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**OXFORD**

FILTRATION  
L I M I T E D

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Brisbane, Australia

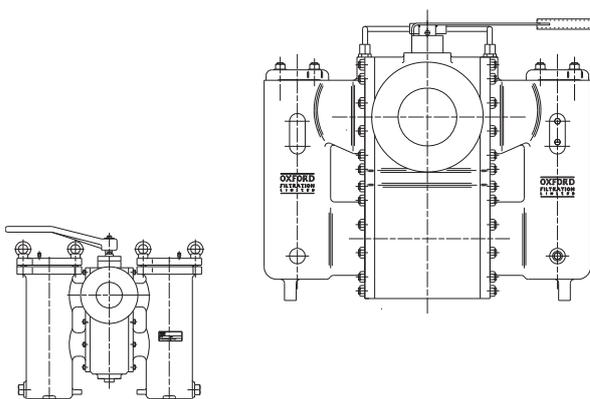
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**INSTALLATION, OPERATING & MAINTENANCE**  
**MANUAL**

FOR THE  
OXFORD FILTRATION LIMITED

**BALL**  
**DUPLEX BASKET**  
**FILTERS**



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## **Important Safeguards**

- Use the filter only as described in this manual.
  - The filter is for use on liquids only.
  - Operators should be suitably trained.
  - A competent person should undertake installation and maintenance.
  - Do not attempt to maintain, repair or adjust the filter whilst it is pressurised.
  - If the fluid to be filtered is in any way hazardous, toxic or flammable, or is at a temperature extreme, the operator and environment should be suitably protected. Extreme care should be exercised if the fluid, at maximum operating temperature, but at room pressure, is above its boiling point. Unless specifically stated otherwise strainers that are sold or used within the European Union, are offered only for fluids (not gases) defined by the Pressure Equipment Directive 97/32/EC at pressures that mean the strainer falls under a self certified conformity assessment as defined by Directive 97/32/EC. A fluid whose vapour pressure at the maximum allowable temperature is greater than 1.5 barg must be treated as a gas and it is assumed for the purposes of the self certification of this vessel that this is not the case. Please discuss with our technical sales team if in doubt.
  - The maximum operating pressure for the standard filter structure is 14 barg at 50°C. But other higher-pressure filters are available. Please see the relevant standard for the flange pressure rating. The maximum working pressure of the assembly is the lower of the above two pressures. The maximum working pressure reduces as the temperature increases. Please consult with Oxford Filtration for further information.
  - Ensure the inlet pressure and temperature is less than that shown on the filter.
  - The filter body material and seal temperature limits are: -
    - Cast iron: -5°C TO +120°C
    - Cast Steel: -20°C to 'O' seal temperature limit
    - Stainless Steel: 'O' seal temperature limits
    - Nitrile or Buna N (NBR) seals: -35°C to +120°C
    - Viton (KPM) seals: -20°C to + 200°C
    - EP or EPDM seals: -50°C to + 150°C
    - FEP encapsulated seals: -55°C to + 260°C
- The seal temperature limits assume complete chemical compatibility with the fluid. Care should be taken with any fluid at elevated temperature, especially above 100°C. Do not allow the fluid to freeze in the filter.
- The filters, when shipped from Oxford Filtration Ltd, do not contain substances specifically hazardous to health. However, the filter may have a thin coating of oil based corrosion preventative on some of it's surfaces. So care should be taken should this be unacceptable in the given application.
  - If a used filter is to be stored or transported, ensure that the filter is clean, suitably protected (including corrosion protection if appropriate) and does not contain substances that could be hazardous to health.
  - If the filter has been subjected to overpressure, mechanical damage, corrosion or erosion, or any form of abuse that may reduce it's strength, the filter should be scrapped or returned to Oxford Filtration Ltd for examination and if practical repair and re-test.
  - Use only the manufacturers recommended attachments and genuine spares.
  - Retain this Manual for future reference.

## **1. Description of the Filter**

These duplex filters remove solid material from the process fluid and provide continuous flow. This is achieved by having two chambers, each containing a perforated sheet/mesh element (basket) that collect the solid material. Only one of the chambers is in operation at any one time; the other is on standby. Flow is diverted from one chamber to the other by a pair of ball valves that are rotated by the change-over handle. The change-over handle covers the on-line chamber. The off-line (stand-by) chamber can be opened (See Routine Maintenance) to allow access to the basket for cleaning. Material collected in the basket will cause the differential pressure across the filter to increase. The differential pressure should not exceed 1 bar (14.5 lb/in<sup>2</sup> )

## **2. Installation**

Unpack strainer and inspect for any damage occurring during transit. An oil may have been used on internal surfaces to prevent rusting and should it be necessary, depending on the application, this can be removed.

Install the filter in the pipeline using appropriate seals and attachments that comply with the relevant codes. Support heavy filters as appropriate. Do not use the cover eye nuts for lifting purposes

Do not fit a raised face flange to a flat face flange.

Drain and vent piping should be ported to a safe area especially if the fluid is hazardous or at a high temperature. The operator should always wear suitable protective equipment (goggles, gloves, vests , clothing etc) consistent with the service

Confirm:

- That the flow direction is correct (as shown by the markings on the inlet & outlet flanges) and that the chamber covers are uppermost
- There is enough space around the filter for maintenance and routine operation.
- That the basket assemblies are fitted and they are the correct filtration level.
- That there are no leaks. (Note: Air can be bled from the 'on-line chamber via the appropriate vent provided on the chamber cover.)
- Remove any flange or thread protectors and make sure there is no foreign or loose debris that could be carried downstream when fluid is introduced to the strainer.
- On DN150 (6") and DN200 (8") sizes ensure the equalizing piping provided is fitted so it can be used if required.

- If the strainers are to be stored, replace the flange or thread protectors and store the strainer indoors in a clean and dry environment.

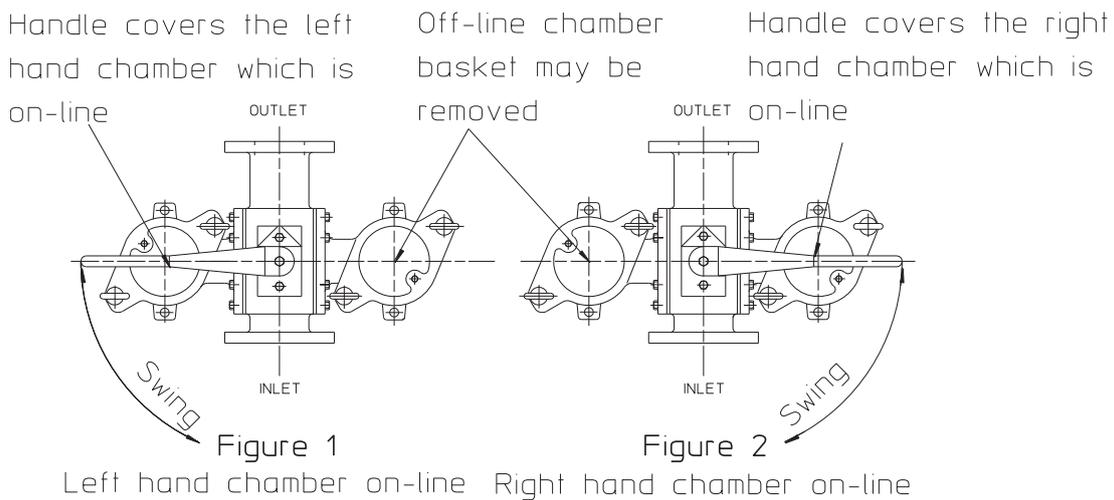
- NOTE:
1. Ideally it should be possible to isolate the filter.
  2. For efficient operation, it should be possible to determine the pressure drop across the filter. The pressure drop across the basket should not exceed 1 bar.
  3. For ease of operation drain valves should be considered.

Oxford Filtration can supply, on request, gauges or switches to satisfy note 2 above and valves to satisfy note 3.

### 3. Routine Maintenance

**3.1 Differential pressure** - The differential pressure (pressure drop) across the filter should not exceed 1 bar (14.5 lb/in<sup>2</sup>). Differential pressures in excess of 1 bar may cause irreparable damage to the basket and will ultimately cause the basket to burst. As the basket collects material (debris), the differential pressure will increase and before the differential pressure exceeds 1 bar, procedures 3.2 and 3.3 should be invoked.

**3.2 Chamber change-over** - To divert the process flow from one chamber to the other, rotate the change-over handle through 180°, until it hits the end stop. The handle normally swings over the inlet port. The on-line chamber is covered by the change-over handle as shown in figures 1 & 2.



**3.3 Basket removal and cleaning** - check that the change-over handle is on its end stop. The chamber that can be worked on is the one that is NOT covered by the change-over handle. Refer to figures 1 & 2.

- With great care, vent the pressure in the chamber via the cover vent and drain the process fluid from the chamber via the drain plug. (Drain valve if fitted)
- Slacken and remove the chamber cover nuts, lift and swing the cover to expose the basket.
- Lift out basket and wash thoroughly. Take care not to damage any fine mesh lining. (Cleaning can be done by using a process compatible liquid or compressed air)
- Check the basket and 'O' seal for wear or damage - replace as necessary. Check the chamber (especially the 'O' seal surface) is clean.
- Replace the basket . Note: Do not restrict the flow path by fitting the handle pillar in front of the inlet port.
- Clean the cover and inspect the 'O' ring for damage/wear - replace if necessary.
- Refit the cover and 'O' ring ensuring the basket handle is engaged with the cover and fixed.
- Refit and tighten the cover nuts
- The air must be removed from the filter by the use of the bleed screw.
- This chamber is now ready for use when required.

**3.4 Leakage:** Any leakage should be cured immediately. Components should be checked for wear, corrosion or deterioration and replaced as necessary.

#### **4 Ball seal replacement**

After prolonged or arduous operation the ball seals may become worn resulting in unacceptable leakage into the standby chamber during routine basket cleaning. The filter need not be removed from the pipeline to replace the ball seals (if there is sufficient room around the filter). To replace the ball seals refer to specific instructions available for removing chamber on request from Oxford Filtration Ltd.

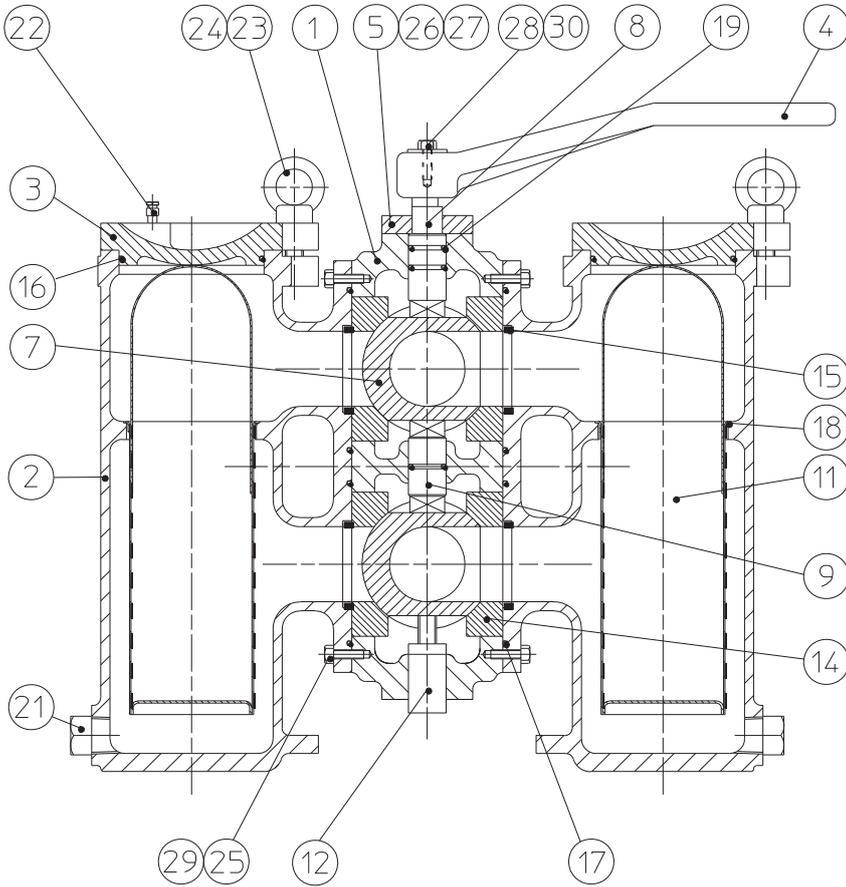
#### **5. Recommended Spares**

The end user should consider the consequences of filter wear or failure and the level of on-site spares holding. The following is a recommended spares holding for most normal applications:

Seal kit	1 off
Basket assembly	1 off

## **6. Fault Finding**

<b>Fault</b>	<b>Cause</b>	<b>Corrective action</b>
6.1 <u>Leaks</u> 6.1.1 <u>body to cover leaks</u>	(i) Dirt on seal face (ii) Cover displaced (iii) Seal missing (iv) Cover loose	(i) Clean seal face and re-fit (ii) Re-fit the cover (iii) Replace the seal (iv) Tighten cover nuts sufficient to prevent leakage
6.1.2 Bleed or drain leaks	As above (i) (iii) & (iv)	
6.2 <u>Element not retaining debries</u>	(i) Basket seal missing (ii) mesh damaged	(i) Re-fit seal (ii) Fit new basket
6.3 Excessive leakage from stand-by chamber during basket maintenance	(i) Worn ball seat (ii) Chamber to body bolting loose	(i) Replace seals (ii) Re-tighten to correct torque
6.4 Change-over handle difficult to move	(i) Differential pressure too high	(i) Equalise pressure
6.5 Leakage from stem	(i) Worn or damaged 'O' seal	(i) Re-fit seals
6.6 Leakage between basket chamber and valve body	(i) Worn or damaged 'O' seal	(i) Re-fit seals



Item No	Description	No Off
1	Body	1
2	Element Chamber	2
3	Filter Cover	2
4	Changeover Handle	1
5	Stem	1
6		
7	Ball	2
8	Changeover Drive Shaft	1
9	Central Drive Shaft	1
10		
11	Element Assembly	2
12	Adjustment Nut Assembly	1
13		
14	Ball Seat	4
15	Ball seal	4
16	O Ring Cover	2
17	O Ring Body	4
18	O Ring Element	2
19	O Ring Drive Shaft	3
20		
21	Drain Plug	2
22	Vent Valve	2
23	Eye Bolt	4
24	Stud Cover	4
25	Stud Chamber	20
26	Setscrew	1
27	Setscrew	1
28	Setscrew	1
29	Plain Nut	20
30	Washer	1



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- ❖ The user must satisfy himself as to the suitability of the equipment for the intended application.
- ❖ Oxford Filtration Ltd., cannot be held responsible for any damage caused by the filter or for any consequential damages.
- ❖ The right is reserved to amend specifications without notice.