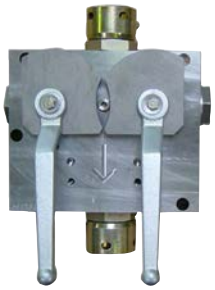
Backflushing High Pressure Filters RFH



Backflushing Filter

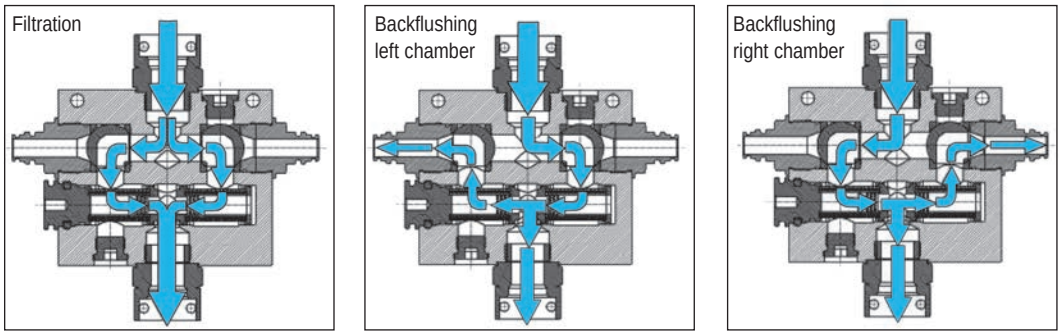
The backflushing high pressure RFH filter is an easy-to-operate backflushing filter for water-based fluids at operating pressures of up to 5076 psi (350 bar). The main application of this filter is to protect shield hydraulics in mining. However, other applications are possible, such as, in the rotary valve hydraulics of pumped storage hydrostations, paint filtration or the protection of high pressure nozzles. Three sizes are available and flow rates of up to 210 gpm (800 L/min) can be achieved.

The backflushing is carried out manually using switch levers. To some extent the filters can also be controlled electrohydraulically or purely hydraulically. Robust filter materials in stainless steel are available, such as slotted tube or multi-layered wire mesh.

Construction and Function

Sizes RFH-1 and RFH-2 consist of stainless steel housing blocks which can be mounted to the supporting structure by means of the bore holes in the corners of the housing.

On the RFH-4, just the filter head is designed as a housing block. In this version, the elements are in two screw-in cylinder bowls. The inlet and outlet connections are opposite each other (inline model). The backflushing ports are on the side. Ensure connection of the backflushing lines to these ports is secure because of the high pressures. A slotted tube or a wire mesh element, which is divided into two filter chambers, is fitted in the filters RFH-1 and RFH-2, respectively. In the RFH-4, two divided elements are fitted. Each filter chamber or each element is backflushed manually by switching a ball valve.



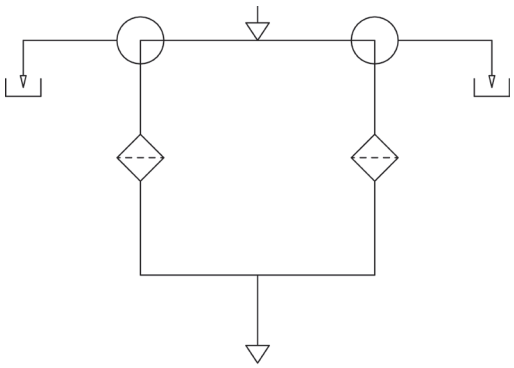
Filtration

The fluid to be filtered flows through both chambers of the filter element from the outside to the inside. The filtrate flows through a T-piece between the two element halves to the outside. Both switch levers indicate the direction of filtration.

Backflushing

Both filter chambers are back-flushed one after the other using their own filtrate when the relevant lever is switched. When backflushing, the flow is reversed into the relevant element segment and removes the contamination from the surface. During the backflushing process, filtration continues via the other half of the element. The flushing time should be 1 to 2 seconds per element half.

In order to prevent both filter chambers being flushed at the same time, the change-over lever is fitted with a rotating lock mechanism. This prevents any interruption to the flow of filtered fluid as a result of incorrect operation.



Circuit Diagram

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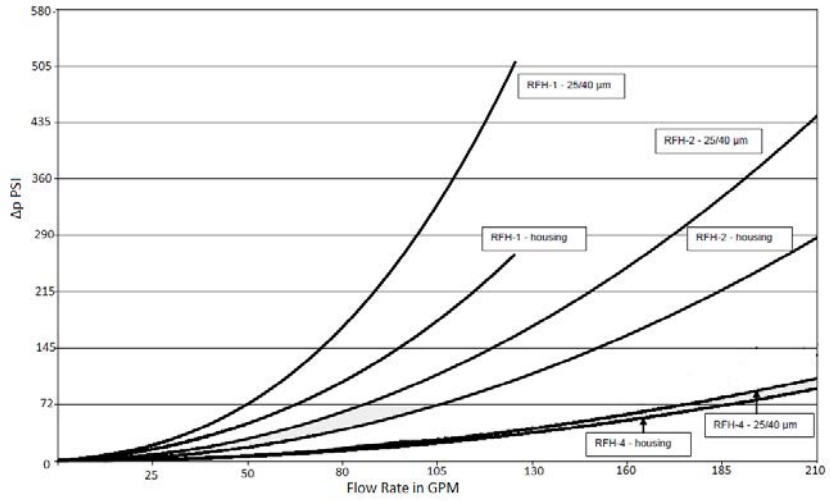

Filter Calculation / Sizing

- For slotted tube filter inserts of 100 µm and 200 µm, the pressure drop curves apply, similar to the 25 µm and 40 µm wire mesh.
- When using 50 µm slotted tube filter inserts, 30% more pressure drop must be added to the valid curves.
- Please take into account the lower permissible differential pressure of the elements when using slotted tube elements.

In order to be able to size the filter correctly, the following design data should be available:

- Flow rate
- Materials
- Required filtration rating
- Type of contamination
- Operating temperature – must be below the boiling point of the medium
- Type of medium
- Viscosity
- Particulate loading in the fluid
- Operating pressure
- Integration of the RFH in the whole system

Filter sizes 1 and 2 are designed as a back-up filter for low levels of solid particle contamination. Due to the greater filter area, the RFH-4 is also suitable for higher particle concentrations. As with all backflushing filters, fibers and sticky substances cause problems when backflushing with the filter, too. Use the flow rate curves for water and emulsion applications to calculate the filter. The initial pressure drop for clean elements can be selected between 2 and 72 psi (0.1 and 5 bar) depending on the operating pressure and level of contamination. The shield hydraulics in coal mining represent a special case. For this application, initial differential pressures of up to 362 psi (25 bar) are usual.