RAPHAEL

Product CATALOG

FIRE PROTECTION

RAPHAEL FP

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RAPHAEL FP

ABOUT US

Raphael is leading the international market valve industry with its wide and innovative product range for water flow control.

Founded in 1949, Raphael Valves Industries Ltd., is a manufacturer of high quality control valves.
Raphael's product range includes hydraulic control valves, butterfly valves, gate valves, check valves and many other solutions for the Irrigation, Waterworks and Fire Protection markets.

Various coating technologies including epoxy, Rilsan (Nylon 11), enamel and more give us the ability to supply a high quality protection for special applications.
All valves are subject to a stringent quality control procedure – Raphael's quality management system is ISO 9001 certified, UL and FM, ABS, Lloyds, EMERCOM, CNBOP-PIB and more.We have the widest range of valves and smart solutions for many uses.

Raphael is actively engaged in advancing the domain of „smart water" and its associated innovations. Several of these smart products are designed to enhance data flow, increase visibility, and optimize technical and logistical operations.

As part of this approach, Raphael's best minds created a one of a kind ultrasonic hydrometer- „ULTRAF PRO". The first worldwide Ultrasonic flow measuring unit integrated with hydraulic valve.

RAPHAEL FP Range valves are essential components in fixed fire suppression systems, serving various industries such as Petrochemical, Oil & Gas, Offshore, and Marine. They facilitate the precise control of water, foam, and seawater flow, enabling manual or remote on-off applications. These valves are purposefully crafted to offer dependable and fail-safe solutions, particularly for fire suppression systems that require rapid response to curb the spread of flames.

OUR VISION OF
LONG-LASTING DEVELOPMENT

The availability of water is limited, yet it is the most vital resource.

At RAPHAEL, our primary goal is to create exceptionally dependable solutions that integrate the most advanced technologies to enhance network performance and conserve precious water resources. In addition to our dedication to delivering top-tier products, we take on the responsibility of maintaining the utmost standards when it comes to safety, as well as demonstrating respect for both individuals and the environment.

This is how we can make the world a better place.

« **Our mission is to improve the well-being of the world by leading the world in water flow control solutions. We protect water, one of the planet›s most essential resources, thereby raising the standard of living for millions of people around the world.**

» **Our offering is defined by the quality and sustainability of our products, which ultimately comes down to the choices we make.**

Decisions related to the materials used, the quality of components, and their impact on the environment are critical factors to consider. Nevertheless, the primary focus lies in the effectiveness of preserving water resources. Our commitment goes beyond the mere creation of sustainable products; our main objective is to support our customers in improving their water management practices, spanning from resource collection to the responsible disposal of treated effluents.

DELUGE SYSTEMS

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Deluge Systems

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Modulating Deluge Systems

*Note:
The current Deluge systems models can be obtained with our economical systems (A series).
For more details, please contact directly our representative.

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RAPHAEL FP


IN CASE OF
FIRE
OPEN DOOR
AND
PULL DOWN LEVER
TALIS

DELUGE SYSTEMS

RAPHAEL FP

Deluge Systems

Electric Actuated with Local Reset Deluge Valve

FDV - DE0

The FDV is a Fire Protection control valve for Deluge fire sprinkler systems, designed for installations in hazardous environments.
The FDV-DE0 Deluge system is actuated electrically and resets locally.
An electric detection system activates a solenoid valve through a control panel to open the FDV deluge valve. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation. Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DE0 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

Commercial Marine Residential

Industry

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

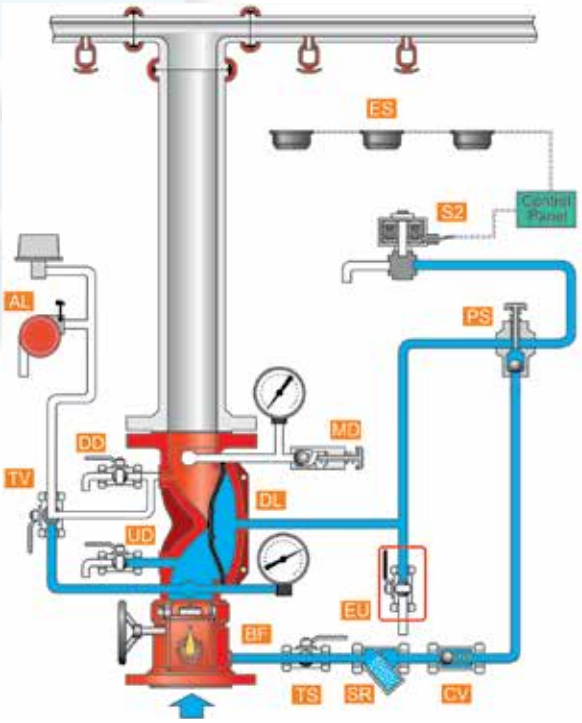
CHARACTERISTICS

- 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 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

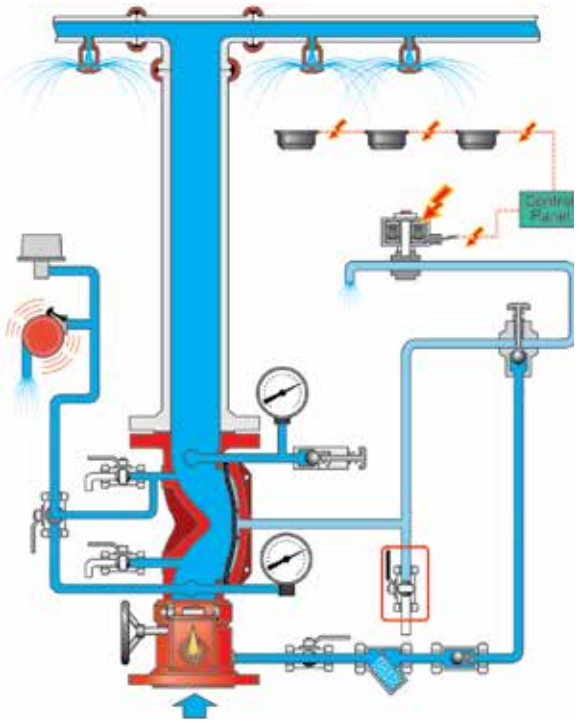
The FDV-DE0 resets to stand-by close position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Schematic drawing

Set position



Fire position



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Man/Auto Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
S2 - Solenoid 2 way
ES - Electric Sensors

OPERATION

SET position

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

FIRE situation

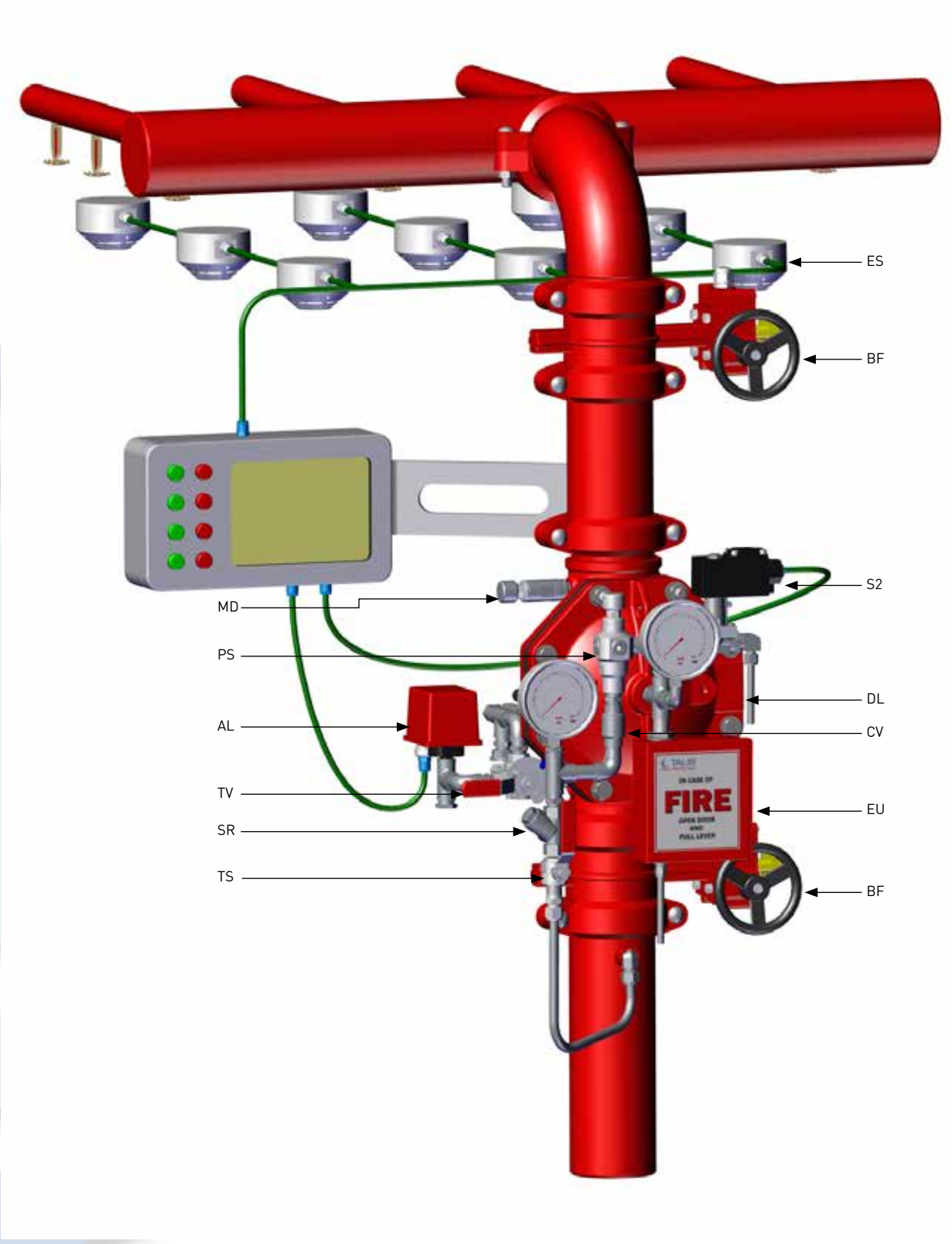
When an electric detection system senses flame heat, it triggers the main control panel that in turn,transmits an electric signal, commanding the 2 way solenoid valve (S2) to open and drain the deluge valve's control chamber.
The FDV Deluge valve opens and admits water to the spray sprinklers line.

RESET position

System reset requires the reset of the electrical alarm system to de-energize and close the solenoid valve, not allowing the FDV control chamber to drain. The PSA (PS) push button should be pressed to enable upstream pressure passage to close the FDV main valve.

FDV - DE0

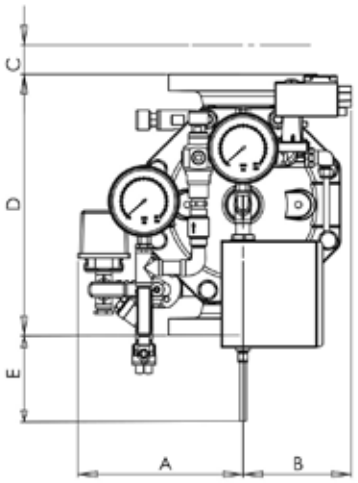
Typical installation

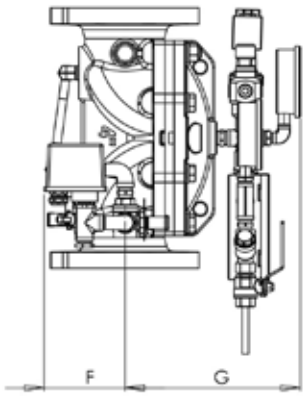


BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve

SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Man/Auto Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
S2 - Solenoid 2 way
ES - Electric Sensors





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	346	13.6
B	250	9.8	250	9.8	266	10.5	296	11.6	314	12.4	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
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	189	7.4	233	9.2	263	10.3	326	12.8	361	14.2	447	17.5
Kg/lb	10.7	23.6	24	53	46	101	73	160.9	112.5	248	229	505

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
- Solenoid Voltage
- Solenoid Enclosure
- Solenoid Protection
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Deluge Systems

Electric Actuated with 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.
The FDV-DE1 Deluge system is actuated electrically and resets remotely.
An electric detection systems activates a solenoid valve through a control panel to open the FDV deluge valve. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation. Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DE1 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

Commercial
Marine
Residential
Industry

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS
Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

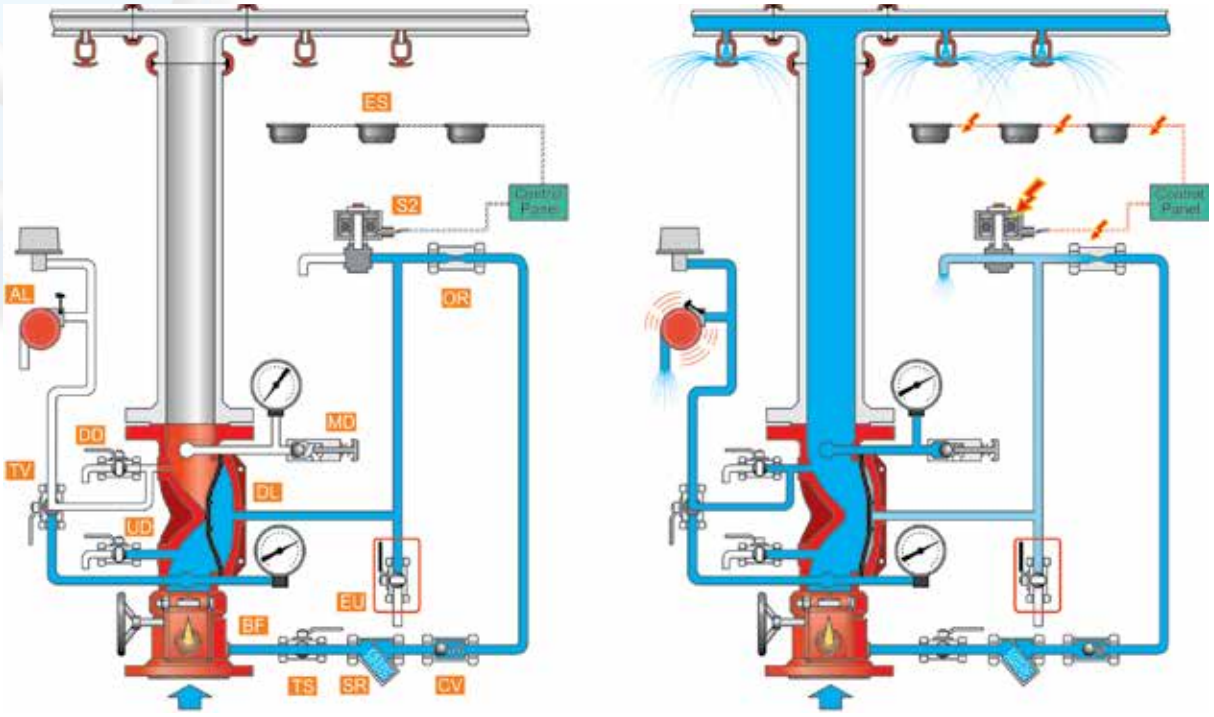
- Hydro-dynamic pattern design ensures high flow rates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The valve is actuated by an electric signal transmitted to the valve's solenoid from the main control panel, due to a flame 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

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

Schematic drawing

Set position

Fire position



DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
OR - Orifice
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
S2 - Solenoid 3 way
ES - Electric Sensors system

OPERATION

SET position

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

FIRE situation

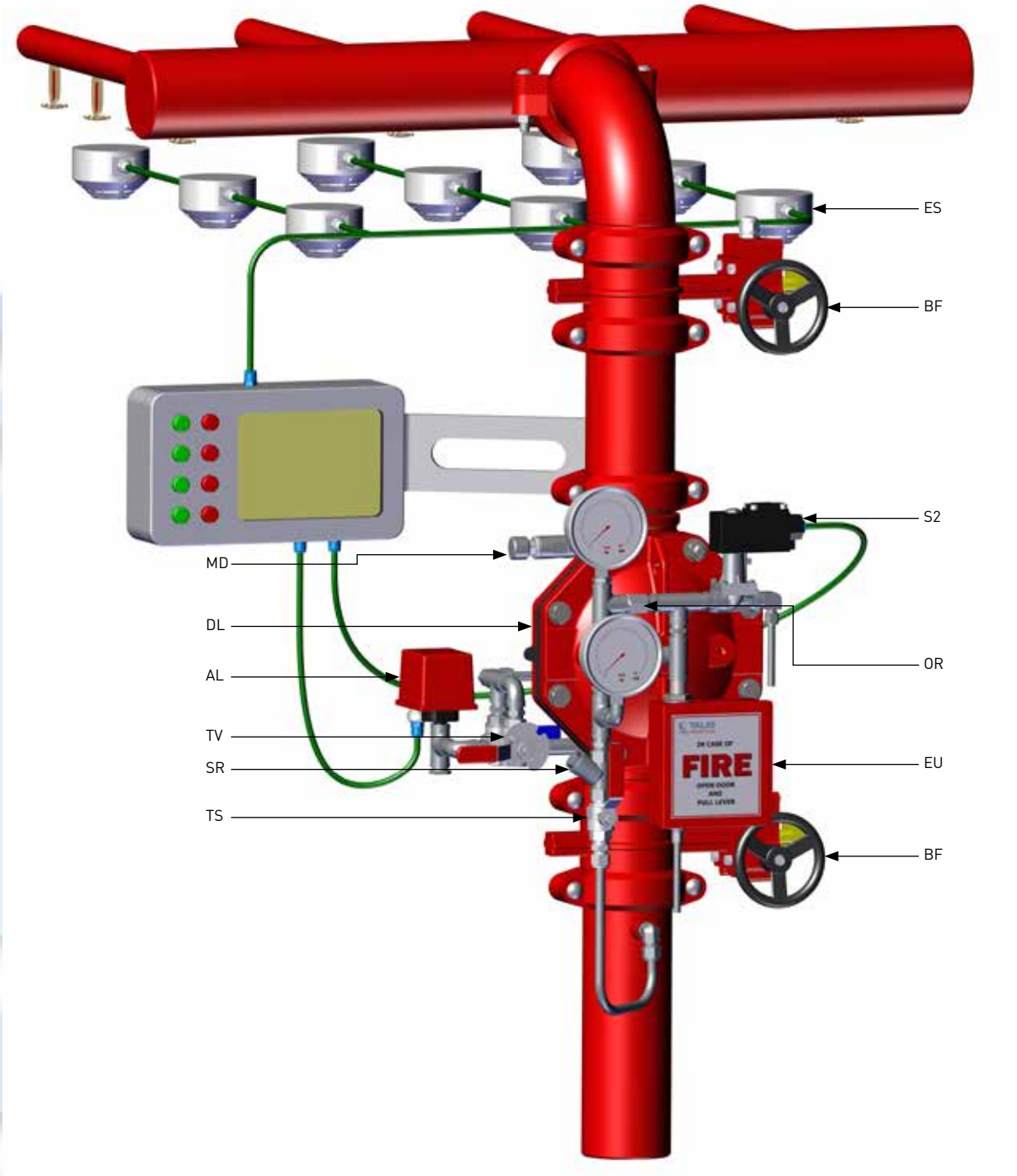
When an electric detection system senses flame heat, it triggers the main control panel that in turn, transmits an electric signal commanding the 2 way solenoid valve (S2) to open and drain the deluge valve's control chamber. The FDV Deluge valve opens and admits water to the spray sprinklers line.

RESET position

System reset requires the reset of the electrical alarm system to de-energize and close the solenoid valve not allowing the FDV control chamber to drain. Upstream water ingresses the FDV Deluge control chamber through the orifice (OR), and the valve closes.

FDV - DE1

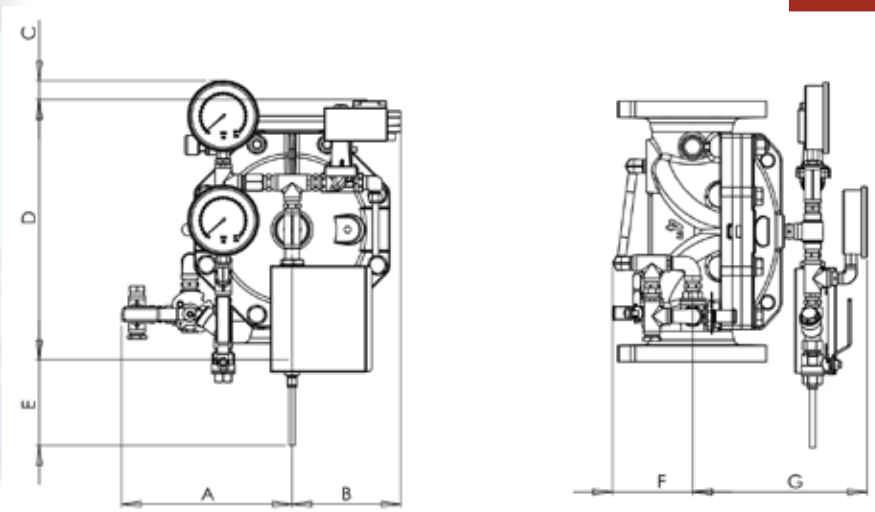
Typical installation



DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve

SR - "Y" strainer
CV - Check valve
OR - Orifice
MD -MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
S2 - Solenoid 3 way
ES - Electric Sensors system



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	460	18
Kg/lb	10	22	24	53	45	99	67	148	109	240	228	502.6

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
- Solenoid Voltage
- Solenoid Enclosure
- Solenoid Protection
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Deluge Systems

3 Way Electric Actuated with Remote Reset Deluge Valve

FDV - 3W - DE1

The FDV-3W-DE1 Deluge system is actuated electrically and resets remotely.
An electric detection system activates a 3 way solenoid valve through a control panel, to open a 3 way actuator and consequently, the FDV deluge valve opens. As the actuator fully drains the deluge valve's control chamber, the valve can transfer its full rate of flow and minimum head loss.
While in set position, the N.C. solenoid valve drains the actuator's control chamber keeping the actuator elastomeric diaphragm free of pressure, assuring this component long service life.
The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.
Designed for vertical or horizontal installation, the globe pattern, line pressure operated FDV-3W-DE1 valve features a direct elastomeric diaphragm seal, with no balancing spring or internal metallic wet components in the valve body.

MARKETS

Marine
Storage
P.O.G.
Tunnels
Airports

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS
Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

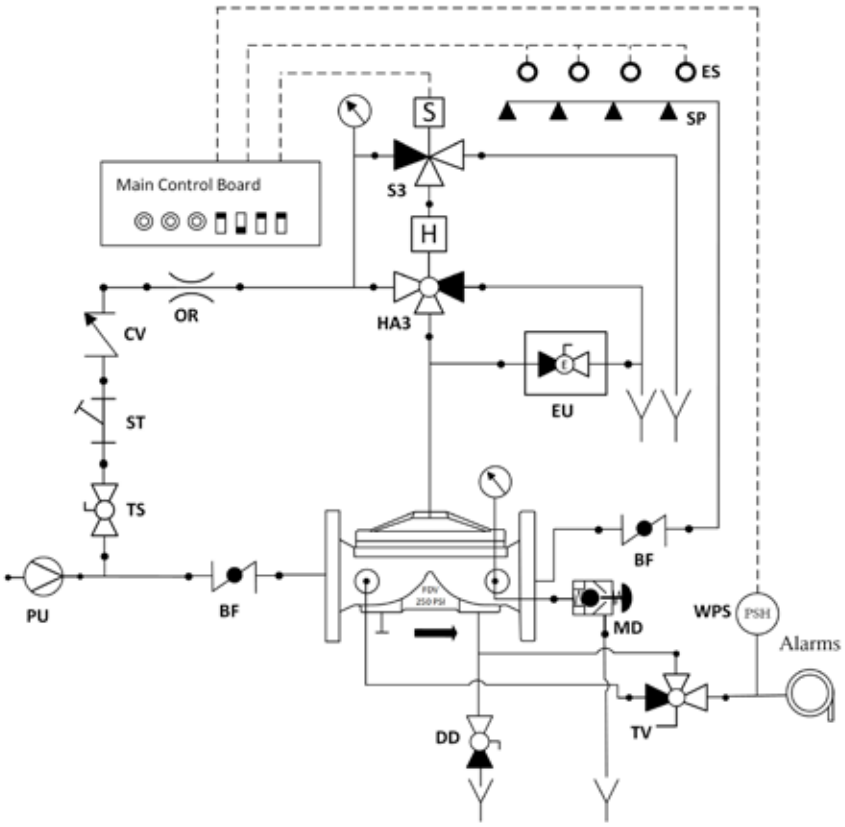
- Only three parts: body, diaphragm & cover plate. No wet metal spring inside the control chamber
- Unobstructed full bore valve
- Simple manual reset of the valve to standby position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

- 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 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

The FDV-3W-DE1 3 way control principal assures the deluge valve full opening with maximum rate of flow and minimum head loss.
This system resets to stand-by close position by de-energizing the solenoid's coil through the main control panel.

Schematic drawing



ES - Electric sensors system
APS - Air pressure switch
PU - Water pump
SP - Sprinklers spray system
HA3 - 3 way Hydraulic actuator N.O.
S3 - 3 way solenoid N.C.
EU - Emergency unit
BF - Butterfly valve
WM - Water motor alarm
MD - Manual automatic drain valve
OR - Orifice
CV - Check valve
WPS - Water pressure switch
DD - Downstream drain
TV - Alarms test valve
ST - "Y" strainer
TS - Trim supply

OPERATION

SET position

Pressurized water in the valve's control chamber is trapped by check valve (CV), and by the closed emergency valve (EU), maintaining the FDV deluge valve closed. The hydraulic actuator's (HA3) control chamber is drained by the 3 way solenoid (S3) and enables the upstream flow into the deluge valve's control chamber, maintaining the valve close.

FIRE situation

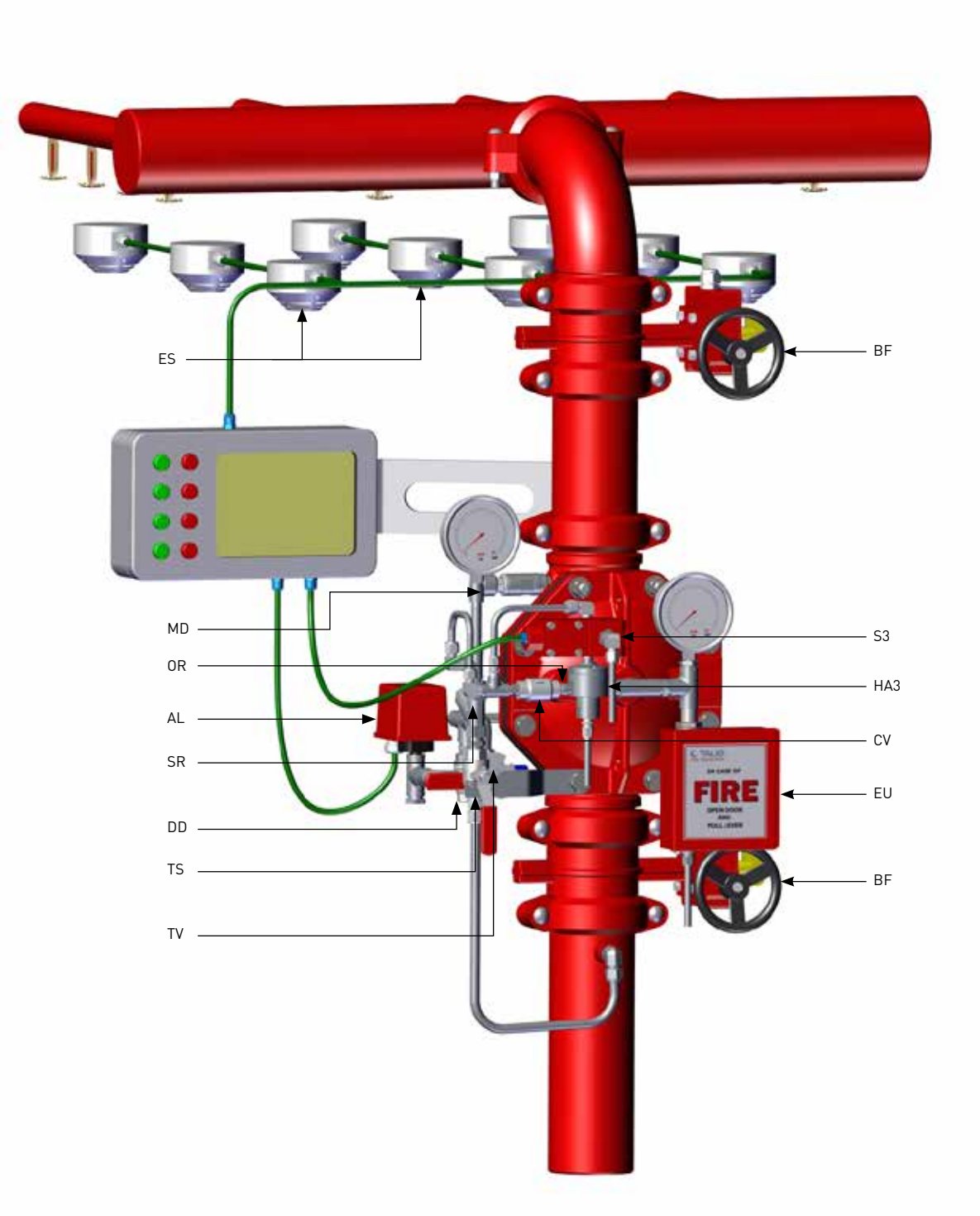
When an electric detection system (ES) senses flame heat, it triggers the main control panel that in turn, transmits an electric signal commanding the 3 way solenoid valve (S3) to change state and pressurize the actuator's control chamber. The actuator (HA3) changes state, blocks the upstream water flow to the deluge control chamber and fully drains this space. Consequently, The FDV Deluge valve opens and admits water to the spray sprinklers line (SP).

RESET position

When the electric signal from the Main control board to the solenoid's coil is interrupted, the solenoid change state and pressurize the actuator (HA3) control chamber that in turn, change state too. The actuator enables the flow from the trim pressure supply valve (TS), through the orifice (OR), into the deluge control chamber that in turn, closes. The sprinklers spray flow stops.

FDV - 3W - DE1

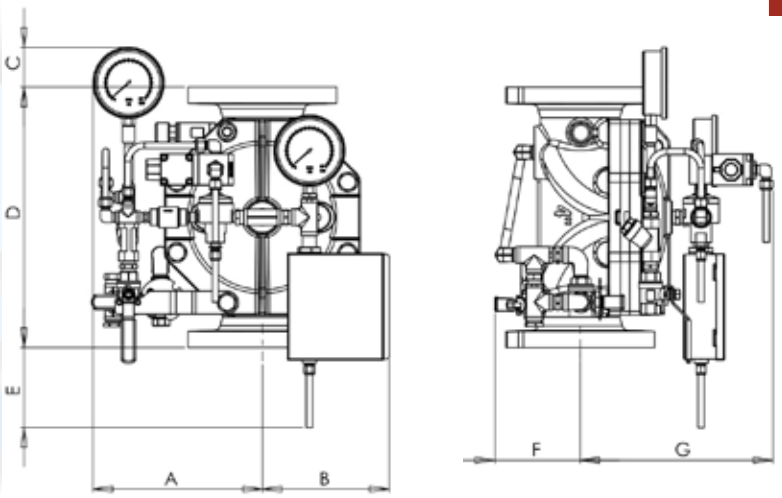
Typical installation



AL - Alarm Pressure Switch
ES - Electric Sensors system
AL - Alarm Pressure Switch
HA3 - Hydraulic actuator 3 way
S3 - Solenoid 3 way

EU - Emergency Unit
BF - Butterfly Valve
MD - Manual Automatic Drain Valve
CV - Check Valve

OR - Orifice
DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	250	9.8	251	9.9	262	10.3	287	11.3	363	14.3	433	17.4
B	194	7.6	194	7.6	194	7.6	195	7.7	232	9.1	308	12.1
C	149	5.9	57	2.2	61	2.4	N/A	N/A	N/A	N/A	N/A	N/A
D	202	8.0	325	12.8	400	15.7	462	18.2	580	22.8	766	30.2
E	222	8.7	160	6.3	123	4.8	90	3.5	36	1.4	N/A	N/A
F	250	9.8	132	5.2	132	5.2	143	5.6	172	6.8	203	8
G	194	7.6	268	10.6	295	11.6	362	14.3	397	15.6	487	19.2
Kg/lb	9.4	20.7	28.5	62.7	44.2	97.2	54.8	120.6	100.8	221.8	228.8	503.4

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
- Solenoid Voltage
- Solenoid Protection
- System installation orientation
- Additional accessories needed

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

Deluge Systems

Pneumatic Actuated with Local Reset Deluge Valve

FDV - DP0

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

The FDV-DP0 Deluge system is actuated pneumatically and resets locally.

When the pneumatic dry pilot detection line is exposed to flame heat, its automatic fire sprinklers shatter-open, while venting the air pressure from the FDV-DP0's actuator, commanding the deluge valve to open.

The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DP0 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

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

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

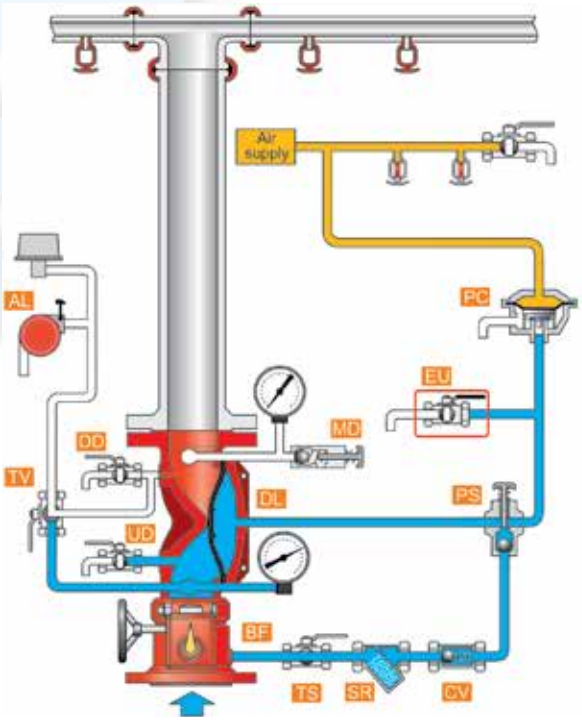
CHARACTERISTICS

- 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

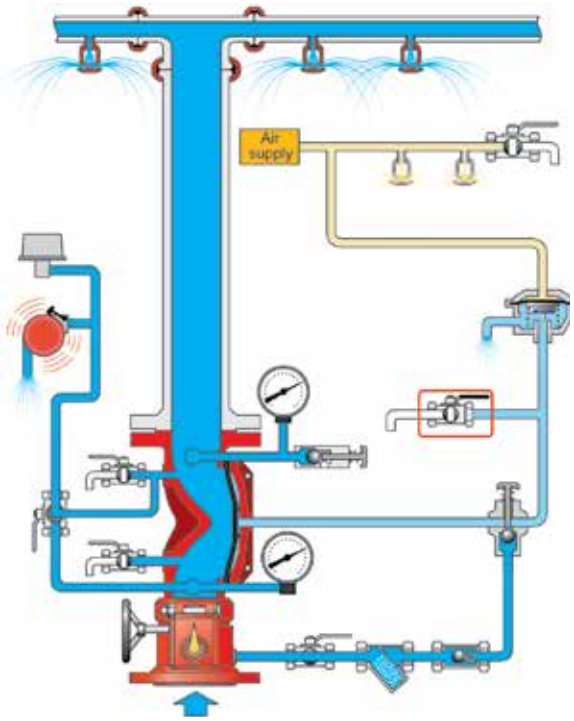
The FDV-DP0 resets to stand-by close position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Schematic drawing

Set position



Fire position



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Man/Auto Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure to Close

OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by the closed PSA (PA), the closed PA-PTC actuator (PC) and by the closed emergency valve (EU), maintaining the FDV Deluge valve (DL) closed.

FIRE situation

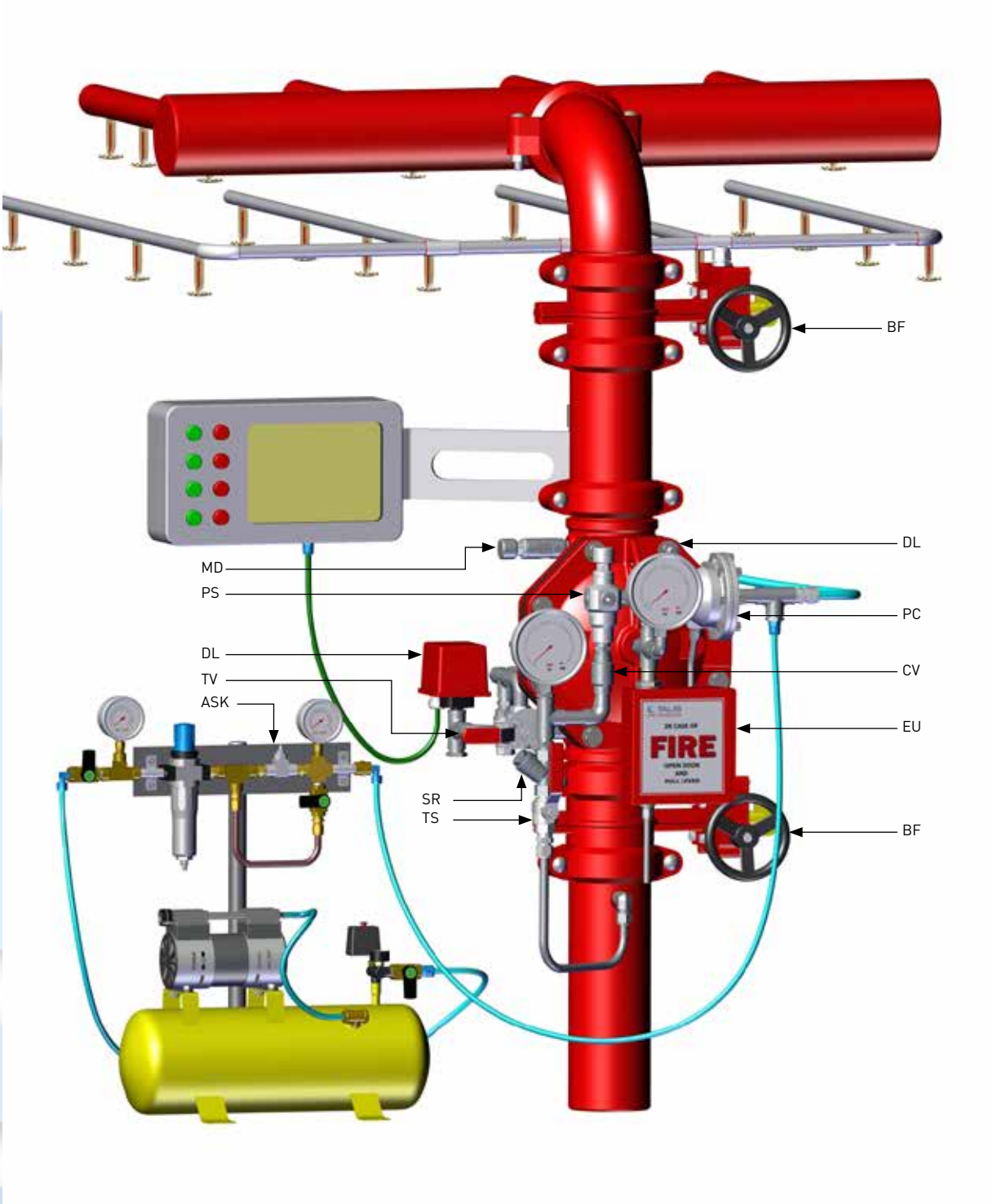
When some of the Dry Pilot detection line's automatic fire sprinklers are subjected to flames heat and shatter-open, the pilot detection line depressurizes the PA-PTC control chamber. The PA-PTC (PC) opens and drains the deluge valve's control chamber.
The FDV deluge valve opens and admits water to the spray sprinklers line.

RESET position

System reset requires the replacement of all the Dry Pilot detection Line's shattered-open automatic fire sprinklers.
The detection line is then pressurizing together with the PA-PTC actuator, to reset it to closed position.
The PSA (PS) push button should be pressed to enable the control chamber filling, closing the FDV deluge valve.

FDV - DP0

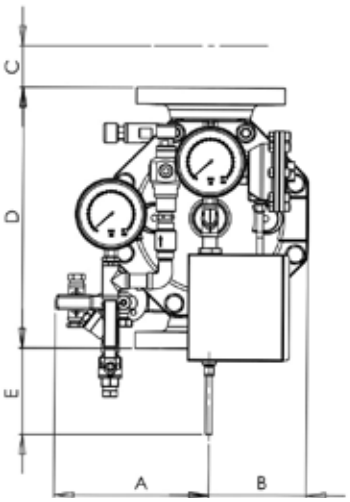
Typical installation

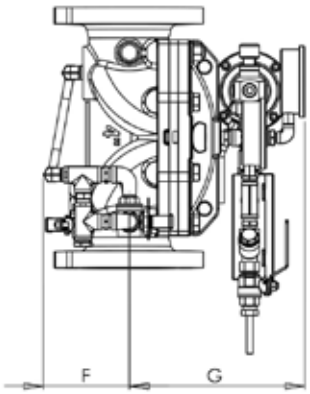


BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve

SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Man/Auto Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure to Close
ASK - Air Supply Kit





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	346	13.6
B	250	9.8	250	9.8	266	10.5	296	11.6	314	12.4	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	189	7.4	233	9.2	263	10.3	326	12.8	361	14.2	461	18
Kg/lb	11.8	26	25	55	47	104	73	160.9	112.5	248	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
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Deluge Systems

Pneumatic Actuated with Remote Reset Deluge Valve

FDV - DP1

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

The FDV-DP1 Deluge system is actuated pneumatically and resets remotely.

When the pneumatic dry pilot detection line is exposed to flame heat, its automatic fire sprinklers shatter-open, venting the air pressure from the FDV-DP1's actuator, commanding the deluge valve to open. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DP1 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 · Storage · P.O.G. · Tunnels · Airports · Industry

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS:
Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

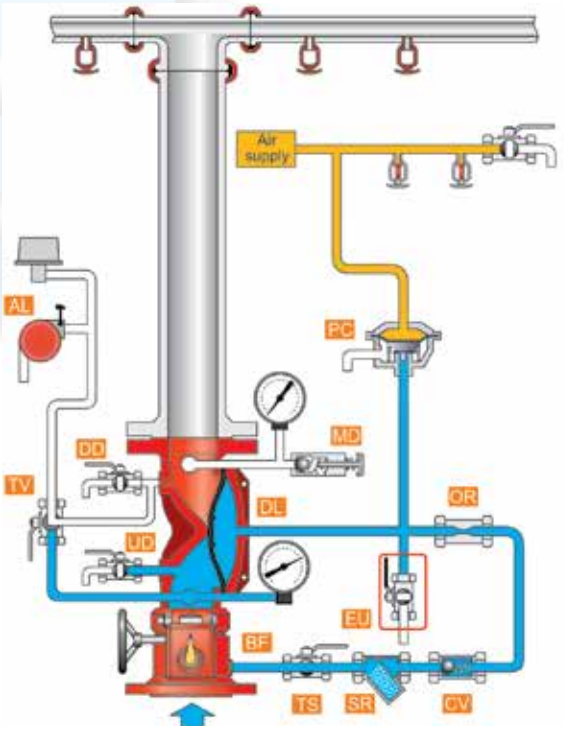
CHARACTERISTICS

- 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 a 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

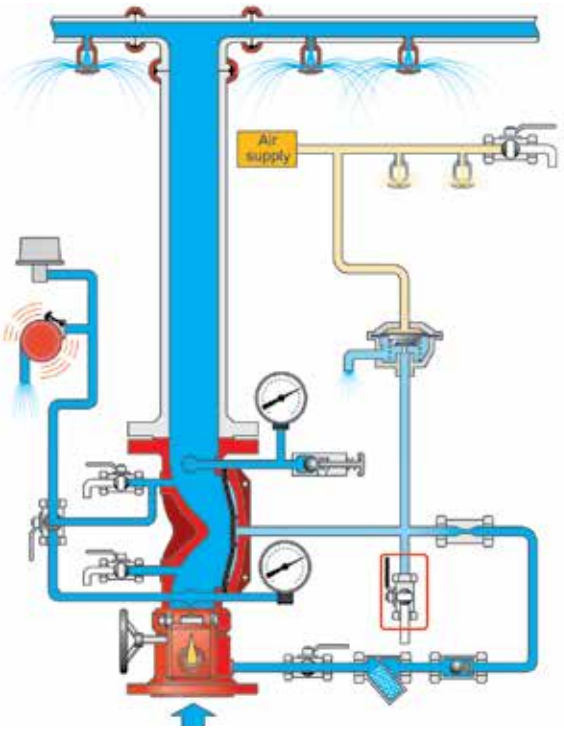
The FDV-DP1 resets to stand-by close position by pressurizing the Dry Pilot.

Schematic drawing

Set position



Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve

AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve

OR - Orifice
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit

OPERATION

SET position

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 automatic Wet Pilot Line sprinklers. The hydraulic pressure accumulated in the Wet pilot detection line maintains the FDV deluge valve (DL) closed.

FIRE situation

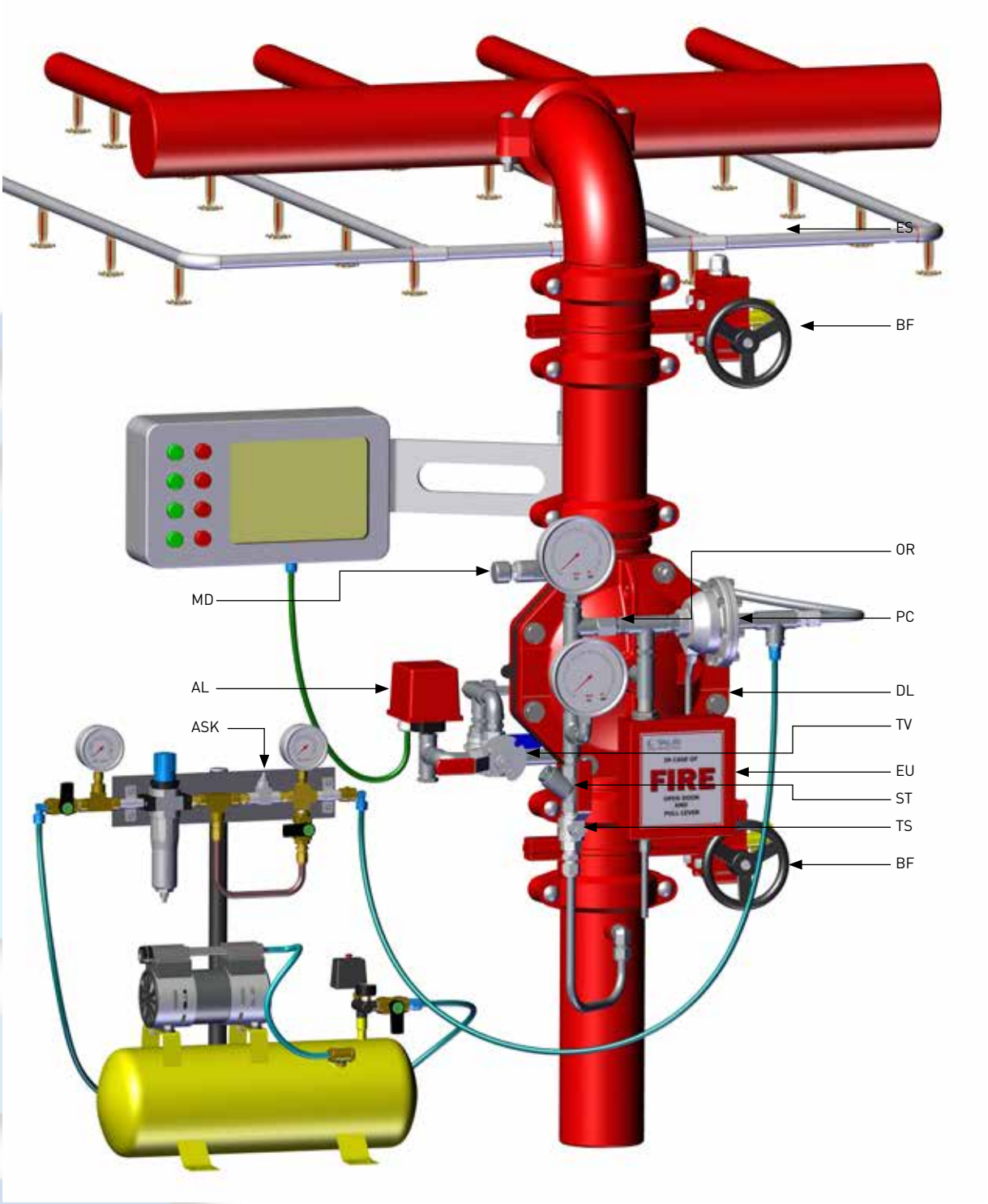
When the Wet pilot detection line's automatic fire sprinklers are subjected to flame heat and shatter-open, it enables the FDV control chamber to drain and de-pressurize, opening of the deluge valve and admitting water into the spray sprinkler system. The Deluge system incorporates an emergency valve,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

RESET position

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.

FDV - DP1

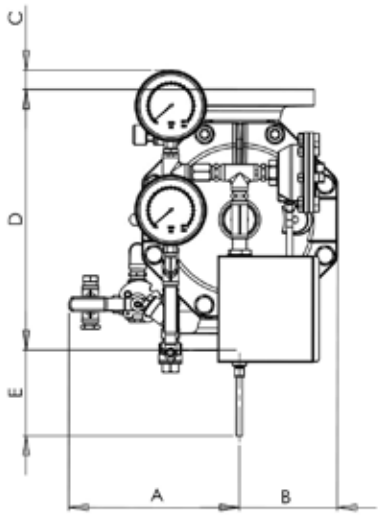
Typical installation

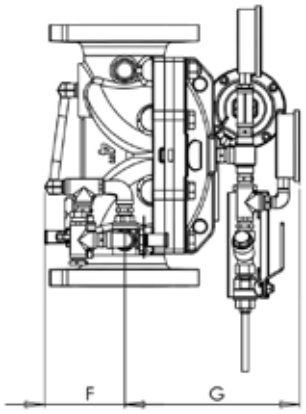


BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve

AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
ASK - Air Supply Kit

OR - Orifice
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit





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	473	18.6
Kg/lb	11	24	24	53	46	101	68	150	109	240	229	505

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
- Additional accessories needed

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

RAPHAEL FP

Deluge Systems

Electric-Pneumatic Actuated with Local Reset Deluge Valve

FDV - DC0

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

The FDV-DC0 Deluge system is actuated electrically or pneumatically and resets locally.

Two detection systems, can independently activate an actuator to open the deluge valve: a pneumatic Dry Pilot detection Line and/or an electric solenoid, connected to sensors through a control Panel. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DC0 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

Commercial | Industry | Storage

P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS
Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

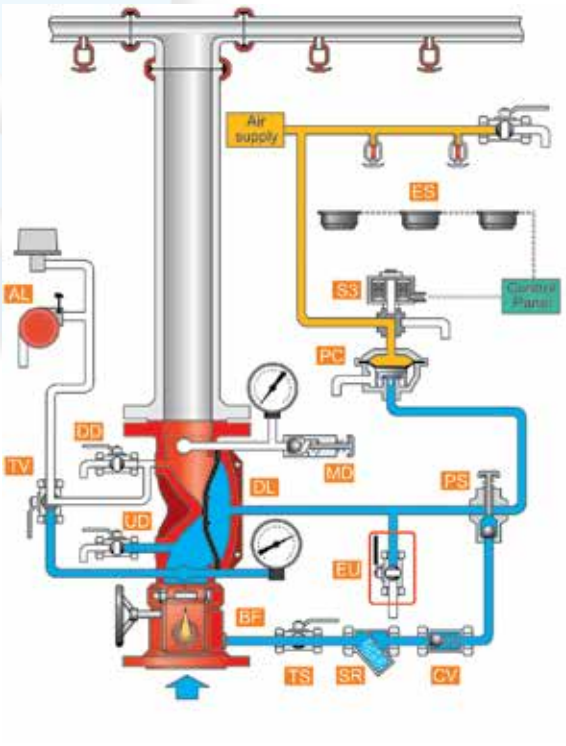
CHARACTERISTICS

- 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 valve is actuated by an electric signal conveyed to the valve's solenoid or by Dry Pilot Line's pneumatic pressure release due to its exposure to flame heat
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges

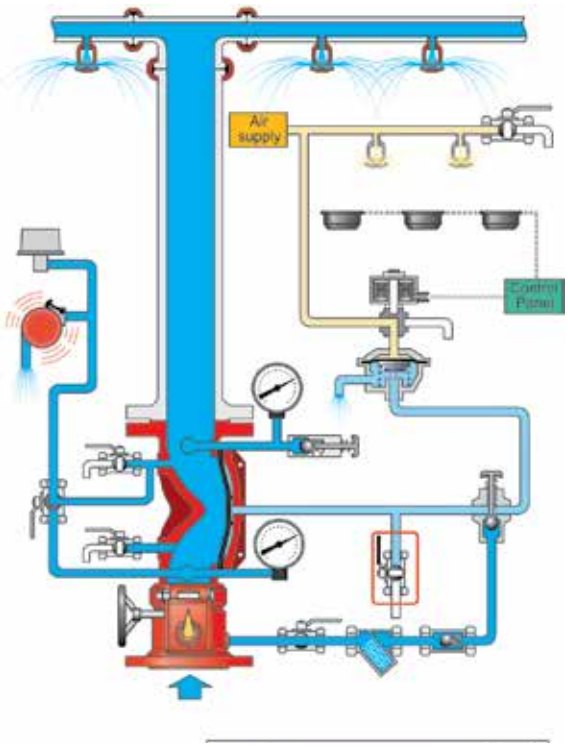
The FDV-DC0 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot Line and manually operating the PSA device.

Schematic drawing

Set position



Fire position



DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - FDV Deluge valve

SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure to Close
S3 - Solenoid 3 way

OPERATION

SET position

Pressurized water in the valve's control chamber is trapped by the check-valve (5), by the closed PA-PTC actuator (9) and by the closed emergency valve (8), maintaining the deluge valve in its closed position.
The air pressure accumulated in the Dry pilot Detection line is conveyed to the PA-PTC actuator, through a 3 way solenoid valve, maintaining the Deluge valve closed.

FIRE situation

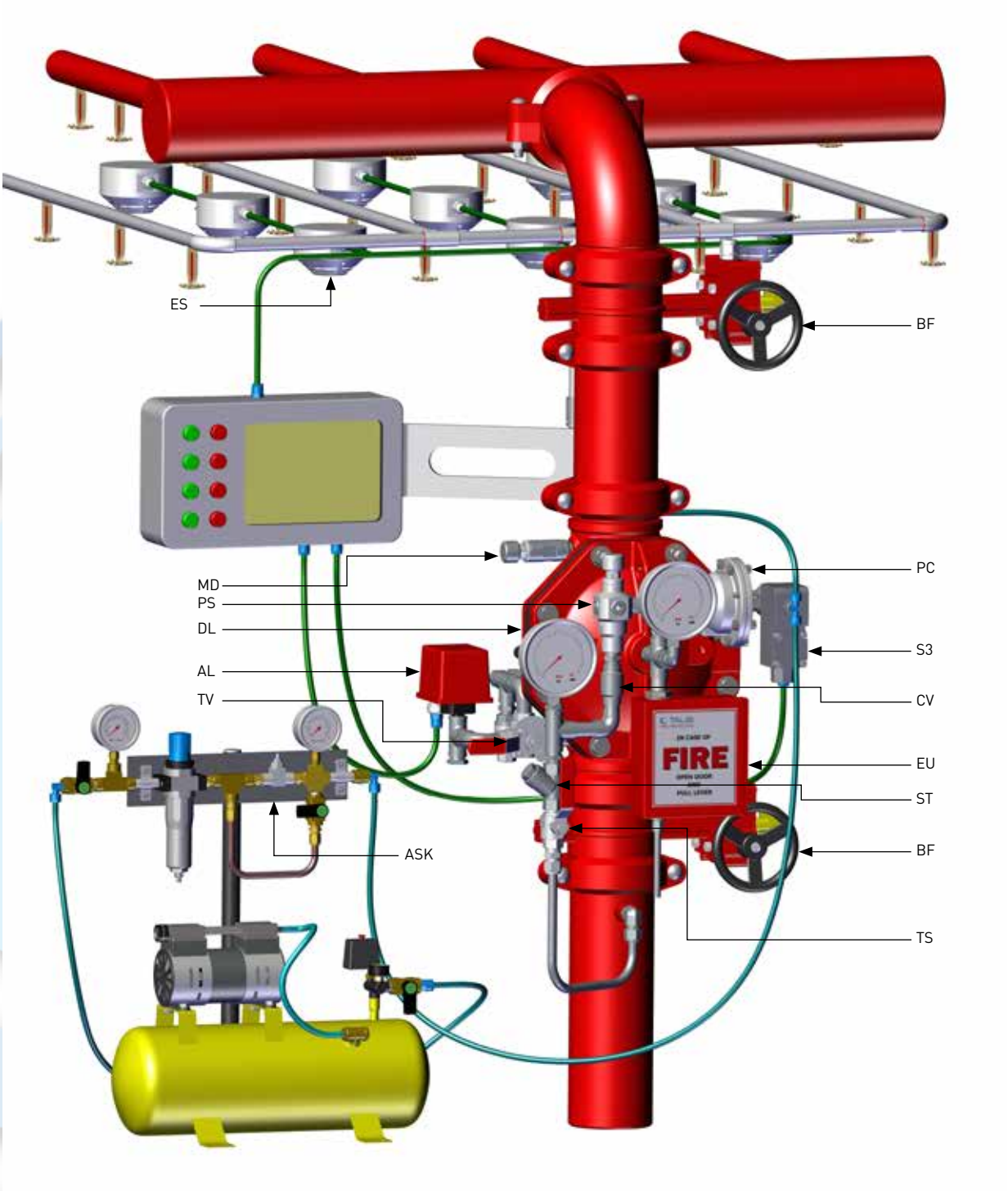
When some of the Wet pilot detection line's automatic fire sprinklers are subjected to the predetermined temperature levels and shutter-open, the pilot line de-pressurizes, tripping open the PA-PTC. Alternatively, an electric detection system senses heat and triggers the main control board that in turn, energizes the 3 way solenoid valve.
The solenoid valve bypasses the Dry pilot detection line depressurizing the PA-PTC. The FDV-DC0's control chamber is 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. Alternatively, the electrical alarm system has to be reset and the solenoid de-energized. Resetting both Detection line and solenoid valve, the PA-PTC actuator pressurizes and closes the FDV deluge valve.

FDV - DC0

Typical installation



DL - FDV Deluge valve
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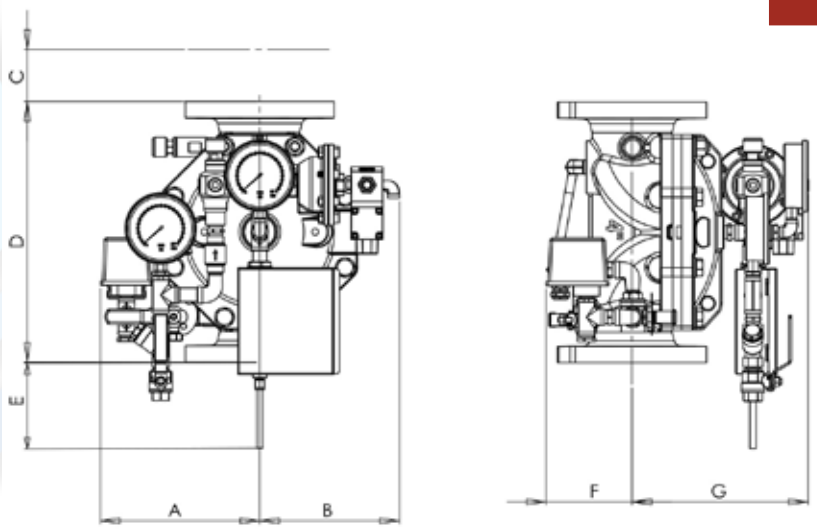
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - FDV Deluge valve

SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure to Close
S3 - Solenoid 3 way
ASK - Air Supply Kit



Dimensions Table

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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
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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	473	18.6
Kg/lb	11	24	24	53	46	101	68	150	109	240	229	505

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
- 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.

Deluge Systems

Electric-Pneumatic Actuated with Remote Reset Deluge Valve

FDV - DC1

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

The FDV-DC1 Deluge system is actuated electrically or pneumatically and can be reset from a remote location. Two detection systems, can independently activate an actuator to open the deluge valve: a pneumatic Dry Pilot detection Line and/or an electric solenoid, connected to sensors through a control panel . The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-DC1 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

Industry

Storage

P.O.G.

Airport

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS
Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

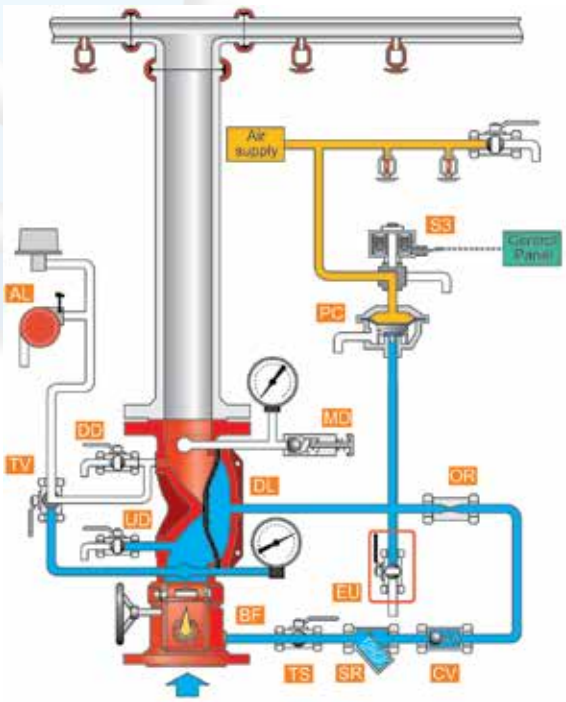
CHARACTERISTICS

- 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 valve is actuated by an electric signal conveyed to the valve's solenoid or 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

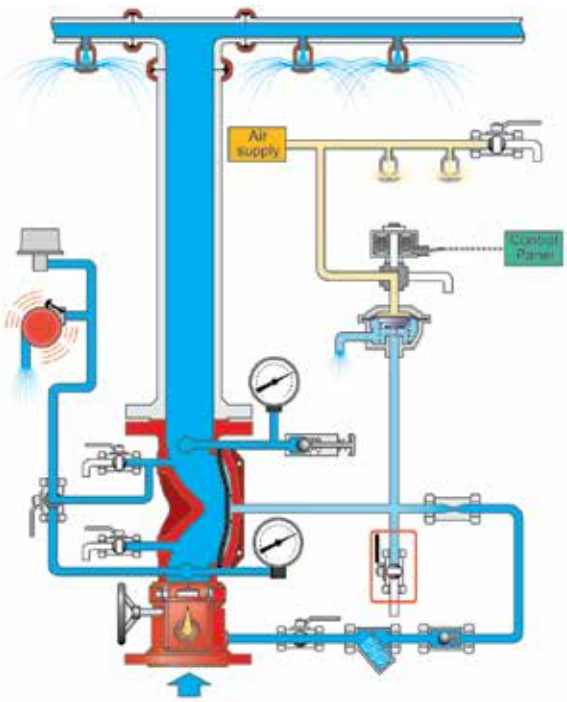
The FDV-DC1 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot Line.

Schematic drawing

Set position



Fire position



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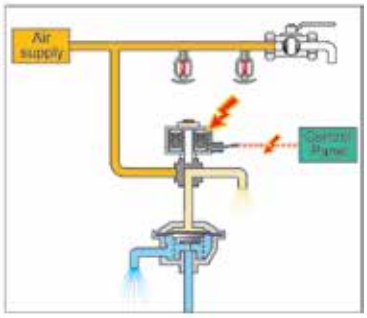
EU - Emergency Manual Unit
PC - PTC – Pneumatic Actuator-Pressure To Close
S3 - Solenoid 3 way



OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by check valve (CV), the closed PA-PTC actuator (PC) and by the closed emergency valve (EU), maintaining the deluge valve in closed position. The air pressure accumulated in the Dry pilot Detection line is conveyed to the PA-PTC actuator, through a 3 way solenoid (S3) valve, maintaining the Deluge valve closed.

FIRE situation

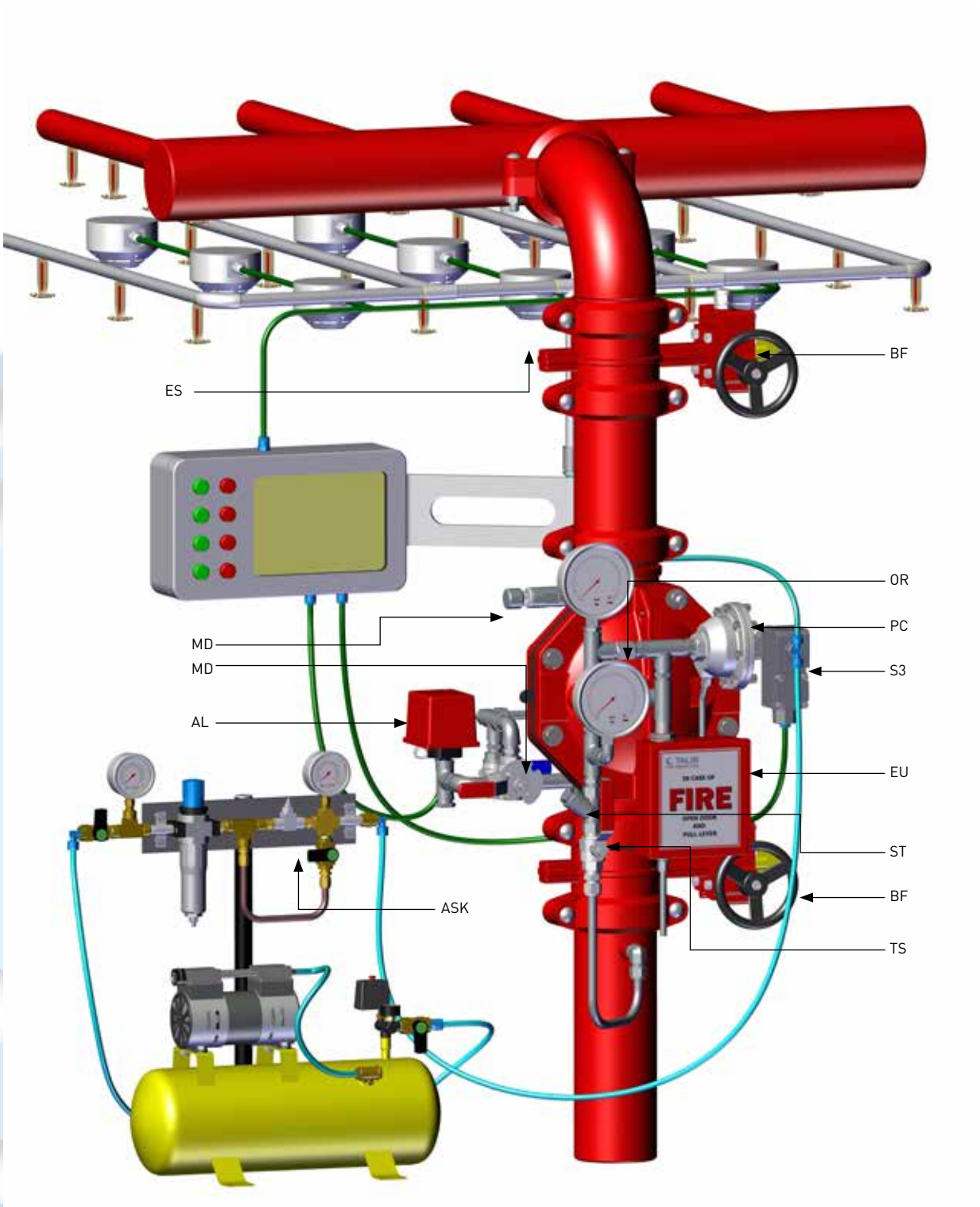
When some of the Wet pilot detection line's automatic fire sprinklers are subjected to the predetermined temperature levels and shutter-open, the pilot line de-pressurizes, tripping open the PA-PTC. Alternatively, an electric detection system senses heat and triggers the main control board that in turn, energizes the 3 way solenoid valve. The solenoid valve bypasses the Dry pilot detection line depressurizing the PA-PTC. The FDV-DC0's control chamber is 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. Alternatively, the electrical alarm system has to be reset and the solenoid de-energized. By this, the PA-PTC actuator pressurizes and closes the FDV deluge valve's drain.Upstream water passing through the orifice (OR), pressurizes the FDV Deluge control chamber and the valve closes.

FDV - DC1

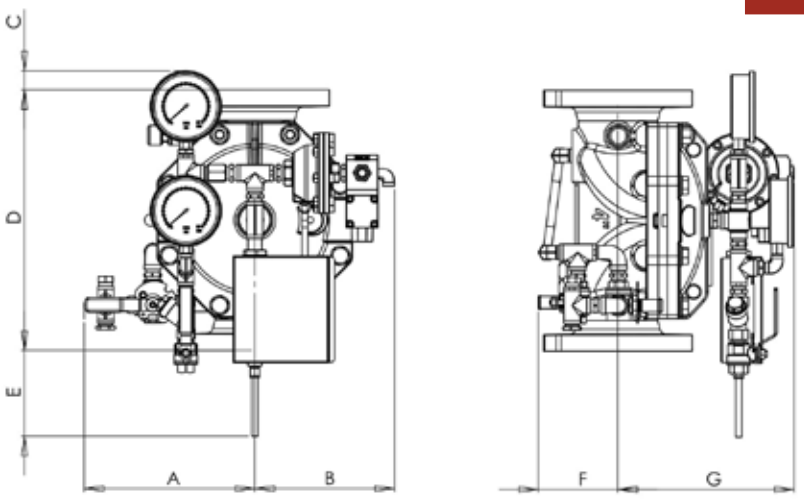
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer

CV - Check valve
OR - Orifice
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve

EU - Emergency Manual Unit
PC - PTC – Pneumatic Actuator-Pressure To Close
S3 - Solenoid 3 way
ASK - Air Supply Kit



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	346	13.6
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	460	18
Kg/lb	12	26	26	57	47	104	69	152	111	245	231	509

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
- Wet Pilot's height
- Solenoid Enclosure
- Solenoid Protection
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Deluge Systems

Hydraulic Actuated, Local reset Deluge Valve

FDV - DH0

The FDV is a Fire Protection control valve for Deluge fire sprinkler systems, designed for installations in hazardous environments.
The FDV-DH0 Deluge system is actuated hydraulicaly and resets locally.
When a hydraulic detection system, a Wet Pilot detection line, is exposed to a predetermined temperature level, its automatic fire sprinklers shatter open and commanding the FDV-DH0 deluge valve to open.
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-DH0 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 Commercial Residential

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

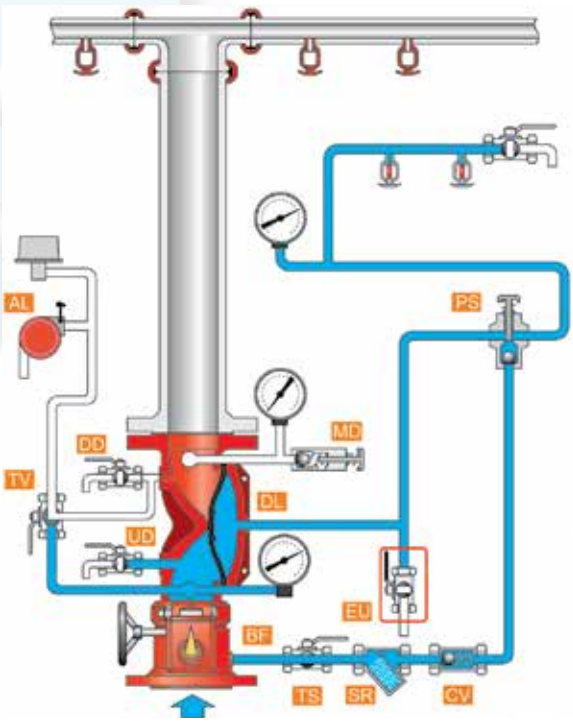
CHARACTERISTICS

- 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

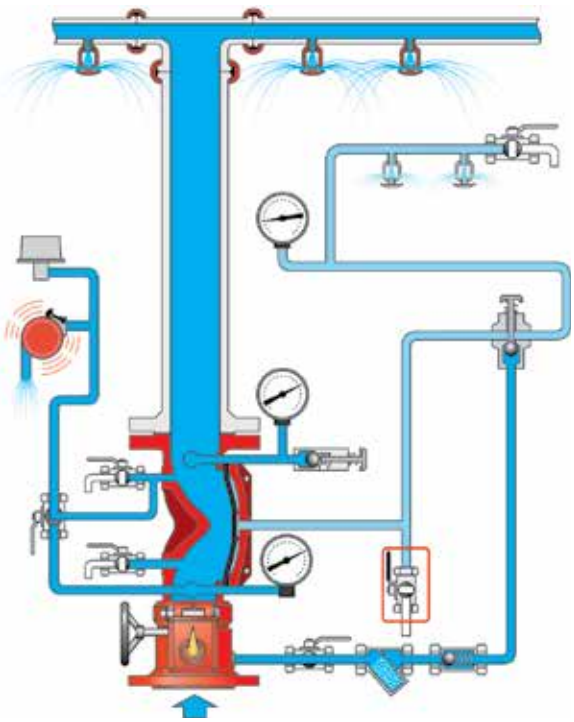
The FDV-DH0 resets to stand-by close position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Schematic drawing

Set position



Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Man/Auto Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit

OPERATION

SET position

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

FIRE situation

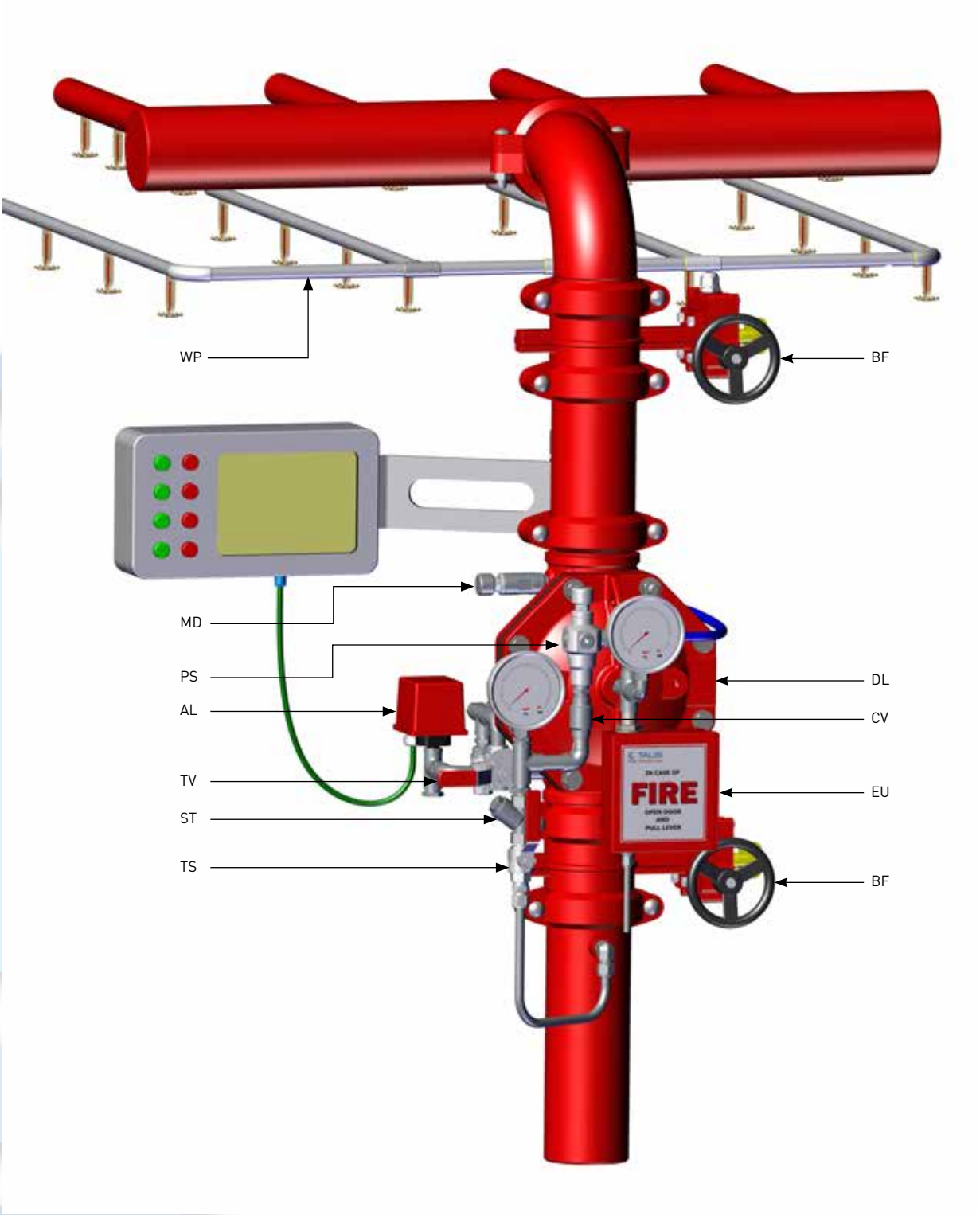
When the Wet pilot detection line's automatic fire sprinklers are subjected to flame heat and shatter-open, it enables the FDV control chamber to drain and de-pressurize, opening of the deluge valve and admitting water into the spray sprinkler system. The Deluge system incorporates an emergency valve,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

RESET position

System reset requires a replacement 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 [PS] push button should be pressed to enable upstream pressure passage to close the FDV's main valve.

FDV - DH0

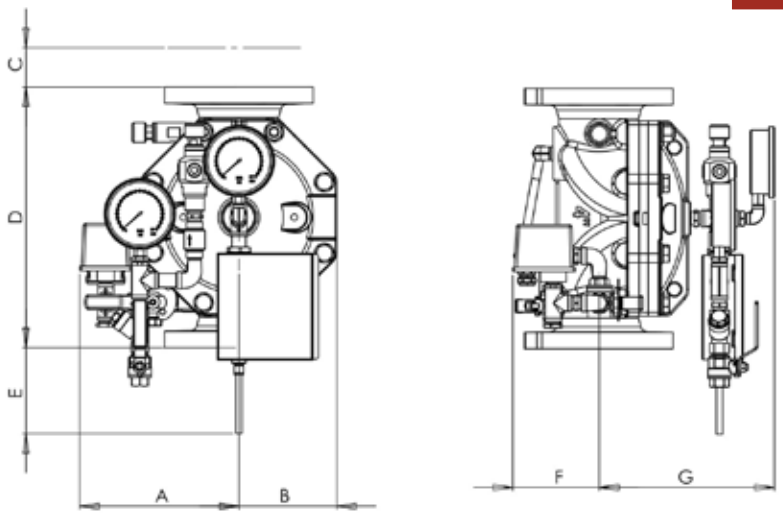
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
WP - Wet Pilot

AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve

PS - PSA – Pressure Supply Arrestor
MD - MADV – Man/Auto Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit



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	346	13.6
B	250	9.8	250	9.8	266	10.5	296	11.6	314	12.4	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	189	7.4	233	9.2	263	10.3	326	12.8	361	14.2	461	18
Kg/lb	9.5	21	23	51	45	99	67	148	108	238	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
- Wet Pilot's height.
- System installation orientation
- Additional accessories needed

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

Deluge Systems

Hydraulic Actuated with 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:
40mm to 250mm (1½" to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

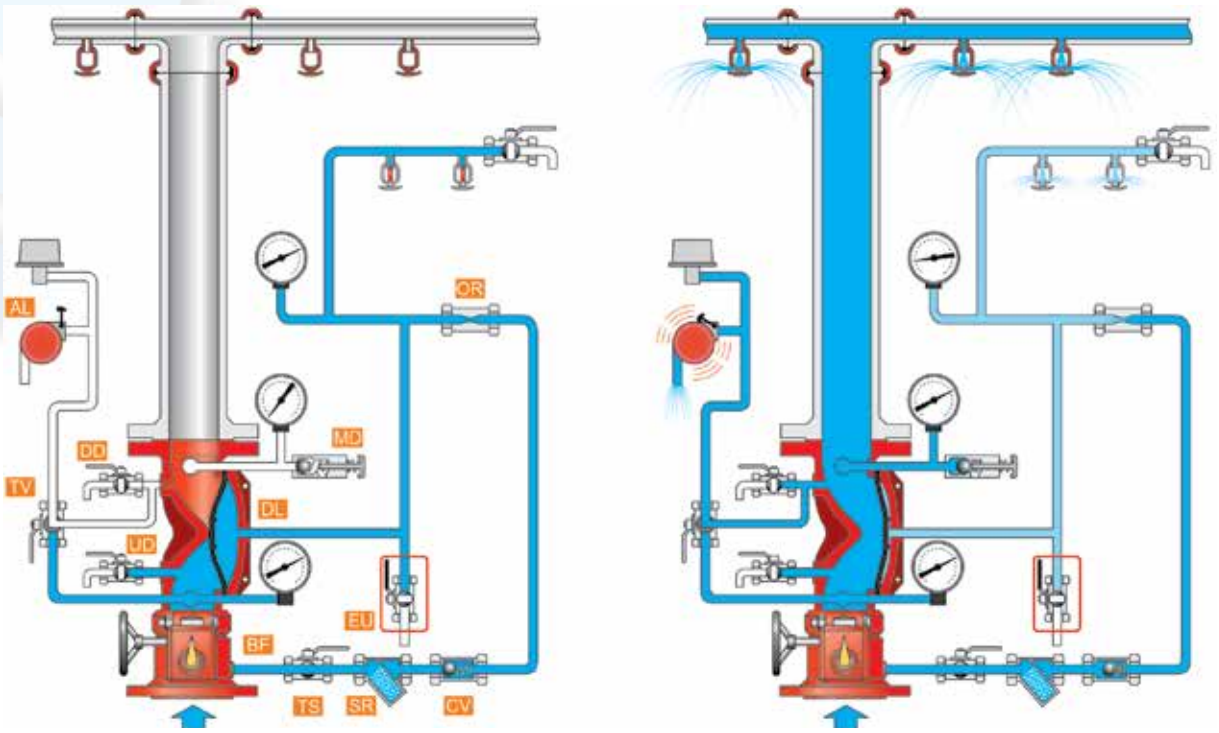
- Hydro-dynamic pattern design ensures high flow rates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The trip is actuated by a Wet Pilot Line's hydraulic pressure release due to its exposure to flame heat
- Soft closing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

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

Schematic drawing

Set position

Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms

TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
OR - Orifice
MD - MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure to Close

OPERATION

SET position

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

FIRE situation

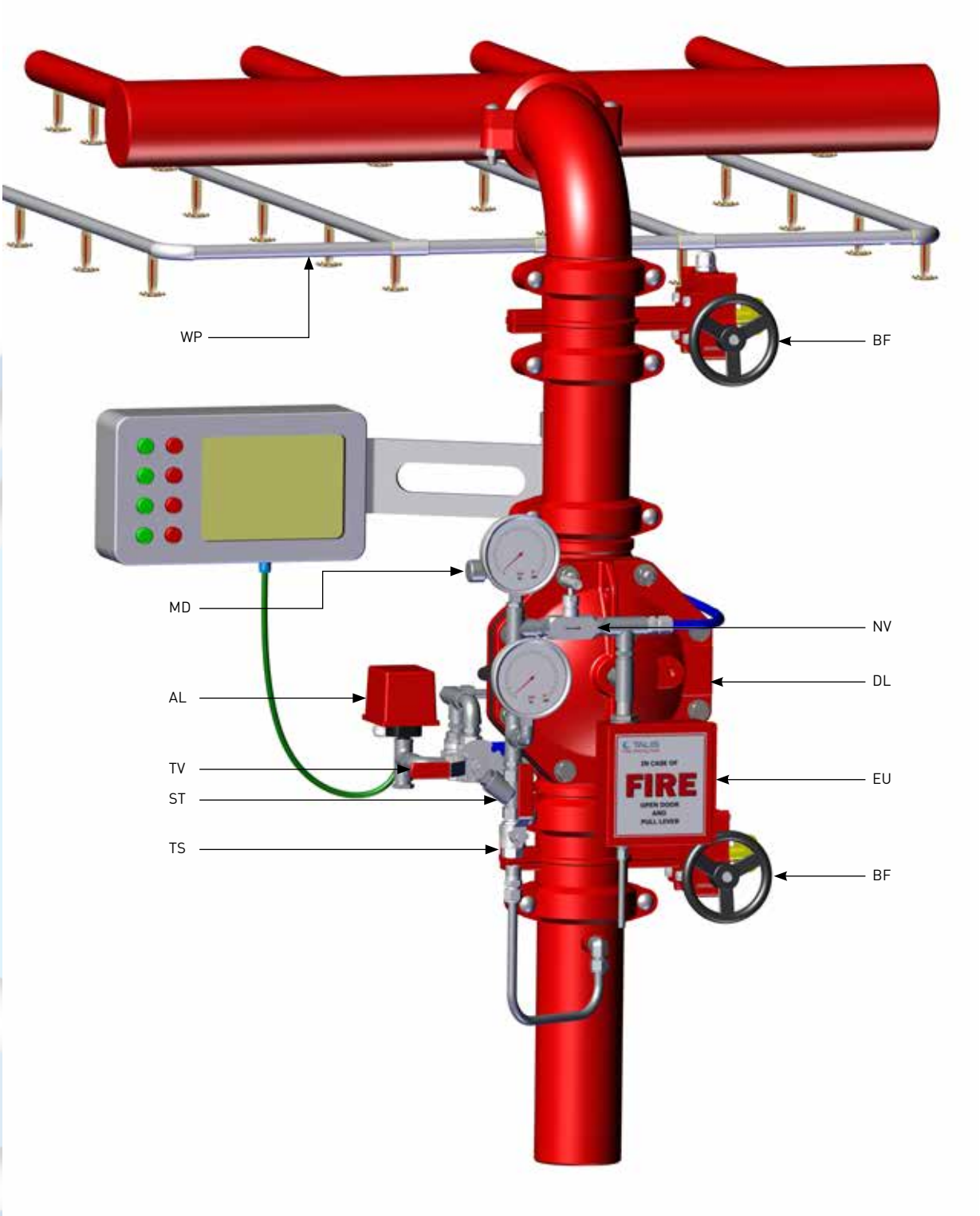
When some of the Wet pilot detection line's automatic fire sprinklers are subjected to flames heat and shatter-open, the pilot detection line depressurizes and the PA-PTC control chamber. The PA-PTC (PC) opens and drains the deluge valve's control chamber. The FDV deluge valve opens and admits water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

RESET position

System reset requires the replacement of all of the dry pilot detection Line's shattered-open automatic fire sprinklers. The detection line is then pressurized, the PA-PTC actuator, to reset it to closed position. The FDV valve control chamber pressurizes as well and the valve closes.

FDV - DH1

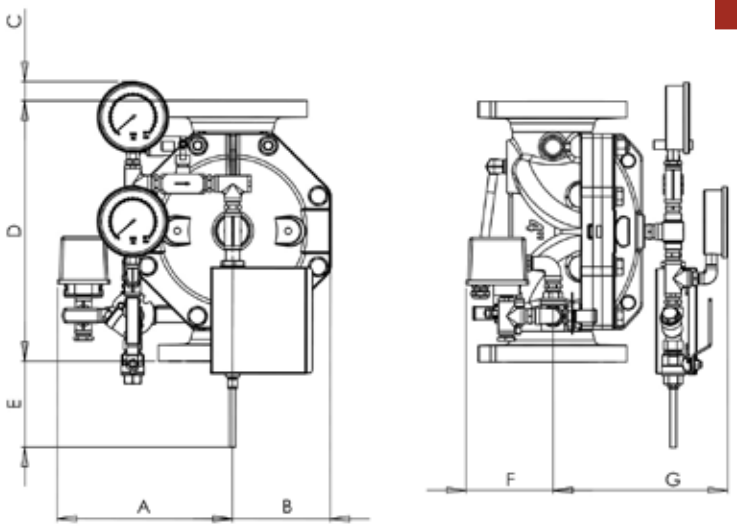
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
WP - Wet Pilot
AL - Acoustic & Electric alarms

TS -Trim supply valve
SR - "Y" strainer
OR - Orifice

MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
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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
- Energize to Open/Close valve
- Wet Pilot's height.
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Deluge Systems

3 Way Hydraulic Actuated with Remote Reset Deluge Valve

FDV - 3W - DH1

The FDV-3W-DH1 Deluge system is actuated hydraulically and resets remotely.

When one or more of the wet pilot detection line's automatic sprinklers is subjected to flame heat and shatter-open, the pressure at the line decreases. Consequently, the pressure at the 3 way actuator control chamber decreases too and the actuator change state. If at set state, water from the valve's upstream passed through the actuator and maintained the deluge valve close, then now the actuator drains the deluge valve's control chamber. This causes the deluge valve to open fully, 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, the globe pattern, line pressure operated FDV-DH1 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 minimum head loss.

MARKETS

Marine · Industry · Storage · 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)

APPROVALS

ADVANTAGES

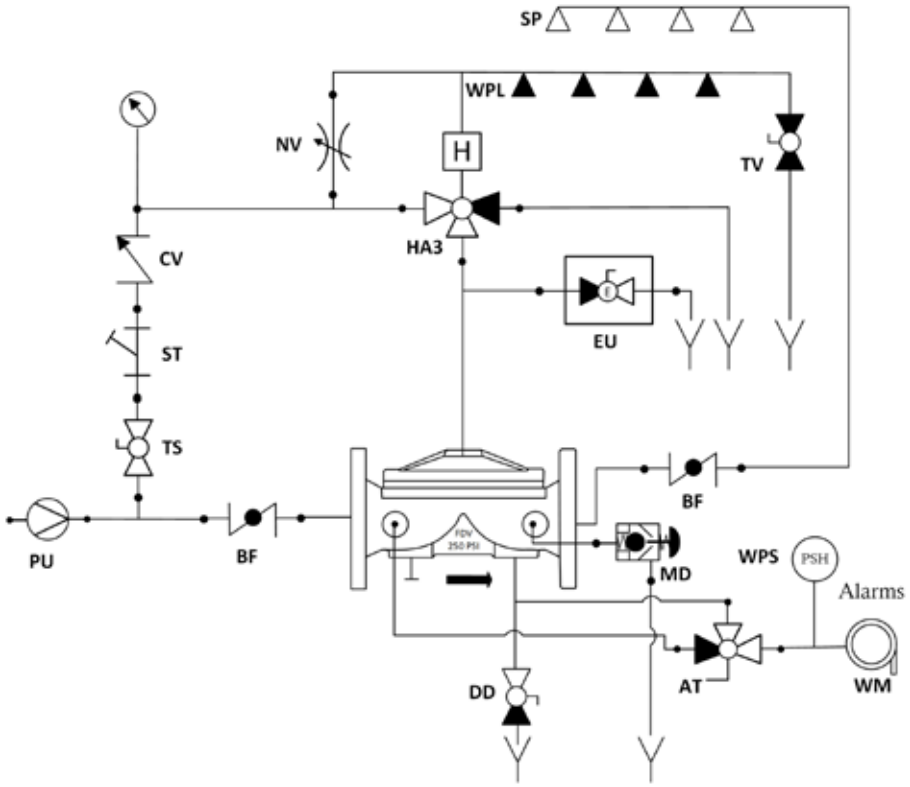
- Only three parts: body, diaphragm & cover plate. No wet metal spring inside the control chamber
- Unobstructed full bore valve
- Simple manual reset of the valve to standby position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

- 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 pressure drop at the pilot line, due to a flame heat that caused one or more automatic sprinkler to shutter open
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges

The FDV-3W-DH1 3 way control principal assures the deluge valve full opening with maximum rate of flow and minimum head loss.
This system resets to stand-by close position by shutter open sprinkler replacement, and re-pressurizing the pilot line.

Schematic drawing



WPL -	Wet pilot line	**AT** -	Alarms test valve	**NV** -	Needle valve
WPS -	Water pressure switch	**EU** -	Emergency unit	**CV** -	Check valve
PU -	Water pump	**BF** -	Butterfly valve	**TS** -	Trim supply
SP -	Sprinklers spray system	**WM** -	Water motor alarm	**DD** -	Downstream drain
HA3 -	3 way Hydraulic actuator N.O.	**MD** -	Manual automatic drain valve	**TV** -	Test valve
				ST -	"Y" strainer

OPERATION

SET position

Pressurized water in the valve's control chamber is trapped by the check valve (CV), and by the closed emergency valve (EU), maintaining the FDV deluge valve closed. The hydraulic actuator's (HA3) control chamber is pressurized by the wet pilot line (WPL). This pressure holds it in an open state that enables upstream flow into the deluge valve's control chamber, maintaining the valve close.

FIRE situation

When one or more of the wet pilot detection line's (WPL) automatic sprinklers is subjected to flame heat and shatter-open, the pressure at the line decreases. Consequently, the pressure at the 3 way actuator (HA3) control chamber decreases too and the actuator change state. Now, the actuator drains the deluge valve's control chamber, causes the deluge valve to open and admitting water into the spray sprinkler system.

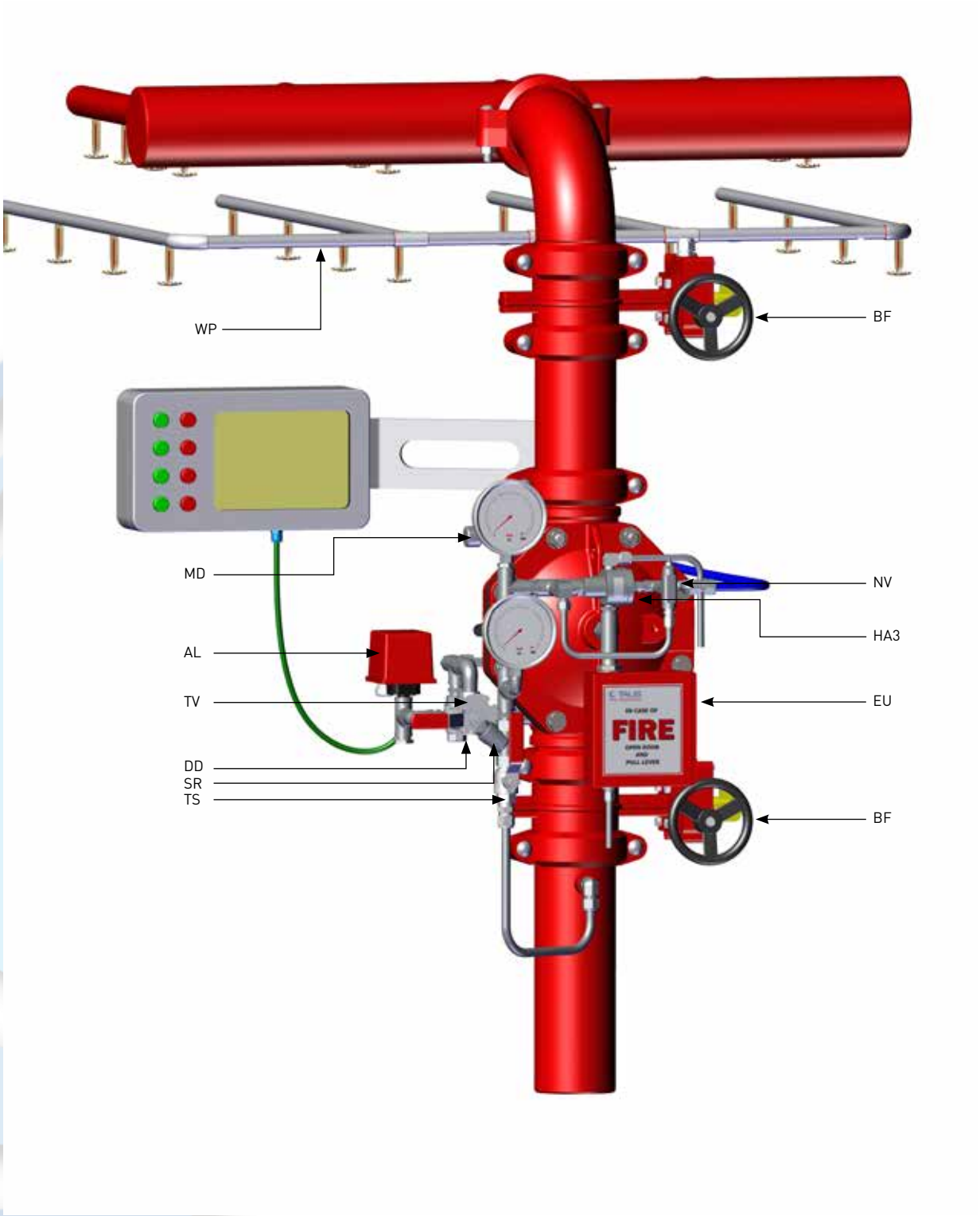
RESET position

System reset requires the replacement of all shattered-open Wet pilot detection line's automatic fire sprinklers. The wet pilot line and the actuator (HA3) control chamber become pressurized and that, in turn, changes its state. The actuator enables now the flow from the trim pressure supply valve (TS), through the orifice (OR), into the deluge control chamber cause it to closes. The sprinklers spray flow stops.

The detection line is then pressurized, the PA-PTC actuator, to reset it to closed position. The FDV valve control chamber pressurizes as well and the valve closes.

FDV - 3W - DH1

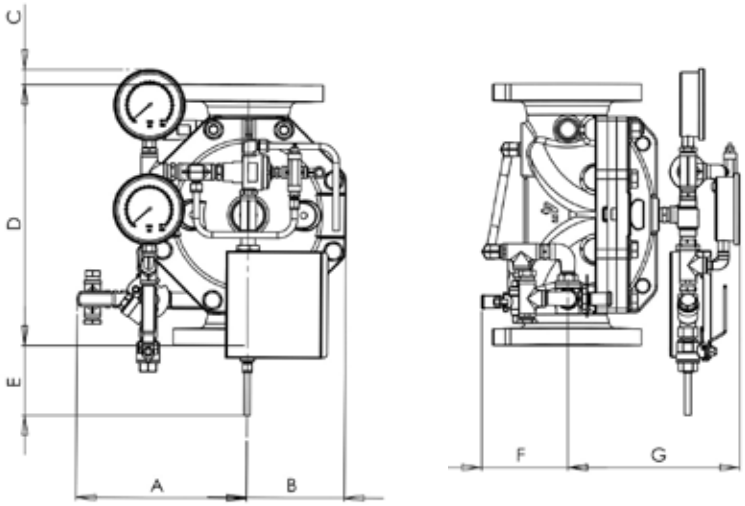
Typical installation



AL - Alarm Pressure Switch
HA3 - Hydraulic actuator 3 way
EU - Emergency Unit
BF Butterfly Valve

MD - Manual Automatic Drain Valve
CV - Check Valve
NV - Needle valve
WP - Wet Pilot

DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	234	9.2	247	9.7	262	10.3	287	11.3	311	12.2	364	14.3
B	140	5.5	140	5.5	177	7.0	178	7.0	231	9.1	307	12.1
C	115	4.5	62	2.4	48	1.9	N/A	N/A	N/A	N/A	N/A	N/A
D	224	8.8	325	12.8	400	15.7	462	18.2	580	22.8	758	29.8
E	230	9.1	145	5.7	214	8.4	74	2.9	21	0.8	N/A	N/A
F	155	6.1	134	5.3	123	4.8	143	5.6	172	6.8	203	8.0
G	200	7.9	235	9.3	264	10.4	331	13.0	366	14.4	455	17.9
Kg/lb	10.3	22.7	27.5	60.5	43	94.6	53.7	118.1	99	217.8	228	501.6

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
- Energize to Open/Close valve
- Wet Pilot's height.
- System installation orientation
- Additional accessories needed

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

Modulating Deluge Systems

Electrical Actuated with Local Reset, Pressure Reducing Deluge Valve **FDV - PE0**

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

The FDV-PE0 is a pressure control Deluge system, actuated electrically and resets locally.

An electric detection systems activates a solenoid valve through a control panel, to open the FDV deluge valve. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure.

The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation. Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-PE0 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 · Industry · Commercial · Residential

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: up to 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

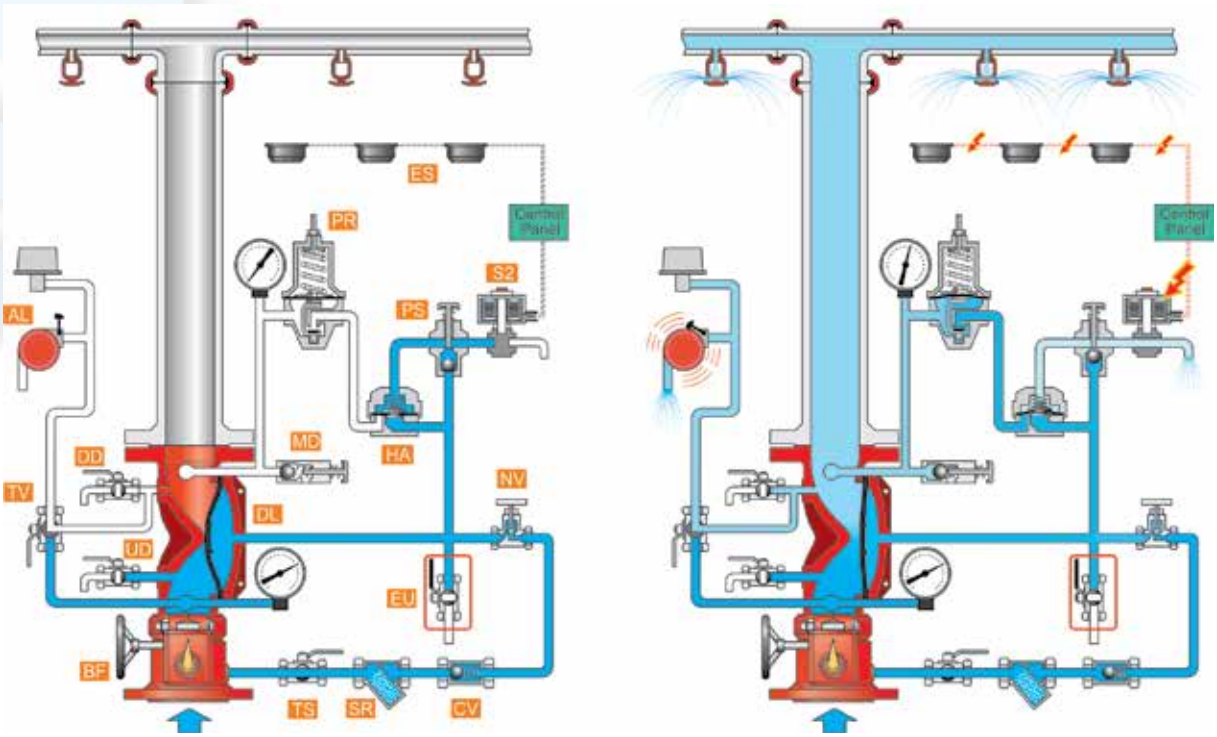
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The valve is actuated by an electric signal transmitted to the valve's solenoid from the main control panel, due to a flame 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
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

The FDV-PE0 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel and by manually operating the local reset device – the PSA.

Schematic drawing

Set position

Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
HA - HAV – 2 Hydraulic Actuator Valve
PR - PRPV – Pressure Reducing Pilot Vale
S2 - Solenoid 2 way
ES - Electric Sensors system

OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by check valve (CV), the Closed Drain actuator HAV-2 (HA) and by the closed emergency valve (EU), maintaining the FDV deluge valve (DL) closed.

FIRE situation

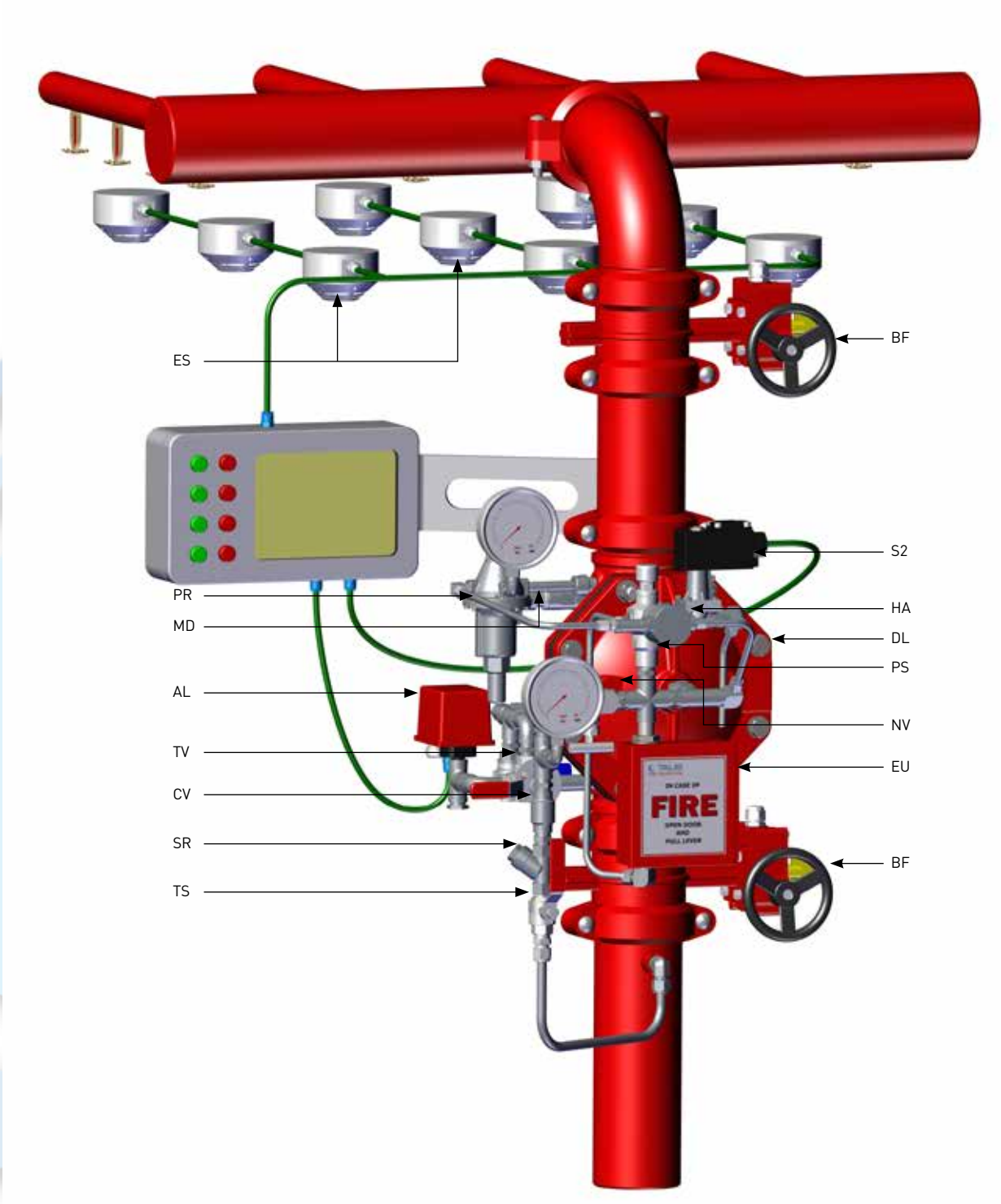
When the electric detection system senses heat, it triggers the main control panel that in turn, transmits an electric signal commanding the 2 way solenoid valve (S2) to open. The solenoid drains the HAV-2's control chamber, commanding the Deluge valve to openthrough the pressure reducing pilot (PR), admitting water to the spray sprinklers line at a steady, preset pressure.

RESET position

System reset requires the reset of the electrical alarm system to de-energize and close the solenoid valve. The PSA (PS) push button should be pressed to pressurize the HAV-2's control chamber. When the drain actuator is close, upstream pressurizes the FDV's control chamber and the valve closes.

FDV - PE0

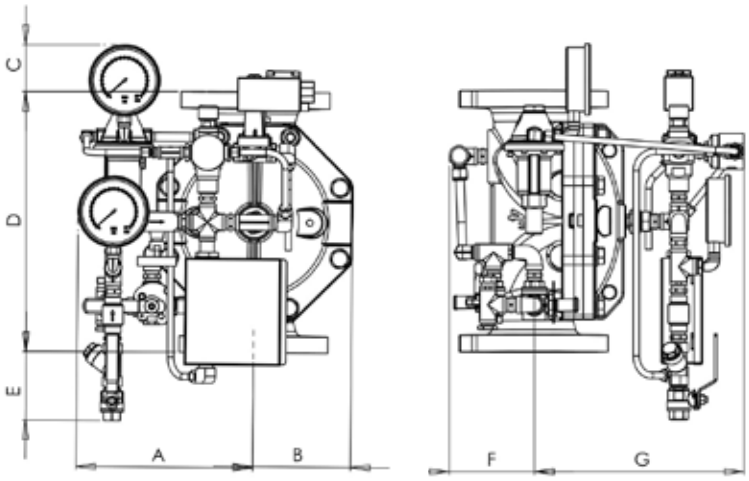
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve

NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit

HA - HAV – 2 Hydraulic Actuator Valve
PR - PRPV – Pressure Reducing Pilot Valve
S2 - Solenoid 2 way
ES - Electric Sensors system



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	240	9.5	267	10.5	279	11	307	12.1	337	13.2	364	14.3
B	268	10.5	237	9.3	284	11.2	258	10.1	362	14.2	308	12
C	82	3.2	64	2.5	N/A	N/A	N/A	N/A	N/A	N/A	43	1.7
D	224	8.8	325	12.8	401	15.8	462	18.2	580	22.8	768.5	30.2
E	177	7	126	5	91	3.6	60	2.3	NA	NA	NA	NA
F	160	6.3	171	6.7	207	8.1	232	9.1	257	10.1	203	8
G	281	11	310	12.2	341	13.4	404	15.9	434	17	497	19.5
Kg/lb	21.5	47.4	33.7	74.3	51	112.4	69.7	153.6	109.1	240.5	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
- Solenoid Voltage
- Solenoid Enclosure
- Solenoid Protection
- System installation orientation
- Additional accessories needed

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

Modulating Deluge Systems

Electric Actuated with Remote Reset, Pressure Reducing Deluge Valve

FDV - PE1

The FDV is a Fire Protection control valve for Deluge fire sprinkler systems, designed for installations in hazardous environments.
The FDV-PE1 is a pressure control Deluge system, actuated electrically and resets remotely.
An electric detection systems activates a solenoid valve through the control panel, to open the FDV deluge valve. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure.
The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation. Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-PE1 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:
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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

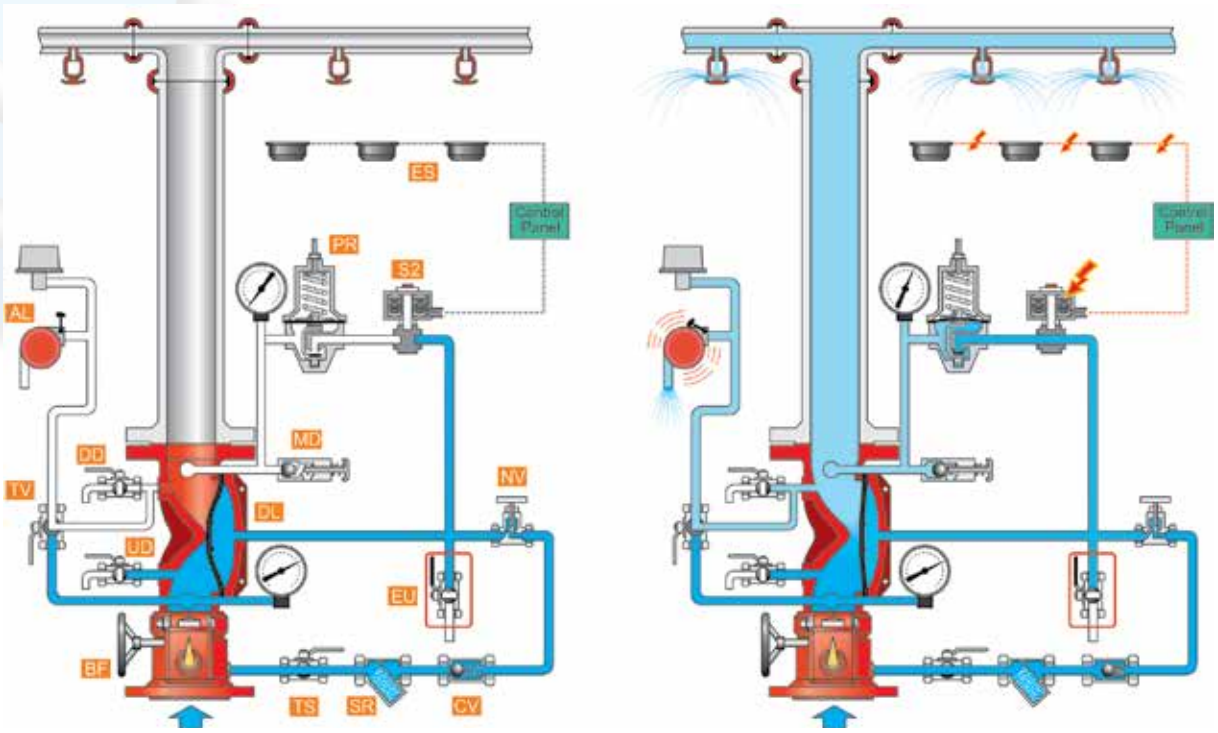
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The valve is actuated by an electric signal transmitted to the valve's solenoid from the main control valve panel, due to a flame heat exposure of heat detection sensors system
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source prevents surges.
- A pressure reducing pilot 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.

Schematic drawing

Set position

Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
PR - PRPV – Pressure Reducing Pilot Valve
S3 - Solenoid 2 way
ES - Electric Sensors system

OPERATION

SET position

Pressurized water in the alve'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

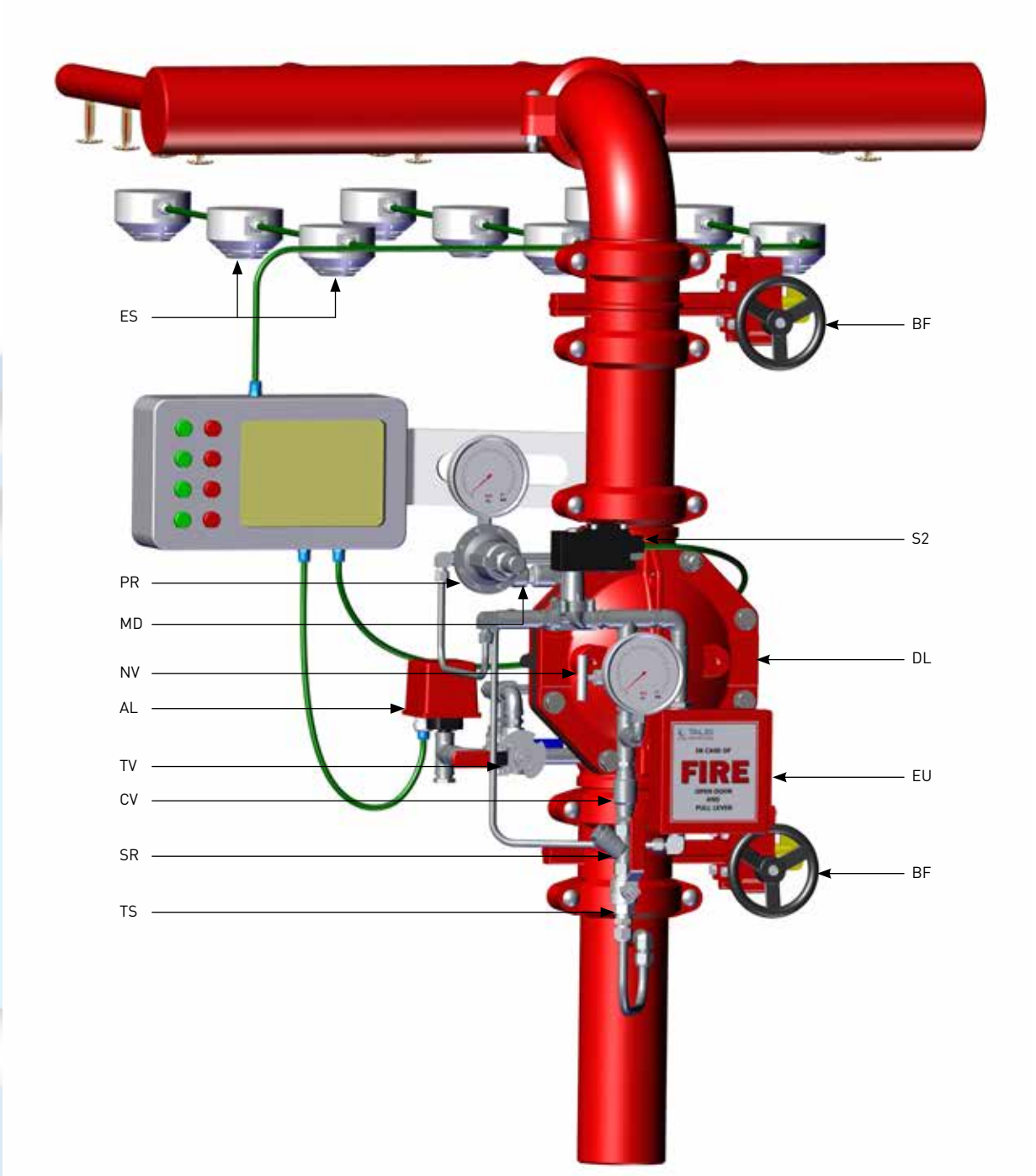
When an electric detection system senses flame heat, it triggers the main control panel that in turn, transmits an electric signal, commanding the 2 way solenoid valve [S2] to open. The deluge valve's control chamber drains through the pressure reducing pilot [PR]. The FDV Deluge valve opens, admitting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

FDV - PE1

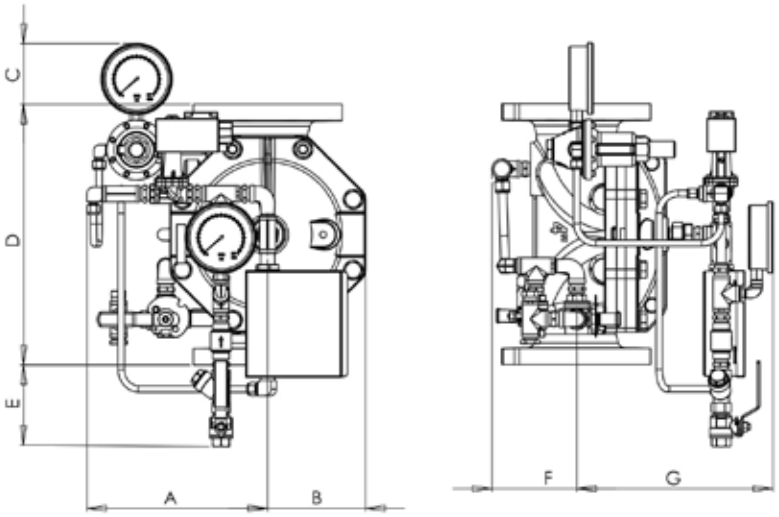
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve

SR - "Y" strainer
CV - Check valve
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
PR - PRPV – Pressure Reducing Pilot Valve
S3 - Solenoid 2 way
ES - Electric Sensors system



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	254	10.0	231	9.1	281	11.1	289	11.4	318	12.5	372	14.6
B	266	10.5	238	9.4	282	11.1	311	12.2	362	14.3	308	12
C	81	3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	43	1.7
D	224	8.8	325	12.8	400	15.7	462	18.2	580	22.8	768.5	30.2
E	235	9.3	182	7.2	137	5.4	107	4.2	57	2.2	N/A	N/A
F	160	6.3	172	6.8	207	8.1	232	9.1	263	10.4	203	8
G	263	10.4	324	12.8	298	11.7	361	14.2	394	15.5	493	19.4
Kg/lb	19.7	43.4	31.2	68.8	48.9	107.8	67.5	148.8	107.3	236.6	233	514

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
- 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.

Modulating Deluge Systems

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

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

The FDV-PP0 is a pressure control Deluge system, actuated pneumatically and resets locally.

When the pneumatic dry pilot fire detection line is exposed to flame heat, its automatic fire sprinklers shatter-open, venting the air pressure from the FDV-PP0's actuator, commanding the deluge valve to open. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure.

The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation. Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-PP0 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 · Industry · Commercial · Residential · P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

REGULATION RATIO: up to 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

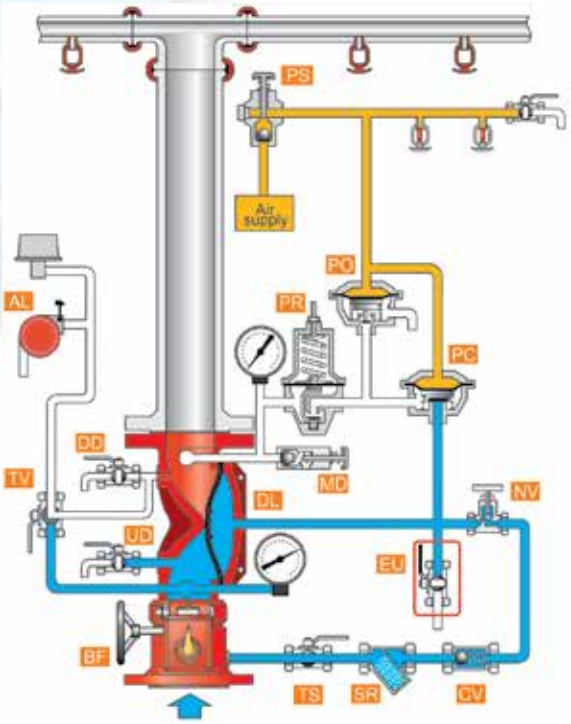
CHARACTERISTICS

- 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 valve 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
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

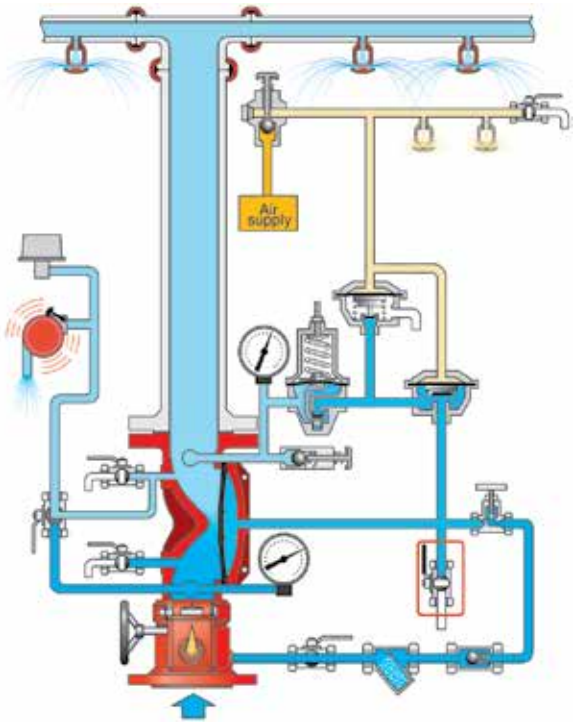
The FDV-PP0 resets to stand-by close position by pressurizing the Dry Pilot Line and manually operating the PSA device.

Schematic drawing

Set position



Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer

CV - Check valve
OR - Orifice
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve

EU - Emergency Manual Unit
PC - PA-PTC-Pneumatic Actuator-Pressure To Close
PO - PA-PTO - Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot Valve

OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by check valve (CV), the closed PA-PTC drain actuator (PC) and by the closed emergency valve (EU), maintaining the deluge valve in its closed position.

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 and the PA-PTC (PC) opens and drains the deluge valve's control chamber through the pressure reducing pilot (PR). The FDV deluge valve opens and admits water at set pressure to the spray sprinklers line.

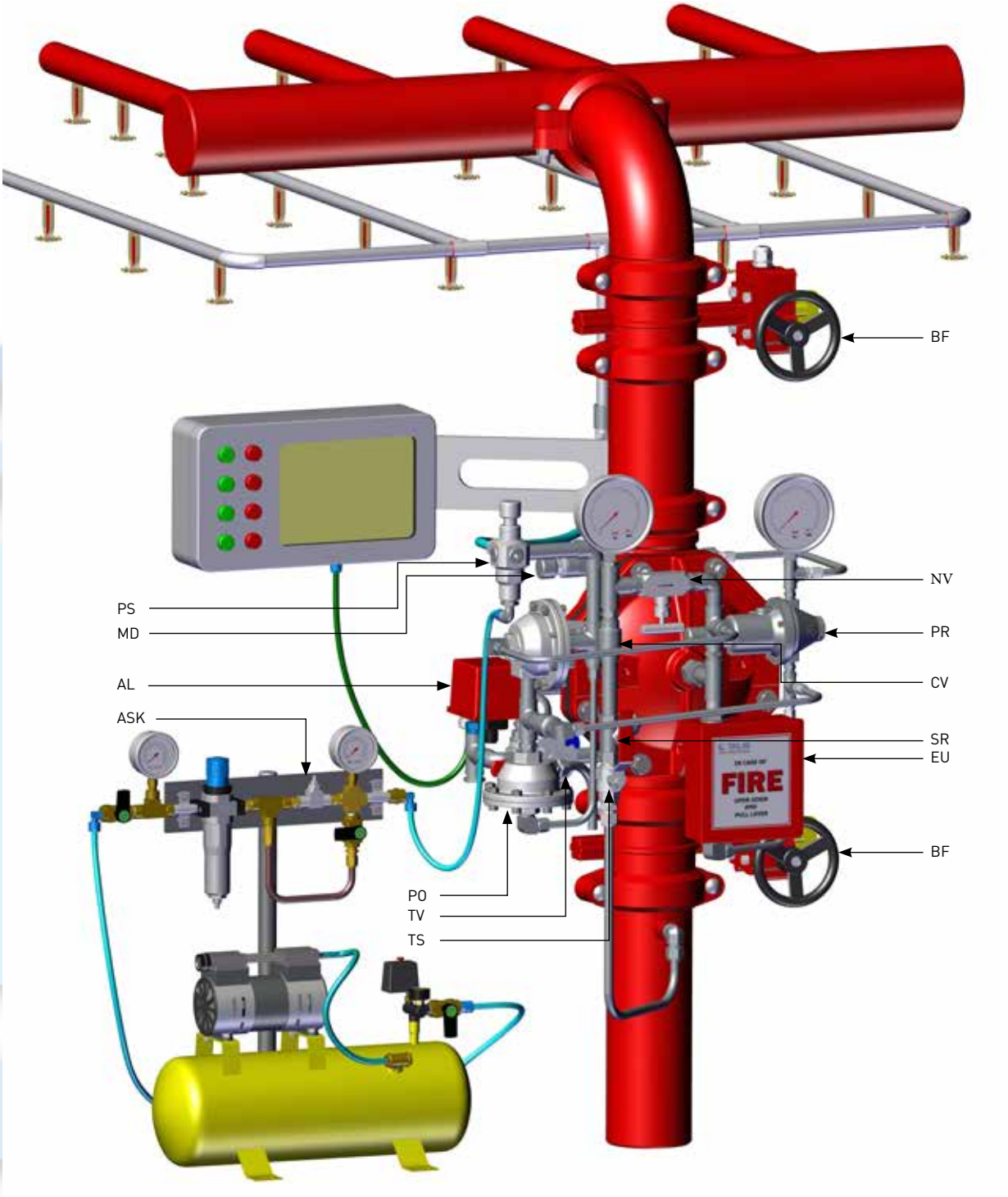
RESET position

Initiating a system reset requires the replacement of all the dry pilot detection Line's shattered-open automatic fire sprinklers.The PSA (PS) push button should be pressed, to enable air supply intake to pressurize the Dry Pilot Line. By that, the PA-PTC actuator closes and upstream pressurizes the FDV deluge valve's control chamber through the needle valve (NV). Consequently, The Deluge valve closes and water spray stops.

FDV - PP0

Typical installation

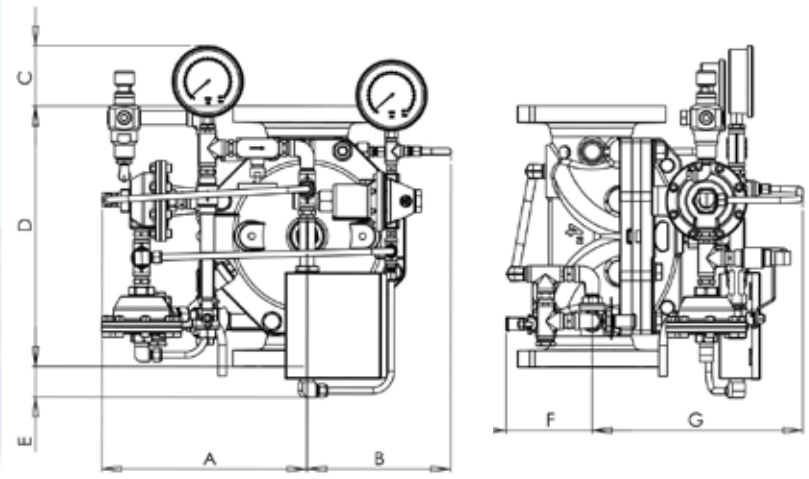
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
ASK - Air Supply Kit

CV - Check valve
OR - Orifice
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve

EU - Emergency Manual Unit
PC - PA-PTC-Pneumatic Actuator-Pressure To Close
PO - PA-PTO - Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot Valve



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	272	10.7	267	10.5	315	12.4	343	13.5	397	15.6	372	14.6
B	269	10.6	231	9.1	246	9.7	269	10.6	304	12	308	12
C	81	3.2	108	4.2	38	1.5	21	0.8	N/A	N/A	43	1.7
D	224	8.8	325	12.8	400	15.8	462	18.2	580	22.8	768.5	30.2
E	120	4.7	69	2.7	32	1.2	4	0.2	NA	NA	NA	NA
F	160	6.3	171	6.7	208	8.2	238	9.4	264	10.4	203	8
G	268	10.5	313	12.3	337	13.2	400	15.7	430	16.9	493	19.4
Kg/lb	25.1	55.3	37.6	82.9	55	121.2	73.6	162.3	113	249.1	239	527

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
- System installation orientation
- Additional accessories needed

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

Modulating Deluge Systems

Pneumatic Actuated with Remote Reset, Pressure Reducing Deluge Valve **FDV - PP1**

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

The FDV-PP1 is a pressure control Deluge system, actuated pneumatically and resets remotely.

When the pneumatic dry pilot fire detection line is exposed to flame heat, its automatic fire sprinklers shatter-open, venting the air pressure from the FDV-PP1's actuators, commanding the deluge valve to open. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-PP1 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 · Industry · Commercial · Tunnel · P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

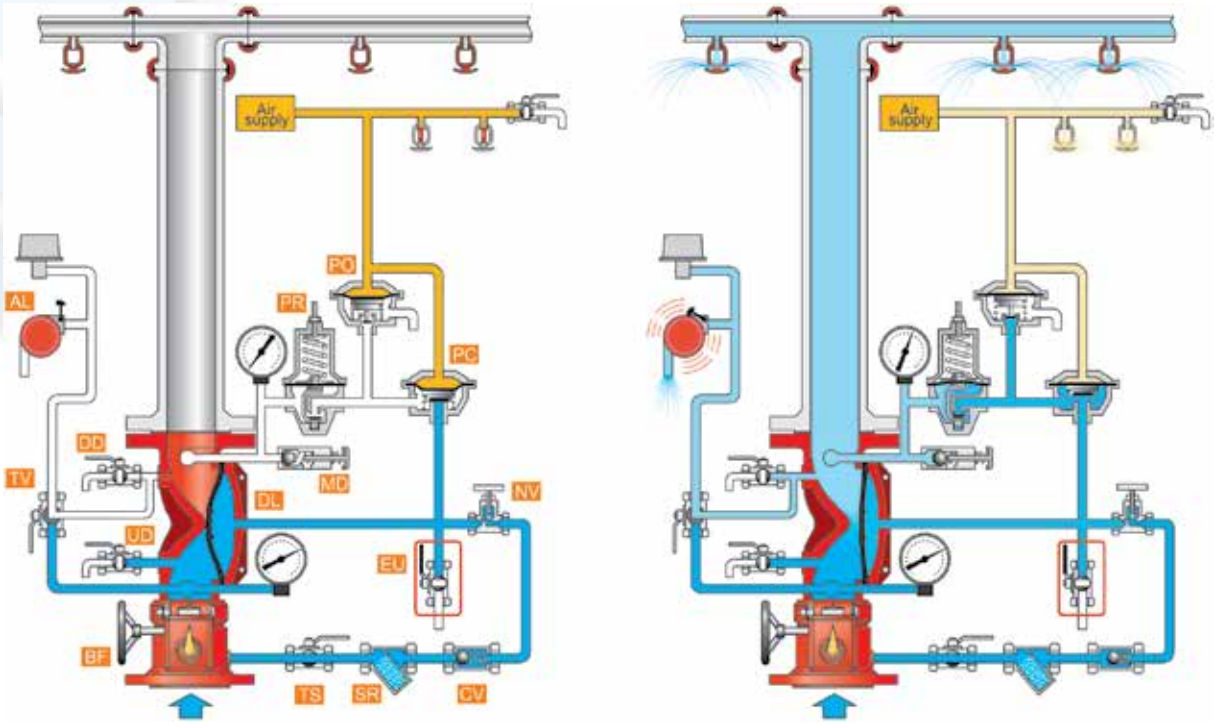
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The valve is actuated by Dry Pilot Line's pneumatic pressure release due to its exposure to flame heat
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source prevents surges
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

The FDV-PP1 resets to stand-by close position by pressurizing the Dry Pilot.

Schematic drawing

Set position

Fire position



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TS - Trim supply valve
SR - "Y" strainer

CV - Check valve
OR - Orifice
NV - Needle valve
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit

PC - PA-PTC-Pneumatic Actuator-Pressure To Close
PO - PA-PTO - Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot ValVe

OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by check valve (CV), the closed PA-PTC drain actuator (PC) and by the closed emergency valve (EU), maintaining the deluge valve in its closed position.

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. Consequently, the PA-PTC (PC)opens and drains the deluge valve's control chamber through the pressure reducing pilot (PR). The FDV Deluge valve opens, admitting water to the spray sprinklers line at a steady preset pressure.

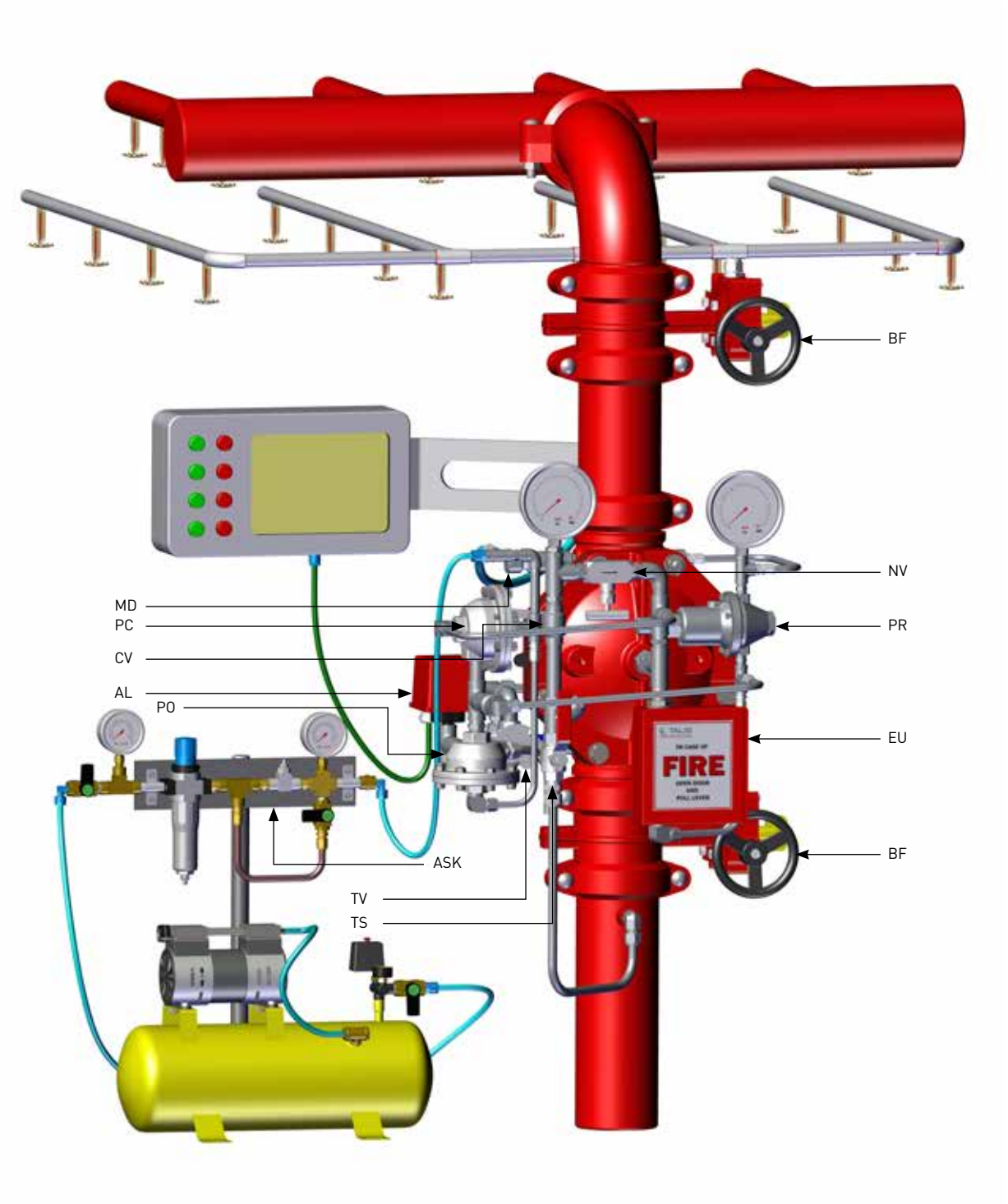
RESET position

Initiating a system reset requires the replacement of all the dry pilot detection Line's shattered-open automatic fire sprinklers. Then, the Dry Pilot Line need to be pressurized to the desired set pressure. The PA-PTC actuator pressurizes, commanding the FDV deluge valve to close.

FDV - PP1

Typical installation

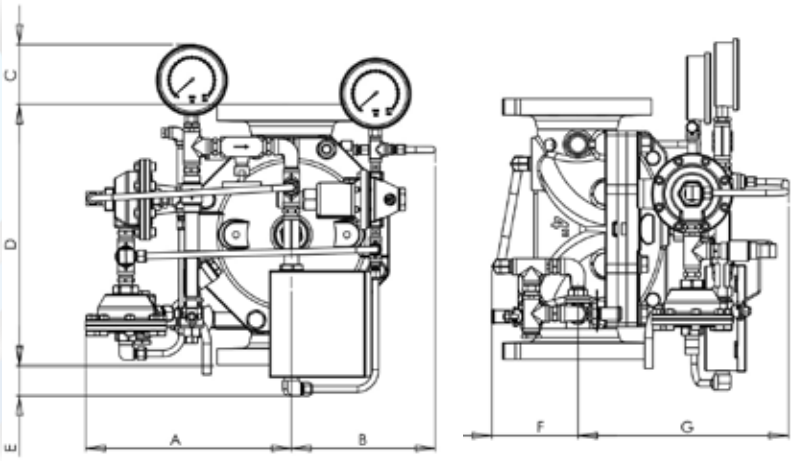
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve

OR - Orifice
NV - Needle valve
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit

PC - PA-PTC-Pneumatic Actuator-Pressure To Close
PO - PA-PTO - Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot Vale
ASK - Air Supply Kit



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	368	14.5	269	10.6	315	12.4	341	13.4	396	15.6	372	14.6
B	266	10.5	228	9	243	9.5	266	10.5	304	12	308	12.1
C	94	3.7	75	2.9	NA	NA	NA	NA	NA	NA	43	1.7
D	224	8.8	325	12.8	400	15.8	462	18.2	580	22.8	768.5	30.2
E	195	7.7	69	2.7	32	1.3	NA	NA	Na	NA	NA	NA
F	125	4.9	204	8	207	8	230	9	259	10.2	203	8
G	301	11.8	367	14.4	355	14	400	15.7	430	16.9	493	19.4
Kg/lb	24.6	54.2	36.7	80.9	54.1	119.2	72.4	159.6	112.2	247.4	237.8	524.2

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
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Modulating Deluge Systems

Electro-Pneumatic Actuated with Local reset, Pressure Reducing Deluge Valve

FDV - PC0

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

The FDV-PC0 is a pressure control Deluge system, actuated electricallyor pneumatically and resets locally.

Two fire detection systems, can independently activate an actuator to open the deluge valve: a pneumatic Dry Pilot detection Line and/or an electric solenoid, connected to sensorst hrough a control panel.

Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-PC0 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

Storage
Industry
Commercial
P.O.G.

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

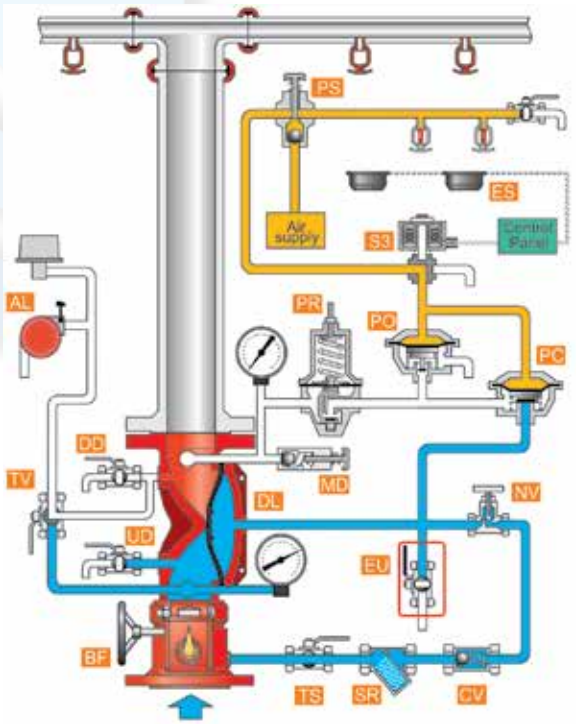
CHARACTERISTICS

- 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 valve is actuated by an electric signal conveyed to the valve's solenoid or 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
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

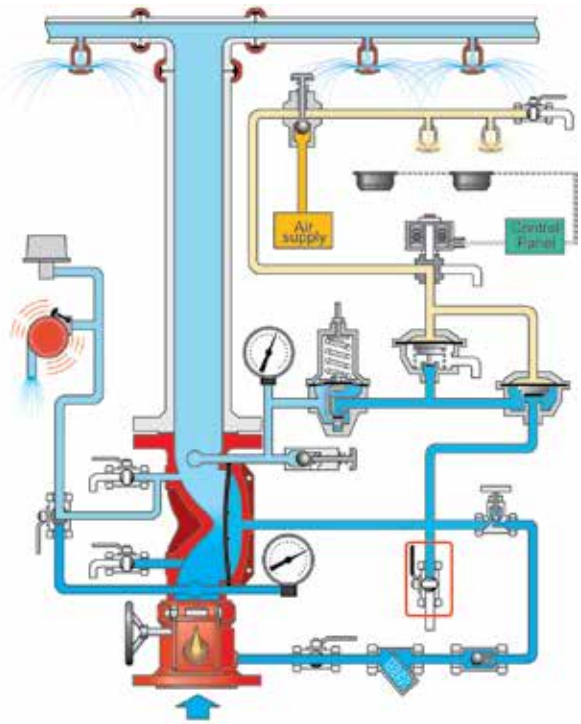
The FDV-PC0 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot Line and manually operating the PSA device - in accordance with the relevant triggered alarm system.

Schematic drawing

Set position

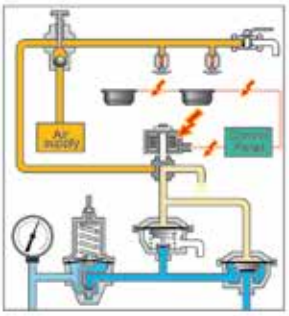


Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
NV - Needle valve
OR - Orifice
PS - PSA - Pressure Supply Arrestor

MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure To Close
PO - PA-PTO – Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot Valve
S3 - Solenoid 3 way
ES - Electric Sensors system



OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by Closed PSA (PA), the closed PA-PTC actuator (PC) and by the closed emergency valve (EU). The pneumatic pressure accumulated in the Dry pilot line is conveyed to the PA-PT Ccontrol chamber through the 3 way solenoid (S3), maintaining the deluge valve in its closed position.

FIRE situation

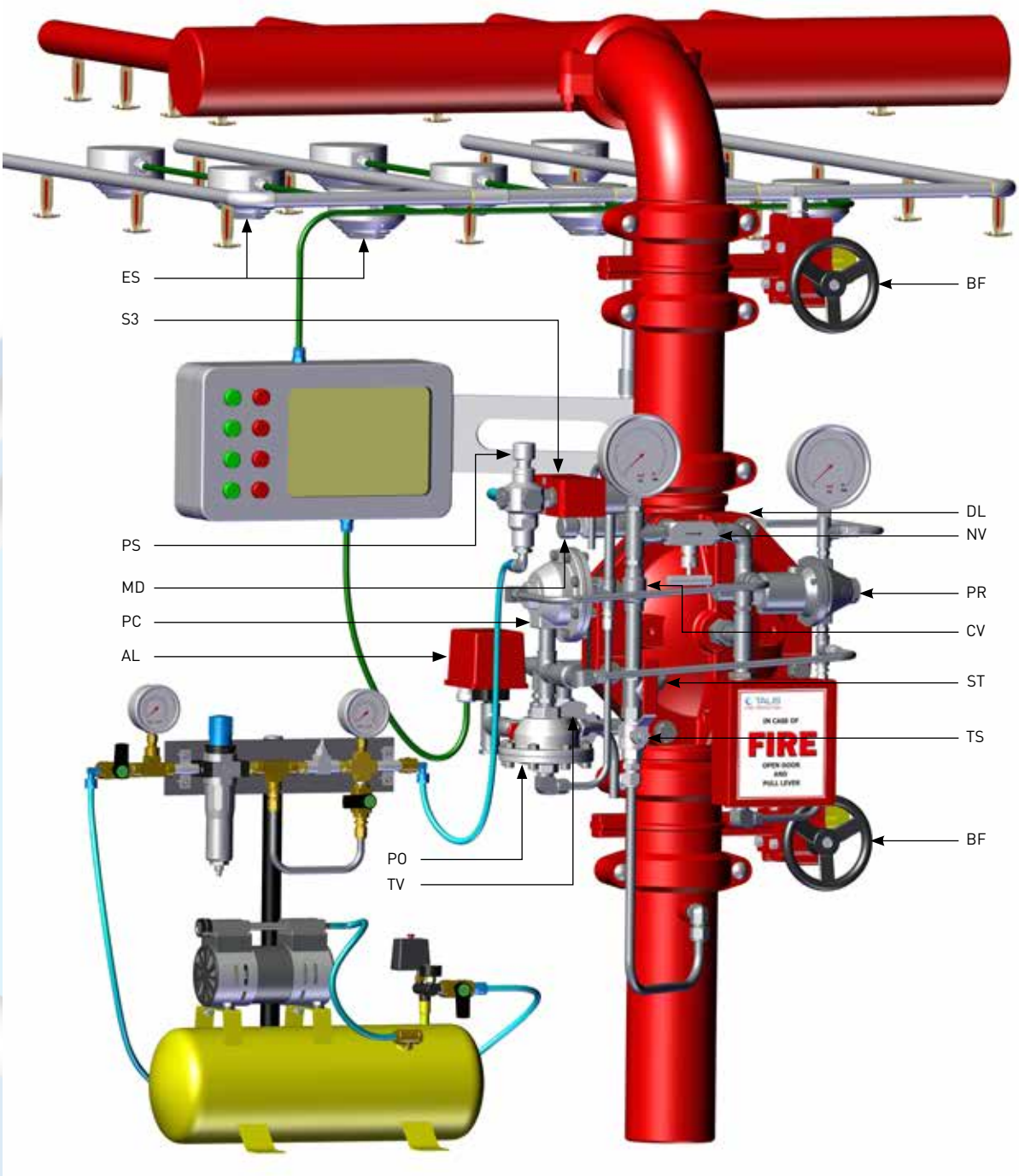
When some of the Dry pilot detection line's automatic fire sprinklers are subjected to the predetermined temperature levels and shutter-open, the pilot line and the PA-PTC control chamber depressurize. Alternatively, an electric detection system senses heat and triggers the main control board that in turn, energizes the 3 way solenoid valve (S3).
The solenoid valve bypasses the dry pilot detection line depressurizing the PA-PTC.The FDV-DC0's control chamber is then drained and the Deluge valve opensthrough the pressure reducing pilot (PR), admitting water to the spray sprinklers line at a steady preset pressure.

RESET position

Initiating a system reset requires the replacement of all shattered-open fire sprinklers in the Wet Pilot detection line. Alternatively, the electrical alarm system has to be reset and the solenoid de-energized. The PSA (PS) push button should be pressed and the Dry Pilot Valve pressurized. Consequently, The PA-PTC pressurizes and closes the FDV deluge valve.

FDV - PC0

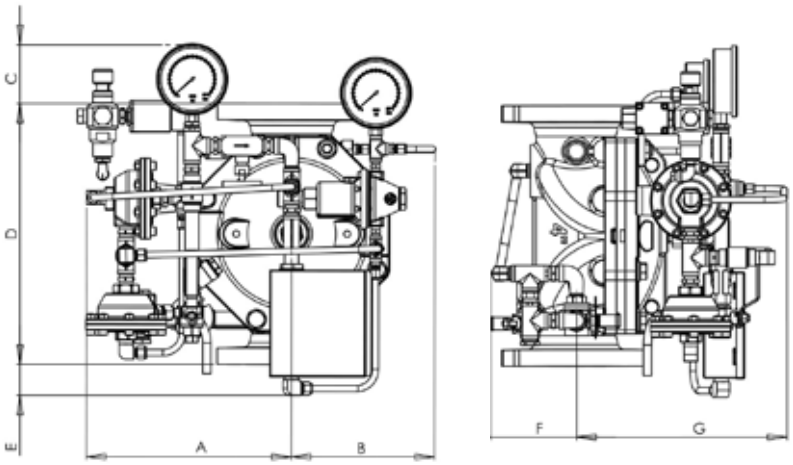
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
NV - Needle valve

OR - Orifice
PS - PSA - Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator- Pressure To Close

PO - PA-PTO – Pneumatic Actuator- Pressure To Open
PR - PRPV – Pressure Reducing Pilot Valve
S3 - Solenoid 3 way
ES - Electric Sensors system



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	283	11.1	315	12.4	393	15.5	388	15.3	442	17.4	437	17.2
B	268	10.5	300	11.8	284	11.2	269	10.6	304	12	308	12
C	121	4.8	141	5.5	71	2.8	54	2.1	16	0.6	43	1.7
D	224	8.8	325	12.8	401	15.8	462	18.2	580	22.8	768.5	30.2
E	205	8	69	2.7	118	4.6	3	0.1	NA	NA	27.4	1
F	145	5.7	172	6.8	206	8.1	232	9.1	258	10.1	203	8
G	306	12	300	11.8	345	13.6	400	15.7	430	16.9	576	22.6
Kg/lb	26.9	59.3	39.1	86.2	56.4	124.3	75	165.3	114.5	252.4	240	529

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
- 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.

RAPHAEL FP

Modulating Deluge Systems

Electro-Pneumatic Actuated with Remote reset, Pressure Reducing Deluge Valve

FDV - PC1

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

The FDV-PC1 is a pressure control Deluge system, actuated electrically or pneumatically and can be reset from a remote location.

Two fire detection systems, can independently activate an actuator to open the deluge valve: a pneumatic Dry Pilot detection Line and/or an electric solenoid, connected to sensors through a control Panel. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure. The Deluge system incorporates an emergency valve, bypassing the fire detection systems for manual operation.

Designed for vertical or horizontal installation, a globe pattern, line pressure operated FDV-PC1 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

Storage · Industry · Marinw · P.O.G. · Tunnel · Airports

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

PNEUMATICS: Air, Nitrogen

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

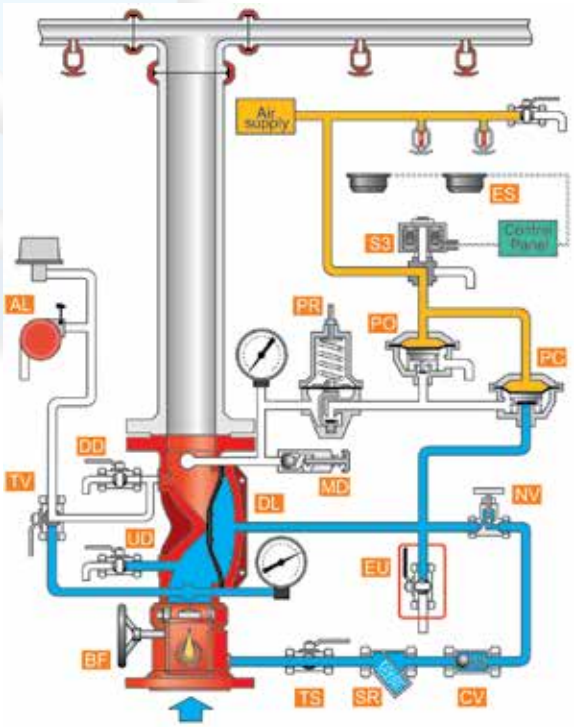
CHARACTERISTICS

- 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 valve is actuated by an electric signal conveyed to the valve's solenoid or 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
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

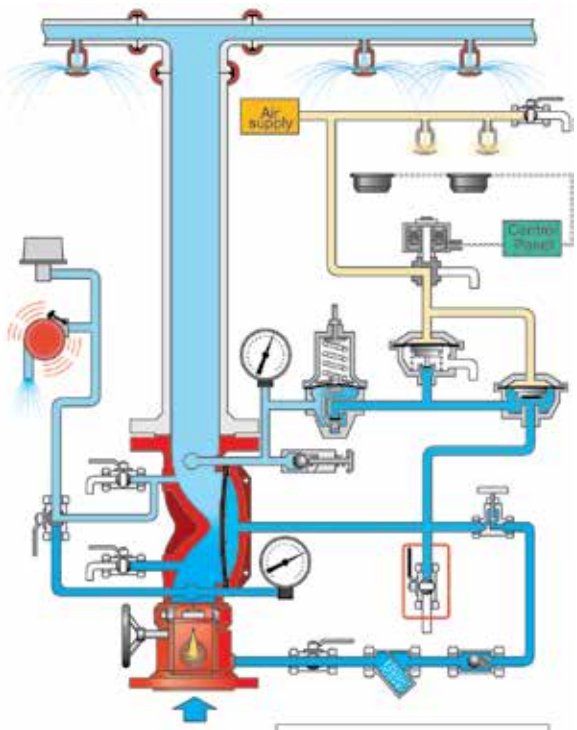
The FDV-PC1 resets to stand-by close position by de-energizing the alarm system solenoid's coil through the main control panel or, pressurizing the Dry Pilot Line.

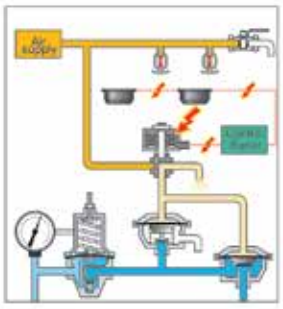
Schematic drawing

Set position



Fire position





BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
OR - Orifice
NV - Needle valve

MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
PC - PA-PTC – Pneumatic Actuator-Pressure To Close
PO - PA-PTO – Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot Valve
S3 - Solenoid 3 way
ES - Electric Sensors system

OPERATION

SET position

Pressurized water in the valve's control chamber (DL) is trapped by the check valve (CV) the closed PA-PTC pneumatic actuator (PC) and by the closed emergency valve (EU). The pneumatic pressure accumulated in the Dry pilot line is conveyed to the PA-PTC through the 3 way solenoid (S3), maintaining the deluge valve in its closed position.

FIRE situation

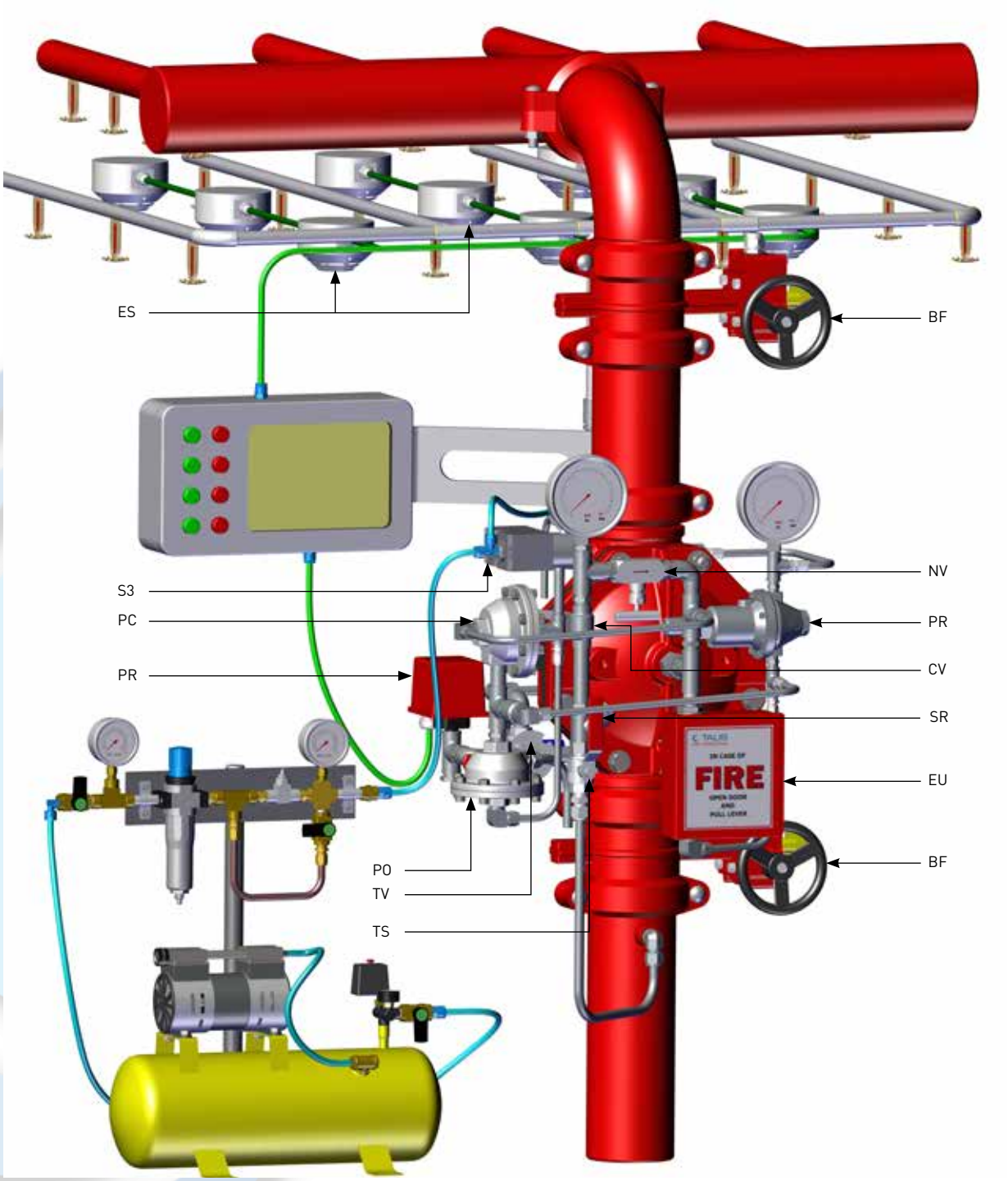
When some of the Dry Pilot detection line's automatic fire sprinklers are subjected to the predetermined temperature levels and shutter-open, the pilot line and the PA-PTC control chamber depressurize.
Alternatively, an electric detection system senses heat and triggers the main control board that in turn, energizes the 3 way solenoid valve (S3). The solenoid valve bypasses the Dry Pilot detection line depressurizing the PA-PTC. The FDV-DC1's control chamber is then drained and the deluge valve opens through the pressure reducing pilot (PR), admitting water to the spray sprinklers line at a steady preset pressure.

RESET position

Initiating a system reset requires the replacement of all shattered-open fire sprinklers in the Wet Pilot detection line. Alternatively, the electrical alarm system has to be reset and the solenoid de-energized. The Dry Pilot Valve is pressurized, and consequently the PA-PTC actuator pressurizes and closes the FDV deluge valve.

FDV - PC1

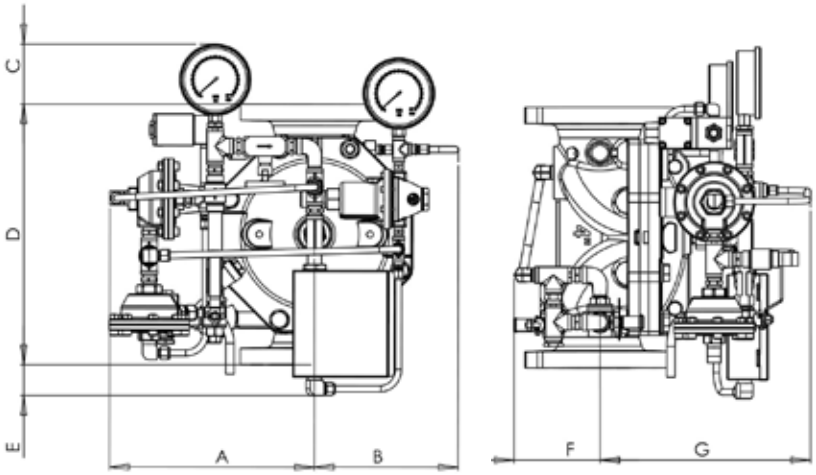
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer

CV - Check valve
OR - Orifice
NV - Needle valve
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit

PC - PA-PTC – Pneumatic Actuator-Pressure To Close
PO - PA-PTO – Pneumatic Actuator-Pressure To Open
PR - PRPV – Pressure Reducing Pilot Valve
S3 - Solenoid 3 way
ES - Electric Sensors system



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	346	13.6	270	10.6	322	14	344	13.5	398	15.7	365	14.4
B	268	10.5	238	9.4	284	11.2	266	10.5	280	11	308	12
C	95	3.7	151	5.9	31	1.2	NA	NA	NA	NA	43	1.7
D	224	8.8	325	12.8	400	15.8	462	18.2	580	11	768.5	30.2
E	205	8	69	2.7	31	1.2	4	0.1	NA	NA	27.4	1
F	164	6.5	170	6.7	207	8.1	230	9	255	10	203	8
G	299	11.8	367	14.5	354	13.9	400	15.8	429	16.9	473	18.6
Kg/lb	25.9	57.1	37.9	83.6	55.2	121.7	73.6	162.3	113.2	249.6	239	527

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
- 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.

Modulating Deluge Systems

Hydraulic Actuated with Local Reset, Pressure Reducing Deluge Valve

FDV - PH0

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

The FDV-PH0 is a pressure control Deluge system, actuated hydraulically and resets locally.

When a hydraulic detection system, a Wet Pilot detection Line, is exposed to a predetermined temperature level, its automatic fire sprinklers shatter open, commanding the FDV-PH0 deluge valve to open. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure. 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-PH0 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

Commercial | Marinw | Residential

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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

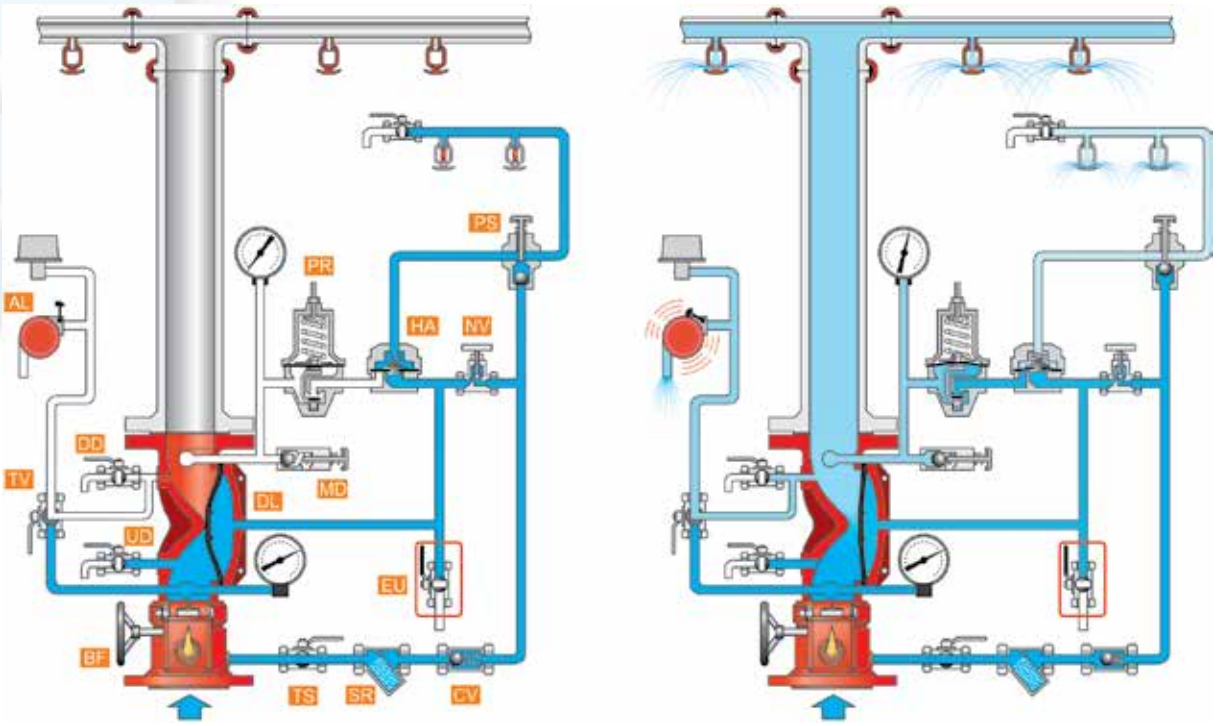
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The valve is actuated by a Wet Pilot Line's hydraulic pressure release due to its exposure to flame heat
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source prevents surges
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

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

Schematic drawing

Set position

Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
HA - HAV-2 Hydraulic Actuator Valve
PR - PRPV – 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) and by the closed hydraulic drain actuator HAV-2 (HA). The hydraulic pressure accumulated in the Wet Pilot detection line keeps this device in its closed position, maintaining the FDV deluge valve (DL) close.

FIRE situation

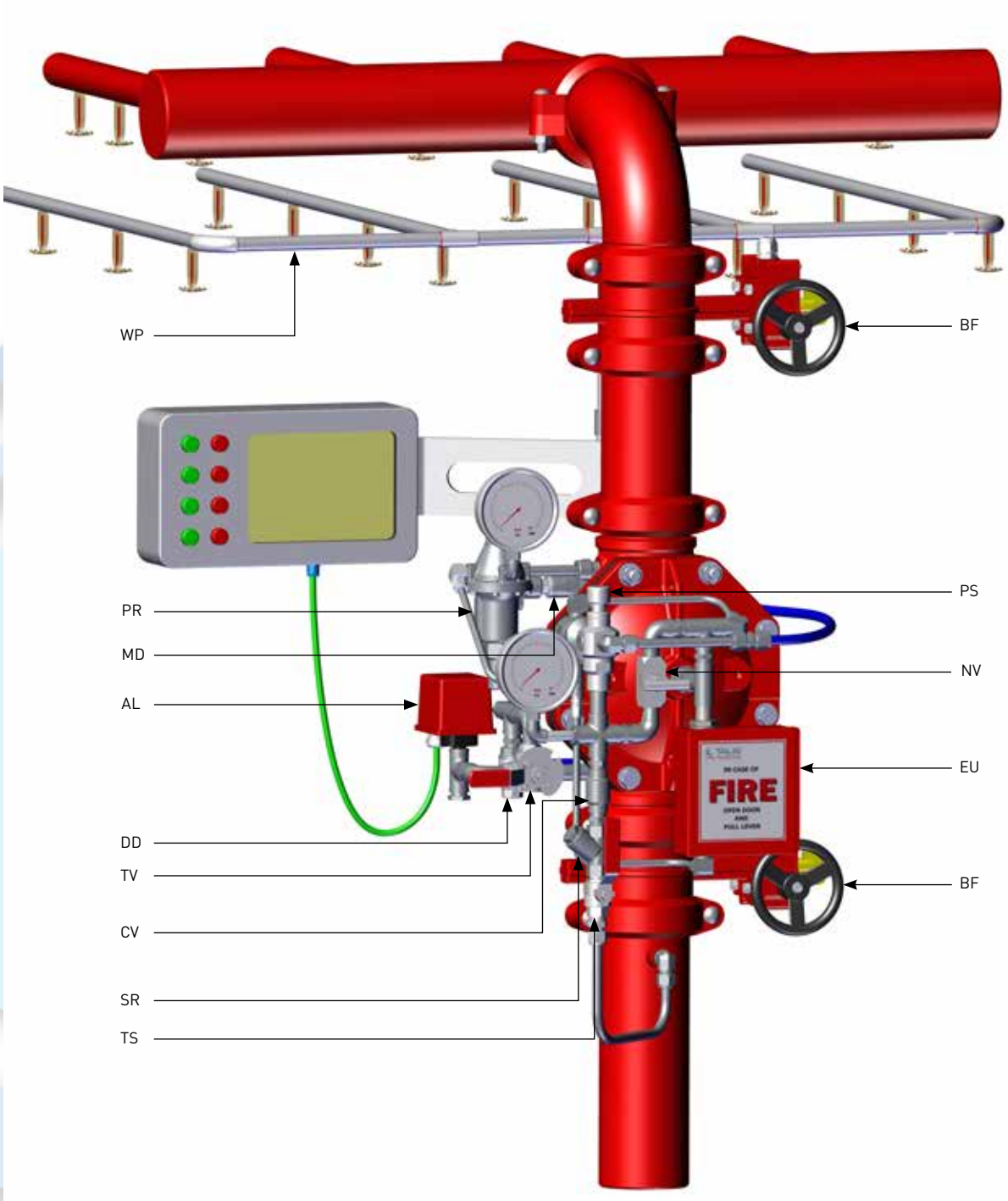
When the Wet Pilot detection line's automatic fire sprinklers are subjected to flame heat and shatter-open, the HAV-2 depressurizes and drains the deluge valve's control chamber through the pressure reducing pilot (PR). The FDV deluge valve opens, admitting water to the spray sprinklers line at a steady preset pressure.

RESET position

Initiating a system reset requires the replacement of all shattered-open fire sprinklers in the Wet Pilot detection line. The PSA (PS) push button is then pressed, to enable air supply intake to pressurize the Wet Pilot detection Line. Consequently, the HAV-2 actuator closes, commanding the FDV deluge valve to close.

FDV - PH0

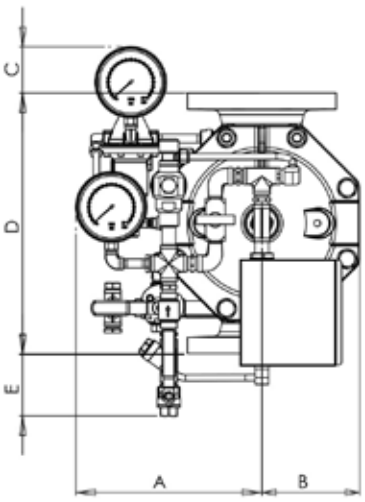
Typical installation

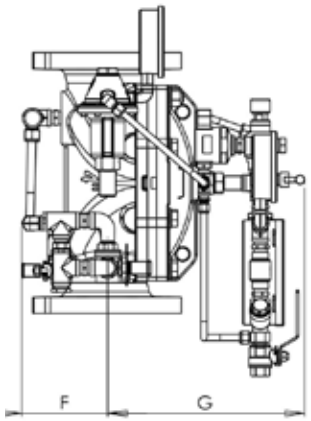


BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
WP - Wet Pilot

SR - "Y" strainer
CV - Check valve
NV - Needle valve
PS - PSA – Pressure Supply Arrestor
MD - MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
HA - HAV-2 Hydraulic Actuator Valve
PR - PRPV – Pressure Reducing Pilot Valve





Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	235	9.2	267	10.5	281	11	306	12	338	13.3	371.5	14.6
B	267	10.5	300	11.8	283	11.1	311	12.2	361	14.2	308	12
C	82	3.2	64	2.5	NA	NA	NA	NA	NA	NA	45	1.8
D	224	8.8	325	12.8	400	15.8	462	18.2	580	22.8	768.5	30.2
E	234	9.2	183	7.2	148	5.8	118	4.6	58	2.3	NA	NA
F	210	8.3	172	6.8	208	8.2	232	9.1	257	10.1	203	8
G	259	10.2	219	8.6	346	13.6	411	16.2	436	17.2	520	20.5
Kg/lb	20.4	45	32.5	71.6	49.9	110.1	68.6	151.2	108	238.1	234	516

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 hieght.
- System installation orientation
- Additional accessories needed

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

Modulating Deluge Systems

Hydraulic Actuated with Remote Reset, Pressure Reducing Deluge Valve

FDV - PH1

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

The FDV-PH1 is a pressure control Deluge system, 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. Once open, the valve reduces the inlet high pressure to a predetermined fixed outlet pressure. 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-PH1 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

Marinw 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 position without closing OS&Y or other valves in the system
- Open fail safe valve, maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line with only one replaceable part which is long life elastomeric diaphragm
- Conforms with inspection, testing and maintenance standard of water-based fire protection systems, NFPA 25

CHARACTERISTICS

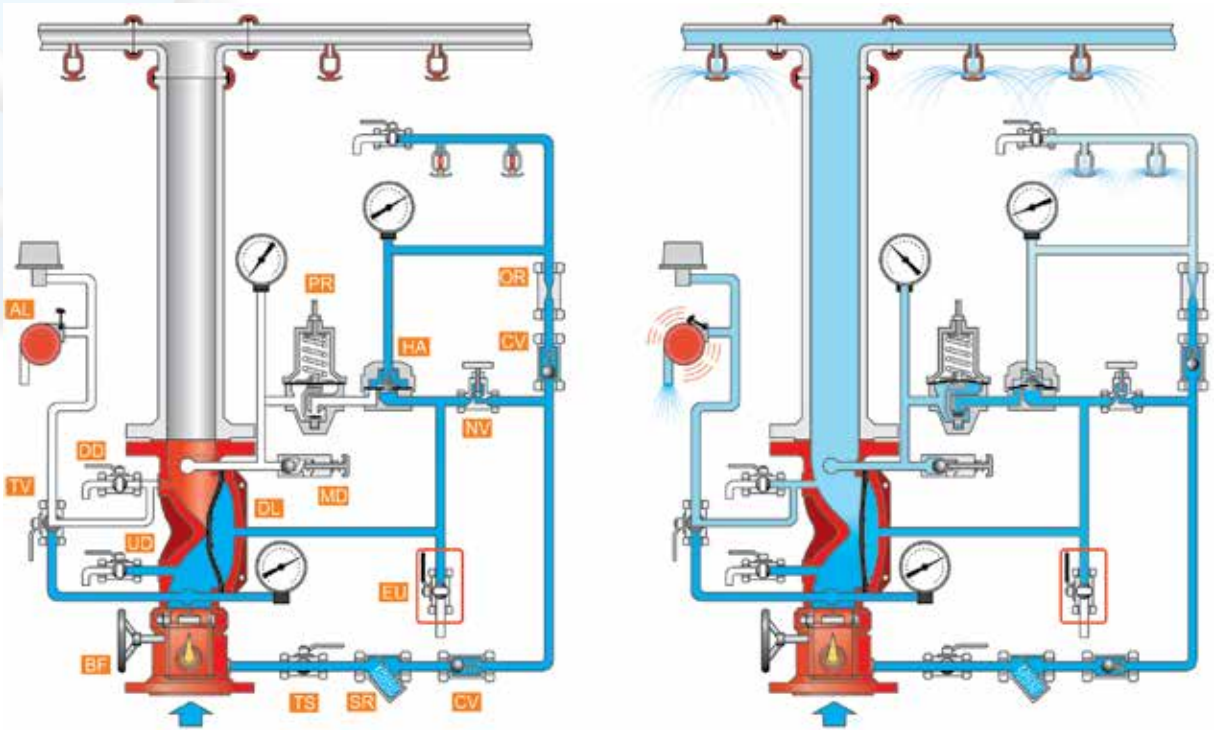
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open automatically upon a gradual release of water pressure from its control chamber. The valve is actuated by a Wet Pilot Line's hydraulic pressure release due to its exposure to flame heat
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges
- A pressure reducing pilot enables a full control over the downstream pressure and ensures a steady set in a wide pressure range

The FDV-PH1 resets to stand-by close position by pressurizing the Dry Pilot Line.

Schematic drawing

Set position

Fire position



BF - Butterfly valve
DL - FDV Deluge valve
UD - Upstream drain valve
DD - Downstream drain valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
OR - Orifice
NV - Needle valve
MD - MADV – Manual Automatic Drain Valve
TV - Alarm test valve
EU - Emergency Manual Unit
HA - HAV-2 Hydraulic Actuator Valve
PR - PRPV – 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) and by the closed hydraulic drain actuator HAV-2 (HA). The hydraulic pressure accumulated in the Wet Pilot line keeps this device in closed position, maintaining the FDV deluge valve (DL) close.

FIRE situation

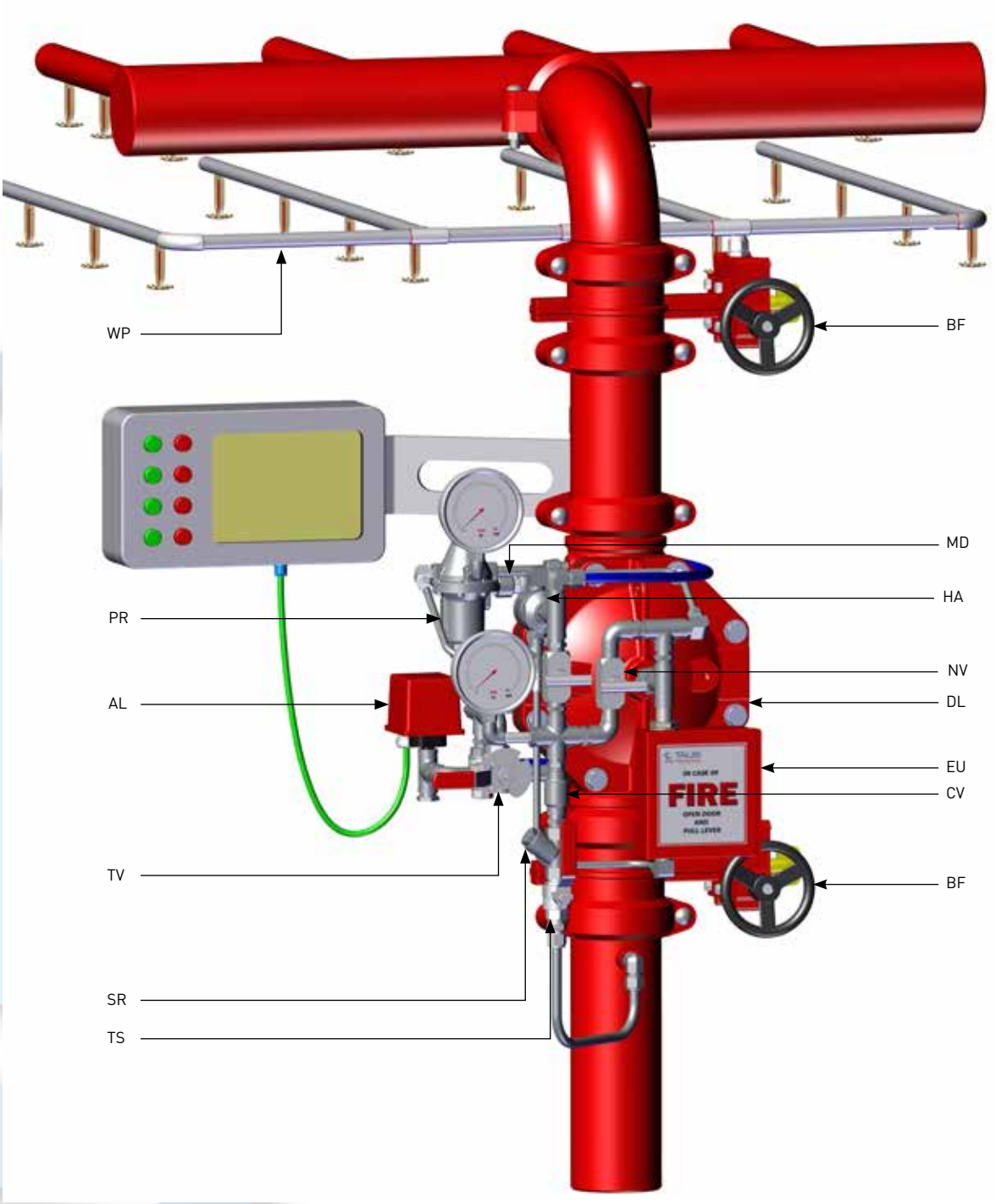
When the Wet Pilot detection line's automatic fire sprinklers are subjected to flame heat and shatter-open, the HAV-2 depressurizes, drains the deluge valve's control chamber through the pressure reducing pilot (PR). The FDV deluge valve opens, admitting water to the spray sprinklers line at a steady preset pressure.

RESET position

Initiating a system reset requires the replacement of all Shattered-open fire sprinklers in the Wet Pilot detection line. By that, the HAV-2 actuator closes and upstream pressurizes the FDV Deluge valve's control chamber through the needle valve (NV). Consequently, The Deluge valve closes and water spray stops.

FDV - PH1

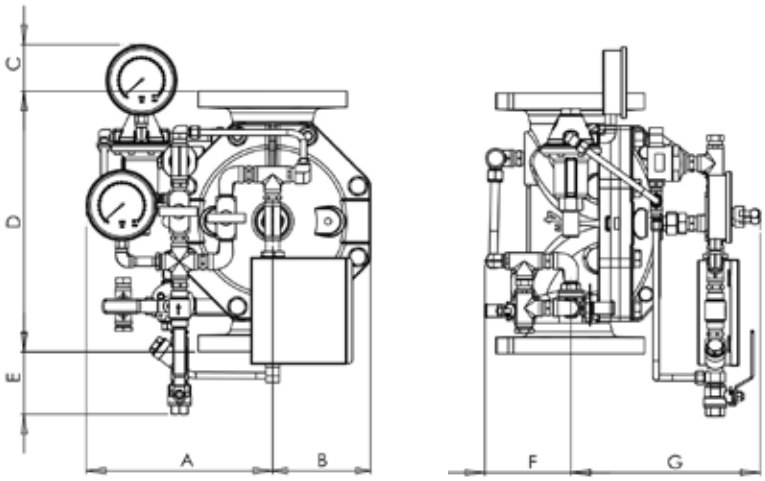
Typical installation



BF - Butterfly valve
DL - FDV Deluge valve
AL - Acoustic & Electric alarms
TS - Trim supply valve
WP - Wet Pilot

SR - "Y" strainer
CV - Check valve
OR - Orifice
NV - Needle valve
MD - MADV – Manual Automatic Drain Valve

TV - Alarm test valve
EU - Emergency Manual Unit
HA - HAV-2 Hydraulic Actuator Valve
PR - PRPV – Pressure Reducing Pilot Valve



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	200	7.9	245	9.6	297	11.7	340	13.4	314	12.3	364	14.3
B	316	12.4	231	9	335	13.2	266	10.5	290	11.4	308	12
C	116	4.6	103	4	73	2.9	58	2.3	44	1.7	43	1.7
D	224	8.8	325	12.8	400	15.8	462	18.2	580	22.8	768.5	30.2
E	233	9.2	182	7.2	92	3.6	62	2.4	NA	NA	NA	NA
F	160	6.3	161	6.3	214	214	231	9.1	255	10	203	8
G	308	12	437	17.2	289	8.4	398	15.7	385	15.1	502	19.8
Kg/lb	20.5	45.2	32.4	71.4	49.4	108.9	68.4	150.8	107.6	237	233.5	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
- Wet Pilot's hieght.
- System installation orientation
- Additional accessories needed

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


IN CASE OF
FIRE
OPEN DOOR
AND
PULL LEVER

PREACTION SYSTEMS

RAPHAEL FP

Preaction Systems

RAPHAEL FP

Double Interlock, Electric and Pneumatic actuation with Local Reset

FPS-DIC0

The Pre-action is a FP combined system based on a controlled FDV deluge valve and a riser check valve installed at its downstream. The pressurized automatic sprinklers pipeline keeps the riser check valve close. The space between the close deluge valve downstream side and the closed check valve's clapper serves as the "Intermediate chamber" where the acoustic alarm and pressure switch are connected.

At double interlock pre-action systems like the one described, the full operation of the system is conditioned by two invents of fire detection or direct result to exposure to fire. The FPS-DIC0 system operation need to be triggered pneumatically and electrically:

In fire situation, the flams heat shatters open one or more of the automatic sprinklers causes the pipeline to depressurize. The pressure decrease causes a pneumatic actuator to open. This is considered as one event of actuation.

When one or more of the smoke detectors is activated, it transmits an electric signal to the main control board. This is considered as the second event of actuation. Only when both events of actuation occur, the control board opens the solenoid valve and consequently, the FDV deluge valve opens, admitting water to the sprinkles pipeline.

MARKETS

Commercial · Industry · Storage

Airports · P.O.G. · Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS: Air, Nitrogen

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

AVAILABLE CONNECTIONS ENDS:
Groove*Groove
Flange*Flange

PRESSURE NOMINAL:
250 psi (17.2 bar)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

APPROVALS

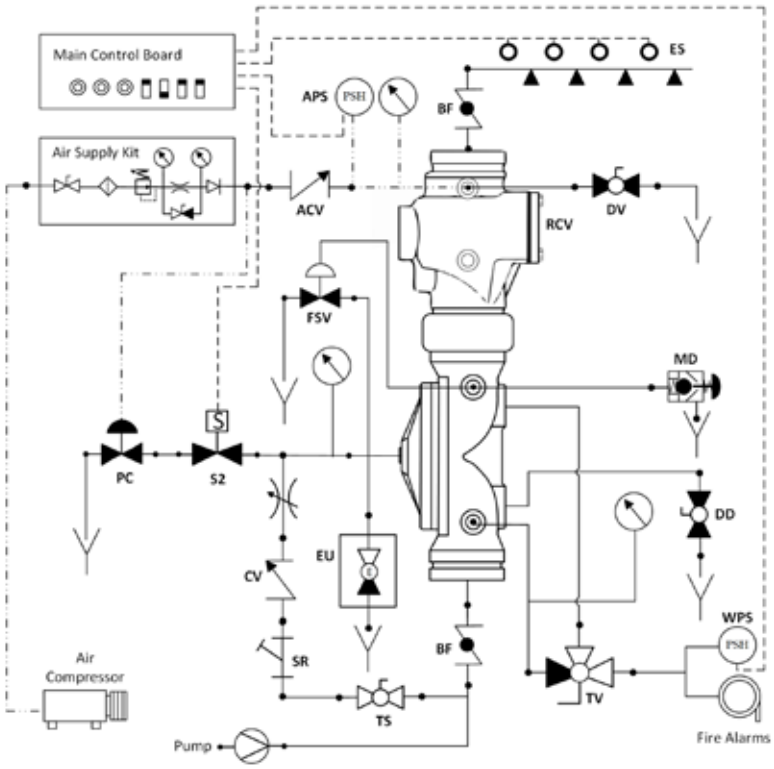
ADVANTAGES

- Suitable for low temperature zone installation – water-spraying pipeline is kept dry
- Unobstructed full bore valve
- Constant air compensation in case of pipeline minor leaks
- Manual/Emergency local operation valve, protected from Accidental activation by-pass all terms
- Open fail-safe valve property by special fail-safe device triggered by downstream pressure
- Low maintenance cost: the main valve is serviced in-line and only one replaceable part - the long-life elastomeric diaphragm. The riser check valve is maintenance free

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open automatically only after two events of actuation. The trip is actuated by an electric signal conveyed to the valve's solenoid and by close sprinklers pipeline pressure decrease
- Soft closing upon pressurization of the valve's control chamber, by line pressure or other independent water source, prevents surges
- The FPS-DIC0 resets to stand-by close position by de-energizing the solenoid's coil through the main control panel, replacing all shuttered open sprinklers and closing the upstream separtion valve

Schematic drawing



ES - Electric sensors system
APS - Air pressure switch
ACV - Air check valve
DV - Drain valve
RCV - Riser check valve
PC - Pneumatic actuator N.O.
S2 - 2 way solenoid
FSV - Fail safe valve
CV - Check valve
WPS - Water pressure switch
DD - Downstream drain
TV - Alarms test valve
SR - "Y" strainer

OPERATION

SET position

Pressurized water in the deluge valve's control chamber is trapped by the check-valve (CV), by the closed solenoid valve (S2), and by the closed emergency valve (EU), maintaining the deluge valve in its closed position. The air pressure accumulated in the downstream spraying pipeline, maintains Riser check valve (RCV) close.

FIRE situation

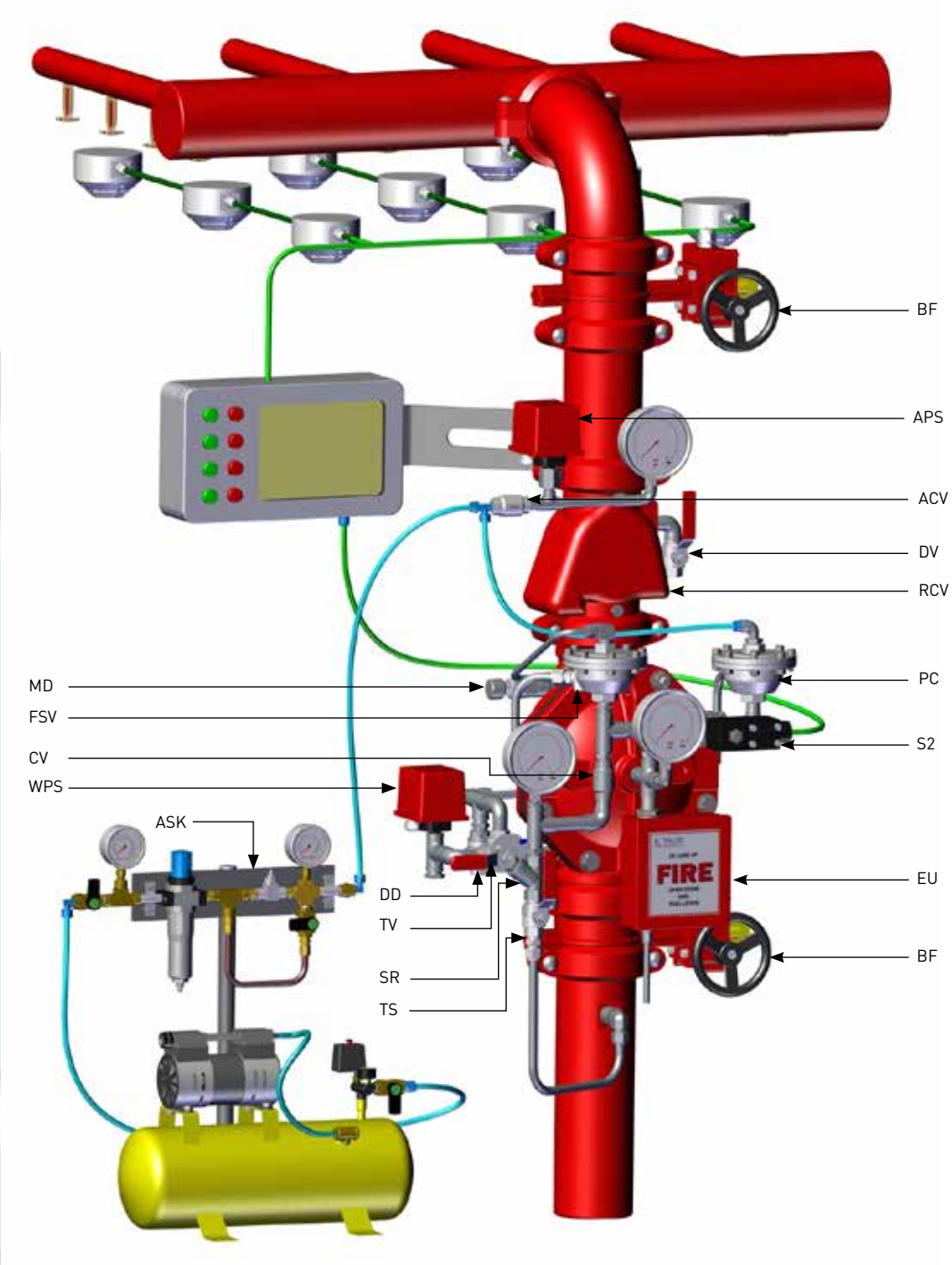
When some oWhen some of the automatic sprinklers are subjected to the predetermined temperature and shutter-open, the pipeline de-pressurizes, tripping open the closed pneumatic actuator (PC) and closes the internal contacts of the low air pressure switch (APS). When this signal is transferred to the main control board, it is considered as the first actuation event. When the electric detection system senses heat and triggers the main control board, it energizes the 2 way solenoid valve coil. This is considered as the second event of actuation. When the solenoid and the actuator (PC) are both open, the deluge control chamber is drained and the valve opens, admitting water through the open riser check valve to the sprinklers pipeline. All alarms are activated. The fail safe valve control chamber is pressurized by the downstream pressure, opens and constantly drains the water flow supplied from the upstream by the trim supply valve (TS)

RESET position

When the solenoid valve is de-energized by the main control board it closes. The full system reset requires the closing of the separation valve at the upstream pipeline (butterfly or OS&Y) and the replacement of all Shattered-open sprinklers in the spray pipeline. Consequently, the fail safe)FSV(will close and the deluge control chamber will become pressurize by the constant flow from the trim supply valve (TS), bypassing the closed upstream separation valve. Before re-pressurizing the downstream pipeline by air, it needs to be fully drained by opening the drain valve (DV) at the riser check valve. Finally, the upstream separation valve need to be opened.

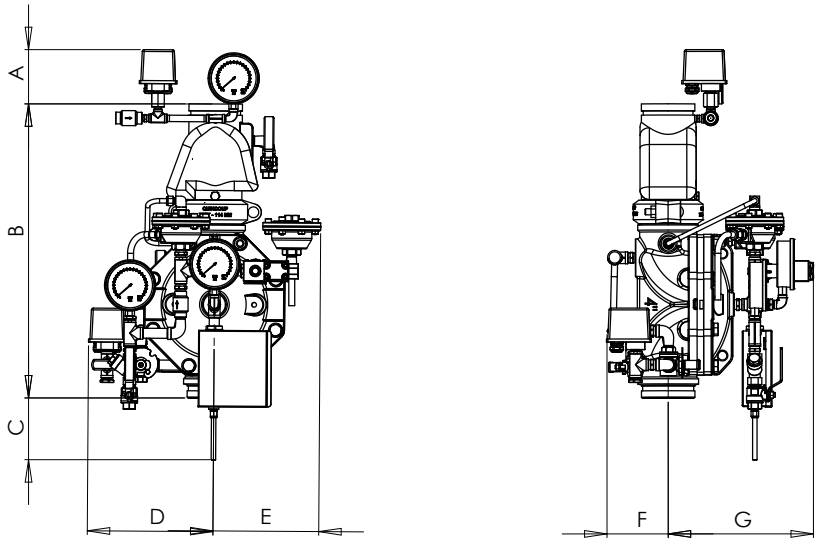
FPS-DIC0

Typical installation



BF - Butterfly valve
ES - Electric Sensors system
APS - Air Pressure Switch
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
PC - Pneumatic actuator Pressure to Close
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve
MD - Manual Automatic Drain Valve
ASK - Air Supply Kit
FSV - Fail Safe Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply

Schematic drawing



Dimensions Table

Size	1½", 2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	108	4.3	96	3.8	115	4.5	115	4.5	114	4.5	113	4.4
B	342	13.5	522	20.6	630	24.8	737	29.0	900	35.4	1200	47.2
C	220	8.7	168	6.6	131	5.2	100	3.9	45	1.8	N/A	N/A
D	171	6.7	183	7.2	300	11.8	325	12.8	350	13.8	383	15.1
E	230	9.1	230	9.1	230	9.1	230	9.1	230	9.1	305	12.0
F	141	5.6	141	5.6	131	5.2	133	5.2	140	5.5	188	7.4
G	235	9.3	265	10.4	270	10.6	366	14.4	370	14.6	460	18.1

Factory Standard

MAIN VALVE:

BODY & COVER

- Ductile iron
- Cast Steel WCB
- Stainless Steel CF8
- Stainless Steel CF8M

RISER CHECK VALVE:

- Ductile iron
- Cast Steel WCB
- Stainless Steel CF8M

ELASTOMERS:

- NR, Fabric reinforced Natural Rubber
- EPDM, Fabric reinforced
- NBR, Fabric reinforced

COATING:

- Base layer – high built Epoxy FBE
- Top layer – electrostatic Polyester powder RAL 3000
  Rilsan Polyamide based (Nylon 11)
  Internal – vitreous Enamel DIN 3475
  External – Epoxy/Polyester powder RAL 3000

TRIM

PIPING & TUBING:

- Stainless Steel 316
- Brass/Copper

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Solenoid Voltage
- Solenoid Protection
- Pneumatic working pressure
- System installation orientation
- Additional accessories needed

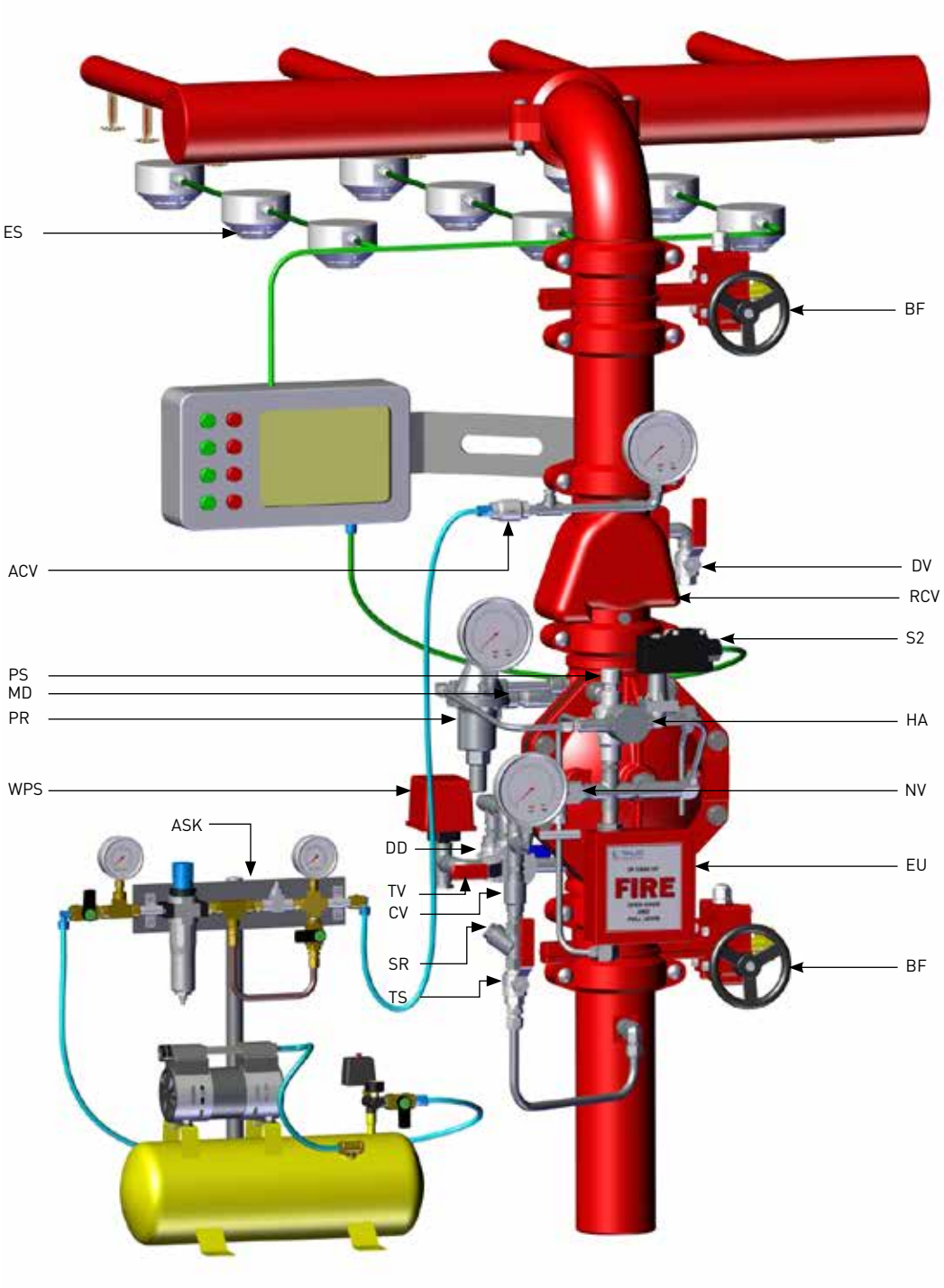
For more detailed technical information, please refer to chapter Engineering Data.

Preaction Systems

Single interlock with pressure reducing, Electric actuation and Local reset

FPS-SCE0

Typical installation



ES - Electric Sensors System
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve

MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer

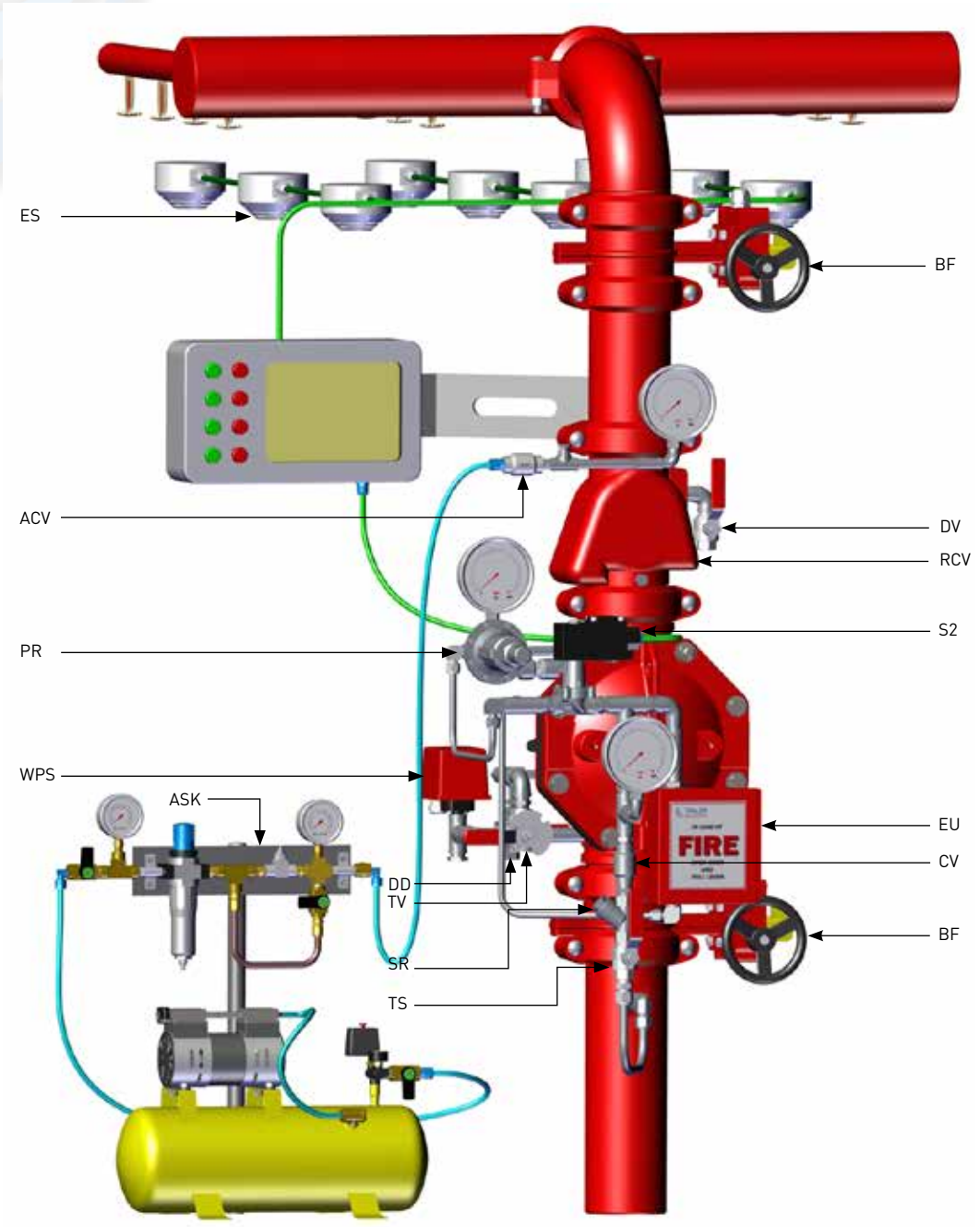
TS - Trim Supply
PR - Pressure Reducing Pilot
HA - Hydraulic Actuator
NV - Needle Valve
PS - PSA – Pressure Supply Arrestor
ASK - Air Supply Kit

Preaction Systems

Single interlock with pressure reducing, Electric actuation and Remote reset

FPS-SCE1

Typical installation



ES - Electric Sensors System
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve
MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply
PR - Pressure Reducing Pilot
HA - Hydraulic Actuator
NV - Needle Valve
ASK - Air Supply Kit

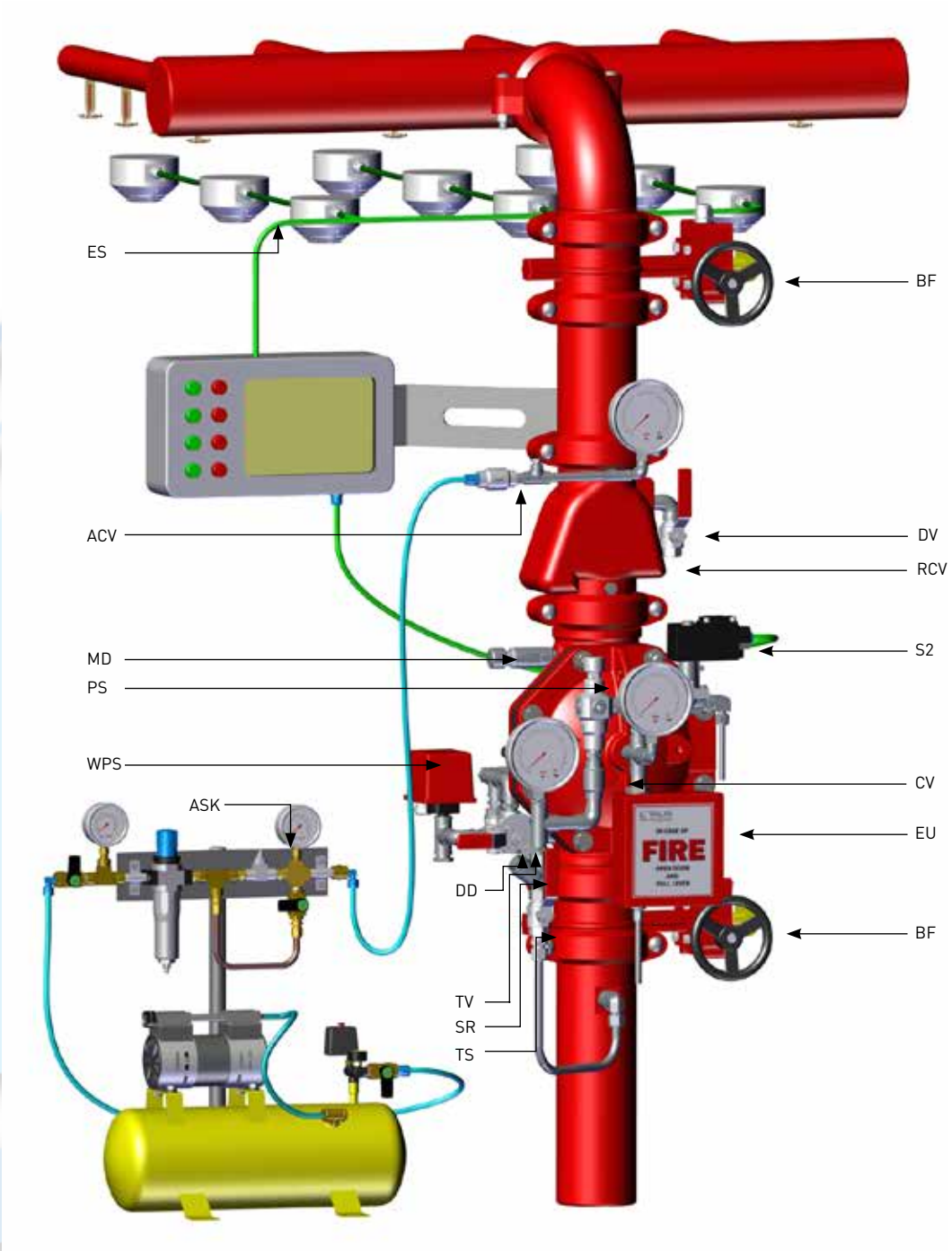
Preaction Systems

RAPHAEL FP

Single interlock, Electric actuation, Local reset

FPS-SIEO

Typical installation



APS - Air Pressure Switch
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit

BF - Butterfly Valve
MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain

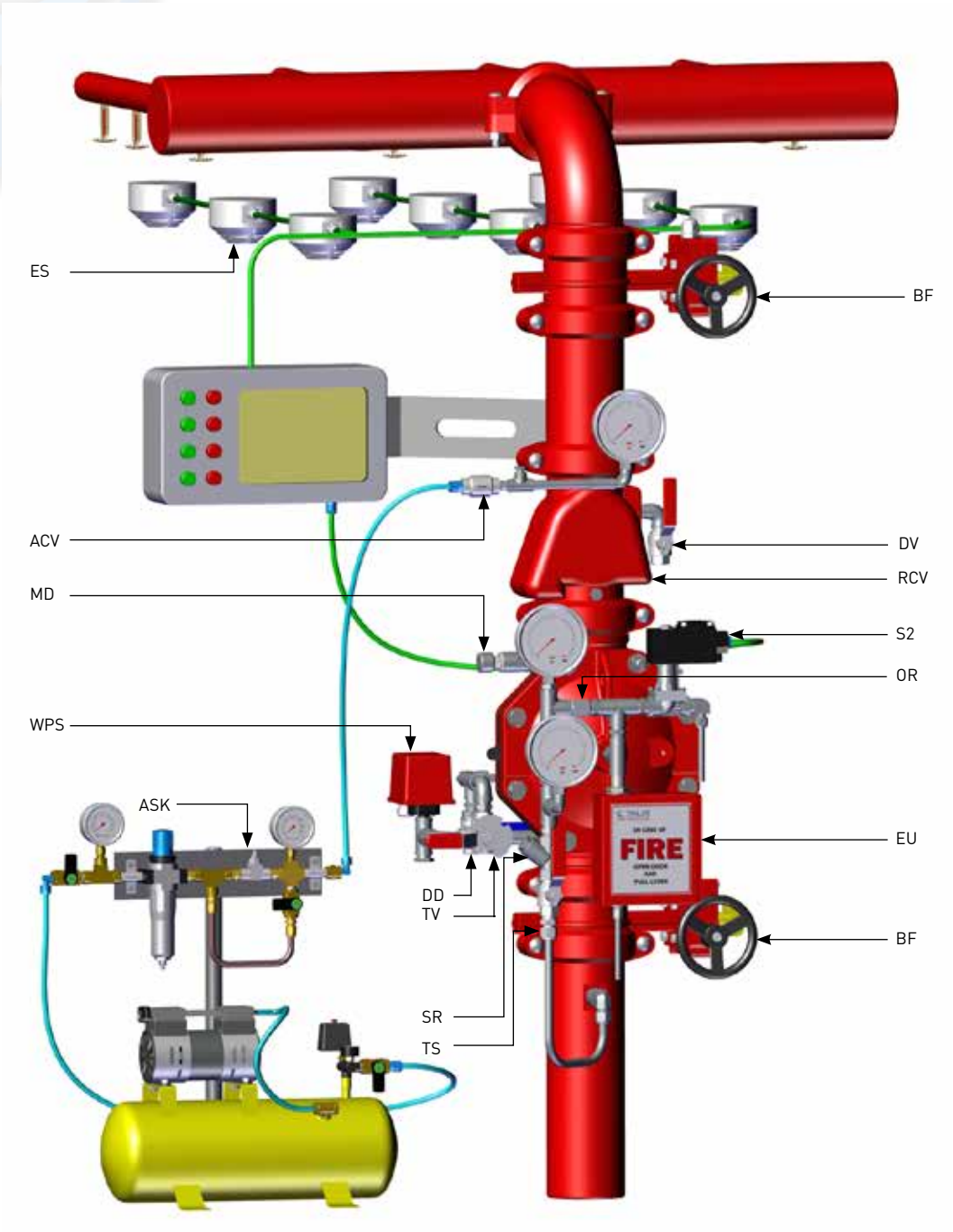
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply
ASK - Air supply kit
PS - Pressure supply arrestor

Preaction Systems

Single interlock, Electric actuation, Remote reset

FPS-SIE1

Typical installation



ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve

MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve

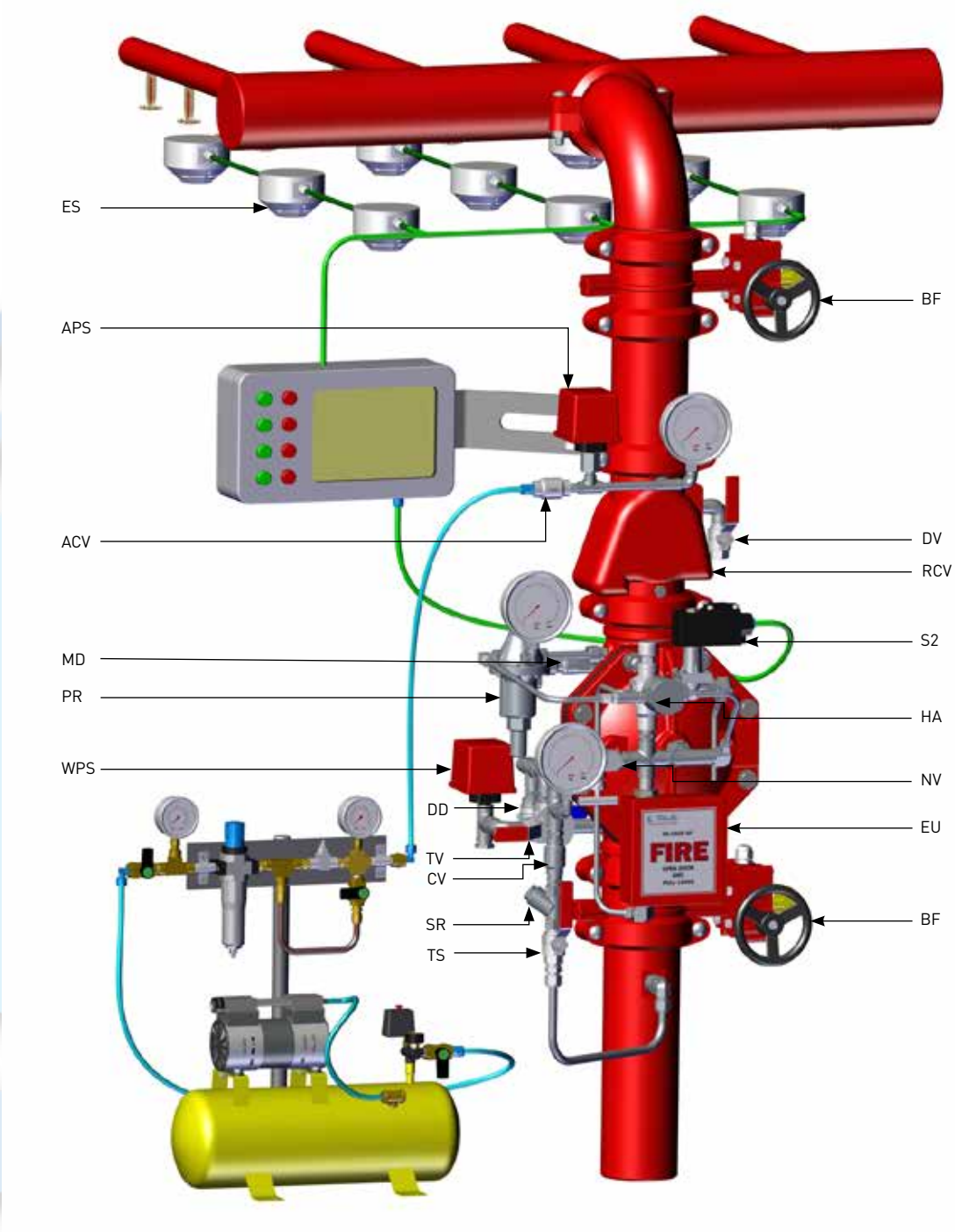
SR - "Y" Strainer
TS - Trim Supply
ASK - Air supply kit
OR - Orifice

Preaction Systems

Double interlock with pressure reducing, Electric actuation and Local reset

FPS-DCEO

Typical installation



APS - Air Pressure Switch
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve

MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer

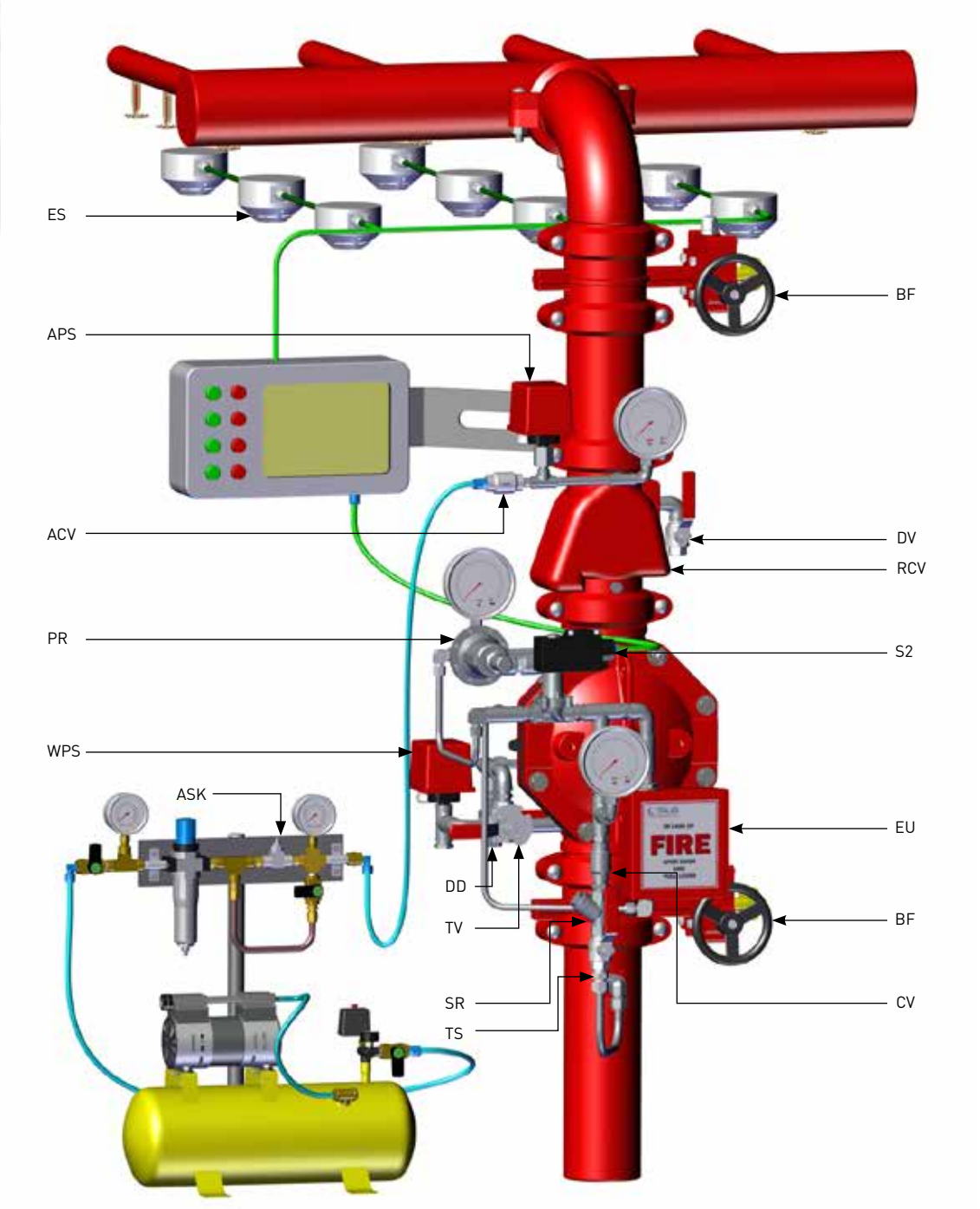
TS - Trim Supply
PR - pressure reducing pilot
HA - Hydraulic actuator
NV - Needle valve
PS - PSA – pressure supply arrestor

Preaction Systems

Double interlock with pressure reducing, Electric actuation and Remote reset

FPS-DCE1

Typical installation



ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve

MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve

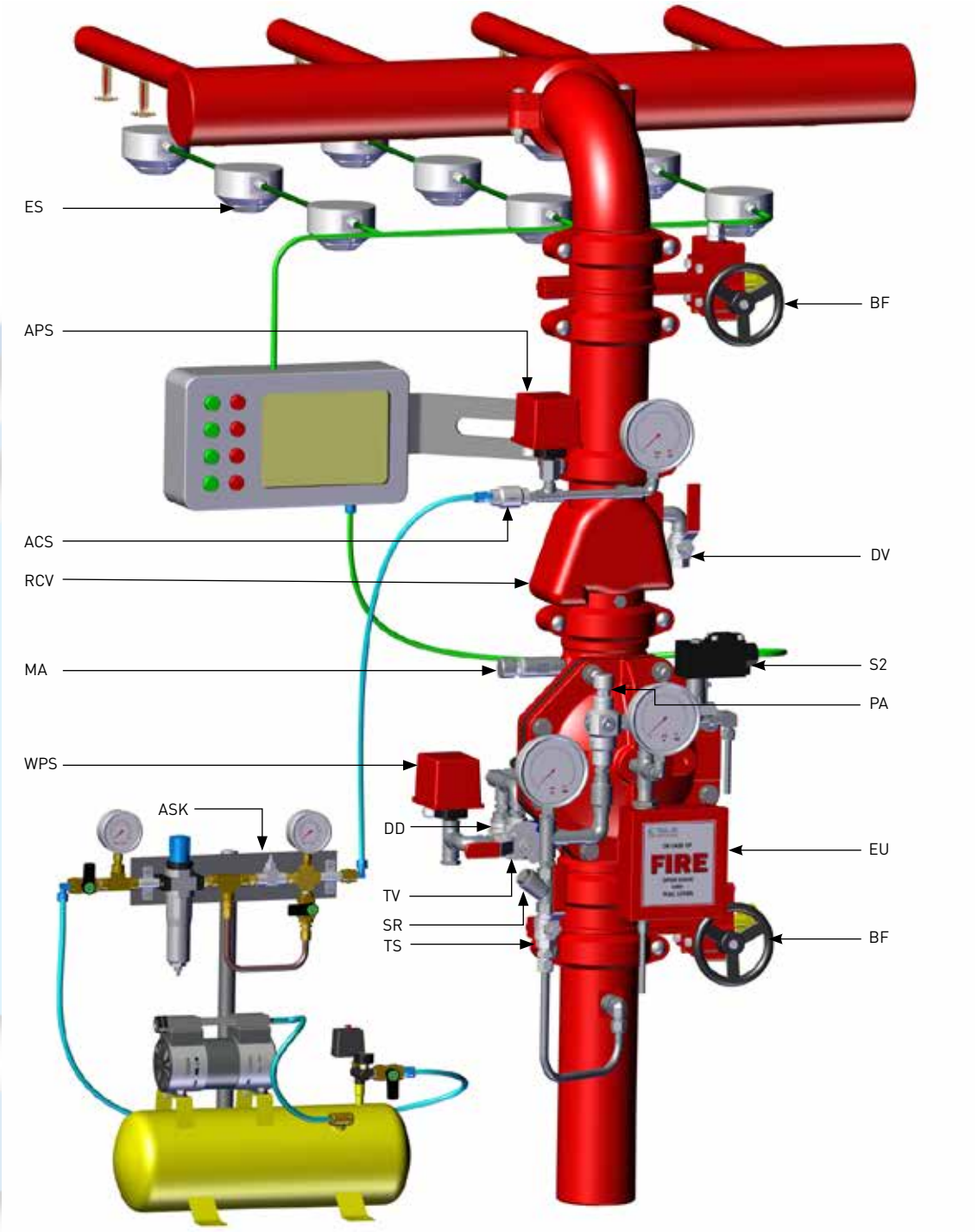
SR - "Y" Strainer
TS - Trim Supply
ASK - Air supply kit
OR - Orifice

Preaction Systems

FPS-DIE0 - Double interlock, Electric actuation and Local reset

FPS-DIE0

Typical installation



APS - Air Pressure Switch
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit

BF - Butterfly Valve
MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain

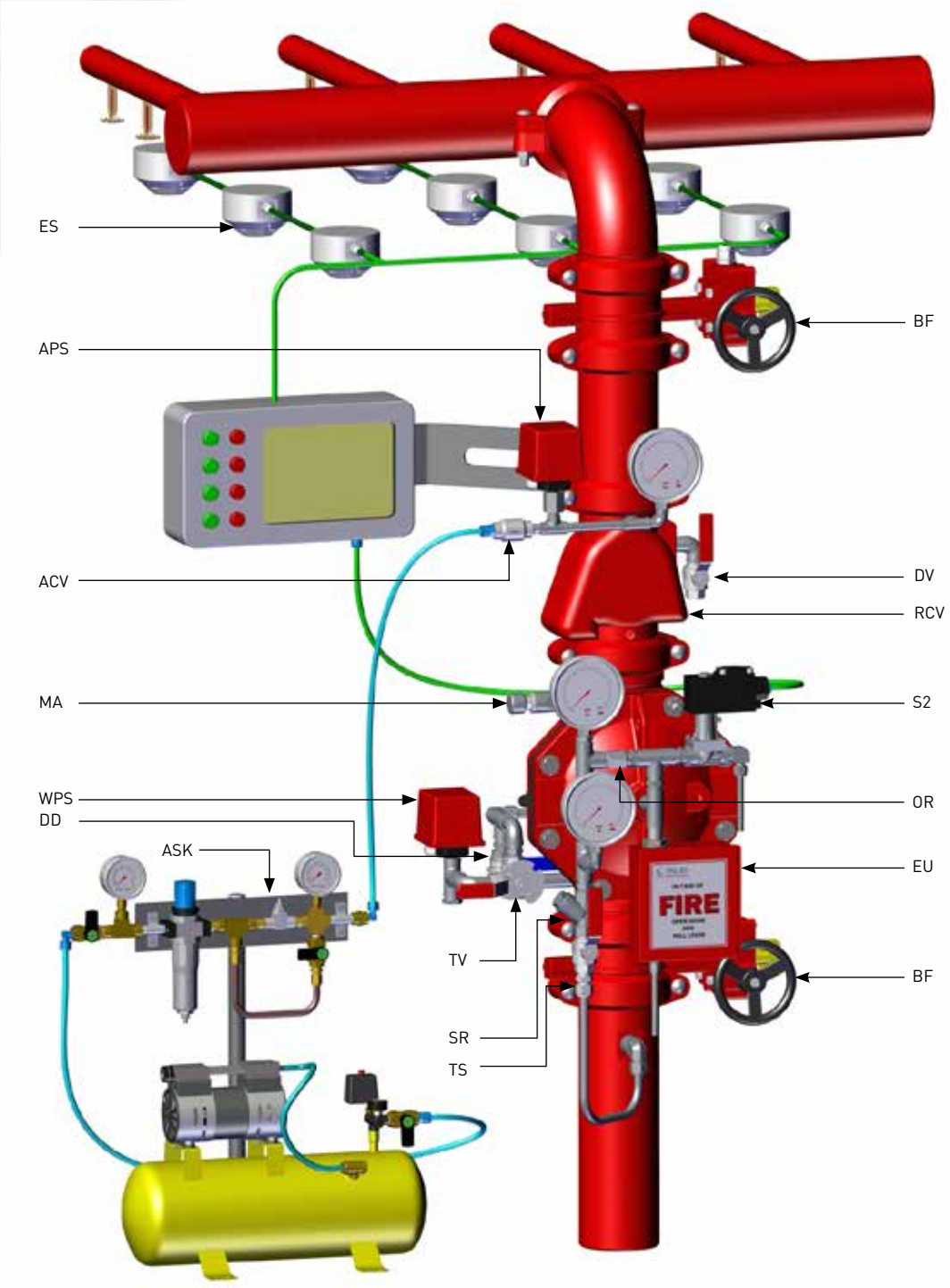
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply
ASK - Air supply kit
PS - Pressure supply arrestor

Preaction Systems

Double interlock, Electric actuation and Remote reset

FPS-DIE1

Typical installation



APS - Air Pressure Switch
ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
S2 - Solenoid 2 way
EU - Emergency Unit
BF - Butterfly Valve
MD - Manual Automatic Drain Valve
CV - Check Valve
WPS - Water Pressure Switch
DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply
ASK - Air supply kit
OR - Orifice

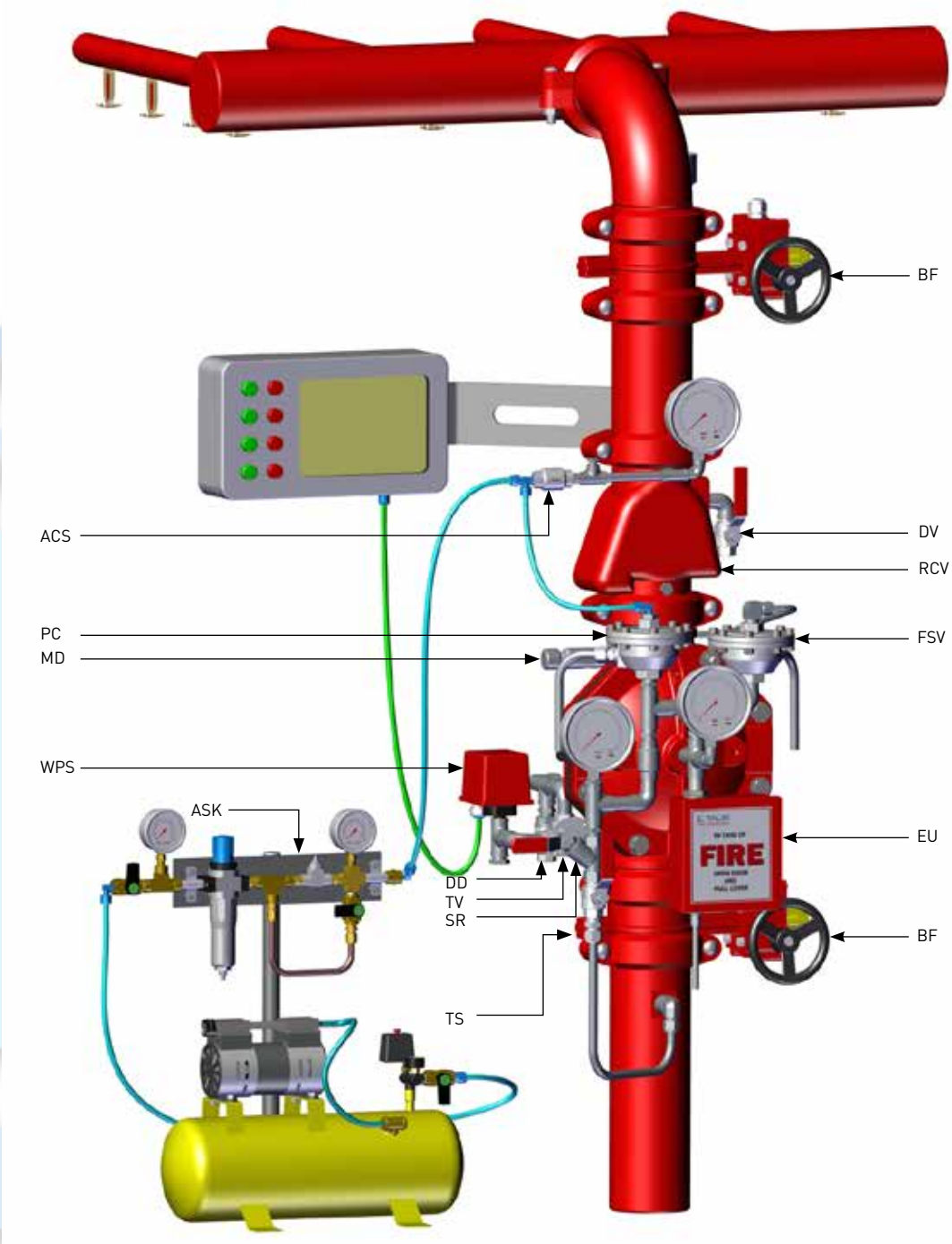
Preaction Systems

RAPHAEL FP

Single interlock, Pneumatic, Local reset

FPS-SIP0

Typical installation



ACV - Air Check Valve
DV - Drain Valve
RCV - Riser Check Valve
EU - Emergency Unit
BF - Butterfly Valve

MD - Manual Automatic Drain Valve
FSV - Fail Safe Valve
CV - Check Valve
WPS - Water Pressure Switch

DD - Downstream Drain
TV - Alarms Test Valve
SR - "Y" Strainer
TS - Trim Supply
PC - Pneumatic actuator N.O.

ON/OFF VALVES

RAPHAEL FP

RAPHAEL FP

3 Way Monitor Valves

Local Hydraulic Actuated Monitor Valve

FDV-R-3W-MH0

The FDV-R-3W-MH0 is a manually operated On-Off Fire Protection Monitor valve, designed to control the opening and closing of fire Monitors, in special hazard fire protection systems.

Assembled in horizontal or vertical position, the FDV-R-3W-MH0 Monitor valve is locally commanded to open/close by a manual emergency valve.

Operating this valve, commands the main valve by pressurizing or de-pressurizing its control chamber, enabling a quick and effortless operation

The globe pattern, line pressure operated FDV-R-3W-MH0 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 minimum head loss.

This valve can be supplied upon request in a PRV configuration, were the monitor's pressure is reduced, to satisfy the system's design.

MARKETS

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

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

SIZE RANGE:
50mm to 200mm (2" to 8")

AVAILABLE CONNECTIONS ENDS:
Flange*Flange, Groove*Groove, 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
- 3 way control principle ensure fast and reliable opening
- Open fail safe valve in high ambient temperatures
- Maintained in stand-by closed position
- 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

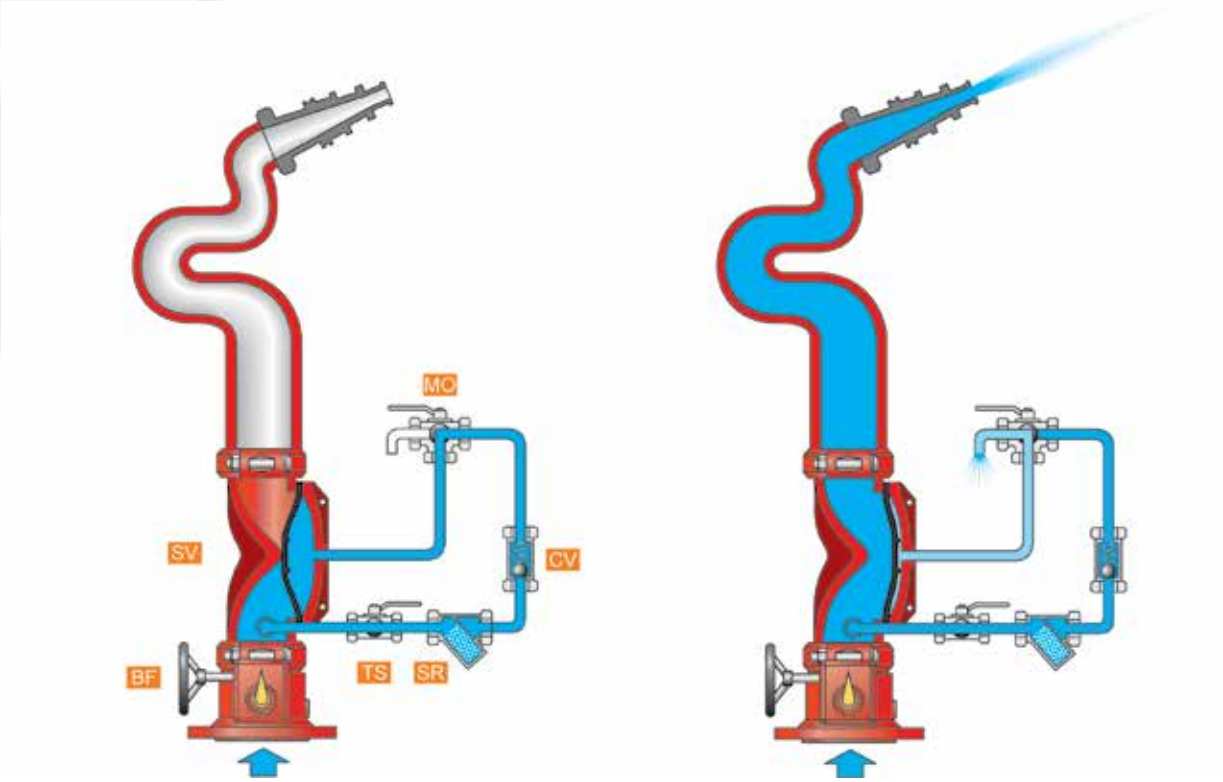
CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- The valve trips open by manually opening a 3 way ball valve and draining the valve's control chamber
- Closing the manual ball valve stops the control chamber's drainage and pressurizes it. By that, the monitor valve closes
- Soft closing controlled pressurization of the valve's control chamber, prevents surges

Schematic drawing

Set position

Fire position



SV - FDV-R Valve
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
MO - Manual Operation valve (3 way)
BF - Butterfly valve

OPERATION

SET position

Pressurized water in the valve's control chamber (SV) is trapped by the Check Valve (CV), forces the valve's diaphragm against its seat and maintains the FDV-R valve close.

FIRE situation

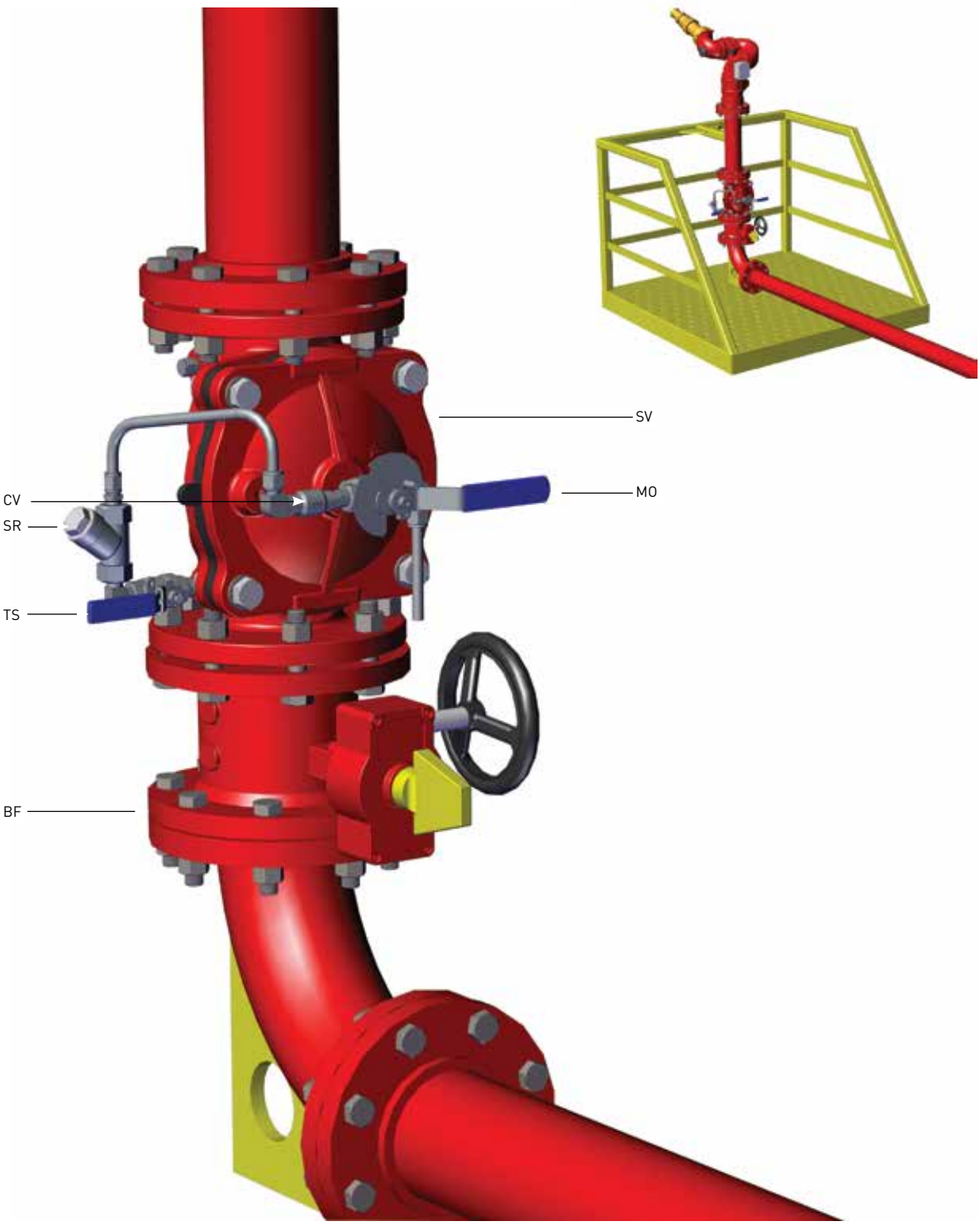
Opening the Manual Operation valve (MO), drains the FDV-R's control chamber and opens the valve.

RESET position

Closing the Manual Operation valve, stops the FDV-R's control chamber drainage admits upstream pressure and pressurizes it. Consequently, the valve's diaphragm is forced to its seat and the valve closes.

FDV-R-3W-MH0

Typical installation

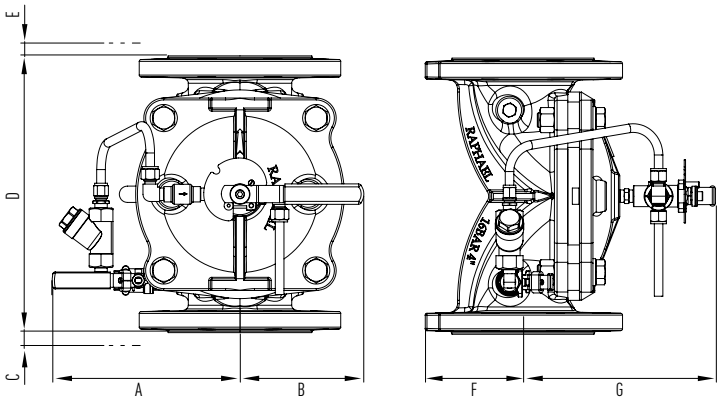


SV - FDV-R Valve
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
MO - Manual Operation valve (3 way)
BF - Butterfly valve

Dimensions Table

Size	2"		2.5"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	196	7.7	204	8	212	8.3	231	9.1	282	11.1	283	11.1
B	82	3.2	93	3.7	100	3.9	111	4.4	158	6.2	178	7
C	16	0.6	7	0.3	-	-	-	-	-	-	-	-
D	190	7.5	215	8.5	283	11.1	305	12	406	16	470	18.5
E	8	0.3	-	-	-	-	-	-	-	-	-	-
F	82	3.2	89	3.5	100	3.9	109	4.3	142	5.6	160	6.3
G	187	7.4	201	7.9	214	8.4	233	9.2	288	11.3	356	14
Kg/lb	8.8	19.4	11.1	24.5	17.6	38.8	23.8	52.5	48.5	106.9	106.9	114.8

Note: In addition to the valve diameters shown at the table, all FP applications based on FDV-R valves can be supplied also in the following diameters: 10" ; 12" ; 14" ; 16"



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
- Additional accessories needed

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

RAPHAEL FP

3 Way Monitor Valves

Remote Hydraulic Actuated Monitor Valve

FDV-R-3W-MH1

The FDV-R-3W-MH1 is a hydraulic controlled On-Off Fire Protection Monitor valve, designed to control the opening and closing of fire Monitors, in special hazard fire protection systems.

Assembled in horizontal or vertical position, the FDV-R-3W-MH1 Monitor valve is commanded to open/close from a control panel or control room, by a hydraulic actuator. The actuator in turns, commands the valve bypressurizing or de-pressurizing the main valve's control chamber, enabling a quick and effortless operation.

The FDV-R-3W-MH1 incorporates an emergency valve, bypassing all terms for a manual operation.

The globe pattern, line pressure operated FDV-R-3W MH1 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 minimum head loss.

MARKETS

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

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

SIZE RANGE:
50mm to 200mm (2" to 8")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

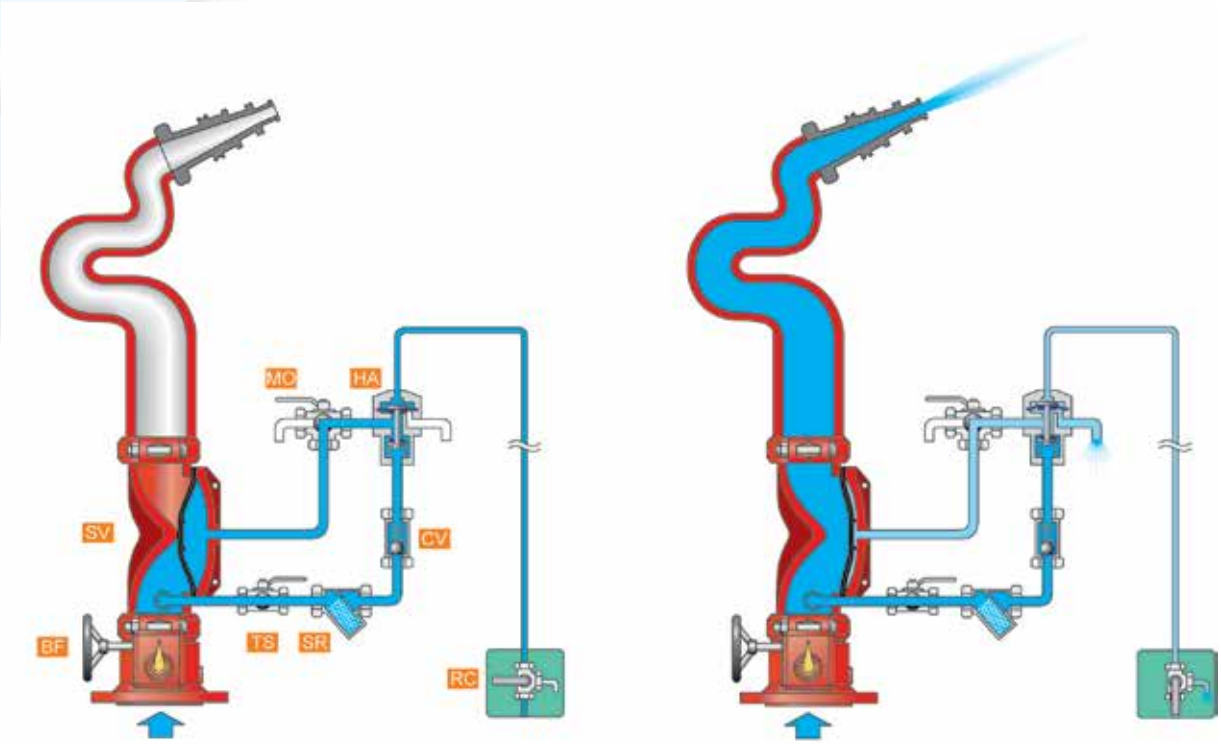
- Only three parts: body, diaphragm & cover plate, no wet metal spring inside the control chamber
- 3 way control principle ensure fast and reliable opening
- Open fail safe valve in high ambient temperatures
- Maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line 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

- 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 hydraulic command pressure transferred by a pilot pipeline, operating a 3 way actuator
- Soft closing by controlled pressurization of the valve's control chamber, prevents surges

Schematic drawing

Set position **Fire position**



SV - FDV-R Valve
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
MO - Manual Operation valve (3 way)
HA - Hydraulic Actuator Valve (3 way)
BF - Butterfly valve

OPERATION

SET position

Pressurized water in the valve's control chamber (SV) is trapped by the Check Valve (CV), forces the valve's diaphragm against its seat and maintains the FDV-R valve close.

FIRE situation

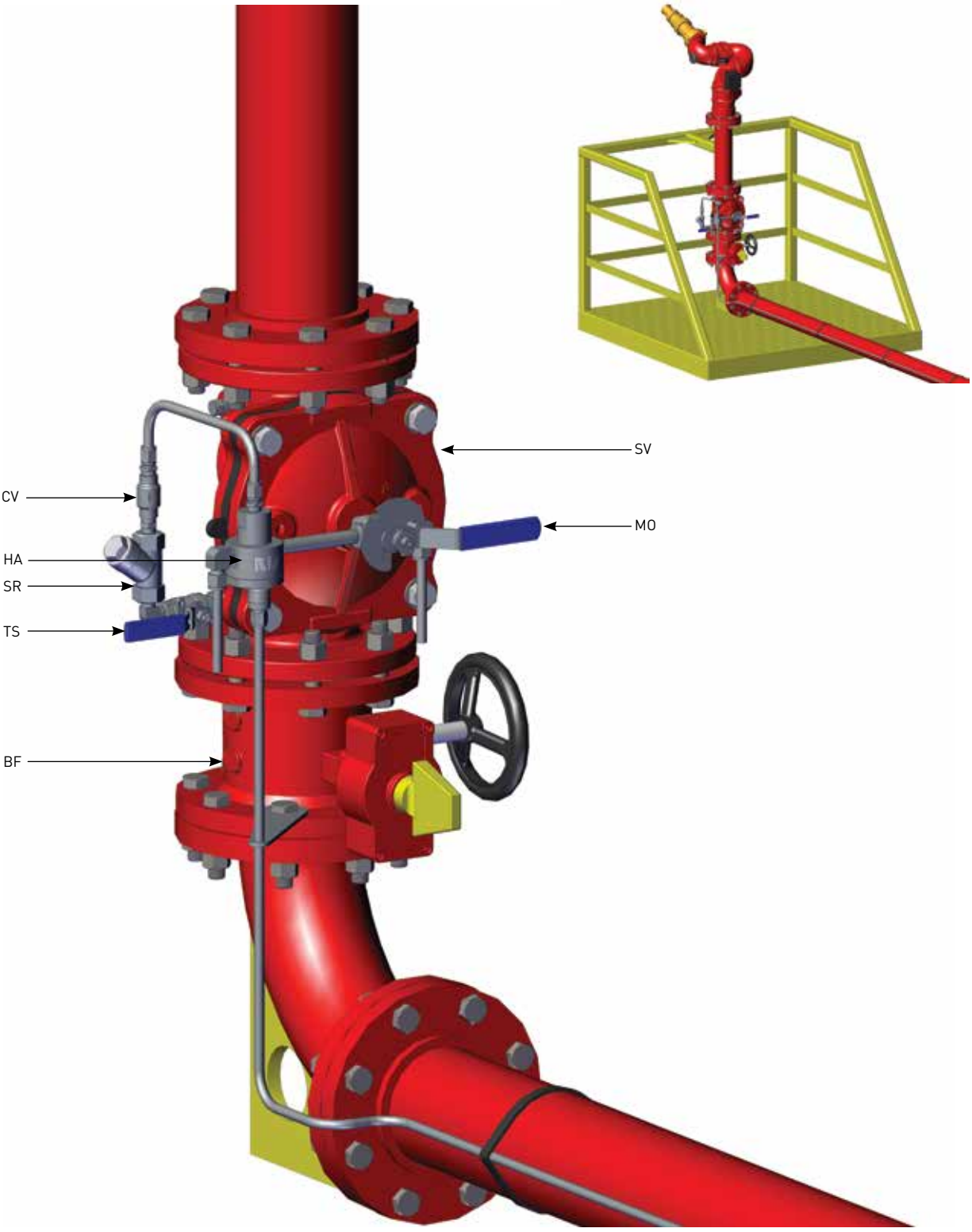
A remote hydraulic command transferred by a pilot pipeline, pressurizes the Hydraulic Actuator valve's control Chamber (HA).
Consequently, the actuator change state and drains the FDV-R's Control Chamber. The valve opens and admits water to the monitor pipeline.
Opening the Manual Operation valve (MO), bypasses all term, drains the FDV-R's control chamber and opens the valve.

RESET position

As the pilot pipeline command pressure drops, the Hydraulic Actuator stops the FDV-R's control chamber drainage, admits upstream pressure and pressurizes it. Consequently, the valve's diaphragm is forces against its seat and the valve closes.

FDV-R-3W-MH1

Typical installation



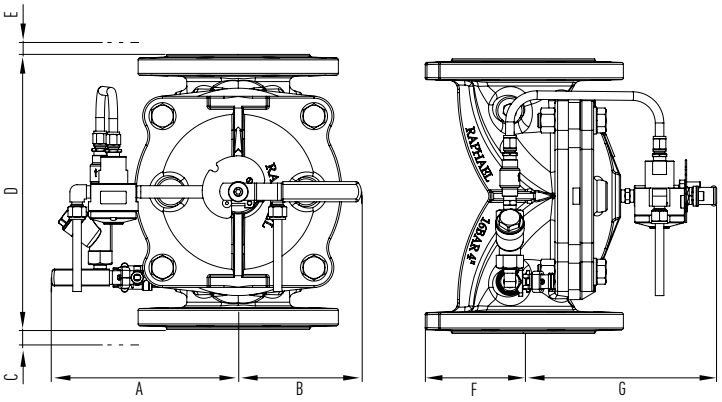
SV - FDV-R Valve
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve

MO - Manual Operation valve (3 way)
HA - Hydraulic Actuator Valve (3 way)
BF - Butterfly valve

Dimensions Table

Size	2"		2.5"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	196	7.37	204	8	212	8.3	232	9.1	216	8.5	242	9.5
B	82	3.2	93	3.7	100	3.9	11	0.4	142	5.6	177	7
C	18	0.7	4	0.2	-	-	-	-	-	-	-	-
D	190	7.5	215	8.5	283	11.1	305	12	406	16	470	18.5
E	90	3.5	77	3	13	0.5	-	-	-	-	-	-
F	82	3.2	89	3.5	106	4.2	109	4.3	142	5.6	160	6.3
G	188	7.4	202	8	208	8.2	232	9.1	288	11.3	356	14
Kg/lb	9.9	21.8	12.3	27.2	18.8	41.5	24.9	54.9	49.4	108.9	66.7	147

Note: In addition to the valve diameters shown at the table, all FP applications based on FDV-R valves can be supplied also in the following diameters: 10" ; 12" ; 14" ; 16"



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
- Additional accessories needed

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

RAPHAEL FP

Monitor Valves

3 Way Remote Electric Actuated Monitor Valve

FDV-R-3W-ME1

The FDV-R-3W-ME1 is an electric controlled On-Off Fire Protection Monitor valve, designed to control the opening and closing of fire Monitors, in special hazard fire protection systems.

Assembled in horizontal or vertical position, the FDV-R-3W-ME1 Monitor valve is commanded to open/close from a control panel or control room, by a solenoid valve.The Solenoid in turns, commands the valve by pressurizing or de-pressurizing the main valve's control chamber, enabling a quick and effortless operation

The globe pattern, line pressure operated FDV-R-3W-ME1 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 minimum head loss.

MARKETS

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

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

SIZE RANGE:
50mm to 200mm (2" to 8")

AVAILABLE CONNECTIONS ENDS:
Flange*Flange, Groove*Groove, 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
- 3 way control principle ensure fast and reliable opening
- Open fail safe valve in high ambient temperatures
- Maintained in stand-by closed position
- 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

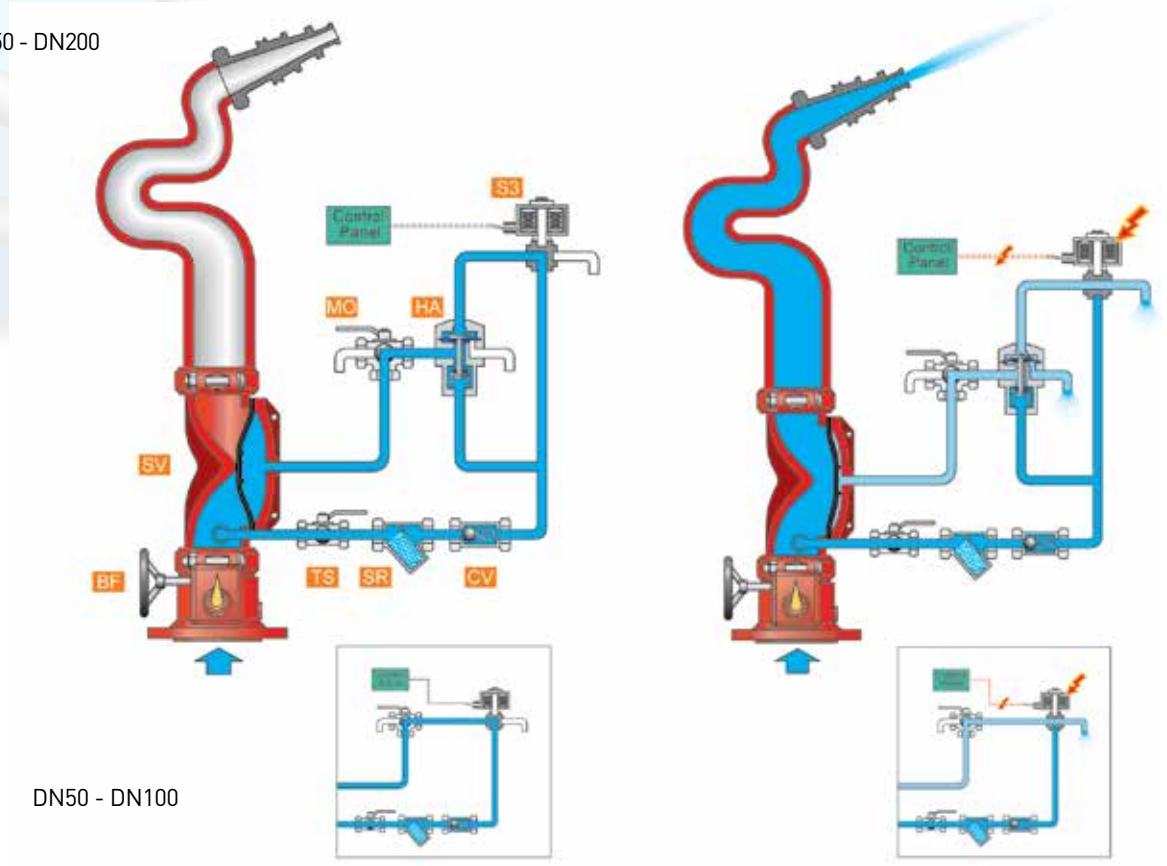
CHARACTERISTICS

- 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 solenoid (DN50 - DN100 valves) or indirectly, by a solenoid operating an actuator (DN150 – DN200 valves)
- Soft closing by controlled pressurization of the valve's control chamber, prevents surges

Schematic drawing

Set position **Fire position**

DN150 - DN200



DN50 - DN100

SV - FDV-R Valve
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
S3 - Solenoid valve (3 way)
MO - Manual Operation valve (3 way)
HA - Hydraulic Actuator Valve (3 way)
PF - Butterfly valve

OPERATION

SET position

Pressurized water in the valve's control chamber (SV) is trapped by the Check Valve (CV), forces the valve's diaphragm against its seat and maintains the FDV-R valve close.

FIRE situation

(DN50-DN100 valves) An electric signal transmitted, commands the 3 way solenoid valve (S3) to open and drain the FDV-R's control chamber. The valve opens and admits water to the monitor pipeline.
(DN150-DN200 valves) An electric signal transmitted, commands the 3 waysolenoid valve (S3) to open and drain the Hydraulic actuator's control chamber. Consequently, the actuator change state and drains the FDV-R's Control Chamber. The valve opens and admits water to the monitor pipeline.
Opening the Manual Operation valve (MO), bypasses all term, drains the FDV-R's control chamber and opens the valve.

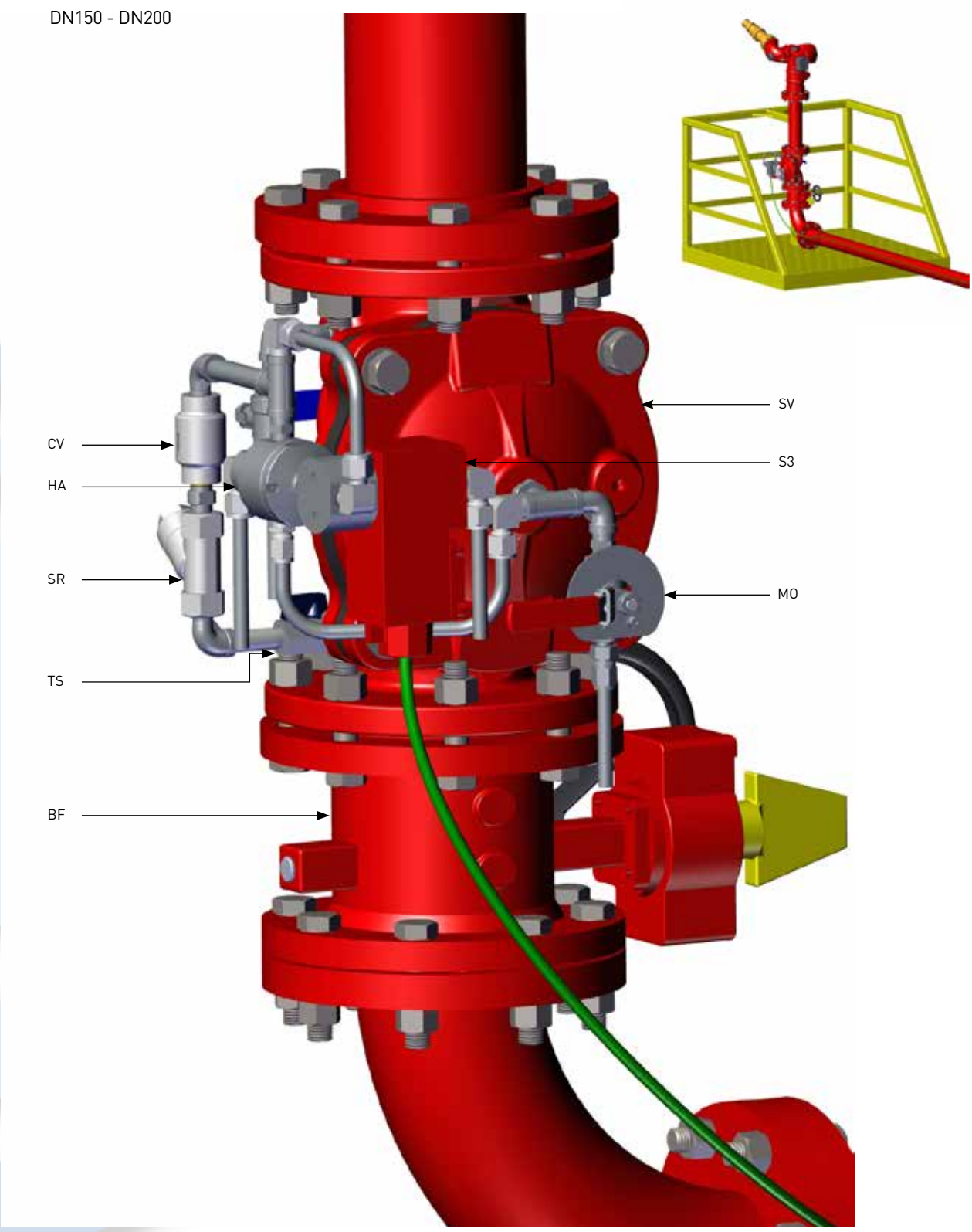
RESET position

(DN50-DN100 valves) An electric signal transmitted, commands the 3 way solenoid valve (S3) to open and drain the FDV-R's control chamber. The valve opens and admits water to the monitor pipeline.
(DN150-DN200 valves) An electric signal transmitted, commands the 3 way solenoid valve (S3) to open and drain the Hydraulic actuator's control chamber. Consequently, the actuator change state and drains the FDV-R's Control Chamber. The valve opens and admits water to the monitor pipeline.
Opening the Manual Operation valve (MO), bypasses all term, drains the FDV-R's control chamber and opens the valve.

FDV-R-3W-ME1

Typical installation

DN150 - DN200

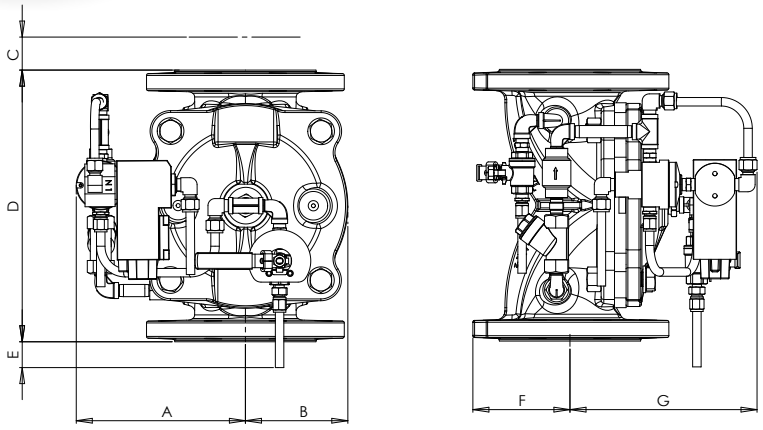


SV - FDV-R Valve
TS - Trim supply valve
SR - "Y" strainer
CV - Check valve
S3 - Solenoid valve (3 way)
MO - Manual Operation valve (3 way)
HA - Hydraulic Actuator Valve (3 way)
PF - Butterfly valve

Dimensions Table

Size	2"		2.5"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	197	7.8	215	8.5	219	8.6	170	6.7	236	9.3	247	9.7
B	83	3.3	93	3.7	100	3.9	115	4.5	151	5.9	177	7
C	17	0.7	4	0.2	-	-	-	-	-	-	-	-
D	190	7.5	215	8.5	283	11.1	305	12	406	16	470	18.5
E	82	3.2	70	2.8	13	0.5	7	0.3	-	-	-	-
F	82	3.2	8.9	3.5	100	3.9	109	4.3	142	5.6	160	6.3
G	188	7.4	201	7.9	214	8.4	265	10.4	348	13.7	418	16.5
Kg/lb	10.2	22.5	12.6	27.8	19.2	42.3	25.5	56.2	51.4	113.3	68.8	151.7

Note: In addition to the valve diameters shown at the table, all FP applications based on FDV-R valves can be supplied also in the following diameters: 10" ; 12" ; 14" ; 16"



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
- Energize to Open/Close valve
- Solenoid Voltage
- Solenoid Enclosure
- Solenoid Protection
- System installation orientation
- Additional accessories needed

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

RAPHAEL FP

Hydraulic Hydrants

Local Hydraulic Actuated, Hydrant Valve

FDV-Ra-HH0

The FDV-Ra-HH0 is a hydraulic controlled On-Off Fire Hydrant, designed to connect a pressurized fixed water supply network to a mobile extinguishing unit, through a fire brigade's quick coupling adapter.

Mounted on a breakage device or directly onto a riser, the FDR-Ra-HH0 Hydraulic Hydrant is locally commanded to open/close by a manual emergency valve. The manual emergency command valve by pressurizing or de-pressurizing the main valve's control chamber, enabling a quick and effortless operation of the Hydraulic Hydrant Designed for vertical installation, the Angle pattern, line pressure operated FDV-Ra-HH0 Hydraulic Hydrant, 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 minimum head loss.

MARKETS

Marine, P.O.G., Airports, Industry, Storage, Tunnel

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water

SIZE RANGE:
50mm to 200mm (2" to 8")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

ACCESSORIES UPON REQUEST:
Pressure gauge, Stand pipe, Breakage device

APPROVALS

ADVANTAGES

- Only three parts: body, diaphragm & cover plate, no wet metal spring inside the control chamber
- 3 way control principle ensure fast and reliable opening
- Open fail safe valve in high ambient temperatures
- Maintained in stand-by closed position
- 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
- Upon request:
- A large selection of stand pipes, offered in various sizes, materials and coatings.
- A brakeage device for water outlet prevention, in case of mechanical damage.

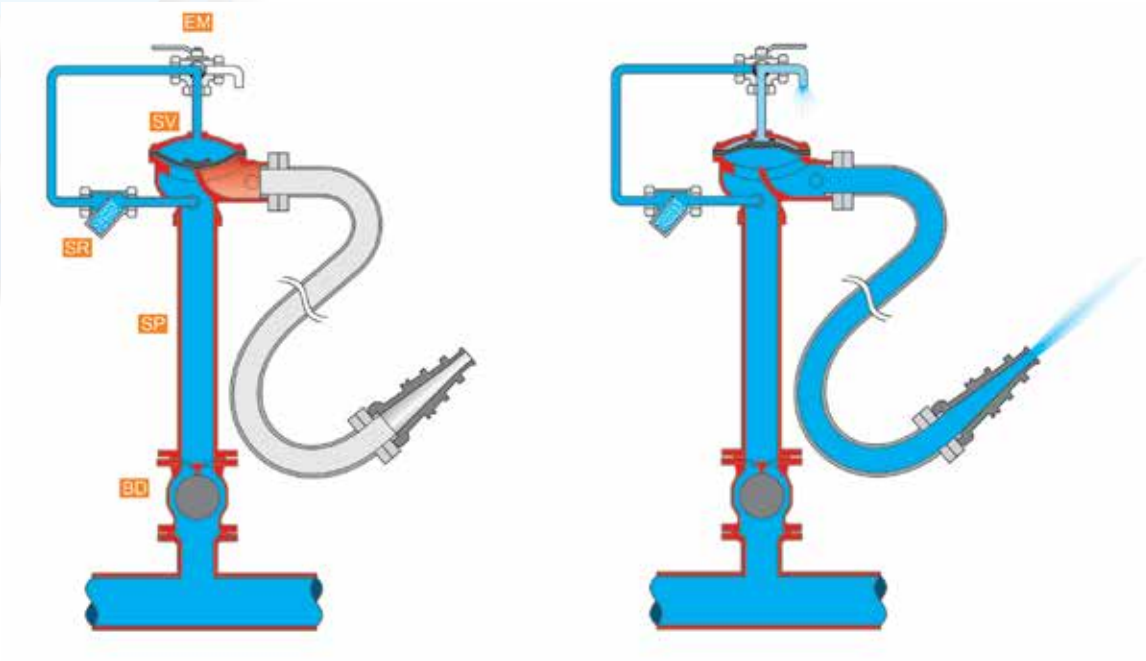
CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- Simple and reliable design
- Quick respond and fast opening of the valve at emergency situation

Schematic drawing

Set position

Fire position



SV - FDV-R Valve
MO - Manual Operation valve (3 way)
SR - strainer
SP - Stand pipe
BD - Breakage device

OPERATION

SET position

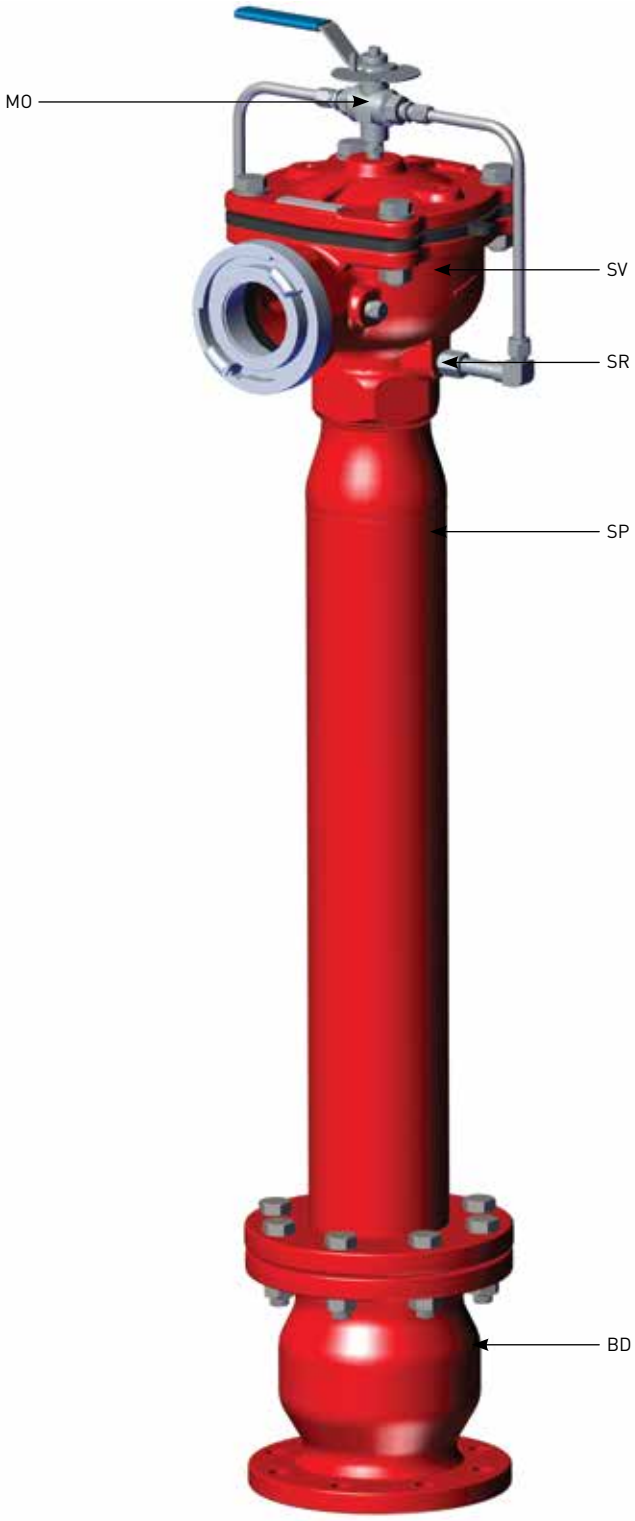
Pressurized water in the valve's control chamber (SV) is trapped by the 3 way manual emergency valve (MO), forces the valve's diaphragm against its seat and maintains the FDV-R valve close.

FIRE situation

Opening the Manual Operation valve (MO), drains the FDV-R's control chamber and opens the valve.

FDV-Ra-HH0

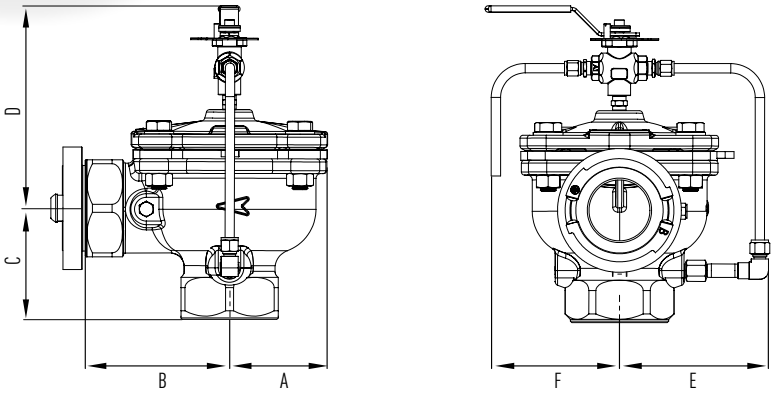
Typical installation



SV - FDV-R Valve
MO - Manual Operation valve (3 way)
SR - strainer
HA - Hydraulic Actuator Valve (3 way)
SP - Stand pipe
BD - Breakage device

Dimensions Table

Size	2"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	62	2.4	100.0	3.9	116.0	4.6	136.0	5.4	175.0	6.9
B	87	3.4	171.0	6.7	158.0	6.2	212.0	8.3	221.0	8.7
C	83	3.3	114.0	4.5	108.0	4.3	125.0	4.9	169.0	6.7
D	176	6.9	208.0	8.2	225.0	8.9	282.0	11.1	346.0	13.6
E	106	4.2	151.0	5.9	172.0	6.8	205.0	8.1	245.0	9.6
F	63	2.5	126.0	5.0	150.0	5.9	176.0	6.9	210.0	8.3
Kg/lb	5	11.0	14.0	30.8	25.0	55.0	47.0	103.4	71.0	156.2



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
- Hose Connection type
- Additional accessories

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

RAPHAEL FP

Hydraulic Hydrants

Hydraulic Actuated, Pressure Reducing Hydrant Valve

FDV-Ra-HHP

The FDV-R-HHP is a hydraulic controlled On-Off Fire Hydrant, designed to connect a pressurized fixed water supply network to a mobile extinguishing unit, through a fire brigade's quick coupling adapter.

Mounted on a breakage device or directly onto a standpipe, the FDR-R-HHP Hydraulic Hydrant is locally commanded to open/close by a manual emergency valve.

The manual emergency valve commands by pressurizing or de-pressurizing the Hydraulic Hydrant's control chamber, enabling a quick and effortless operation of the Hydraulic Hydrant.

Once commanded to open, the FDR-R-HHP valve acts as a pressure reducing valve, reducing the inlet water pressure to a pre-set desired outlet pressure. The outlet pressure is maintained constant regardless of fluctuations in flow rate and changes in main pipeline pressure.

Designed for vertical installation, the Angle pattern, line pressure operated FDV-R-HH0 Hydraulic Hydrant 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 minimum head loss.

MARKETS

Marine, P.O.G., Airports, Industry, Storage, Tunnel

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water
SIZE RANGE:50mm to 200mm (2" to 8")
AVAILABLE CONNECTIONS ENDS:
Flange*Hose Coupling, Groove*Hose Coupling, Thread*Hose Coupling
PRESSURE NOMINAL:
250 psi (17.2 bar)
REGULATION RATIO:5:1
SENSITIVITY: 1.45 psi (0.1 Bar)
ACCESSORIES UPON REQUEST:
Pressure gauge, Stand pipe, Breakage device

APPROVALS

ADVANTAGES

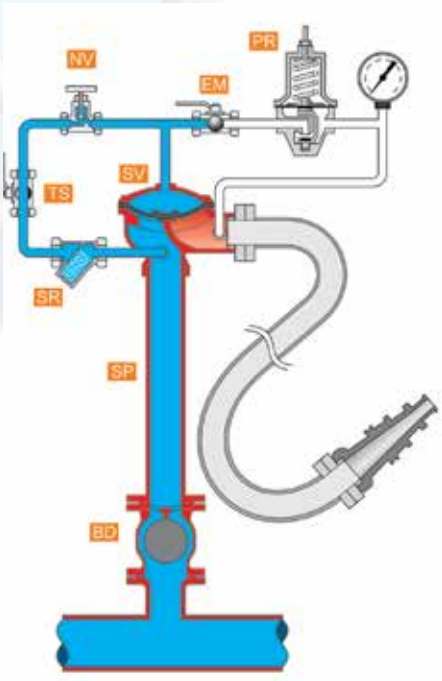
- Only three parts: body, diaphragm & cover plate, no wet metal spring inside the control chamber
- 3 way control principle ensure fast and reliable opening
- Open fail safe valve in high ambient temperatures
- Maintained in stand-by closed position
- Low maintenance cost: the valve is serviced in-line 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
- Upon request:
- A large selection of stand pipes, offered in various sizes, materials and coatings.
- A brakeage device for water outlet prevention, in case of mechanical damage.

CHARACTERISTICS

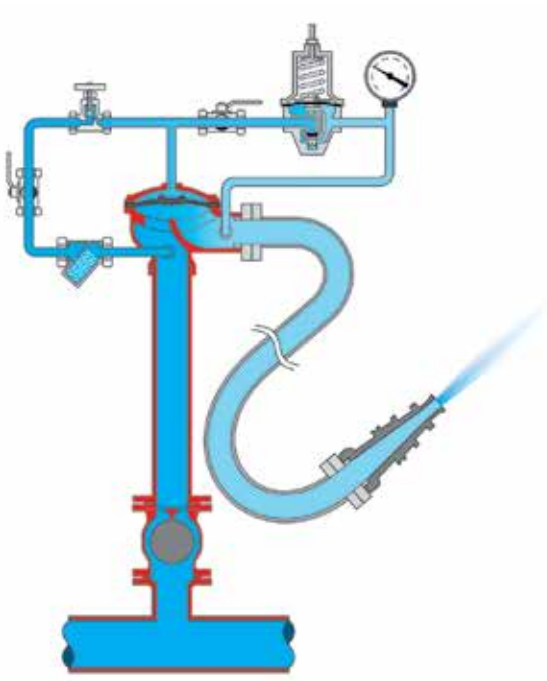
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- Simple and reliable design
- Quick respond and fast opening of the valve at emergency situation
- Pressure reducing to a predetermined set of outlet pressure

Schematic drawing

Set position



Fire position



PR - PRDV-pressure reducing pilot vale
EM - Manual Operation valve (2 way)
NV - Needle valve
TS - Trim supply valve
SR - Strainer
SV - FDV-R Valve
SP - Standpipe
BD - Breakage device

OPERATION

SET position

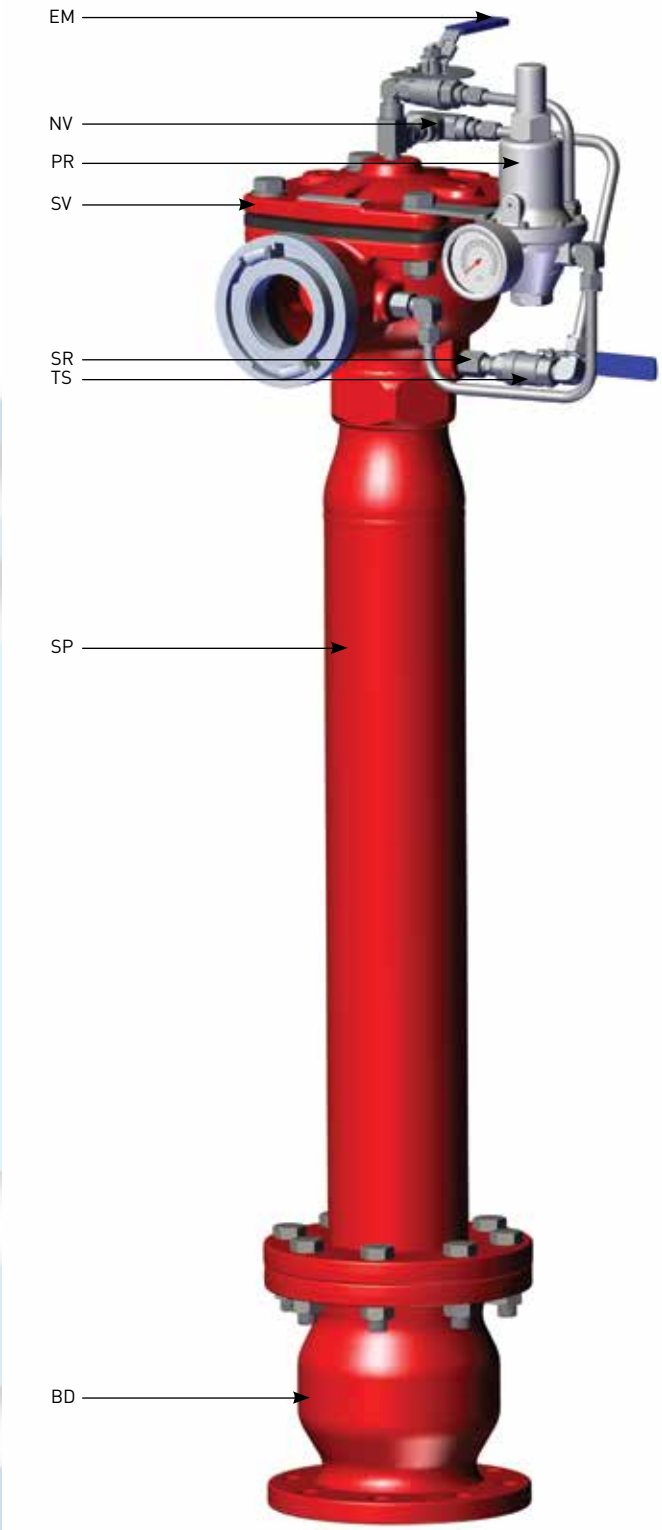
Pressurized water in the valve's control chamber (SV) is trapped by the 2 way manual emergency valve (MO), forces the valve's diaphragm against its seat and maintains the FDV-Ra valve close.

FIRE situation

Opening the Emergency Manual Operation valve (EM), drains the FDV-Ra's control chamber through the pressure reducing pilot (PR) and opens the valve, maintaining a fixed outlet set pressure.

FDV-Ra-HHP

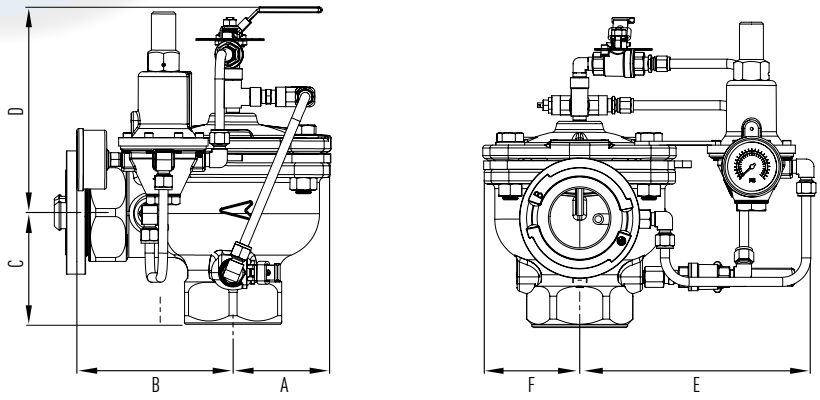
Typical installation



PR - PRDV-pressure reducing pilot vale
EM - Manual Operation valve (2 way)
NV - Needle valve
TS - Trim supply valve
SR - Strainer
SV - FDV-R Valve
SP - Standpipe
BD - Breakage device

Dimensions Table

Size	2"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	98	3.9	100.0	3.9	107.0	4.2	136.0	5.4	175.0	6.9
B	92	3.6	149.0	5.9	175.0	6.9	212.0	8.3	221.0	8.7
C	83	3.3	114.0	4.5	108.0	4.3	142.0	5.6	169.0	6.7
D	178	7.0	210.0	8.3	227.0	8.9	284.0	11.2	348.0	13.6
E	210	8.3	245.0	9.6	257.0	10.1	303.0	11.9	328.0	12.9
F	63	2.5	101.0	4.0	114.0	4.5	151.0	5.9	179.0	7.0
Kg/lb	8.5	18.7	17.0	37.4	28.0	61.6	50.0	110.0	74.0	162.8



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®

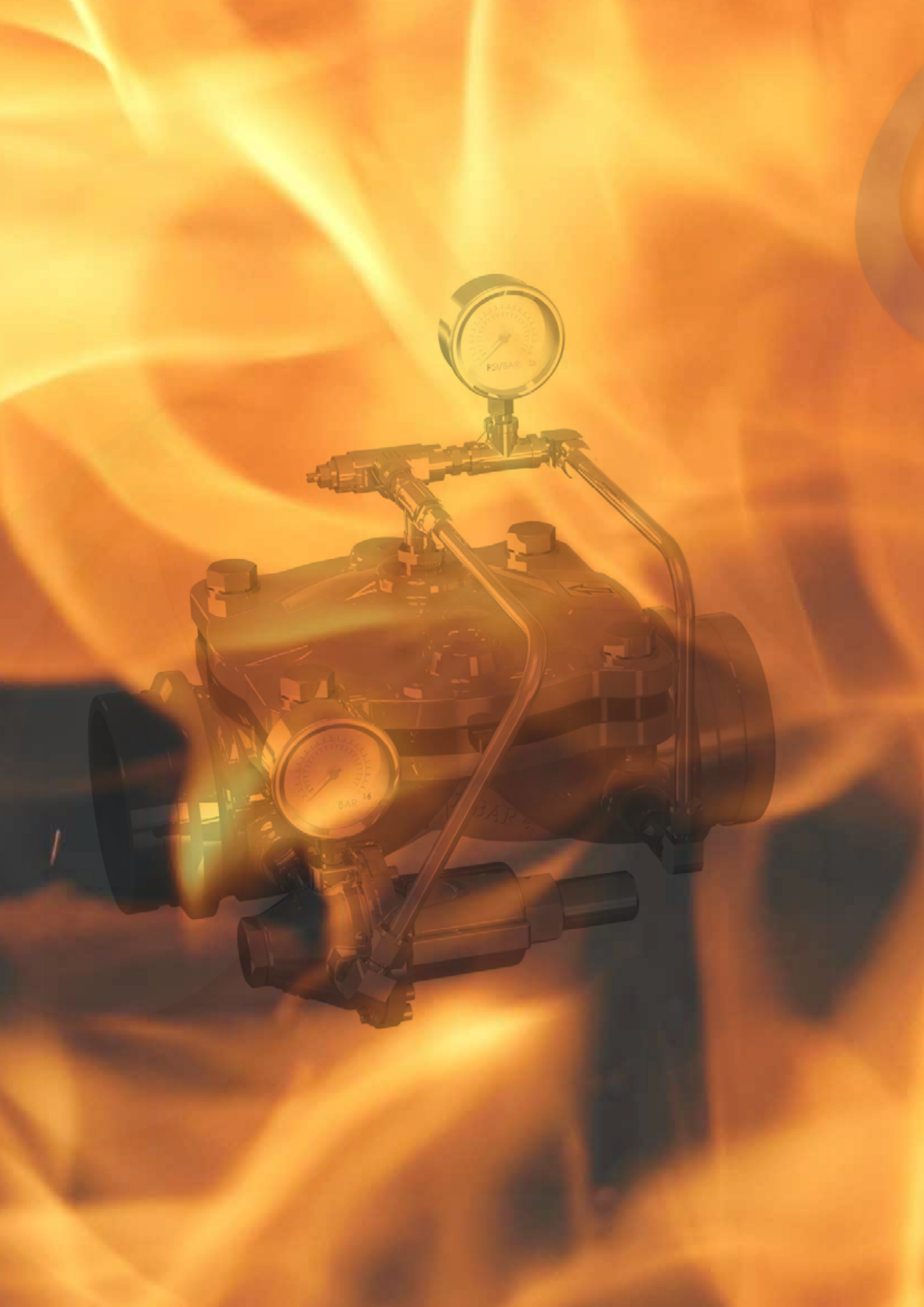
ACCESSORIES:

- 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
- Hose Connection type
- Additional needed accessories

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



CONTROL VALVES

PRESSURE CONTROL VALVES

RAPHAEL FP

RAPHAEL FP

Pressure Control Valves

Pressure Reducing Control Valve

FDV-R-PN2

The FDV-R-PN2 Pressure reducing valve is an automatic hydraulic control service valve, designed to operate in fixed fire protection system.

The FDV-R-PN2 pilot controlled hydraulic valveis activated by line pressure. The pilot valve has a spring-loaded membrane which is sensitive to downstream pressure. The pilot's spring is pre-set to a desired reduced pressure. The pilot valve maintains a constant downstream pressure by gradually opening or closing of the main valve, reducing the inlet water pressure to a pre-set desired outlet pressure. The outlet pressure is maintained constant, regardless of fluctuations in flow rate and changes in main pipeline pressure.

Designed for vertical or horizontal installation, the line pressure operated FDV-R-PN2 Pressure reducing 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 minimum head loss.

MARKETS

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

SIZE RANGE:
FDV-R valve (globe) - 40mm to 400mm (1½" to 16")
FDV-Ra valve (angled) – 50mm to 200mm (2" to 8")

AVAILABLE CONNECTIONS ENDS:
Flange*Flange, Groove*Groove, 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
- 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
- Reduces inlet pressure to a predetermined fixed and constant outlet pressure, regardless of fluctuations or changes in main pipeline pressure and flow rate

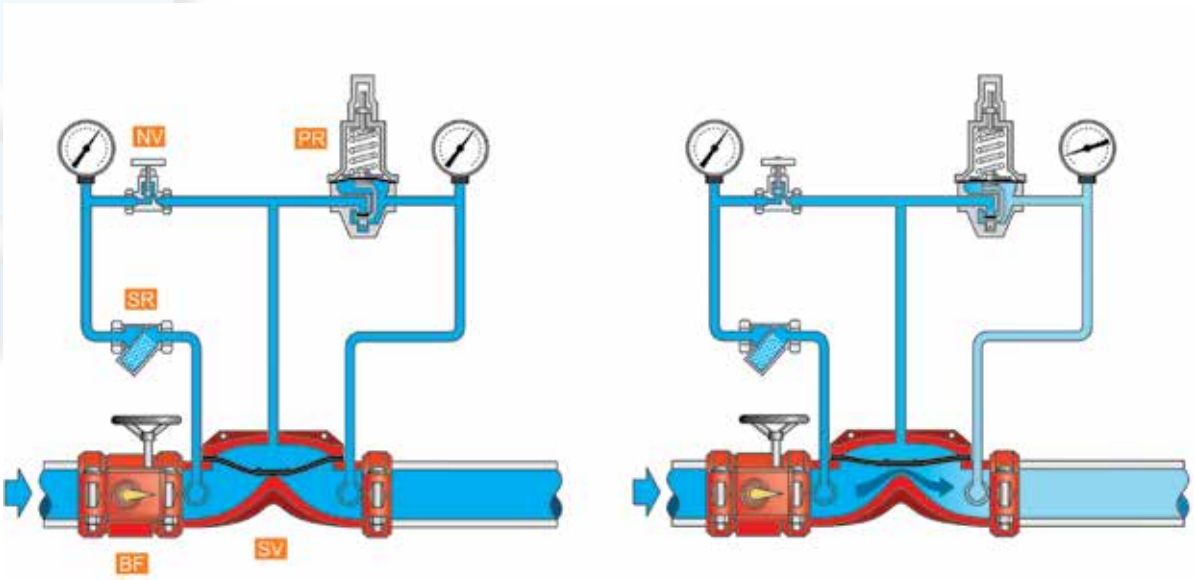
CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- Simple and reliable design
- Quick respond to downstream pressure changes
- Pressure reducing to a predetermined set of outlet pressure

Schematic drawing

Set position

Fire position



PR - PRPV – Pressure Reducing Pilot Valve
NV - Needle valve
SR - strainer
SV - FDV-R service valve
BF - Butterfly valve

SET Position:

When a fire protection system is in a SET position, there is no flow at the system's piping and the water pressure is at the FDV-R-PN2 Pilot's SET pressure.
The FDV-R-PN2 valve's control chamber is pressurized by the inlet flow, calibrated by the Needle valve **[NV]** forcing the diaphragm against its seat maintaining the valve close.

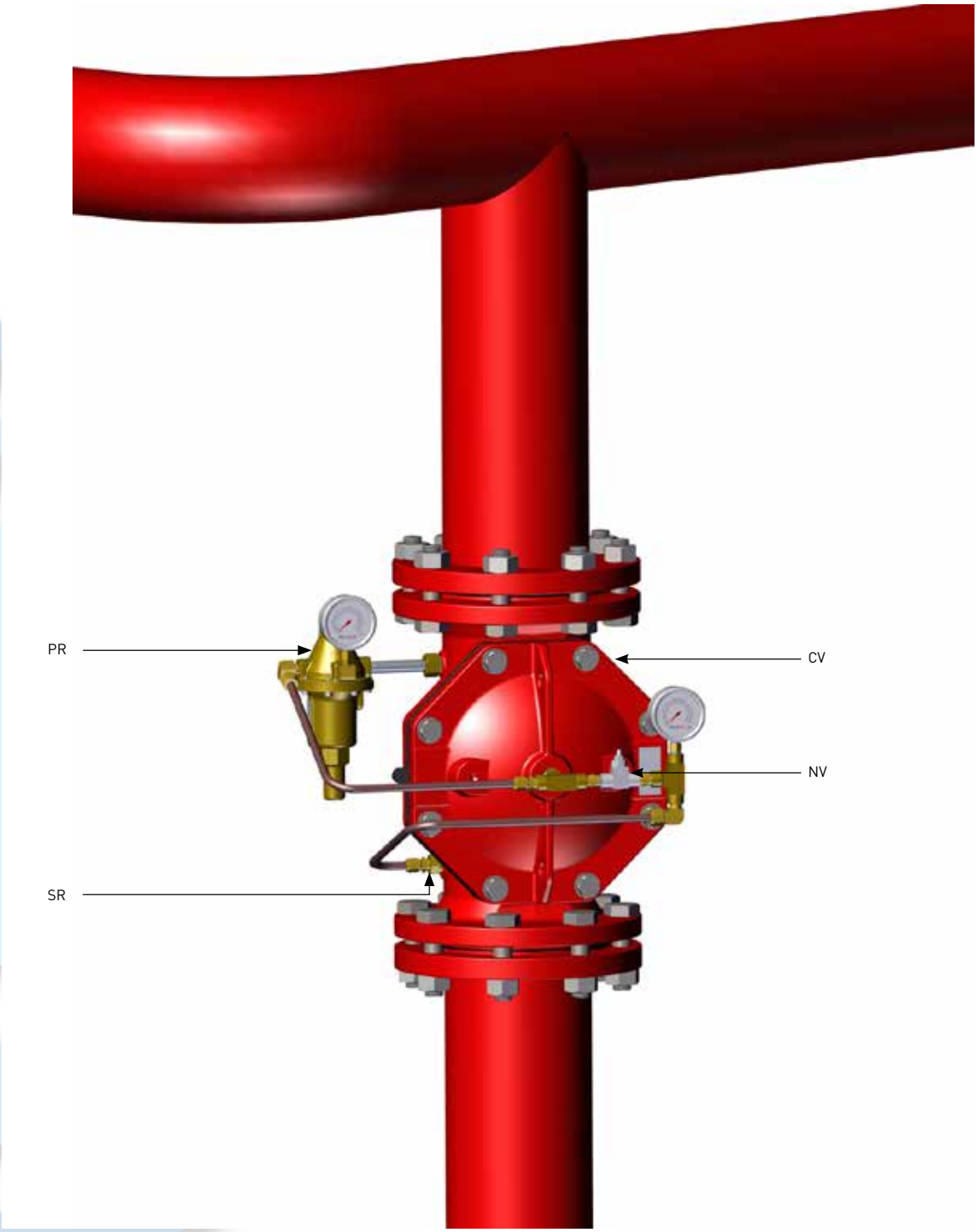
OPERATION

The FDV-R's control chamber is pressurized by a calibrated inlet flow passing through a needle valve **[NV]**, and de-pressurized by the PRPV pressure reducing pilot valve **[PR]**.
The pilot's drain flow volume is controlled by the downstream pressure passing through a sense pipe and manipulating the pilot's diaphragm and the seal mechanism.

Any change at the downstream pressure reflects the ratio between the volume of the control chamber's inlet and outlet flows. Consequently, the FDV-R valve's diaphragm position changes, maintaining the downstream at the pilot's set pressure.

FDV-R- PN2

Typical installation



PR - PRPV – Pressure Reducing Pilot Valve

NV - Needle valve

SR - Strainer

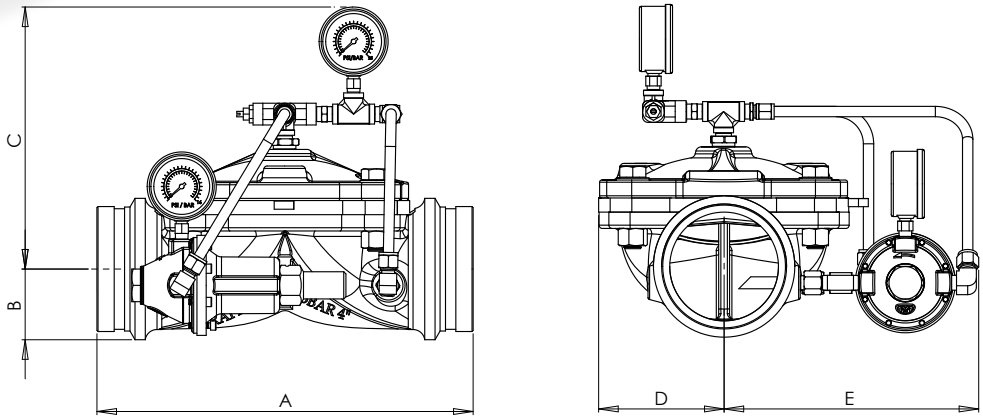
CV - FDV-R Control Valve

BF - Butterfly valve

Dimensions Table

Size	1.5"-2"		3"		4"		6"		8"		10"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	190	7.5	283	11.1	305	12	470	18.5	406	16	635	25
B	57.5	2.3	100	3.9	109	4.3	160	6.3	142	5.6	198	7.8
C	268.5	10.6	306	12	177	7	308	12.1	195	7.7	317	12.5
D	111.5	4.4	111	4.4	115	4.5	177	7	150	5.9	233	9.2
E	166	6.5	182	7.2	261	10.3	304	13.4	307	12.1	237	10.7
Kg/lb	10.4	22.9	19.3	42.5	25.6	56.4	50.2	110.7	67.6	149	109.5	241.4

Note: In addition to the valve diameters shown at the table, all FP applications based on FDV-R valves can be supplied also in the following diameters: 10" ; 12" ; 14" ; 16"



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
- Additional accessories needed

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

RAPHAEL FP

Pressure Control Valves

Pressure Relief Control Valve

FDV-R-RN2

The FDV-R-RN2 Pressure Relief valve is an automatic hydraulic control service valve, designed to operate in fixed fire protection system, especially in fire pump units. The FDV-R-RN2 pilot controlled hydraulic valve is activated by line pressure. The pilot valve has a spring-loaded membrane which is sensitive to upstream pressure. The pilot's spring is pre-set to a desired maximum pressure. The pilot valve maintains a maximum pressure in the pipe system by quickly opening the main valve, discharging any excess pressure off the pipe system, preventing any potential damage.

Designed for vertical or horizontal installation, the line pressure operated FDV-R-RN2 Pressure Relief 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 minimum head loss.

MARKETS

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

SIZE RANGE:
FDV-R valve (globe) - 40mm to 400mm (1½" to 16")
FDV-Ra valve (angled) – 50mm to 200mm (2" to 8")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

APPROVALS

ADVANTAGES

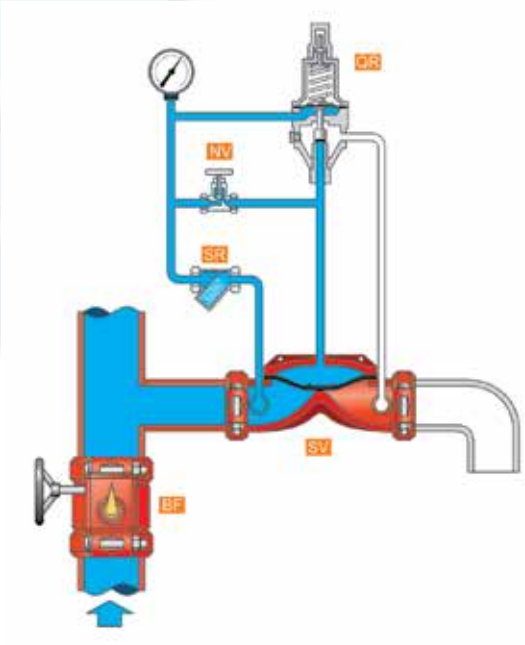
- Only three parts: body, diaphragm & cover plate, no wet metal spring inside the control chamber
- Low maintenance cost: the valve is serviced in-line and only one replaceable part - the long-life elastomeric diaphragm
- Conforms with inspection, Testing and Maintenance Standard of water-based Fire Protection Systems, NFPA 25
- Maintains a constant set upstream pressuresecuring the system from over pressure

CHARACTERISTICS

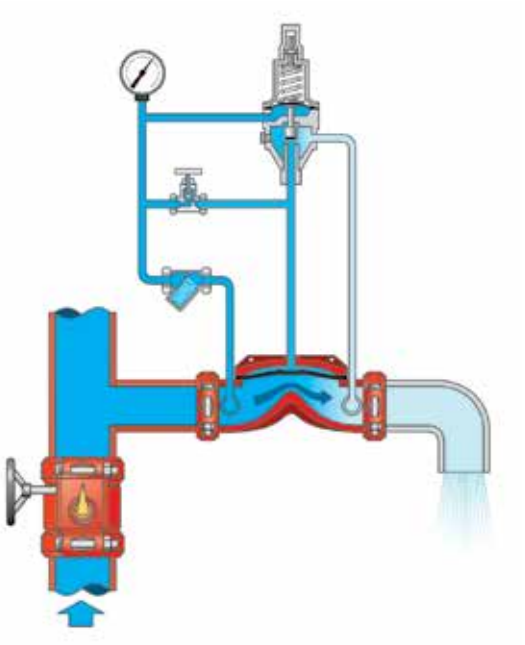
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss
- Simple and reliable design
- Quick respond to downstream pressure changes

Schematic drawing

Set position



Fire position



QR - QRPV – Quick Relief Pilot Valve
NV - Needle valve
SR - strainer
SV - FDV-R service valve

SET Position:

When a fire protection system is in SET position, and water pressure in the pipe system is maintained within the pre-established pressure range considered safe for operation, the FDV-R-RN2 will remain closed.
The FDV-R-RN2 valve's control chamber is pressurized by the inlet flow, pre calibrated by the Pressure Relief Pilot **[QR]** forcing the diaphragm against its seat, preventing the valve from opening.

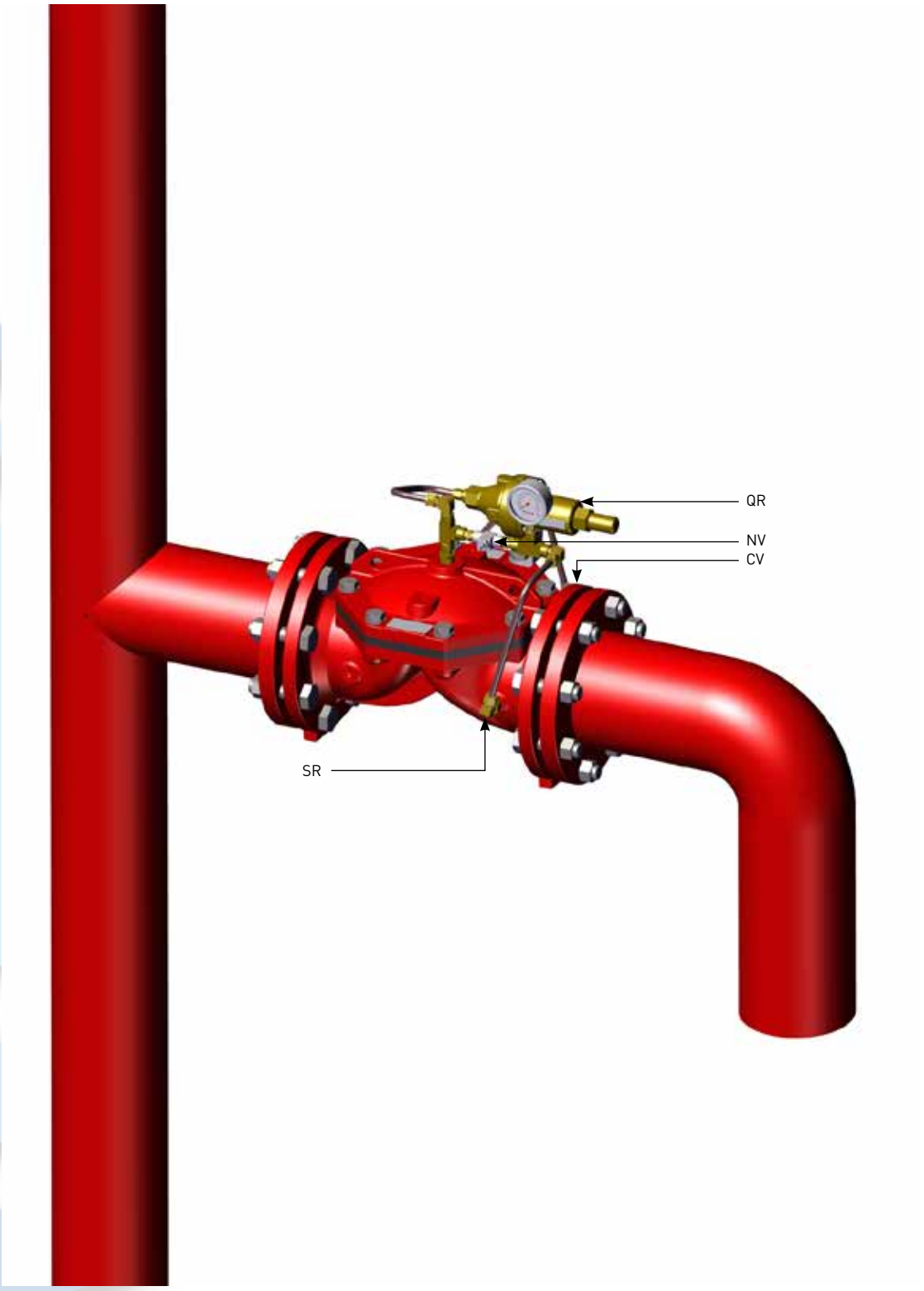
OPERATION

When the Fire system trips open and Fire pump starts-up and pressure rises in the pipe system surpassing the preset maximum pressure, the FDV-R-RN2 will quickly open, to enable water discharge out of the pipe system to the valve's downstream.

The valve is controlled by the Pressure relief pilot. The pilot's is commanded by a hydraulic sensor port, connected to the pipe system, through the valve's upstream port. The pilot commands the valve to open, proportioning the adequate water passage necessary to maintain the system within the safe maximum required set pressure, regardless of system flow.

FDV-R- RN2

Typical installation



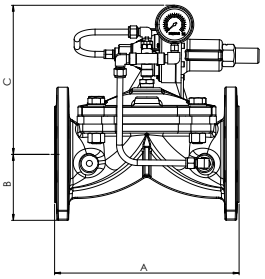
QR - QRPV – Quick Relief Pilot Valve
NV - Needle valve
SR - strainer
CV - FDV-R Control Valve

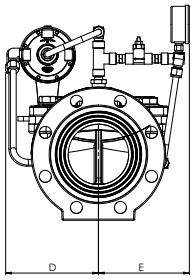
Dimensions Table

FDV-R-RN2 Globe

Size	2"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	111	4.4	198	7.8	190.6	7.5	184.2	7.3	277.5	10.9
B	176	6.9	162	6.4	176	6.9	352	13.9	245	9.6
C	146	5.7	172.6	6.8	184	7.2	137	5.4	220	8.7
D	120	4.7	154.3	6.1	178	7.0	218	8.6	226.4	8.9
E	83	3.3	116	4.6	113.8	4.5	148	5.8	171.5	6.8
F	229	9.0	208	8.2	220	8.7	253.7	10	314	12.4
Kg/lb	6.2	13.6	20.1	44.2	25.6	56.3	48.1	105.8	719	158.2

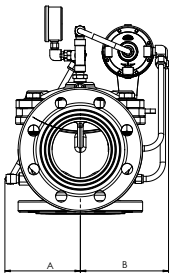
Note: In addition to the valve diameters shown at the table, all FP applications based on FDV-R valves can be supplied also in the following diameters: 10" ; 12" ; 14" ; 16"

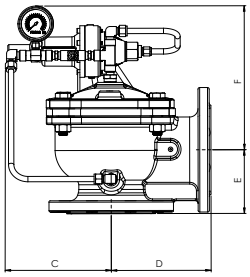




FDV-Ra-RN2 Angled

Size	1.5" - 2"		3"		4"		6"		8"	
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
A	190	7.5	314	12.4	336	13.2	410	16.1	470	18.5
B	82	3.2	100	3.9	109	4.3	142.5	5.6	161	6.3
C	204	8	197.2	7.8	209	8.2	241	9.5	308	12.1
D	211	8.3	163	6.4	177.6	7.0	253.4	10	250	9.8
E	166	6.5	182	7.2	202	8.0	184.2	7.3	451	17.8
Kg/lb	8.6	20	17.5	38.5	23.7	52.3	52.3	115.1	65.8	144.8





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

- Pattern: globe or angled
- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Upstream set pressure
- Additional accessories needed

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

ENGINEERING DATA

BASIC VALVES

RAPHAEL FP

Engineering Data

FDV Basic Valves

RAPHAEL FP

Basic Valves

General Description

The FDV hydraulic control valve's solid and simple construction, in edition with its hydro-dynamically engineered inner streamlined flow passages, makes it the valve on which a large selection of fire protection application is based on.
The FDV type is a full bore globe patterned valve featuring direct elastomeric diaphragm seal with no balancing spring or inside metallic moving wet components. The valve is designed for vertical or horizontal installation. Its symmetric shape enables a revers flow without any head loss change.
A selection of cast metals, coatings, diaphragms and fasteners, enables its usage in rough environment and streaming media. The FDV valve is suitable for on-shore as well as off- shore installations and can operate with fresh water, brackish water, foam and seawater.
9 optional ports provide an easy and flexible trim piping and tubing connection.

MARKETS

Marine P.O.G. Airports Residential

Industry Storage Tunnel Commercial

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

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

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

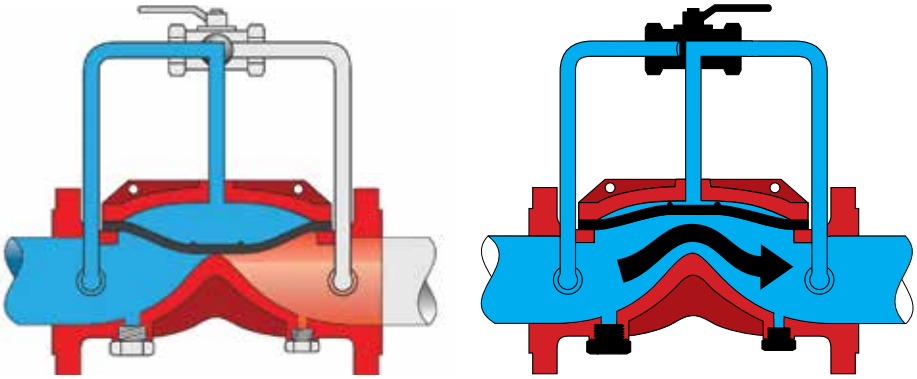
APPROVALS

ADVANTAGES

- Simple and robust construction
- No inside metallic moving wet components
- 4 side, 2 bottom and 3 cover ports enable easy trim and accessories
- connection
- Durable material and coatings enables long lasting usage in rough
- conditions including off shore and seawater
- Large valve sizes and connection ends selection
- Diaphragm original design enables gradual and precise valve opening
- or closing
- Maintenance free between the NFPA 25 five years checks
- Stands fully in most strict fire protection design and operation demands

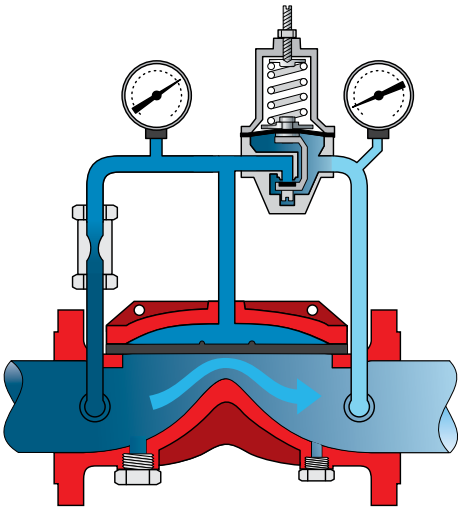
ON-Off Operation

The FDV is a normally open valve with a very low breaking through pressure of less than 5 psi.
When the valve's control chamber becomes pressurized, the force applied on the upper diaphragm surface, pushes it against the valves seat and holds the valve close. The diaphragm's springiness compensates for the low area/force ratio as the valve need to close although the downstream pressure nearly equalizes the upstream.
When the valve's control chamberis drained and de-pressurizes, the force applied by line pressure raises the diaphragm from its seat, pushes it into the control chamber space and drains the residual water out.
By that, water passage obstruction clears and the valves fully opens. This demonstrate a typical On-Off operation: a pressurized control chamber causes the valve to close while a drainage of this space combined with the valve's internal pressure, causes it to fully open.



Modulating Operation

Manipulating the control chamber pressure using suitable pilot valves, enables the control of the upstream pressure, downstream pressure and valve's rate of flow.
A change in the control chamber's pressure and as a result, the chamber's water volume, will place the diaphragm at a position that would narrow or enlarge the water passage cross area. Controlled diaphragm moves can be used to regulate gradually valve's flow in regard of line pressure deviation, as demonstrated in the schema bellow.



FDV

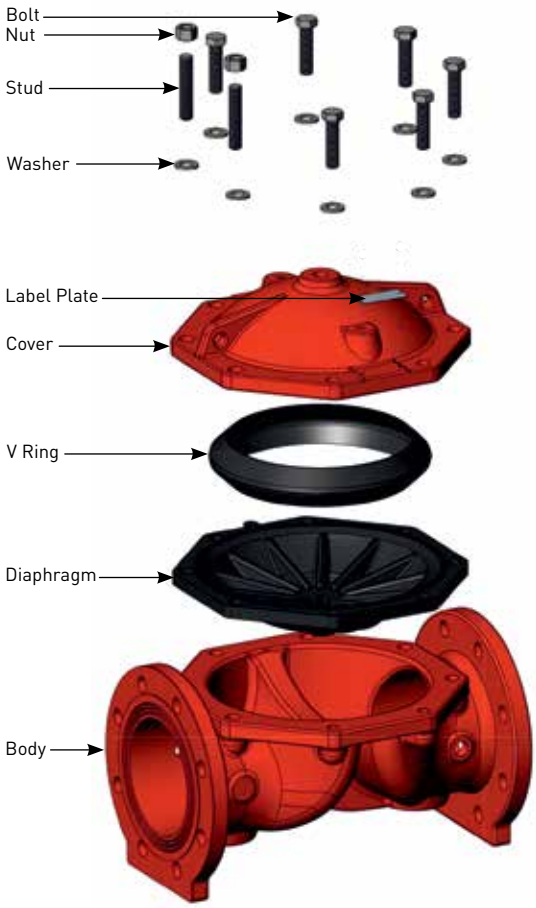
Optional pattern

Diameter / Connection	1.5" DN40	2" DN50	3" DN80	4" DN100	6" DN150	8" DN200	10" DN250
TH-TH	■	■					
GR-GR	■	■	■	■	■	■	■
GR-FL			■	■	■	■	
FL-GR			■	■	■	■	
FL-FL			■	■	■	■	■

■ Available Option

Construction Materials& Coatings

Body & Cover	
Ductile Iron	ASTM A-536
Stainless Steel	ASTM A743, CF8M
Stainless Steel	ASTM A743, CF8
Cast Steel	ASTM A-216 Grade WCB
Nickel Aluminum Bronze	ASTM B148 UNS C95800
Diaphragm	
NR	Nylon fabric reinforced natural rubber
EPDM	Nylon fabric reinforced EPDM
NBR	Nylon fabric reinforced Nitrile rubber
Fasteners	
Stainless Steel 304	ASTM F593
Stainless steel 316	ASTM F593
Galvanized steel	ASTM F2329
Nickel Alloys	Monel 400; Cupro-nickel
Coating	
Internal-Rilsan (Nylon 11)	External-Rilsan (Nylon 11)
Internal-Epoxy based Polyurethane	External-Epoxy based Polyurethane
Internal-FBE Phenolic Epoxy+Polyester	External-FBE Phenolic Epoxy+Polyester
Internal-Vitreous Enamel	External-Epoxy based Polyurethane



Valves Construction and Applications

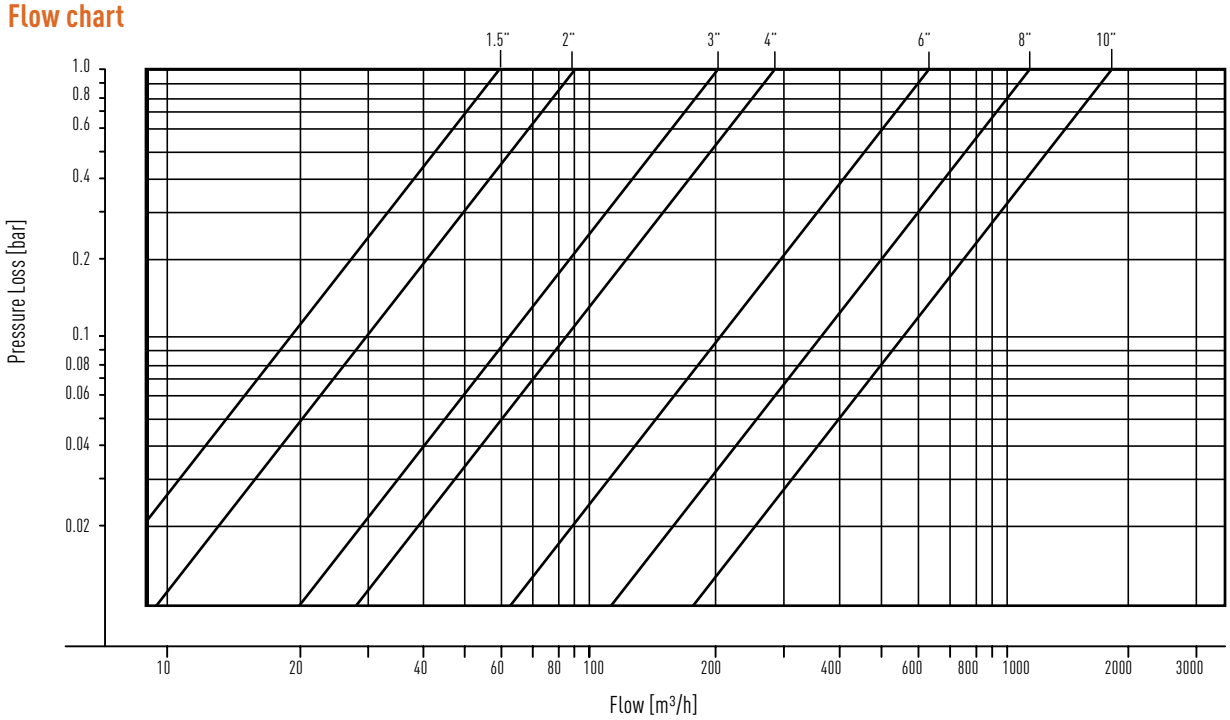
	Water	Brackish Water	Sea Water	Foam
Body & Cover	Ductile Iron	Stainless Steel CF8M	Ni.Al.Br	Stainless Steel CF8
Fasteners	Galvanized Steel	Stainless Steel 316	Nickel Bronze alloys	Stainless Steel 304
Diaphragm	Natural Rubber	EPDM	EPDM	EPDM
Coating	Rilsan	Un Coated	Un Coated	Un Coated

FDV valves flow factor

NOMINAL DIAMETER		FLOW FACTOR	
INCH	MM	Kv	Cv
1.5	DN40	59	68
2	DN50	87	101
3	DN80	207	240
4	DN100	345	400
6	DN150	768	891
8	DN200	1290	1496
10"	DN250	1850	2146

Kv = Valve flow coefficient (m^3/h) / (bar)
Cv = Valve flow coefficient (gpm) / (psi)
Cv = 1.16 Kv ; Kv = 0.862 Cv
Q = Flow rate in m^3/h orgpm
Δp = Head loss across the valve in bar or psi
$Q = Kv \sqrt{\Delta p}$

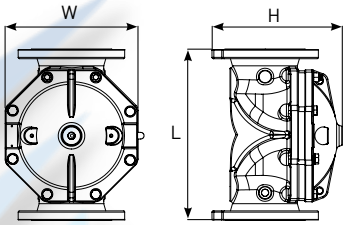
Flow chart



FDV

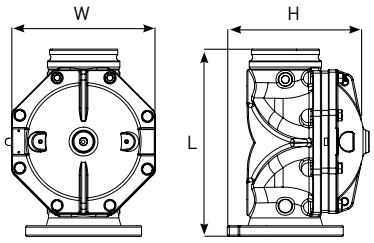
FDV FL-FL

SIZE (IN)	L	H	W	Kg (lb)
DN 50 (2")	220 (8.6)	165 (6.5)	140 (5.5)	8.9 (19.6)
DN 80 (3")	327 (12.9)	200 (7.9)	230 (9.0)	21.3 (47)
DN 100 (4")	400 (15.7)	227 (8.9)	302 (11.9)	38 (84)
DN 150 (6")	464 (18.3)	365 (14.4)	354 (13.9)	56.6 (127.7)
DN 200 (8")	570 (22.4)	416 (16.4)	466 (18.3)	96 (211.6)
DN 250 (10")	768 (30.20)	638 (25.1)	616 (24.2)	218.6 (482)



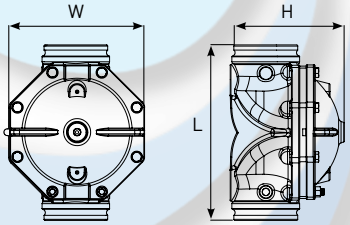
FDV FL-GR

SIZE (IN)	L	H	W	Kg (lb)
DN 80 (3")	327 (12.9)	200 (7.9)	230 (9.0)	17.6 (39)
DN 100 (4")	400 (15.7)	227 (8.9)	302 (11.9)	34.2 (75.4)
DN 150 (6")	464 (18.3)	365 (14.4)	354 (13.9)	48.8 (107.6)
DN 200 (8")	570 (22.4)	416 (16.4)	466 (18.3)	86 (189.6)



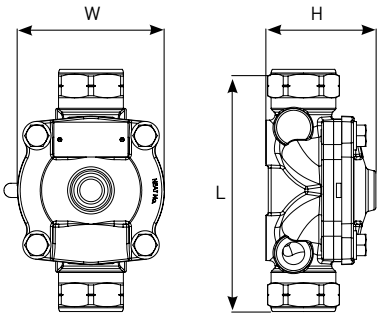
FDV GR-GR

SIZE (IN)	L	H	W	Kg (lb)
DN 40 (1.5")	205 (8.0)	97 (3.8)	127 (5.0)	2.9 (6.4)
DN 50 (2")	220 (8.7)	112 (4.4)	140 (5.5)	4.5 (9.9)
DN 80 (3")	327 (12.9)	158 (6.2)	230 (9.0)	13.3 29.3)
DN 100 (4")	400 (15.7)	212 (8.3)	302 (11.9)	27 (59.5)
DN 150 (6")	464 (18.3)	300 (11.8)	354 (13.9)	42.3 (93.6)
DN 200 (8")	570 (22.4)	364 (14.3)	466 (18.3)	75.4 (166.2



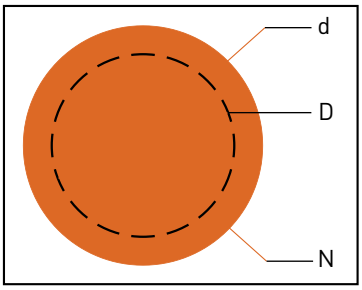
FDV TH-TH

SIZE (IN)	L	H	W	Kg (lb)
DN 40 (1.5")	204 (8.0)	94 (3.7)	125 (4.9)	2.91 (6.4)
DN 50 (2")	222 (8.7)	113 (4.4)	140 (5.5)	4.97 (11)



Flange Drilling Specification - Nominal Dimensions in inches & (mm)

Nominal Valve Size	ANSI B16.42 (Class 150)			ISO 7005-2 (PN 16)			ANSI B16.24 (Class 150)			ANSI B16.50 (Class 150)		
	Dim. D	Dim. d	Qty. n	Dim. D	Dim. d	Qty. n	Dim. D	Dim. d	Qty. n	Dim. D	Dim. d	Qty. n
3" (DN 80)	6.00 (152.4)	0.75 (19.0)	4	6.30 (160.0)	0.71 (18.0)	8	6.00 (152.4)	0.75 (19.0)	4	6.00 (152.4)	0.75 (19.1)	4
4" (DN 100)	7.5 (190.5)	0.75 (19.0)	8	7.5 (190.5)	0.71 (18.0)	8	7.5 (190.5)	0.75 (19.0)	8	7.5 (190.5)	0.75 (19.1)	8
6" (DN 150)	9.50 (241.3)	0.88 (22.2)	8	9.50 (241.3)	0.87 (22.0)	8	9.50 (241.3)	0.88 (22.2)	8	9.50 (241.3)	0.88 (22.4)	8
8" (DN 200)	11.75 (298.5)	0.88 (22.2)	8	11.61 (295)	0.87 (22.0)	12	11.75 (298.5)	0.88 (22.2)	8	11.75 (298.5)	0.88 (22.4)	8
10" (DN 250)	14.25 (362)	1 (25.4)	12	14 (355)	1.02 (26)	12	14.25 (362)	1	12	14.25 (362)	1 25.4	12



Port Sizing

Port Description	Port Size in NPT per ANSI B1.20.1						
	DN40 1.5"	DN50 2"	DN80 3"	DN100 4"	DN150 6"	DN200 8"	DN250 10"
Control Chamber Supply	½"	½"	½"	½"	½"	½"	½"
Bottom Downstream Drain	¾"	¾"	¾"	1"	1"	1"	1"
Side Port	½"	½"	½"	½"	½"	½"	½"
Bottom Upstream Drain	¾"	¾"	1¼"	2"	2"	2"	2"

Engineering Data

FDV-R Basic Valves

RAPHAEL FP

Basic Valves

General Description

The FDV-R type is a globe pattern valve featuring direct elastomeric diaphragm seal with no balancing spring or inside metallic moving wet components. The valve is designed for vertical or horizontal installation.
Solid and simple construction, with hydro-dynamicallyengineered inner streamlined flow passage, makes it the basic valve for large selection of fire protection applications.

A wide selection of cast metals, coatings, diaphragms and fasteners, enables its usage in harsh environment and flow media. The FDV valve is suitable for on-shore as well as off-shore installations and can operate with fresh water, brackish water, foam and seawater.
7 optional trim ports provide an easy and flexible trim piping and tubing connection.

MARKETS

ADVANTAGES

- Simple and robust construction
- No inside metallic moving wet components
- 4 side, and 3 cover ports enable easy trim and accessories
- connection
- Durable material and coatings enables long lasting usage is rough conditions including foam, off shore and seawater
- Large valve sizes and connection ends selection
- Diaphragm original design enables gradual and precise valve opening
- or closing
- Maintenance free between the NFPA 25 five years checks
- Stands fully in most strictfire protection design and operation demands

TECHNICAL DATA

FLUID:
Water, Brackish water, Sea water, Foam

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

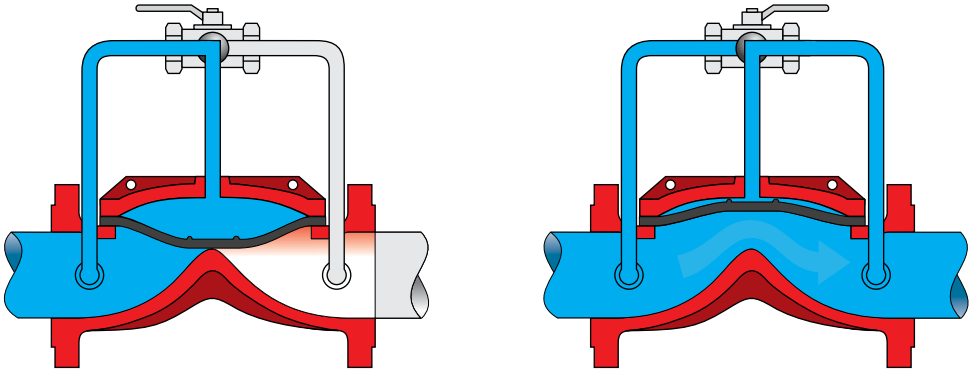
AVAILABLE CONNECTIONS ENDS:
Flange*Flange, Groove*Groove,
Flange*Groove, Groove*Flange, Thread*Thread

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

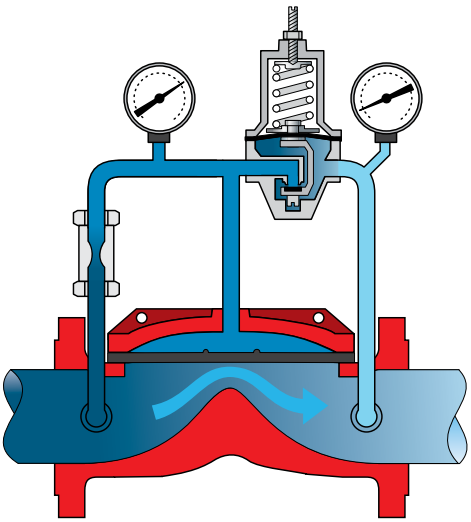
ON-Off Operation

The FDV-R is a normally open valve with a very low breaking through pressure of less than 5 psi. When the valve's control chamber becomes pressurized, the force applied on the upper diaphragm surface, pushes it against the valves seat and holds the valve close. The diaphragm's springiness compensates for the low area/force ratio as the valve need to close although the downstream pressure nearly equalizes the upstream.
When the valve's control chamberis drained and de-pressurizes, the force applied by the line pressure, raises the diaphragm from its seat, pushes it into the control chamber space and drains the residual water out. By that, water passage obstruction clears and the valves fully opens. This demonstrate a typical On-Off operation: a pressurized control chamber causes the valve to close while a drainage of this space combined with the valve's internal pressure, causes it to fully open.



Modulating Operation

Manipulating the control chamber pressure using suitable pilot valves, enables the control of the upstream pressure, downstream pressure and valve's rate of flow.
A change in the control chamber's pressure and as a result, the chamber's water volume, will place the diaphragm at a position that would narrow or enlarge the water passage cross area. Controlled diaphragm moves can be used to regulate gradually valve's flow in regard of line pressure deviation, as demonstrated in the schema bellow.



FDV-R

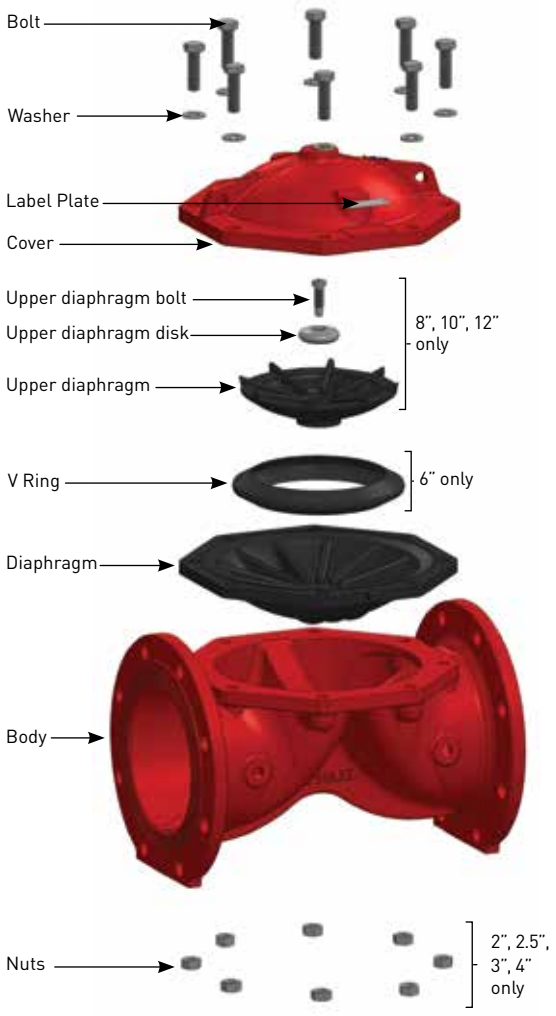
FDV-R optional Patterns

Valve	Dia. / End Conn.	1.5" DN40	2" DN50	2.5" DN65	3" DN80	4" DN100	6" DN150	8" DN200	10" DN250	12" DN300	14" DN350	16" DN400
FDV-R Globe	TH-TH	■	■	■	■	■						
	GR-GR	■	■	■	■	■	■	■				
	FL-FL		■	■	■	■	■	■	■	■	■	■

■ Available Options

Construction Materials& Coatings

Body & Cover	
Ductile Iron	ASTM A-536
Stainless Steel	ASTM A743, CF8M
Stainless Steel	ASTM A743, CF8
Cast Steel	ASTM A-216 Grade WCB
Nickel Aluminum Bronze	ASTM B148 UNS C95800
Diaphragm	
NR	Nylon fabric reinforced natural rubber
EPDM	Nylon fabric reinforced EPDM
NBR	Nylon fabric reinforced Nitrile rubber
Fasteners	
Stainless Steel 304	ASTM F593
Stainless steel 316	ASTM F593
Galvanized steel	ASTM F2329
Nickel Alloys	Monel 400; Cupro-nickel
Coating	
Internal-Rilsan (Nylon 11)	External-Rilsan (Nylon 11)
Internal-Epoxy based Polyurethane	External-Epoxy based Polyurethane
Internal-FBE Phenolic Epoxy+Polyester	External-FBE Phenolic Epoxy+Polyester
Internal-Vitreous Enamel	External-Epoxy based Polyurethane



Valves Construction and Applications

FDV-R	Water	Brackish Water	Sea Water	Foam
Body & Cover	Ductile Iron	Stainless Steel CF8M	Ni.Al.Br	Stainless Steel CF8
Fasteners	Galvanized Steel	Stainless Steel 316	Nickel Bronze alloys	Stainless Steel 304
Diaphragm	Natural Rubber	EPDM	EPDM	EPDM
Coating	Rilsan	Un Coated	Un Coated	Un Coated

FDV valves flow factor

NOMINAL DIAMETER		FLOW FACTOR	
INCH	MM	Kv	Cv
1.5	DN40	40	46.4
2	DN50	70	81.2
2.5	DN65	100	116
3	DN80	170	197
4	DN100	290	336.4
6	DN150	490	568.4
8	DN200	790	916.4
10"	DN250	1400	1624
12"	DN300	1800	2088
14"	DN350	1850	2146
16"	DN400	2000	2320

Kv = Valve flow coefficient (m^3/h) / (bar)

Cv = Valve flow coefficient (gpm) / (psi)

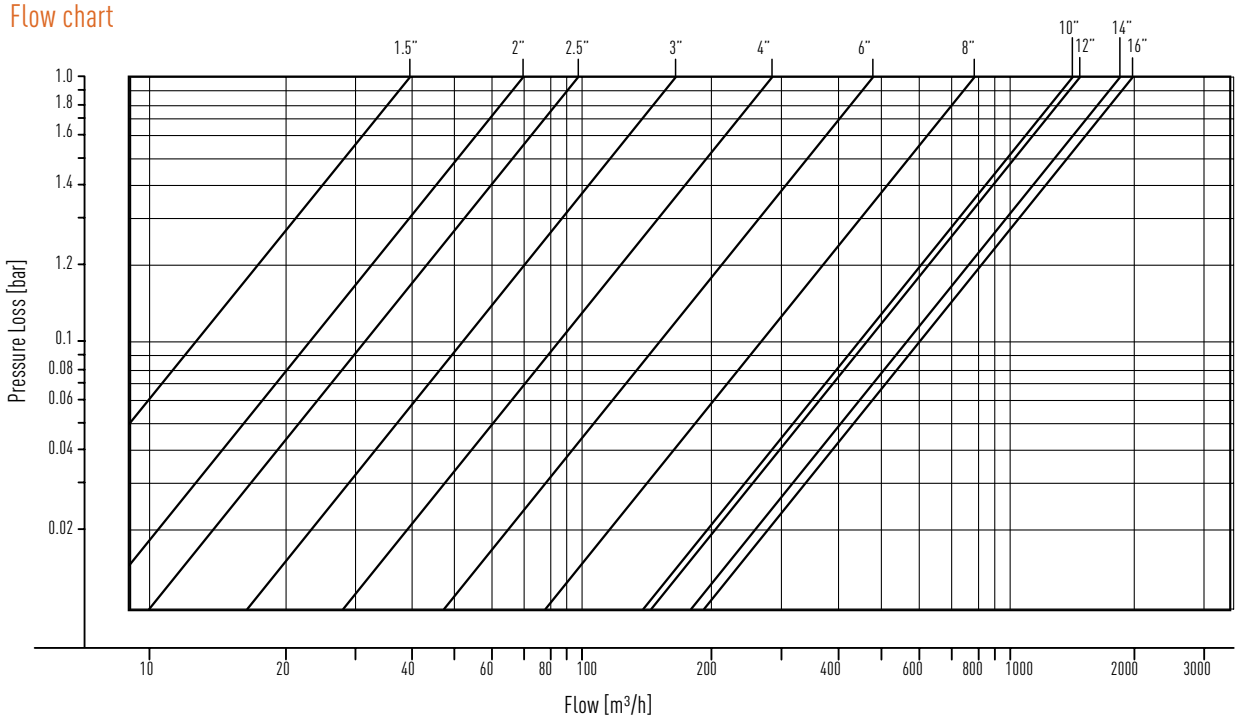
Cv = 1.16 Kv ; Kv = 0.862 Cv

Q = Flow rate in m^3/h orgpm

Δp = Head loss across the valve in bar or psi

$Q = Kv \sqrt{\Delta p}$

Flow chart



RAPHAEL

FDV-Ra

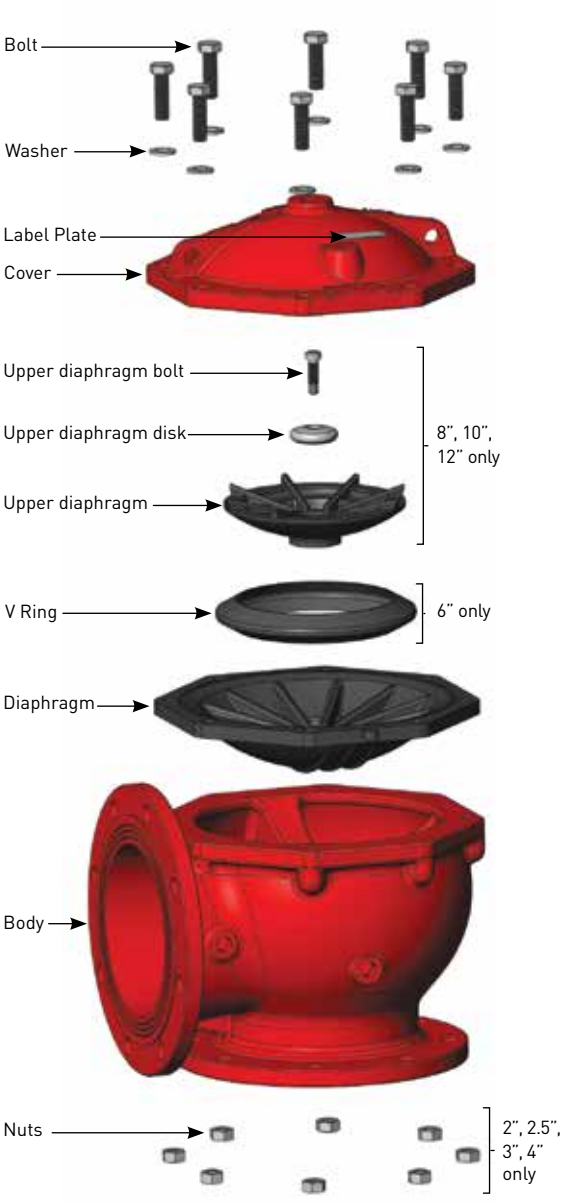
FDV-Ra optional Patterns

Valve	Dia. / End Conn.	1.5" DN40	2" DN50	2.5" DN65	3" DN80	4" DN100	6" DN150	8" DN200	10" DN250	12" DN300	14" DN350	16" DN400
FDV-Ra Angle	TH-TH		■	■	■							
	GR-GR			■	■	■	■					
	FL-FL			■	■	■	■	■				

■ Available Options

Construction Materials& Coatings

Body & Cover	
Ductile Iron	ASTM A-536
Stainless Steel	ASTM A743, CF8M
Stainless Steel	ASTM A743, CF8
Cast Steel	ASTM A-216 Grade WCB
Nickel Aluminum Bronze	ASTM B148 UNS C95800
Diaphragm	
NR	Nylon fabric reinforced natural rubber
EPDM	Nylon fabric reinforced EPDM
NBR	Nylon fabric reinforced Nitrile rubber
Fasteners	
Stainless Steel 304	ASTM F593
Stainless steel 316	ASTM F593
Galvanized steel	ASTM F2329
Nickel Alloys	Monel 400; Cupro-nickel
Coating	
Internal-Rilsan (Nylon 11)	External-Rilsan (Nylon 11)
Internal-Epoxy based Polyurethane	External-Epoxy based Polyurethane
Internal-FBE Phenolic Epoxy+Polyester	External-FBE Phenolic Epoxy+Polyester
Internal-Vitreous Enamel	External-Epoxy based Polyurethane



Valves Construction and Applications

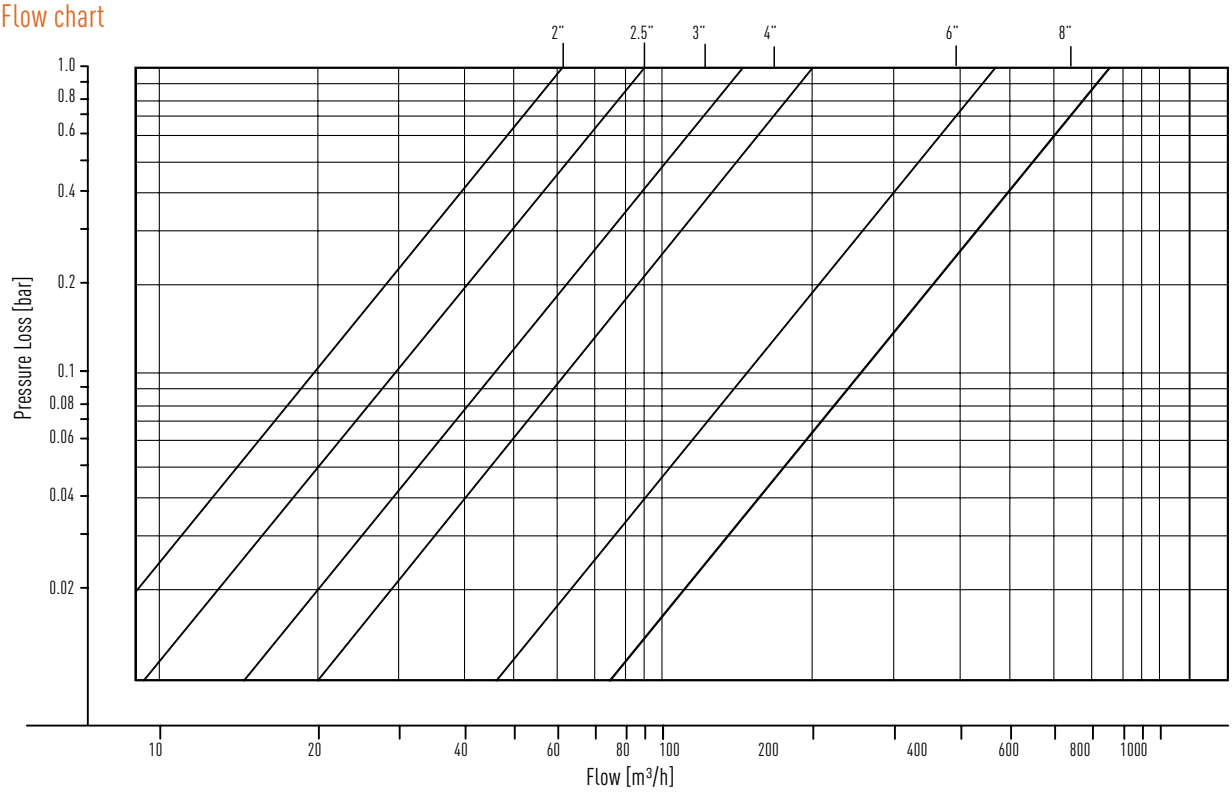
FDV-Ra	Water	Brackish Water	Sea Water	Foam
Body & Cover	Ductile Iron	Stainless Steel CF8M	Ni.Al.Br	Stainless Steel CF8
Fasteners	Galvanized Steel	Stainless Steel 316	Nickel Bronze alloys	Stainless Steel 304
Diaphragm	Natural Rubber	EPDM	EPDM	EPDM
Coating	Rilsan	Un Coated	Un Coated	Un Coated

FDV-Ra Flow Factor

NOMINAL DIAMETER		FLOW FACTOR	
INCH	MM	Kv	Cv
2	DN50	62	72
2.5	DN65	90	104.4
3	DN80	155	179.8
4	DN100	200	232
6	DN150	470	545.2
8	DN200	750	870

Kv = Valve flow coefficient (m^3/h) / (bar)
Cv = Valve flow coefficient (gpm) / (psi)
Cv = 1.16 Kv ; Kv = 0.862 Cv
Q = Flow rate in m^3/h orgpm
Δp = Head loss across the valve in bar or psi
$Q = Kv \sqrt{\Delta p}$

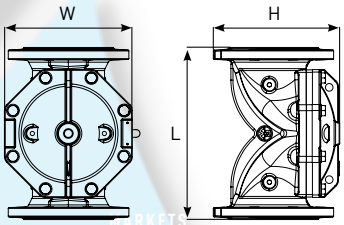
Flow chart



FDV-R

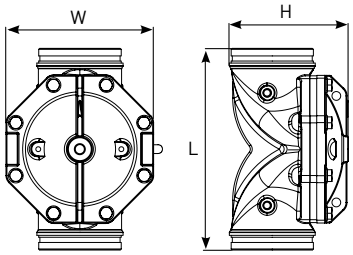
FDV-R FL-FL

SIZE (IN)	L	H	W	Kg (lb)
DN 50 (2")	190 (7.5)	159 (6.3)	165 (6.5)	7.9 (17.4)
DN 65 (2.5")	216 (8.5)	173 (6.8)	185 (7.3)	9.3 (20.5)
DN 80 (3")	283 (11.1)	200 (7.8)	200 (7.8)	17.5 (35.6)
DN 100 (4")	305 (12.0)	220 (8.6)	230 (9.0)	26 (57.3)
DN 150 (6")	460 (16.0)	295 (11.6)	300 (11.8)	46 (101.4)
DN 200 (8")	470 (18.5)	383 (15.0)	354 (13.9)	67.5 (148.8)
DN 250 (10")	635 (25)	430 (16.9)	464 (18.3)	111 (244.7)
DN 300 (12")	749 (29.5)	474 (18.6)	480 (18.9)	151 (332.9)
DN 350 (14")	749 (29.5)	520 (20.5)	520 (20.5)	177 (390.2)
DN 400 (16")	860 (33.9)	711 (28.0)	616 (24.2)	327 (720.9)



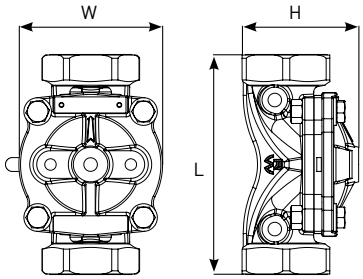
FDV-R GR-GR

SIZE (IN)	L	H	W	Kg (lb)
DN 40 (1.5")	159 (6.3)	80 (3.1)	96 (3.8)	1.5 (3.3)
DN 50 (2")	190 (7.5)	96 (3.8)	125 (4.9)	3.0 (6.6)
DN 65 (2.5")	225 (8.9)	114 (4.5)	140 (5.5)	4.7 (10.4)
DN 80 (3")	290 (11.4)	140 (5.5)	200 (7.9)	10.8 (20.3)
DN 100 (4")	346 (13.6)	173 (6.8)	230 (9.0)	18.0 (36.7)
DN 150 (6")	412 (16.2)	239 (9.4)	302 (11.9)	33 (72.7)
DN 200 (8")	470 (18.5)	350 (13.8)	354 (13.9)	51 (112.4)



FDV-R TH-TH

SIZE (IN)	L	H	W	Kg (lb)
DN 40 (1.5")	159 (6.2)	80 (3.1)	96 (3.8)	2.0 (4.4)
DN 50 (2")	190 (7.5)	196 (7.7)	125 (4.9)	3.5 (7.7)
DN 65 (2.5")	225 (8.8)	110 (4.3)	140 (5.5)	5 (11)
DN 80 (3")	290 (11.4)	138 (5.4)	200 (7.9)	24.2 (20.3)
DN 100 (4")	346 (13.6)	220 (8.7)	230 (9.0)	16.5 (36.4)

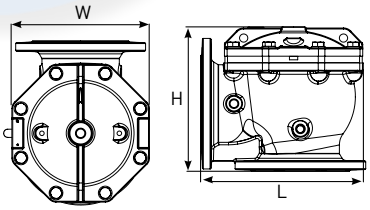


Port Description

Port Description	DN50 2"	DN65 2.5"	DN80 3"	DN100 4"	DN150 6"	DN200 8"	DN250 10"	DN300 12"	DN350 14"	DN400 16"
Diaphragm Chamber Supply	1/4"	1/4"	1/4"	1/4"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"
Upstream & Downstream side ports	1/4"	1/4"	1/4"	1/4"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"

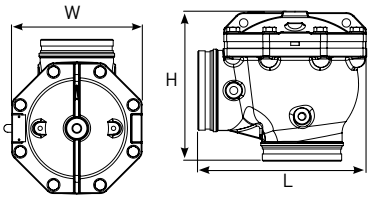
FDV-Ra FL-FL

SIZE (IN)	L	H	W	Kg (lb)
DN 50 (2")	112 (4.4)	159 (6.2)	165 (6.5)	8.1 (17.9)
DN 65 (2.5")	122 (4.8)	160 (6.3)	185 (7.2)	11 (24.2)
DN 80 (3")	154 (6.0)	210 (8.2)	200 (7.9)	19 (41.9)
DN 100 (4")	177 (7.0)	230 (9.0)	230 (9.0)	26.5 (58.4)
DN 150 (6")	218 (8.6)	315 (12.4)	300 (11.8)	48.7 (107.4)
DN 200 (8")	225 (8.8)	400 (15.7)	354 (13.9)	62.5 (137.8)



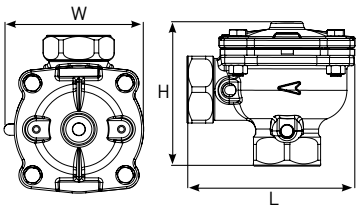
FDV-Ra GR-GR

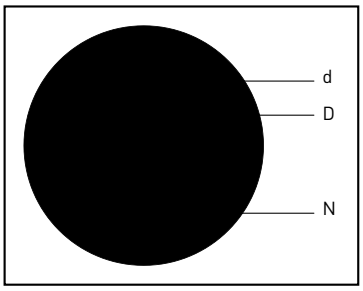
SIZE (IN)	L	H	W	Kg (lb)
DN 50 (2")	90 (3.5)	150 (5.9)	125 (4.9)	3.0 (6.6)
DN 65 (2.5")	117 (4.6)	160 (6.3)	125 (4.9)	4.7 (10.4)
DN 80 (3")	148 (5.8)	205 (8.0)	200 (7.9)	10.8 (23.8)
DN 100 (4")	150 (5.9)	227 (8.9)	230 (9.0)	18.0 (39.7)
DN 150 (6")	206 (8.1)	317 (12.5)	300 (11.8)	33 (72.7)
DN 200 (8")	225 (8.8)	400 (15.7)	354 (13.9)	51 (112.4)



FDV-Ra TH-TH

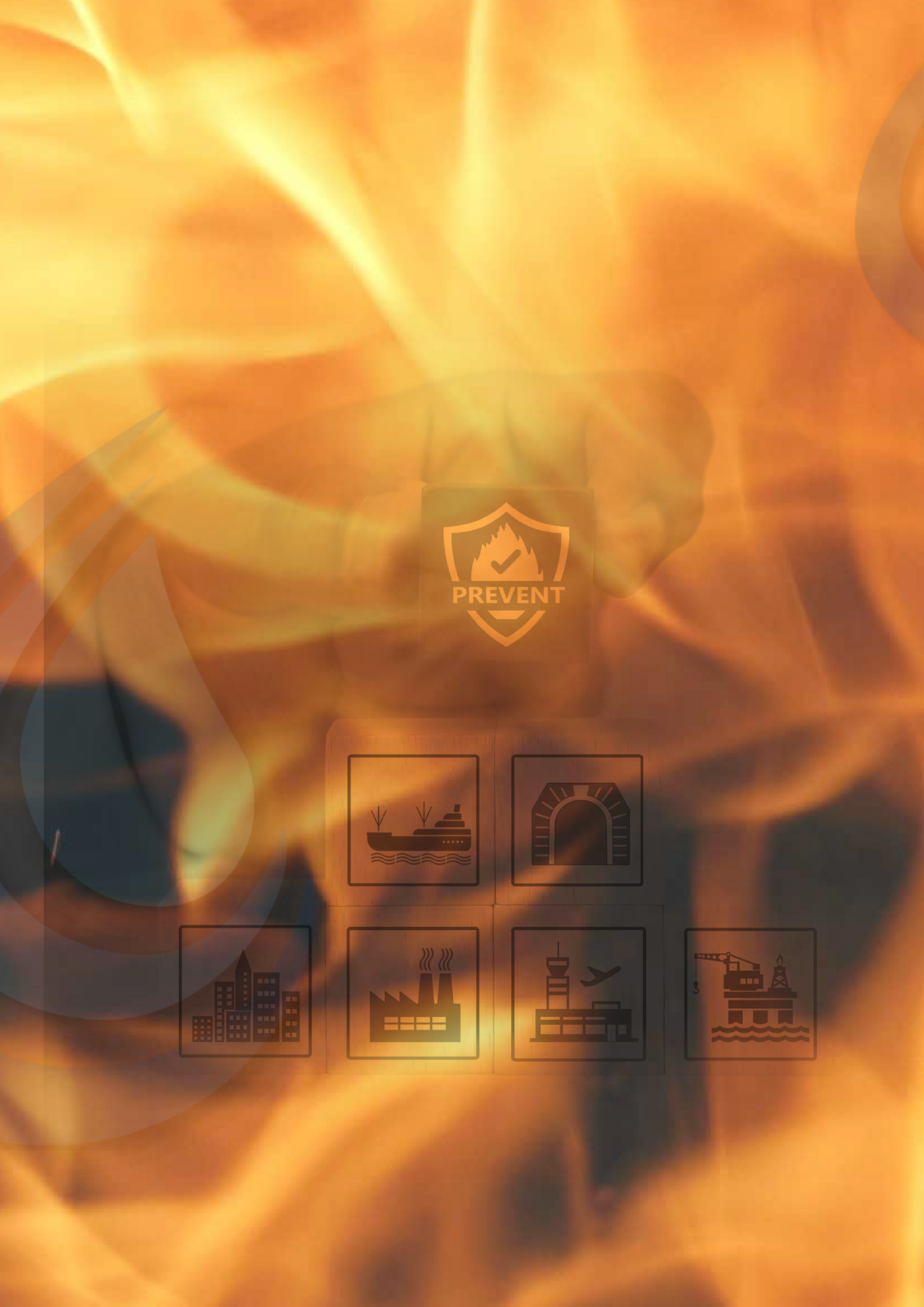
SIZE (IN)	L	H	W	Kg (lb)
DN 50 (2")	90 (3.5)	150 (5.9)	125 (4.9)	4.2 (9.2)
DN 65 (2.5")	117 (4.6)	160 (6.3)	125 (4.9)	7 (15.4)
DN 80 (3")	148 (5.8)	205 (8.0)	200 (7.9)	12 (26.5)
DN 100 (4")	150 (5.9)	227 (8.9)	230 (9.0)	15.9 (35.0)





Flange Drilling Specification - Nominal Dimensions in inches & (mm)

Nominal	ANSI B16.42 (Class 150)			ISO 7005-2 (PN 16)		
Valve Size	Dim. D	Dim. d	Qty. n	Dim. D	Dim. d	Qty. n
3" (DN 80)	6.00 (152.4)	0.75 (19.0)	4	6.30 (160.0)	0.71 (18.0)	8
4" (DN 100)	7.5 (190.5)	0.75 (19.0)	8	7.5 (190.5)	0.71 (18.0)	8
6" (DN 150)	9.50 (241.3)	0.88 (22.2)	8	9.50 (241.3)	0.87 (22.0)	8
8" (DN 200)	11.75 (298.5)	0.88 (22.2)	8	11.61 (295)	0.87 (22.0)	12
10" (DN 250)	14.25 (362)	1 (25.4)	12	14 (355)	1.02 (26)	12
12" (DN 300)	17 (431.8)	1 (25.4)	12	16.14 (410)	1.02 (26)	12
14" (DN 350)	18.75 (476.3)	1.125 (28.57)	12	18.50 (470)	1.02 (26)	16
16" (DN 400)	21.25 (539.8)	1.125 (28.57)	16	20.66 (525)	1.16 (29.5)	16


PREVENT

PRODUCT SELECTION GUIDE

RAPHAEL FP

Product Selection Guide

Deluge Systems

Application

Type		Actuation		Reset		Operation	
Standard	D	Electric	E	Local	0	Standard	0
Modulating	P	Pneumatic	P	Remote	1	3 way	1
Basic	A	Electro pneumatic	C				
		Hydraulic	H				

Main Valve

Valve Size		Connection End		Standard		Construction material		Coating		Elastomer material	
1 1/2"	15	FL*FL	FF	ANSI #150 FF (standard)	1	Ductile Iron ASTM A-536	DIC	Epoxy Polyester powder	EP	NR	NR
2"	02	GR*GR	GG	ANSI #150 RF	2	Cast Steel ASTM A-216 Grade WCB	WCB	Rilsan	RL	EPDM	DM
3"	03	FL*GR	FG	PN-16 FF (standard)	3	Nickel Aluminum bronze ASTM B148 UNS C95800	NAB	Epoxy + Polyurethane & Enamel (int)	PU	NBR	NB
4"	04	GR*FL	GF	PN-16 RF	4	Stainless steel ASTM A743, CF8M	SS6	Polyester	PE		
6"	06	TH*TH	TT	NPT	5	Stainless steel ASTM A743, CF8	SS4				
8"	08			BSP	6						
10"	10										

Trim

Accessories material		Tubing material		Fitted options		Installation orientation	
AISI 304	SS4	Copper	CUB	Pressure Switch	PS	Vertical	V
AISI 316	SS6	AISI 316	SS6	Ex-proof	EX	Horizontal	H
Brass	BRS	Copro Nickel	CN	MADV	MD		
Nickel Aluminum bronze ASTM B148 UNS C95800	NAB	Monel® nickel-copper alloy 400	MON	Drain Valves	DR		
				Water Motor Alarm	WM		
				Position Indicator	PI		
				Pressure Gauge	PG		
				Latch SOV	LS		

On-Off Valves

Application

Type		Actuation		Pressure Control		Latching	
Hydraulic Hydrant	H	Electric	E	No	0	No	0
Monitor Valve	M	Pneumatic	P	Yes	1	Yes	1
		Hydraulic	H				
		Local Manual	LM				

Main Valve

Valve Size		Valve Pattern		Connection End		Standard		Construction material		Coating		Elastomer material	
1 1/2"	15	Globe	G	FL*FL	FF	ANSI #150 RF (Std.)	1	Ductile Iron ASTM A-536	DI	Epoxy Polyester powder	EP	NR	NR
2"	02	Angle	A	GR*GR	GG	ANSI #150 FF	2	Cast Steel ASTM A-216 Grade WCB	WCB	Rilsan	RL	EPDM	DM
3"	03			TH*TH	TT	PN-16 RF (Std.)	3	Nickel Aluminum bronze ASTM B148 UNS C95800	NAB	Epoxy + Polyurethane & Enamel (int)	PU	NBR	NB
4"	04					PN-16 FF	4	Stainless steel ASTM A743, CF8M	SS6	Polyester	PE		
6"	06					ASTD	5	Stainless steel ASTM A743, CF8	SS4				
8"	08					NPT	6						
10"	10					BSP	7						
12"	12												

Trim

Accessories material		Tubing material		Fitted options		Installation orientation	
AISI 304	SS4	Copper	CUB	Pressure Switch	PS	Vertical	V
AISI 316	SS6	AISI 316	SS6	Ex-proof	EX	Horizontal	H
Brass	BRS	Copro Nickel	CN	ADV	AD		
Nickel Aluminum bronze ASTM B148 UNS C95800	NAB	Monel® nickel-copper alloy 400	MON	Position indicator	PI		
				Pressure Gauge	PG		

Product Selection Guide

Control Valves

Application

Type		Pressure Set	
Pressure Reducing	PN2	PN2 Std. (7Bar)	S
Pressure Relief	RN2	RN2 Std. (7Bar)	L
		Other	0

Main Valve

Valve Size		Valve Patern		Connection End		Standard		Construction material		Coating		Elastomer material	
1 1/2"	15	Globe	G	FL*FL	FF	ANSI #150RF	1	Ductile Iron ASTM A-536	DIC	Epoxy Polyester powder	EP	NR	NR
2"	02	Angle	A	GR*GR	GG	PN-16	2	Cast Steel ASTM A-216 Grade WCB	WCB	Rilsan	RL	EPDM	DM
3"	03			TH*TH	TT	ANSI #150FF	3	Nickel Aluminum bronze ASTM B148 UNS C95800	NAB	Epoxy + Polyurethane Enamel (int)	PU	NBR	NB
4"	04					ASTD	4	Stainless steel ASTM A743, CF8M	SS6	Polyester	PE		
6"	06					BSTD	5	Stainless steel ASTM A743, CF8	SS4				
8"	08					NPT	6						
10"	10					BSP	7						
12"	12												
14"	14												
16"	16												

TECHNICAL DATA

Trim

Accessories material		Tubing material	
AISI 304	SS4	Copper	CUB
AISI 316	SS6	AISI 316	SS6
Brass	BRS	Copro Nickel	CN
Nickel Aluminum bronze ASTM B148 UNS C95800	NAB	Monel® nickel-copper alloy 400	MON

FIRE PROTECTION

IRRIGATION

WATERWORKS

SMART SOLUTIONS

RAPHAEL VALVES INDUSTRIES (1975) LTD, founded in 1949, is the first Israeli manufacturer of water control valves. RAPHAEL's research department constantly strives to introduce new and innovative products and solutions for water control systems including water works, fire-protection, irrigation systems and other fields.

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RAPHAEL

CAT-FIRE PROTECTION_EN_11.23