Class F Hose Pressure Regulator

The Class F Hose Pressure Regulator combines the features of a fire hydrant valve and a direct acting water pressure regulator, to give a single unit which protects the fire crew from excess pressure in the fire hose which could cause difficulties in handling the hose. High pressure fire systems are to be found in high rise buildings, oil, gas and chemical facilities.

OPERATION

The Class F hose pressure regulator incorporates a spring loaded “balanced” pressure reducing valve combined with a hydrant stop valve. The stop valve element is operated in exactly the same way as a conventional hydrant stop valve (clockwise rotation to close, anti-clockwise rotation to open).

The reducing valve element is opened by the load applied to the pressure adjusting spring and closed by the reduced pressure acting upon the underside of the diaphragm. Under working conditions the balance of these two forces determines the degree of valve opening required to maintain a steady outlet pressure.

Accurate pressure control is achieved by a venturi section in the outlet flow area, which ensures that there is a minimal rise in outlet pressure between the fully open and fully closed positions.

Under conditions of varying flow rates, the close control of the Class F ensures a uniform fire fighting pressure is maintained at any hydrant in a fire protection system.

APPLICATIONS

The Class F hose pressure regulator is suitable for:

- Fire mains systems in high rise buildings.
- High pressure systems on oil rig platforms and in oil refineries and chemical plants.
- Hand held hoses and fixed monitors, where individual pressure requirements vary.
- Applications with high pressure drops caused by the length of water mains.
- Applications with low pressure condition produced by pump characteristics.
- Floating production, storage and off-loading (FPSO) vessels.

TECHNICAL SPECIFICATION

Size Valve size is always 1½"

Connections

Inlet	Standard	Flanged 1½"
	Options	Flanged 2, 2½, 3"
	Available as	ANSI 150/300
Outlet	Standard	2½" BS336 Instantaneous female coupling.
	Options	Screwed 2½" BSP male. To suit internationally recommended adaptors.

Materials

The standard valve construction is bronze with aluminium bronze trim, which is used for both fresh water and sea water.

This is also available in Titanium and AB2.

Our Technical Department will be pleased to advise on other required materials.

Inlet Pressure Range 4.8 to 20.7 Barg

Outlet Pressure Range* 4.1 to 8.3 Barg

* Setting including rise at dead end of 0.7 Barg (see page 56).

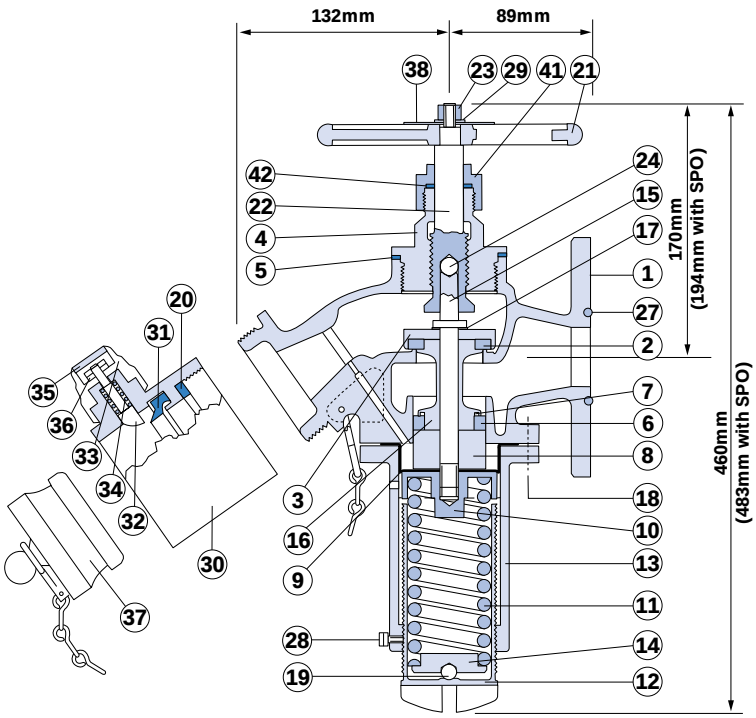
FEATURES AND BENEFITS

- Designed to meet the needs of modern fire protection technology.
- Maintains a uniform fire fighting pressure at every hydrant in a fire protection system, irrespective of location.
- Accurate pressure control is maintained despite varying flow levels and inlet pressures.
- Greatly reduces installation costs by completely eliminating expensive relief piping systems.
- Individual floor level pressure requirements met by quick and easy in-situ regulator adjustment.
- Sea-water resistant trim incorporated as standard.
- Available in a wide variety of material options, to suit particular applications.

CE MARKING

The Class F is not required to be PED certified on water applications, hence cannot be CE marked.

PARTS

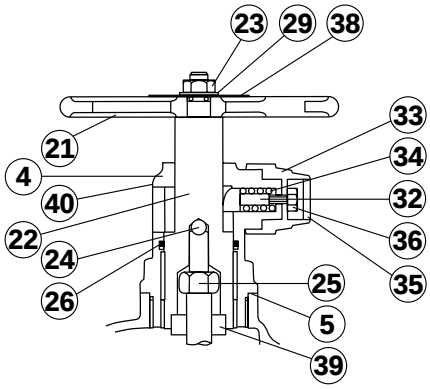


Weight approx. 15kg

OPTIONAL 'SPO' DEVICE

Class F with set pressure override device
An optional feature of the valve is a set pressure override device (or SPO) which, when actuated, allows full opening of the valve without regulating the downstream pressure, thereby bringing it very close to the available inlet pressure.

The SPO can be used for manifolding applications where the valve has to supply a combination of units e.g. water cannons, hand held hoses or foam making equipment.



SPRING SELECTION

DEAD END PRESSURE SETTING RANGE (Barg)	DEAD END PRESSURE SETTING RANGE (Psig)	COLOUR CODE
4.1 to 5.5	60 to 80	Brown
5.5 to 8.3	80 to 120	Blue

ITEM	PART	MATERIAL
1	Body	Bronze
2*	Valve Disc	Nitrile
3	Disc Holder	Bronze
4	Bonnet	Bronze
5*	Bonnet Joint	NAF
6*	High Pressure Seal	Rubber
7	H.P. Seal Ring	Al. Bronze
8	Distance Piece	Al. Bronze
9*	Diaphragm	Nitrile
10	Piston	Bronze
11	Spring	Plt. Steel
12	Adjusting Screw	Bronze
13	Spring Chamber	Bronze
14	Adjusting Screw Plate	Al. Bronze
15	Valve Stem	Al. Bronze
16	Valve Stem Sleeve	Al. Bronze
17*	Valve Stem Joint	NAF
18	Set Screws	St. St.
19*	Adjusting Screw Ball	Phosphor Bronze
20	Washer	Rubber
21	Handwheel	Bronze
22	Handwheel Stem	Bronze
23	Handwheel Nut	Brass
24*	Handwheel Stem Ball	Phosphor Bronze
25	Valve Stem Nut	Brass
26	Handwheel Stem 'O' Ring	Rubber
27	Body 'O' Ring	Nitrile
28	Lock Screw	St. St.
29	Handwheel Washer	Brass
30	Adaptor Body	Bronze
31*	Coupling Washer	Neoprene
32*	Coupling Bolt	Bronze
33	Quick Release Cap	Bronze
34*	Coupling Spring	Phosphor Bronze
35	Screwed Cap	Brass
36	Philidas Nut	Bronze
37	Cap and Chain	Bronze
38	Nameplate	Aluminium
39	Retaining Nut	Bronze
40	Position Indicator	Aluminium
41	Gland	Bronze
42*	Gland 'O' Ring	Nitrile

*Repair pack; available from Safety Systems UK Ltd.

Recommended inspection every 12 months

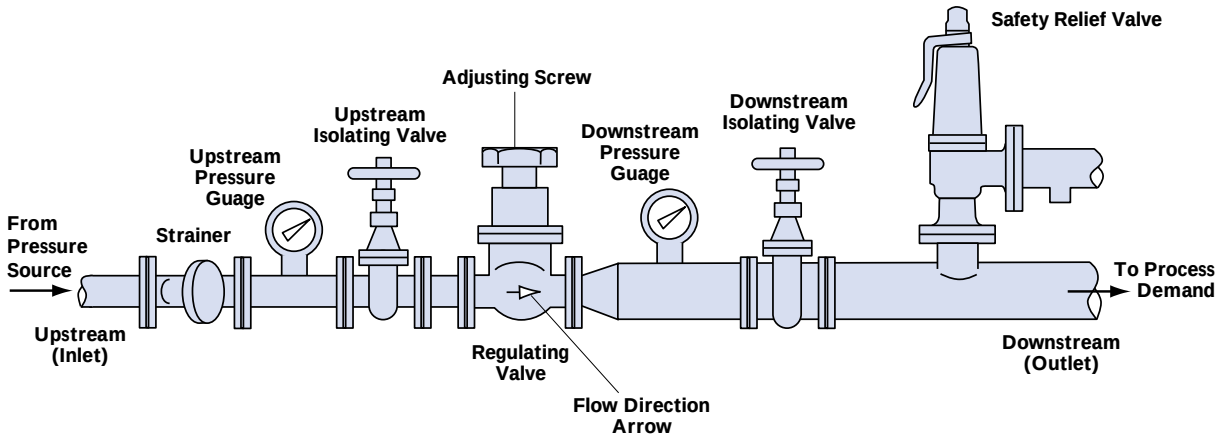
Installation

1) Mount the valve with the spring centre line vertical and with the adjusting screw uppermost.
2) Ensure the valve and pipework is adequately supported and that the pipe does not impose strain onto the valve.
3) Provide adequate headroom or adjustment and space underneath to remove the bottom cover or plug, to give access for dismantling.
4) It is recommended to fit pressure gauges downstream of the valve.
5) Isolating valves and line strainers are advisable.
6) The downstream (outlet) system should be protected by a correctly sized safety relief valve, set at a pressure not less than 1 barg or 15% (whichever is the greater) above the dead end setting of the regulator. See page 56 for definitions.
7) Flush the pipework to ensure that it is clear of dirt and debris.
8) For valves on air, gas and steam. The outlet piping should be expanded to accommodate the increased volume.
9) Ensure correct orientation of the valve, with respect to the direction of flow. Each valve is marked with a flow direction arrow.
10) Ensure that the correct spring is fitted for the required downstream (outlet) pressure, including the 'rise at dead end' (see page 56).

Setting

All direct acting regulating valves should be set against a 'Dead end', allowing for a 'rise at dead end'. For definitions of these terms please refer to Page 78.

1) Remove all the load from the spring by unscrewing the adjusting screw (see item 12 on individual valve drawings).
2) Provide a downstream (outlet) 'Dead end' complete with pressure gauge, by closing a suitable isolating valve.
3) Admit upstream (inlet) pressure.
4) Commence adding load to the spring by screwing the adjusting screw (item 12). Stop when the required downstream (outlet) dead end setting pressure has been achieved.
5) Open the downstream isolating valve slowly to allow flow through the valve. On steam applications it is important that the down stream system is allowed to clear any condensate and to warm through gradually.
6) If necessary, reset the pressure by turning the adjusting screw and then checking the new dead end setting.



RISE AT DEAD END

This is the amount of downstream pressure rise which occurs between the valve being fully open and closed.

All direct acting, spring loaded pressure reducing valves use two forces which open and close the valve and seat, thus regulating the flow through the valve.

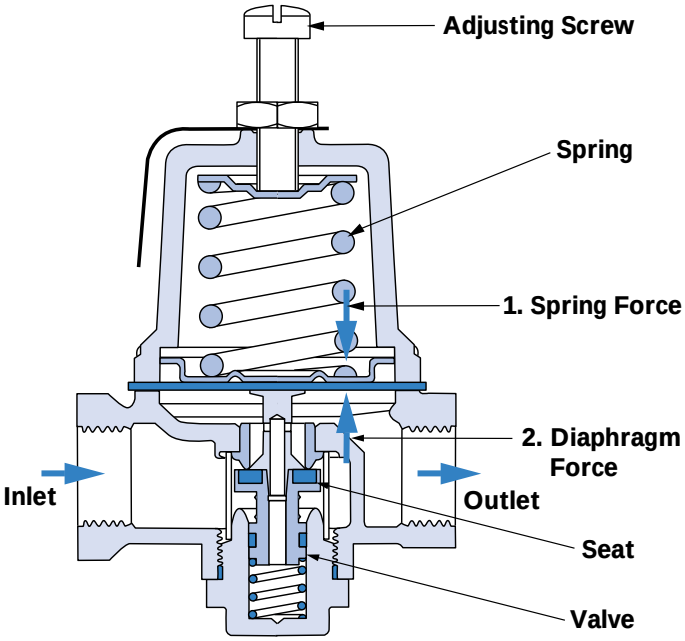
1) The **'spring force'** which tends to open the valve.

2) The **'diaphragm force'** is created by the pressure in the outlet, acting on the underside of the diaphragm, opposing the spring force. This force tends to close the valve. When the valve is flowing at the correct pressure, the spring will have pushed the valve the correct distance away from the seat, allowing flow through the valve.

Once there is no demand from the system, the outlet pipe work will effectively be closed, i.e. the flow through the valve will come up against a dead end (nowhere to go). Under this condition the pressure will rise in the outlet, which in turn will increase the diaphragm force which opposes the spring force. This will tend to close the valve. When the diaphragm force is greater than the spring force, the valve will be fully closed.

The amount of rise in the outlet from the flowing pressure to the fully closed pressure is thus called "Rise at dead end".

DEAD END SETTING



When commissioning the system and setting the valve, it is recommended practice to close off the outlet piping, i.e. dead end. It is important therefore to set the valve under this condition at the dead end pressure (flowing pressure plus the rise at dead end). **It is also important that when selecting the appropriate spring, the dead end pressure is used and not the flowing pressure**.

All sizing charts are based on the valve being fully open with a standard rise at dead end. However, alternative figures can be used, that reduce or increase the flow rate, dependent on the allowable rise. Please refer to the sizing examples.