

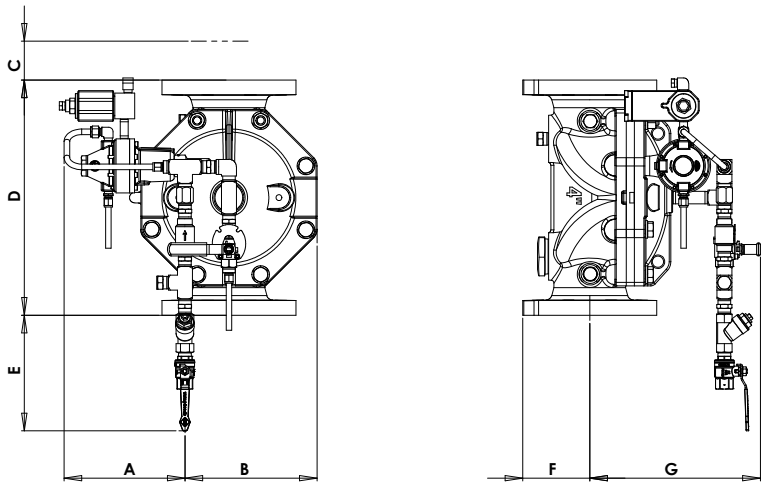
FDV - AC1



S3 - Solenoid 3 way
DL - FDV Deluge valve
TS - Trim supply valve
ST - Strainer
CV - Check valve
PA - PAV - Pneumatic Actuator
PC - Pressure gauge Connection
OR - Orifice
DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
EV - Emergence Valve
ASK - Air Supply Unit
DPL – Dry Pilot Line
ES - Electric Sensors

Parametric drawing:

FDV-AC1



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	200	7.8	200	7.8	232	9.1	280	11	253	9.9	306	12	324	12.7
B	62	2.4	62	2.4	116	4.6	150	5.9	177	6.7	231	9	308	12.1
C	94	3.7	140	5.5	70	2.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D	220	8.6	220	8.6	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	295	10.1	285	11.2	243	9.6	196	7.7	164	6.5	110	4.3	N/A	N/A
F	51	2	58	2.2	100	3.9	114	4.5	141	5.5	172	6.7	203	8
G	223	8.8	245	9.6	252	9.9	292	11.5	360	1.4	394	15.5	484	97.8
Kg/lb	10	22	11.8	26	29.	64	44.8	98.7	56	123	101	222	230	507

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 Nickel plated
- Nickel Aluminum Bronze
- Stainless steel CF8M
- Monel®
- Cupro-Nickel

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
- 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.

Hydraulically Actuated, Local Reset, Economic Deluge Valve

FDV - AH0

The FDV-AH0 fire protection system is based on Raphael's FDV deluge valve and is equipped with a hydraulically controlled trim. The FDV is 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 has no internal metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-AH0 deluge system is hydraulically actuated and can be locally reset. In a fire situation, when the wet pilot detection line is exposed to flame heat, one or more automatic sprinklers shatter, releasing pressure from the deluge control chamber and causing the deluge valve to open.

The system incorporates an emergency valve that bypasses the fire detection system for manual operation. Additionally, the trim is equipped with a PSA - a device that enables local system reset by repressurizing the control chamber and closing the FDV valve.

The system is suitable for use with automatic sprinklers on the wet pilot pipeline and with open nozzles on the main spraying pipelines.

MARKETS

Commercial
Industry
Marine
Storage
Residential
Airport
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)

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.
- Fail-safe, open-type valve maintained in the standby closed position by the PSA.
- 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

- 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-AH0 resets to the stand-by closed position by pressurizing the wet Pilot Line and manually operating the PSA device.

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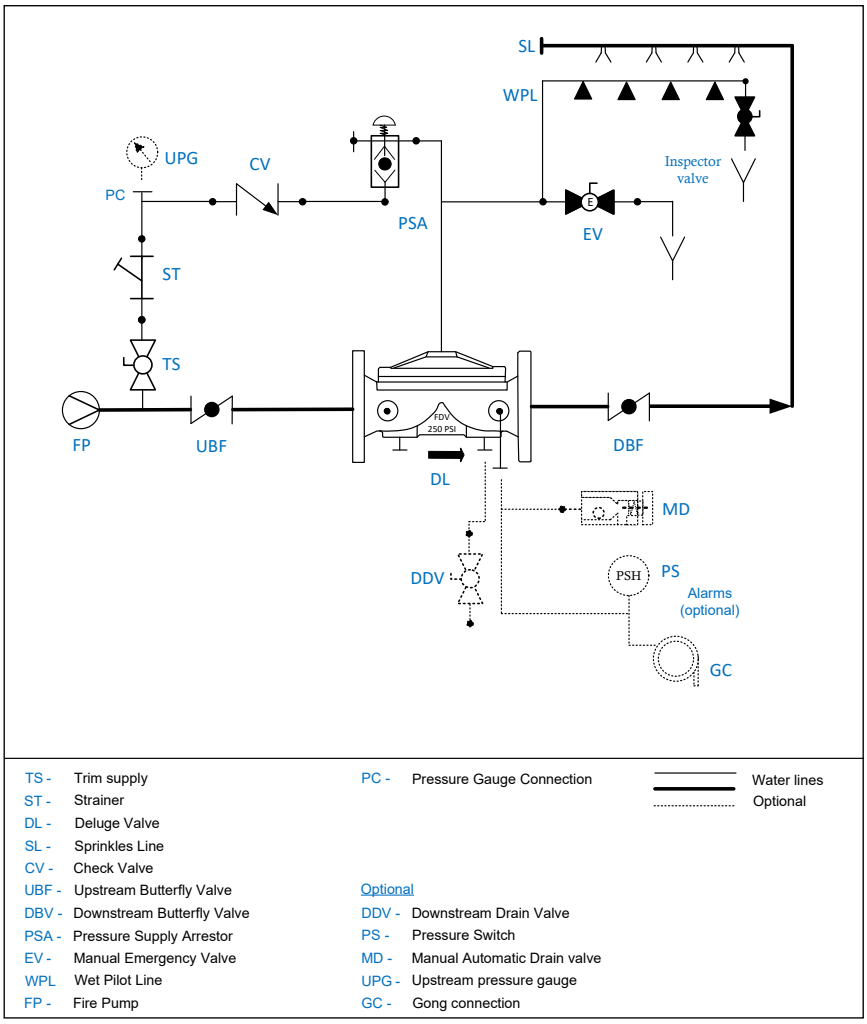
Schematic drawing:

FDV-AH0

Set position



TS -	Trim supply	PC -	Pressure Gauge Connection		Water lines
ST -	Strainer				Optional
DL -	Deluge Valve				
SL -	Sprinkles Line				
CV -	Check Valve				
UBF -	Upstream Butterfly Valve	Optional			
DBV -	Downstream Butterfly Valve	DDV -	Downstream Drain Valve		
PSA -	Pressure Supply Arrestor	PS -	Pressure Switch		
EV -	Manual Emergency Valve	MD -	Manual Automatic Drain valve		
WPL	Wet Pilot Line	UPG -	Upstream pressure gauge		
FP -	Fire Pump	GC -	Gong connection		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber is trapped by the closed PSA [PSA], the closed emergency valve [EV], and the closed automatic wet pilot detection line [WPL]. The hydraulic pressure accumulated in the wet pilot detection line keeps the FDV deluge valve [DL] closed.

FIRE SITUATION

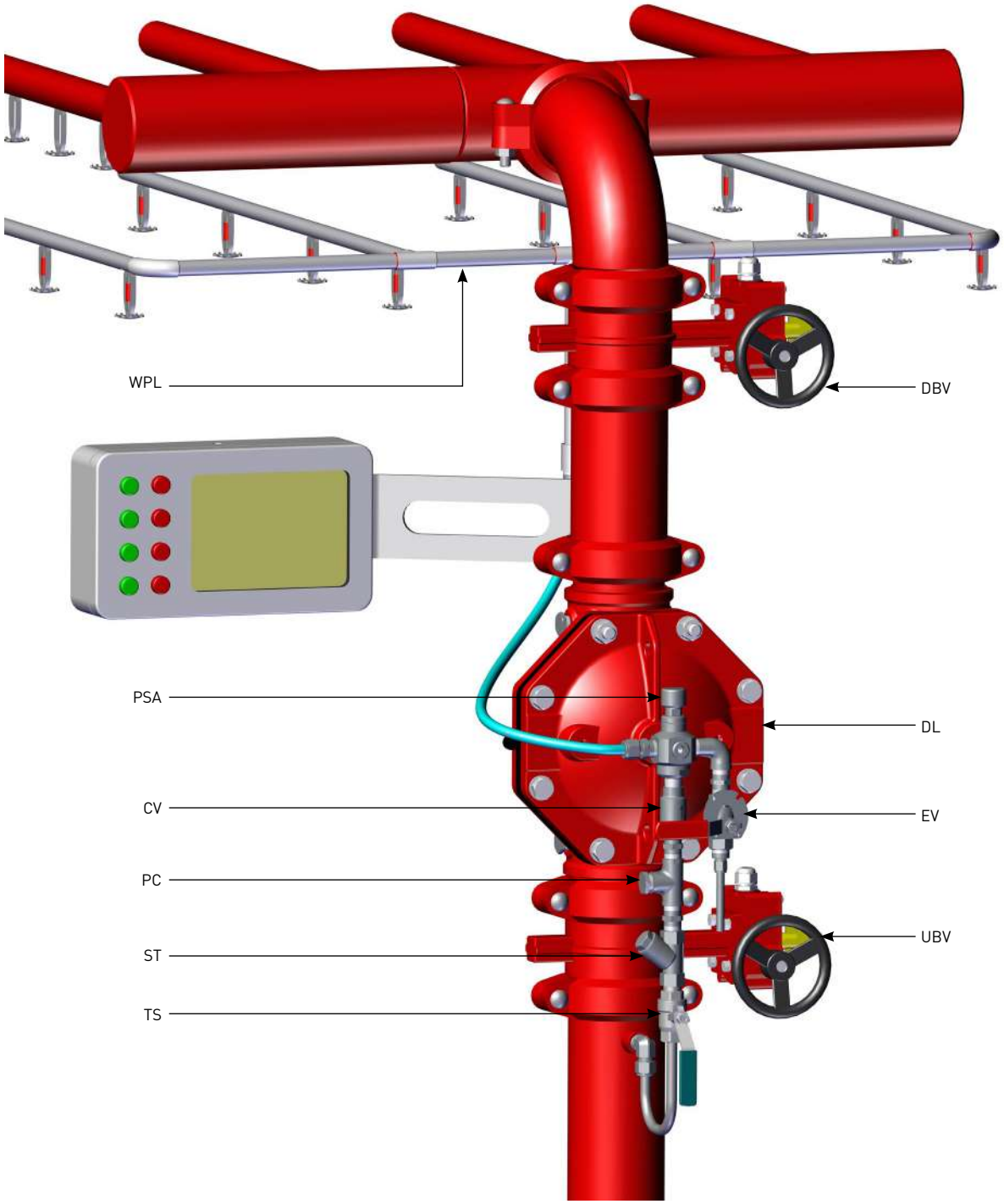
Pressurized water in the valve's control chamber is trapped by the closed PSA [PSA], the closed emergency valve [EV], and the closed automatic wet pilot detection line [WPL]. The hydraulic pressure accumulated in the wet pilot detection line keeps the FDV deluge valve [DL] closed.

RESET POSITION

System reset requires replacement of all shattered automatic fire sprinklers in the wet pilot detection line. The wet pilot line must then be re-pressurized by the upstream supply pressure. The PSA [PSA] push button must be pressed to allow upstream pressure to re-pressurize the pilot line and close the FDV main valve.

Typical installation

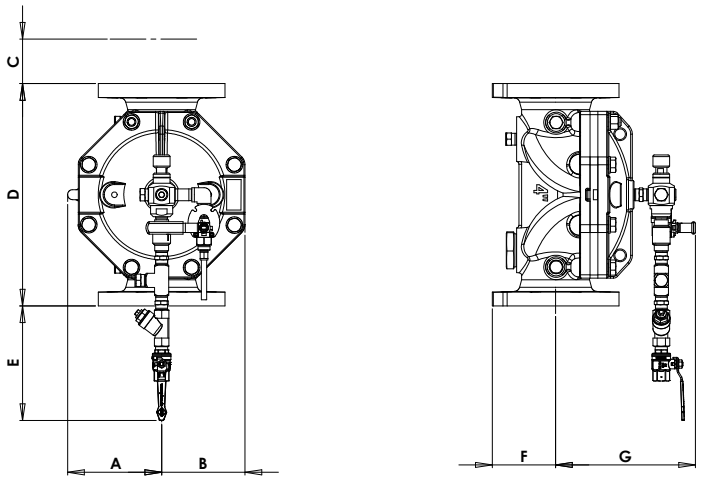
FDV - AH0



TS – Trim Supply
DL – Deluge valve
ST – Strainer
CV – Check Valve
EV – Emergency Valve
CP – Pressure gauge Connection
PSA – Pressure Supply Arrestor
WPL – Wet Pilot line
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve

Parametric drawing:

FDV-AH0



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	72	2.8	81	3.2	134	5.3	170	6.7	197	7.7	250	9.8	324	12.7
B	97	3.8	105	4.1	100	3.4	150	5.9	177	6.7	230	9	307	12
C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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	305	12	295	11.6	244	9.6	206	8.1	174	6.8	120	4.7	22	0.8
F	52	2	58	2.3	100	3.9	114	4.5	141	5.5	172	6.7	203	8
G	172	6.7	186	7.3	216	8.5	251	9.9	318	12.5	353	13.9	442	17.4
Kg/lb	6	13.2	7.7	16.9	25	55	40.7	89	51	112	96	152	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
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Wet pilot line Hight
- Additional accessories needed:
  - Pressure gauge
  - Pressure switch
  - Drain valve (manual or automatic)
  - Gong

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

Hydraulically Actuated, Remote Reset Deluge Valve

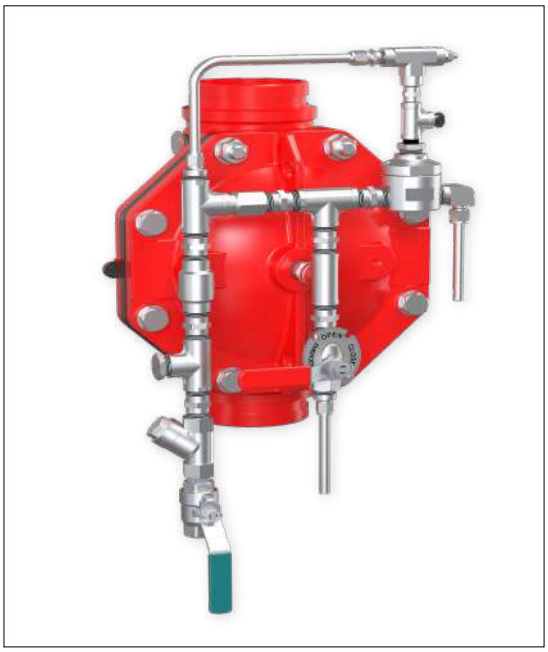
FDV - AH1

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:
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)

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.

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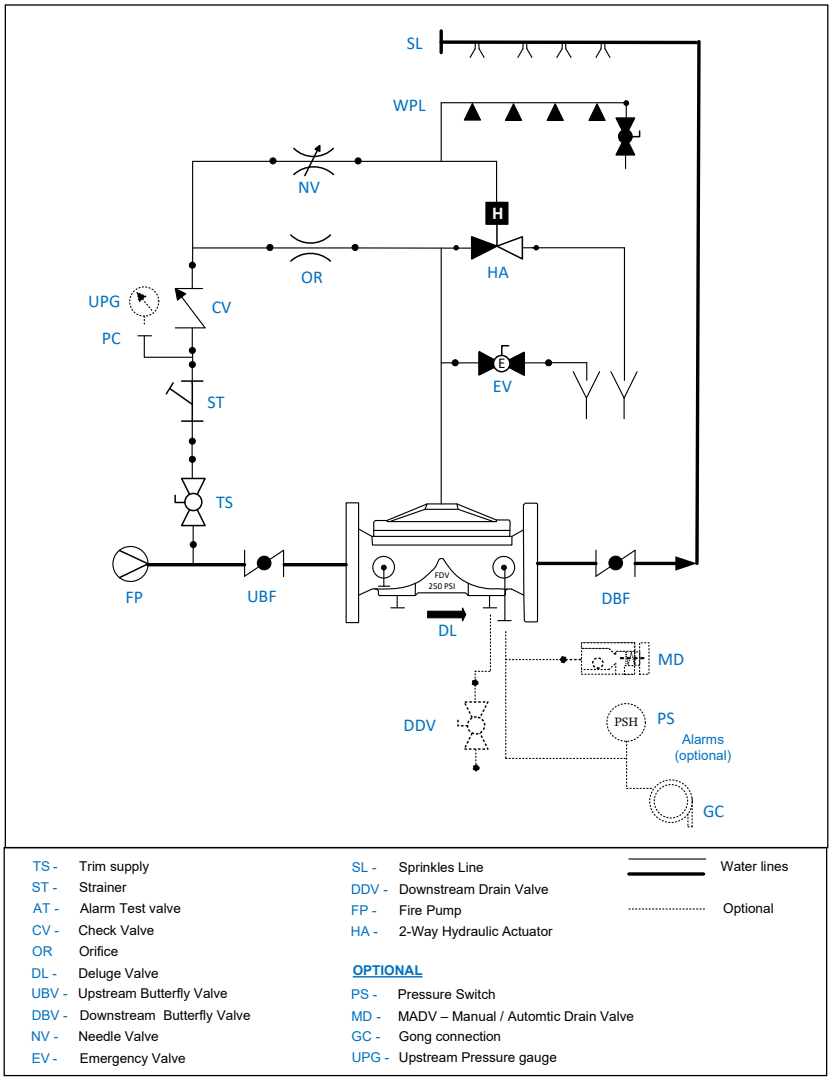
Schematic drawing:

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).

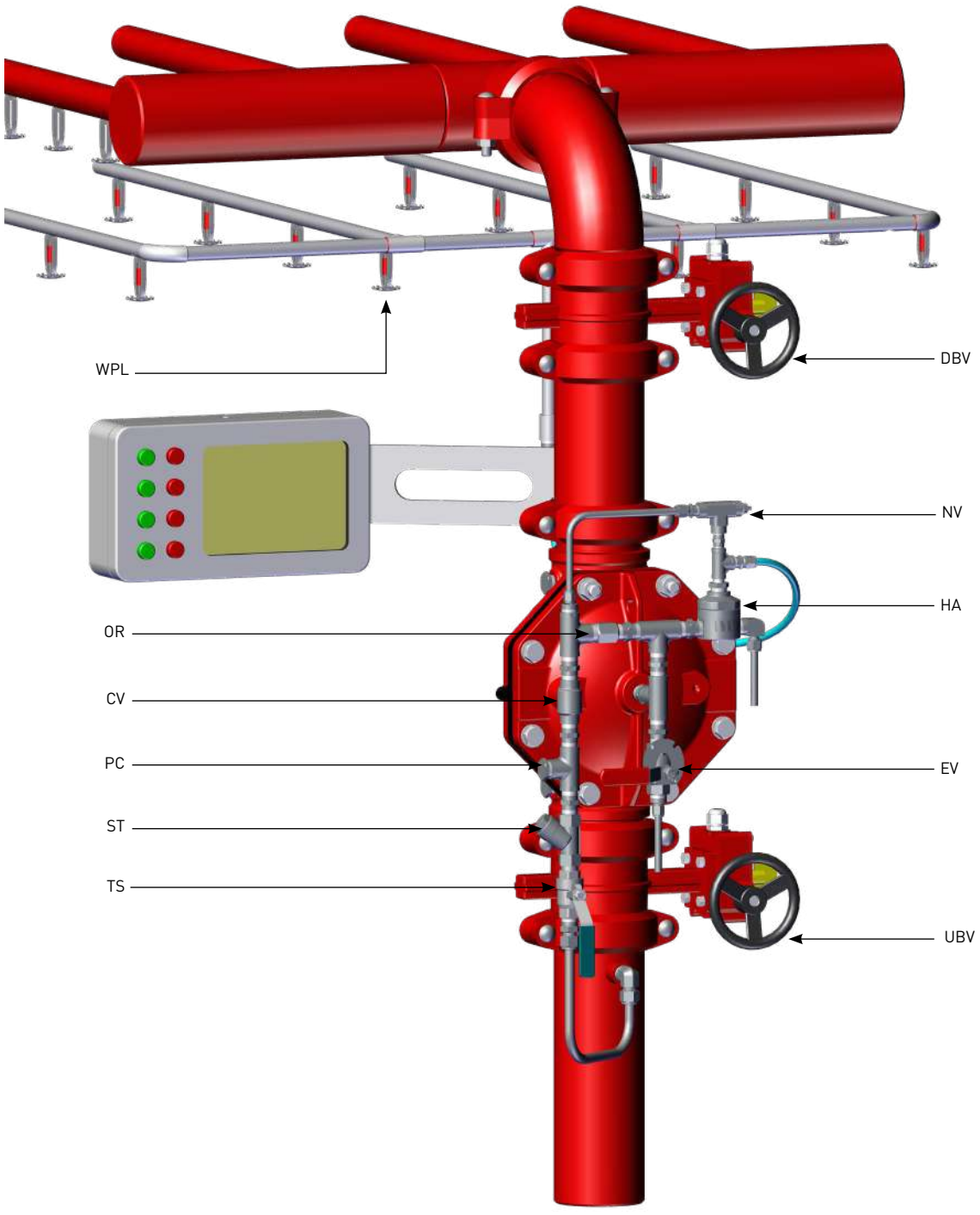
RESET POSITION

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.

Typical installation

FDV - AH1



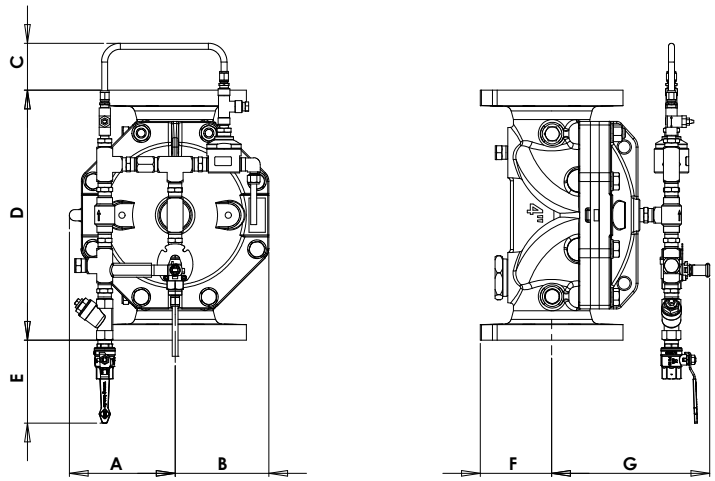
UBF - Upstream Butterfly valve
DBF - Downstream Butterfly valve
TS - Trim supply valve
SR - Y strainer

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

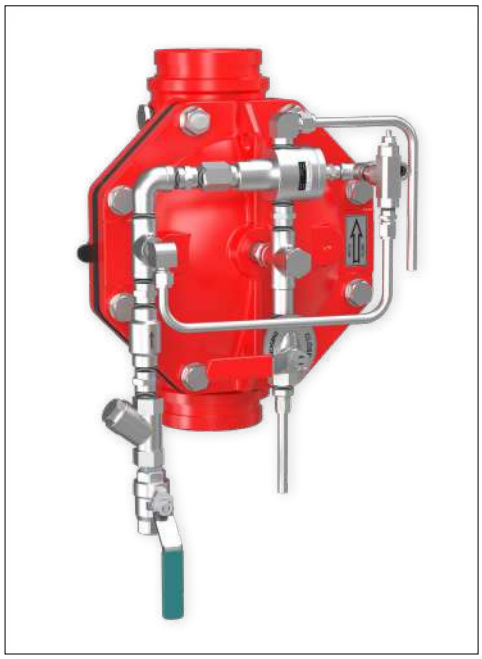
- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Working pressure
- System installation orientation
- Deluge valve ends and standard
- Deluge valve material and coating
- Trim materials
- Additional accessories needed:
  Pressure gauge
  Pressure switch
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

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

Hydraulically Actuated, Remote Reset Deluge Valve

FDV-3W- AH1

The FDV-3W-AH1 fire protection system is based on Raphael's FDV deluge valve and is equipped with a hydraulically actuated control trim. 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 valve contains no balancing spring and no metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-3W-AH1 deluge system is hydraulically actuated and can be reset remotely. When one or more automatic sprinklers in the wet pilot detection line are exposed to flame heat and shatter open, the pressure in the detection line decreases. This pressure drop also reduces the pressure in the three-way actuator's control chamber, causing the actuator to change its state. In this state, the actuator drains the deluge valve's control chamber, allowing the valve to open fully and admit water into the spray sprinkler system.

When the detection line is re-pressurized, the actuator returns to its initial state. This allows upstream pressure to flow into the deluge valve's control chamber, re-pressurizing it and closing the valve. Consequently, water flow to the spray sprinkler system stops.

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

MARKETS

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

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)

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 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

- Hydrodynamic pattern design ensures high flow rates with minimal head loss.
- The valve automatically trips open when water pressure in its control chamber is gradually released. The trip is actuated by a pressure drop in the pilot line caused by flame heat that triggers one or more automatic sprinklers to open.
- Soft closing upon re-pressurization of the valve's control chamber—by line pressure or another independent water source—prevents surges.

The FDV-3W-AH1 three-way control principle ensures full valve opening with maximum flow rate and minimal head loss.

The system resets to the standby closed position by replacing the opened sprinkler(s) and re-pressurizing the pilot line.

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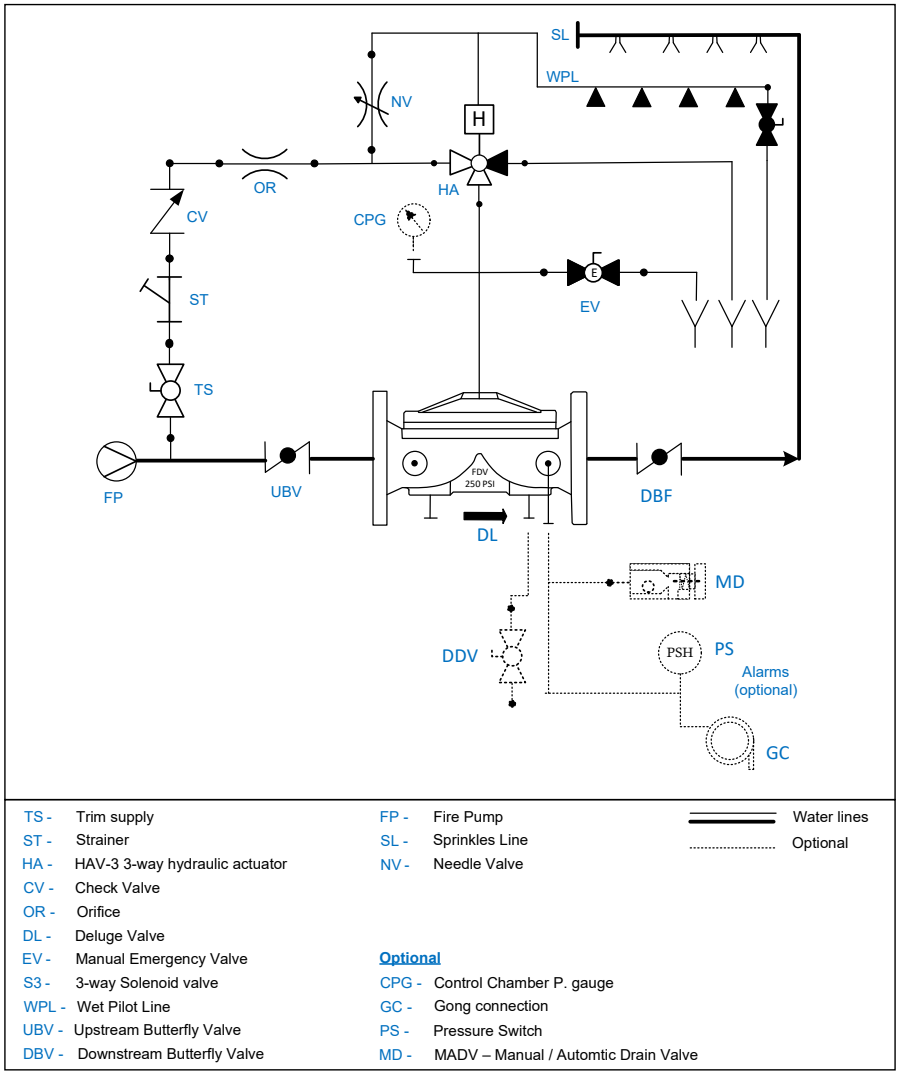
Schematic drawing:

FDV-3W-AH1

Set position



TS -	Trim supply	FP -	Fire Pump		Water lines
ST -	Strainer	SL -	Sprinkles Line		Optional
HA -	HAV-3 3-way hydraulic actuator	NV -	Needle Valve		
CV -	Check Valve				
OR -	Orifice				
DL -	Deluge Valve				
EV -	Manual Emergency Valve	**Optional**			
S3 -	3-way Solenoid valve	CPG -	Control Chamber P. gauge		
WPL -	Wet Pilot Line	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 retained by the check valve (CV) and the closed emergency valve (EV), keeping the FDV deluge valve in a closed position.

The control chamber of the hydraulic actuator HAV-3 (HA) is pressurized by the Wet Pilot Line (WPL). This pressure holds the actuator open, allowing upstream water to flow into the deluge valve's control chamber and thereby maintaining the valve in its closed condition.

FIRE SITUATION

When one or more automatic sprinklers in the Wet Pilot detection Line (WPL) are exposed to fire heat and operate, the line pressure drops. As a result, the pressure in the control chamber of the 3-way hydraulic actuator (HA) also decreases, causing it to change state.

In this new position, the actuator vents the deluge valve's control chamber to drain, opening the deluge valve and allowing water to flow into the sprinkler system (SL).

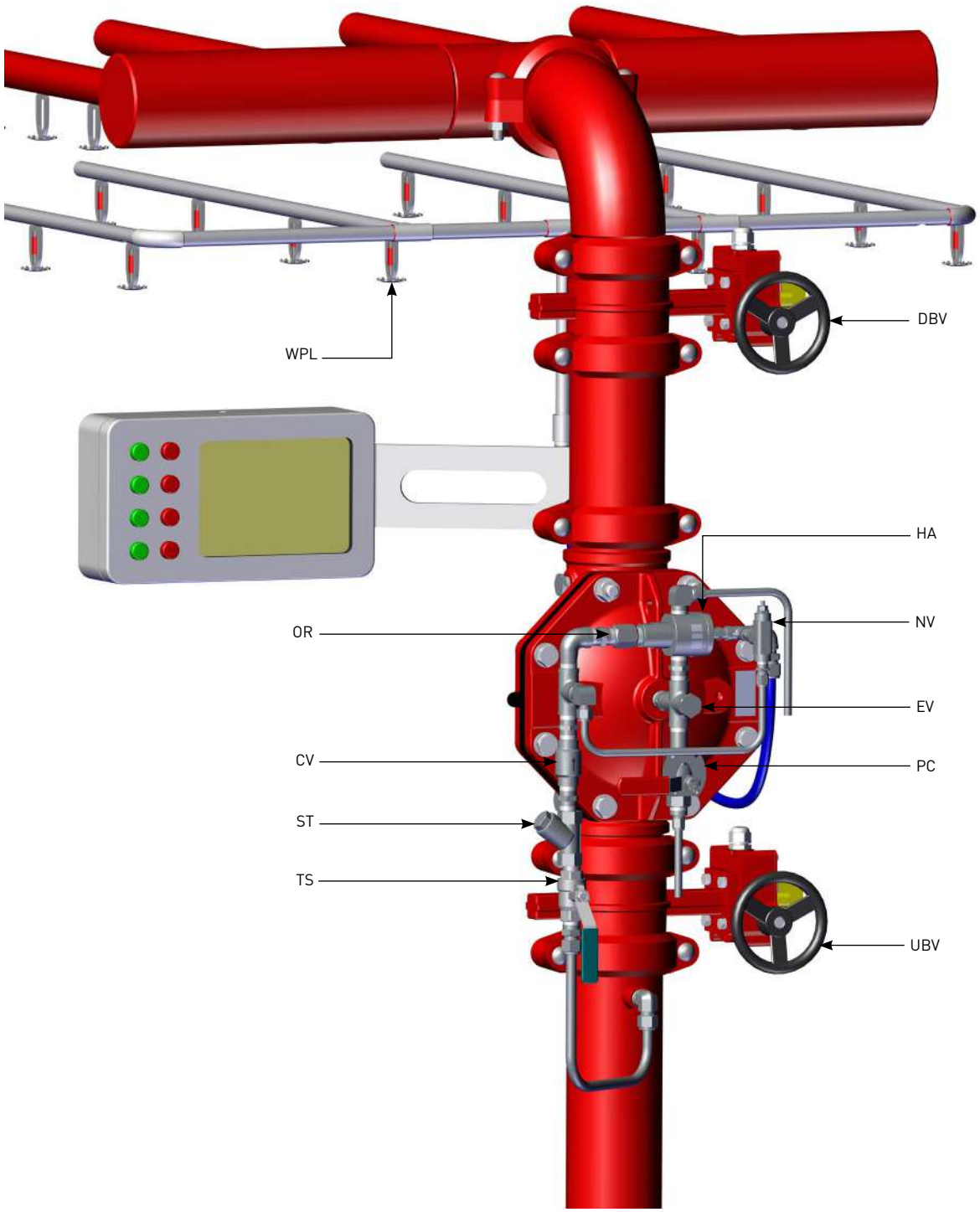
RESET POSITION

To reset the system, all operated automatic sprinklers in the Wet Pilot Detection Line (WPL) must be replaced. The Wet Pilot Line and the actuator's (HA) control chamber are then re-pressurized, returning the actuator to its normal position.

In this state, the actuator permits flow from the Trim Supply valve (TS), through the orifice (OR), into the deluge valve control chamber. This re-pressurization closes the deluge valve and stops water discharge from the sprinkler system.

Typical installation

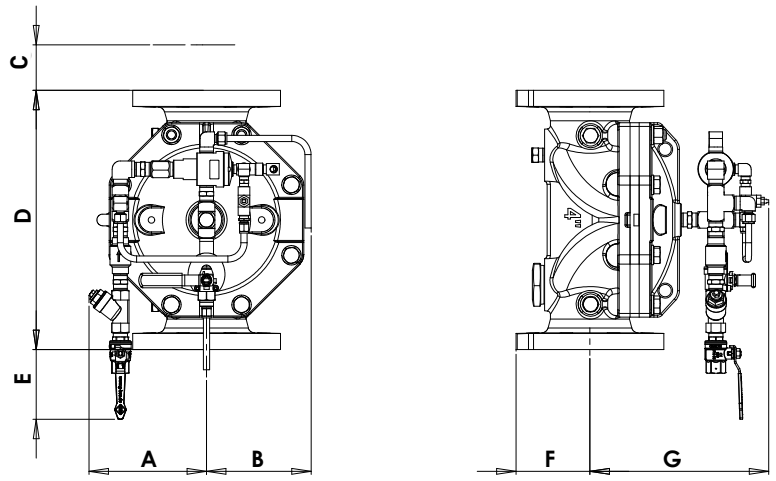
FDV-3W-AH1



HA - Hydraulic actuator 3 way
EV - Emergency Unit
NV - Needle Valve
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve
PC - Pressure gauge connection
WPL - Wet Pilot Line
CV - Check Valve
OR - Orifice
SR - "Y" Strainer
TS - Trim Supply

Parametric drawing:

FDV-3W-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	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	7.3	16.2	9.2	20.3	26.3	58	42	92.6	52.7	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:

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

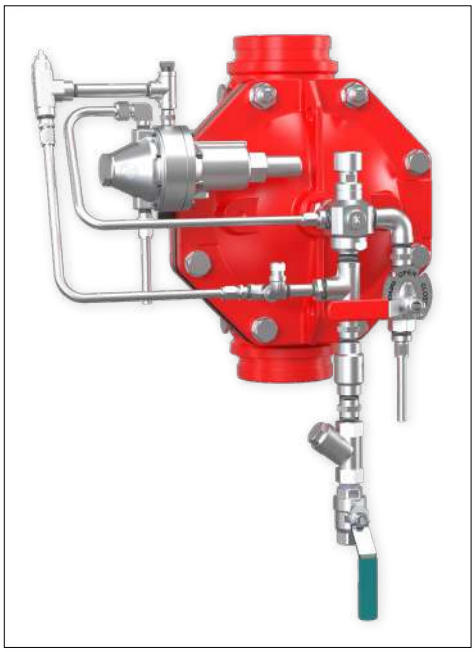
PLEASE SPECIFY

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

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

Hydraulically & Anti-Columning Actuated, Remote Reset Deluge Valve

FDV-AA0



The FDV is a fire protection control valve for deluge fire sprinkler systems, 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 or internal metallic components in the wetted area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-AA0 deluge system is actuated hydraulically and reset locally.

When a hydraulic detection system - a Wet Pilot Detection Line - is exposed to a predetermined temperature, the automatic fire sprinklers shatter open, causing a pressure drop that activates a pilot valve, which in turn commands the FDV-AA0 deluge valve to open. The Anti-Columning feature ensures reliable system operation regardless of the detection line's height or its distance from the control valve. The deluge system also incorporates an emergency valve that bypasses the fire detection system for manual operation.

In addition, the FDV-AA0 system is equipped with a PSA device that manually and locally pressurizes the deluge control chamber and the wet pilot line. This keeps the valve closed, prevents re-pressurization during actuation (when the control chamber must be drained), and compensates for minor leakage-related pressure losses.

This configuration is suitable for open-nozzle water spray pipelines.

MARKETS

Commercial · Industry · Marine · Storage · Residential · Airport

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)

APPROVALS

ADVANTAGES

- Only 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 draining or opening the valve itself, neither closing OS&Y or other valves in the system
- Full Anti Columning property enables a nearly unlimited pilot line height.
- Open fail safe valve, maintained in stand-by closed position by the PSA.
- Low maintenance cost: the valve is serviced in-line and only one replaceable part - the long-life elastomeric diaphragm.
- Conforms with inspection, Testing and Maintenance Standard of 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.
- The anti-columning properties guarantee an immediate system trip, regardless of the Wet Pilot height.
- Soft closing, upon pressurization of the valve's control chamber- by line pressure or another independent water source—prevents surges

The FDV-AA0 resets to the stand-by closed position by pressurizing the Dry Pilot Line and manually operating the PSA device.

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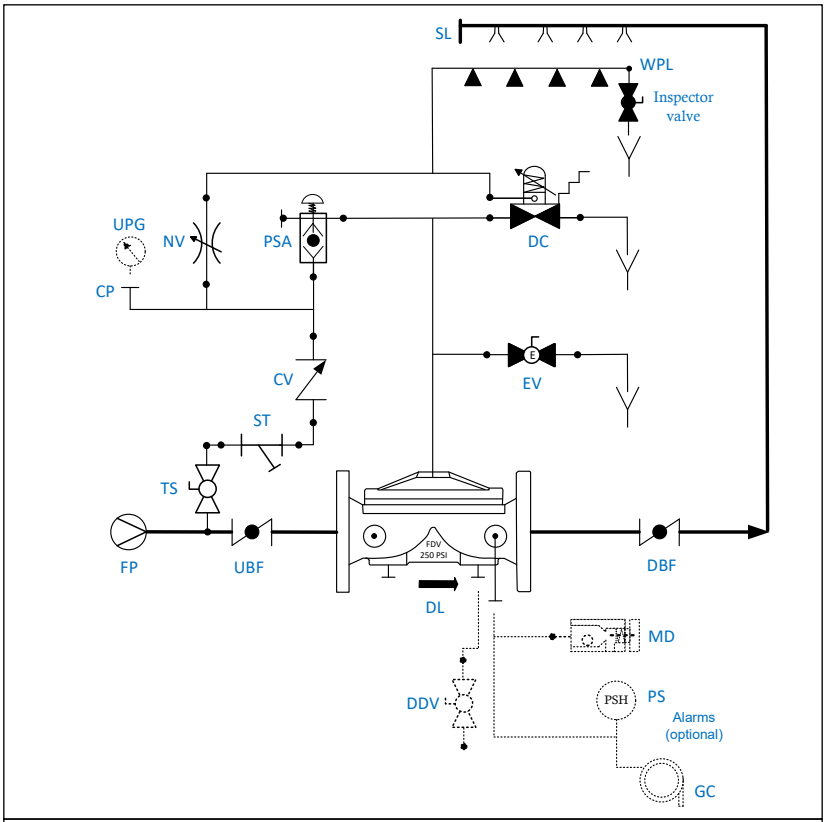
Schematic drawing:

FDV-AA0

Set position



TS -	Trim supply	DL -	Deluge Valve		Water lines
ST -	Strainer	SL -	Sprinkles Line		Optional
AT -	Alarm Test valve	PC -	Pressure Gauge Connection		
DC	DCPV – Drain Control Pilot Valve	NV -	Needle valve		
CV -	Check Valve				
UBF -	Upstream Butterfly Valve	Optional			
DBV -	Downstream Butterfly Valve	DDV -	Downstream Drain Valve		
PSA -	Pressure Supply Arrestor	PS -	Pressure Switch		
EU -	Manual Emergency Valve	MD -	MADV – Man. / Auto. Drain Valve		
WPL	Wet Pilot Line	UPG -	Upstream pressure gauge		
FP -	Fire Pump	GC -	Gong connection		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber (DL) is trapped by the closed PSA (PSA), the closed emergency valve (EM) and by the closed DCPV drain pilot valve (DC). The hydraulic pressure accumulated in the Wet pilot line keeps this device in its close position, maintaining the FDV deluge valve closed.

FIRE SITUATION

When some of the Wet pilot detection line's automatic fire sprinklers are subjected to the predetermined temperature levels and shutter-open, the pilot line pressure drops and the DCPV (DC) opens its drain port regardless of the residual column pressure.

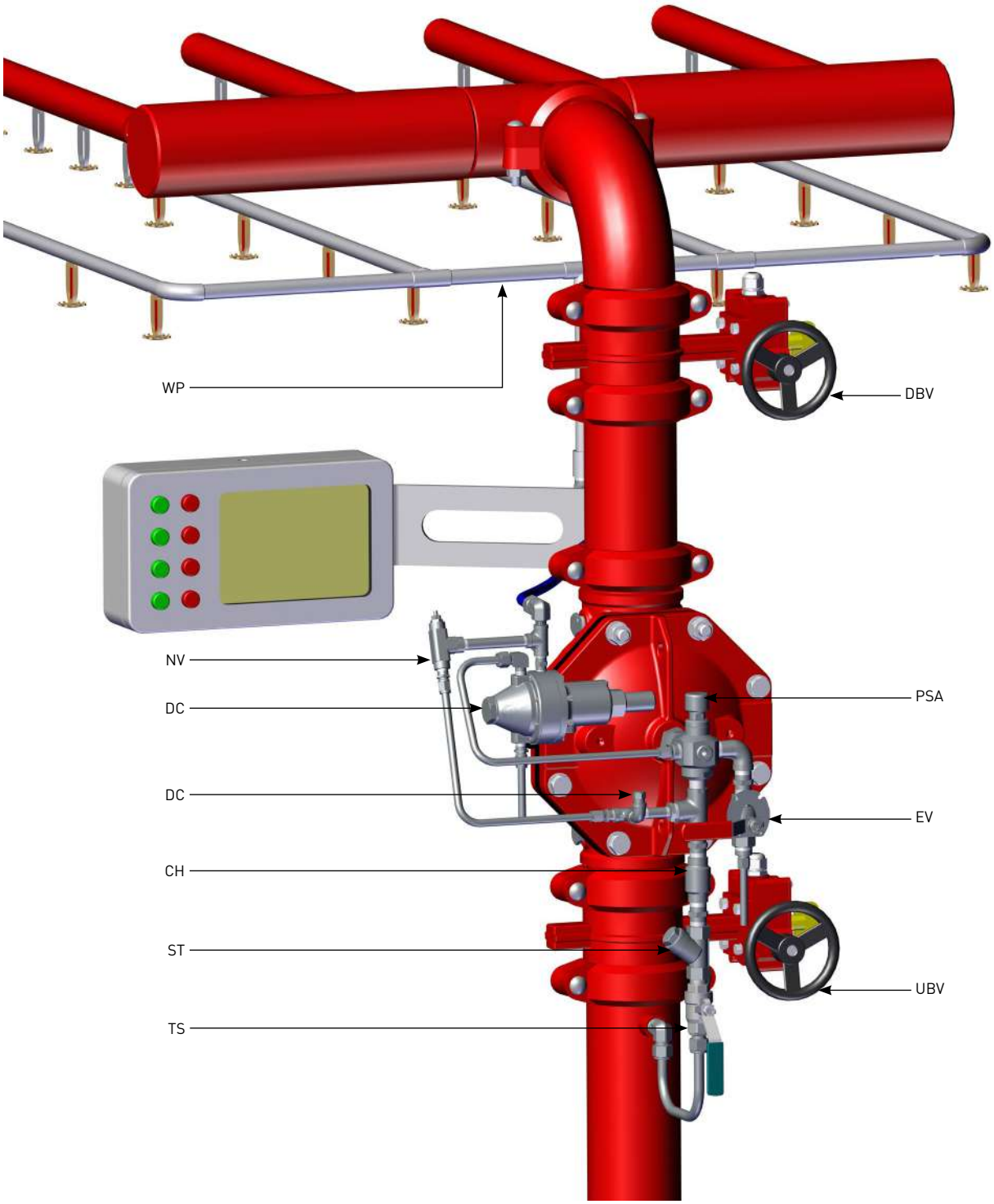
Opening its drain port, the DCPV releases the FDV control chamber pressure causing it to open and admit water into the spray sprinklers pipeline.

RESET POSITION

System reset requires the replacement of all Shattered-open Fire sprinklers in the Detection pilot line (WP). The wet pilot line is then pressurized to reset the DCPV to closed position. The PSA (PSA) push button should be pressed to enable upstream pressure passage to close the FDV's main valve.

Typical installation

FDV-AA0



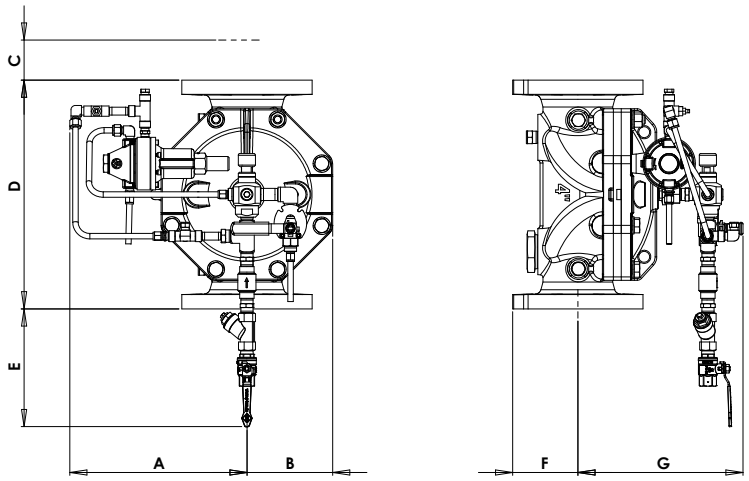
UBF - Upstream Butterfly valve
DBF - Downstream Butterfly valve
PC - Pressure Gauge Connection
WP - Wet Pilot line

TS - Trim supply valve
ST - "Y" strainer
CV - Check valve
NV - Needle Valve

PSA - Pressure Surge Arrestor
EV - Emergency Valve
DC - DCPV - Drain Control Pilot Valve

Parametric drawing:

FDV-AA0



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	225	8.8	231	9	263	10.3	310	12.2	330	13	382	15	410	16.1
B	105	4.1	105	4.1	116	4.6	150	5.9	177	6.7	231	9	308	12.1
C	66	2.6	62	2.4	42	1.6	N/A	N/A	N/A	N/A	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	305	12	295	10.1	243	9.6	206	81	174	6.8	120	4.7	22	0.8
F	52	2	50	2	100	3.9	114	4.5	143	5.6	172	6.7	203	8
G	187	7.36	200	7.9	232	9	269	10.6	336	13.3	370	14.5	458	18
Kg/lb	10	22	12	26.4	29.5	65	45	99	55.6	122	101	222	230	507

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
- 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.

Electrically Actuated, Local Reset, Pressure Reducing Deluge Valve

FDV - PE0

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-PE0 is a pressure control Deluge system, actuated electrically and resets locally. However, the system's functional principle remains unchanged:

In fire situation, an electric detection system activates a solenoid valve through a control panel, to open the FDV deluge valve. Once open, the valve reduces the high inlet pressure to a predetermined fixed outlet pressure. 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 maintaining it at a steady level. It responds to downstream pressure fluctuations caused by changes in flow demand, ensuring stable output pressure.

The system is equipped with a PSA - a device that manually and locally pressurizes the wet pilot pipeline, automatically stops pressurization in a fire scenario, and compensates for minor leakage-related pressure losses. This system is suitable for open-nozzle water spray 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)

REGULATION RATIO: 5:1

SENSITIVITY:
1.45 psi (0.1 Bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the valve's standby position without draining or opening the valve itself, and without closing the OS &Y or other system valves.
- Maintained in a 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

- The hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The valve trips open automatically upon gradual release of water pressure from its control chamber. The trip is actuated by an electric signal transmitted to the valve's solenoid from the main control panel, triggered by flame heat exposure detected by the sensor system.
- Soft closing, achieved by pressurizing the valve's control chamber using line pressure or an independent water source, prevents pressure surges.
- A pressure-reducing pilot allows full control over the downstream pressure.

The FDV-PE0 resets to its standby closed position by de-energizing the alarm system solenoid coil via the main control panel and manually operating the local reset device (PSA).

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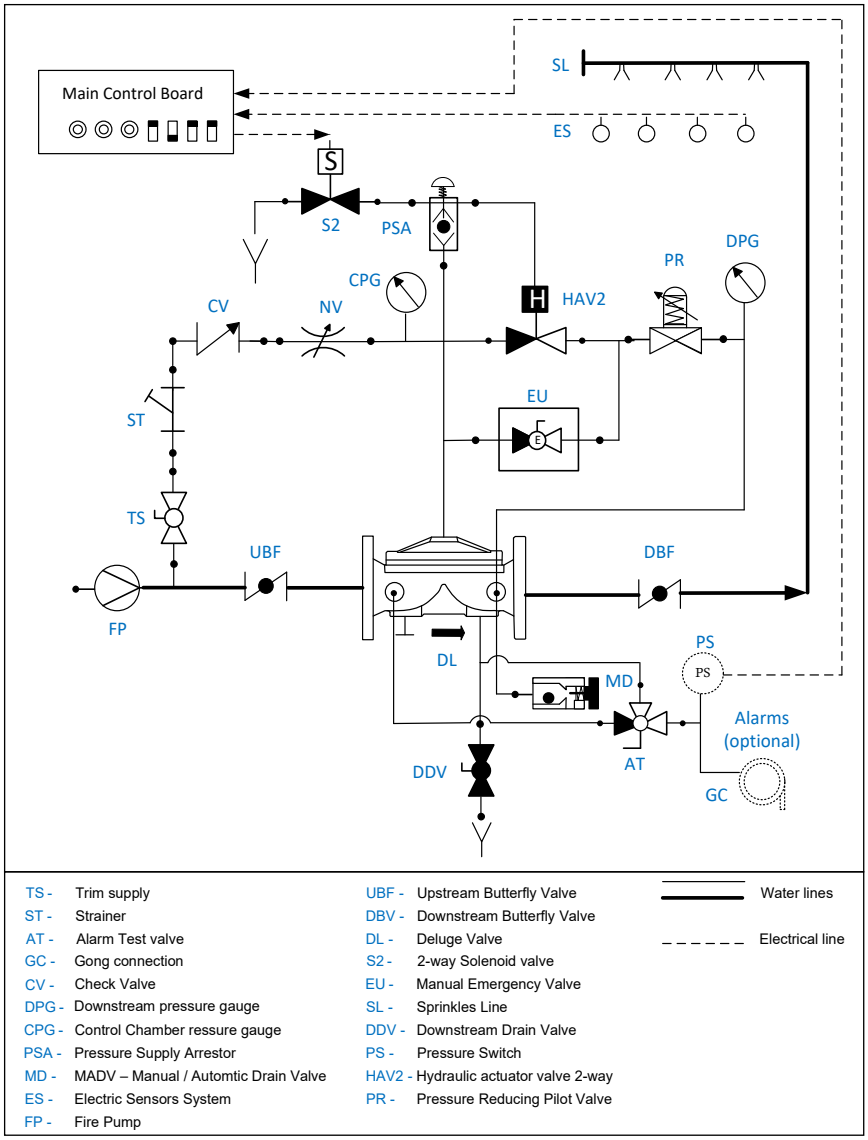
Schematic drawing:

FDV-PEO

Set position



TS -	Trim supply	UBF -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	DL -	Deluge Valve		Electrical line
GC -	Gong connection	S2 -	2-way Solenoid valve		
CV -	Check Valve	EU -	Manual Emergency Valve		
DPG -	Downstream pressure gauge	SL -	Sprinkles Line		
CPG -	Control Chamber ressure gauge	DDV -	Downstream Drain Valve		
PSA -	Pressure Supply Arrestor	PS -	Pressure Switch		
MD -	MADV – Manual / Automtic Drain Valve	HAV2 -	Hydraulic actuator valve 2-way		
ES -	Electric Sensors System	PR -	Pressure Reducing Pilot Valve		
FP -	Fire Pump				

OPERATION

SET POSITION

Pressurized water in the actuator's (HAV2) control chamber is trapped by the close solenoid and by the closed PSA (PSA).

Pressurized water in the valve's control chamber (DL) is trapped by the closed actuator, the closed PSA (PSA), the check valve (CV) and by the closed emergency valve (EU), maintaining the FDV deluge valve (DL) closed.

FIRE SITUATION

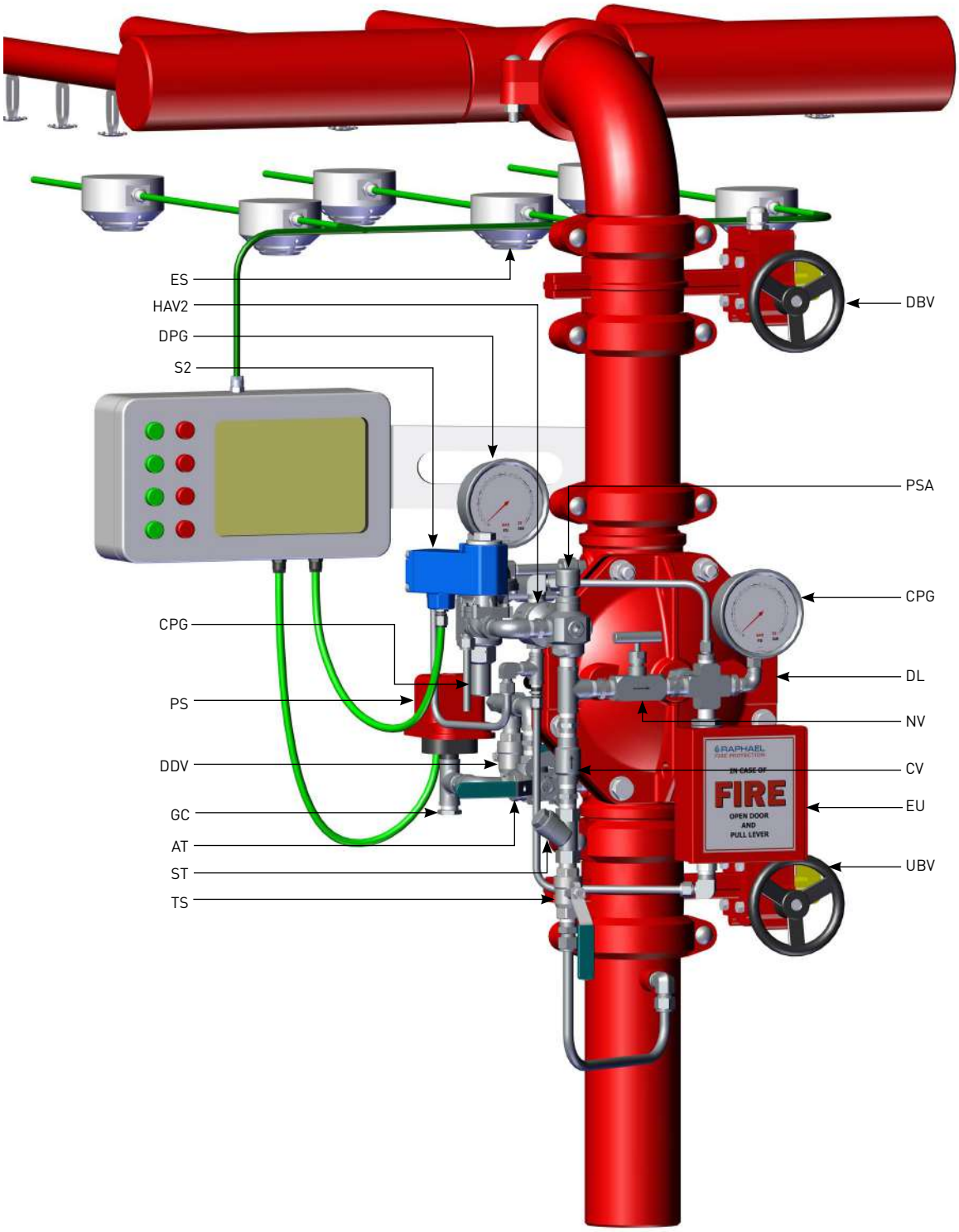
When the electric detection system (ES) senses flame heat, it activates the main control panel, which transmits an electric signal commanding the 2-way solenoid valve (S2) to open and drain the actua-tor's control chamber. Consequently, the actuator (HAV2) opens and drains the Deluge valve through the pressure-reducing pilot (PR). The pilot regulates the downstream pressure and maintains it at a steady set pressure.

RESET POSITION

To reset the system, the electrical alarm system must be reset to de-energize and close the solenoid valve. This action stops the drainage of the actuator's control chamber. The PSA (PSA) push button should then be pressed to allow the upstream pressure to flow through, thereby pressurizing the actuator's control chamber and closing the FDV deluge valve.

Typical installation

FDV - PE0



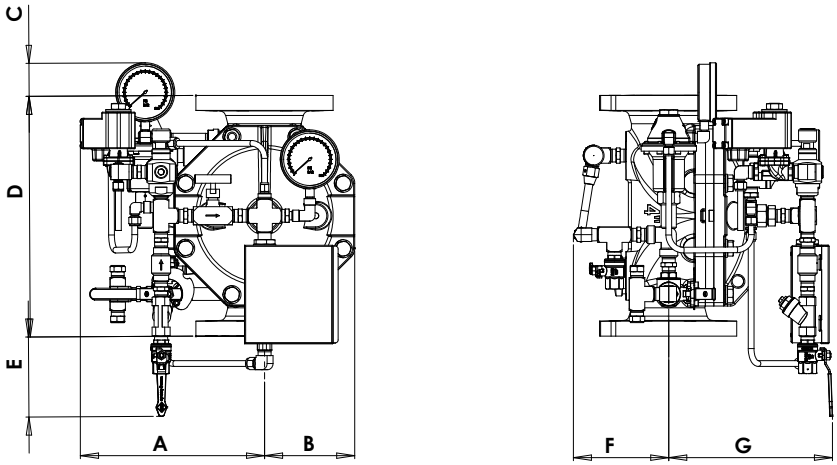
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
GC – Gong Connection
DDV – Downstream Drain Valve
HAV2 – Hydraulic actuator 2 way
PS – Pressure Switch

OR – Orifice
S2 – 2-way Solenoid
PSA – Pressure Supply Arrestor
MD – Manual Automatic Drain Valve
PR – Pressure Reducing Pilot Valve
ASK – Air Supply Kit
ES – Electric Sensors

DPG – Downstream Pressure Gauge
CPG – Control chamber Pressure Gauge
UBV – Upstream Butterfly Valve
DBV – Downstream Butterfly Valve
DL – Deluge valve

Parametric drawing:

FDV-PEO



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	267	10.5	297	11.7	290	11.4	315	12.4	340	13.4	395	15.5
B	122	4.8	121	4.7	135	5.3	150	5.9	178	7	232	9.1	305	12
C	103	4	103	4	93	3.6	54	2.1	45	1.77	47	1.8	44	1.7
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	222	8.7	170	6.7	133	5.3	100	3.9	47	1.8	N/A	N/A
F	151	5.9	151	5.9	137	5.4	158	6.2	167	6.6	191	7.5	221	8.7
G	260	10.2	208	8.1	230	9	272	10.7	340	13.3	374	14.7	490	19.3
Kg/lb	14.5	32	15.2	33.5	32.2	70.5	48	106	59	130	104	230	235	518

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
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed
  Alarm pressure switch
  Gong

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

Electrically Actuated, Remote Reset, Pressure Reducing Deluge Valve — FDV - PE1

This deluge system is based on Raphael's FDV valve, equipped with an electrically actuated control trim. The installed FDV valve is available in a range of optional materials and coatings to meet various operational conditions. However, the system's functional principle remains unchanged: in the event of a fire, an electrical detection system activates the valve's control trim by energizing its solenoid coil. As a result, pressurized water trapped in the FDV control chamber is released, the valve opens, and the spray nozzle pipeline becomes pressurized.

This system is capable of reducing upstream pressure to a pre-set downstream pressure and maintaining it at a steady level. It responds to any downstream pressure fluctuations caused by changes in flow demand, ensuring a stable set pressure.

MARKETS

Marine · P.O.G. · Airports

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 & cover plate. No wet metal spring inside the control chamber
- Unobstructed full-bore valve
- Simple manual reset of the valve to standby
- Open fail-safe valve, maintained in stand-by 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 flowrates with minimum head loss
- The valve trips open automatically upon a gradual release of water pres-sure from its control chamber.
- The valve is actuated by an electric signal transmitted to the valve's solenoid from the main control valve panel, due to a flame heat exposure of electrical detection sensors system
- A pressure reducing pilot valve enables a full control over the downstream pressure and ensures a steady set in a wide pressure range.

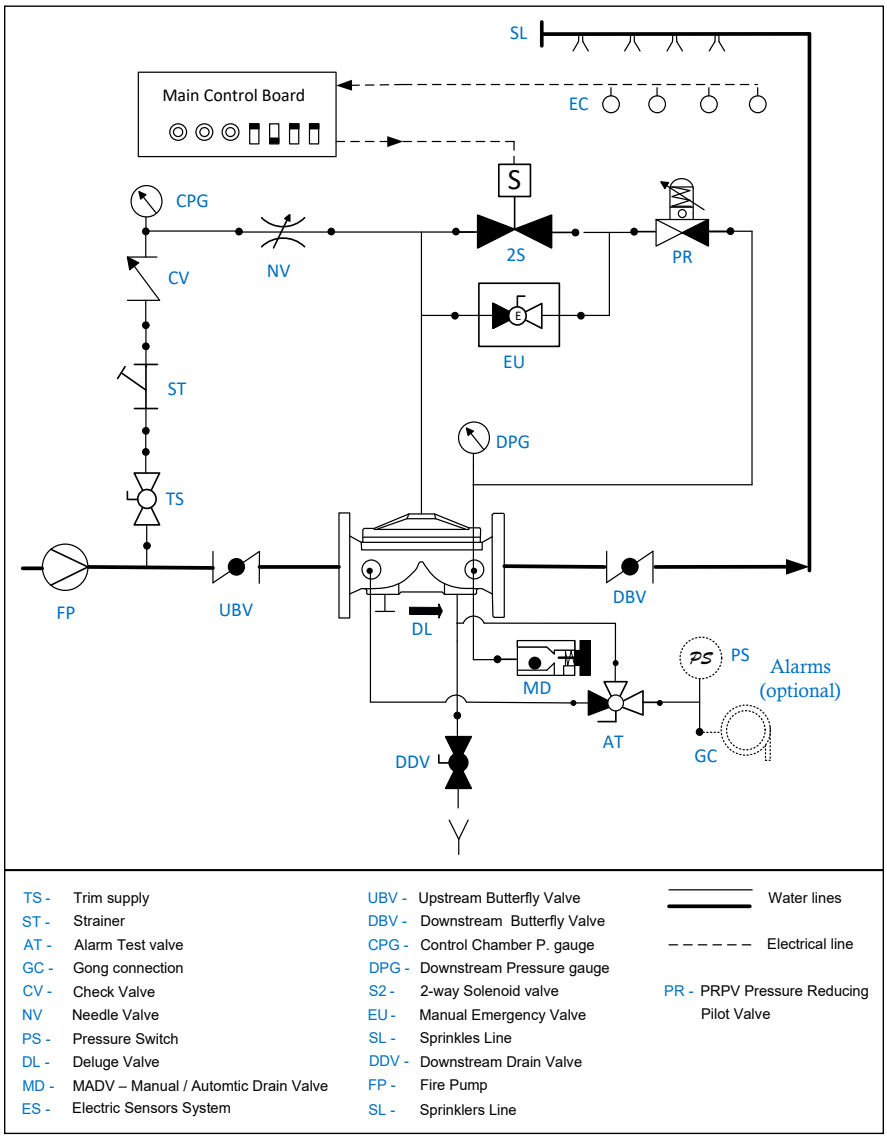
The FDV-PE1 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-PE1

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	CPG -	Control Chamber P. gauge		Electrical line
GC -	Gong connection	DPG -	Downstream Pressure gauge		
CV -	Check Valve	S2 -	2-way Solenoid valve	PR -	PRPV Pressure Reducing Pilot Valve
NV	Needle Valve	EU -	Manual Emergency Valve		
PS -	Pressure Switch	SL -	Sprinkles Line		
DL -	Deluge Valve	DDV -	Downstream Drain Valve		
MD -	MADV – Manual / Automtic Drain Valve	FP -	Fire Pump		
ES -	Electric Sensors System	SL -	Sprinklers Line		

OPERATION

SET POSITION

Pressurized water in the valve's control chamber [DL] is trapped by the check valve [CV], by the closed 2-way solenoid [S2] and by the closed emergency valve [EU], maintaining the FDV deluge valve [DL] closed.

FIRE SITUATION

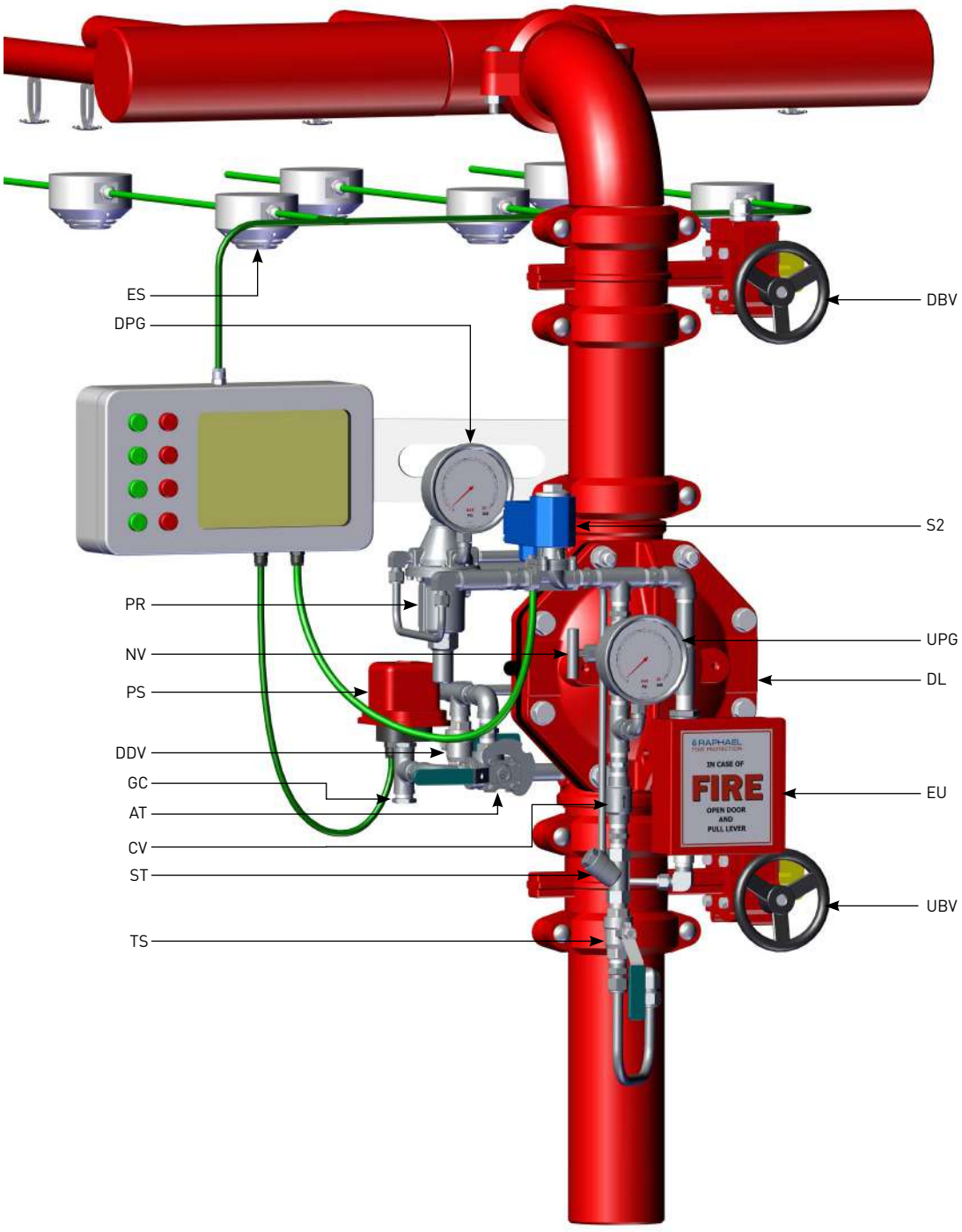
When an electric detection system [ES] senses flames heat, it triggers the main control panel that in turn, transmits an electric signal, commanding the 2-way solenoid valve [S2] to open. The deluge valve's control chamber drains through the pressure reducing pilot [PR]. The FDV Deluge valve opens, admitting water to the spray sprinklers line [SL] at a steady, preset pressure.

RESET POSITION

System reset requires the reset of the electric alarm system to de-energize and close the 2-way solenoid valve. The FDV deluge control chamber pressurizes and the valve closes. In addition, the downstream pipe line need to be drained by operating the Drain valve [MD] manually

Typical installation

FDV - PE1



TS - Trim supply valve
ST - "Y" Strainer
CV - Check valve
AT - Alarms Test valve
GC - Gong Connection
DDV - Downstream Drain Valve

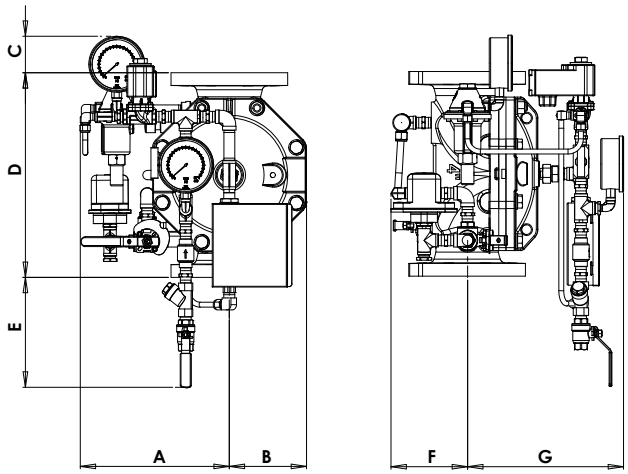
PS - Pressure Switch
NV - Needle Valve
PR - PRPV Pressure Reducing pilot
DPG - Downstream Pressure Gauge
ES - Electric Sensors
DBV - Downstream Butterfly Valve

S2 - 2-way Solenoid valve
UPG - Upstream Pressure Gauge
DL - Deluge valve
EU - MEU manual Emergency Unit
UBV - Upstream Butterfly valve

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Parametric drawing:

FDV-PE1



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	284	11.2	285	11.2	303	11.9	289	11.3	315	12.4	340	13.4	395	15.5
B	122	4.8	122	4.8	141	5.5	150	5.9	177	6.9	231	9	306	12
C	107	4.2	108	4.2	65	2.5	55	2.1	75	3	79	3.1	46	1.8
D	204	8.0	220	8.6	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	288	11.3	280	11	298	11.7	190	7.4	158	6.2	103	4	N/A	N/A
F	141	5.5	141	5.5	120	4.7	150	5.9	168	6.6	191	7.5	234	9.2
G	275	10.8	288	11.3	254	10	310	12.2	350	13.7	383	15	503	19.8
Kg/lb	13.7	30.2	15.6	34.4	32.4	71.4	47.5	104	59	130	104	230	235	518

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
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed

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

Pneumatically Actuated, Local Reset, Pressure Reducing Deluge Valve **FDV - PP0**

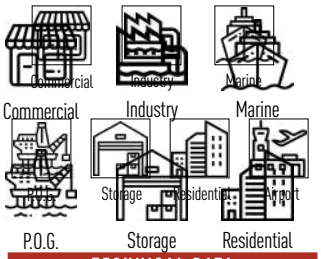
The FDV-PP0 fire protection system is based on Raphael's FDV deluge valve and features a control trim that can be actuated both, pneumatically and electrically. The FDV valve is available in a variety of materials and coatings, making it suitable for installation in hazardous environments.

The FDV-PP0 deluge system is pneumatically actuated and can be reset locally. In the event of a fire, exposure of the pneumatic dry pilot detection line to heat causes one or more of its automatic sprinklers to shatter, venting air pressure from the actuator and triggering the deluge valve to open.

The system is capable of reducing upstream pressure to a preset downstream level and maintaining it steadily. It automatically compensates for downstream pressure fluctuations caused by changes in flow demand, ensuring consistent performance.

The deluge system includes an emergency valve that bypasses the fire detection systems for manual operation. Additionally, the trim includes a PSA device that enables local system to reset - i.e., closing the FDV valve by re-pressurizing its control chamber. This system is suitable for configurations with automatic sprinklers installed on the dry pilot line and open nozzles on the main spray lines.

MARKETS



TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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)

REGULATION RATIO: up to 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the valve's standby position without draining or opening the valve itself, and without closing the OS &Y or other system valves.
- Maintained in a 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

- The hydro-dynamic 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 either by an electric signal conveyed to the valve's solenoid or by a release of pneumatic pressure in the Dry Pilot Line due to exposure to flame heat.
- Soft closing occurs when the valve's control chamber is pressurized, either by line pressure or by an independent water source, thereby preventing pressure surges.
- A pressure-reducing pilot enables full control of the downstream pressure and ensures a stable setpoint across a wide pressure range.

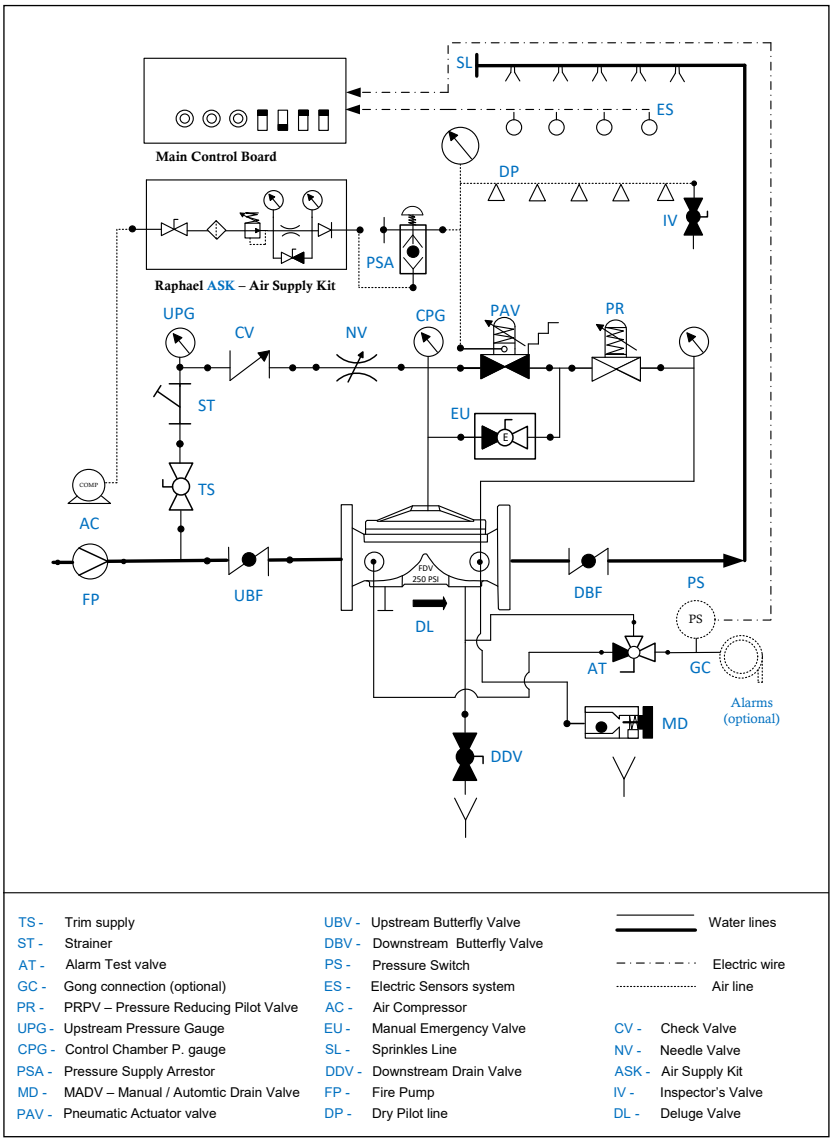
The FDV-PP0 resets to a stand-by closed position either by repressurizing the Dry Pilot Line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-PP0

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	PS -	Pressure Switch		Electric wire
GC -	Gong connection (optional)	ES -	Electric Sensors system		Air line
PR -	PRPV – Pressure Reducing Pilot Valve	AC -	Air Compressor		
UPG -	Upstream Pressure Gauge	EU -	Manual Emergency Valve	CV -	Check Valve
CPG -	Control Chamber P. gauge	SL -	Sprinkles Line	NV -	Needle Valve
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 (DL) is retained by the closed pneumatic actuator (PAV), the closed emergency valve (EU), and the check valve (CV), thereby keeping the deluge valve in its closed position.

FIRE SITUATION

When one or more automatic fire sprinklers in the Dry Pilot (DP) detection line are exposed to a predetermined temperature and open, the pilot line depressurizes, causing the pneumatic actuator to open. The FDV-PP0's control chamber is then drained through the pressure-reducing pilot valve (PR), resulting in the deluge valve opening and allowing water to flow into the spray sprinkler line at a steady, preset pressure.

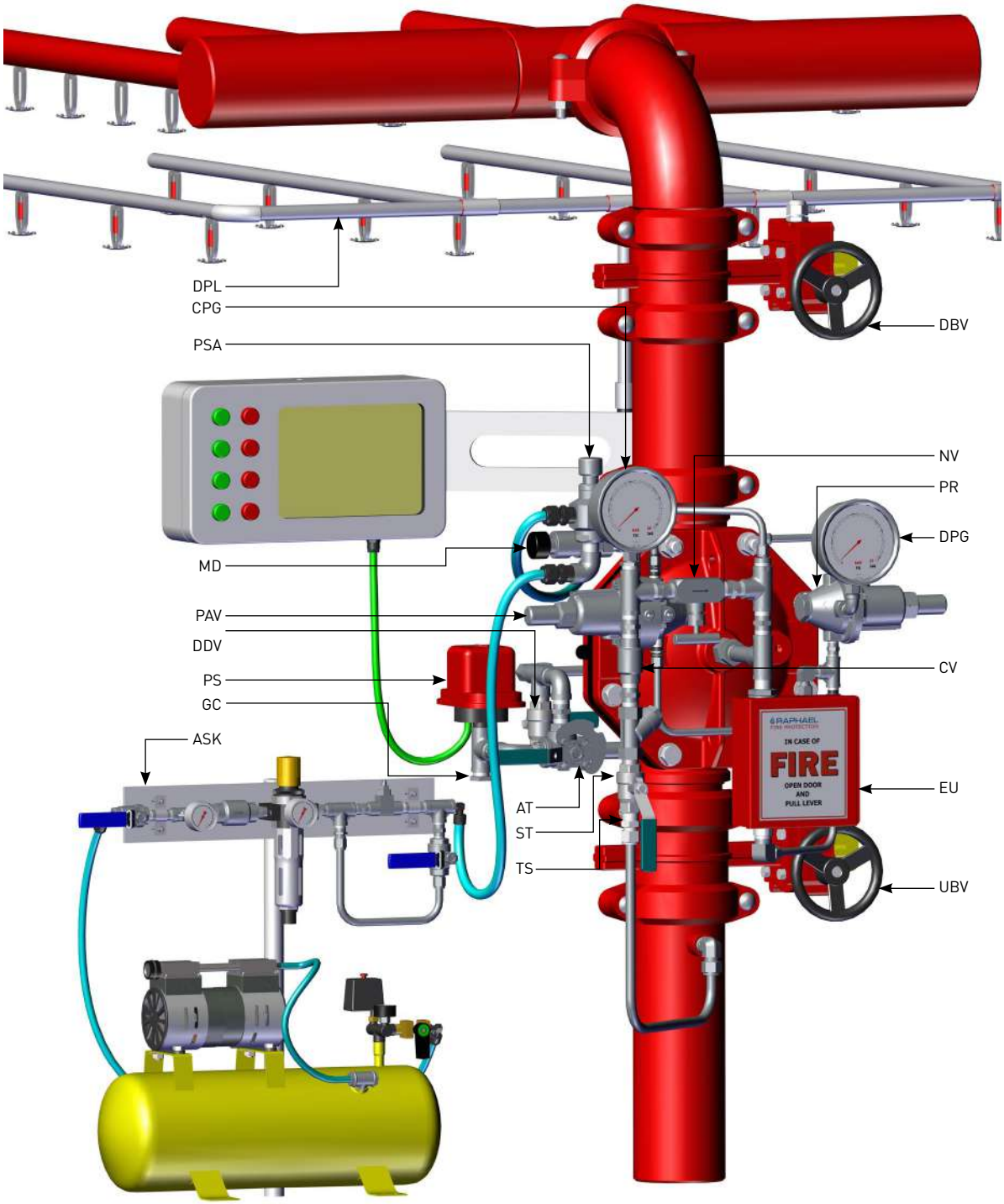
RESET POSITION

To initiate a system reset, all opened fire sprinklers in the Dry Pilot detection line must be replaced. In addition, the electrical alarm system must be reset. The PSA push button should be pressed, and the Dry Pilot Valve repressurized.

As a result, the pneumatic actuator becomes pressurized, and the FDV deluge valve closes.

Typical installation

FDV - PP0



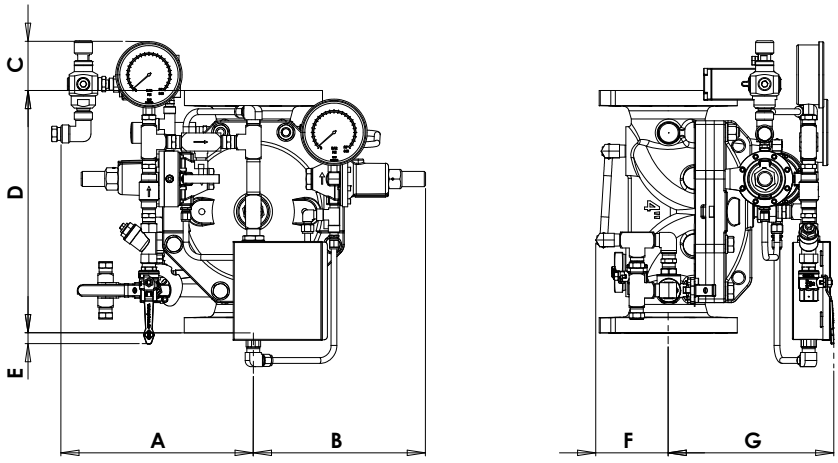
TS - Trim supply valve
ST - "Y" Strainer
AT - Alarms test valve
NV - Needle valve bypass
GC - Gong connection
PS - Pressure switch
S3 - 3-way Solenoid valve

PR - PRPV Pressure Reducing Pilot Valve
CV - Check Valve
ASK - Air Supply Kit
DDV - Downstream drain valve
PAV - PAV-2 Pneumatic Actuator
PSA - PSA – Pressure Supply Arrestor

DPL - Dry Pilot Line
CPG - Control Chamber pressure Gauge
DPG - Downstream Pressure Gauge
EU - MEU manual Emergency Unit
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FDV-PP0



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	254	10	255	10	255	10	296	11.6	290	11.4	340	13.4	372	14.6
B	214	4.8	214	8.4	214	8.4	247	9.7	284	11.2	323	12.7	337	13.3
C	153	6	150	5.9	128	5	61	2.4	40	1.6	10	0.4	45	1.8
D	202	8	224	8.8	325	12.8	401	15.8	462	18.2	580	22.8	768.5	30.2
E	151	10.5	151	5.9	155	6.1	93	3.6	56	2.2	N/A	N/A	N/A	N/A
F	150	4.6	150	5.9	150	5.9	128	5	120	4.7	172	6.7	220	8.5
G	194	10.2	194	7.6	194	7.6	255	10	273	10.7	380	14.9	510	20
Kg/lb	12	26.4	17.8	39.2	17.8	39.2	36.6	80.6	52.5	116	108	238	238	524

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
- Deluge valve ends
- Deluge valve coating
- Trim material
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

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

Pneumatically Actuated, Remote Reset, Pressure Reducing Deluge Valve

FDV - PP1

The FDV-PP1 fire protection system is based on Raphael's FDV deluge valve. It is pneumatically actuated and can be remotely reset. The FDV valve is available in various materials and coatings, making it suitable for installation in hazardous environments.

In the event of a fire, heat exposure causes one or more automatic sprinklers on the pneumatic dry pilot detection line to shatter open, venting air pressure from the actuator and triggering the deluge valve to open.

The system is capable of reducing upstream pressure to a preset downstream level and maintaining it consistently. It automatically compensates for downstream pressure fluctuations caused by changes in flow demand, ensuring reliable performance.

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

MARKETS

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

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the valve's standby position without draining or opening the valve itself, and without closing the OS &Y or other system valves.
- Maintained in a 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

- The hydro-dynamic 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 either by an electric signal conveyed to the valve's solenoid or by a release of pneumatic pressure in the Dry Pilot Line due to exposure to flame heat.
- Soft closing occurs when the valve's control chamber is pressurized, either by line pressure or by an independent water source, thereby preventing pressure surges.
- A pressure-reducing pilot enables full control of the downstream pressure and ensures a stable setpoint across a wide pressure range.

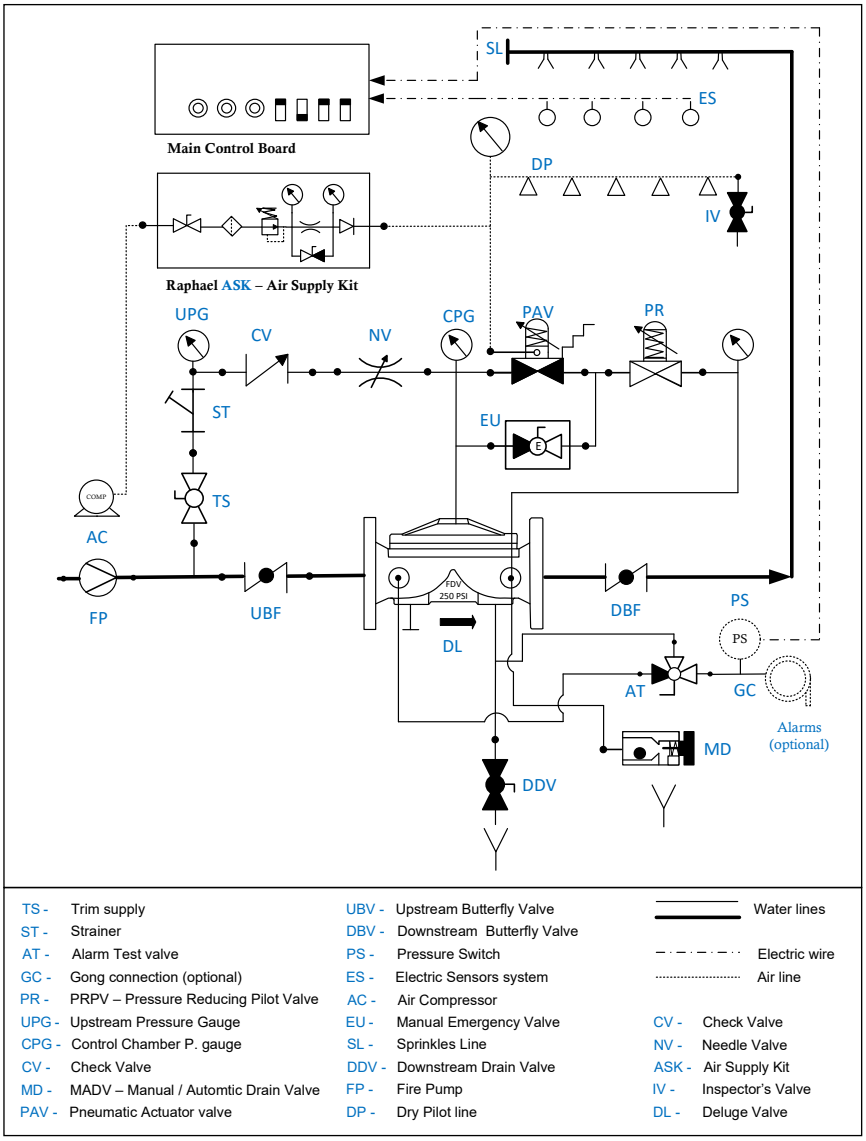
The FDV-PP1 resets to a stand-by closed position by de-energizing the solenoid coil of the alarm system through the main control panel and by pressurizing the Dry Pilot Line.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-PP1

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	PS -	Pressure Switch		Electric wire
GC -	Gong connection (optional)	ES -	Electric Sensors system		Air line
PR -	PRPV – Pressure Reducing Pilot Valve	AC -	Air Compressor		
UPG -	Upstream Pressure Gauge	EU -	Manual Emergency Valve	CV -	Check Valve
CPG -	Control Chamber P. gauge	SL -	Sprinkles Line	NV -	Needle Valve
CV -	Check Valve	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 (DL) is trapped by the closed pneumatic actuator (PAV), the closed emergency valve (EU), and the check valve (CV), thereby maintaining the deluge valve in its closed position.

FIRE SITUATION

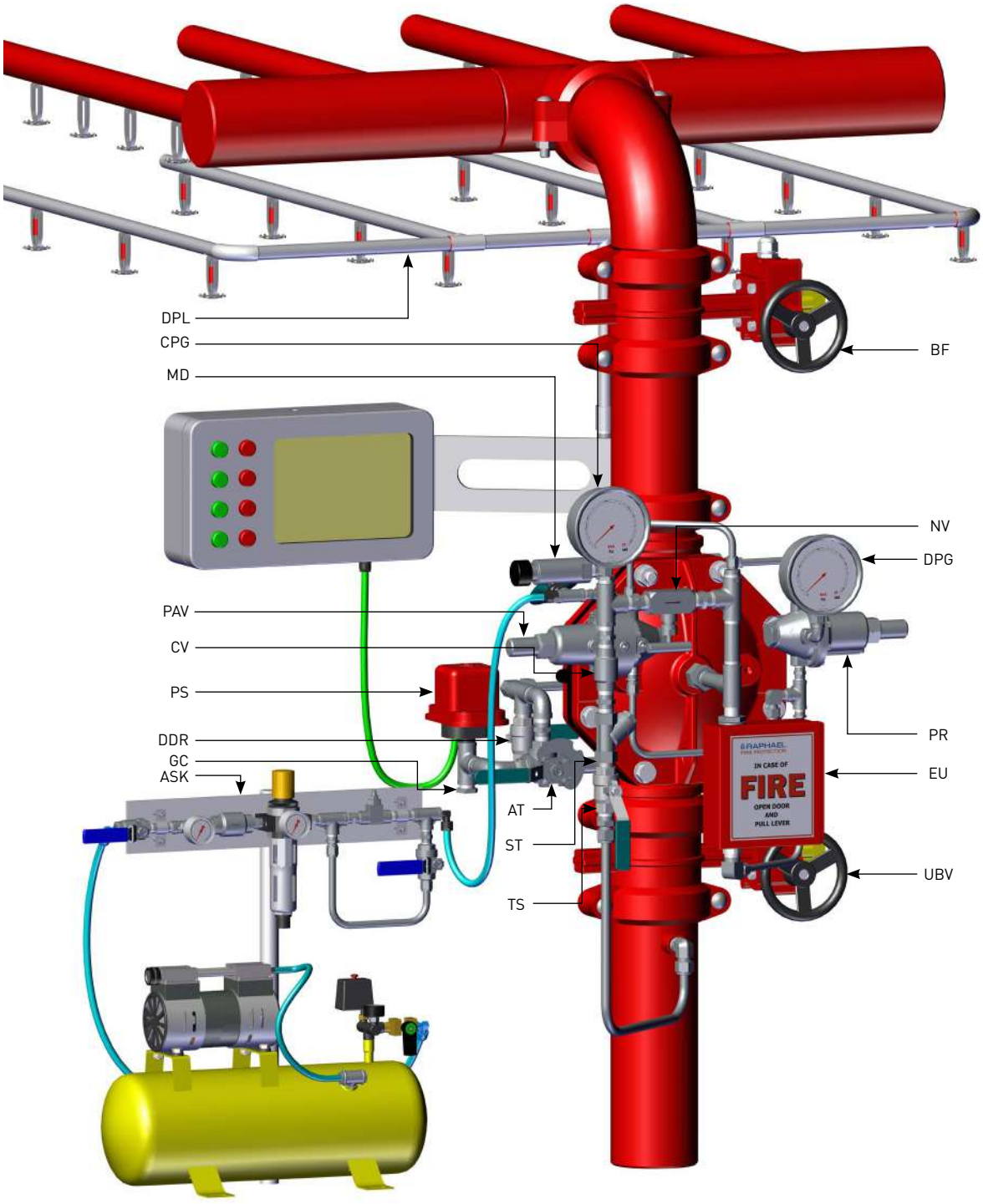
When one or more automatic fire sprinklers in the Dry Pilot (DP) detection line are exposed to a predetermined temperature and open, the pilot line depressurizes, causing the pneumatic actuator to open. When open, the pneumatic actuator vents the deluge control chamber causing it to open and admit water to the spray sprinkler line at a steady, preset pressure.

RESET POSITION

To initiate a system reset, all opened fire sprinklers in the dry Pilot detection line must be replaced. As a result, the pneumatic actuator is pressurized, closed, and the FDV deluge valve closes.

Typical installation

FDV - PP1



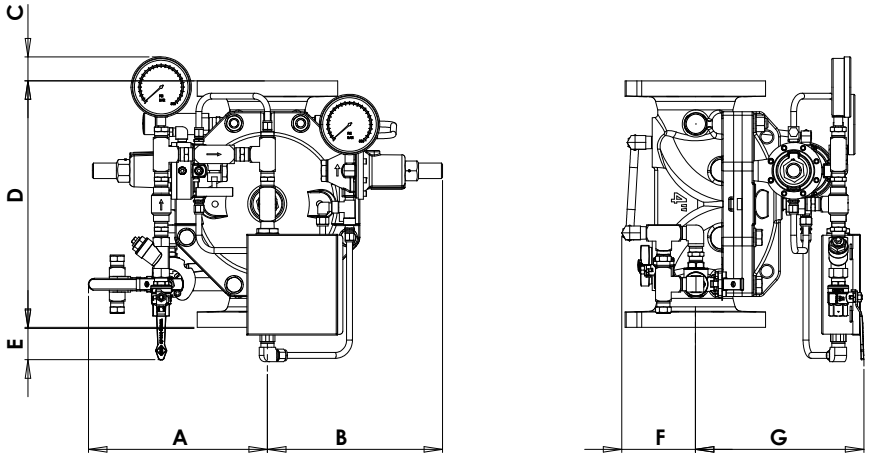
TS - Trim supply valve
ST - "Y" Strainer
AT - Alarms Test Valve
ASK - Air supply Kit
GC - Gong Connection
PS - Pressure Switch

DDV - Downstream Drain Valve
PAV - Pneumatic Actuator Valve 2 way.
NV - Needle Valve
CV - Check Valve
MD - MADV Manual Automatic DrainValve
DPL - Dry Pilot Line

DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
CPG - Control chamber Pressure Gauge
DPG - Downstream Pressure Gauge
PR - PRPV Pressure Reducing Pilot Valve
EU - MEU Manual Emergency Unit

Parametric drawing:

FDV-PP1



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	261	10.2	296	11.6	290	11.4	313	12.3	338	13.3	393	15.4
B	214	8.4	218	8.6	238	9.4	284	11.2	310	1.2	304	11.9	307	12
C	138	5.4	130	5.1	76	2.9	39	1.5	N/A	N/A	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	153		142	5.6	93	3.6	56	2.2	23	0.9	N/A	N/A	N/A	N/A
F	150	5.9	129	5	120	4.7	119	4.6	159	6.2	172	6.7	219	8.6
G	194	7.6	207	8.1	263	10.3	272	10.7	338	13.3	378	14.8	510	20
Kg/lb	15.4	34	17.7	39	34.2	75.4	50.5	111	70	154	106	233	263	580

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
- Pneumatic working pressure
- Deluge valve ends
- Deluge valve coating
- Trim material
- System installation orientation
- Additional accessories needed

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

Electro-Pneumatically Actuated, Local reset, Pressure Reducing Deluge Valve

FDV - PC0

The FDV-PC0 fire protection system is based on Raphael's FDV deluge valve and features a control trim that can be actuated both, pneumatically and electrically. The FDV valve is available in a variety of materials and coatings, making it suitable for installation in hazardous environments.

The FDV-PC0 deluge system is pneumatically actuated and can be reset locally. In the event of a fire, exposure of the pneumatic dry pilot detection line to heat causes one or more of its automatic sprinklers to shatter, venting air pressure from the actuator and triggering the deluge valve to open. Alternatively, if a sensor from the electric detection system activates the main control board, it opens a solenoid valve that vents the dry pilot line, thereby opening the deluge valve.

The system is capable of reducing upstream pressure to a preset downstream level and maintaining it steadily. It automatically compensates for downstream pressure fluctuations caused by changes in flow demand, ensuring consistent performance.

The deluge system includes an emergency valve that bypasses the fire detection systems for manual operation. Additionally, the trim includes a PSA device that enables local system to reset - i.e., closing the FDV valve by re-pressurizing its control chamber. This system is suitable for configurations with automatic sprinklers installed on the dry pilot line and open nozzles on the main spray lines.

MARKETS

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

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the valve's standby position without draining or opening the valve itself, and without closing the OS &Y or other system valves.
- Maintained in a 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

- The hydro-dynamic 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 either by an electric signal conveyed to the valve's solenoid or by a release of pneumatic pressure in the Dry Pilot Line due to exposure to flame heat.
- Soft closing occurs when the valve's control chamber is pressurized, either by line pressure or by an independent water source, thereby preventing pressure surges.
- A pressure-reducing pilot enables full control of the downstream pressure and ensures a stable setpoint across a wide pressure range.

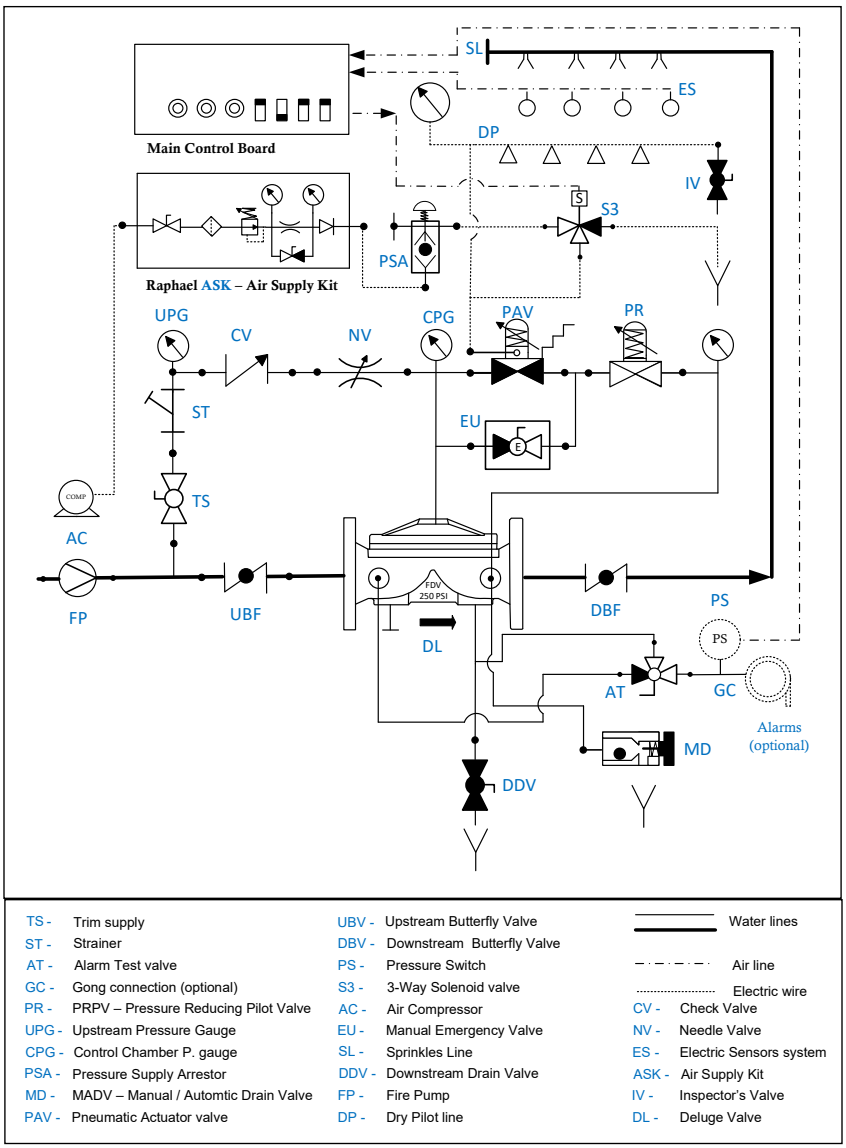
The FDV-PC0 resets to a stand-by closed position either by de-energizing the solenoid coil of the alarm system through the main control panel or by pressurizing the Dry Pilot Line and manually operating the PSA device, in accordance with the relevant triggered alarm system.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-PC0

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 (optional)	S3 -	3-Way Solenoid valve		Electric wire
PR -	PRPV – Pressure Reducing Pilot Valve	AC -	Air Compressor	CV -	Check Valve
UPG -	Upstream Pressure Gauge	EU -	Manual Emergency Valve	NV -	Needle 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 (DL) is trapped by the closed pneumatic actuator (PAV), the closed emergency valve (EU), and the check valve (CV), thereby maintaining the deluge valve in its closed position.

FIRE SITUATION

When one or more automatic fire sprinklers in the Dry Pilot (DP) detection line are exposed to a predetermined temperature and open, the pilot line depressurizes, causing the pneumatic actuator to open.

Alternatively, an electric detection system may sense heat and trigger the main control board, which in turn energizes the three-way solenoid valve (S3). This solenoid valve bypasses the Dry Pilot detection, vents the pneumatic actuator (PAV) control chamber to the atmosphere, and opens it. The FDV-PC0's control chamber is then drained through the pressure-reducing pilot valve (PR), causing the deluge valve to open and admit water to the spray sprinkler line at a steady, preset pressure.

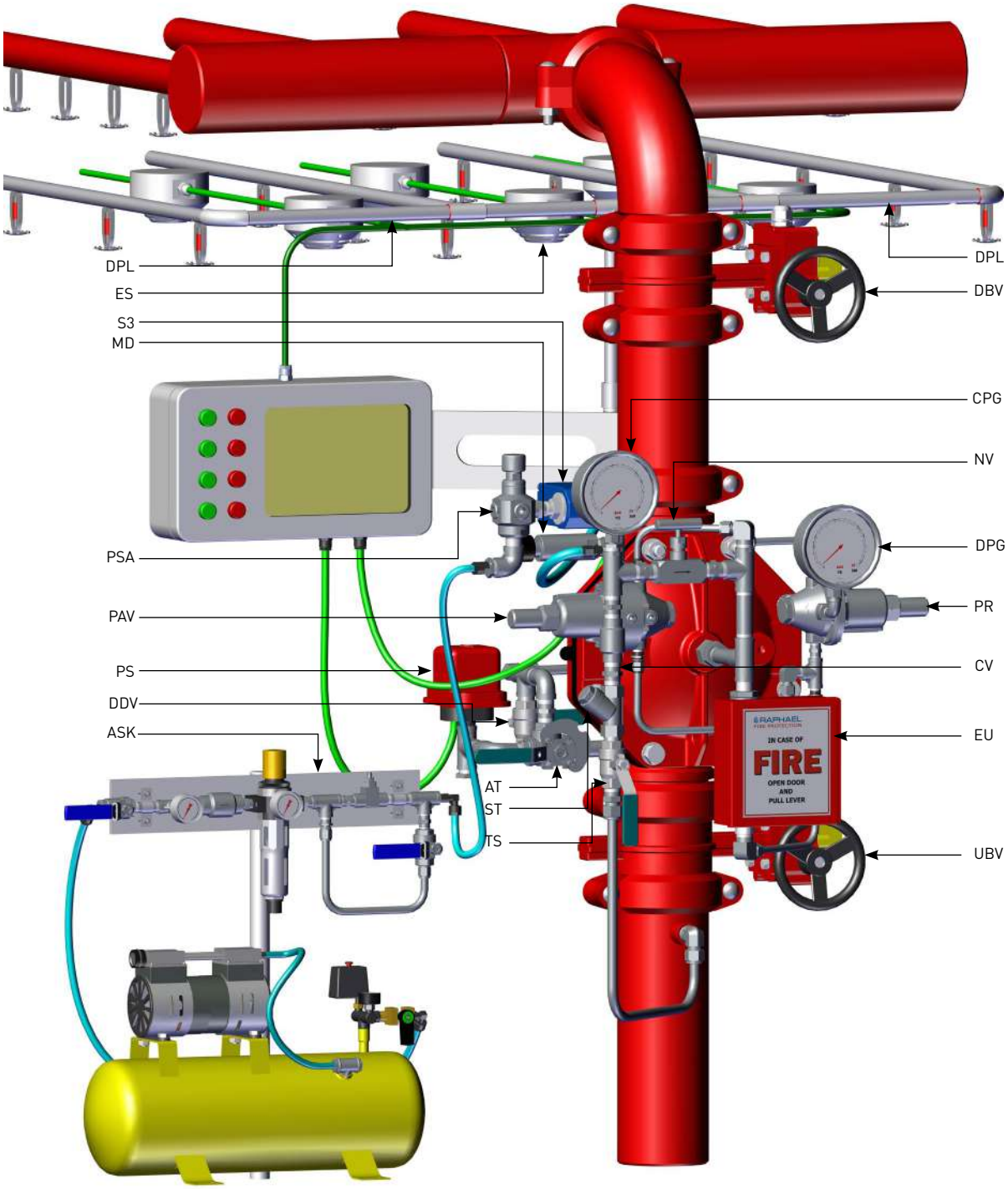
RESET POSITION

To initiate a system reset, all opened fire sprinklers in the dry Pilot detection line must be replaced. Additionally, the electrical alarm system must be reset and the solenoid valve de-energized. The PSA (PSA) push button should be pressed, and the Dry Pilot Valve repressurized.

As a result, the pneumatic actuator is pressurized, and the FDV deluge valve closes.

Typical installation

FDV - PC0



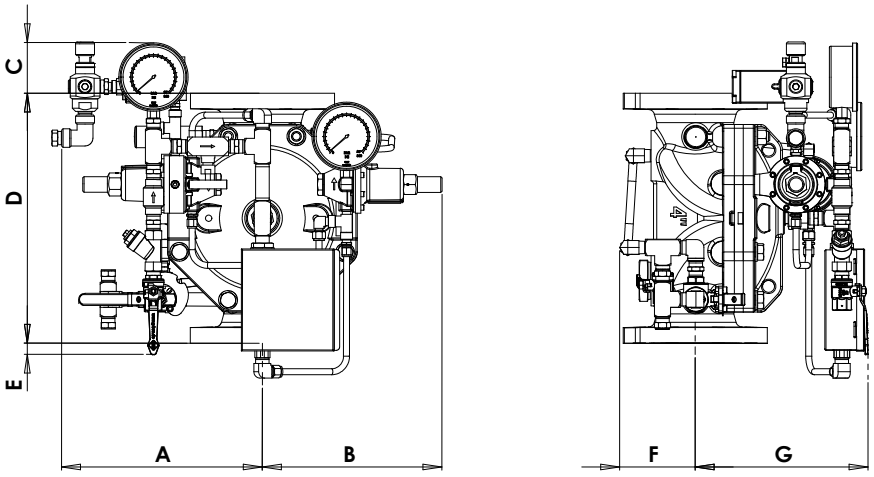
TS - Trim supply valve
ST - "Y" Strainer
AT - Alarms test valve
NV - Needle valve bypass
GC - Gong connection
PG - Pressure switch
S3 - 3-way Solenoid valve

PR - Pressure Reducing Pilot Valve
CV - Check Valve
ASK - Air Supply Kit
DDV - Downstream drain valve
PAV - PAV-2 Pneumatic Actuator
PSA - PSA – Pressure Supply Arrestor
ES - Electric Sensors

DPL - Dry Pilot Line
NV - Needle Valve
CPG - Control Chamber pressure Gauge
DPG - Downstream Pressure Gauge
EU - MEU manual Emergency Unit
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FDV-PC0



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	255	10	255	10	296	11.6	290	11.4	340	13.4	372	14.6
B	214	8.4	214	8.4	247	9.7	284	11.2	323	12.7	376	14.8
C	150	5.9	150	5.9	139	5.5	80	3.2	N/A	N/A	45	N/A
D	224	8.8	325	12.8	401	15.8	462	18.2	580	22.8	768.5	30.2
E	151	5.9	155	6.1	93	3.6	56	2.2	N/A	N/A	N/A	N/A
F	150	5.9	150	5.9	128	5	120	4.7	172	6.7	220	8.5
G	194	7.6	194	7.6	255	10	273	10.7	380	14.9	510	20
Kg/lb	17.8	39.2	17.8	39.2	36.6	80.6	52.5	115.7	108	238	238	524

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
- Deluge valve ends
- Deluge valve coating
- Trim material
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- Solenoid Voltage
- Solenoid Enclosure
- Solenoid Protection
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

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

Electro-Pneumatically Actuated, Remote Reset, Pressure Reducing Deluge Valve

FDV - PC1

The FDV-PC1 fire protection system is based on Raphael's FDV deluge valve and incorporates a control trim that can be actuated both pneumatically and electrically. The FDV valve is available in a wide range of materials and coatings, making it suitable for installation in hazardous environments.

The FDV-PC1 deluge system is primarily pneumatically actuated and can be reset locally. In the event of a fire, heat exposure along the pneumatic dry pilot detection line causes one or more automatic sprinklers to shatter, releasing air pressure from the actuator and initiating the opening of the deluge valve. Alternatively, activation of an electric detection sensor signals the main control board to energize a solenoid valve, which vents the dry pilot line and consequently opens the deluge valve.

The system is capable of reducing upstream pressure to a preset downstream pressure and maintaining it at a constant level. It automatically compensates for downstream pressure fluctuations resulting from changes in flow demand, thereby ensuring stable and reliable performance.

The deluge system is equipped with an emergency manual valve that allows operation independent of the fire detection systems. It is suitable for configurations that combine automatic sprinklers on the dry pilot line with open nozzles on the main spray lines.

MARKETS

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

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm, and cover plate. No wet metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the valve's standby position without draining or opening the valve itself, and without closing the OS &Y or other system valves.
- Maintained in a 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

- The hydrodynamic flow pattern design ensures high flow rates with minimal head loss.
- The valve opens automatically following a controlled release of water pressure from its control chamber. Actuation is achieved either by an electrical signal to the valve solenoid or by pneumatic pressure release from the Dry Pilot Line due to exposure to fire heat.
- Soft closing occurs when the valve control chamber is pressurized, either by line pressure or by an independent water source, thereby preventing pressure surges.
- A pressure-reducing pilot valve provides full control of downstream pressure and maintains a stable setpoint over a wide inlet pressure range.

The FDV-PC1 is reset to the closed standby position by de-energizing the alarm system solenoid coil via the main control panel and by repressurizing the Dry Pilot Line.

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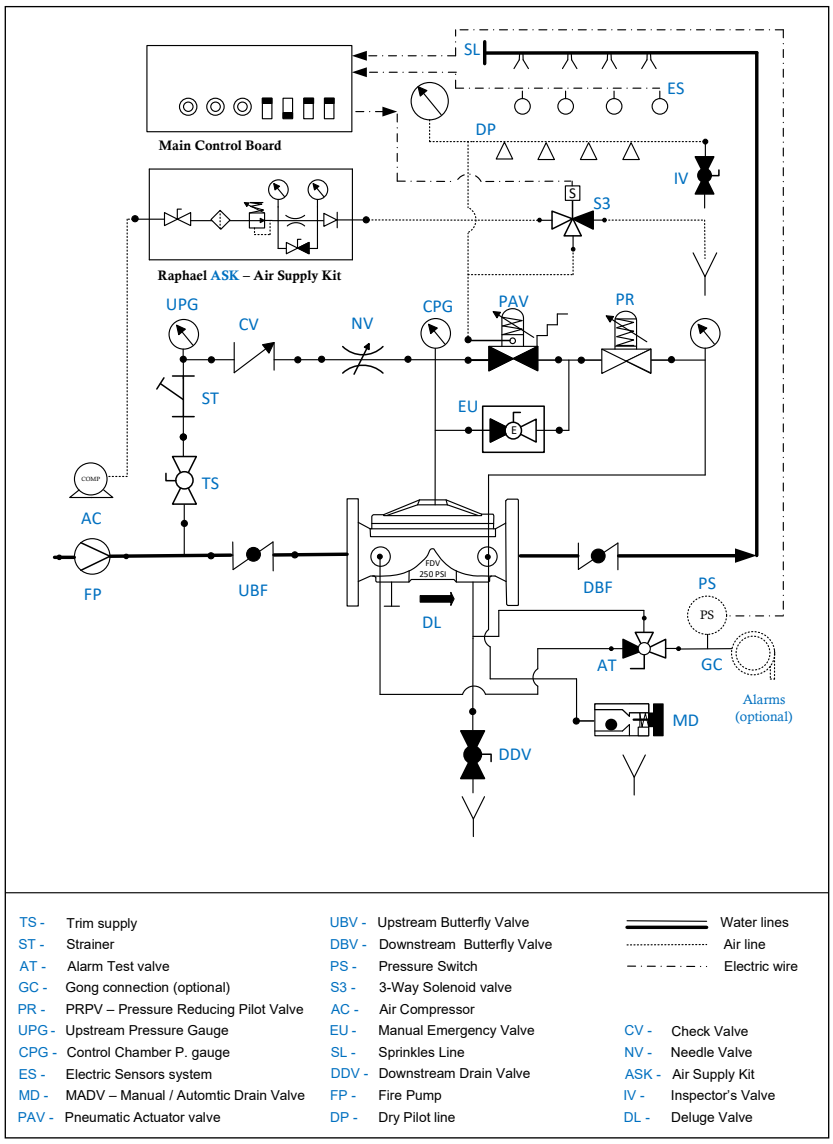
Schematic drawing:

FDV-PC1

Set position



OPERATION

SET POSITION

Pressurized water in the valve control chamber (DL) is retained by the closed pneumatic actuator (PAV), the closed emergency valve (EU), and the check valve (CV), thereby maintaining the deluge valve in the closed standby position.

FIRE SITUATION

When one or more automatic fire sprinklers installed on the Dry Pilot (DP) detection line are exposed to a predetermined temperature and operate, the pilot line depressurizes, causing the pneumatic actuator (PAV) to open.

Alternatively, an electric detection system may sense heat and activate the main control board, which energizes the three-way solenoid valve (S3). The solenoid valve bypasses the Dry Pilot detection line, vents the pneumatic actuator (PAV) control chamber to atmosphere, and opens it. As a result, the FDV-PC0 control chamber is drained through the pressure-reducing pilot valve (PR), causing the deluge valve to open and supply water to the spray sprinkler line at a steady, preset pressure.

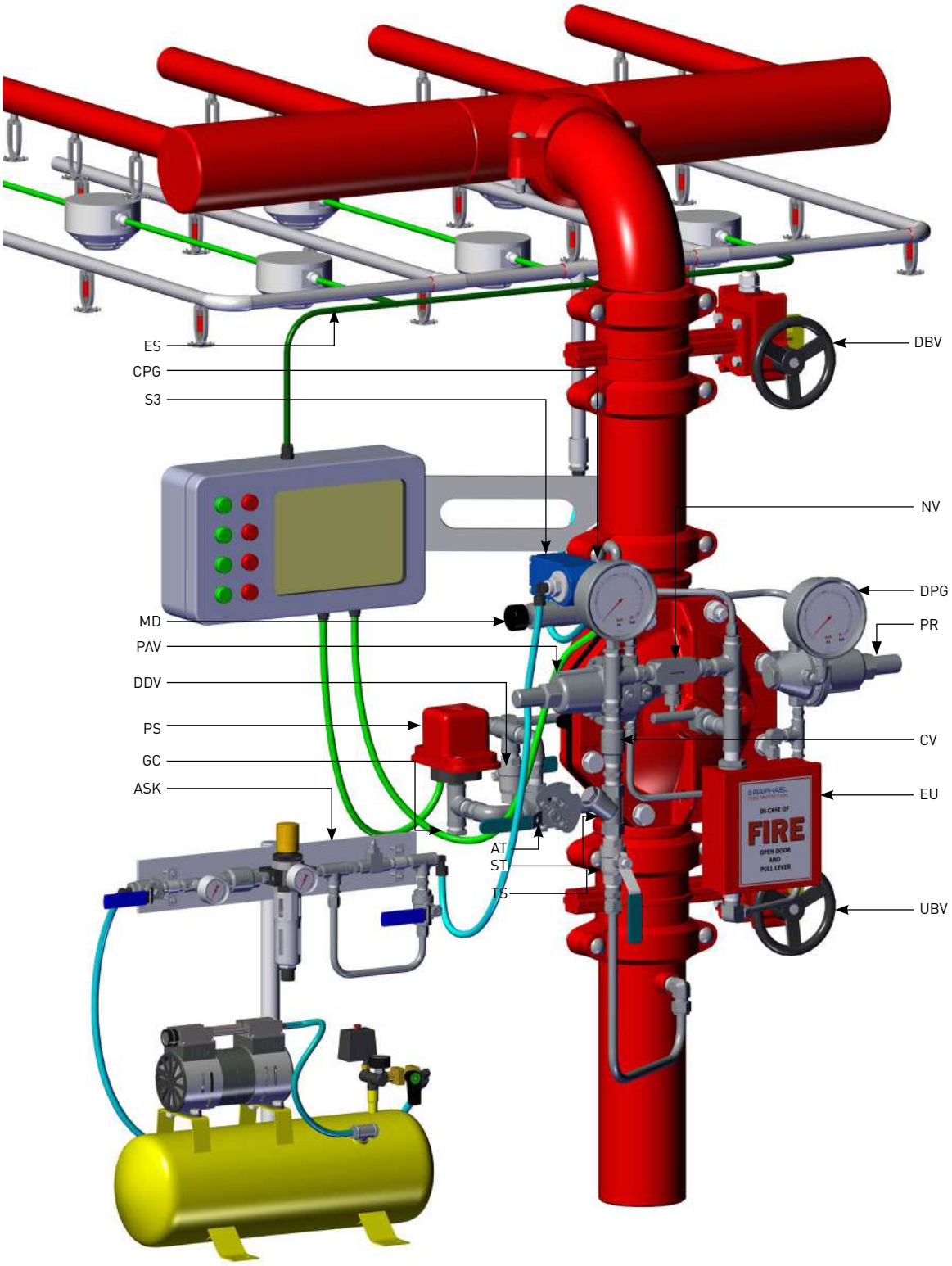
RESET POSITION

To initiate a system reset, all operated fire sprinklers on the Dry Pilot detection line must be replaced and the line repressurized.

In addition, the electrical alarm system must be reset and the solenoid valve de-energized. Consequently, the pneumatic actuator is repressurized and the FDV deluge valve returns to the closed standby position.

Typical installation

FDV - PC1



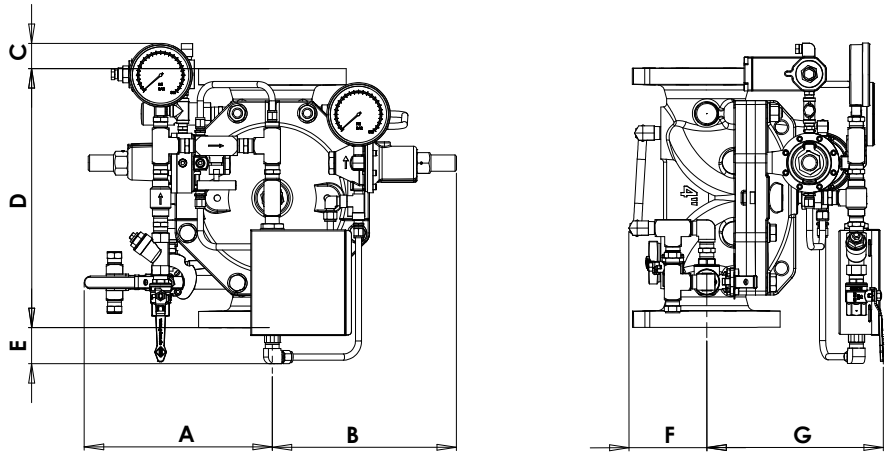
TS - Trim supply valve
ST - "Y" Strainer
AT - Alarms test valve
NV - Needle valve bypass
GC - Gong connection
PG - Pressure switch
S3 - 3-way Solenoid valve

PR - PRPV Pressure Reducing Pilot Valve
CV - Check Valve
ASK - Air Supply Kit
DDV - Downstream drain valve
PAV - PAV-2 Pneumatic Actuator
ES - Electric Sensors

DPL - Dry Pilot Line
CPG - Control Chamber pressure Gauge
DPG - Downstream Pressure Gauge
EU - MEU manual Emergency Unit
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FDV-PC1



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	261	10.2	296	11.6	290	11.4	313	12.3	338	13.3	372	14.6
B	214	8.4	218	8.6	238	9.4	284	11.2	310	1.2	304	11.9	406	16
C	144	5.6	136	5.3	84	3.3	44	1.7	14	0.5	N/A	N/A	44	1.7
D	204	8.0	220	8.6	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	133	6.1	142	5.6	93	3.6	56	2.2	N/A	N/A	N/A	N/A	N/A	N/A
F	150	5.9	129	5	120	4.7	115	0.6	159	6.2	172	6.7	219	8.6
G	194	7.6	207	8.1	263	10.3	272	10.7	338	13.3	378	14.8	510	20
Kg/lb	16.4	36.1	18.6	40	35.1	77.2	51	112	70.8	156	107	235	237	522

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
- Deluge valve ends
- Deluge valve coating
- Trim material
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- Solenoid Voltage
- Solenoid Enclosure
- Solenoid Protection
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

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

Hydraulically Actuated, Local Reset, Pressure Reducing Deluge Valve — FDV - PH0

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-PH0 is a pressure-control deluge system, hydraulically actuated and locally reset. When the hydraulic detection system (a wet pilot detection line) is exposed to a predetermined temperature, one or more automatic sprinklers shatter open, triggering the FDV-PH0 deluge valve to open. Once open, the valve reduces the high inlet pressure to a predetermined fixed outlet pressure. 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 maintaining it at a steady level. It responds to downstream pressure fluctuations caused by changes in flow demand, ensuring stable output pressure.

The system is equipped with a PSA - a device that manually and locally pressurizes the wet pilot pipeline, automatically stops pressurization in a fire scenario, and compensates for minor leakage-related pressure losses. This system is suitable for open-nozzle water spray pipelines.

MARKETS

Commercial, Industry, Marine, 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 spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the valve's standby position without draining or opening the valve itself, and without closing the OS &Y or other system valves.
- Maintained in a 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

- Hydrodynamic pattern design ensures high flow rates with minimal head loss.
- The valve trips open automatically upon gradual release of water pressure from its control chamber. The trip is actuated by the hydraulic pressure release of a Wet Pilot Line, triggered by exposure to flame heat.
- Soft closing occurs upon pressurization of the valve's control chamber — either by line pressure or an independent water source — to prevent surges.
- A pressure-reducing pilot enables full control over downstream pressure and ensures stable regulation across a wide pressure range.

The FDV-PH0 resets to the stand-by closed position by pressurizing the Dry Pilot Line and manually operating the PSA device.

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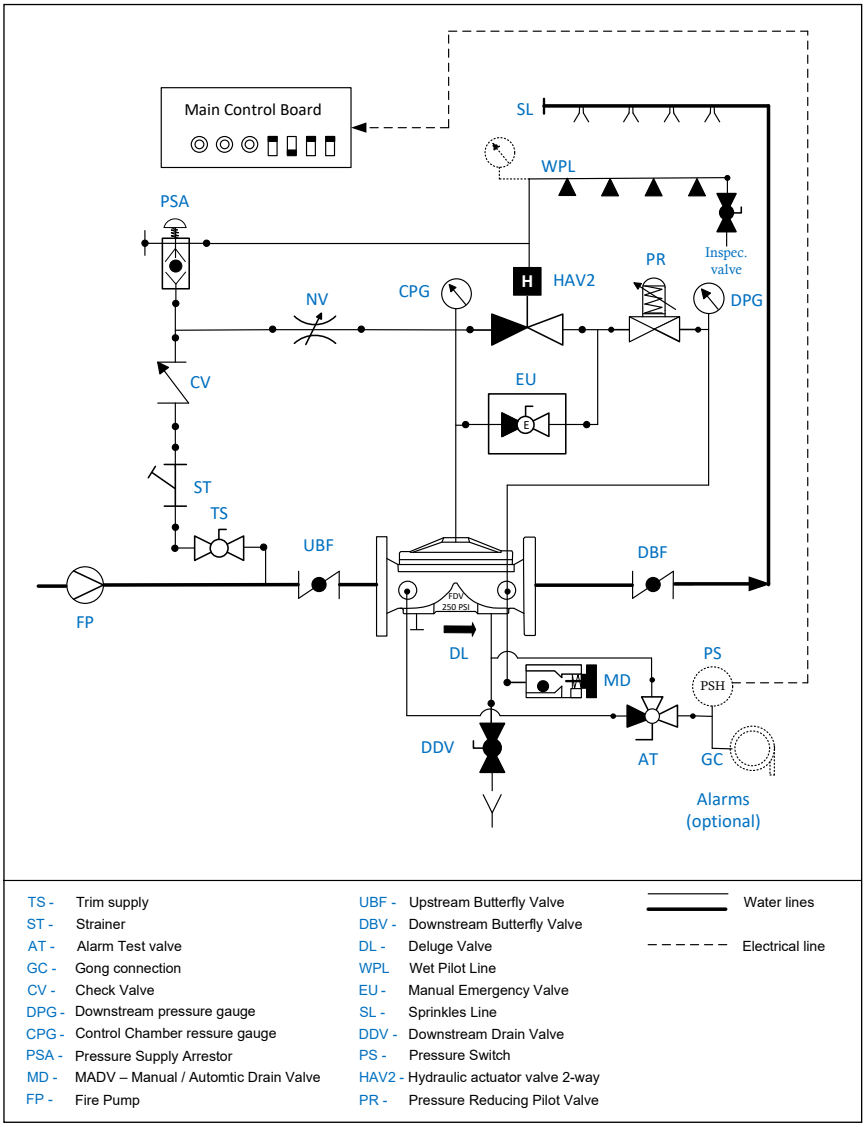
Schematic drawing:

FDV-PH0

Set position



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

OPERATION

SET POSITION

Pressurized water in the valve's control chamber (DL) is trapped by the check valve (CV), the closed emergency valve (EU), the closed hydraulic drain actuator (HAV2), and the pressure release arrestor device (PSA).

The hydraulic pressure accumulated in the Wet Pilot detection line (WPL) keeps the hydraulic actuator in its closed position, thereby maintaining the FDV deluge valve closed.

FIRE SITUATION

When the automatic fire sprinklers in the Wet Pilot detection line are exposed to flame heat and shatter open, the hydraulic actuator's control chamber depressurizes and drains the deluge valve's control chamber through the pressure-reducing pilot valve PRPV (PR).

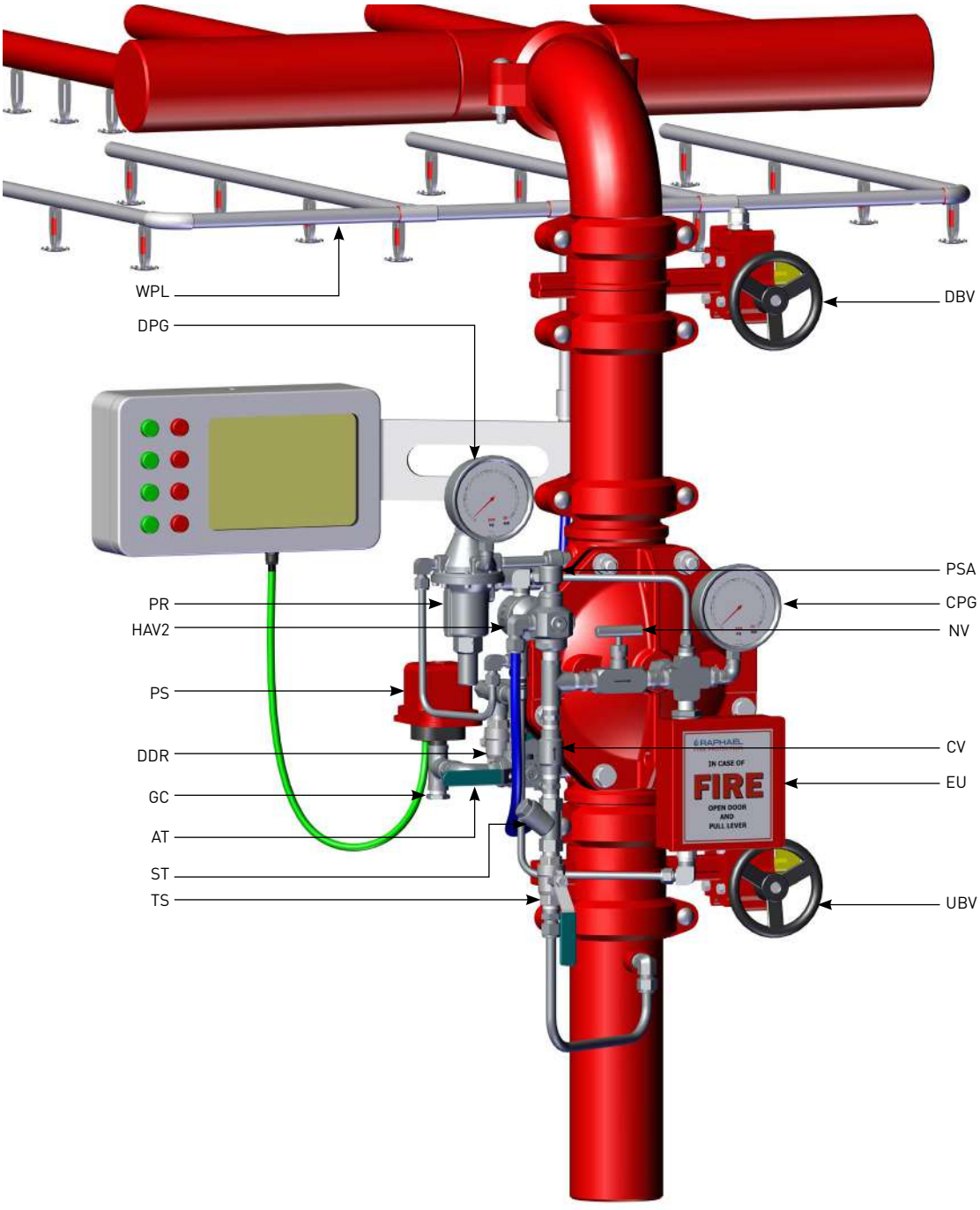
The FDV deluge valve opens, admitting water into the spray sprinkler line (SL) at a reduced and steady preset pressure.

RESET POSITION

To reset the system, all shattered-open fire sprinklers in the Wet Pilot detection line must be replaced. Then, the Pressure Release Arrestor device (PSA) push button must be pressed to enable the re-pressurization of the Wet Pilot detection line. As a result, the hydraulic actuator closes, commanding the FDV deluge valve to close.

Typical installation

FDV - PH0



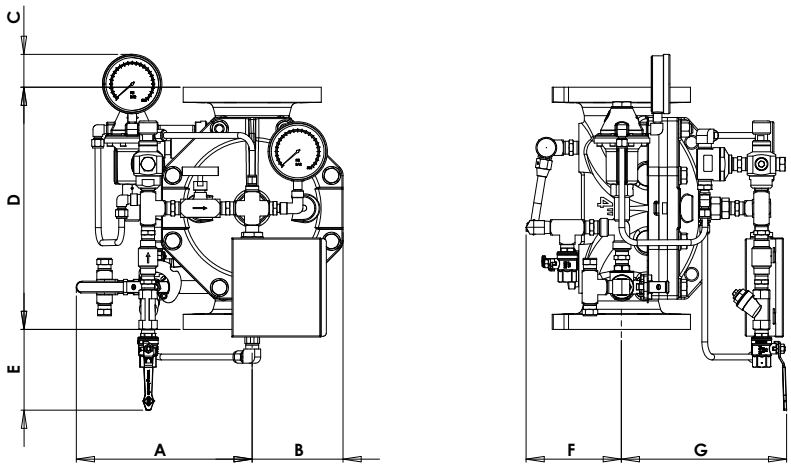
TS - Trim supply valve
ST - "Y" strainer
CV - Check valve
AT - Alarm test valve
GC - Gong Connection
DDR - Downstream drain valve

PS - Pressure Switch
HAV2 - Hydraulic Actuator Valve
PR - Pressure Reducing Pilot Valve
DPG - Downstream Pressure Gauge
WPL - Wet Pilot Line
DBV - Downstream Butterfly valve

PSA - Pressure Supply Arrestor
NV - Needle valve
CPG - Control chamber Pressure Gauge
EU - Emergency Manual Unit
UBV - Upstream Butterfly valve

Parametric drawing:

FDV-PH0



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	260	10.2	267	10.5	297	11.7	290	11.4	315	12.4	340	13.4	395	15.5
B	122	4.8	121	4.7	135	5.3	150	5.9	178	7	232	9.1	305	12
C	101	3.9	103	4	93	3.6	54	2.1	45	1.77	47	1.8	44	1.7
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	222	8.7	170	6.7	133	5.3	100	3.9	47	1.8	N/A	N/A
F	151	5.9	151	5.9	137	5.4	158	6.2	167	6.6	191	7.5	221	8.7
G	260	10.2	208	8.1	230	9	272	10.7	340	13.3	374	14.7	490	19.3
Kg/lb	13	29	15.2	33.5	32.2	70.5	48	106	59	130	104	230	235	518

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
- Wet Pilot's installation height.
- Deluge valve material and coating
- Deluge valve ends and standard
- Trim materials
- System installation orientation
- Additional accessories needed:
  Alarm Pressure switch
  Alarm Gong

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

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.

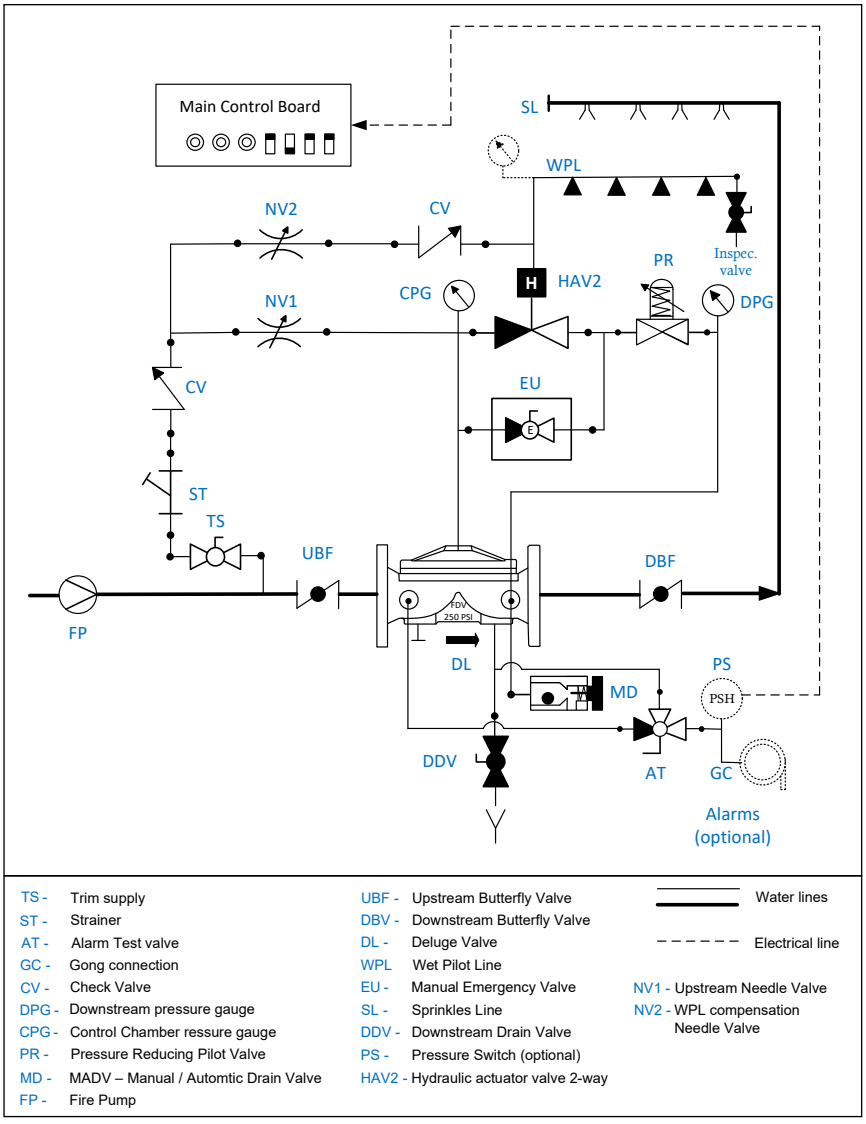
The FDV-PH1 resets to the standby closed position by pressurizing the Dry Pilot Line.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

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).

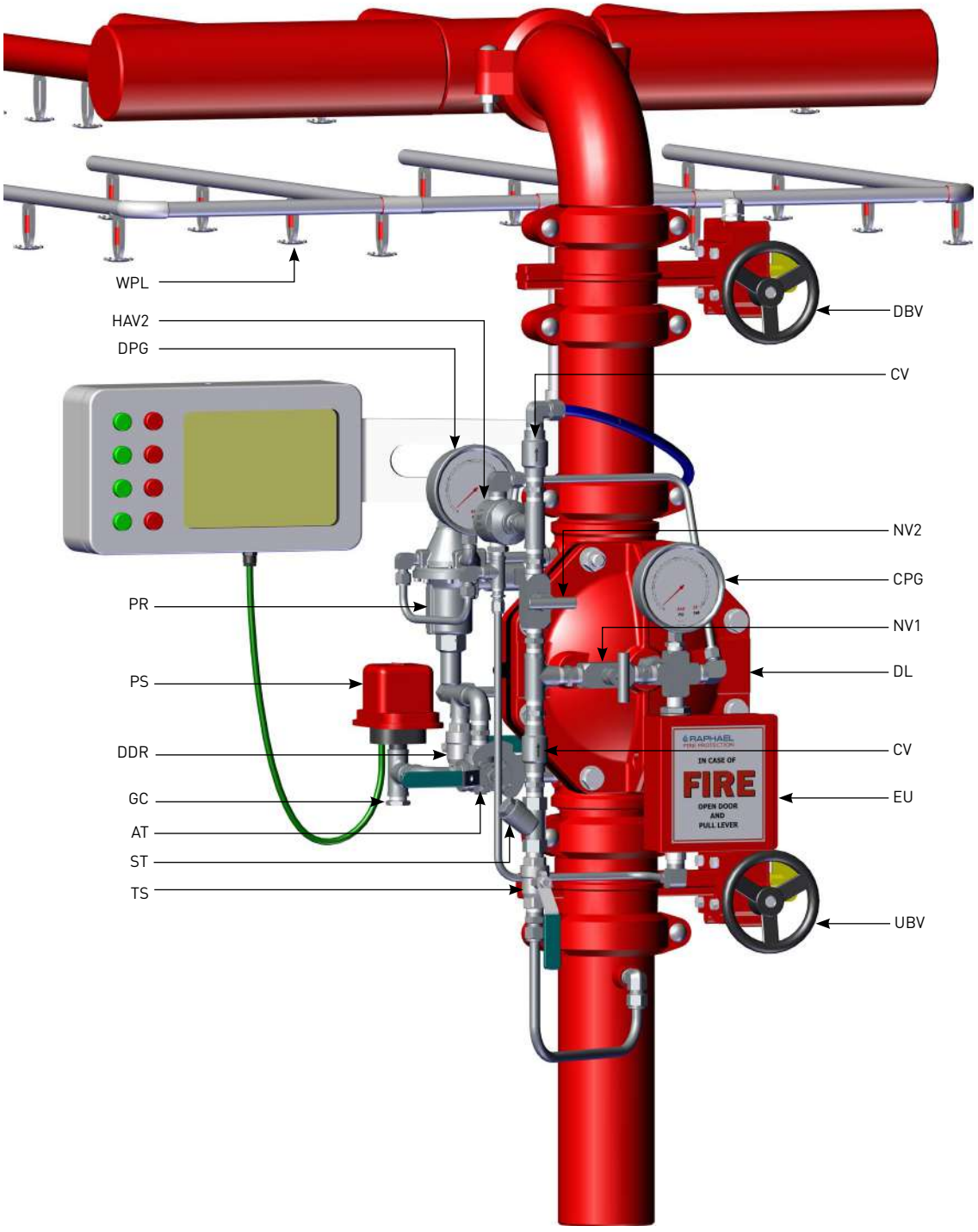
Once the FDV opens, water flows into the sprinkler piping. The PRPV pilot senses the downstream pressure and regulates the FDV opening, maintaining a steady preset downstream pressure. Opening the MEU door and pulling down the ball valve handle bypasses all control elements, drains the FDV control chamber,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



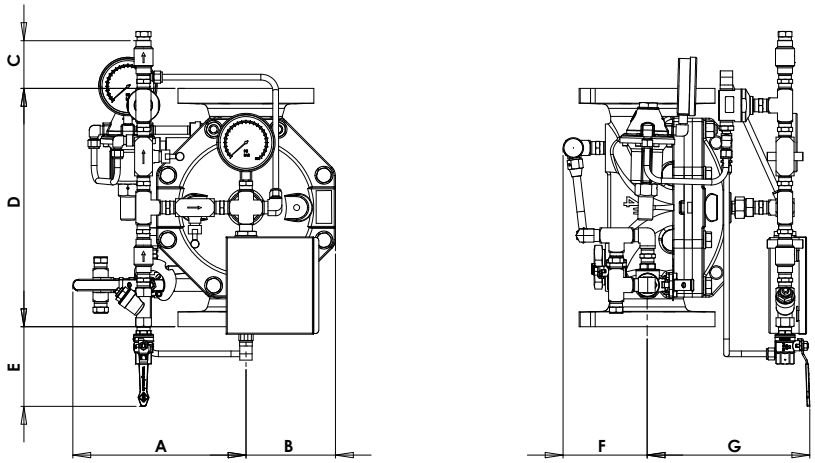
TS – Trim Supply
ST – Strainer
AT – Alarm Test valve
GC – Gong Connection
DDR – Downstream Drain Valve
PS – Pressure Switch

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.

Hydraulic Actuated, Local Reset, Pressure Reducing Deluge Valve & Anti-Columning

FDV - PA0

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 area. Its hydrodynamic flow path ensures high flow rates with minimal head loss.

The FDV-PA0 is a pressure-control deluge system, hydraulically actuated and locally reset. When the hydraulic detection system (a wet pilot detection line) is exposed to a predetermined temperature, one or more automatic sprinklers open, triggering the FDV-PA0 deluge valve to activate. Once open, the valve reduces the high inlet pressure to a predetermined fixed outlet pressure. The anti-columning feature ensures system operation regardless of the detection line's height or distance from the control valve.

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.

The system is equipped with a PSA device that manually and locally pressurizes the wet pilot pipeline, automatically stops pressurization in a fire scenario, and compensates for minor leakage-related pressure losses. This configuration is suitable for open-nozzle water spray pipelines.

MARKETS

Commercial · Industry · Marine · Storage · Residential · Airport

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

SIZE RANGE:
50mm to 250mm (2" 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 wetted metal spring inside the control chamber.
- Full-bore, unobstructed design.
- Simple manual reset to the standby position without closing the butterfly valve or other valves in the system.
- Open fail-safe valve, maintained in a normally closed standby position.
- Low maintenance cost: serviced in-line with only one replaceable part - a long-life elastomeric diaphragm.
- The anti-columning feature ensures system operation regardless of the detection line's height or distance from the control valve.
- Conforms to inspection, testing, and maintenance standards for water-based fire protection systems (NFPA 25).

CHARACTERISTICS

- Hydrodynamic flow-path design ensures high flow rates with minimal head loss.
- The valve trips open automatically upon gradual release of water pressure from its control chamber. The trip is actuated by the hydraulic pressure release of a Wet Pilot Line, triggered by exposure to flame heat.
- Soft closing occurs upon pressurization of the valve's control chamber - either by line pressure or by an independent water source - preventing surges.
- A pressure-reducing pilot enables full control of downstream pressure and ensures stable regulation across a wide pressure range.
- The anti-columning pilot assures valve opening regardless of the Wet Pilot Line's pressure.

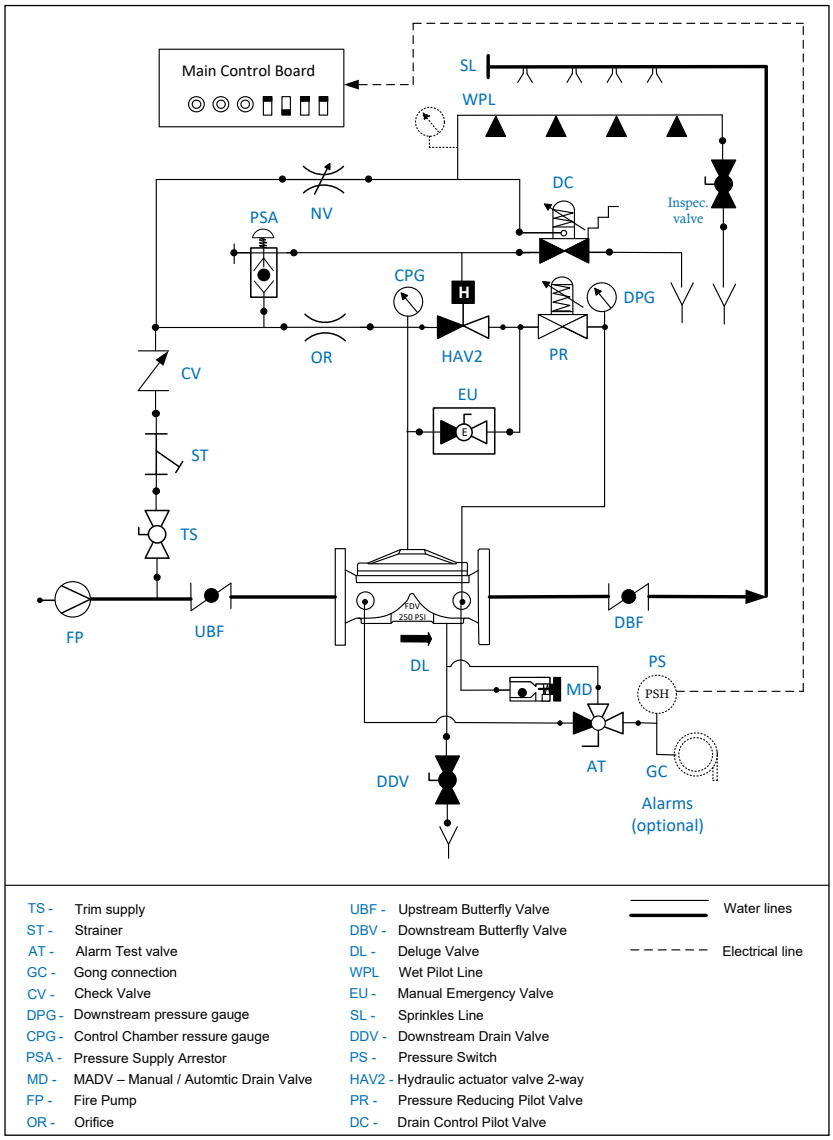
The FDV-PA0 resets to the stand-by closed position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Raphael Valves Industries (1975) Ltd., North Ind. Zone Or Akiva, PO Box 555, Israel 3065401

Schematic drawing:

FDV-PA0

Set position



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

OPERATION

SET POSITION

Pressurized water in the valve's control chamber (DL) is retained by the check valve (CV), the closed emergency valve (EU), and the closed HAV-2 actuator (HAV). The hydraulic pressure accumulated in the Wet Pilot Line keeps the DCPV drain pilot (DC) in its closed position, thereby maintaining the HAV-2 closed and consequently keeping the FDV deluge valve (DL) closed.

FIRE SITUATION

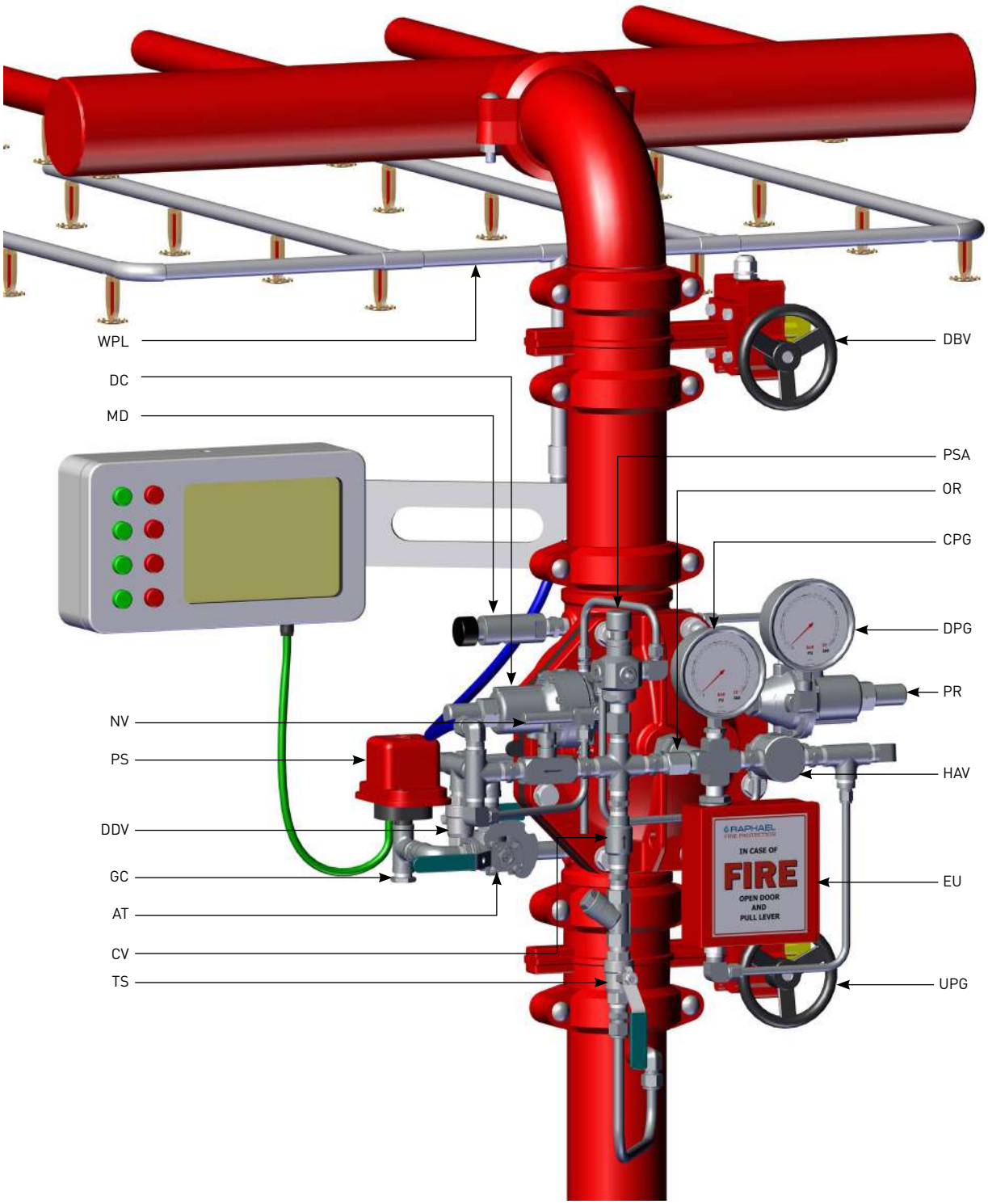
Pressurized water in the valve's control chamber (DL) is retained by the check valve (CV), the closed emergency valve (EU), and the closed HAV-2 actuator (HAV). The hydraulic pressure accumulated in the Wet Pilot Line keeps the DCPV drain pilot (DC) in its closed position, thereby maintaining the HAV-2 closed and consequently keeping the FDV deluge valve (DL) closed.

RESET POSITION

Resetting the system requires replacing all activated (shattered-open) fire sprinklers in the detection pilot line. The Wet Pilot Line is then re-pressurized, returning the DCPV (DC) to its closed position. The PSA (PS) push button must be pressed to enable upstream pressure to pressurize the HAV-2 control chamber, thereby closing the FDV valve.

Typical installation

FDV - PA0



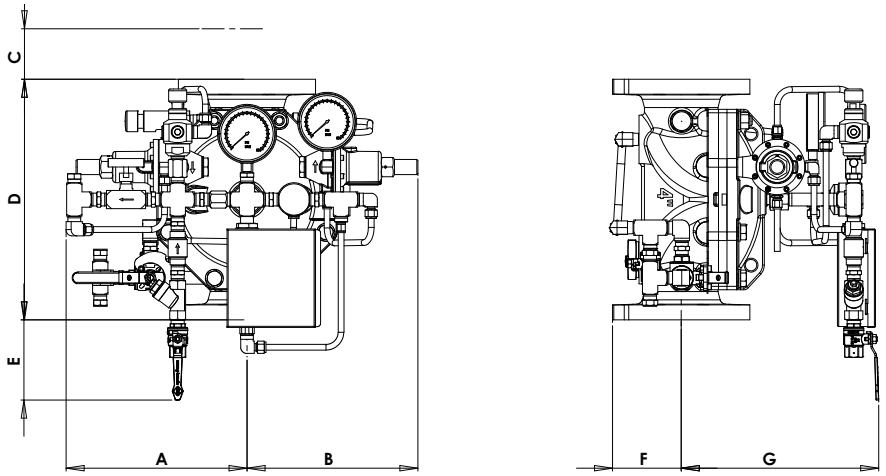
TS - Trim supply valve
ST - "Y" strainer
CV - Check valve
AT - Alarm test valve
GC - Gong Connection
DC - Drain Control Pilot Valve
DDR - Downstream drain valve

PS - Pressure Switch
HAV2 - Hydraulic Actuator Valve
PR - Pressure Reducing Pilot Valve
DPG - Downstream Pressure Gauge
WPL - Wet Pilot Line
DBV - Downstream Butterfly valve
PSA - Pressure Supply Arrestor

NV - Needle valve
OR - Orifice
CPG - Control chamber Pressure Gauge
EU - Emergency Manual Unit
UBV - Upstream Butterfly valve

Parametric drawing:

FDV-PA0



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	293	11.5	300	11.8	300	11.8	315	12.4	340	13.4	395	15.5
B	217	8.5	238	9.3	284	11.1	257	10.1	304	12	349	13.7
C	66	2.6	45	1.7	N/A	N/A	N/A	N/A	N/A	N/A	43	1.7
D	220	8.6	324	12.7	400	15.7	464	18.2	570	22.4	766	30.1
E	222	8.7	77	3	133	5.2	101	4	47	1.8	N/A	N/A
F	151	5.9	128	5	120	4.7	158	6.2	172	6.8	222	8.7
G	262	10.3	292	11.5	233	9.1	372	14.6	380	15	540	21.2
Kg/lb	20	44	37	97	42	93	72	159	108	238	240	530

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
- Wet Pilot's installation hieght.
- Deluge valve material and coating
- Deluge valve ends and standard
- Trim materials
- System installation orientation
- Additional accessories needed:
  Alarm Pressure switch
  Alarm Gong

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