1. Features

Compact, ready-to-connect filter aggregates for modern hydraulic and lubrication systems

- Low noise internal gear pump with double bearing driving shaft
- Minimum loss of performance due to the high efficiency and the volume flow optimized design of parts
- Integrated pressure limitation valve
- Visual/electrical maintenance indicators
- Equipped with highly efficient MAHLE Sm-x spin-on cartridges
- Beta rated elements according to ISO 16889 multipass test
- High dirt holding capacity due to the large filter surface
- Defined cleanliness classes
- Easy to service
- Worldwide distribution
2. Mode of operation

The filter assembly consists of a filter block with an integrated electric motor, a gear pump, a filter housing and a spin-on cartridge. With its double-bearing drive shaft design, the internal-gear pump is extremely quiet and virtually vibration-free, with excellent suction capacity and sophisticated mechanical- and volumetric efficiencies. The MAHLE spin-on cartridges can be supplied with filter ratings ranging from 3 µm to 25 µm and Sm-x assembly (ß5(c) to ß20(c) according to ISO 16889) or with Mic elements with a nominal size of 10 and 25 µm.

In bypass mode, superior oil cleanliness codes per ISO 4406 of up to 14/12/09 and better can be achieved with these filter units and the MAHLE Sm-x spin-on cartridges.

To monitor the filter element, a differential pressure indicator is supplied as standard. For customer-specific requirements, the entire range of MAHLE differential pressure indicators is available with one or two switching levels, LED displays, various contact types, and connector plugs.

The pump units are suitable for all mineral-oil-based hydraulic oils and lubricating oils.

The standard scope of supply includes the complete unit with On/Off switch, motor protection feature, 2-m plug power cord, pump, maintenance indicator, and the selected spin-on cartridge. Units are available for prompt delivery.

3. Separation grade characteristics

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The pump units are suitable for all mineral-oil-based hydraulic oils and lubricating oils.

The standard scope of supply includes the complete unit with On/Off switch, motor protection feature, 2-m plug power cord, pump, maintenance indicator, and the selected spin-on cartridge. Units are available for prompt delivery.

4. Filter performance data

tested according to ISO 16889 (multipass test)

Sm-x elements with max. Δp 10 bar

<table>
<thead>
<tr>
<th>Sm-x</th>
<th>β5(c) 200</th>
<th>β7(c) 200</th>
<th>β10(c) 200</th>
<th>β20(c) 200</th>
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<tbody>
<tr>
<td>3</td>
<td>200</td>
<td>200</td>
<td>200</td>
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<td>6</td>
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<td>10</td>
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<tr>
<td>25</td>
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</tr>
</tbody>
</table>

values guaranteed up to 10 bar differential pressure

5. Quality assurance

MAHLE filters and filter elements are produced according to the following international standards:

<table>
<thead>
<tr>
<th>Norm</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN ISO 2941</td>
<td>Hydraulic fluid power filter elements; verification of collapse/burst resistance</td>
</tr>
<tr>
<td>DIN ISO 2942</td>
<td>Hydraulic fluid power filter elements; verification of fabrication integrity</td>
</tr>
<tr>
<td>DIN ISO 2943</td>
<td>Hydraulic fluid power filter elements; verification of material compatibility with fluids</td>
</tr>
<tr>
<td>DIN ISO 3723</td>
<td>Hydraulic fluid power filter elements; method for end load test</td>
</tr>
<tr>
<td>DIN ISO 3724</td>
<td>Hydraulic fluid power filter elements; verification of flow fatigue characteristics</td>
</tr>
<tr>
<td>ISO 3968</td>
<td>Hydraulic fluid power-filters-evaluation of pressure drop versus flow characteristics</td>
</tr>
<tr>
<td>ISO 10771.1</td>
<td>Fatigue pressure testing of metal containing envelopes in hydraulic fluid applications</td>
</tr>
<tr>
<td>ISO 16889</td>
<td>Hydraulic fluid power filters-multipass method for evaluation filtration performance of a filter element</td>
</tr>
</tbody>
</table>
### 6. Symbols

![Filter Aggregate Pi 8200 Diagram](Image)

### 7. Order numbers

Example for ordering filters:

1. **Filter aggregate**

   - V = 14 l/min with visual/electrical maintenance indicator and HC 28 spin-on cartridge
   - Type: Pi 82001-069 HC 28
   - Order number: 70383014

   **Order number** | **Type** | **with opt./electr. indicator**
   --- | --- | ---
   70383013 | Pi 82001-069 HC 18 | 70383014 | Pi 82001-069 HC 28 | 70383015 | Pi 82001-069 HC 34 | 70383019 | Pi 82001-069 HC 66 | 70383017 | Pi 82001-069 HC 60 | 70320065 | Pi 82001-069 HC 35 | 70383016 | Pi 82001-069 HC 36 | 70377257 | Pi 82003-069 HC 34 | 70383025 | Pi 82003-069 HC 66 | 70383024 | Pi 82003-069 HC 60 | 70383023 | Pi 82003-069 HC 35 | 70383022 | Pi 82003-069 HC 36

2. **Spar part spin-on cartridge**

   - Sm-x 10
   - Type: HC 28
   - Order number: 77643398

   **Order number** | **Type** | **Filter material** | **max. Δ p [bar]** | **Filter surface [cm²]**
   --- | --- | --- | --- | ---
   77643331 | HC 18 | Mic 10 | 7000 | 7638
   77643398 | HC 28 | Sm-x 10 | 3400 |
   77504194 | HC 34 | Mic 10 | 14025 |
   76714750 | HC 66 | Sm-x 3 | |
   77478829 | HC 60 | Sm-x 6 | |
   77643844 | HC 35 | Sm-x 10 | |
   77643851 | HC 36 | Sm-x 25 | |
8. Technical specifications

Pi 82001-069/Pi 82003-069

Volume flow: 14 l/min/35 l/min
Nominal pressure: 10 bar
Test pressure: 13 bar
Temperature range: -10 to +80 °C
Bypass setting: 3.5 bar
Maintenance indicator setting: 2.2 bar
Connection suction side: G¾/G1
Connection pressure side: G¾/G1
Motor output: 0.25 kW/0.55 kW
Revolutions: 1400 1/min
Voltage: 230V AC/50 Hz
Nominal current: 2.5 A/4.2 A
Type of protection: IP 54 in inserted and secured status
Contact: normally open/closed
Cable sleave: M20x1.5
Viscosity range: 10 – 200 mm²/s

The switching function can be changed by turning the electric upper part by 180° (normally closed contact or normally open contact). The state on delivery is a normally closed contact. By inductivity in the direct current circuit the use of suitable protection circuit should be considered. Further maintenance indicator details and designs are available in the maintenance indicator data sheet.

We draw attention to the fact that all values indicated are average values and do not always occur in specific cases of application. Our products are continually being further developed. Values, dimensions and weights can change as a result of this. Our specialized department will be pleased to offer you advice.

We recommend you to contact us concerning applications of our filters in areas governed by the EU Directive 94/9 EC (ATEX 95). The standard version can be used for liquids based on mineral oil (corresponding to the fluids in Group 2 of Directive 97/23 EC Article 9). If you consider to use other fluids please contact us for additional support.

Subject to technical alteration without prior notice!
9. Dimensions

All dimensions except "C" in mm.

<table>
<thead>
<tr>
<th>Aggregate type</th>
<th>Spin-on cartridge type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pi 82001-069</td>
<td>HC 18</td>
<td>495</td>
<td>183</td>
<td>G¾</td>
<td>90</td>
<td>112</td>
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<td></td>
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<tr>
<td></td>
<td>HC 34</td>
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</tr>
<tr>
<td></td>
<td>HC 35</td>
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</tr>
<tr>
<td></td>
<td>HC 36</td>
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<td></td>
</tr>
<tr>
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<td>HC 60</td>
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</tr>
<tr>
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<td>HC 66</td>
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</tr>
<tr>
<td>Pi 82003-069</td>
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<td>214</td>
<td>G1</td>
<td>100</td>
<td>125</td>
<td>9</td>
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<tr>
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<td>HC 35</td>
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<td>HC 36</td>
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<tr>
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<td>HC 60</td>
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</tr>
<tr>
<td></td>
<td>HC 66</td>
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</table>

10. Installation, operating and maintenance instructions

10.1 Filter aggregate installation
When installing the filter aggregate make sure that sufficient space is available to remove the spin-on cartridge. The filter aggregate should be installed with the spin-on cartridge pointing downwards. The maintenance indicator must be visible.

10.2 Connecting the electrical maintenance indicator
The electrical indicator is connected via a 2-pole appliance plug according to DIN EN 175301-803 with poles marked 1 and 2. The electrical section can be inverted to change from normally open position to normally closed position or vice versa.

10.3 When should the filter element be replaced?
1. Filter aggregates equipped with visual and electrical maintenance indicator:
   During cold starts, the indicator may give a warning signal. Press the red button of the visual indicator once again only after operating temperature has been reached. If the red button immediately pops up again and/or the electrical signal has not switched off after reaching operating temperature, the filter element must be replaced after the end of the shift.
2. Filter aggregates without maintenance indicator:
   The spin-on cartridge should be replaced after the trial run or flushing of the system. Afterwards follow instructions of the manufacturer.
3. Please always ensure that you have original MAHLE spare spin-on cartridges in stock.

10.4 Spin-on cartridge exchange
1. Stop system and relieve filter aggregate from pressure.
2. Unscrew the spin-on cartridge with the aid of a belt spanner by turning some to the left.
3. Make sure that the order number on the spin-on cartridge corresponds to the order number of the plate.
4. The seal of the screw-on cartridge should be lightly oiled.
5. Screw cartridge on in accordance with the printed-on instructions.
### Order number for spare parts

<table>
<thead>
<tr>
<th>Position</th>
<th>Type</th>
<th>Order number</th>
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<tbody>
<tr>
<td></td>
<td>Maintenance indicator</td>
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<tr>
<td></td>
<td>Visual PiS 3098/2,2</td>
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<tr>
<td></td>
<td>Electrical PiS 3097/2,2</td>
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</tr>
<tr>
<td></td>
<td>Electrical upper part only</td>
<td>77536550</td>
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<tr>
<td></td>
<td>Seal kit for maintenance indicator</td>
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