

Stainless Steel Air Service Equipment

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

SAFETY

The unit must not be supplied with air pressure greater than those rated for the unit (see attached specification label)

GENERAL

Technical Data	
Primary Pressure	20 barg (MAX) (290 psig) Manual Drain. Unless Otherwise Stated.
Secondary Pressure Ranges	17 barg (MAX) (247 psig) Automatic Drain 0,5 → 2,0 barg. (7,2 → 29 psig) 0,5 → 4,0 barg. (7,2 → 58 psig) 0,5 → 8,0 barg. (7,2 → 116 psig) 0,5 → 12,0 barg. (7,2 → 174 psig)
Temperature Range	-20°C - +80°C (-4°F → +176°F)
Operating Medium	Air, Non corrosive gasses and Sour Gas.
Port Sizes	½, 3/8, and ¼ NPT or BSP Parallel.
Guage Port.	1/8 (Option ¼ NPT) or BSP Parallel.
Materials	
Body & Trim	316 Stainless Steel and Inconel
Seals	Fluoroelastomer
Filter Element	40 Micron 316 Stainless Steel 5 Micron (Optional) 316 Stainless Steel
NACE REQUIREMENTS COMPLIED WITH.	

INSTALLATION

Clear all pipe work of swarf, dirt, pipe scale and water before fitting the unit. For the regulator the air supply should be clean, free of excess oil and water, for the filter regulator the supply should be free of excess solid contaminant and excess oil or water as the filter will become quickly blocked if there is excess contaminant. Also the bowl has limited capacity and will quickly fill, allowing fluid to re-enter the air stream.

Back off adjusting screw (15) anticlockwise to relieve fully the load on control springs (18) & (19).

Fit appropriate size fittings to inlet and outlet ports. Check the correct direction of flow (IN) and (OUT) are marked over their respective ports. Note the gauge port (34) is on the outlet side of the unit.

Recommended minimum outside diameter of pipe are 8mm for ¼, 10mm for 3/8 and 15mm for ½ ports as any smaller may cause excessive pressure drop downstream.

The Pressure Reducing Valve can be mounted either horizontally or vertically but the Filter Regulator needs to be vertical in order for the filter to drain correctly.

FUNCTION

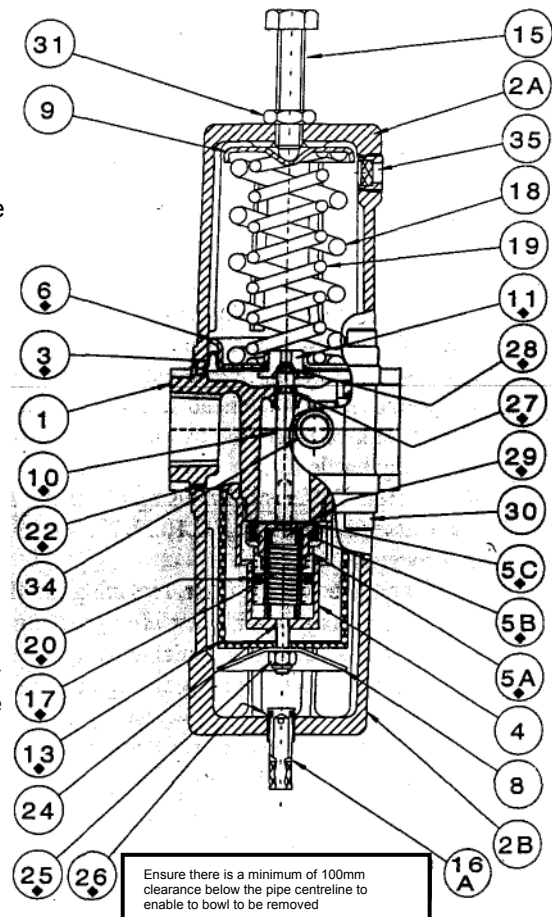
FILTER REGULATOR

Air entering the unit is directed downward over the top of the differential

Housing (4) and outward to the inside wall of the bowl. Water and dirt drain to the quiet zone beneath the filter baffle (8) which prevents them from entering the air stream again. Cleaner air now passes through the filter depositing further dirt on the outside of the filter. Clean air now enters the working parts of the regulator.

REGULATOR

With the adjusting screw (15) wound fully anticlockwise so there is no load on the control springs (18) & (19) the valve seat (5C) is held shut by the seat spring (17) and the force on the area differential between (5C) and (20). Thus no air



will pass through to the outlet. As the adjusting screw is wound anticlockwise it compresses the control springs which push down on the valve spindle (10) this pushes the seat seal fully off the seat allowing air to pass through to the output side. As air pressure increases on the output side it pushes against the diaphragm (3) progressively reducing the control spring load on the stem, which in turn allows the seat seal to progressively close reducing the flow of air to the outlet. This reduces the outlet pressure and the load opposing the control spring. Thus the unit will balance with the flow being maintained sufficient to provide enough outlet pressure to balance the control spring force. Thus the control spring force directly sets the outlet pressure any variation in flow being automatically compensated for by a slight change in outlet pressure.

For Self Relieving Regulators if the outlet pressure rises above that which is set, the diaphragm will lift the relief seat (11) off the seal (28) and vent the excess pressure to atmosphere via the breather (35).

OPERATING INSTRUCTIONS

The unit must not be supplied with air pressures greater than those rated for the unit (see specification label attached to unit). That is usually pressure of 20 BarG maximum for a manual drain unit and 17 BarG maximum for an automatic drain unit. The pressure is set by turning the adjusting screw (15) clockwise to increase the pressure and anti-clockwise to decrease the pressure. Note; if pressure is set under flow conditions then the set pressure will rise when the downstream flow is reduced or blocked.

The pressure should not be set at a value greater than the maximum rated for the control springs (see specification label attached to unit).

The unit should not be used on air supplies that contain additives that could attack the materials of construction.

MAINTENANCE

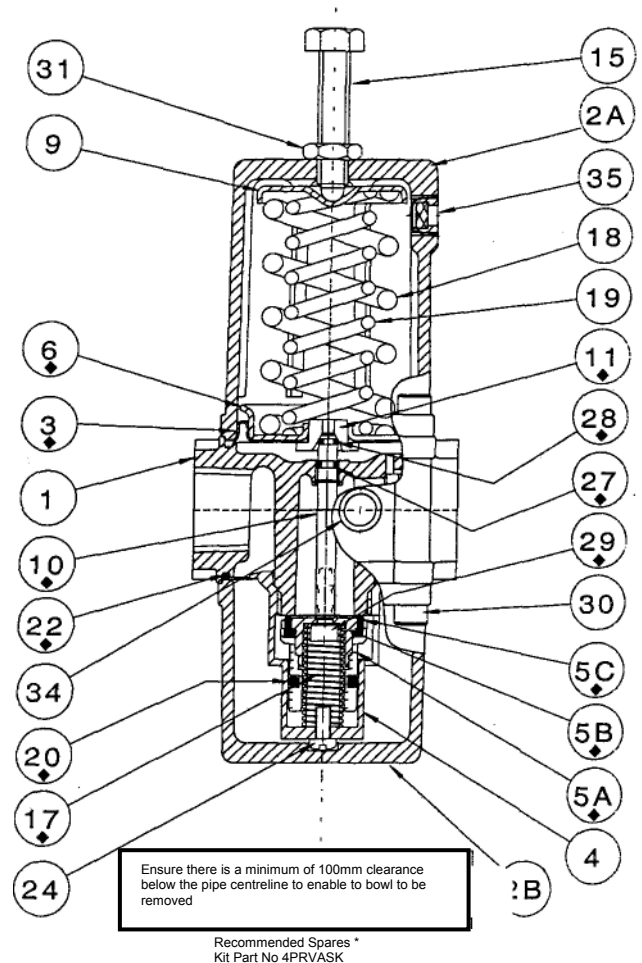
Recommended parts on the Parts List/Assembly Drawing. It is advisable to replace all spare parts when servicing the unit as the main spares come as pre-assembled sub-units.

1. Shut off air supply and exhaust the system completely. Ideally the unit should be removed to a suitable clean area if available, however, with care it may be serviced in line.
2. Wind adjusting screw (15) fully anti-clockwise. Unscrew 4 cap head screws (30) on the top bonnet approx 3 full turns and ensure the bonnet (2A) is free to lift. Remove 4 cap head screws (30) fully and remove the bonnet (2A) to expose diaphragm assembly (3, 6 & 11) to be replaced.
3. Unscrew 4 cap head screws (30) on the bottom bowl approx 3 full turns, if air issues from the unit at any time **STOP** as the air supply has not been isolated, ensure the bowl (2B) is free to lift. Remove the 4 cap head screws (30) full and remove the bowl. Remove filter (13) by unscrewing the M4 nut (25) and removing baffle (8).
4. Unscrew differential housing (4) using adjustable spanner across one flat and diameter, exposing Seat and Stem Assembly (5A, 5B, 5C, 10, 20, 27, 28 & 29). Take care not to loose the spring (17) withdraw the assembly downwards.
5. Clean the bowl and filter, replacing the filter with a new one if it is too heavily contaminated. Replace the Seat and Stem assembly with new after greasing the 'O' rings (20, 27 & 28) with a good quality mineral based grease. Lightly grease the differential housing bore (4) and replace the seat spring (17). Screw the housing back onto the body over the seat assembly taking care it does not foul the seat assembly. Tighten when full in place. Ensure the seat is free to operate by pushing down on the valve stem (10). It should move smoothly in both directions. Replacement of the other parts is a reversal of the removal procedure. Note; the diaphragm (3) should be assembled dry (ie; no lubrication).

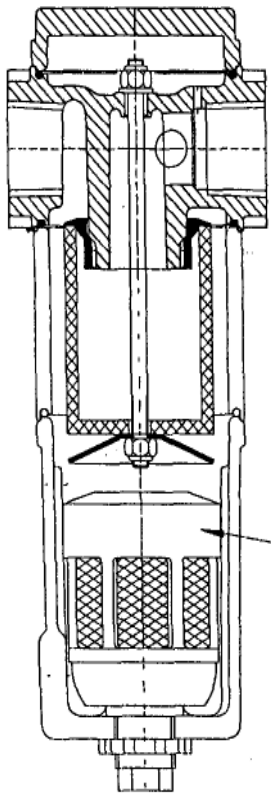
FILTER

Recommended parts on the Parts List/Assembly Drawing

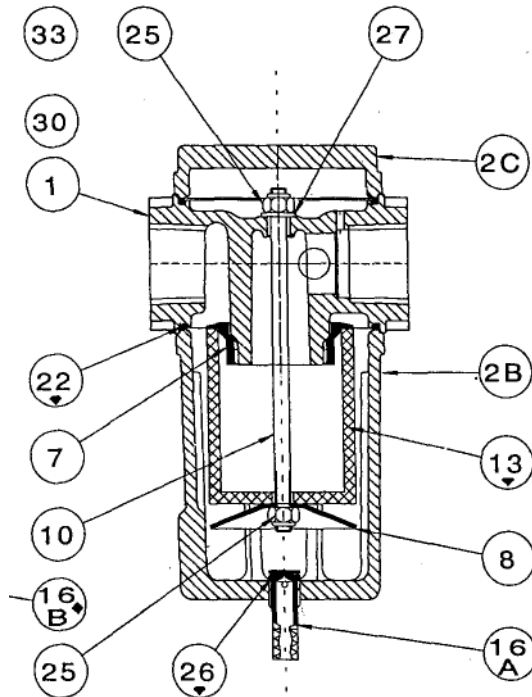
1. Shut off air supply and exhaust the system completely. Ideally the unit should be removed to a suitable clean area if available, however, with care it may be serviced in line.
2. Unscrew 4 cap head screws (30) on the bottom bowl approx 3 full turns, if air issues from the unit at any time **STOP** as the air supply has not been isolated, ensure the bowl (2B) is free to lift. Remove the 4 cap head screws (30) full and remove the bowl. Remove filter (13) by unscrewing the M4 nut (25) and removing baffle (8).
3. Clean or replace the filter clean bowl. Reassembly is a reverse of the dis-assembly.



FILTER



AUTOMATIC DRAIN



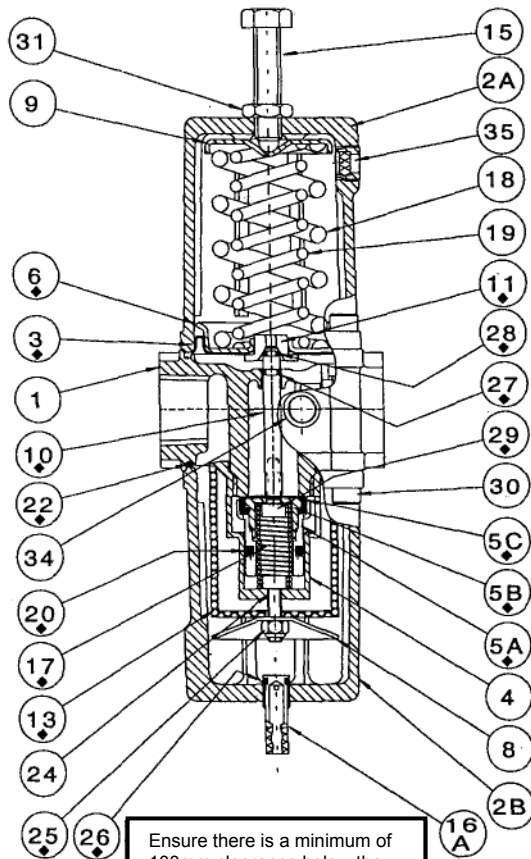
RECOMMENDED SPARES – *

MANUAL DRAIN

Ensure there is a minimum of 100mm clearance below the pipe centreline to enable the bowl to be removed

No	Reference No	Description	Quantity
1	SSBF 485/1N	BODY	1
2A	SSBF 233/2C	BONNET	1
2B	SSBF 238/2B	BOWL	1
7	SSBF 233/7	LOCATOR	1
8	SSBF 238/17	FILTER WASHER	1
10	SSBF 238/233/19	SPINDLE	1
13	SSBF 238/25	FILTER ELEMENT	1*
16A	SSBF 238/18	MANUAL DRAIN	1
16B	3000 – 97	AUTOMATIC DRAIN	1*
22	CM 320 – 15V	“O” RING FLUROELASTOMER – BOWL	2*
25		NYLOC NUT: M4 – 316 STAINLESS STEEL	2
26	OS 3V	“O” RING FLUROELASTOMER – MANUAL DRAIN	1*
27	891 – 460	M4 – SPACE	1
30		CAP SCREW M5 by 12mm U/Head 316 STAINLESS STEEL	8
32	SDF 238/248	LABEL	1
33	SDF 238/249	PRODUCT RANGE LABEL	1
34		1/8” BSP PRESSURE PLUG	2
RECOMMENDED SPARES – *			
Spares Kit Part No 4FLMASK			
Auto Drain Part No 3000 – 97			

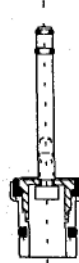
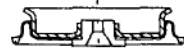
FILTER REGULATOR



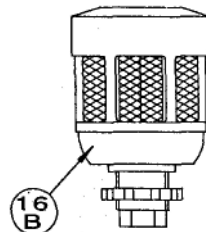
Ensure there is a minimum of 100mm clearance below the pipe centreline to enable to bowl to be removed

RECOMMENDED SPARES – *
Spares Kit Part No 4FLMASK

Diaphragm Assembly
consisting of
Parts 2, 6 and 11



Seat & Stem assembly
consisting of parts
5A, 5B, 5C, 10, 20, 27, 28 & 29

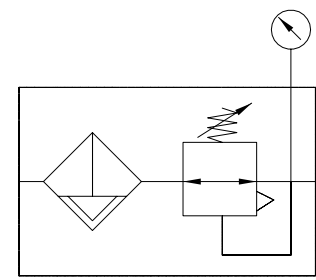
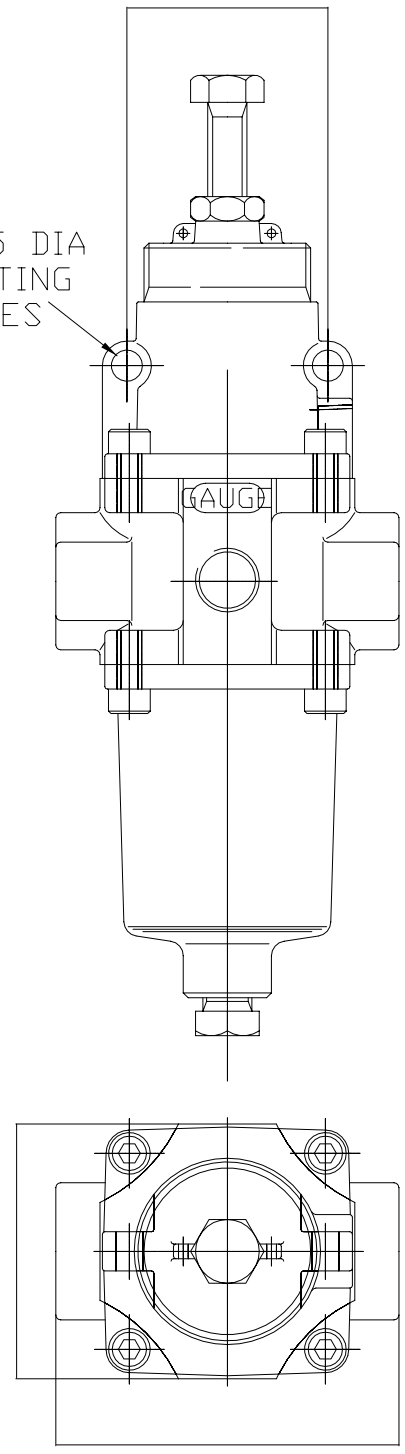
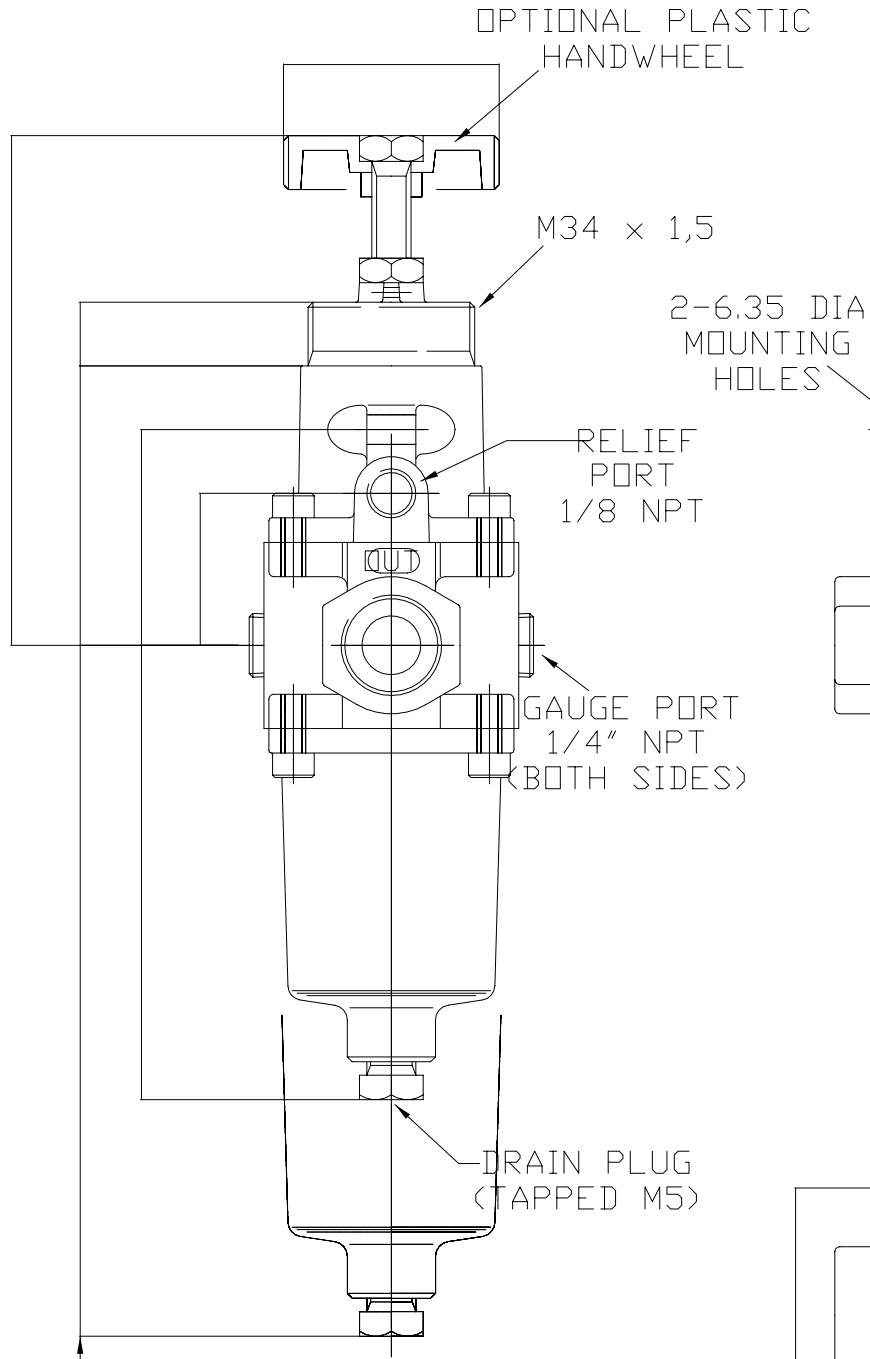


Automatic Drain
3000 – 97

No	Reference No	Description	Quantity
1	SSBF 485/1 N	BODY	
2A	SSBF 238/2C	BONNET	
2B	SSBF 238/2C	BOWL	
3	SSBF 238/4-1	DIAPHRAGM – FLUORELASTOMER	
4	SSBF 238/2C	DIFFERENTIAL HOUSING	
5A	SSBF 238/5-4	SEAT	
5B	SSBF 238/5-5	SEAT SLEEVE	
5C	SSBF 238/5-3	SEAT SEAL – FLUORELASTOMER	
6	SSBF 238/4-2	DIAPHRAGM WASHER	
8	SSBF 238/2C	FILTER WASHER	
9	SSBF 238/9	SPRING WASHER	
10	SSBF 238/5-2	STEM	
11	SSBF 238/4-3A	RELIEF SEAT	
13	SSBF 238/2C	FILTER ELEMENT	
15	SSBF 238/10	ADJUSTABLE HANDLE	
16A	SSBF 238/2C	MANUAL DRAIN	
16B	3000 - 97	AUTOMATIC DRAIN	
17	SSBF 238/6	SEAT SPRING INCONEL	
18	SSBF 238/8-8-4	8 Barg Outer Spring & 4 Barg Spring 316 Stainless Steel	
19	SSBF 238/8-8-2	8 Barg Inner Spring 316 Stainless Steel	
18	SSBF 238/8-12	12 Barg Outer Spring 316 Stainless Steel	
19	SSBF 238/8-12A	12 Barg Inner Spring 316 Stainless Steel	
18	SSBF238/8-2	2 Barg Outer Spring 316 Stainless Steel	
20	SSBF 485/1 N	“O” Ring – FLUORELASTOMER – DIFFERENTIAL	
21			
22	CM 320 - 15V	“O” Ring – FLUORELASTOMER – BOWL	
23			
24		CAP SCREW M4 16mm 316 STAINLESS STEEL	
25		BYLOC NUT: M4 – 316 STAINLESS STEEL	
26	OS 3V	“O” Ring – FLUORELASTOMER – MANUAL DRAIN	
27	01-06-TA003V	“O” Ring – FLUORELASTOMER – STEM	
28	BS 004V	“O” Ring – FLUORELASTOMER – RELEIF SEAT	
29		CAP SCREW M4 by 8mm U/HEAD 316 STAINLESS STEEL	
30		CAP SCREW M5 by 12mm U/HEAD 316 STAINLESS STEEL	
31		LOCK NUT M8 – 316 STAINLESS STEEL	
32	SSBF 238/248	LAEBL	
33	SSBF 238/249	PRODUCT RANGE LABEL	
34		1/8” NPT PRESSURE PLUG	
RECOMMENDED SPARES – *			
Spares Kit Part No 4FLMASK			
Auto Drain Part No 3000 – 97			

Generally NACE will apply if the Supply Pressure is greater than 4 BarG and the mol% of Hydrogen Sulphide H₂S in the supply gas is greater than 0.01%

NACE REQUIREMENTS
MR0175 – 98
SULPHIDE STRESS CRACKING RESISTANT METALLIC MATERIALS for OILFIELD EQUIPMENT



SYMBOL

SPECIFICATION
 CONNECTIONS 1/2 NPT
 MAXIMUM INLET PRESSURE 20 bar

FLOW (GRAPHS AVAILABLE ON REQUEST)
 WORKING TEMPERATURE -20° TO +80°C
 MAXIMUM BLEED FLOW 0,5cc AT 2 bar
 SECONDARY PRESSURE

GAUGE PORTS 1/4 NPT
 RELIEF PORT 1/8 NPT
 WEIGHT 1.4 kg

REGULATED PRESSURES

0,05 TO 2 bar	02
0,05 TO 4 bar	04
0,25 TO 7 bar	07
0,25 TO 10 bar	10
0,5 TO 16 bar	16

FILTER ELEMENTS

25 MICRON (STANDARD)
 5 MICRON (OPTIONAL)
 (FOR 5 MICRON ELEMENT ADD 05 TO
 END OF THE PRODUCT CODE)

MAXIMUM BLEED FLOW 0,5cc AT 2 bar
 SECONDARY PRESSURE

PRODUCT CODE 4FRMSV--2--

1/2 NPT FILTER/REGULATOR
 (SELF RELIEVING - MANUAL DRAIN)

DRG. No: SSAF 485 N

ENSURE THAT A CLEARANCE
 OF AT LEAST 141mm IS LEFT
 BELOW THE PIPE CENTRE
 LINE TO ENABLE THE BOWL
 TO BE REMOVED