

## Low-Pressure filter

### Pi 1500

Operating pressure 10 (25) bar, Nominal size up to 600  
according DIN 24550

#### 1. Features

##### Efficient filters for modern hydraulic systems

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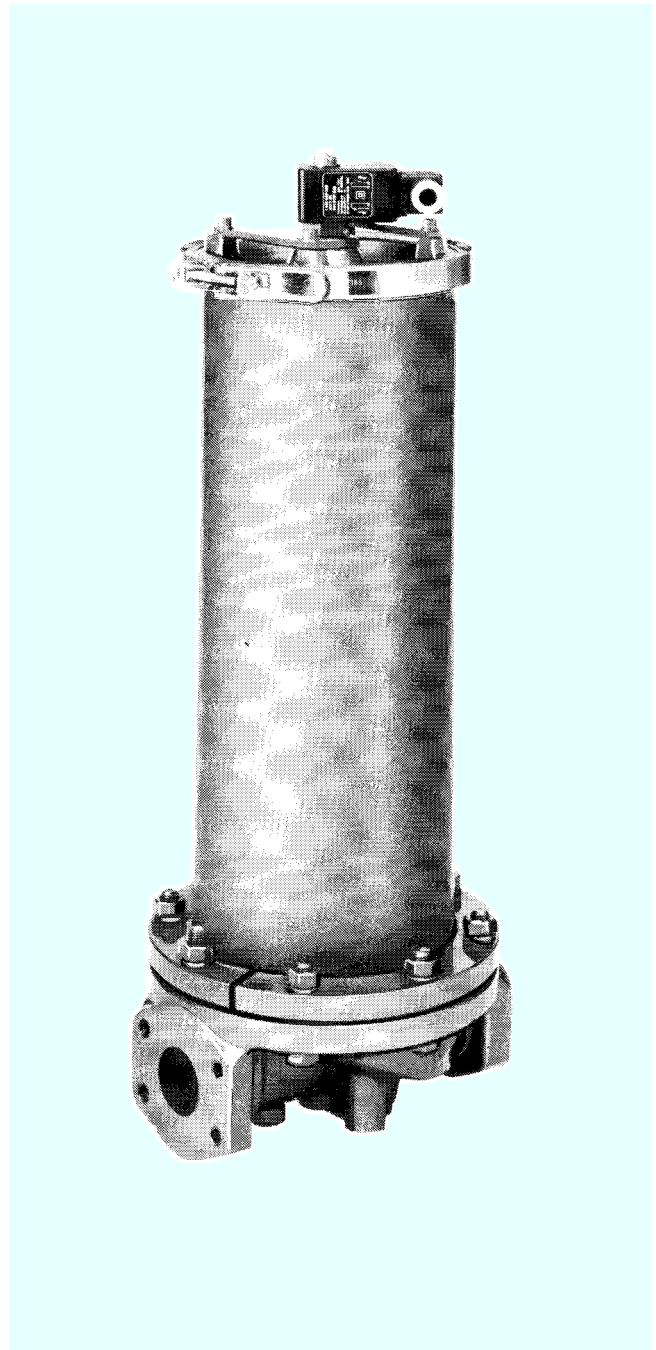
- Modular design
  - Minimal pressure loss
  - Compact design
  - Visual / electrical / electronic differential pressure indication
  - Threaded or SAE 4 bolt flange ports
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##### Quality filters, easy to service

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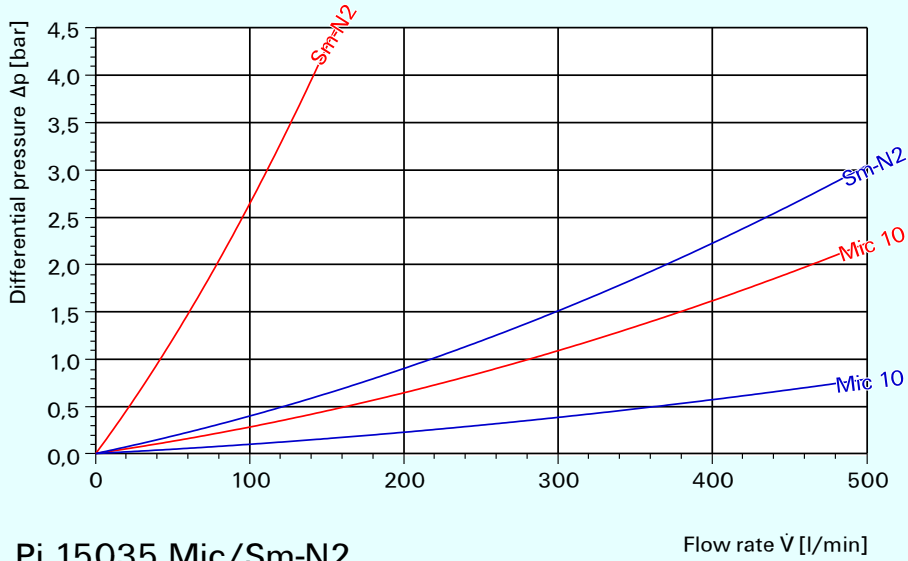
- Highly efficient Sm-x or Sm-N2 filter elements
  - $\beta$ -rated elements per ISO 4572
  - Large dirt holding capacity and high differential pressure stability providing optimal element service life
  - 100% bubble-point tested elements
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##### World-wide sales



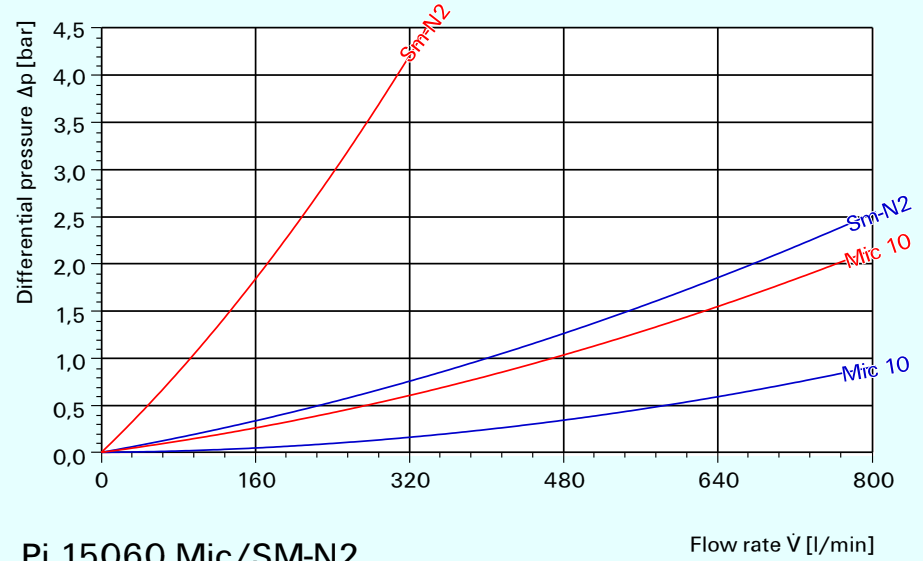
## 2. Flow rate / pressure drop curve compl. filter

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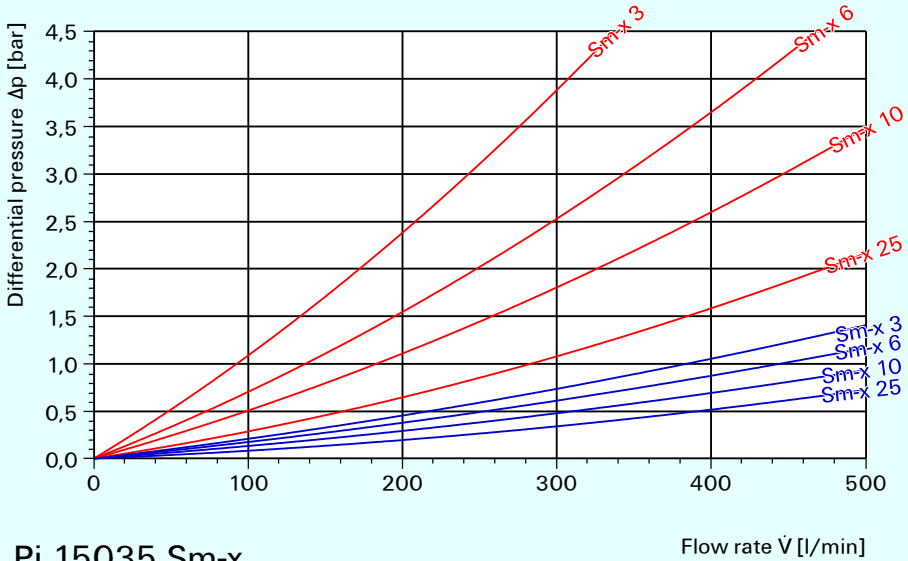
Pi 15035 Mic/Sm-N2

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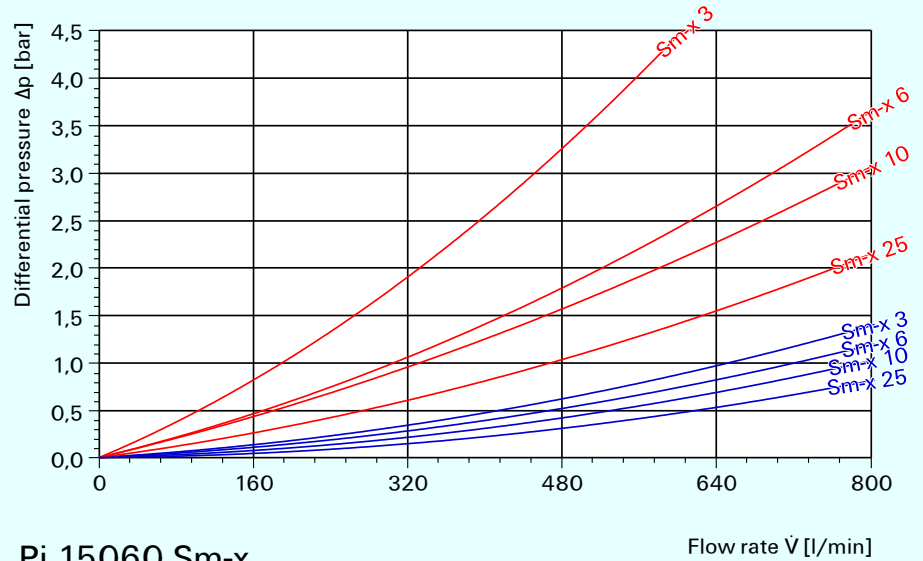
Pi 15060 Mic/SM-N2

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Pi 15035 Sm-x

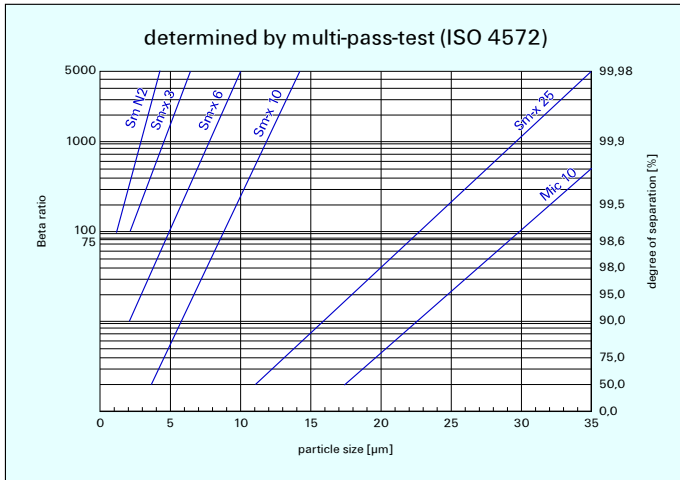
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Pi 15060 Sm-x

190 mm<sup>2</sup>/s (25° E)  
33 mm<sup>2</sup>/s (4,5° E)

### 3. Separation characteristics



### 4. Filter performance data

tested according to ISO 4572 (multi-pass-test)

Sm-x-Elements  
with  $\Delta p$  10 bar

Sm-x 3  $\beta_3 \geq 75$   
 Sm-x 6  $\beta_6 \geq 75$   
 Sm-x 10  $\beta_{10} \geq 75$   
 Sm-x 25  $\beta_{25} \geq 75$

at 5 bar differential pressure

The filter element Sm N2 is an element with a very large dirt holding capacity, especially for bypass filtration.

#### Example for ordering filters:

- Housing design  
 $\dot{V} = 350$  l/min, bypass, electrical indication, nominal pressure 10 bar  
 Type-no. **Pi 15035/10-058** · Order-no. **610.177.8**
- Filter element  
 Sm-x 10  
 Type-no. **Pi 23063 RN Sm-x 10** · Order-no. **792.420.2**  
 For housing Pi 15060 2 elements are required

### 7. Part Numbers

#### 7.1 Housing design

Order-number	Type number	Nominal pressure [bar]	Nominal size NG [l/min]	① with bypass valve with visual indicator	② with bypass valve with electrical indicator	③ with visual indicator	④ with electrical indicator	
610.176.0	Pi 15035/10-057	10	<b>350</b>					1
610.177.8	Pi 15035/10-058							
610.178.6	Pi 15035/10-068							
610.179.4	Pi 15035/10-069							
610.185.1	Pi 15035/25-057	25						
610.186.9	Pi 15035/25-058							
610.180.2	Pi 15060/10-057	10	<b>600</b>					2
610.181.0	Pi 15060/10-058							
610.182.8	Pi 15060/10-068							
612.635.3	Pi 15060/10-069							
610.187.7	Pi 15060/25-057	25						
610.188.5	Pi 15060/25-058							

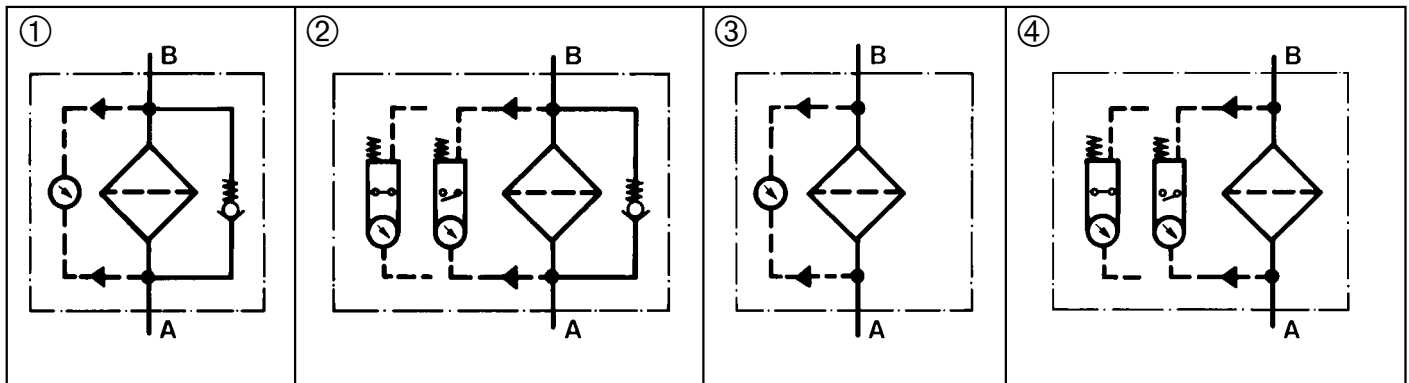
When filter with non bypass configuration is selected, the collapse pressure of the element may not be exceeded.

## 5. Test regulations

MAHLE filter elements are manufactured respectively, tested in accordance with the following international standards:

No.	Designation
ISO 2941	Hydraulic-filter elements: Verification of burst resistance
ISO 2942	Hydraulic-filter elements: Determination of fabrication integrity
ISO 2943	Hydraulic-filter elements: Verification of material compatibility with hydraulic fluids
ISO 3723	Hydraulic-filter elements: Method for testing end-cap load
ISO 3724	Hydraulic-filter elements: Verification of flow fatigue characteristics
ISO 39682	Hydraulic-filters: Evaluation of pressure drop versus flow
ISO 4572	Hydraulic-filter elements: Testing of filter performance (multi-pass-test)

## 6. Symbols



## 7.2 Filter elements\*

( ) = filter surface [ ] = order number

	Sm-N 2 Δp 10 bar	Sm-x 3 Δp 10 bar	Sm-x 6 Δp 10 bar	Sm-x 10 Δp 10 bar	Sm-x 16 Δp 10 bar	Sm-x 25 Δp 10 bar
1	(8850 cm <sup>2</sup> )	(13515 cm <sup>2</sup> )	(13515 cm <sup>2</sup> )	(13515 cm <sup>2</sup> )	(13515 cm <sup>2</sup> )	(13515 cm <sup>2</sup> )
	611.265.0	792.419.4	796.409.1	792.420.2	796.367.1	796.026.3
	[Pi 2S063 RN Sm-N 2]	[Pi 21063 RN Sm-x 3]	[Pi 22063 RN Sm-x 6]	[Pi 23063 RN Sm-x 10]	[Pi 24063 RN Sm-x 16]	[Pi 25063 RN Sm-x 25]
2	2x (8850 cm <sup>2</sup> )	2x (13515 cm <sup>2</sup> )	2x (13515 cm <sup>2</sup> )	2x (13515 cm <sup>2</sup> )	2x (13515 cm <sup>2</sup> )	2x (13515 cm <sup>2</sup> )
	611.265.0	792.419.4	796.409.1	792.420.2	796.367.1	796.026.3
	[Pi 2S063 RN Sm-N 2]	[Pi 21063 RN Sm-x 3]	[Pi 22063 RN Sm-x 6]	[Pi 23063 RN Sm-x 10]	[Pi 24063 RN Sm-x 16]	[Pi 25063 RN Sm-x 25]

\*further elements available upon request

## 8. Specifications

Nominal pressure:	10/25 bar*
Temperature range:	-10 °C bis +120 °C (other temperature ranges on request)
Bypass valve opening pressure:	$\Delta p$ 3,5 bar $\pm$ 10 %
Filter head material:	GDAI
Filter bowl material:	St (steel)
Sealing material:	NBR
Activating pressure of visual/electrical differential pressure indicator:	$\Delta p$ 2,2 bar $\pm$ 10 %
Electrical data of differential pressure indicator:	
Maximum voltage:	230 V $\sim$ / =
Maximum current on contact:	2,5 A
Maximum contact load:	60 VA / 40 W
Inrush current:	70 VA
Type of protection:	IP 65 when inserted and secured
Contact:	bistable
Cable connection:	PG 11 $\varnothing$ 6-10

The electrical indicator function can be changed from the Normally Open position to the Normally Closed position or visa versa by inverting the electrical section.

With the inrush current of 70 VA the indicator can trigger small contactors or contactor relays.

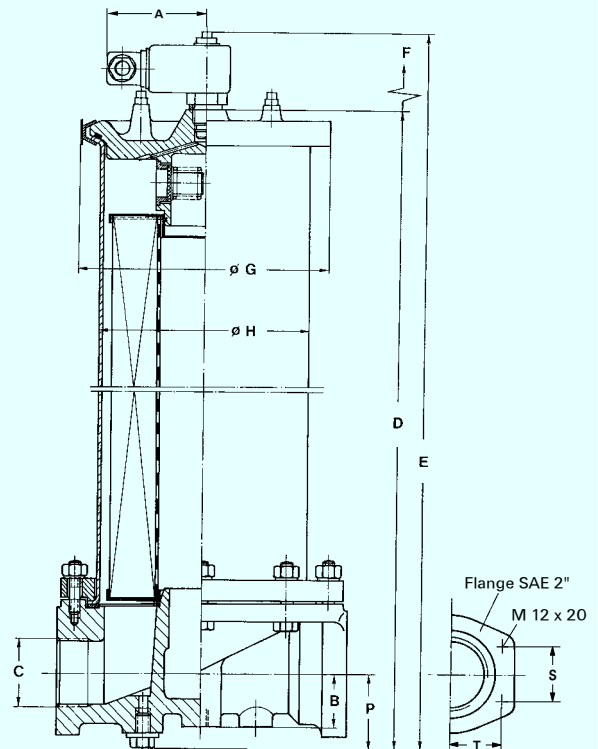
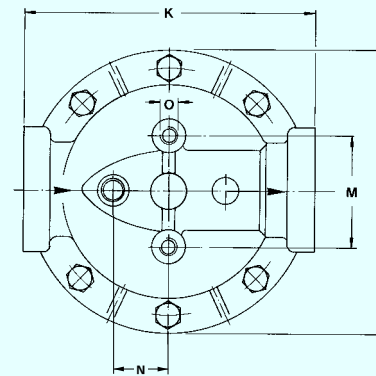
Inductivity in the direct current may require the use of a signal eraser.

For further information and executions please see our leaflet "contamination indicators".

Filters compatible with standard mineral oils.

Please contact us in case of using other media.

Housings with nominal pressure 10 bar are fitted standard with an air bleeder valve.

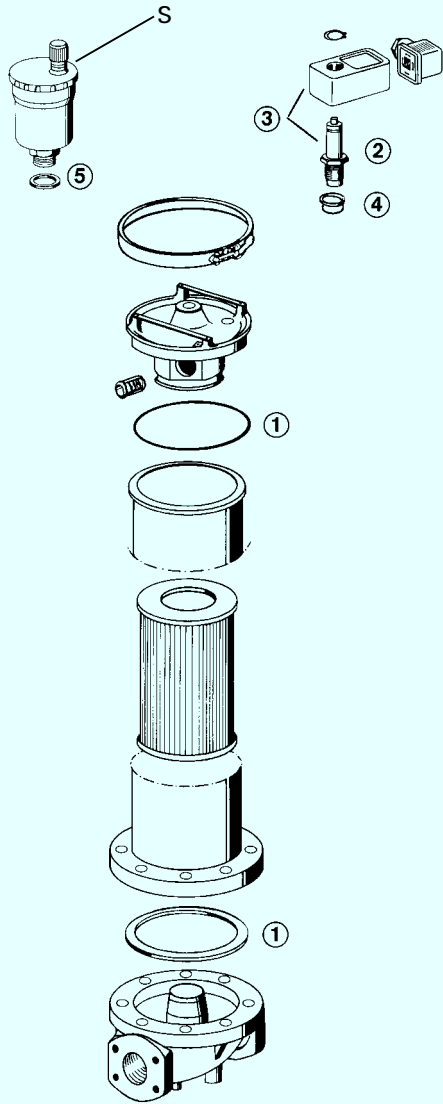


## 9. Dimensions

All dimensions (except "C" and "O") in mm

Dimension	Type	Pi 15035	Pi 15060
	A		78
B		42	42
C		G 1½	SAE 2"*
D		607	1035
E		643	1068
F		425	850
G		190	190
H		164	164
I		225	225
K		230	230
M		90	90
N		44	44
O		M 12 x 20	M 12 x 20
P		59	59
R		45	45
S		-	42,9
T		-	77,8
Weight		17,1 kg	27,1 kg

\*Standard pressure series hole pattern 3000 PSI



## 11. Spare Parts List

Pos.	Housing design
①	Seal kit NBR 783.140.7 FPM 783.141.5 EPDM 783.142.3
②	Differential pressure indicator visual visual/electrical
③	766.997.1 766.994.8 Pis 3098 / 2,2 Pis 3097 / 2,2
④	Seal kit for differential pressure indicator Pis 3098 / 2,2 + Pis 3097/2,2 NBR 776.030.9 FPM 776.031.7 EPDM 776.032.5
⑤	Air bleeder valve 935.251.9
	Adapter for filter elements (Pi 15060) 610.184.4

## 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.

The contamination indicator must be visible.

### 10.2 Connecting the electrical contamination indicator

The electrical indicator is connected via a 2-pole appliance plug according to DIN 43650 with poles marked 1 and 2.

The electrical section can be inverted to change from Normally Open position to Normally Closed position or visa versa.

### 10.3 When must the filter element be replaced?

- Filters equipped with visual and electrical contamination indicator:  
During cold starts, the indicator may give a warning signal. Depress the red button of the visual indicator once again only after operating temperature has been reached. If the red button immediately pops out 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.
- Filters without contamination indicator:  
The filter element should be replaced after the trial run or flushing of the system. Afterwards follow instructions of the manufacturer.
- Please always ensure that you have original MAHLE-replacement elements in stock: disposable elements (Sm-x, Sm-N2) cannot be cleaned.

### 10.4 Element replacement

- Stop system and relieve filter from pressure.
- Loosen quick-action clamp, remove cover, and open drain valve. Housing completely vented.
- Remove filter element from the filter bowl. Remove spacer sleeve at Pi 15060. After proper cleaning please use again.
- Check seal for damages, replace if necessary.
- Make sure that the part number on the spare element corresponds with the part number on the filter label. It's necessary to replace always both elements of Pi 15060. Remove the plastic bag and push element over the spigot in the filter head. Attach sleeve on Pi 15060 an fit second element.
- Close drain valve, relocate cover, and close the quick-action clamp. Filters are automatically vented via the air bleeder valve (10 bar version), the protection cap 5 has to be turned 2 times for being open.

# MAHLE

MAHLE Filtersysteme GmbH

Bereich Industriefilter · Schleifbachweg 45 · D-74613 Öhringen · Postfach 13 09 · D-74603 Öhringen  
Telefon (0 79 41) 67-0 · Telefax (0 79 41) 67-429 · Internet: <http://www.mahle.com> · E-mail: [ub2.industrie@mahle.com](mailto:ub2.industrie@mahle.com)