

OW DUAL FILTERS

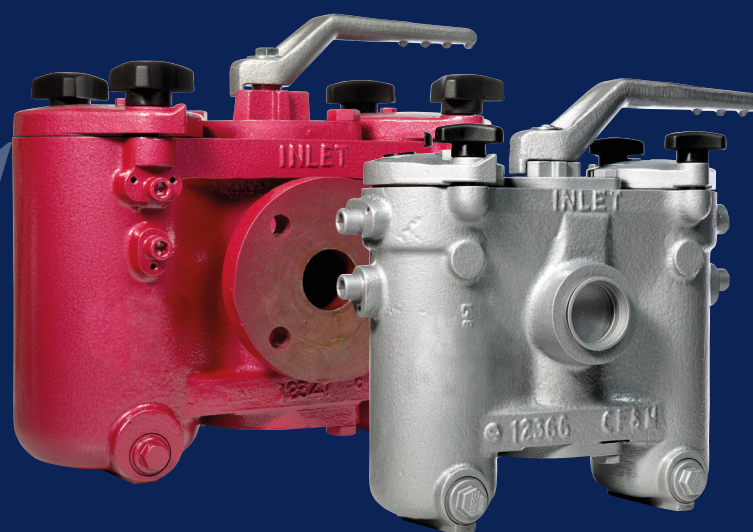
INSTALLATION, OPERATION
AND MAINTENANCE MANUAL

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AIRPEL®

READ AND UNDERSTAND THIS MANUAL PRIOR
TO OPERATING OR SERVICING THIS PRODUCT.





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1.0 General

OW Dual Filters are for use where uninterrupted flow is required, therefore the line does not need to be shut down to clean the basket. The filter consists of a diverter valve and two chambers containing the filter baskets; one duty, collecting debris, and the other on standby.

As the duty basket becomes increasingly blocked with debris – the flow can be diverted, without interruption, to the standby (clean) basket by turning the handle through 180°. For safety reasons the handle always covers the duty (pressurised) chamber. Basket cleaning is a quick and simple tool-free operation.

The equipment must be installed, started up, operated and maintained and if necessary, repaired only by authorised, properly trained and qualified personnel.

It is the responsibility of the owner / operator to ensure full compliance with all relevant safety and environmental regulations during movement of, installation, operation, maintenance, assembly and disassembly of the equipment. All international, national and local codes of practice shall be observed and shall take precedence over any stated or implied practice in this document.

It is the responsibility of the owner / operator to ensure that the equipment is only used for the duties for which equipment has been supplied, and that all operations are within the design and operating parameters stated on the equipment data sheets and/or general arrangement drawings.

Keep these instructions in a readily accessible place.

It is the responsibility of the equipment owner or operator to ensure that anyone installing, operating or maintaining the equipment has read and fully understood these instructions and complies with them at all times.

Carry out work on the equipment only when:

- Equipment has been fully isolated from the process line and valves have been locked off and secured against accidental opening.
- Where necessary the equipment has been depressurised.
- Where required the equipment has been suitably flushed and purged of harmful gases, vapours or liquids.
- Any electrical supply has been disconnected and secured against accidental energising either by locks, key switches or removal of supply line fuses.
- A notice has been attached to locked out process valves or electrical switchgear clearly stating that work on equipment is in progress.
- Any lifting equipment or tackle is in good order and certified for intended use.
- The persons carrying out work on the equipment have been provided with suitable tools for the task to be conducted and have the necessary protective clothing and safety equipment and are suitably trained in their use.

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2.0 Installation

Fit the filter assembly into the pipeline ensuring:

- There is no undue stress on the unit - support large filters appropriately.
- The unit is installed using suitable flange bolting materials and gaskets.
- The flow direction is correct.
- The unit is vertical with the cover at the top and the basket (element) is fitted.
- The unit is protected by suitable safety devices (pressure relief valves, earthing straps etc.) as appropriate within the system that it is installed.
- There is enough space available for maintenance operations.
- The fluid is compatible with the materials of construction.
- The filter is being operated within its pressure/temperature performance envelope and within the flange drilling pressure/temperature limits.
- The filter is clean, including (if appropriate) the removal of corrosion preventative liquids applied during manufacture.
- The cover(s), drain plug and any other attachments are secure.
- Fill the filter with fluid, bleed air from the unit via the bleed screw(s) and check for leaks.

3.0 Operation

During normal operation the changeover handle is positioned over one chamber / side of the filter (see schematic diagram, section 10). Intermediate positions of the handle are not recommended.

Flow is diverted from one chamber/side of the filter to the other by turning the handle through 180°. The flow passes through the chamber/side that is covered by the handle.

The Filter needs very little attention during normal operation. The need to clean/replace the filter basket(s) is indicated by the pressure drop across the filter. The frequency with which this is required is governed by the debris loading. A Differential Pressure Indicator (DPI) may be fitted as an optional extra to indicate when the basket needs cleaning. If not purchased as part of the filter itself, a differential pressure gauge, transmitter or switch suitable to measure the operating differential pressure between inlet and outlet sides of the filter must be installed on the adjacent piping.

The Differential Pressure (ΔP) should be monitored. If an optional Differential Pressure Indicator (DPI) with standard spring is fitted to monitor the ΔP , the pointer moves from 'clean' (green) to 'dirty' (red) when the ΔP is 0.7 bar (10 psi). The standby chamber should be brought on duty and the dirty basket removed for cleaning/replacement when the ΔP reaches this point (see below).

The ΔP should not be allowed to exceed the maximum (burst) Dirty pressure of 1.4 bar (20 psi) at any time. When the ΔP reaches this pressure, the dirty basket **must** be removed and cleaned or replaced with new.



Warning: Max. $\Delta P = 1.4$ bar

Failure to clean or replace the basket(s) when this ΔP has been reached may result in loss of downstream pressure and upset desired downstream process conditions. Failure to act promptly can cause damage to the filtration membrane and result in debris passing into the line downstream of the filter.

Note: Filters and baskets which are capable of operating outside standard parameters can be designed to order.

Important: Where the filter is fitted with a Pressure Equalising Valve this valve should remain open during normal operation. This ensures the standby chamber remains immediately available for duty and prevents any pressure build-up in the isolated chamber should the operating temperature increase in service.

A Pressure Equalising Valves is not installed on all filters. These are generally only fitted to filters at the higher end of the size and/or pressure range, or as required for specific applications.

To clean or inspect the basket(s) in the duty chamber:

- Check that the Pressure Equalising Valve (where fitted) is open to ensure the pressures in the duty and standby chambers are equal. Important: Do not attempt to operate the changeover mechanism with the equalising valve closed as this may damage internal parts of the filter.
- Divert the flow to the standby chamber by turning the handle through 180° until it is hard against the stop.
- Close the pressure equalising valve (where fitted).
- Carefully release the pressure in the chamber to be cleaned using the bleed screw in the cover. Safe working procedures compliant with all local regulations shall be followed at all times.

Warning:

Before opening the filter cover to allow access to the internal basket, it is the responsibility of the owner/operator to ensure that the filter body is:

- Fully Isolated.
- Depressurised.
- Evacuated of hazardous / harmful products and / or gasses.

- Once the pressure has been released – remove the drain plug and fibre washer and then slacken the cover nuts to drain the chamber of fluid (care should be taken with hazardous fluids).
- Swing the cover(s) open (remove the cover on the DN150 & DN200 OW dual units) to access the basket(s).
- Remove the basket(s) and clean thoroughly – inspect for damage and replace as necessary.
- When cleaning baskets with fine mesh linings care should be taken not to damage the lining by the use of sharp objects or high pressure wash jets. Paper/fibreglass and other disposable elements cannot be successfully cleaned. They should be replaced with new clean elements.
- Ensure there is no debris below the basket register (as this is the clean side of the filter). Flush any dirt/debris out through the drain connection. Ensure the basket register surfaces are clean.



- Inspect and clean the drain plug sealing surfaces, fit a new sealing washer and replace the drain plug.
- Refit the basket(s) (and basket O-ring, if fitted) ensuring they are correctly located on the register.
- Inspect and clean the cover sealing surfaces. Inspect the O-Rings for damage or permanent deformation. Replace with new if necessary.
- Lift and swing the cover(s) into position taking care not to damage the cover O-ring. Progressively and evenly hand tighten the nuts to clamp the cover.
- Open the Pressure Equalising Valve (where fitted).
- Bleed the air from the standby chamber by releasing the bleed screw in the cover(s) until all air is eliminated – then tighten the bleed screw.

The standby chamber is now available for duty once again.

Periodically inspect the filter assembly for corrosion and other deterioration that may affect the integrity of the vessel.

Notes:

If the filter is fitted with a Pressure Equalising Valve – the valve must be opened before turning the handle and closed immediately after the handle has reached its limit of motion, before attempting to open the filter cover.

In normal operation – the standard dual filter design (not the positive seal option), allows a small amount of fluid to bypass between the duty and the standby chambers. This is a design feature that eliminates the requirement of a pressure equalising system on smaller, lower pressure filters. The drain on the standby chamber should be left open during maintenance to allow this fluid to drain away.

The positive seal filter option utilises a special seal set into the internal cocks (valves). This reduces any fluid bypass to a negligible level. After cleaning the basket, it is important to bleed air from the standby chamber by opening the pressure equalising valve and releasing the bleed screw in the cover(s). Once all air has been eliminated – tighten the bleed screw.

CELEROS FT recommend the fitting of valves to the drain connections for ease of use and increased operator safety.





4.0 Maintenance

The OW Filter requires very little routine maintenance.

Regularly check the condition of 'O' seals and sealing surfaces – replace and / or clean as necessary.

Regularly check the condition of the baskets (particularly the fine mesh, where fitted) for damage and replace as necessary.

Periodically inspect the filter assembly for corrosion and other deterioration that may affect the integrity of the vessel.

It is recommended that the changeover handle is operated back and forth a minimum of once per day (to prevent seizure). Frequency of basket cleaning remains process dependant.

Description	Interval (every)	Remarks
Visual inspection, external	Week	
Inspection of Filter/internals for damage	6-9 Months	Each time Filter is opened
Operate Changeover Handle	Day	
Clean and Lubricate: Cover Nuts & Studs, Cock spindle, Upper & Lower Cock	Year	General Purpose Grease

Re: General Purpose Grease: Use a good general purpose grease such as Castrol Spheerol LMM or BP Energrease Universal.



5.0 Specifications

Model	OW/O	OW/WB	OW/S	OW/S A300	OW/S/WB	OW/C	OW/GM	OW/SS	OW/SS A300
Body & Cover	Cast Iron EN1561 EN-JL 1030	Cast Iron EN1561 EN-JL 1030	Cast Steel EN10213- 2 1.0625	Cast Steel EN10213- 2 1.0625	Cast Steel EN10213- 2 1.0625	Cast Iron EN1561 EN-JL 1030	Gunmetal (Bronze) BS1400 LG4C	St. Steel BS1504 316 C16	St. Steel BS1504 316 C16
Sleeve	–	Gunmetal (Bronze) BS1400 LG4C	–	–	Gunmetal (Bronze) BS1400 LG4C	–	–	–	–
Changeover Cocks	SG Iron EN1563 EN-JS 1020	Gunmetal (Bronze) BS1400 LG4C	SG Iron EN1563 EN-JS 1020	SG Iron EN1563 EN-JS 1020	Gunmetal (Bronze) BS1400 LG4C	St. Steel BS1504 316 C16	Gunmetal (Bronze) BS1400 LG4C	St. Steel BS1504 316 C16	St. Steel BS1504 316 C16
Internal Components	Mild Steel BS970 220 MO7	St. Steel BS970 303 S31	Mild Steel BS970 220 MO7	Mild Steel BS970 220 MO7	St. Steel BS970 303 S31	St. Steel BS970 303 S31	Phosphor Bronze BS1400 PB1	St. Steel BS970 303 S31	St. Steel BS970 303 S31
Baskets	Type 316 Stainless Steel								
Drain Plugs	Brass	Brass	Stainless Steel	Stainless Steel	Brass	Stainless Steel	Phosphor Bronze	Stainless Steel	Stainless Steel
Standard Seals	Viton®	Viton®	Viton®	Viton®	Viton®	Viton®	Viton®	Viton®	Viton®
Max Non- Shock Working Pressure	17 barg at 50°C	17 barg at 50°C	22 barg at 50°C	50 barg at 50°C	22 barg at 50°C	17 barg at 50°C	17 barg at 50°C (1)	22 barg at 50°C	48 barg at 50°C
Body Colour	Red	Blue	Silver	Silver	Silver	Blue	Natural	Natural	Natural

- 1) Gunmetal (bronze) DN20, 25 and 40 filters are rated at 13.8 bar at 50°C.
Viton is a registered trademark of DuPont performance Elastomers.



6.0 Specifications (continued)

Cast Iron DN150 (6") multibasket OW filters are made from SG Iron (EN1563 EN-JS1020). Cast Iron filter covers DN80 (3") and above are made from SG Iron (EN1563 EN-JS1020).

The OW range of filters is available in a number of formats to suit most applications. The table shows the standard formats available and lists the materials of construction, maximum working pressure and the relevant colour code.

Other body, cover, seal and basket materials are available on request.

The table should be considered as guidance only. The pressures stated (at 50°C) are accurate, but any variance in operating temperature results in a corresponding change to the maximum operating pressure. Extra caution is required for filters to be operated below 0°C or above 100°C.

Consult your Celeros FT Sales/Applications Engineer for guidance on specific applications.

7.0 Hazardous Fluids & Pressures

The filters, when despatched from CELEROS FT, do not contain substances specifically hazardous to health, but may have a thin coating of oil based corrosion preventative on machined & internal surfaces.

If the fluid to be filtered is in any way hazardous, the operator and the environment should be suitably protected. Care should be exercised if the fluid at atmospheric conditions is above its boiling point.

Relieve the pressure in the filter before opening the filter cover.

Do not make any adjustments whilst the filter is pressurised.

If a 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.

8.0 'O' seal temperature limits

In addition to the Pressure/Temperature limits stated in section 5.0, the operating temperature of the filter is limited by the elastomer seals fitted. Each should be considered entirely separately when considering the suitability of the filter for a given application.

Viton®	-20°C to +200°C
Ethylene Propylene	-50°C to +150°C
PTFE Encapsulated Viton	-20°C to +200°C
PTFE Encapsulated Silicone	-55°C to +260°C

The above values are guidelines based upon absolute compatibility with the process fluid and are not binding due to unknown factors that may be detrimental to the performance of the 'O' seals.



9.0 Legislative Conformity

All cast OW filters marketed within the European Union comply with the European Pressure Equipment Directive (2014/68/EU).

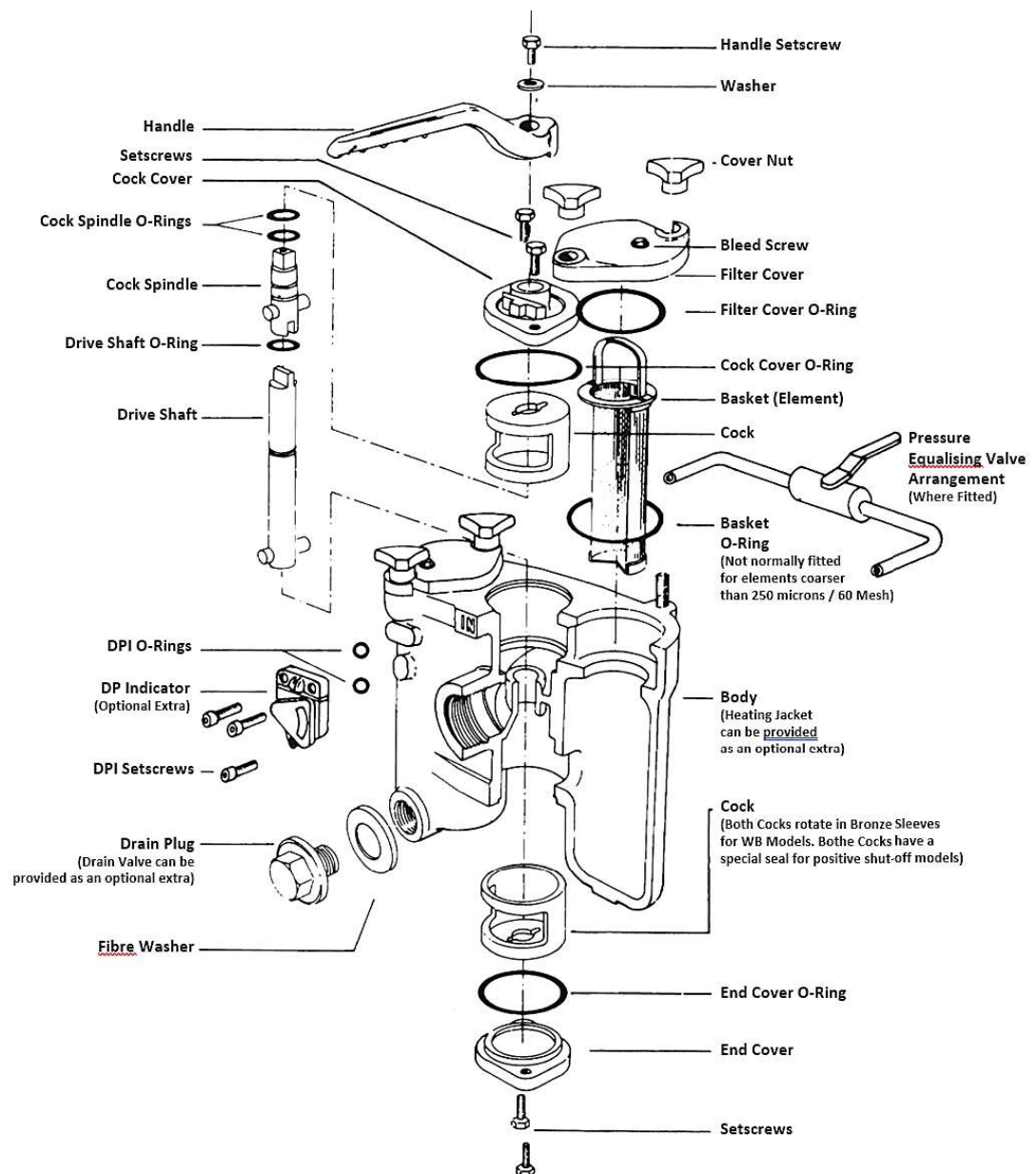
All cast OW filters marketed within the United Kingdom comply with the Pressure Equipment (Safety) Regulations 2016.

Where applicable, cast iron OW filters are to be restricted to Sound Engineering Practice applications only.

Designs to alternative international codes and standards are available for some models.

Consult your Celeros FT Sales/Applications Engineer to discuss your specific requirements.

10.0 Exploded View – Main Components



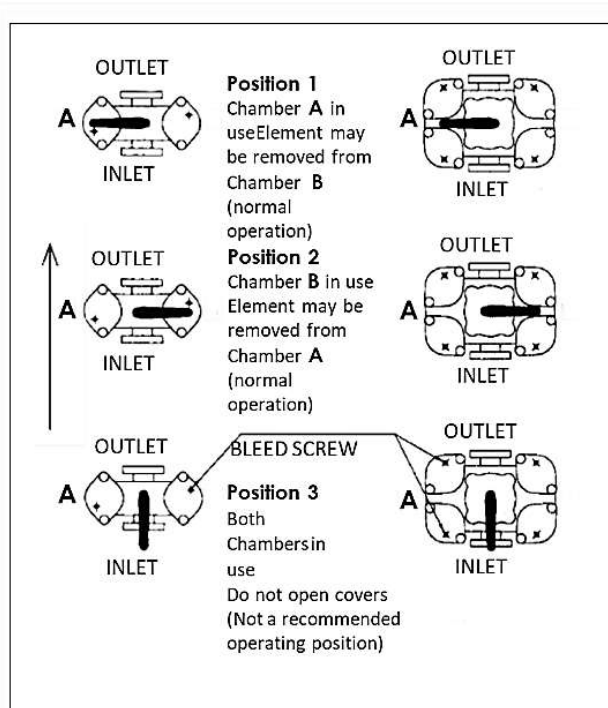
11.0 Exploded View – Main Components (continued)

Notes:

- 1) All filters have ½" drain plugs.
- 2) Filters with threaded inlet/outlet ports can be either NPT or BSP threads.
- 3) The drain port can be threaded NPT or BSP.
- 4) When ordering spares please define (as appropriate):
 - Filter size and body material.
 - Seal kit material (e.g. Viton® or EPDM).
 - Basket mesh size.
- 5) A Differential Pressure Indicator (DPI) may be fitted as an optional extra to indicate when the basket needs cleaning.
- 6) O-Rings and seals are available as a Seal Kit:
 - Cover O-Rings
 - Basket O-Rings
 - Cock Spindle O-Rings
 - Drive Shaft O-Rings
 - Bleed Screw Washer
 - Drain Plug Washer

Illustrations shown are not binding. The right to change specification without notice is reserved.

12.0 Schematic - Filter Function for differing Handle Positions





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| SPEED
| EXCELLENCE
| PARTNERSHIP



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For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.celerosft.com.

Celeros Flow Technology reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing.

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