Raphael

FIRE PROTECTION

CONTROL VALVES

Product Catalog

Fire Product Catalog

RAPHAEL VALVES INDUSTRIES (1975) LTD.

Founded in 1949, Raphael Valves Industries Ltd., is a manufacturer of high-quality control valves. With an extensive and pioneering product lineup, Raphael leads the global market in valve technology.

Our product range includes Fire Protection sectors, hydraulic control valves, butterfly valves, gate valves, check valves and more, specifically designed to meet the needs of the Irrigation, Waterworks. Each valve undergoes thorough quality control testing and manufacturing procedures, holding prestigious certifications such as ISO 9001, UL and FM approval.

Raphael offers a wide range of elastomeric diaphragm-type valves in streamlined globe and angle patterns. These valves are essential components in fixed fire extinguishing systems using water, foam, or seawater media. Our Fire Protection range includes Deluge and Preaction systems, Pressure control valves, Monitors and Hydrants, suitable for various environments such as Petro-chemical, Oil & Gas, Offshore, and Marine applications.

CONTROL VALVES

PRESSURE CONTROL VALVES

FDV-R-PN2 4

FDV-R-RN2 8

Pressure Reducing Control Valve

FDV-R-PN2

The FDV-R-PN2 Pressure reducing valve is an automatic hydraulic control valve, designed to operate in fixed fire protection system ad in peripheral FP water supply systems.

The FDV-R-PN2 pilot controlled hydraulic valve is activated by line pressure. The pilot valve has a spring-loaded membrane which is sensitive to the downstream pressure. The pilot's spring is pre-set to a desired reduced pressure. Accordingly, it 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. As a result, the outlet pressure is maintained constant, regardless of fluctuations in flow rate and changes in main pipeline pressure.

Designed for vertical, horizontal and angled 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. In addition, the hydrodynamic pattern design ensures high flow rates with minimum head loss.

MARKETS

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.

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

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

CONNECTIONS ENDS:
Flange*Flange,
Groove*Groove,
Thread*Thread
PRESSURE NOMINAL:
UL - 250 psi (17.2 bar)
FM - 300 psi)20.7 bar)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

CHARACTERISTICS

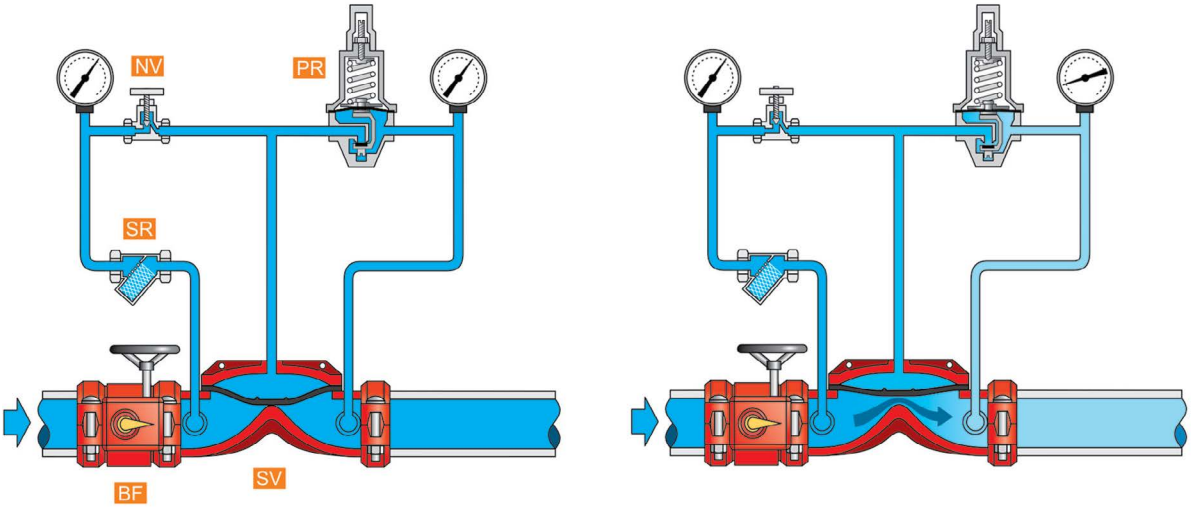
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- Simple and reliable design.
- Quick respond to downstream pressure changes.
- Pressure reducing to a predetermined set of outlet pressure.

APPROVALS

Schematic drawing:

FDV-R-PN2

Set position



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

SET POSITION

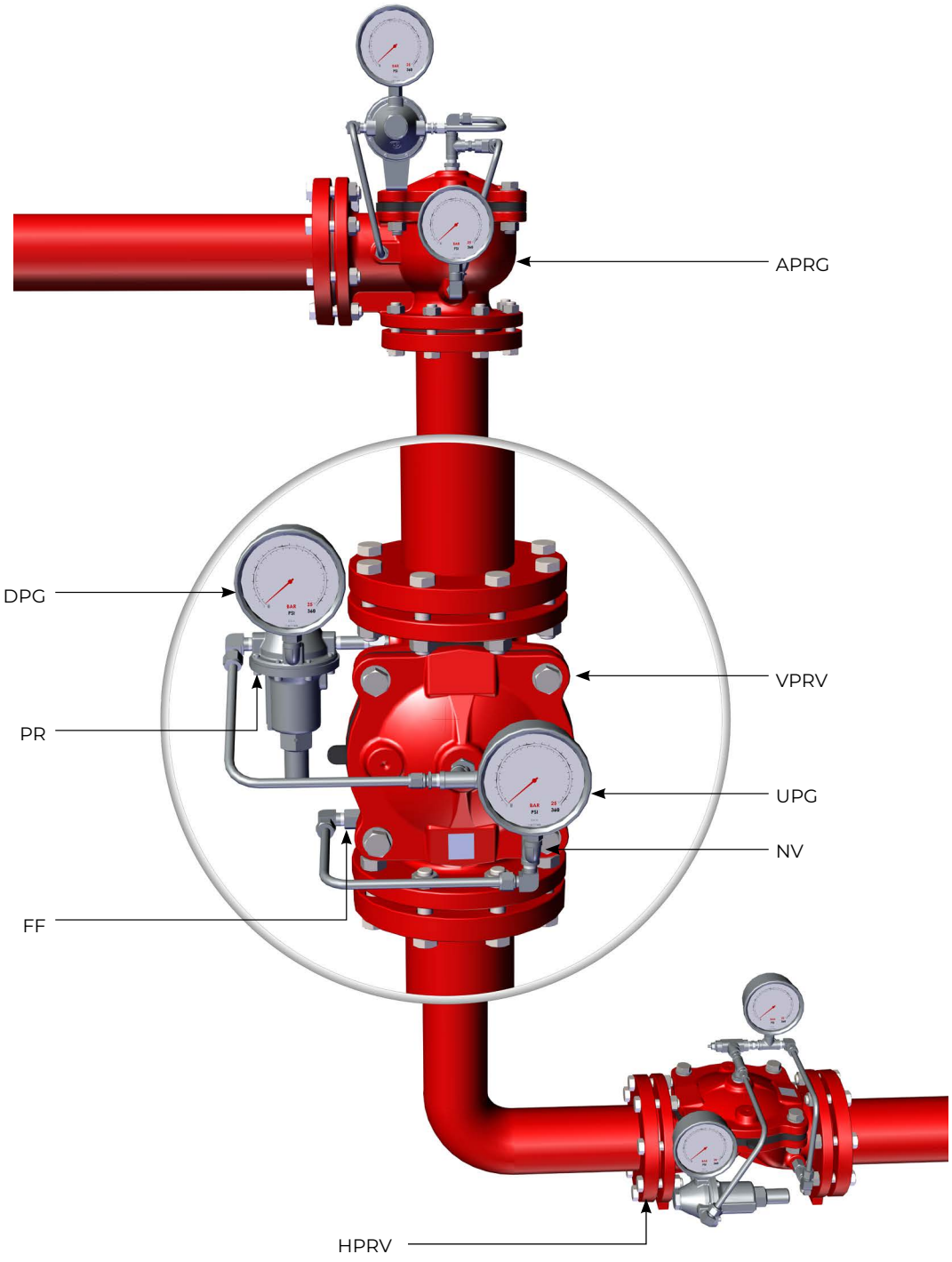
When the fire protection system is in the SET position, there is no flow through the system piping, and the water pressure equals the FDV-R-PN2 Pilot's set pressure. The FDV-R-PN2 valve's control chamber is pressurized by the inlet flow. Since there is no drainage from the control chamber through the Pressure Reducing Pilot Valve PRPV (PR), the pressure forces the diaphragm firmly against its seat, keeping the valve closed.

OPERATION

The FDV-R's control chamber is pressurized by a calibrated inlet flow passing through a Needle Valve (NV) and depressurized by the PRPV Pressure Reducing Pilot Valve (PR). The pilot's drain flow rate is governed by the downstream pressure, which acts through a sensing line to manipulate the pilot's diaphragm and sealing mechanism. Any variation in downstream pressure alters the balance between the control chamber's inlet and outlet flow rates. Consequently, the FDV-R valve's diaphragm position adjusts automatically to maintain the downstream pressure at the pilot's set point.

Typical installation

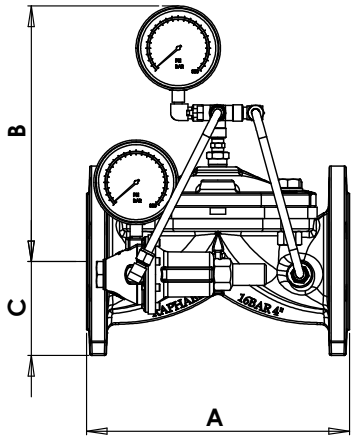
FDV-R- PN2

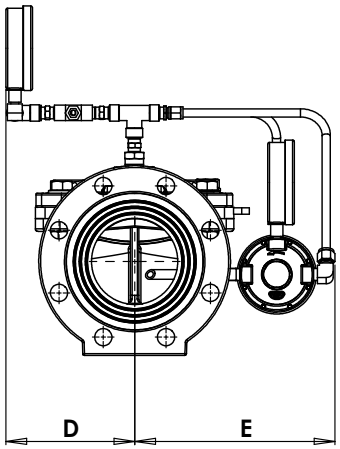


DPG – Downstream Pressure Gauge
PR – PRPV – Pressure Regulation Pilot Valve
FF – Finger Filter
NV – Needle Valve
UPG – Upstream Pressure Gauge
VPRV – Vertical Installation
APRV – Angled Installation
HPRV – Horizontal Installation

Parametric drawing:

FDV-R-PN2





Dimensions Table

Size	2"		3"		4"		6"		8"		10"		12"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	Inch	mm	inch	mm	inch
A	190	7.5	283	11.1	305	12	406	16	470	18.5	635	25	749	29.5
B	220	8.6	233	9.2	298	11.7	316	12.4	384	15.1	426	16.7	328	12.9
C	82	3.2	100	3.9	108	4.2	142	5.6	160	6.3	197	7.7	234	9.2
D	117	4.6	119	4.7	150	5.9	150	5.9	177	6.7	233	9.2	240	9.4
E	179	7	212	8.3	232	9.1	281	11	277	10.9	233	9.2	282	11.1
Kg/lb	10	22	19	42	26	57	50	110	57	126	109	240	141	310

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

- Valve ends
- Instalattion oriantation
- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- Trim material
- Upstream set pressure
- Additional accessories needed:
- Direct acting Relief Valve

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

Pressure Relief Control Valve

FDV-R-RN2

The FDV-R-RN2 Globe type and FDV-Ra-RN2 Angled type Pressure Relief valves are automatic hydraulic control valves, designed to operate in fixed fire protection systems, particularly in fire pump units.

The FDV-R/Ra-RN2 hydraulic pilot-controlled valve is activated by line pressure. The pilot valve features a spring-loaded membrane that is sensitive to upstream pressure and pre-set to a desired maximum pressure. When the line pressure exceeds the set pressure, the relief valve opens, discharging any excess pressure and preventing potential damage.

Designed for both vertical and horizontal installation, the line pressure-operated FDV-R/Ra-RN2 Pressure Relief valves feature a direct elastomeric diaphragm seal, with no balancing spring or internal metallic wet components in the valve body. The hydrodynamic pattern design ensures high flow rates with minimal head loss.

MARKETS

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 pressure securing the system from over pressure.

TECHNICAL DATA

FLUID: Water, Brackish water, Sea water, Foam

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

CONNECTIONS ENDS:
Flange*Flange,
Groove*Groove,
Thread*Thread
PRESSURE NOMINAL:
UL - 250 psi (17.2 bar)
FM - 300 psi)20.7 bar)

REGULATION RATIO: 5:1

SENSITIVITY: 1.45 psi (0.1 Bar)

CHARACTERISTICS

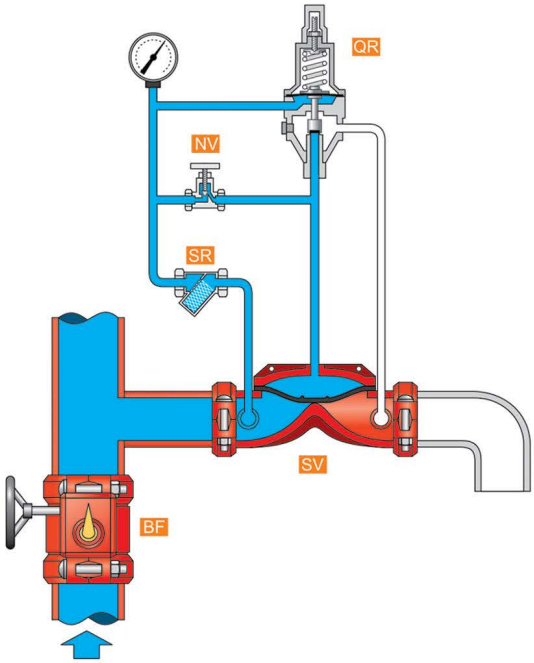
- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- Simple and reliable design.
- Quick respond to downstream pressure changes.

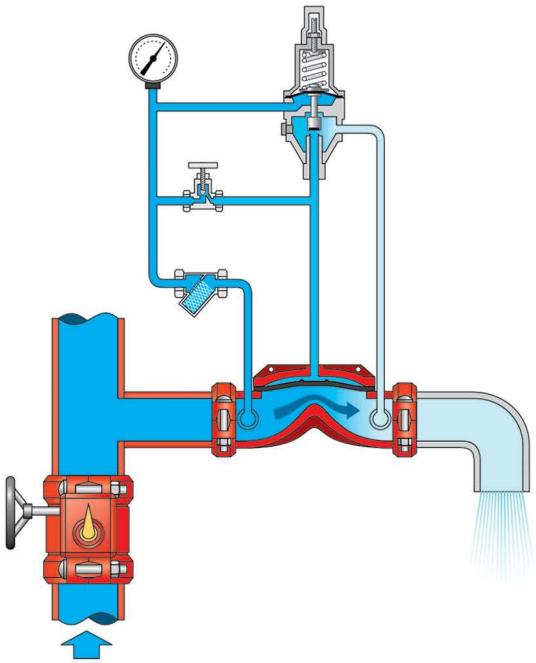
APPROVALS

Schematic drawing:

FDV-R-RN2

Set position





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

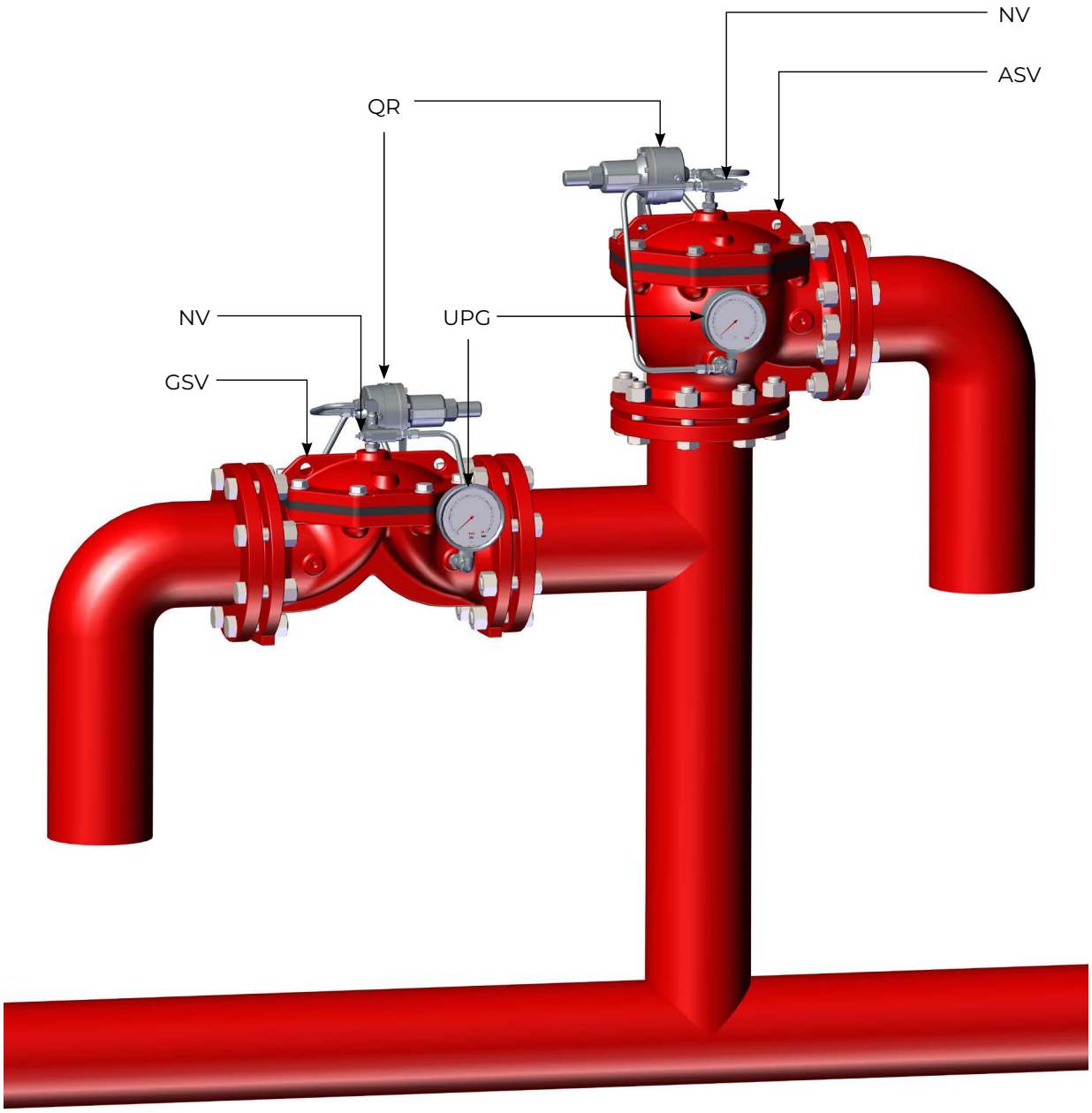
When the Fire system trips open and Fire pump starts-up and pressure rises in the pipe system surpassing the preset maximum pressure, the FDV-R-RN2 will quickly open, to enable water discharge out of the pipe system to the valve's downstream.

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.

Typical installation

FDV-R-RN2

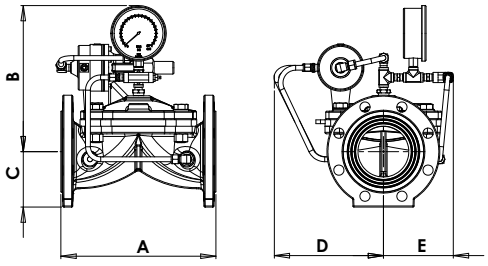


UPG – Upstream Pressure Gauge
QR – QRPV – Quick Release Pilot Valve
NV – Needle Valve
VPRV – Vertical Installation
ASV – Angled Service Valve
GSV – Globe Service Valve

Parametric drawing and Dimension Table: FDV-R-RN2

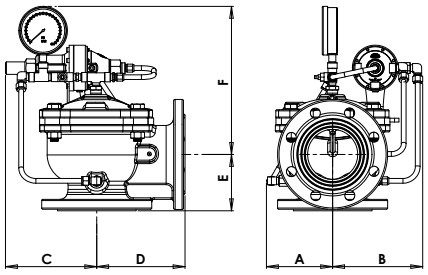
FDV-R-RN2 Globe type

Size	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	406	16	470	18.5	635	25
B	12	0.5	31	1.2	32	1.2	5	0.2	N/A	N/A	N/A	N/A
C	217	8.5	230	9.0	282	11.1	314	12.4	386	15.1	390	15.3
D	82	3.3	100	3.9	109	4.3	142	5.6	160	6.3	197	7.6
E	63	2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
F	115	4.5	140	5.5	153	6.0	200	7.9	226	8.9	277	10.6
G	128	5.0	128	5.0	156	6.1	150	5.9	178	7.0	233	9.2
Kg/lb	11.3	25	19.3	42.5	27	59.5	50.4	111	68.1	150	110	242



FDV-Ra-RN2 Angled type

Size	2"		3"		4"		6"		8"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	Inch
A	110	4.3	123	4.8	133	5.2	165	5.2	207	8.1
B	140	5.5	168	6.6	181	7.1	202	7.1	254	10
C	164	6.4	172	6.7	184	7.2	175	7.2	216	8.5
D	124	4.8	155	6.1	178	7.0	218	7	227	8.9
E	81	3.1	116	4.6	124	4.8	148	4.8	171	6.7
F	243	9.5	263	10.3	298	11.7	346	11.7	409	16.1
Kg/lb	8.6	19	22.7	50	29	64	50.5	111	74.7	164



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: Glob or angled
- Valve ends
- Instalation orientation (Globe type)
- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Trim material
- Upstream set pressure
- Additional accessories needed

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

Providing advanced solutions to customers around the world

North America|South America|Europe|Africa|Asia|Australia

RAPHAEL, founded in 1949, is the first Israeli manufacturer of water control valves.

RAPHAEL's research department constantly strives to introduce innovative products and solutions for water control systems including water works, fire protection and irrigation systems.

Raphael

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