



Actuators & Controls

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## SERVICE MANUAL No. I-0140

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### Model FD-1F High Pressure Gas Filter and Condensate Knockout

CUSTOMER: \_\_\_\_\_

P.O.#: \_\_\_\_\_

W.O.#: \_\_\_\_\_

TAG: \_\_\_\_\_

DATE: \_\_\_\_\_

APPLIES TO OPERATOR MODEL: \_\_\_\_\_

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## INSTALLATION

The Model FD-1F filter has two ½ FNPT connection ports and one ½ FNPT drain. The two ports are located on the flange (3), one marked “IN” for upstream inlet, the other marked “OUT” for downstream outlet. The drain connection is located in the bottom flat head (2) and can be connected to a drain line or an optional drain valve can be installed.

The Model FD-1F filter should always be installed in a vertical orientation with the outlet and inlet ports horizontal and topmost. To secure the filter unit in place use two mounting brackets. The first mounting bracket should be positioned as high as possible on the narrow part of the neck flange (3). The second mounting bracket should be positioned between 7" to 9" below the first bracket, as a removable clamp.

Remove shipping plugs from the ports. Connect line pressure to inlet port (marked "IN") and the exit line to outlet port (marked "OUT"). The use of Teflon tape, thread compounds or sealants is permissible, but should be applied sparingly to male pipe threads only. Remove test plug from drain to connect drain line or optional blowout drain valve.

**CAUTION: Do not allow foreign particles, Teflon tape or thread compound to enter ports. Do not use excessive torque to tighten fittings in ports, use just enough torque to provide a leak-tight seal.**

Before turning on main gas supply, ensure nuts on the cap of the filter are securely tightened.  
Torque nuts to 50 ft-lb.

**CAUTION: Filter operates under high internal pressure.**

## MAINTENANCE

The FD-1F filter requires servicing to maintain the proper pressure and cleanliness of gas flow leaving the filter. This servicing is to replace the dirty filter element and periodically but less often, the O-rings. The life of the element depends solely on the solids contained in the gas and volume of gas flowing through the filter. A differential 35 psi or higher across the filter at normal flow conditions indicates the element is dirty and needs to be replaced.

### Tools required for Maintenance Servicing

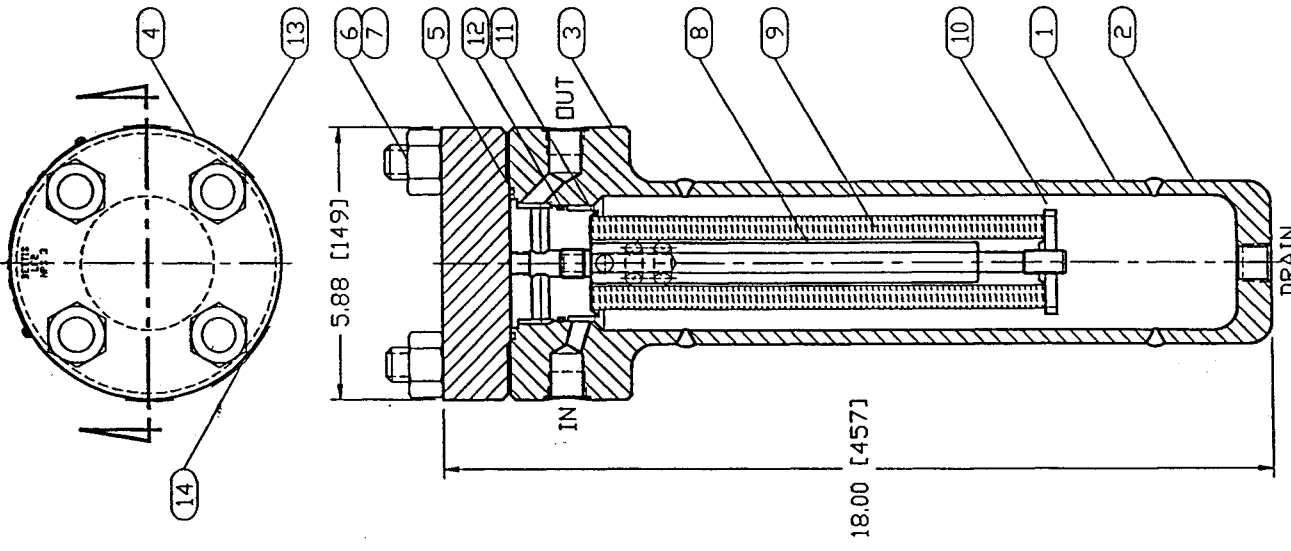
- ! 1-1/8" wrench or socket
- ! 3/4" open end wrench
- ! 1/2NC bolt or eyebolt
- ! Cloth rag

### Element Replacement and O-Ring Check

1. Turn off main gas supply to filter unit.
2. If unit has an optional drain valve, open drain valve. Otherwise, bleed upstream or downstream.
3. **CAUTION: The filter operates under high internal pressure. Therefore loosen nuts on top cap slowly until all internal pressure is released. Then remove nuts and cap.**
4. Thread a 1/2NC bolt into the top of the hanger assembly. Holding the bolt, pull the hanger assembly out of the flange body.
5. Inspect O-rings from cap and hanger for wear and damage. If worn or damaged, replace the O-rings. Spare part kits are available from Bettis.
6. Remove bottom retainer nut and slide element off support bar.
7. Clean any residue or contaminants from inside flange housing.
8. Tighten support rod, then slide the new filter over support rod. Apply teflon tape or thread compound to end thread of support rod, screw on and tighten retainer nut. Replace hanger assembly back into filter body, making sure O-rings are properly seated.
9. Replace cap and tighten nuts evenly, torquing to 50 ft-lb.
10. Turn on main gas supply, and check for leaks.

ITEM	DESCRIPTION	MATERIAL	QTY	NOTE
1	NPS 3 SMLS PIPE	SA-333-6	1	
2	NPS 3 FLAT HEAD	SA-350-LF2	1	
3	NPS 3 WELD NECK FLANGE	SA-350-LF2	1	
4	CAP	SA-350-LF2	1	
5	O-RING, CAP	VITON 70A	1	(Y)
6	STUD	SA-320-L7M	4	
7	NUT	SA-194-7M	4	
8	SUPPORT ROD	C1018	1	
9	FILTER ELEMENT	FIBRE	1	(Y)
10	RETAINER NUT	AL 6061-T6	1	
11	ELEMENT HANGER	AL 6061-T651	1	(Y)
12	O-RING, HANGER	VITON 70A	1	(Y)
13	DECAL (eg. 40 MICRON)	VINYL	1	
14	DECAL (DE-PRESSURIZE BEFORE ...)	VINYL	1	
15	SHIPPING PLUG (LOOSENED)	A105	2	(H)
16	TEST PLUG (SEALED DRAIN)	A105	1	(H)

NOTE: (Y) RECOMMENDED SPARE PARTS, PART NO. SPRK-FD-1F  
(H) NOT SHOWN



SPECIFICATIONS:  
 PORTS: 1/2 NPT X 1/2 NPT X 1/2 NPT  
 SERVICE: AIR, SWEET GAS, H2S SOUR GAS  
 TEMP. RATING: -46°C THRU 65°C  
 OPTION: DRAIN VALVE  
 MAWP: 1500 DR 2220 PSIG, AS SPEC'D  
 STD ELEMENT 40 MICRON  
 EQUIVALENT Cv: 3.0 AT 1000 PSIG INLET  
 COMPLIANCE WITH NACE MR-01-75, AND  
 APPLICABLE PARTS OF ASME VIII-1

**BETTS** BETTS CANADA LTD.

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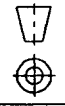
CUTAWAY ASSEMBLY  
 FD-1F V2 (PORTS IN BODY)  
 HIGH PRESSURE GAS FILTER  
 AND CONDENSATE KNOCK-OUT

C-0229--DVG\_VIEV\_02 WEIGHT 41.5 LB  
 MAR-14-96

UNLESS SPECIFIED OTHERWISE  
 ALL DIMENSIONS INCHES (mm)

UPDT SPECIFICATIONS  
 RS-1996-03-14@9097-1-R  
 REVISED HANGER FOR O-RING  
 RB-1995-07-20@9097-1-R  
 PORTS WERE IN BODY, OUT CAP  
 RB-1995-06-20@9097-1-R

REV BY: DATE+REF  
 TOLERANCES  
 XXX ±0.5 (#10)  
 XX ±0.2 (#5)  
 X ±0.1 (#2)



DWG. NO. C-0229

SCALE 1:4 BY GS CHK N/A DATE MAY-17-95  
 V.D. Q-JE-WES DWG. NO. C-0229 REV 3-