PREACTION SYSTEMS

PREACTION SYSTEMS


IN CASE OF
FIRE

Double Interlock, Electro-Pneumatically Actuated, Local Reset

FPS-DIC0

The Preaction system is a fire protection (FP) combined system, consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline keeps the riser check valve closed. The section between the downstream side of the closed deluge valve and the check valve clapper serves as the "intermediate chamber," where the water pressure switch and acoustic alarm are connected.

In double-interlock Preaction systems, such as the one described, full system activation is dependent on two independent fire-related events: one resulting from heat exposure, and the other from fire detection. The operation of the FPS-DIC0 system requires both pneumatic and electrical triggering.

In the event of fire, heat causes one or more automatic sprinklers to open, leading to depressurization of the sprinkler pipeline. The resulting pressure drop triggers the air pressure switch, which sends a signal to the main control board. This constitutes the first actuation event. In parallel, the pressure drop opens a pneumatic actuator located on the deluge valve control chamber drain line, which is installed in series with a normally closed solenoid valve. At this stage, the solenoid valve remains closed.

When one or more smoke detectors are activated, they send an electrical signal to the main control board. This constitutes the second actuation event. Only when both actuation events occur does the control board open the solenoid valve, which in turn causes the FDV deluge valve to open, allowing water to flow into the sprinkler pipeline.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID:
Water, Foam

PNEUMATICS:
Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2'' to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for low temperature zone installation – water spraying pipeline is kept dry.
- Full-bore, unobstructed design
- The ASK - Air Supply Unit provides a constant air compensation in case of pipeline minor leaks.
- The Manual /Emergency local operation valve installed in a metal enclosure is fully protected from Accidental activation. When opened, it by-passes all terms.
- Open fail-safe valve property by special fail-safe device – the PSA.
- 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 flow rates with minimal head loss.
- The valve opens automatically only after two independent actuation events occur. The first is an electric signal transmitted from the heat detection sensors to the valve's solenoid; the second is a pressure drop in the closed sprinklers pipeline.

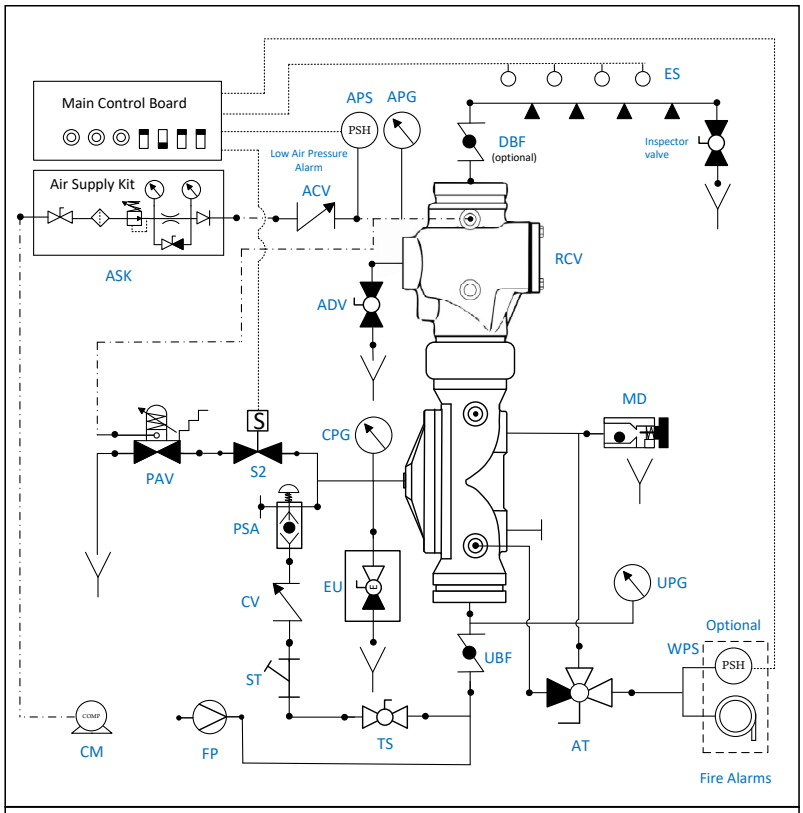
The FPS-DIC0 resets to its stand-by closed position by de-energizing the solenoid coil through the main control panel and replacing all open (shuttered) sprinklers, which enables the downstream pipeline to be re-pressurized. Additionally, the PSA push button must be pressed

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

Schematic drawing:

FPS-DICO

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		Air line
AT -	Alarm Test valve	CPG -	Control Chamber P. gauge		Electrical line
GC -	Gong connection	UPG -	Upstream Pressure gauge		
CV -	Check Valve	APG -	Air Pressure gauge	ACV -	Air Check Valve
OR -	Orifice	APS -	Air Pressure Switch	EU -	Manual Emergency Valve
WPS -	Water Pressure Switch	SL -	Sprinkles Line	S2 -	2-way Solenoid valve
DL -	Deluge Valve	ADV -	Downstream Drain Valve	PAV -	Pneumatic Actuator Valve
MD -	MADV – Man./ Auto. Drain Valve	FP -	Fire Pump	RCV -	Riser Check Valve
ES -	Electric Sensors System	SL -	Sprinklers Line	ASK -	Air Supply Valve

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

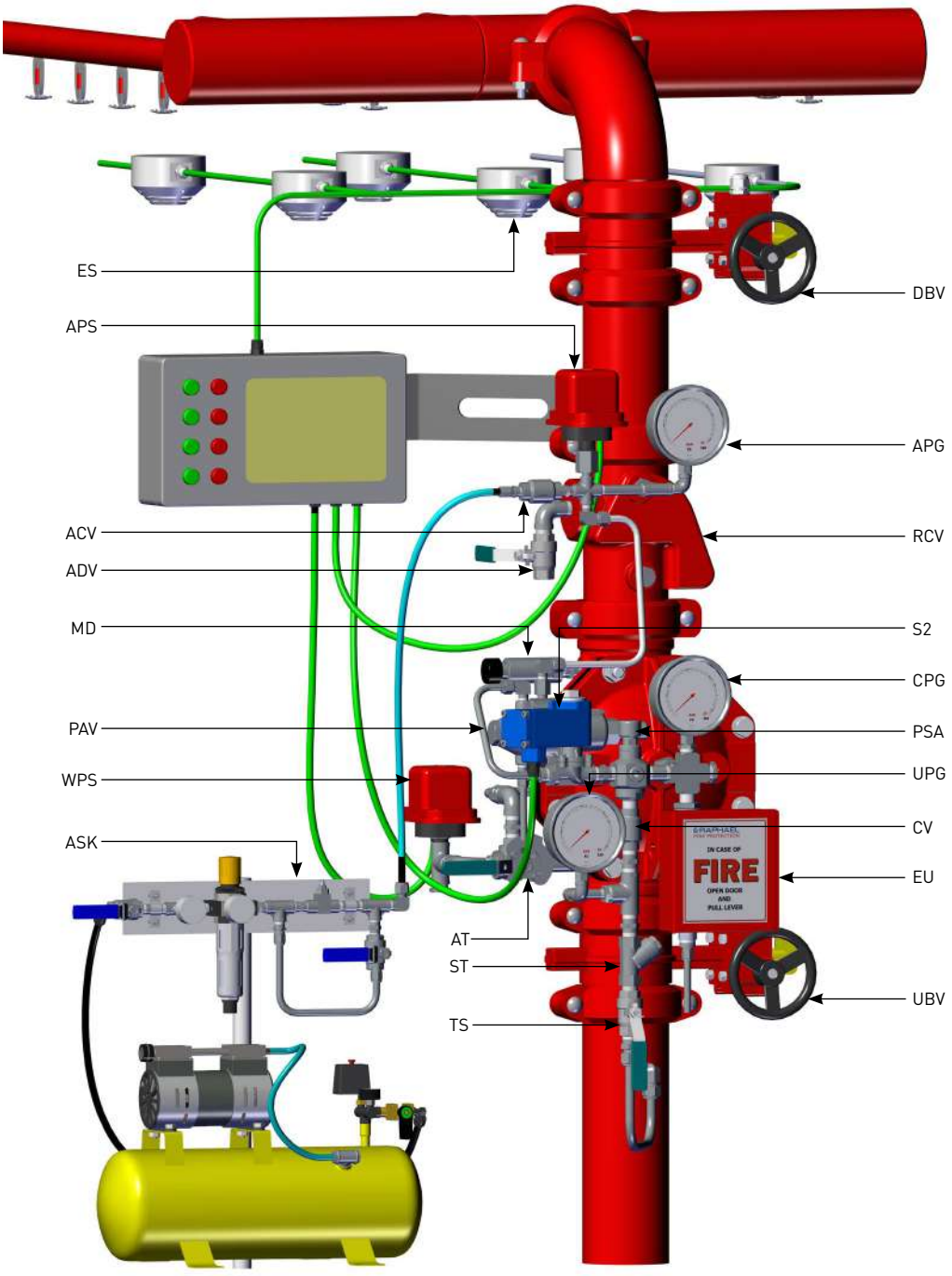
When some of the automatic sprinklers are subjected to the predetermined temperature and shutter-open, the pipeline de-pressurizes, tripping open the closed pneumatic actuator (PAV) and closes the internal contacts of the low air pressure switch (APS). When this signal is transferred to the main control 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 (PAV) 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 constant water flow from the trim supply valve (TS) to the deluge control chamber, pressurizes it and causes the valve to close. The full system reset requires the replacement of all Shattered-open sprinklers in the spray pipeline. Before re-pressurizing this pipeline by air, it needs to be fully drained by opening the drain valve at the riser check valve.

Typical installation

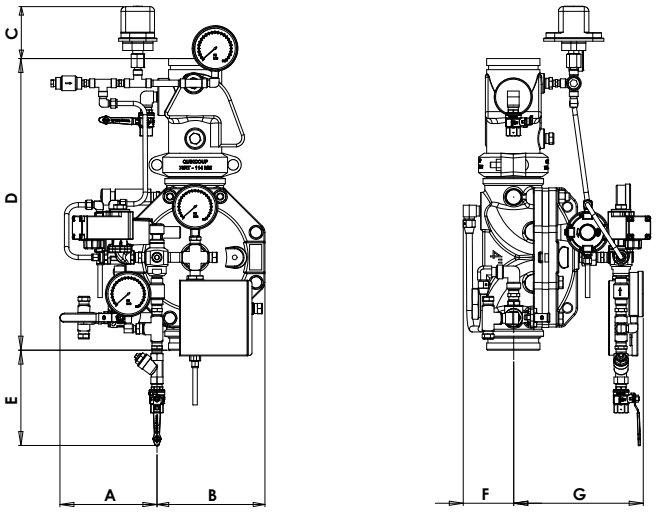
FPS-DIC0



DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
APS - Air Pressure switch
APG - Air Pressure Gauge
ES - Electric Sensors system
ASK - Air Supply Kit
ACV - Air Check Valve
RCV - Riser Check Valve
ADV - Air Drain Valve
CPG - Control Chamber Pressure Gauge
UPG - Upstream Pressure Gauge
S2 - Solenoid 2 way
PAV - Pneumatic actuator Valve
PSA - Pressure Supply Arrestor
MD - Manual Automatic Drain Valve
EU - Emergency Unit
CV - Check Valve
ST - "Y" Strainer
TS - Trim Supply
WPS - Water Pressure Switch (optional)
AT - Alarms Test Valve

Parametric drawing:

FPS-DICO



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	280	11	296	11.6	290	11.4	315	12.4	336	13.2	373	14.7
B	122	4.8	122	4.8	150	5.9	204	8.3	229	9	305	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	295	11.6	275	10.8	206	8.1	138	5.4	156	6.1	58	2.3
F	127	5	140	5.5	145	5.7	146	5.7	157	6.1	180	7.0
G	258	10.1	317	12.4	288	11.3	385	15.1	330	13	450	17.7
Kg/lb	17.3	38.1	31	68.3	52	114	80.4	177	130	286	182	401

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile iron
- Cast Steel WCB
- Stainless Steel CF8M

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- Pneumatic working pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch
  - Low air pressure switch

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

Single interlock with Pressure Reducing, Electrically Actuated, Local reset

FPS-SCE0

The preaction system is a combined fire-protection (FP) system consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic-sprinkler pipeline keeps the riser check valve in the closed position.

The section between the downstream side of the closed deluge valve and the clapper of the check valve functions as the intermediate chamber, where both the water-pressure switch and the acoustic alarm are connected.

In single-interlock pre-action systems, such as the FPS-SCE0 described here, full system activation depends on the occurrence of a single independent fire-related event detected by the electric fire-detection sensors.

When one or more electric detectors are triggered, they send an electrical signal to the main control board. This constitutes the actuation event. Consequently, the control board energizes the solenoid valve, opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline. The low-air-pressure switch is used for supervision only.

Fire suppression is activated only when one or more sprinklers open due to heat. Water is discharged exclusively through the sprinklers that have opened directly above the fire.

The trim is equipped with a PSA - a device that enables local system reset, that is, reclosing the FDV valve by re-pressurizing its control chamber. The PSA is considered a latching device and keeps the valve open even in the event of a power outage.

The FPS-SCE0 system is also capable of reducing upstream pressure to a predetermined downstream pressure and maintaining it at a steady level. The pressure-reducing pilot responds to any downstream-pressure changes caused by flow-rate variations, ensuring a stable set pressure.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS:
Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm 2'' to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for low temperature zone installation – water spraying pipeline is kept dry.
- Full-bore, unobstructed design
- The ASK - Air Supply Unit provides constant air compensation in case of pipeline minor leaks.
- The Manual /Emergency local operation valve installed in a metal enclosure is fully protected from Accidental activation. When opened, it by-passes all terms.
- Open fail-safe valve property by special fail-safe device – the PSA.
- Low maintenance cost: the valve can be serviced in-line and includes only one replaceable part — a long-life elastomeric diaphragm.

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The system trips open automatically only after one event of actuation - one or more of the electric sensors is triggered and sent an electric signal to the main board

The FPS-SCE0 resets to stand-by close position, by de-energizing the solenoid valve coil through the main control panel and replacing all shuttered open sprinklers, enabling the pressurizing of downstream pipeline. In addition, by manually operating the local reset device – the PSA.

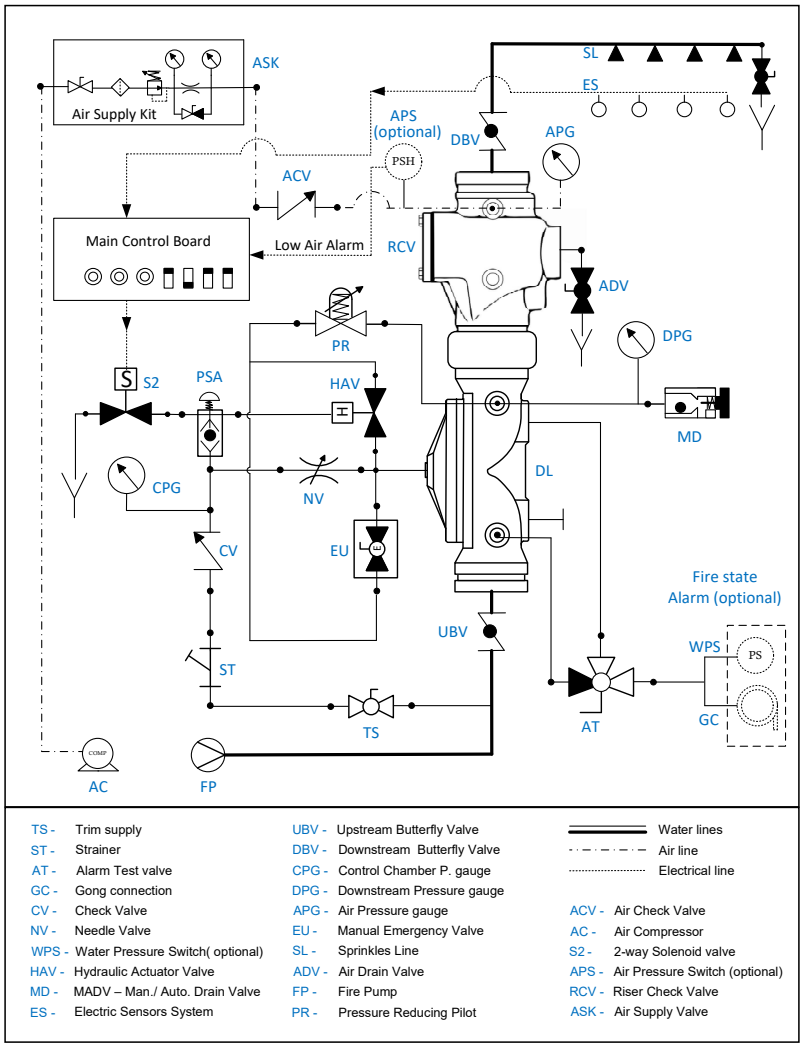
A pressure-reducing pilot enables full control over the downstream pressure and ensures a steady set in a wide pressure range.

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

Schematic drawing:

FPS-SCE0

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve's control chamber by the check valve (CV), the closed pneumatic actuator valve (HAV), the closed PSA (PSA) device, and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

When the electric detection system senses heat, it sends a signal to the control board, recognized as the single actuation event. The control board then energizes the solenoid valve (S2), which drains the hydraulic actuator (HAV) control chamber, allowing it to open. When open, water trapped in the deluge control chamber flows through the pressure-reducing pilot to the downstream, and the deluge valve opens. Water admitted by the deluge flows through the open riser check valve to the sprinkler pipeline. This activates all alarms, including the water-pressure switch (WPS) and the water-motor gong. The low-air-pressure switch (APS), if installed, serves for supervisory purposes only.

The PSA (PSA) prevents the control HAV's control chamber from re-pressurizing and, thereby, latches the deluge valve open.

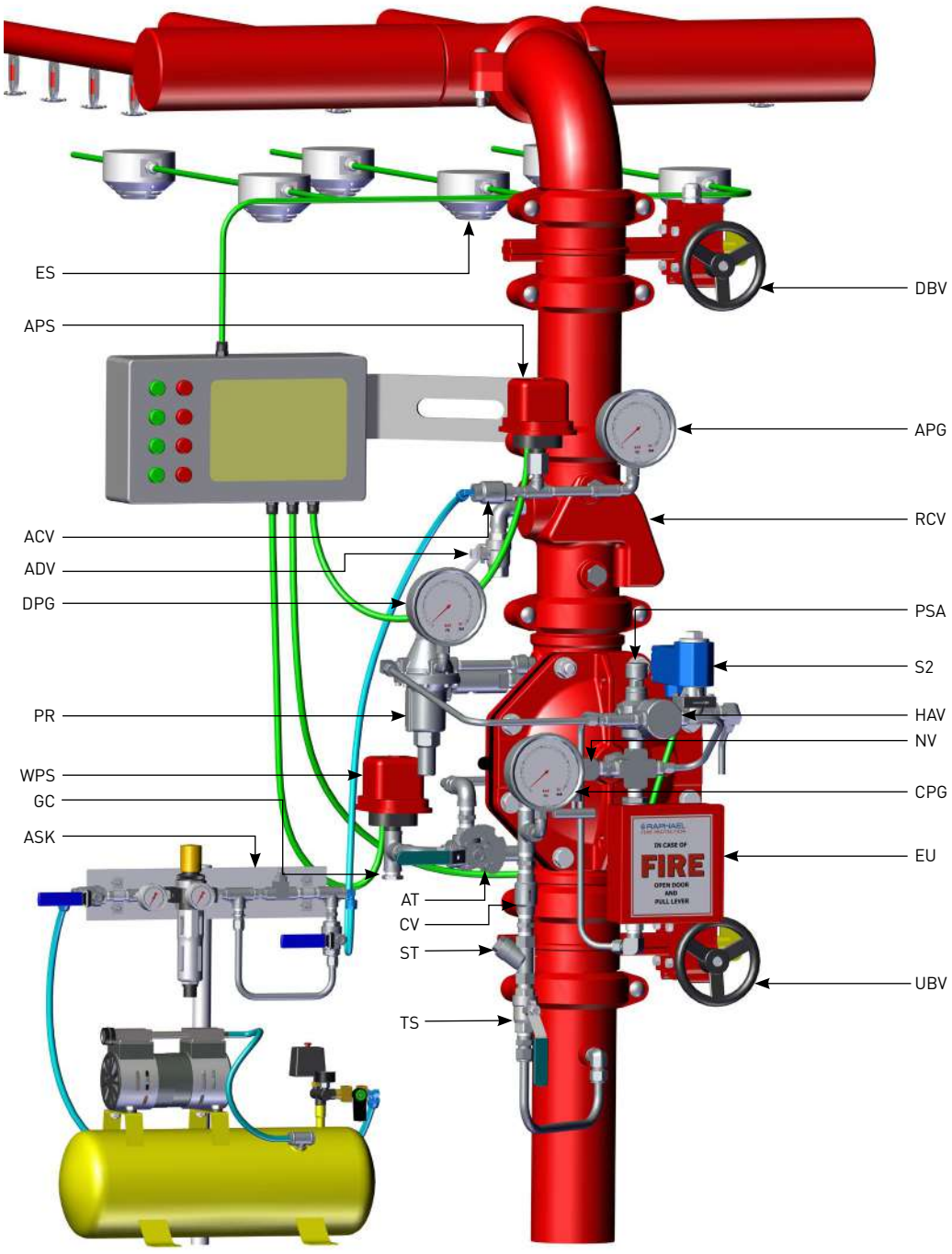
RESET POSITION

When the control board de-energizes the solenoid valve (S2) and the PSA pushbutton has been pressed, the HAV control chamber pressurizes and the actuator closes. Upstream flow through the trim supply valve (TS) and the needle valve (NV) pressurizes the deluge control chamber, causing it to close. After it closes, the PSA pushbutton can be released.

All burst-open sprinklers must be replaced. Before re-pressurizing the spray pipeline with air, it must be thoroughly drained using the air-drain valve (ADV).

Typical installation

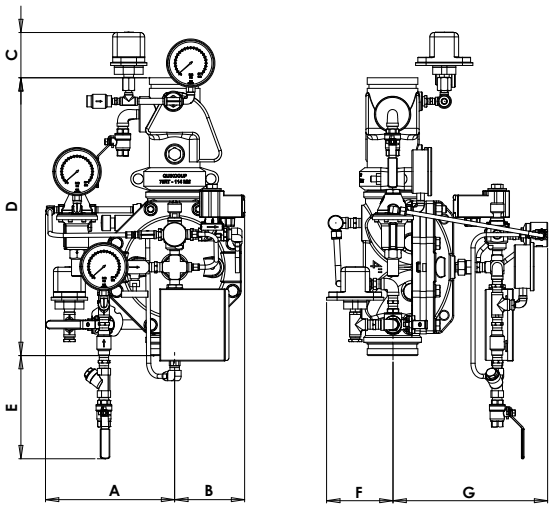
FPS-SCE0



DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
CPG - Control Chamber Pressure Gauge
DPG - Downstream Pressure Gauge
APG - Air Pressure Gauge
ES - Electric Sensors system
ASK - Air Supply Kit
ACV - Air Check Valve
ADV - Air Drain Valve
S2 - Solenoid 2 way
PR - Pressure Reducing Pilot Valve
PSA - Pressure Supply Arrestor
EU - Emergency Unit
CV - Check Valve
ST - "Y" Strainer
TS - Trim Supply
NV - Needle Valve
AT - Alarms Test Valve
GC - Gong Connection
HAV - Hydraulic Actuator Valve
WPS - Water Pressure Switch
APS - Air Pressure Switch (optional)
RCV - Riser Check Valve

Parametric drawing:

FPS-SCE0



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	263	10.3	296	11.6	290	11.4	315	12.4	336	13.2	394	15.5
B	146	5.7	146	5.7	150	5.9	176	6.9	231	9	308	12.1
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	222	8.7	223	8.7	138	5.4	101	3.9	49	1.9	N/A	N/A
F	108	4.2	159	6.2	145	5.7	146	5.7	157	6.1	216	8.5
G	273	10.7	302	11.8	340	13.3	404	15.9	441	17.3	517	20.3
Kg/lb	18.6	41	31	68.3	53	116	81.2	178	131	288	186	410

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Pneumatic pressure
- Downstream set pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch
  - Low air pressure switch

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

Single interlock with Pressure Reducing, Electrically Actuated, Remote reset

FPS-SCE1

The Preaction system is a combined fire protection (FP) system consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline maintains the riser check valve in the closed position. The section between the downstream side of the closed deluge valve and the clapper of the riser check valve functions as the "intermediate chamber", to which the water pressure switch and the acoustic alarm are connected.

In single-interlock pre-action systems, such as the FPS-SCE1 described here, full system activation depends on the occurrence of a single fire-related event caused by heat and detected by electric fire detection sensors.

When one or more electric detectors are triggered, they send an electrical signal to the main control board, constituting the actuation event. Only when this actuation event occurs does the control board energize the solenoid valve, thereby opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline. The low air pressure switch is used for supervisory purposes only.

The FPS-SCE0 system can reduce upstream pressure to a preset downstream pressure and maintain it at a steady level. The pressure-reducing pilot responds to downstream pressure changes caused by variations in flow demand and keeps the set pressure stable.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID: Water

PNEUMATICS: Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2" to 10")

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

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 design.
- Simple manual reset of the valve to standby position without closing OS&Y or other valves in the system.
- Low maintenance cost: the valve can be serviced in-line and includes only one replaceable part — a long-life elastomeric diaphragm.
- Complies with NFPA 25, the standard for the inspection, testing, and maintenance of water-based fire protection systems.

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The system trips open automatically only after a single actuation event: one or more electric sensors are triggered and send an electrical signal to the main control board.

The FPS-SCE1 resets to the standby closed position by de-energizing the solenoid coil via the main control panel and replacing all sprinklers that have burst open, thereby allowing the downstream pipeline to be re-pressurized.

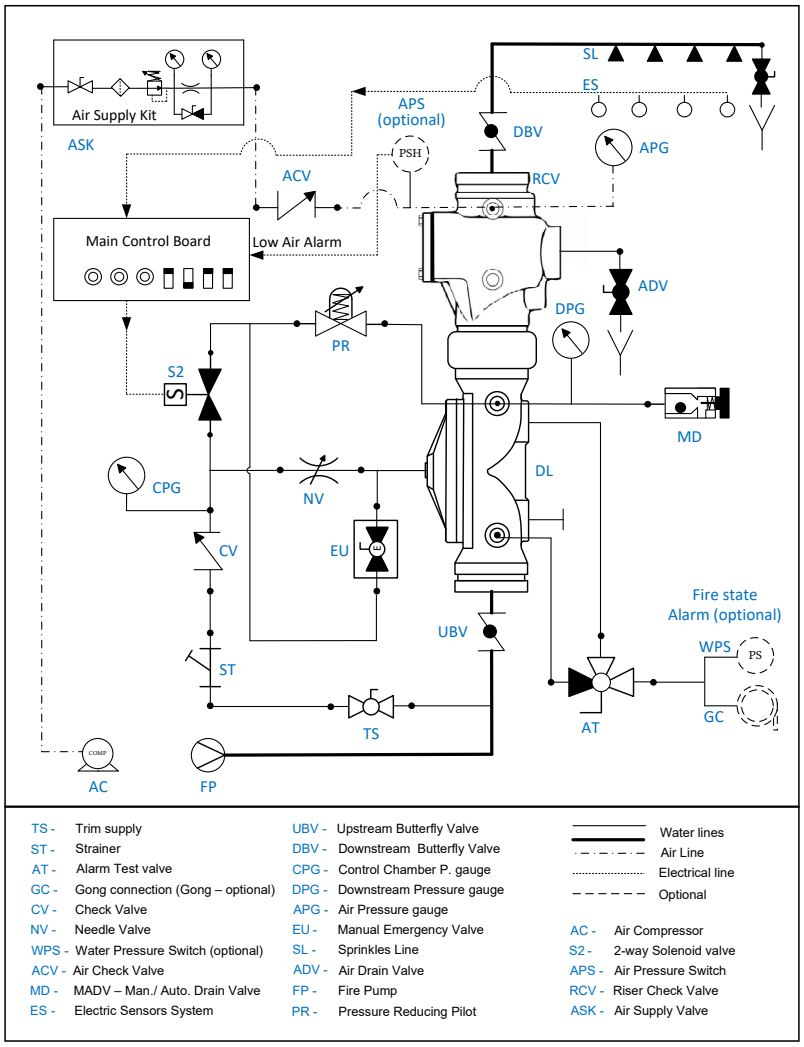
A pressure-reducing pilot provides full control of the downstream pressure and maintains a stable set pressure over a wide operating range.

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

Schematic drawing:

FPS-SCE1

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve's control chamber by the check valve (CV), the closed solenoid valve (S2), and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

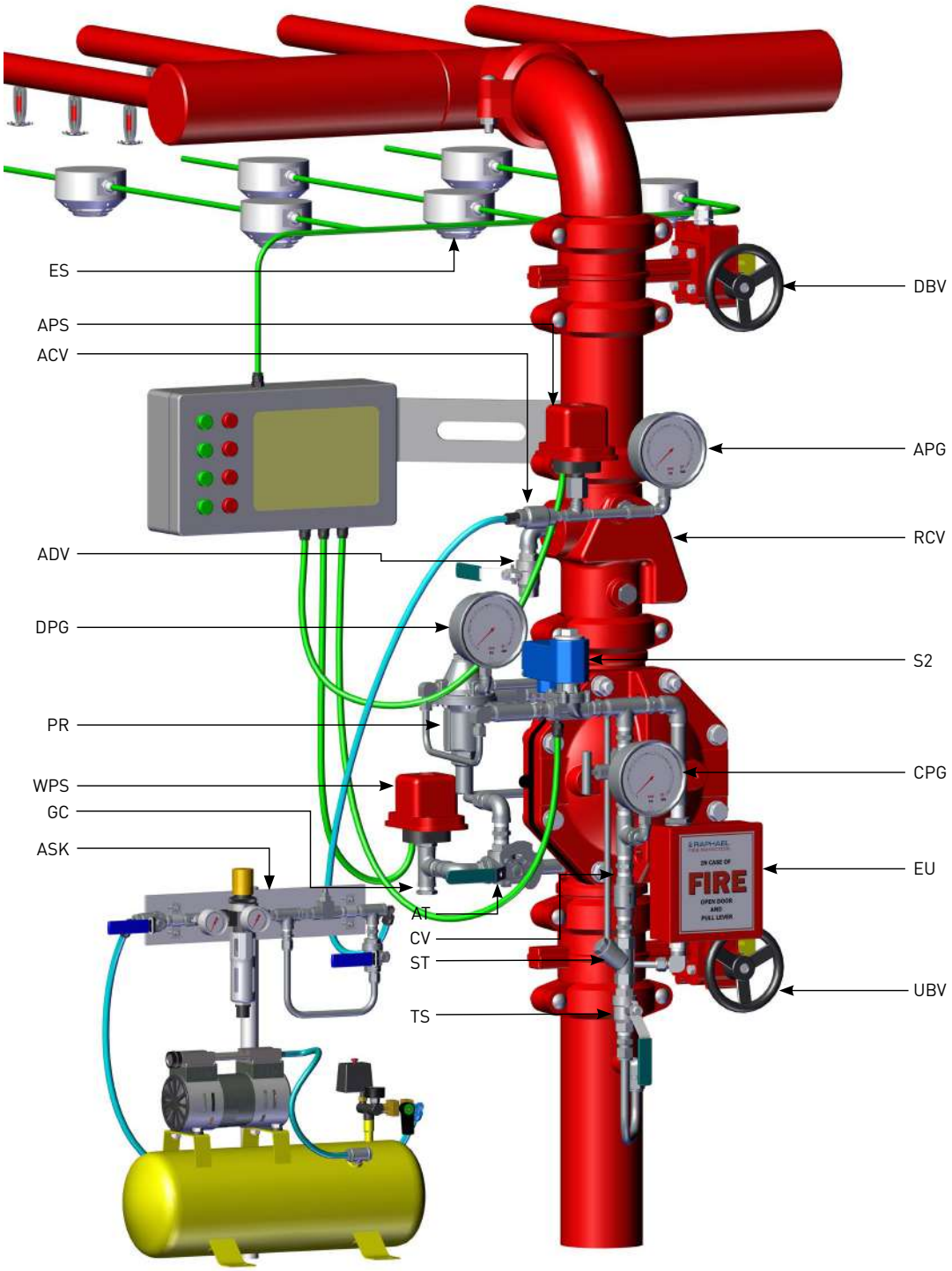
When the electric detection system senses heat, it sends a signal to the control board, which is recognized as the actuation event. The control board then energizes the solenoid valve (S2), draining the deluge valve control chamber through the pressure-reducing pilot to the downstream side. Consequently, the deluge valve opens and admits water through the open riser check valve into the sprinkler pipeline. This action activates all alarms, including the water pressure switch (WPS) and the water motor gong.

RESET POSITION

When the control board de-energizes the solenoid valve (S2), upstream flow through the trim supply valve (TS) and the needle valve (NV) pressurizes the deluge valve control chamber, causing it to close. All sprinklers that have burst open must be replaced. Before re-pressurizing the spray pipeline with air, it must be completely drained by opening the air drain valve (ADV).

Typical installation

FPS-SCE1



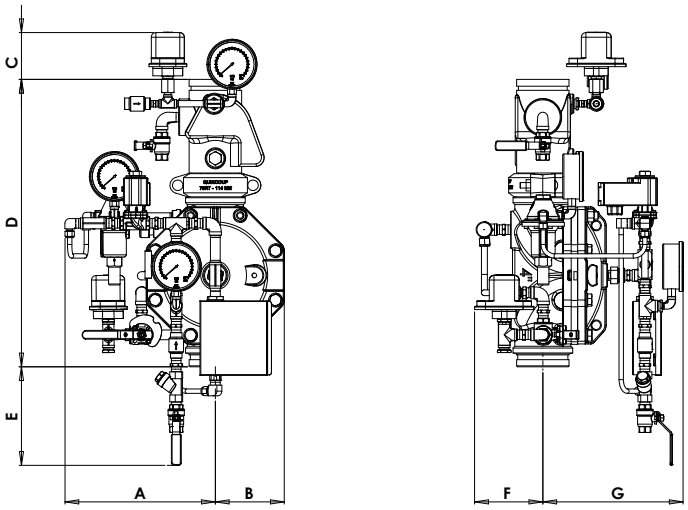
DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
CPG - Control Chamber Pressure Gauge
DPG - Downstream Pressure Gauge
APG - Air Pressure Gauge
ES - Electric Sensors system

ASK - Air Supply Kit
ACV - Air Check Valve
ADV - Air Drain Valve
S2 - Solenoid 2 way
PR - Pressure Reducing Pilot Valve
EU - Emergency Unit
CV - Check Valve

ST - "Y" Strainer
TS - Trim Supply
AT - Alarms Test Valve
GC - Gong Connection
WPS - Water Pressure Switch
APS - Air Pressure Switch (optional)
RCV - Riser Check Valve

Parametric drawing:

FPS-SCE1



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	242	9.5	199	7.8	298	11.7	315	12.4	245	9.6	394	15.5
B	212	8.3	241	9.5	150	5.9	176	6.9	232	9.1	307	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	295	11.6	300	11.8	190	7.5	157	6.2	105	4.1	N/A	N/A
F	108	4.2	159	6.2	145	5.7	146	5.7	157	6.1	216	8.5
G	276	10.8	276	10.8	310	12.2	347	13.6	380	14.9	503	19.8
Kg/lb	17.5	38.5	32	70.5	51.8	114	80.6	178	130	287	186	410

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch
  - Supervisor de interruptor de baja presión

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

Single interlock, Electrically Actuated, Local reset

FPS-SIE0

The Preaction system is a fire protection (FP) combined system, consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline maintains the riser check valve in a closed position. The section between the downstream side of the closed deluge valve and the check valve clapper functions as the "intermediate chamber," where the water pressure switch and the acoustic alarm are connected.

In single-interlock Preaction systems, such as the FPS-SIE0 described here, full system activation depends on the occurrence of a single, independent fire-related event - specifically, heat exposure detected by electric sensors.

When one or more electric detectors are triggered, they send a signal to the main control board, initiating the actuation event. Only after this event occurs does the control board energize the solenoid valve, thereby opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline.

The trim is equipped with a PSA - an integrated device that enables local system reset, i.e., re-closing the FDV valve by re-pressurizing its control chamber.

Additionally, the PSA functions as a latching device, keeping the valve open even in the event of a power outage.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS: Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2" to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for low temperature zone installation – water spraying pipeline is kept dry.
- Full-bore, unobstructed design.
- The ASK - Air Supply Unit provides a constant air compensation in case of pipeline minor leaks.
- The Manual /Emergency local operation valve installed in a metal enclosure is fully protected from Accidental activation. When opened, it by-passes all terms.
- Open fail-safe valve property by special fail-safe device – the PSA.
- Low maintenance cost: the valve can be serviced in-line and includes only one replaceable part — a long-life elastomeric diaphragm.

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The system trips open automatically after one events of actuation:

  The second one or more of the electric sensors is triggered and sent an electric signal to the main board the activation of the Air pressure switch at fire situation, when air pressure drops at the sprinklers pipeline is used for supervision only.

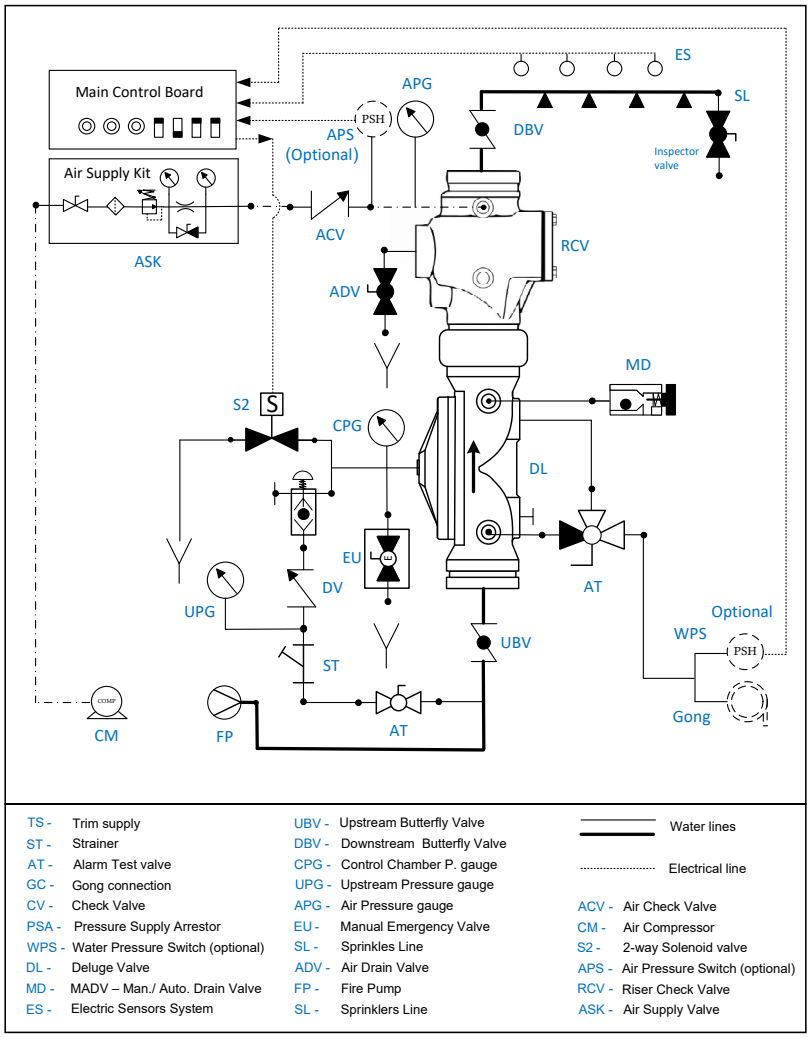
The FPS-SIE0 resets to stand-by close position by de-energizing the solenoid coil through the main control panel and replacing all shuttered open sprinklers enabling the pressurizing of downstream pipeline. In addition, the PSA bush button must be pressed locally.

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

Schematic drawing:

FPS-SIE0

Set position



TS -	Trim supply	UBV -	Upstream Butterfly Valve		Water lines
ST -	Strainer	DBV -	Downstream Butterfly Valve		
AT -	Alarm Test valve	CPG -	Control Chamber P. gauge		Electrical line
GC -	Gong connection	UPG -	Upstream Pressure gauge		
CV -	Check Valve	APG -	Air Pressure gauge	ACV -	Air Check Valve
PSA -	Pressure Supply Arrestor	EU -	Manual Emergency Valve	CM -	Air Compressor
WPS -	Water Pressure Switch (optional)	SL -	Sprinkles Line	S2 -	2-way Solenoid valve
DL -	Deluge Valve	ADV -	Air Drain Valve	APS -	Air Pressure Switch (optional)
MD -	MADV – Man./ Auto. Drain Valve	FP -	Fire Pump	RCV -	Riser Check Valve
ES -	Electric Sensors System	SL -	Sprinklers Line	ASK -	Air Supply Valve

OPERATION

SET POSITION

Pressurized water is retained in the deluge valve's control chamber by the check valve (CV), the closed solenoid valve (S2), the PSA (PSA) device and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

When one the electric detection system senses heat, it sends a signal to the control board - recognized as the single actuation event. The control board then energizes the solenoid valve (S2), which drains the deluge valve's control chamber, allowing it to open. Water admitted by the deluge flows through the open riser check valve to the sprinkler pipeline. This activates all alarms, including the water pressure switch (WPS) and the water motor gong. The Low air pressure switch (APS) if installed, serves for supervisory purposes only.

The PSA (PSA) avoids the control HAV's control chamber re-pressurization and by that, latches the deluge valve open.

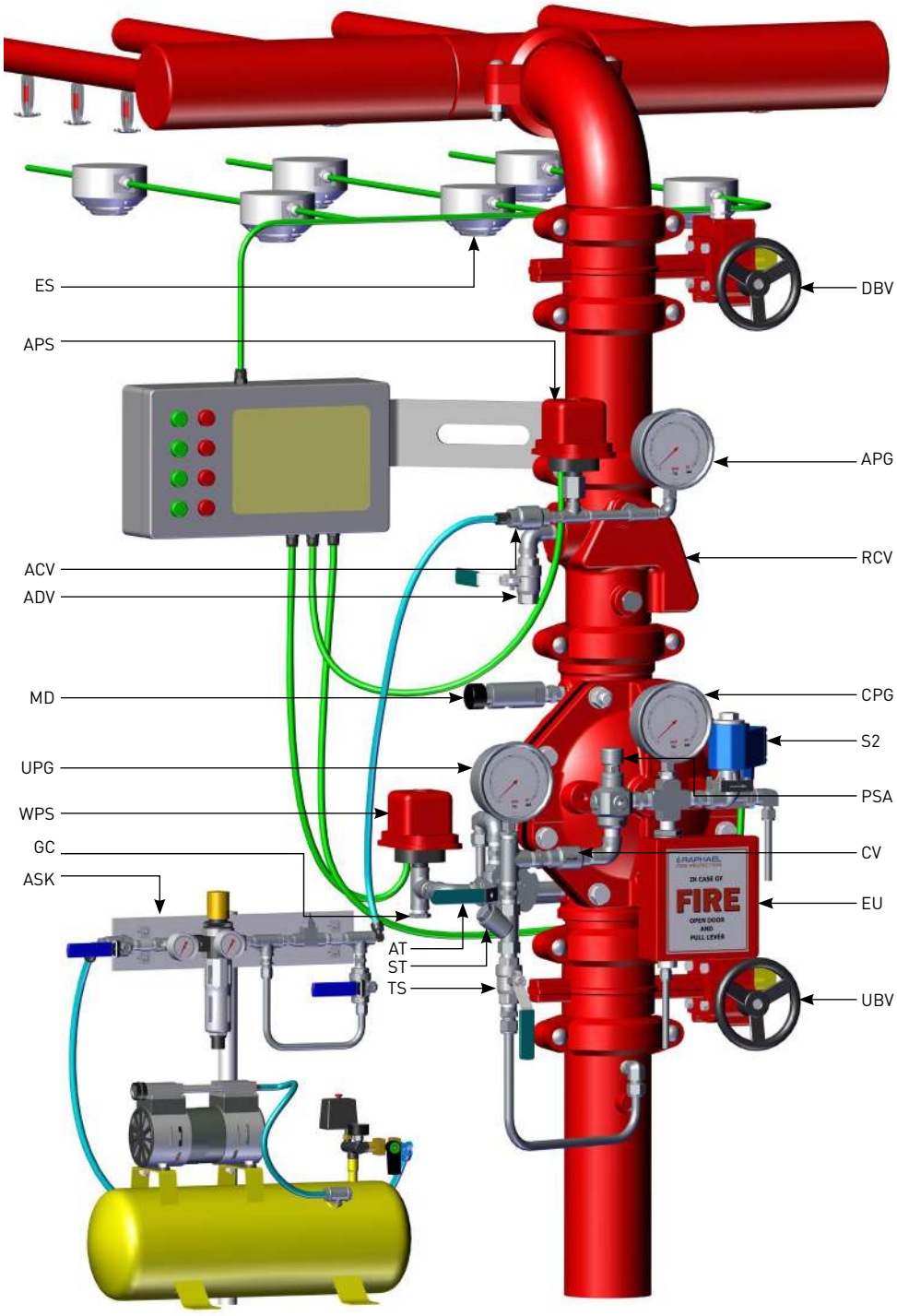
RESET POSITION

When the control board de-energizes the solenoid valve (S2) and the PSA pushbutton was pressed, the deluge control chamber pressurizes, and the valve closes. After it closes, the PSA push button can be released.

All burst-open sprinklers must be replaced. Before re-pressurizing the spray pipeline with air, it must be thoroughly drained using the Air drain valve (ADV).

Typical installation

FPS-SIE0



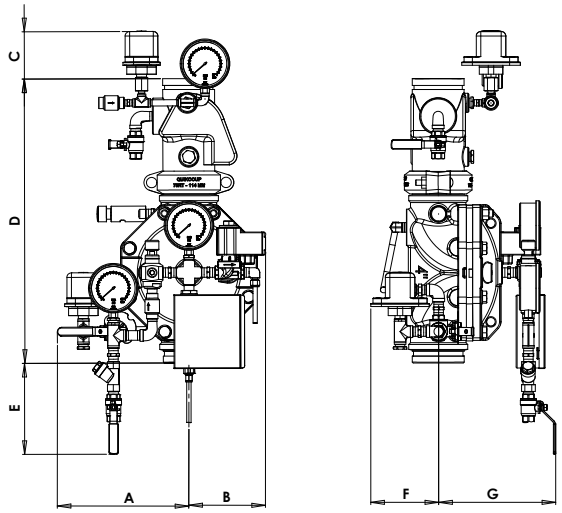
TS - Trim Supply
ST - "Y" Strainer
AT - Alarms Test Valve
GC - Gong Connection
ES - Electric Sensor
EU - Emergency Unit
CV - Check Valve

S2 - Solenoid 2 way
ASK - Air supply kit
ADV - Air Drain Valve
RCV - Riser Check Valve
APS - Air Pressure Switch
WPS - Water Pressure Switch
MD - Manual Automatic Drain Valve

APG - Air Pressure Gauge
CPG - Control Chamber Pressure Gauge
UPG - Upstream Pressure Gauge
PSA - Pressure Supply Arrestor
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FPS-SIEO



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	263	10.3	296	11.6	290	11.4	315	12.4	336	13.2	373	14.7
B	155	6.1	170	6.7	185	7.2	176	6.9	231	9.0	307	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	221	8.7	259	10.1	219	8.6	188	7.4	137	5.4	37	1.45
F	127	5	140	5.5	145	5.7	146	5.7	157	6.1	180	7.0
G	173	6.8	202	7.9	226	8.9	292	11.5	330	13	415	16.3
Kg/lb	13.2	29.2	26.8	59.0	48.2	106	76.4	168	126	277	179	394

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Min. penuematic pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch

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

Single interlock, Electrically Actuated, Remote Reset

FPS-SIE1

The Preaction system is a fire protection (FP) combined system, consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline maintains the riser check valve in the closed position. The section between the downstream side of the closed deluge valve and the clapper of the riser check valve functions as the "intermediate chamber", where the water pressure switch and the acoustic alarm are connected.

In single - interlock pre - action systems, such as the FPS - SIE0 described here, full system activation depends on the occurrence of a single independent fire - related event, specifically heat exposure detected by electric sensors.

When one or more electric detectors are triggered, they send a signal to the main control board, initiating the actuation event. Only after this event occurs does the control board energize the solenoid valve, thereby opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS: Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2'' to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for low temperature zone installation – water spraying pipeline is kept dry.
- Full-bore, unobstructed design.
- The ASK - Air Supply Unit provides a constant air compensation in case of pipeline minor leaks.
- The Manual /Emergency local operation valve installed in a metal enclosure is fully protected from Accidental activation. When opened, it by-passes all terms.
- Low maintenance cost: the valve can be serviced in-line and includes only one replaceable part — a long-life elastomeric diaphragm.

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The system trips open automatically after one events of actuation: one or more of the electric sensors is triggered and sent an electric signal to the main board

  The activation of the Air pressure switch at fire situation, when air pressure drops at the sprinklers pipeline is used for supervision only.

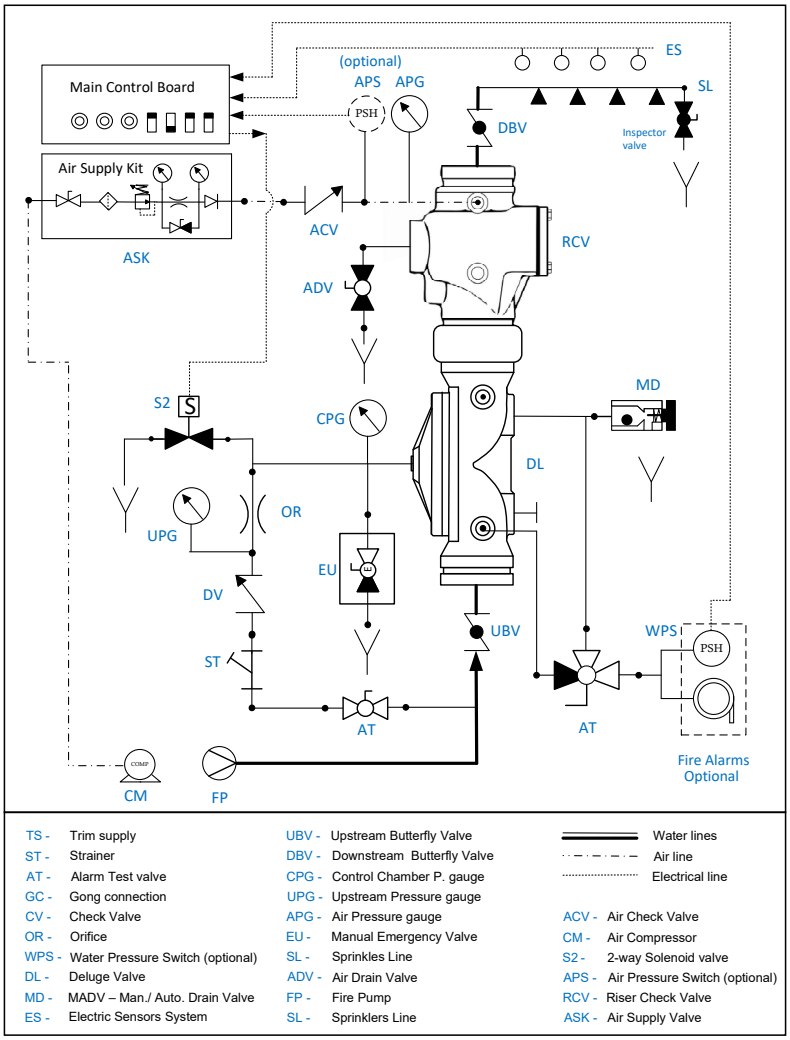
The FPS-SIE1 resets to stand-by close position by de-energizing the solenoid coil through the main control panel and replacing all shuttered open sprinklers enabling the pressurizing of downstream pipeline.

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

Schematic drawing:

FPS-SIE1

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve control chamber by the check valve (CV), the closed solenoid valve (S2), and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

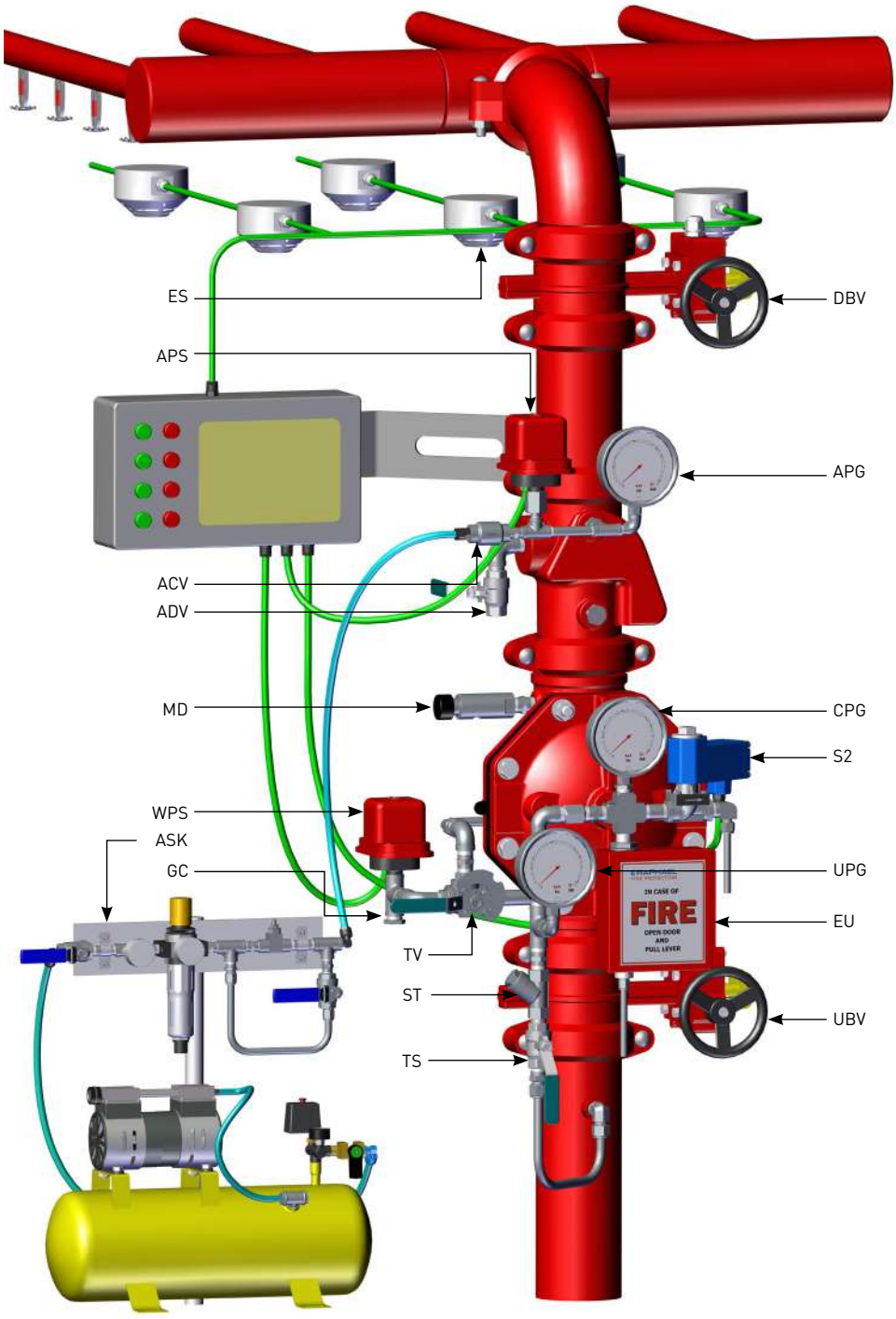
When the electric detection system (ES) senses heat, it sends a signal to the control board, which is recognized as the single actuation event. The control board then energizes the solenoid valve (S2), draining the deluge valve control chamber and allowing the deluge valve to open. Water admitted by the deluge valve flows through the opened riser check valve into the sprinkler pipeline. This action activates all alarms, including the water pressure switch (WPS) and the water motor gong. The low air pressure switch (APS), if installed, serves supervisory purposes only.

RESET POSITION

When the control board de-energizes the solenoid valve (S2), upstream flow through the needle valve pressurizes the deluge valve control chamber, causing the valve to close. All sprinklers that have burst open must be replaced. Before re-pressurizing the spray pipeline with air, it must be thoroughly drained using the air drain valve (ADV).

Typical installation

FPS-SIE1



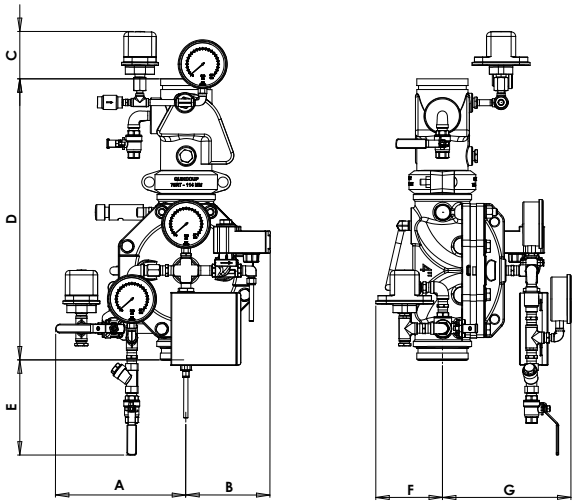
TS - Trim Supply
ST - "Y" Strainer
AT - Alarms Test Valve
GC - Gong Connection
ES - Electric Sensor
EU - Emergency Unit

S2 - Solenoid 2 way
ASK - Air supply kit
ADV - Air Drain Valve
ACV - Air Check Valve
APS - Air Pressure Switch
WPS - Water Pressure Switch

MD - Manual Automatic Drain Valve
APG - Air Pressure Gauge
CPG - Control Chamber Pressure Gauge
UPG - Upstream Pressure Gauge
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FPS-SIE1



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	263	10.3	296	11.6	290	11.4	315	12.4	336	13.2	373	14.7
B	155	6.1	170	6.7	185	7.2	176	6.9	231	9.0	307	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	221	8.7	259	10.1	219	8.6	188	7.4	137	5.4	37	1.45
F	127	5	140	5.5	145	5.7	146	5.7	157	6.1	180	7.0
G	173	6.8	202	7.9	226	8.9	292	11.5	330	13	415	16.3
Kg/lb	13.2	29.2	26.8	59.0	48.2	106	76.4	168	126	277	179	394

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Min. penuematic pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch
  - Supervisory low Pressure Switch

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

Double interlock, Electric-Electric Actuated, Local Reset, Pressure Reducing

FPS-DCE0

The pre-action system is a combined fire-protection system consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline keeps the riser check valve closed. The section between the downstream side of the closed deluge valve and the check-valve clapper functions as the intermediate chamber, where the water-pressure switch and the acoustic alarm are installed.

In double-interlock pre-action systems, such as the FPS-DCE0 described here, full system activation depends on two independent fire-related events: one caused by heat exposure and the other by fire detection. Activation of the FPS-DCE0 requires two electrical signals.

When a fire occurs, heat causes one or more automatic sprinklers to open, resulting in a pressure drop in the sprinkler pipeline. This pressure drop actuates the air-pressure switch, which sends a signal to the main control board. This constitutes the first actuation event.

At this stage, the normally closed solenoid valve in the deluge valve's control-chamber drain line remains closed.

When one or more electric detectors are triggered, they send an electrical signal to the main control board, constituting the second actuation event. Only after both events have occurred does the control board energize the solenoid valve, opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline.

The trim is equipped with a PSA – a device that enables local system reset by pressurizing the valve's control chamber and thereby closing the FDV valve. The PSA functions as a latching device that keeps the valve open even during a power outage.

The FPS-DCE0 system can reduce upstream pressure to a defined downstream pressure and maintain it at a steady level. The pressure-reducing pilot responds to downstream-pressure variations caused by changes in flow demand and keeps the set pressure stable.

MARKETS

Commercial
Industry
Storage
Airports
Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS:

Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2'' to 10'')

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

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

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The system trips open automatically only after two actuation events:
  The first: a drop in air pressure in the sprinkler pipeline, which actuates the air-pressure switch.
  The second: one or more electric sensors are triggered and send an electrical signal to the main control board.

The FPS-DCE0 resets to the standby closed position by de-energizing the solenoid coil through the main control panel and replacing all opened sprinklers, which enables the downstream pipeline to be repressurized.

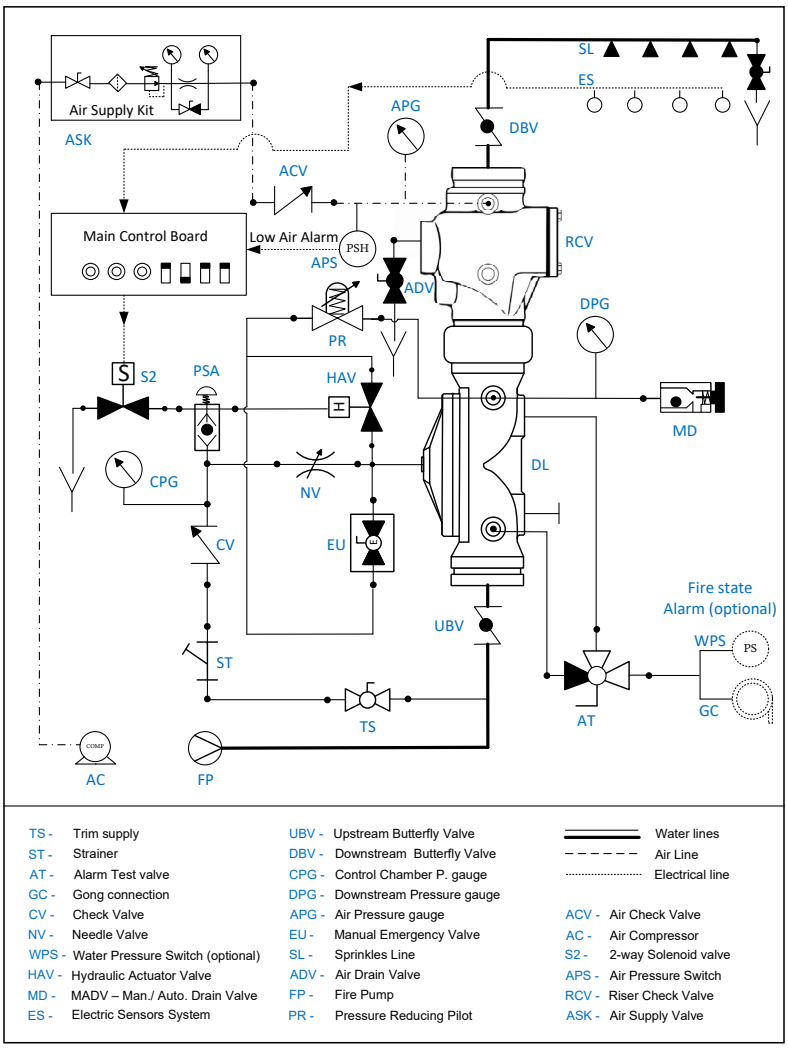
A pressure-reducing pilot provides full control over downstream pressure and maintains a steady set point across a wide pressure range.

The FDV-DCE0 resets to the standby closed position by de-energizing the alarm-system solenoid coil through the main control panel and manually operating the local reset device – the PSA.

Schematic drawing:

FPS-DCE0

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve's control chamber by the check valve (CV), the closed solenoid valve (S2), the closed PSA device (PSA), the closed hydraulic actuator (HAV), and the closed emergency valve (EV), keeping the deluge valve closed.

Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

When heat activates one or more sprinklers, they open, causing the pipeline to depressurize. This actuates the low-air-pressure switch (APS), which closes its internal contacts and sends a signal to the main control board – recognized as the first actuation event.

If the electric detection system senses heat, it sends a signal to the control board – recognized as the second actuation event. The control board then energizes the solenoid valve (S2), which drains the hydraulic actuator (HAV) control chamber and allows it to open.

Once open, water trapped in the deluge valve's control chamber flows through the pressure-reducing pilot to the downstream side, causing the deluge valve to open. Water admitted by the open deluge valve flows through the open riser check valve to the sprinkler pipeline. This activates all alarms, including the water-pressure switch (WPS) and the water-motor gong.

The PSA prevents the control chamber from re-pressurizing, thereby latching the deluge valve open.

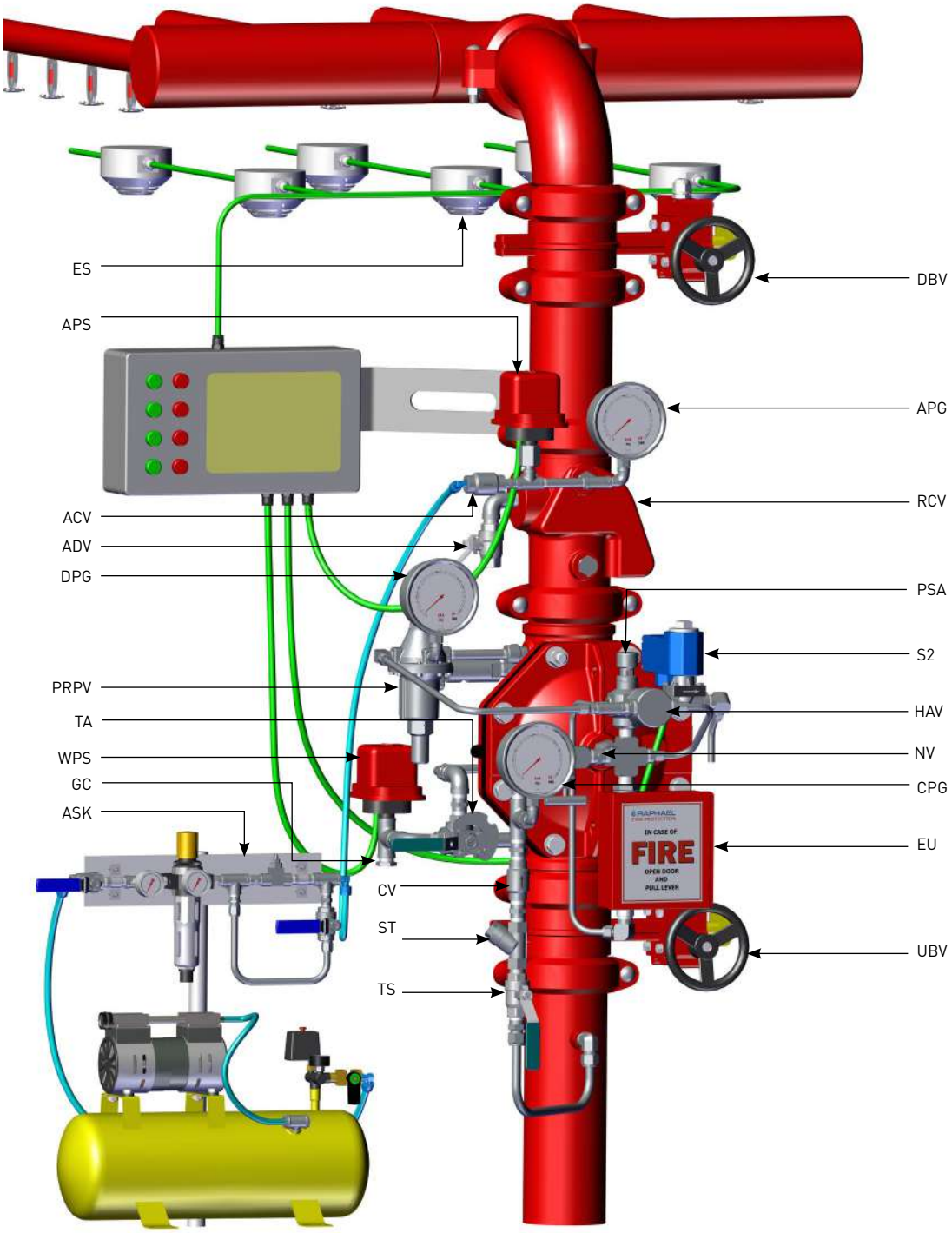
RESET POSITION

When the control board de-energizes the solenoid valve (S2) and the PSA pushbutton has been pressed, the HAV control chamber becomes re-pressurized and the actuator closes. Upstream flow through the trim supply valve and the needle valve re-pressurizes the deluge valve's control chamber, causing it to close. Once it closes, the PSA pushbutton can be released.

All opened sprinklers must be replaced. Before re-pressurizing the spray pipeline with air, the pipeline must be completely drained by opening the air-drain valve (ADV).

Typical installation

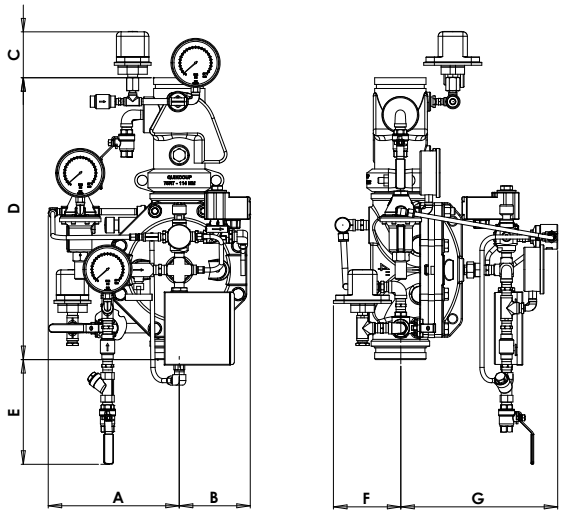
FPS-DCE0



DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
CPG - Control Chamber Pressure Gauge
DPG - Downstream Pressure Gauge
APG - Air Pressure Gauge
ES - Electric Sensors system
ASK - Air Supply Kit
ACV - Air Check Valve
ADV - Air Drain Valve
S2 - Solenoid 2 way
PR - Pressure Reducing Pilot Valve
PSA - Pressure Supply Arrestor
EU - Emergency Unit
CV - Check Valve
ST - "Y" Strainer
TS - Trim Supply
NV - Needle Valve
AT - Alarms Test Valve
GC - Gong Connection
HAV - Hydraulic Actuator Valve
WPS - Water Pressure Switch
APS - Air Pressure Switch (optional)
RCV - Riser Check Valve

Parametric drawing:

FPS-DCE0



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	263	10.3	296	11.6	290	11.4	315	12.4	336	13.2	394	15.5
B	146	5.7	146	5.7	150	5.9	176	6.9	231	9	308	12.1
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	222	8.7	223	8.7	138	5.4	101	3.9	49	1.9	N/A	N/A
F	108	4.2	159	6.2	145	5.7	146	5.7	157	6.1	216	8.5
G	273	10.7	302	11.8	340	13.3	404	15.9	441	17.3	517	20.3
Kg/lb	18.6	41	31	68.3	53	116	81.2	178	131	288	186	410

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch

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

Double interlock, Electric-Electric Actuated, Remote Reset, Pressure Reducing

FPS-DCE1

The Pre-action system is a fire protection (FP) combined system, consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline maintains the riser check valve in a closed position. The section between the downstream side of the closed deluge valve and the check valve clapper functions as the "intermediate chamber," where the water pressure switch and the acoustic alarm are connected.

In double-interlock pre-action systems, such as the FPS-DCE1 described here, full system activation depends on the occurrence of two independent, fire-related events: one caused by heat exposure and the other by fire detection. The activation of the FPS-DCE1 system requires two electrical signals.

In the event of a fire, heat causes one or more automatic sprinklers to open, resulting in a drop in pressure within the sprinkler pipeline. This pressure drop activates the air pressure switch, which sends a signal to the main control board. This constitutes the first actuation event.

When one or more Electric detectors are triggered, they send an electrical signal to the main control board, constituting the second actuation event. Only when both actuation events have occurred does the control board energize the solenoid valve, thereby opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline.

The FPS-DCE1 system is capable to reduce the upstream pressure to a set downstream pressure and maintain it in a steady level. The pressure reducing pilot responses to any downstream pressure changes caused by consumption flow rate changes and keeps a stable set pressure.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS:

Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2" to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

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

CHARACTERISTICS

- Hydro-dynamic pattern design ensures high flowrates with minimum head loss.
- The system trips open automatically only after two actuation events:
  The first: A drop in air pressure in the sprinkler pipeline, which activates the air-pressure switch.
  The second: One or more electric sensors are triggered and send an electrical signal to the main control board.

The FPS-DCE1 resets to the standby closed position by de-energizing the solenoid coil through the main control panel and replacing all opened sprinklers, allowing the downstream pipeline to be re-pressurized.

A pressure-reducing pilot provides full control over the downstream pressure and maintains a stable setpoint across a wide pressure range.

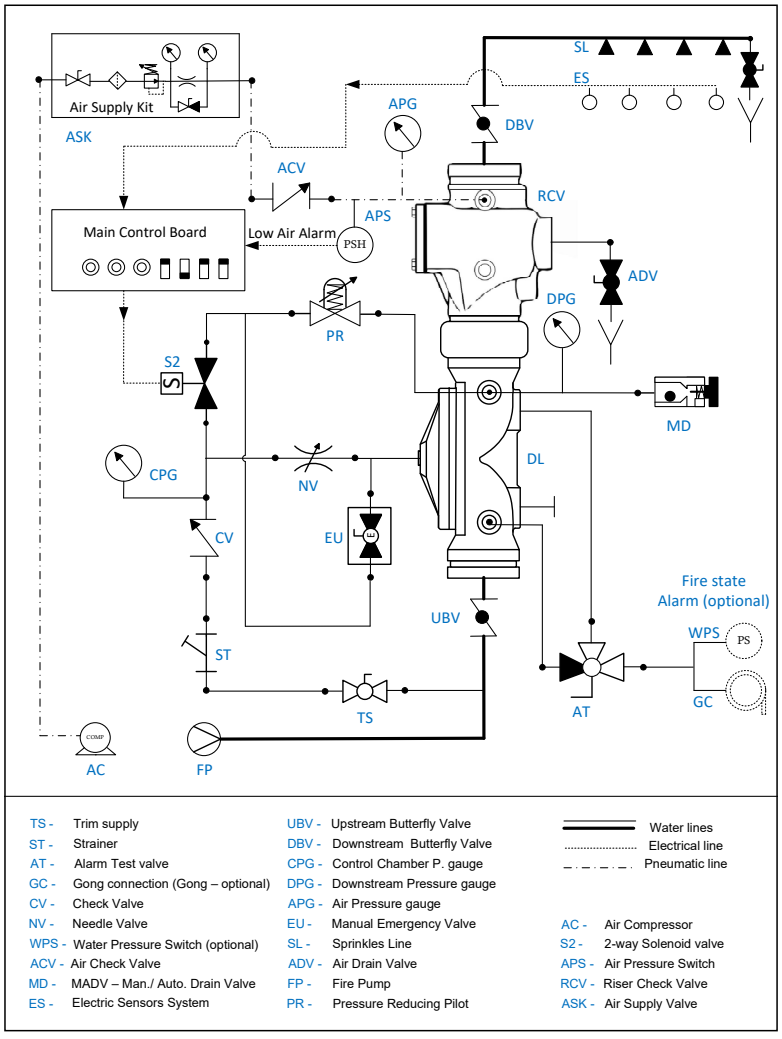
The FDV-DCE1 resets to the standby closed position by de-energizing the alarm-system solenoid coil through the main control panel.

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

Schematic drawing:

FPS-DCE1

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve control chamber by the check valve (CV), the closed solenoid valve (S2), and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

When heat activates one or more sprinklers, they open and release air, causing the pipeline to depressurize. This triggers the low-air-pressure switch (APS), which closes its internal contacts and sends a signal to the main control board, recognized as the first actuation event.

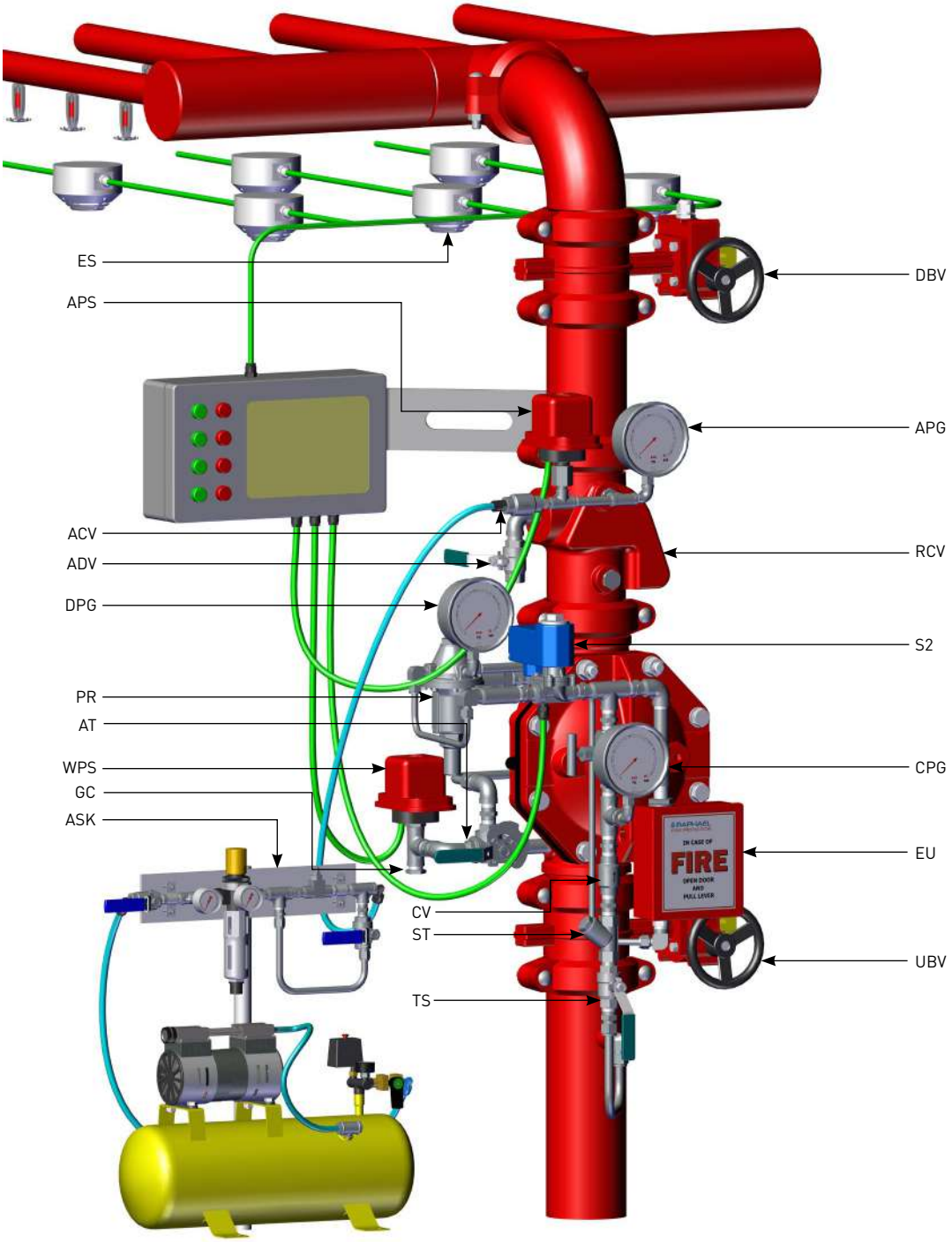
If the electric detection system senses heat, it sends a signal to the main control board, recognized as the second actuation event. The control board then energizes the solenoid valve (S2), which drains the deluge valve control chamber through the pressure-reducing pilot to the downstream side. As a result, the deluge valve opens and admits water through the now-open riser check valve into the sprinkler pipeline. All alarms are activated, including the water-pressure switch (WPS) and the water motor gong.

RESET POSITION

When the control board de-energizes the solenoid valve (S2), upstream flow through the trim supply valve and the needle valve re-pressurizes the deluge valve control chamber, closing the valve. All opened sprinklers must be replaced. Before re-pressurizing the spray pipeline with air, it must be completely drained by opening the air-drain valve (ADV).

Typical installation

FPS-DCE1



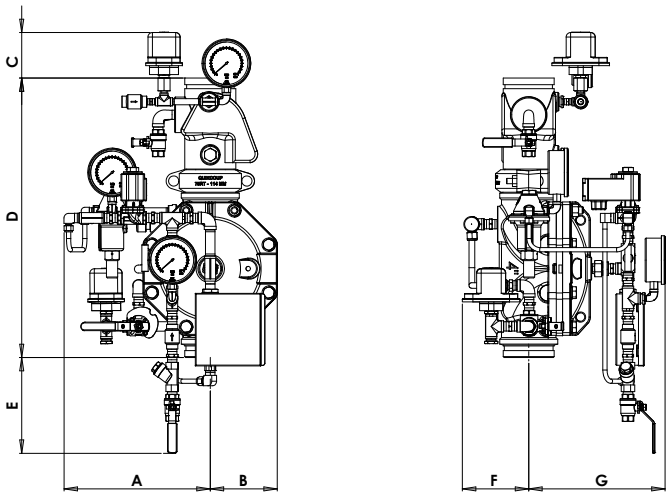
DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
CPG - Control Chamber Pressure Gauge
DPG - Downstream Pressure Gauge
APG - Air Pressure Gauge
ES - Electric Sensors system
ASK - Air Supply Kit

ACV - Air Check Valve
ADV - Air Drain Valve
S2 - Solenoid 2 way
PR - Pressure Reducing Pilot Valve
PSA - Pressure Supply Arrestor
EU - Emergency Unit
CV - Check Valve
ST - "Y" Strainer

TS - Trim Supply
NV - Needle Valve
AT - Alarms Test Valve
GC - Gong Connection
HAV - Hydraulic Actuator Valve
WPS - Water Pressure Switch
APS - Air Pressure Switch (optional)
RCV - Riser Check Valve

Parametric drawing:

FPS-DCE1



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	242	9.5	199	7.8	298	11.7	315	12.4	245	9.6	394	15.5
B	212	8.3	241	9.5	150	5.9	176	6.9	232	9.1	307	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	295	11.6	300	11.8	190	7.5	157	6.2	105	4.1	N/A	N/A
F	108	4.2	159	6.2	145	5.7	146	5.7	157	6.1	216	8.5
G	276	10.8	276	10.8	310	12.2	347	13.6	380	14.9	503	19.8
Kg/lb	17.5	38.5	32	70.5	51.8	114	80.6	178	130	287	186	410

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch
  - Low air pressure switch

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

Double interlock, Electrically Actuated, Local reset

FPS-DIE0

The Preaction system is a fire protection (FP) combined system, consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline maintains the riser check valve in a closed position. The section between the downstream side of the closed deluge valve and the check valve clapper functions as the "intermediate chamber," where the water pressure switch and the acoustic alarm are connected.

In double-interlock Preaction systems, such as the FPS-DIE0 described here, full system activation depends on the occurrence of two independent, fire-related events: one caused by heat exposure and the other by fire detection. The activation of the FPS-DIE0 system requires two electrical signals.

In the event of a fire, heat causes one or more automatic sprinklers to open, resulting in a drop in pressure within the sprinkler pipeline. This pressure drop activates the air pressure switch, which sends a signal to the main control board. This constitutes the first actuation event.

At this stage, a normally closed solenoid valve located on the deluge valve's control chamber drain line remains closed.

When one or more Electric detectors are triggered, they send an electrical signal to the main control board, constituting the second actuation event. Only when both actuation events have occurred does the control board energize the solenoid valve, thereby opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline.

The trim is equipped with a PSA – a device that enables the local reset of the system i.e. closing the FDV valve by pressurizing the valve's control chamber. In addition, the PSA is considered as a latching device that keeps the valve open even in case of power outage.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID: Water

PNEUMATICS: Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2' to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for low temperature zone installation – water spraying pipeline is kept dry.
- Full-bore, unobstructed design.
- The ASK - Air Supply Unit provides a constant air compensation in case of pipeline minor leaks.
- The Manual /Emergency local operation valve installed in a metal enclosure is fully protected from Accidental activation. When opened, it by-passes all terms.
- Open fail-safe valve property by special fail-safe device – the PSA.
- 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 system trips open automatically only after two events of actuation:
- The first: Air pressure drop at the sprinklers pipeline that activates the Air pressure switch.
  The second: one or more of the electric sensors is triggered and sent an electric signal to the main board

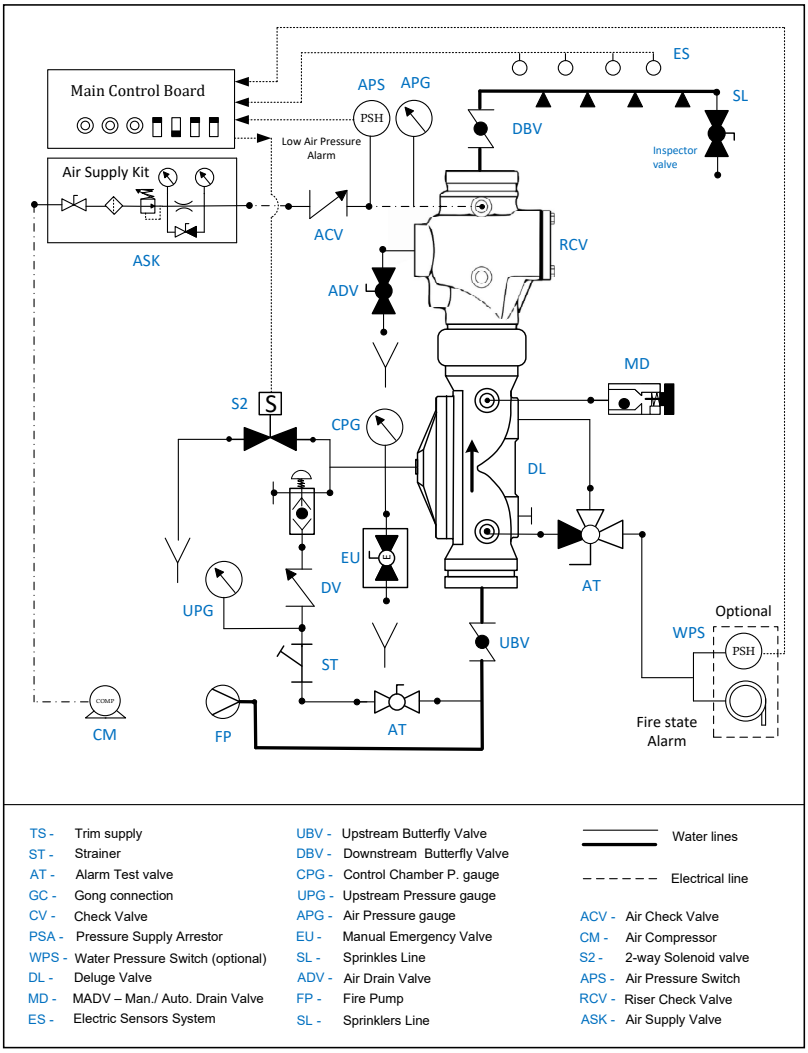
The FPS-DIE0 resets to stand-by close position by de-energizing the solenoid coil through the main control panel and replacing all shuttered open sprinklers enabling the pressurizing of downstream pipeline. In addition, the PSA bush button must be pressed locally.

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

Schematic drawing:

FPS-DIE0

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve's control chamber by the check valve (CV), the closed solenoid valve (S2), the close PSA (PSA) device, by the close Hydraulic actuator (HAV) and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

When heat activates one or more sprinklers, they burst open, causing the pipeline to depressurize. This triggers the low air pressure switch (APS), which closes its internal contacts and sends a signal to the main control board - recognized as the first actuation event.

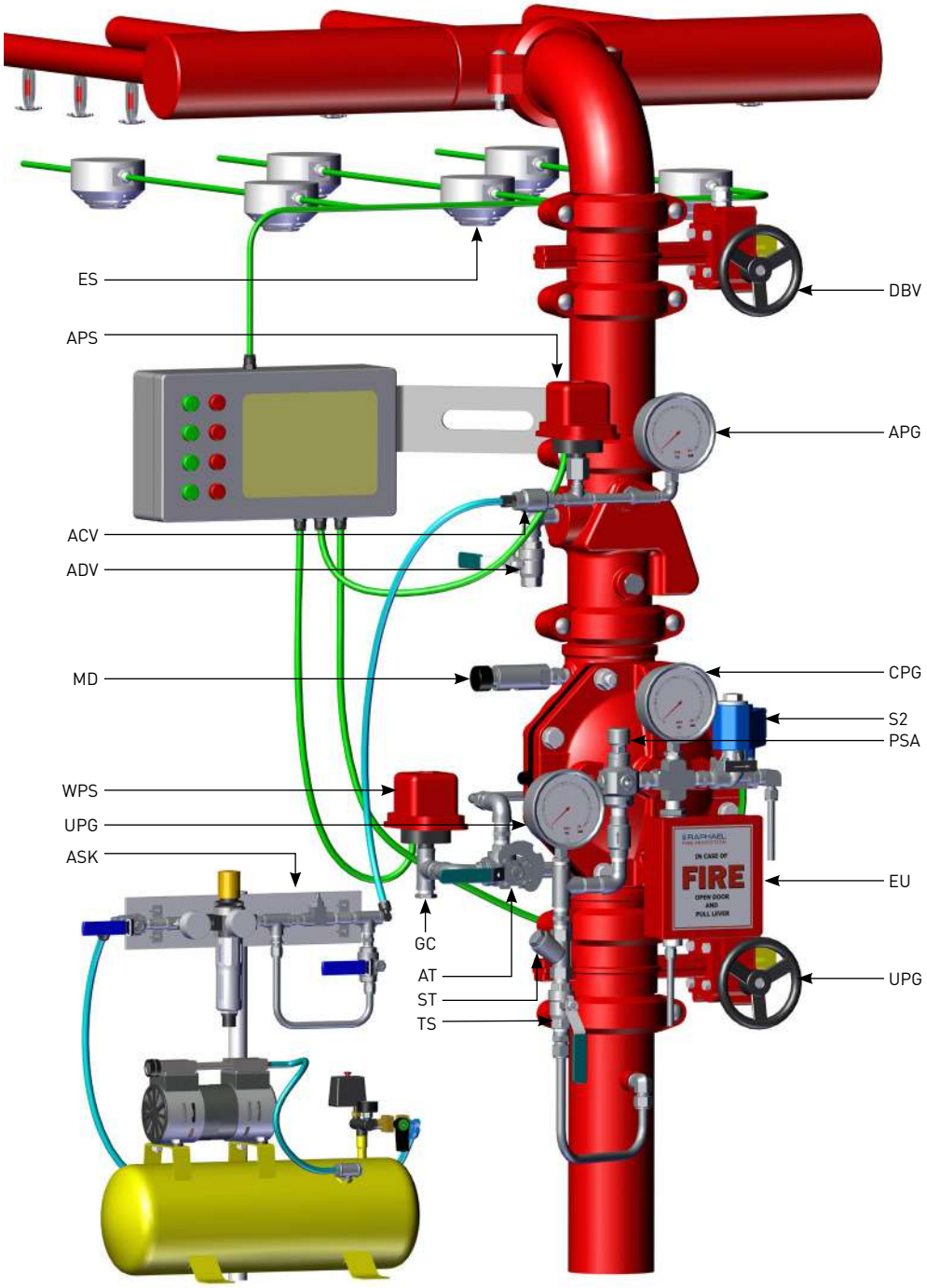
If the electric detection system senses heat, it sends a signal to the control board - recognized as the second actuation event. The control board then energizes the solenoid valve (S2), which opens and drains the deluge valve's control chamber, allowing the valve to open. Water flows through the open riser check valve to the sprinkler pipeline. This activates all alarms, including the water pressure switch (WPS) and the water motor gong. The PSA avoids the control chamber pressurization and by that, latches the deluge valve open.

RESET POSITION

When the control board de-energizes the solenoid valve (S2), the valve closes. All burst-open sprinklers must be replaced. Before re-pressurizing the spray pipeline with air, it must be completely drained by opening the drain valve (ADV). The PSA (PSA) push button must then be pressed, which enables the trim supply valve (TS) to restore pressure in the control chamber and close the deluge valve.

Typical installation

FPS-DIEO



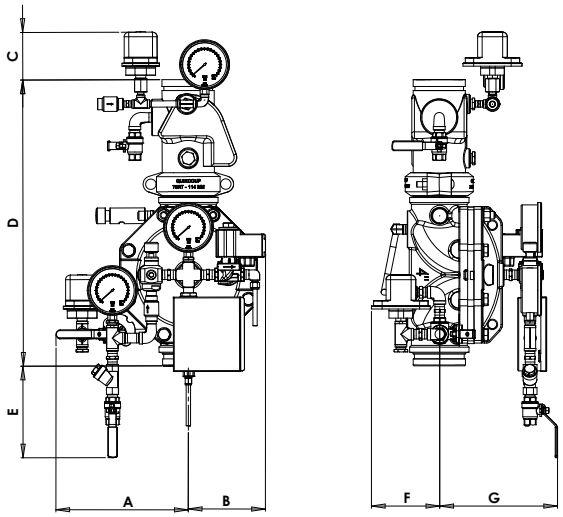
TS - Trim Supply
ST - "Y" Strainer
AT - Alarms Test Valve
GC - Gong Connection
ES - Electric Sensor
EU - Emergency Unit
S2 - Solenoid 2 way

ASK - Air supply kit
ADV - Air Drain Valve
ACV - Air Check Valve
APS - Air Pressure Switch
WPS - Water Pressure Switch
MD - Manual Automatic Drain Valve
APG - Air Pressure Gauge

CPG - Control Chamber Pressure Gauge
UPG - Upstream Pressure Gauge
PSA - Pressure Supply Arrestor
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FPS-DIE0



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	263	10.3	296	11.6	290	11.4	315	12.4	336	13.2	373	14.7
B	155	6.1	170	6.7	185	7.2	176	6.9	231	9.0	307	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	208	8.1	158	6.2	117	4.6	87	3.4	42.6	1.7	N/A	NqA
F	127	5	140	5.5	145	5.7	146	5.7	157	6.1	180	7.0
G	173	6.8	202	7.9	226	8.9	292	11.5	330	13	415	16.3
Kg/lb	14.2	31.3	27.9	61.5	50	110	77.2	170	126	277	179	394

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Downstream set pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch

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

Double interlock, Electrically Actuated, Remote reset

FPS-DIE1

The Preaction system is a fire protection (FP) combined system, consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline maintains the riser check valve in a closed position. The section between the downstream side of the closed deluge valve and the check valve clapper functions as the "intermediate chamber," where the water pressure switch and the acoustic alarm are connected.

In double-interlock Preaction systems, such as the FPS-DIE1 described here, full system activation depends on the occurrence of two independent, fire-related events: one caused by heat exposure and the other by fire detection. The activation of the FPS-DIE1 system requires two electrical signals.

In the event of a fire, heat causes one or more automatic sprinklers to open, resulting in a drop in pressure within the sprinkler pipeline. This pressure drop activates the air pressure switch, which sends a signal to the main control board. This constitutes the first actuation event.

At this stage, a normally closed solenoid valve located on the deluge valve's control chamber drain line remains closed.

When one or more Electric detectors are triggered, they send an electrical signal to the main control board, constituting the second actuation event. Only when both actuation events have occurred does the control board energize the solenoid valve, thereby opening the FDV deluge valve and allowing water to flow into the sprinkler pipeline.

MARKETS

Commercial · Industry · Storage · Airports · Residential

TECHNICAL DATA

FLUID:
Water

PNEUMATICS: Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2'' to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for low temperature zone installation – water spraying pipeline is kept dry.
- Full-bore, unobstructed design.
- The ASK - Air Supply Unit provides a constant air compensation in case of pipeline minor leaks.
- The Manual /Emergency local operation valve installed in a metal enclosure is fully protected from Accidental activation. When opened, it by-passes all terms.
- 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 system trips open automatically only after two events of actuation:

  The first: Air pressure drop at the sprinklers pipeline that activates the Air pressure switch.

  The second: one or more of the electric sensors is triggered and sent an electric signal to the main board

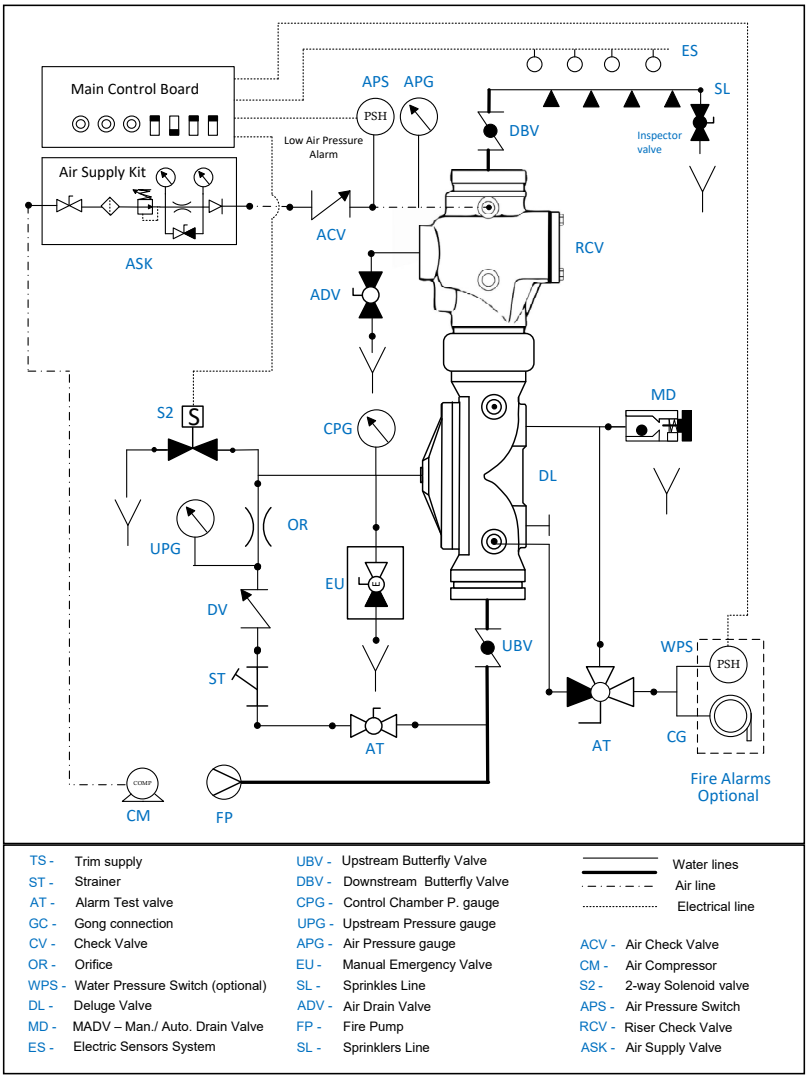
The FPS-DIE1 resets to stand-by close position by de-energizing the solenoid's coil through the main control panel and replacing all shuttered open sprinklers enabling the pressurizing of downstream pipeline.

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

Schematic drawing:

FPS-DIE1

Set position



OPERATION

SET POSITION

Pressurized water is retained in the deluge valve's control chamber by the check valve (CV), the closed solenoid valve (S2), and the closed emergency valve (EU), keeping the deluge valve closed. Air pressure in the downstream spray pipeline keeps the riser check valve closed.

FIRE SITUATION

When heat activates one or more sprinklers, they burst open, causing the pipeline to depressurize. This triggers the low air pressure switch (APS), which closes its internal contacts and sends a signal to the main control board—recognized as the first actuation event.

If the electric detection system senses heat, it sends a signal to the control board—recognized as the second actuation event. The control board then energizes the solenoid valve (S2), which opens and drains the deluge valve's control chamber, allowing the valve to open. Water flows through the open riser check valve to the sprinkler pipeline. This activates all alarms, including the water pressure switch (WPS) and the water motor gong.

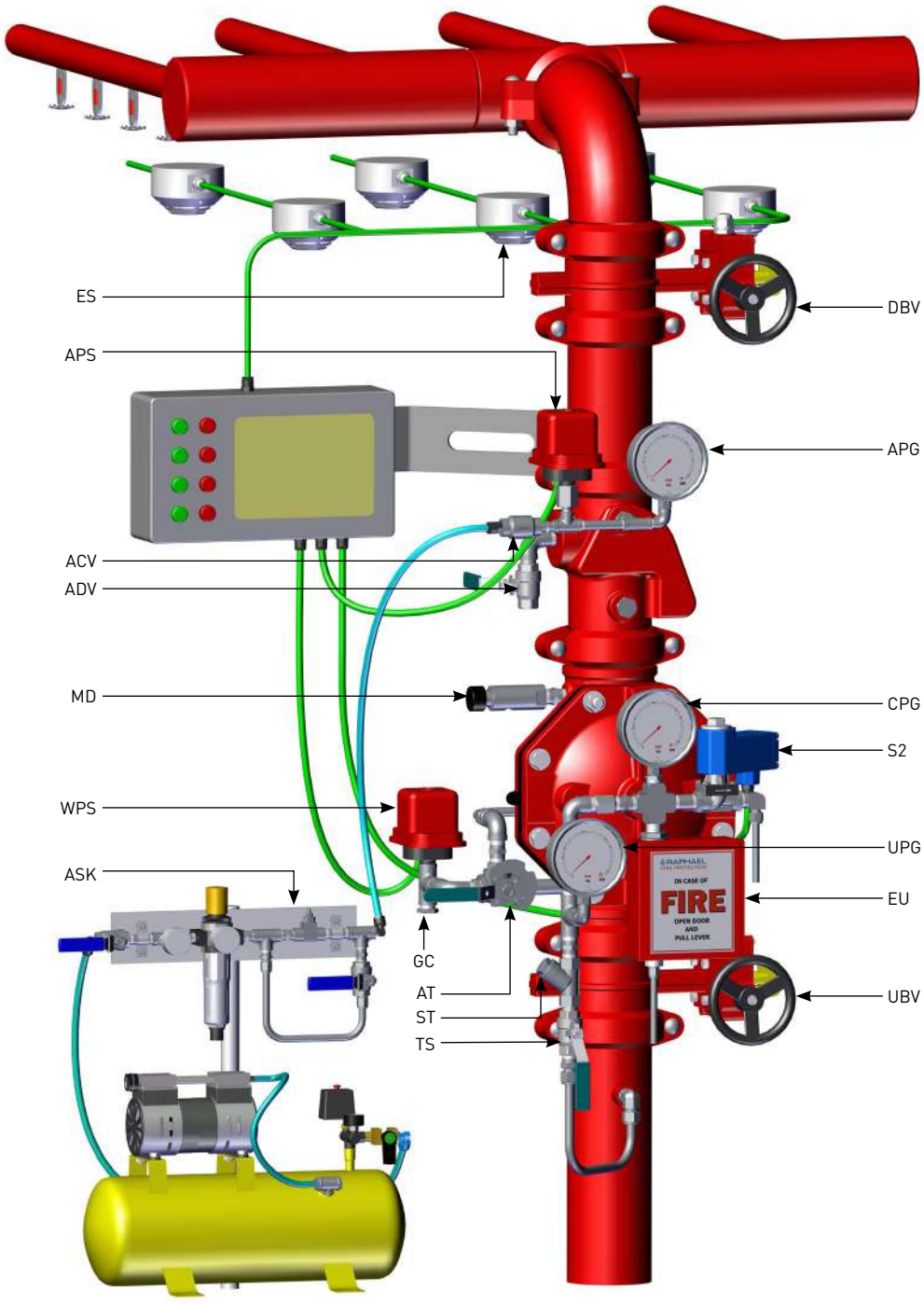
RESET POSITION

When the control board de-energizes the solenoid valve (S2), it closes. The trim supply valve (TS) restores pressure to the control chamber, closing the deluge valve.

To fully reset the system, all burst opened sprinklers must be replaced. Before re-pressurizing the spray pipeline with air, it must be completely drained by opening the drain valve (ADV) near the riser check valve.

Typical installation

FPS-DIE1



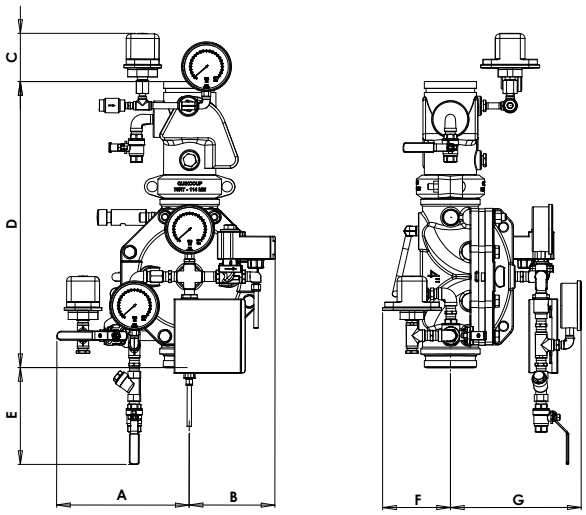
TS - Trim Supply
ST - "Y" Strainer
AT - Alarms Test Valve
GC - Gong Connection
ES - Electric Sensor
EU - Emergency Unit
S2 - Solenoid 2 way

ASK - Air supply kit
ADV - Air Drain Valve
ACV - Air Check Valve
APS - Air Pressure Switch
WPS - Water Pressure Switch
MD - Manual Automatic Drain Valve
APG - Air Pressure Gauge

CPG - Control Chamber Pressure Gauge
UPG - Upstream Pressure Gauge
UBV - Upstream Butterfly Valve
DBV - Downstream Butterfly Valve

Parametric drawing:

FPS-DIE1



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	263	10.3	296	11.6	290	11.4	315	12.4	336	13.2	373	14.7
B	155	6.1	170	6.7	185	7.2	176	6.9	231	9.0	307	12
C	120	4.7	120	4.7	116	4.5	114	4.5	122	4.8	132	5.2
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	221	8.7	259	10.1	219	8.6	188	7.4	137	5.4	37	1.45
F	127	5	140	5.5	145	5.7	146	5.7	157	6.1	180	7.0
G	173	6.8	202	7.9	226	8.9	292	11.5	330	13	415	16.3
Kg/lb	13.2	29.2	26.8	59.0	48.2	106	76.4	168	126	277	179	394

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile Iron

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

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
- System installation orientation
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch

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

Single interlock, Pneumatically Actuated, Local reset, Preaction

FPS-SIP0

The pre-action system is a combined fire protection (FP) system consisting of a controlled FDV deluge valve and a riser check valve installed downstream. The pressurized automatic sprinkler pipeline keeps the riser check valve closed. The section between the downstream side of the closed deluge valve and the check-valve clapper serves as the intermediate chamber, where the water-pressure switch and the acoustic alarm are installed.

In single-interlock pre-action systems, such as the one described here, full system activation depends on a single fire-related event. When heat activates one or more automatic sprinklers on the dry pilot line, the pipeline depressurizes. The pressure drop opens a pneumatic actuator located on the deluge valve control-chamber drain line, causing the deluge valve to open and allowing water to flow into the sprinkler pipeline.

The resulting pressure drop also triggers the air-pressure switch, which sends a signal to the main control board for supervisory purposes only.

MARKETS

Commercial, Industry, Storage, Airports, Residential

TECHNICAL DATA

FLUID:
Water, Foam

PNEUMATICS: Air, Nitrogen

SIZE RANGE:
50 mm to 250 mm (2'' to 10")

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

PRESSURE NOMINAL:
250 psi (17.2 bar)

APPROVALS

ADVANTAGES

- Suitable for installation in low-temperature zones, as the water-spraying pipeline is kept dry.
- Full-bore unobstructed design.
- The ASK air-supply unit provides constant air compensation in the event of minor pipeline leaks.
- The manual/emergency local-operation valve, installed in a metal enclosure, is fully protected against accidental activation. When opened, it bypasses all control functions.
- Open fail-safe valve operation is achieved by means of the special fail-safe device, the PSA.
- Low maintenance cost: the main valve is serviced in-line and has only one replaceable part, the long-life elastomeric diaphragm. The riser check valve is maintenance-free.

CHARACTERISTICS

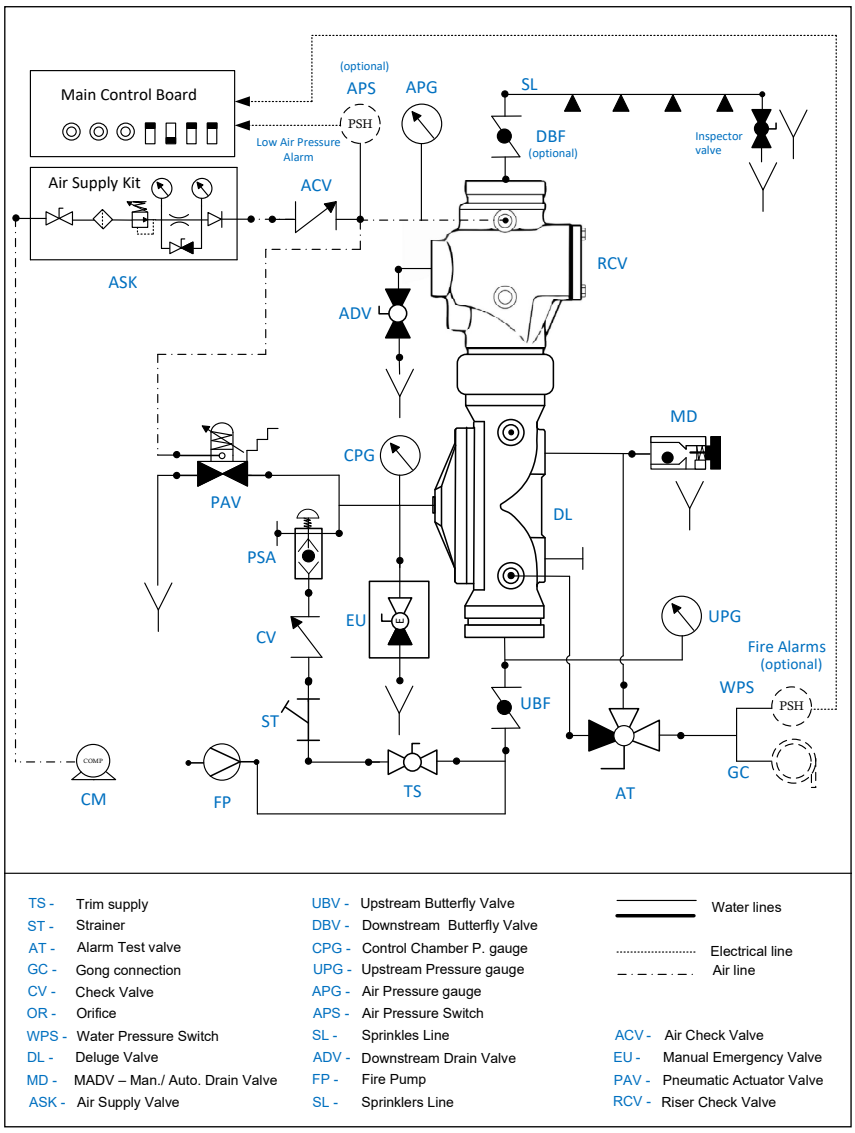
- Hydro-dynamic pattern design ensures high flow rates with minimal head loss.
- The valve trips open automatically after a single actuation event. The trip is initiated by a pressure decrease in the sprinkler pipeline (the dry pilot line).
- The FPS-SIP0 resets to its standby closed position after all activated (open) sprinklers along the dry pilot line are replaced, allowing both the pilot line and the downstream pipeline to be re-pressurized. In addition, the PSA push button must be pressed.

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

Schematic drawing:

FPS-SIPO

Set position



OPERATION

SET POSITION

Pressurized water in the deluge valve's control chamber is trapped by the PSA device (PSA), by the closed pneumatic actuator (PAV), and by the closed emergency valve (EU), maintaining the deluge valve in its closed position. The air pressure accumulated in the downstream spraying pipeline, main-tains Riser check valve (RCV) close.

FIRE SITUATION

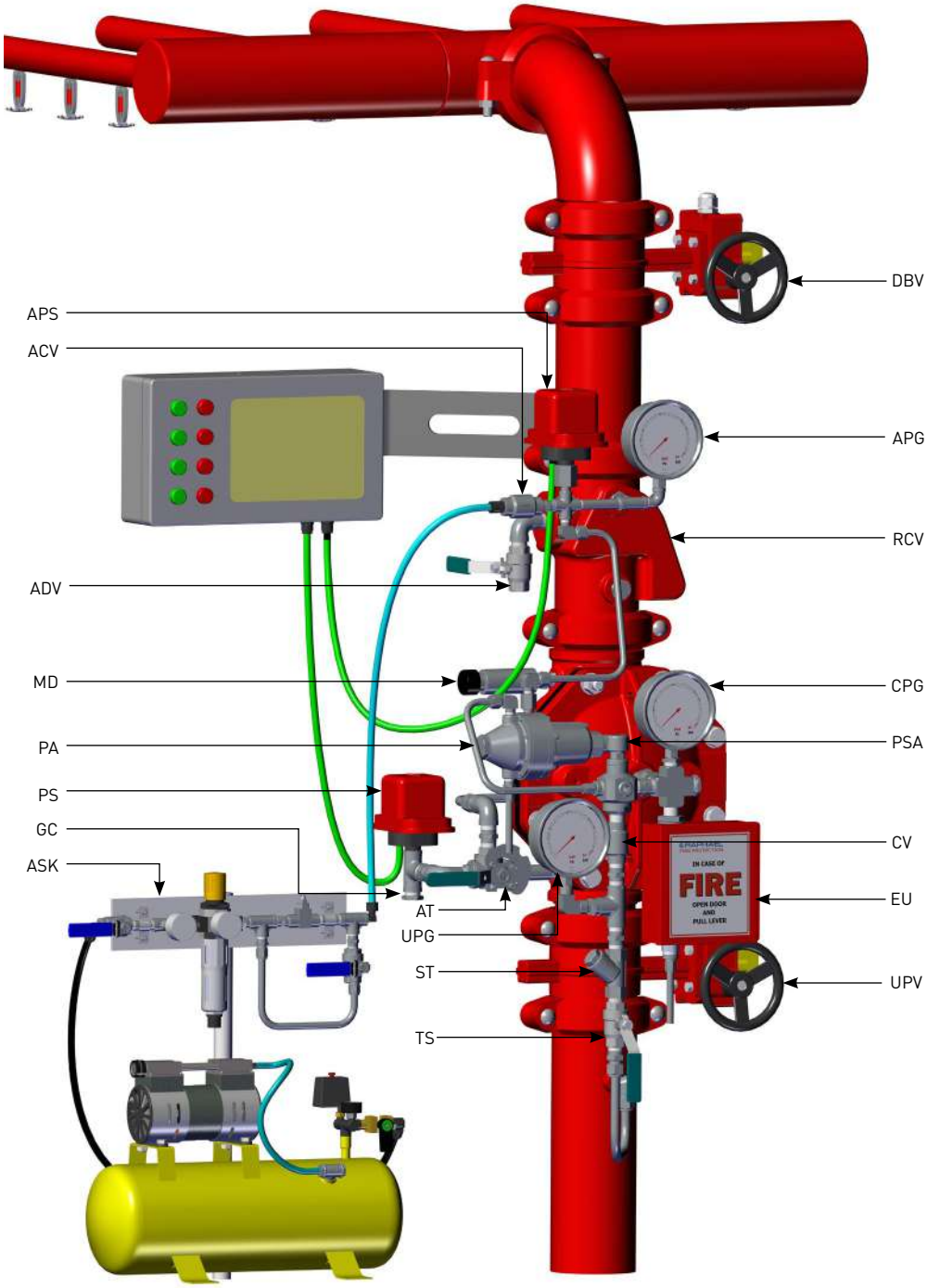
When some of the automatic sprinklers are subjected to the predetermined temperature and shutter-open, the pipeline de-pressurizes, tripping open the closed pneumatic actuator (PAV) and closes the internal contacts of the low air pressure switch (APS). When this signal is transferred to the main con-trol board, it is considered as an actuation event. When the pneumatic actuator opens, 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 PSA (PSA) avoids upstream pressure pressuriz-ing the deluge control chamber and by that, latching the valve into its open state.

RESET POSITION

The butterfly valve at the valves upstream needs to be closed, enabling the replacement of all shattered-open sprinklers in the spray pipeline and in the Dry pilot line. Then, both lines (SL & DPL) need to be pressurized to a set pressure. Pressurizing the Dry pilot line close the pneumatic actuator. At this stage, the PSA push button needs to be pushed to open a path for the upstream pressure to the deluge control chamber. Pressurizing the control chamber closes the valve so it is safe to open the butterfly valve (UBF).

Typical installation

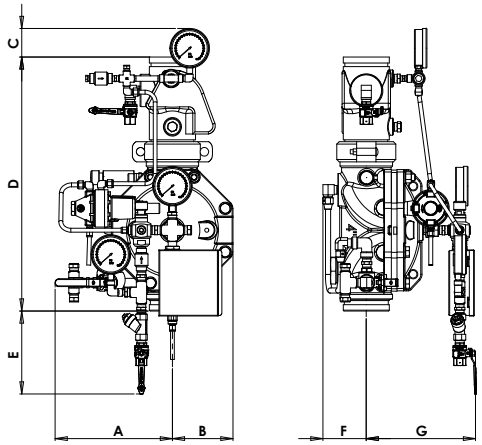
FPS-SIP0



DBV - Downstream Butterfly Valve
UBV - Upstream Butterfly Valve
APS - Air pressure switch
APG - Air Pressure Gauge
DPL - Dry Pilot Line
ASK - Air Supply Kit
ACV - Air Check Valve
RCV - Riser Check Valve
ADV - Air Drain Valve
CPG - Control Chamber Pressure Gauge
UPG - Upstream Pressure Gauge
PA - Pneumatic actuator Valve
PSA - Pressure Supply Arrestor
MD - Manual Automatic Drain Valve
EU - Emergency Unit
GC - Gong Connection
CV - Check Valve
ST - "Y" Strainer
TS - Trim Supply
WPS - Water Pressure Switch (optional)
AT - Alarms Test Valve

Parametric drawing:

FPS-SIP0



Dimensions Table

Size	2"		3"		4"		6"		8"		10"	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	262	10.3	297	11.6	290	11.4	314	12.3	348	13.7	394	15.5
B	122	4.8	122	4.8	150	8.9	177	6.9	232	9.1	300	11.8
C	78	3	80	3.1	70	2.7	73	2.8	90	3.5	90	3.5
D	392	15.4	523	20.5	629	24.7	736	28.9	897	35.3	1200	47.2
E	319	12.5	243	9.5	205	8	174	6.8	122	4.8	22	0.8
F	75	2.9	87	3.4	107	4.2	151	5.9	160	6.3	187	7.3
G	225	8.8	237	9.3	272	10.7	337	13.2	367	14.4	457	18
Kg/lb	16.1	35.5	30.3	66.8	51.5	114	79.5	175	129	284	181	400

Factory Standard

MAIN VALVE

BODY & COVER

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

RISKER CHECK VALVE:

- Ductile iron
- Cast Steel WCB
- Stainless Steel CF8M

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

FITTINGS:

- Stainless Steel 316
- Brass

ACCESSORIES:

- Stainless steel CF8M
- Brass

PLEASE SPECIFY

- Working Media
- Ambiental conditions
- Min/Max operating flow
- Min/Max operating pressure
- Pneumatic working pressure
- System installation orientation
- Valve ends and standard
- Deluge valve material and coating
- Trim materials
- Solenoid Voltage
- Solenoid Protection
- Additional accessories needed:
  - Water motor Alarm (Gong)
  - Water pressure switch

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