1. Features

Duplex filter for gear boxes, lubrication and hydraulic systems

- Modular system
- Compact design
- Weight optimized design
- Minimal pressure drop through optimal flow design
- Flange connections, DIN DN 80, SAE 3"
- Visual/electrical maintenance indicator
- Drain on dirt and clean side
- Beta rated elements according to ISO 16889 multipass test
- Defined cleanliness classes according to ISO 4406/1999
- Elements with high differential pressure stability and dirt holding capacity
- Version according to DIN 24550 also deliverable
- Quality filters, easy to service
- Worldwide sales and service
Duplex Filter
Pi 232
Nominal pressure 25 bar (360 psi), nominal size 800 and 1400

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2. Flow rate/pressure drop curve complete filter

\[ y = \text{differential pressure } \Delta p \text{ [bar]} \]
\[ x = \text{flow rate } V \text{ [l/min]} \]

3. Separation grade characteristics

\[ y = \beta \text{-value} \]
\[ x = \text{particle size } \mu m \]

determined by multipass tests (ISO 16889)
calibration according to ISO 11171 (NIST)

4. Filter performance data

tested according to ISO 16889 (multipass test)

PS elements with

max. \( \Delta p \) 20 bar

- PS 3 \( \beta_{5C} \) \( \geq \) 200
- PS 6 \( \beta_{7C} \) \( \geq \) 200
- PS 10 \( \beta_{10C} \) \( \geq \) 200
- PS 25 \( \beta_{20C} \) \( \geq \) 200

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>
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determined by multipass tests (ISO 16889)
calibration according to ISO 11171 (NIST)

4. Filter performance data

tested according to ISO 16889 (multipass test)

PS elements with
- max. \( \Delta p \) 20 bar
- PS 3 \( \beta_{3(C)} \) \( \geq \) 200
- PS 6 \( \beta_{7(C)} \) \( \geq \) 200
- PS 10 \( \beta_{10(C)} \) \( \geq \) 200
- PS 25 \( \beta_{20(C)} \) \( \geq \) 200

values guaranteed up to
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PS elements with
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\[ \begin{align*}
\text{PS 3} & \quad \beta_{85(C)} \geq 200 \\
\text{PS 6} & \quad \beta_{70(C)} \geq 200 \\
\text{PS 10} & \quad \beta_{60(C)} \geq 200 \\
\text{PS 25} & \quad \beta_{20(C)} \geq 200
\end{align*} \]

values guaranteed up to 10 bar differential pressure

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6. Symbols

7. Order numbers

Example for ordering filters:

1. Housing design
   V = 800 l/min and visual/electrical maintenance indicator
   Type: Pi 23240-069
   Order number: 70554948

2. 2x Filter element
   Type: PS 25
   Order number: 76321663

### 7.1 Housing design

<table>
<thead>
<tr>
<th>Nominal size NG [l/min]</th>
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<th>Type</th>
<th>with bypass valve and visual indicator</th>
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<th>with visual indicator</th>
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<tbody>
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When filter with non bypass configuration is selected the collapse pressure must not be exceeded!

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<th>Nominal size NG [l/min]</th>
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<th>Filter surface [cm²]</th>
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<tr>
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*other element types are available on request
6. Symbols

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Example for ordering filters:

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   Type: Pi 23240-069
   Order number: 70554948

2. 2x Filter element
   PS 25
   Type: 852014 PS 25
   Order number: 76321663

7.1 Housing design

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When filter with non-bypass configuration is selected the collapse pressure must not be exceeded!

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<table>
<thead>
<tr>
<th>Nominal size NG [l/min]</th>
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6. Symbols

7. Order numbers

Example for ordering filters:

1. Housing design

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When filter with non bypass configuration is selected the collapse pressure must not be exceeded!

2. 2x Filter element

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*other element types are available on request
8. Technical specifications

Design: line mounting filter
Nominal pressure: $10^7$ load changes 25 bar (360 psi)
Test pressure: 33 bar (470 psi)
Temperature range: -10 °C to +120 °C
survival temperature -40 °C (other temperature ranges on request)
minimum viscosity of the fluid: 10 mm²/s
Bypass setting: Δp 3.5 bar ± 10
Filter head material: GAL
Filter housing material: AL
Filter cover material: GAL
Sealing material: NBR
Maintenance indicator setting: Δp 2.2 bar ± 10 %
Electrical data of maintenance indicator:
Max. voltage: 250 V AC/200 V DC
Max. current: 1 A
Contact load: 70 W
Type of protection: IP 65 in inserted and secured status
Contact: normally open/closed
Cable sleave: M20x1.5

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 which 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

In Inlet
Out Outlet
°1 Pressure equalization screw
°2 Drain clean side G ½
°3 Drain dirt side G ½
°4 Maintenance indicator
°5 Clearance B
8. Technical specifications

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Contact: normally open/closed
Cable sleave: M20x1.5

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 which 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

Inlet *3 Drain clean side G½
Outlet *4 Maintenance indicator
*1 Pressure equalization screw
*2 Drain dirt side G½
*5 Clearance B
All dimensions in mm.

<table>
<thead>
<tr>
<th>Type</th>
<th>Connection</th>
<th>A</th>
<th>B</th>
<th>Weight [kg]</th>
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10. Installation, operating and maintenance instructions

10.1 Filter installation
When installing the filter make sure that sufficient space is available to remove filter element and filter housing.
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 to normally closed position or vice versa. The state on delivery is a normally closed contact.

10.3 When should the filter element be replaced?
1. Filters 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. Filters without maintenance indicator:
   The filter element 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 elements in stock: disposable elements (PS, Sm-N) cannot be cleaned.

10.4 Element replacement

Note: Elements may only be replaced by people who are familiar with the function of the filter. When replacing elements, appropriate safety clothing (protective goggles, gloves, safety shoes) must be worn.

Note: The maintenance indicator monitors the filter side in operation, which is identified by the position of the switching lever catch. The change-over transfer valve must be switched prior filter servicing. Now the signal of the maintenance indicators cancelled and the red button can be repressed again.

1. Operate pressure equalizing screw. Swivel switching lever.
   Place through or drip pan underneath to collect leaving oil.
   Close pressure equalization screw.

2. Loosen vent screw of the filter side not in use by 2-3 turns.

3. Remove drain plug in housing bottom and drain oil.

4. Unscrew filter cover counter-clockwise.
   Warning: The shift lever may not, from now until the screwing back in of the filter housing (7.), be activated under any circumstances!

5. Lift out filter element.

6. Check seal on filter cover. We recommend replacement in any case.

7. Make sure that the order number on the spare element corresponds to the order number of the filter name-plate. Remove the element packaging and put the element with the o-Ring side down into the housing.

8. Push the element carefully over the spigot and tight cover with the hand-tight.

9. Tighten drain plug housing bottom.

10. To refill the filter chamber, operate only the pressure equalizing screw. Tighten the screw when fluid emerges bubble-free from the drain.

11. Tight vent screw. Check for leakage by actuating the equalizing screw again.
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## 11. Spare parts list

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Fax +49 7941 67-23429
industrialfiltration@mahle.com
www.mahle.com
70582030.05/2015
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70582030.04/2015
### Order numbers for spare parts

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