Magnetic Filter

Magnochem, Magnochem-Bloc

Supplementary Operating Manual

Legal information/Copyright

Supplementary Operating Manual Magnetic Filter

Original operating manual

Contents

1 Supplementary Operating Manual

1.1 General

This supplementary operating manual accompanies the installation/operating manual. All information contained in the installation/operating manual must be observed.

Table 1: Relevant operating manuals

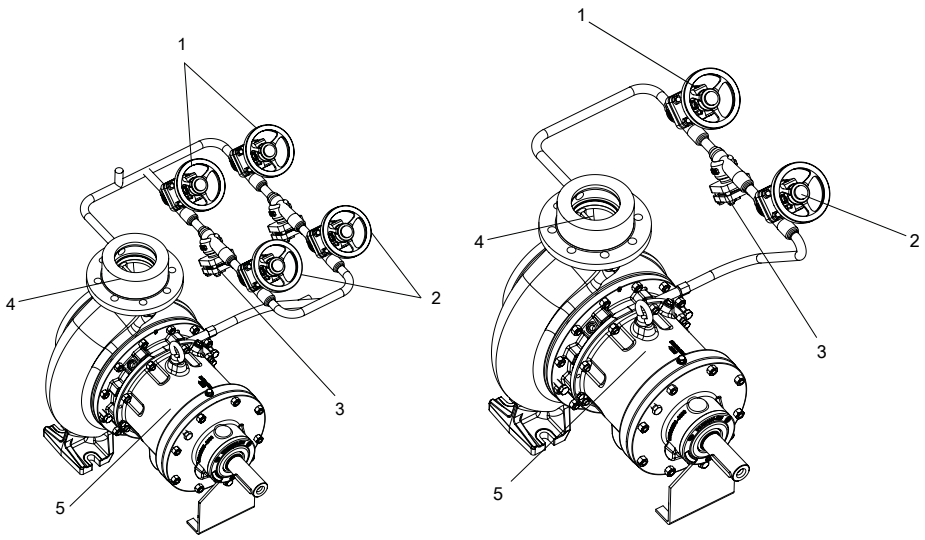
Type series	Reference number of the installation/operating manual
Magnochem	2747.8
Magnochem-Bloc	2747.81

Manufacturer's product literature

For accessories and/or integrated machinery components observe the relevant manufacturer's product literature.

1.2 Design and function

The magnetic filter is designed for use in circulation circuits to filter liquids containing magnetic and non-magnetic contaminants, which must be removed to protect the rotor space.



Double-branch circulation layout

Single-branch circulation layout

1	Shut-off elements upstream of the filters	2	Shut-off elements downstream of the filters
3	Magnetic filter	4	Main flow filter
5	Rotor space of magnetic coupling		

Function

Double-branch design

Coarse particles are filtered from the fluid handled with the (self-cleaning) main flow filter.

From the main flow filter the fluid handled is pumped through one of two parallel pipe branches to the rotor space of the magnetic coupling.

Each pipe branch comprises a magnetic filter as well as a shut-off element upstream of the filter and a shut-off element downstream of the filter.

During operation only one pipe branch is open and filters dirt particles (especially magnetic particles) out of the fluid handled. The second pipe branch is only used when the first pipe branch is shut off so cleaning work can be performed at its magnetic filter.

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Single-branch design

Coarse particles are filtered from the fluid handled with the (self-cleaning) main flow filter.

From the main flow filter the fluid handled is pumped through the pipe branch to the rotor space of the magnetic coupling.

The pipe branch comprises a magnetic filter as well as a shut-off element upstream of the filter and a shut-off element downstream of the filter.

During operation the pipe branch is open and filters dirt particles (especially magnetic particles) out of the fluid handled.

1.3 Monitoring the magnetic filter

As the magnetic filter will become clogged by particles after a period of time, it has to be monitored.

DANGER

Clogged magnetic filter

Explosion hazard by excessive surface temperature!

Damage to the pump set!

▹ Monitor the magnetic filter. Clean it when necessary.

The following monitoring methods are available:

- Monitoring the containment shroud temperature with a thermocouple or Pt100 resistance thermometer
- Monitoring the pressure difference

1.3.1 Monitoring the containment shroud temperature with a thermocouple or Pt100 resistance thermometer

1.3.1.1 Function

The containment shroud temperature is measured with a thermocouple or a Pt100 resistance thermometer. If the magnetic filter becomes clogged by solid particles, the flow rate through the magnetic coupling will be reduced. This will lead to a temperature increase at the containment shroud.

1.3.1.2 Determining the trigger value

NOTE

After any changes to the fluid temperature or system speed, the trigger value must be re-determined and re-set.

Steady state

Steady state is reached when the temperature rise does not exceed 2 K/h (to EN 13463-1: 2009-07).

✓ The magnetic filter has been cleaned.

1. Start up the pump set.
2. Operate the pump set at duty point until the containment shroud temperature has reached steady-state condition.
3. Note down the containment shroud temperature as **Temperature A**.
4. Calculate the containment shroud steady-state temperature:
   Temperature A + 5 K = containment shroud steady-state temperature
5. Set the trigger value to the calculated containment shroud steady-state temperature.

1.3.1.3 Setting the calculated trigger value

Enter the calculated trigger value in the customer-supplied monitoring systems in accordance with the manufacturer's product literature.

1.3.2 Monitoring the pressure difference

1.3.2.1 Function

The pressure is measured upstream and downstream of the magnetic filter. If the permissible pressure difference is exceeded, a warning signal must be triggered.

1.3.2.2 Determining the trigger value

The maximum pressure loss value (contamination of the magnetic filter) serves to trigger a warning signal indicating that the magnetic filter needs cleaning. This value must be determined in tests at the site.

Steady state

Steady state is reached when the temperature rise does not exceed 2 K/h (to EN 13463-1: 2009-07).

1. Start up the pump set.
2. Note down the pressure readings on the pressure gauges.
3. Operate the pump set at duty point until the rotor space temperature has reached steady-state condition.
4. In the active magnetic filter pipe branch slowly close one of the two shut-off elements in several increments. Monitor the rotor space temperature during this process. When the containment shroud temperature begins to increase, the maximum pressure loss between the measurement points has been reached.
5. Again, note the pressure difference (= value which triggers the warning signal).
6. Fully open the throttled shut-off element again.

1.3.2.3 Setting the calculated trigger value

Enter the calculated trigger value in the customer-supplied monitoring systems in accordance with the manufacturer's product literature.

1.4 Supervision of operation

1. Monitor the rotor space temperature during operation.
2. If a temperature rise is detected in the rotor space, clean the magnetic filter. (⇨ Section 1.5, Page 6)

1.5 Cleaning the magnetic filter

1. **Single-branch design only:** Switch off the pump set.
2. **Double-branch design only:** Open the shut-off elements upstream and downstream of the uncontaminated magnetic filter to maintain circulation.
3. Close the shut-off elements upstream and downstream of the contaminated magnetic filter.
4. Allow the contaminated magnetic filter to cool down to ambient temperature.
5. Clean and re-insert the contaminated magnetic filter in accordance with the manufacturer's product literature.
6. **Single-branch design only:** Switch on the pump set.

1.6 Cleaning intervals

The necessary cleaning intervals depend on the level of contamination of the fluid handled. It is advisable to clean the filter on a daily basis following commissioning of the pump set and then to schedule cleaning intervals depending on the degree of contamination.

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