Oil Mist Filter

ONF 4-20
1. Safety Instructions .................................. 2
   1.1. For Your Orientation .............................. 2
2. Understanding the Oil Mist Filter .. 3
   2.1. Application and Use ............................. 3
   2.2. Design .............................................. 3
3. Installation and Operation.............. 4
   3.1. Fitting The ONF ................................. 4
   3.2. Fitting The Oil Return Line For The DUO 10
        (PK 196 173-T) ................................... 4
4. Maintenance ....................................... 5
   4.1. Draining the Operating Fluid .................. 5
   4.2. Changing the Filter Cartridge .................. 5
5. Technical Data ................................. 5
6. Spare Parts ........................................ 5
7. Accessories ....................................... 5
Declaration Of Contamination ............. 6

1. Safety Instructions

☞ Read and follow all instructions in this manual.
☞ Inform yourself regarding:
   – Hazards which can be caused by the pump;
   – Hazards which can be caused by your system.
☞ Observe the safety and accident prevention regulations.
☞ Regularly check that all accident prevention measures are being complied with.
☞ Do not carry out any unauthorised conversions on or alterations to the unit.
☞ When returning units, take note of shipping instructions in the Section “Service”.

1.1. For Your Orientation

Instructions in the text
➡ Operating instructions: Here you have to do something!

Symbols used
The following symbols are used throughout in the illustrations:
Vacuum flange
Exhaust flange

Position numbers
Identical components and accessories parts have the same position numbers in all illustrations.

Pictogram definitions

WARNING
Danger of personal injury.

WARNING
Danger of burns from touching hot parts.

CAUTION
Danger of damage to the unit or to the system.

PLEASE NOTE
Attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Please note:
Current operating instructions are also available via www.pfeiffer-vacuum.net.
2. Understanding the Oil Mist Filter

2.1. Application and Use

The oil mist filter is fitted to the exhaust port of the rotary vane vacuum pump. It reduces air pollution by operating fluid mist expelled in greater or smaller quantities (depending on the working pressure) from the pump.

The Oil Mist Filter ONF 4 - 20 is suitable for rotary vane vacuum pumps with smaller gas throughputs, up to a volume flow rate of 20 m$^3$/h.

The ONF 4 - 20 is specially suitable for Pfeiffer Vacuum rotary vane vacuum pumps DUO 5/10/20.

The filter is not suitable where the pumping of corrosive gases and vapours or those gases which tend to polymerise or which can cause resinification of the oil mist filter is involved.

2.2. Design

A micro-fibre cylindrical filter cartridge is encased in plexiglass. A pressure plate is pressed down onto the filter element by a spring. The arrangement of pressure plate and spring is such that it works as an over-pressure valve and opens when the filter element becomes dirty.

Separated operating fluid can be observed through the plexiglass and drained off via the drain screw.

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Fig. 2

4 Spring
6 Drain screw
7 Screw
8 Nut
9 O-ring
10 O-ring
11 Two part casing
12 Filter cartridge
18 Pressure plate
X Pumping connection
Exhaust connection
3. Installation and Operation

3.1. Fitting The ONF

ISO small flanges or ISO clamping flanges are provided on the input and output ports for connecting the oil mist filter.

➡ The flange marked with an “X” in Fig. 2 should always be connected facing the pump.

Avoid stress from the connecting lines acting on the pump.

CAUTION

As a result of differences in temperature between the pump and the oil mist filter or where the application involves the pumping of condensable vapours, condensed vapour (e.g. water) is deposited in the ONF. Condensate returned via the oil return line causes a deterioration in the quality of the pump operating fluid. Any operating fluid which has been enriched with condensate should be drained off in accordance with the instructions in Section 3.1.

➡ drain off or return separated operating fluid if the oil in the oil mist filter becomes foamy because of a high gas throughput.

CAUTION

If gases are being pumped which should not be allowed to escape into the atmosphere an exhaust line must be fitted.

The exhaust line should be laid so that no excess pressure can build up in it.

CAUTION

3.2. Fitting The Oil Return Line (PK 196 173 -T)

Fitting

➡ Drain off any operating fluid from the ONF by turning out the operating fluid drain screw.
➡ Unscrew operating fluid drain screw 6 on the ONF, drain off any operating fluid and screw in hose nipple 220 in place of the drain screw; take care with the O-ring 137.
➡ Dismantle gas ballast valve 42 from the pump.
➡ Re-fit the gas ballast valve with intermediate flange 45 and screw tight with longer screws; take care with the two O-rings 148.
➡ Screw hose nipple 220 into intermediate flange 45; take care with O-ring 138.
➡ Fit oil return hose 222 both sides on the hose nipples and tighten with hose clips 223.

The function of the oil return system to the vacuum pump is only safeguarded providing the rotary vane pump working pressure is < 100 mbar. Long evacuation phases with high intake pressures should also follow longer operating phases with lower working pressures (< 100 mbar).
4. Maintenance

4.1. Draining the Operating Fluid

**WARNING**

Toxic gases and vapours can escape from the pump fluid which may also become enriched with substances harmful to health (radioactive, chemical etc.) during the pumping of certain media.

Operating fluid which has been enriched with toxic or aggressive substances must be treated carefully. Compliance with all relevant regulations is essential.

If the operating fluid rises too high in the oil mist filter (filter cartridge half-full) it must be drained off.

- Unscrew drain screw 15.
- Drain operating fluid.

If the operating fluid is uncontaminated it can be re-used in the vacuum pump.

4.2. Changing the Filter Cartridge

It is necessary to change the filter cartridge if oil mist forms on the exhaust flange or if the exhaust pressure increases to the point where the baffle, which operates as an over-pressure valve, opens.

**Dismantling**

Before proceeding with dismantling the oil mist filter, the connected vacuum pump must be disconnected.

- Unscrew screws 7; take care to the pre-stressing of the compressing spring.
- Remove casing upper part from lower part, take care with seal 9.
- Remove filter cartridge 12 from the casing.
- Once the cartridge has been replaced, assembly is in reverse order.

5. Technical Data

<table>
<thead>
<tr>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Separation level</td>
</tr>
<tr>
<td>Permissible working pressure</td>
</tr>
<tr>
<td>Weight</td>
</tr>
</tbody>
</table>

6. Spare Parts

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
<th>Peace</th>
<th>Dimensions</th>
<th>Number</th>
<th>Comments</th>
<th>Ordering quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Spring</td>
<td>1</td>
<td></td>
<td>P 0920 554 E</td>
<td></td>
<td>PK E17 001 -T</td>
</tr>
<tr>
<td>9</td>
<td>O-ring</td>
<td>1</td>
<td>66,27 x 3,53</td>
<td>P 4070 959 PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>O-ring</td>
<td>1</td>
<td>4,48 x 1,78</td>
<td>P 4070 047 PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Filter cartridge</td>
<td>1</td>
<td></td>
<td>PK 095 627</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Pressure plate</td>
<td>1</td>
<td></td>
<td>P 0920 553 E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>O-ring</td>
<td>1</td>
<td>5 x 1,5</td>
<td>P 4070 065 PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>138</td>
<td>O-ring</td>
<td>1</td>
<td>6 x 2,2</td>
<td>P 4070 088 PV</td>
<td></td>
<td></td>
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<tr>
<td>148</td>
<td>O-ring</td>
<td>1</td>
<td>27 x 2,5</td>
<td>P 4070 465 PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>220</td>
<td>Hose nipple with nozzle</td>
<td>1</td>
<td></td>
<td>PK 194 225</td>
<td></td>
<td></td>
</tr>
<tr>
<td>221</td>
<td>Hose nipple</td>
<td>1</td>
<td></td>
<td>PK 194 317</td>
<td></td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>Oil return hose</td>
<td>1</td>
<td>0,5 m, 4/6</td>
<td>P 2364 052 MV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>223</td>
<td>Hose clip</td>
<td>2</td>
<td>SMS, B6 - W4</td>
<td>P 4165 500 AY</td>
<td></td>
<td></td>
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7. Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Number</th>
<th>Ordering quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrofit kit oil return unit</td>
<td>ONF 4-20</td>
<td>PK 196 173</td>
<td>-T</td>
</tr>
</tbody>
</table>
Declaration on contamination of vacuum units and components

Repairs and/or maintenance will be carried out on vacuum units and components only if a fully filled out, correct contamination declaration is provided. If this is not the case, the corresponding repairs will be delayed or omitted. A separate declaration must be submitted for each device and each component.

This declaration can only be completed and signed by authorised and qualified staff:

1. Description of component
   - Equipment type/model: __________________________
   - Code No.: __________________________
   - Serial No.: __________________________
   - Invoice No.: __________________________
   - Delivery Date: __________________________

2. Reason for return
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

3. Equipment condition
   - Has the equipment been used? yes □ no □
   - What type of pump oil was used? __________________________

4. Process related contamination of equipment
   - toxic yes □ no □
   - corrosive yes □ no □
   - microbiological hazard*) yes □ no □
   - explosive*) yes □ no □
   - radioactive*) yes □ no □
   - other harmful substances yes □ no □

*) We will not accept delivery of any equipment that has been radioactively or microbiologically contaminated without written evidence of decontamination!

5. Please list all substances, gases and by-products which may have come into contact with the equipment:

<table>
<thead>
<tr>
<th>Tradename</th>
<th>Chemical name (or Symbol)</th>
<th>Danger class</th>
<th>Precautions associated with substance</th>
<th>Action if spillage or human contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

|  - Has the vacuum device/component been cleaned? yes □ no □  |
|  Detergents: __________________________  |
|  Cleaning method: __________________________  |

|  - Is the equipment free from potentially harmful substances? yes □ no □ |

6. Legally binding declaration
   We hereby guarantee that the details in this declaration are correct and complete. I, the undersigned, am able to provide a true assessment. We are aware of our liability toward the contractor for damage resulting from incomplete or inaccurate details; we undertake to indemnify the contractor against third-party claims. We are also aware, irrespective of this declaration, of our liability toward third parties, which include in particular those employees of the contractor who are entrusted with handling/repairing the product.

Name of Organisation: __________________________________________
Address: __________________________________________ Post code: __________________________
Tel.: __________________________ Fax: __________________________ Email: __________________________
Name: __________________________ Job title: __________________________

Date: __________________________ Company stamp: __________________________
Legally binding signature: __________________________
Vacuum is nothing, but everything to us!

- Turbopumps
- Rotary vane pumps
- Roots pumps
- Dry compressing pumps
- Leak detectors
- Valves
- Components and feedthroughs
- Vacuum measurement
- Gas analysis
- System engineering
- Service