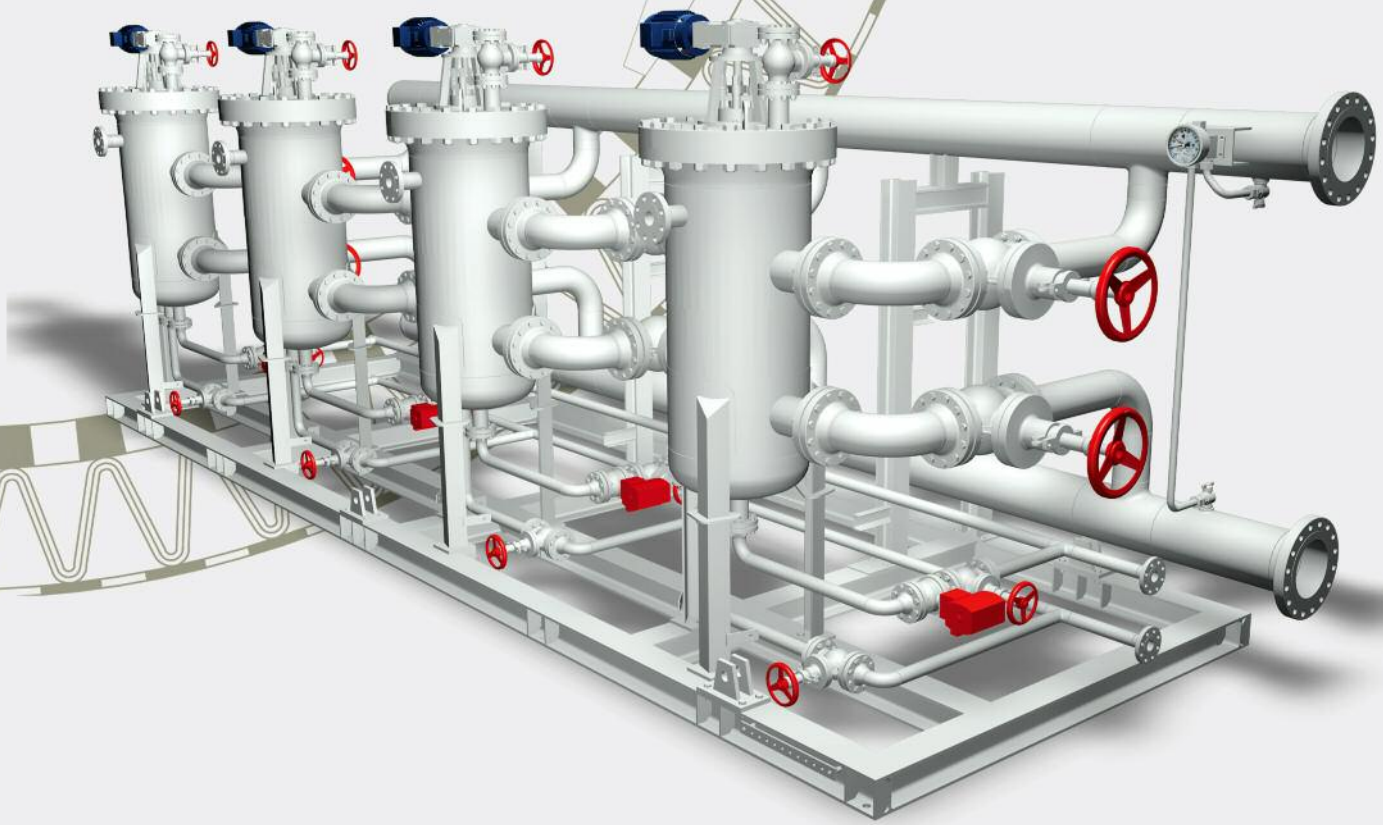
FILTREX®

ACR

Automatic Backwashing Filter



Advanced Refinery Filtration

FILTREX **ACR** Advanced Filtration

The ACR Filtration Technology

It is a unique, superior technology successfully demonstrated in many commercial operations, which uses a proprietary wire mesh as filtering medium. The mechanical strength of the wire mesh is achieved by inserting it into two “pleated” screens which are inserted into a strong cartridge.

Such assembly constitutes the filtering element of the ACR filter.

The filtering element is placed into a filter vessel ensuring a very simple construction and assembly with reduced plot area requirements.

A key feature of this technology is the presence of a rotating shaft inside the filtering element, which drastically reduces the consumption of wash oil during the automatic backwash phase.

The shaft also ensures a very high backwash efficiency and allows the filtration phase to continue while the backwash phase takes place.

The ACR Filter backwashes on-condition (by DCS automated mode) based on delta pressure, by an adjustable independent timer (timer mode) or when initiated by operator (manual mode).

Characteristics which make the ACR Filters unique

The high efficiency of the backwash is the key to the superior performance. This parameter is simply measured by monitoring the pressure drop between the filter inlet and outlet after each backwash cycle. This pressure drop remains constant and close to zero in all the operating ACR filters confirming that there is no cake accumulation on the filtering element as function of time.

The absence of a substantial cake formation on the wire mesh allows the ACR filter to operate at a low pressure drop (about 0.5 bar or 7.0 psi) avoiding contaminant and asphaltene agglomeration.

The design flexibility to sustain large variations in solids content. Because of the short time required to backwash a filter vessel (about 10 seconds), the ACR filter is able to cope with a sudden increase in the solids content simply by increasing the frequency of the backwashes.

The very small consumption of wash oil (much less than 1% of the feed to the filter) ensures significant savings in operating costs and provides R.O.I. time for new investments in 6-10 months

The ACR technology can operate with all the heaviest and viscous fluids at an absolute filtration degree of up to 4 microns. This means that no particles bigger than the specified filtration degree can be found after the filter due to a removal efficiency of 100%.

The Advantages

Improved production.
Wash oil savings of 97% when compared to any conventional technologies.
Reduced reactor catalyst skimming requirements.
Lower operating and maintenance costs reducing by 60-80% the number of valves avoiding the requirement for a dedicated PLC.
No need for ordinary maintenance. More than 2 years without any scheduled maintenance.
Smaller plot area 50% than a conventional filter, allows to cope with any footprint and easily retrofits existing filtration systems.
Every single unit supplied so far is in operation with complete customer’s satisfaction

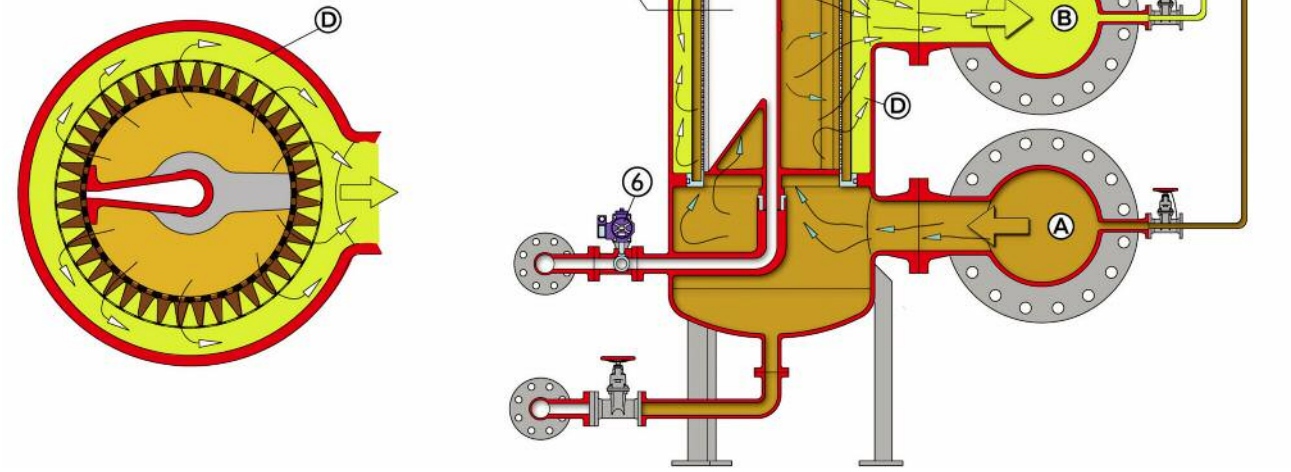
The Task

Reliable and efficient filtration of:
Vacuum residuum (VRDS)
Atmospheric residuum (ARDS)
Slurry Oil (SO)
Cycle Oil (CO)
Coker Gas Oils (CGO) and Heavy Coker Gas Oils (HCGO)
Vacuum Gas Oils (VGO) and Heavy Vacuum Gas Oils (HVGO)
Atmospheric Gas Oil (AGO), Diesel
Naphtha
Amines

Backwash using the same filtered fluid

PHASE 1 - FILTRATION

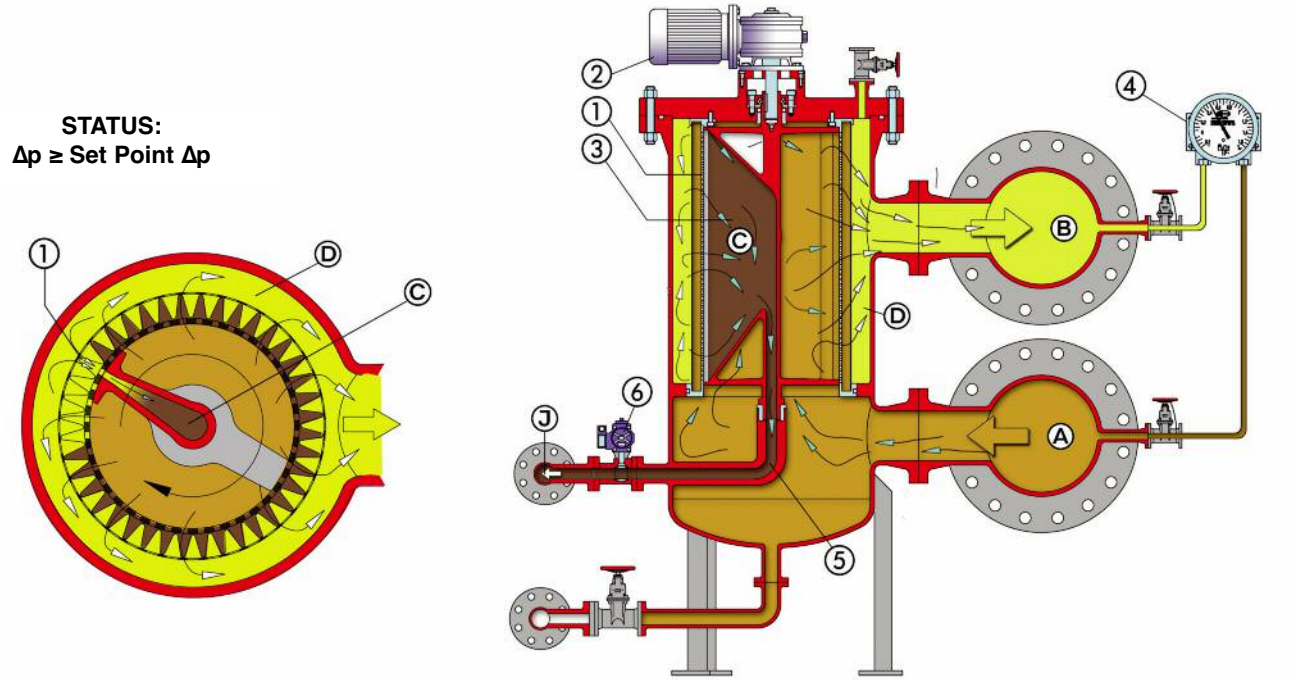
STATUS:
Δp < Set Point Δp



1 - FILTRATION:
The fluid enters from Ⓐ, and flows through all the sectors ① (inside-outside filtration).
The filtered fluid is collected in chamber Ⓓ and exits from Ⓑ.
During this phase the filter operates as a static filter and the cleaning of the cartridge is not operating.
As more and more impurities build-up on the cartridge surface, the differential pressure Δp shown on the differential gauge ④ gradually increases with time until it reaches the set-point value starting the Phase 2 (filtration and cleaning).

PHASE 2 - FILTRATION and CLEANING

STATUS:
Δp ≥ Set Point Δp



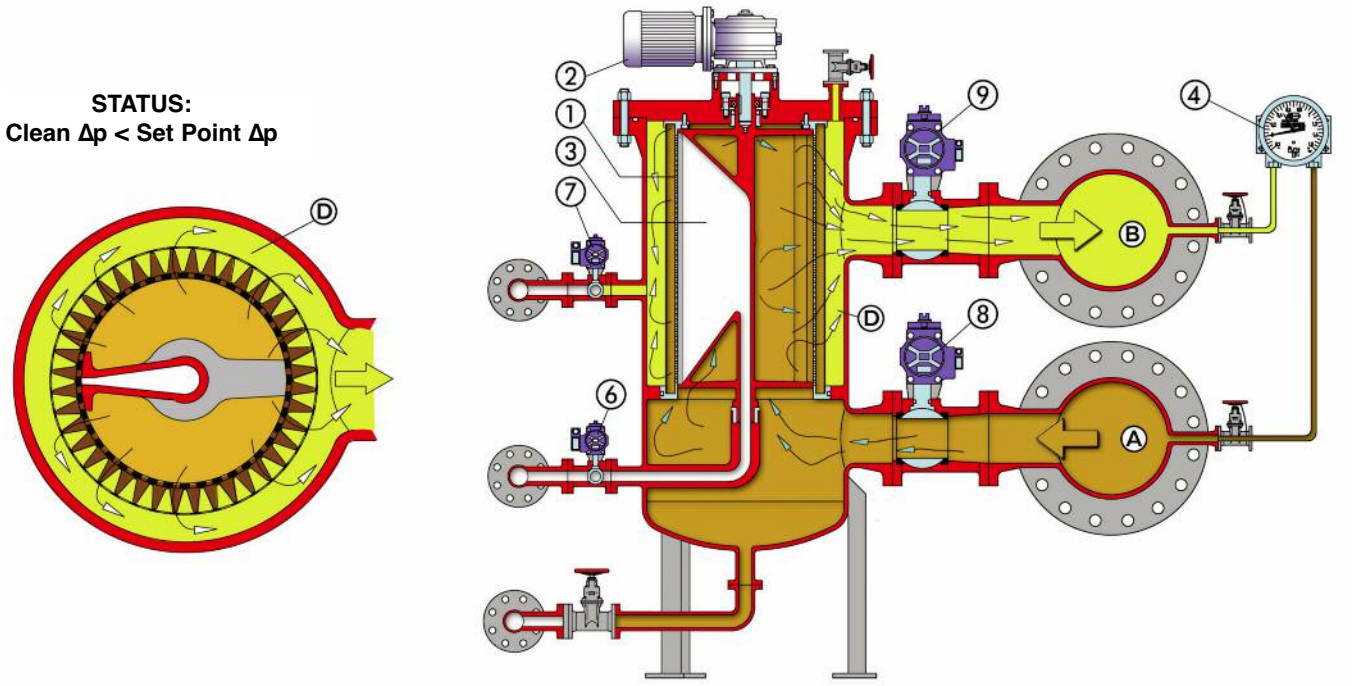
1 - FILTRATION:
Filtration is continuously ensured by all sectors ① (inside-outside filtration).

2 - CARTRIDGE CLEANING:
While all the filtering sectors are in the filtration mode, the sector ① in front of the nozzle ③ is cleaned by the filtered feed flowing in reverse sense of filtration from the chamber Ⓓ to the chamber Ⓒ (outside-inside backwash) which then exits from the nozzle Ⓙ through the open backwash outlet valve ⑥.
The impurities are carried by the backwash fluid (filtered feed) through the chamber Ⓒ into the duct ⑤ and evacuated from the nozzle Ⓙ.
At the end of the backwash set-time, the motor ② stops and the backwash valve ⑥ closes, thus returning to normal filtration (Phase 1).

Backwash using external fluid

PHASE 1 - FILTRATION

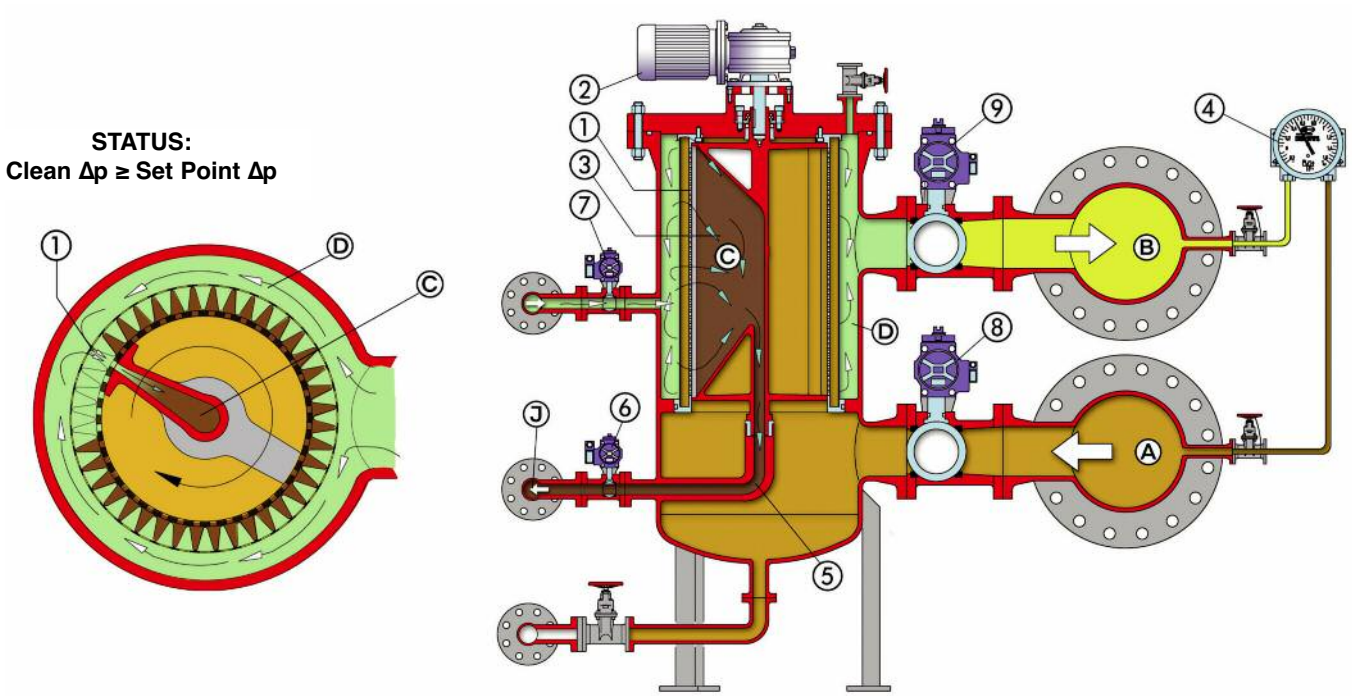
STATUS:
Clean Δp < Set Point Δp



1 - FILTRATION:
The fluid enters from Ⓐ, and flows through all the sectors ① (inside-outside filtration).
The filtered fluid is collected in chamber Ⓓ and exits from Ⓑ.
During this phase the filter operates as a static filter and the cleaning of the cartridge is not operating.
As more and more impurities build-up on the cartridge surface, the differential pressure Δp shown on the differential gauge ④ gradually increases with time until it reaches the set-point value starting the Phase 2 (cleaning).

PHASE 2 - CLEANING

STATUS:
Clean Δp ≥ Set Point Δp



1 - FILTRATION:
Filtration is stopped by closing the main inlet and outlet valves ⑧ and ⑨.

2 - CARTRIDGE CLEANING:
Backwashing is performed using a clean external washing oil (WO) through the open backwash inlet and outlet valves ⑦ and ⑥.
The sector ① in front of the nozzle ③ is cleaned by the WO flowing in reverse sense of filtration from the chamber Ⓓ to the chamber Ⓒ (outside-inside backwash) which enters from the open inlet backwash valve ⑦, and exits from the nozzle Ⓙ through the open backwash outlet valve ⑥.
The impurities are carried by the WO through the chamber Ⓒ into the duct ⑤ and evacuated from the nozzle Ⓙ.
At the end of the backwash set-time the motor ② stops, the backwash valves ⑦ and ⑥ close, the main inlet and outlet valves ⑧ and ⑨ open, thus returning to normal filtration (Phase 1).

Constant Research is the key to a successful product

Research has always been on top of Filtrex priorities.

The company has invested heavily in sophisticated testing rigs and laboratories.

The effort has produced the most advanced filtering equipments available today.

Don't use old technology, it's time to switch to the state of the art

Feed Filter for Hydrocraker Unit (Blend of HCGO/HVGO) Port Arthur, USA

Feed Filter for CR-40 DAO GOFINER Unit (Deasphalted Oil) Priolo Gargallo, Italy

Feed Filter for DHDS Unit (Blend of VGO/LCO), Mumbai, India

Feed Filters for Hydrocracker Unit (HCGO) – Sakai, Japan

Feed Filter for Hydrocraker Unit (HCGO) - St. Charles, USA

Feed Filter for Hydrocraker Unit (VGO) – Bangkok, Thailand

FILTREX *a worldwide organization*

Filtrex s.r.l. with its headquarters and state of the art manufacturing facilities in Milano, Italy provides filtration solutions and technical services to many industries such as hydrocarbon, chemical, environment protection, power generation, water treatment, Navy and marine transport. Filtrex operates from its headquartes in Italy and through worldwide branches, and has received prestigious certifications for quality and standards of engineering and manufacturing.

Filtrex provides its customers with a comprehensive scope of work, services and supply, preparing the engineering design specifications and P&ID's, purchasing equipment and materials, fabricating and assembling the filters into module(s) in its fabrication shop, furnishing data books and operating manuals, and providing technical services for inspection, installation, commissioning, start up and after start up.

Filtrex Corporate Headquartes - Milano (Italy)

Filtrex Manufacturing Unit #4 - 22,000 covered sqmt - Vignate (Italy)

ACR is only one of the comprehensive range of filters manufactured by FILTREX.
Please contact us for details and documentation

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