

INDUFIL FCF (FLOW CONDITIONED FILTER)

SEAL GAS FILTRATION SYSTEM



DESIGN BENEFITS

- Standard compliance to ASME VIII Div. 1/PED/ATEX Ex II 2G and in accordance with API 692
- Optimized filter design and oleophobic media increase filtration efficiency and coalescing performance to improve dry gas reliability
- Easy installation, each filter can be configured to suit any application
- Compact, reduced component design enables smaller footprint

PRODUCT DESCRIPTION

Indufil FCF Seal Gas Filtration Systems are available in single and duplex configuration, in stainless steel as a standard and in higher alloys. The filters comply with international pressure vessel and design codes and were designed in alignment with API 692.

In addition to complying to filtration requirements for contaminants of 1 micron and smaller at efficiencies of 99.9%, these new filtration systems are engineered to improve dry gas seal reliability, simplify maintenance and reduce system footprint.

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Design Features

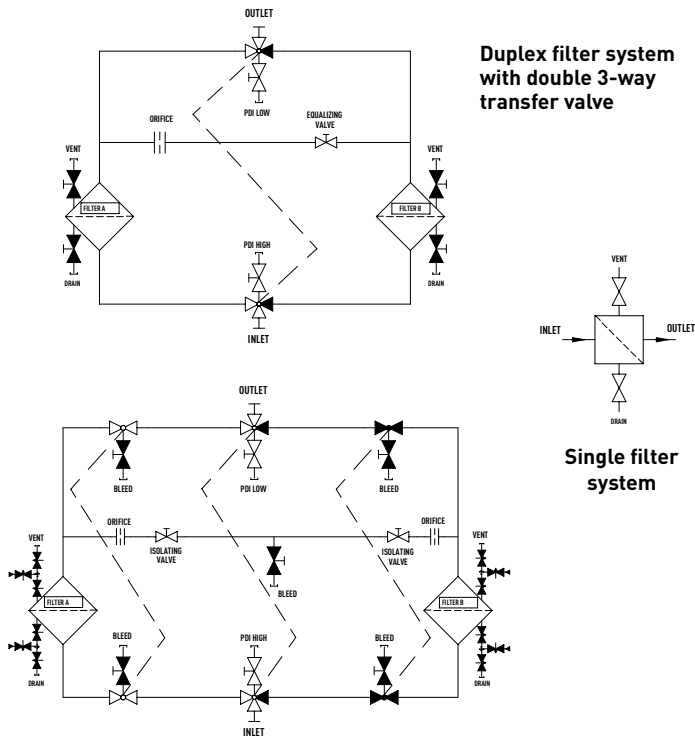
- Combined coalescing and particle filtration functionality
- All filter systems can be equipped with double three-way, zero leakage transfer valves
- Transfer valves are available in single block or double block and bleed arrangement
- All needle valves on drain/vent connections are lockable as an option with bolted bonnets instead of screwed closure
- Both transfer valve and needle valves are standard and compliant to fugitive emission according to ISO 15848
- Fire safe and insulation options are available

Performance Capabilities

Filtration Efficiency	Liquid Removal	Pressure Limits	Temperature Limits
Down to 1 μm and efficiencies to 99.9%/ β 1,000	Down to 0.005 ppm (w)	Up to 413 bar/5990 psi max.	-70° to 250°F/-94° to 482°C

System Configuration: Single/Duplex/Double Block and Bleed

Every filter system requires periodical maintenance when filter elements need to be replaced. The advantage of a duplex filter configuration is that the operating process is not interrupted during standard maintenance. The zero leak double 3-way transfer valve easily changes over the flow to the standby filter housing isolating the housing that requires maintenance without interrupting the gas flow. When working with hazardous gas, additional safety can be required and a double block and bleed configuration is advised. The double block and bleed valve operates with three valves in line adding an extra isolation seal to the standby filter housing. As the operator must changeover three times to change the flow, accidental changeover is minimized. The bleeds guarantee trapped gas between the valves can be removed in a controlled process.




Duplex filter system
with double block
and bleed and 3-way
transfer valve

Duplex filter system
with double 3-way
transfer valve

Single filter
system

SEAL GAS FILTRATION SYSTEM

System Options







Filter Element options						
	Temperature	Media and Construction	Construction Materials	Application	Rating	Particulate Efficiency
	<=150C°	Glassfiber, standard epoxy bonded	Standard stainless steel 316 caps and core with higher grade alloys as option	Particulate only or combined particulate and coalescing	1 / 3 / 10 micron	99.9% / B1000
	<=200C°	Glassfiber, high temperature epoxy bonded				
	<=320C°	Stainless steel, full welded construction				

Elastomers

Indufil seal gas filters use a bolted design which avoids welded connections and enables easy maintenance and a compact footprint. To seal of the gas flow Indufil filter systems uses elastomer O-rings. As a standard Indufil filters come with high quality FKM elastomer O-rings that have an improved protection against explosive decompression and have a temperature range from -40 C° to 220 C°. Indufil filters can be equipped with special application O-ring compounds on request (see more information on Demanding Conditions).

Connections

The bolted design of Indufil seal gas filter provides high flexibility in connection configurations according to end user specification, and any connection type can be combined with the configurations described. If any other type of connection is requested, contact the local John Crane office for more information.

Connection type	Configurations for drain and vent	
Flanged RF		No block 
Flanged RTJ		Single block 
NPT		Double block 
BSP		Double block and bleed 

SEAL GAS FILTRATION SYSTEM

Further Options

Larger gas flows and gas flows with high volumes of liquid may need pre-separation, measurement and management of the drained liquid.

Pre-separation option	
Cyclone	Installed before the filter element using rotational effects of gravity to separate bulk mixtures of solids and fluids for the gas flow.
Demister	Installed before the filter element, but after a cyclone, to further condition (enhance liquid droplet removal) the gas flow. The demister has a stainless-steel knitted wire mesh pack that efficiently removes larger liquid droplets.
Reservoir	A reservoir is an extension to the bottom of the filter housing, or a separate vessel where the drained liquids are collected. Available in 0.5 – 5.0 l.
Level measurement	Visual and automated level measurement options are available for the reservoir: <ul style="list-style-type: none"> • Level Glass: Rectangle vertical glass on the outside of filter housing • Level Gauge: External measuring instrument connected to the reservoir plus integrated visual level indication • Level Switch and Transmitters: Devices measuring the liquid level and sending a signal to the control room when alarm point has been reached.
Auto drain	When the liquid level alarm point is reached the auto drain automatically opens and closes the drain to remove the liquids in the reservoir.
External Pre separator	Where liquid concentrations are too high to be separated in the filter housing, API prescribes the use of an external pre separation unit, see separate information on pre separator solutions.

Demanding Condition /Harsh Environments

Elastomers

Options for demanding applications:

- H₂S (Hydrogen Sulfide) Sour gas
- Low temperature capability up to -94°F/-70°C
- Ultra high temperature materials up to 482°F/250°C
- AED (anti-explosive decompression) materials in FFKM

Higher alloys

Standard Indufil Seal gas filters are manufactured in stainless steel 316L protecting the filter system against most environments. For increased durability and safety (E.g. Norsok), John Crane offers higher alloys for the bolting or complete filter system:

- (Super) Duplex stainless steel
- Inconel 625
- Incoloy 825
- Monel
- Titanium

Insulation

Options are available for vessel insulation to protect equipment and employees against extreme high and low temperatures.

Firesafe valves

Optional firesafe valves protect the filter transfer valve against external leakages in case of a fire.

Materials

Standard European materials on all pressure-containing parts. Local content available on request. As standard all Indufil pressure containing metal parts are supplied with Type 3.1 certification. This is an inspection certificate according to EN 10204:2004 that declares the 'metallic products' are in compliance with the order requirements and testing.

All higher alloys can be supplied with Type 3.2 certification which provides full material traceability. Such certification provides clarity and confidence when working with complex global supply chains.



Your Name
Is How We Make Ours

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Together, we will work with you to keep your mission-critical operations up and running with support and guidance from our experienced team.



North America	Europe	Latin America	Middle East & Africa	Asia Pacific
United States of America	United Kingdom	Brazil	United Arab Emirates	Singapore
Tel: 1-847-967-2400	Tel: 44-1753-224000	Tel: 55-11-3371-2500	Tel: 971-481-27800	Tel: 65-6518-1800
Fax: 1-847-967-3915	Fax: 44-1753-224224	Fax: 55-11-3371-2599	Fax: 971-488-62830	Fax: 65-6518-1803

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