

Tank top return line filter

Pi 500

Nominal size 160 up to 1000
according to DIN 24550

1. Features

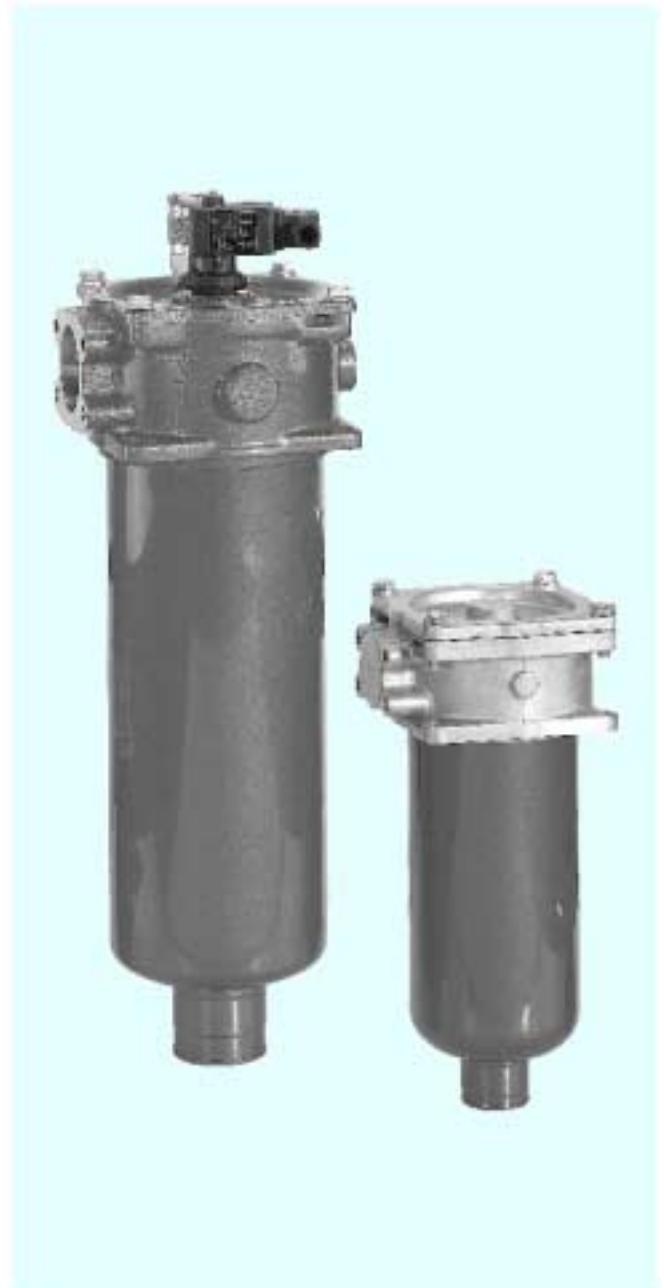
Efficient filters for modern hydraulic systems

- Modular design
 - Minimal pressure loss
 - Compact design
 - Visual / electrical / electronic contamination control
 - Threaded or flange ports
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Quality filters, easy to service

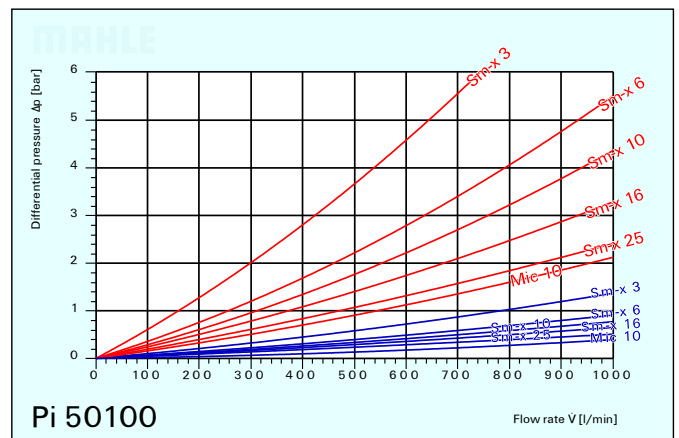
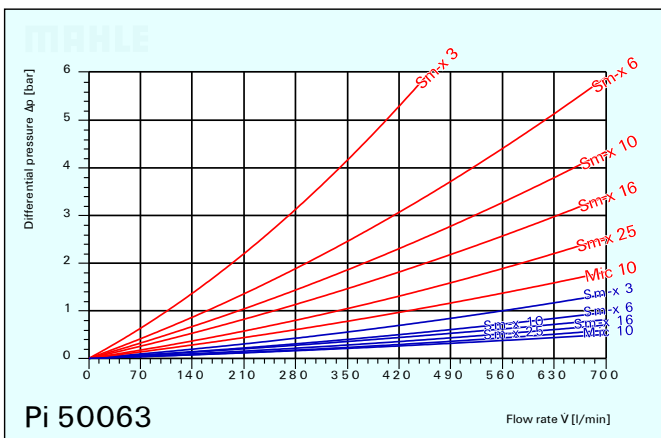
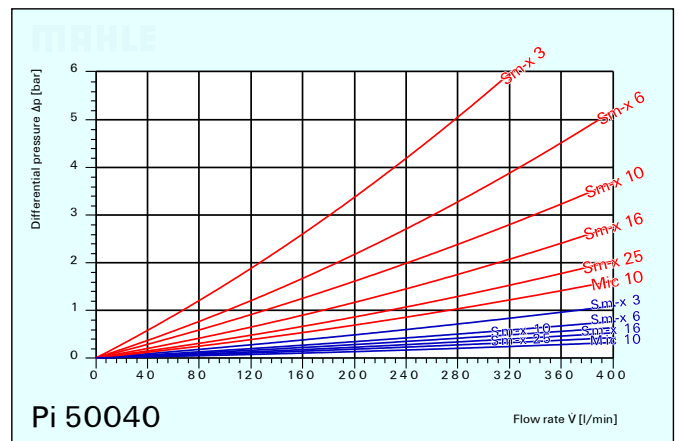
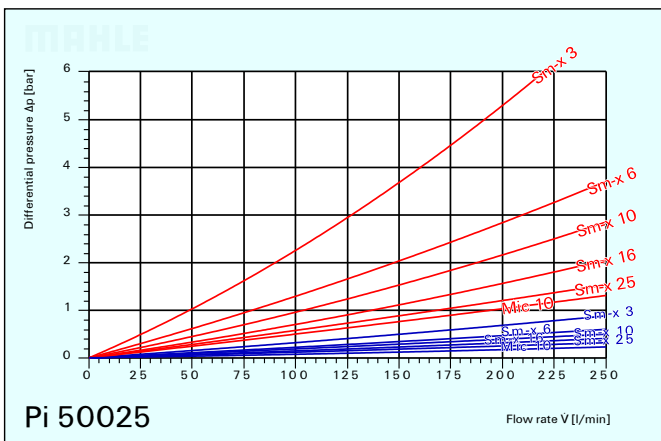
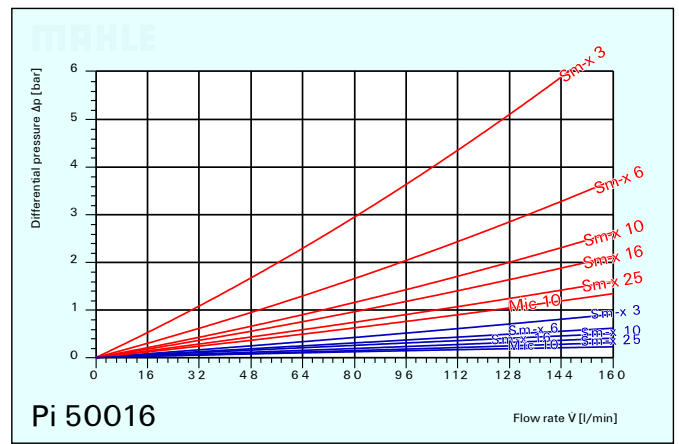
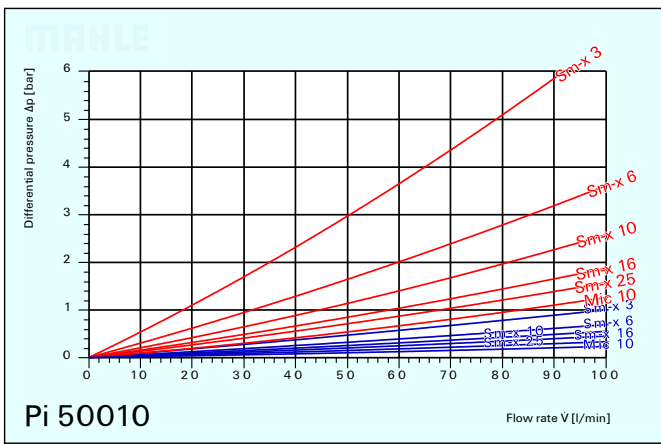
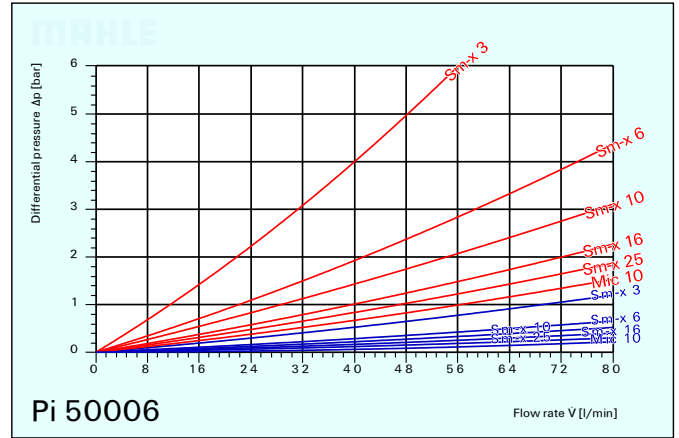
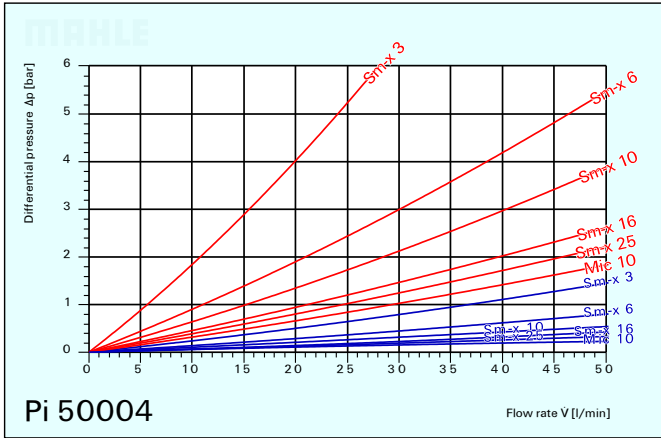
- Highly efficient Mic- or Sm-x filter elements
 - β -rated elements per ISO 4572
 - Large dirt holding capacity and high differential pressure stability providing optimum element service life
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World-wide sales

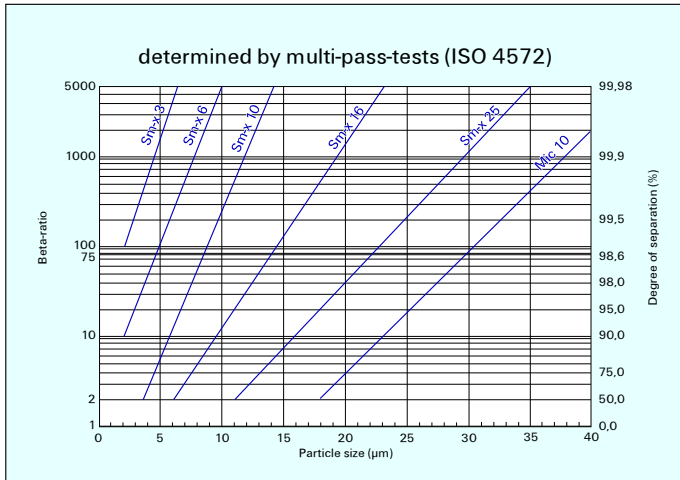


2. Flow rate/pressure drop curve compl. filter

█ 190 mm²/s (25° E)
█ 33 mm²/s (4,5° E)



3. Separation characteristics



4. Filter performance data

tested according to ISO 16 889

Sm-x-elements
with Δp 10 bar

- Sm-x 3 $\beta_{5(c)} \geq 200$
- Sm-x 6 $\beta_{7(c)} > 200$
- Sm-x 10 $\beta_{10(c)} \geq 200$
- Sm-x 16 $\beta_{15(c)} \geq 200$
- Sm-x 25 $\beta_{20(c)} \geq 200$

at 5 bar final differential pressure

7. Order numbers

7.1 Housing Design* Pi 50 016– Pi 50 025– Pi 50 040– Pi 50 063– Pi 50 100–										
Housing design	with bypass-valve 3,5 bar	with indicator cavity	with visual indicator 2,2 bar	with electrical indicator 2,2 bar	with pressure gauge (DM)	with pressure switch Normally Open (DSS)	with pressure switch Normally Closed (DSO)	with filling connection (BA)	Type number	Nominal size (NG)
Type number	①	①	②	③	④	⑤	⑤			
-047									Pi 50 016–...*	160
-056									Pi 50 025–...*	250
-057									Pi 50 040–...*	400
-058									Pi 50 063–...*	630
-059									Pi 50 100–...*	1000
-050										
-052										
-092										
-093										
-094										
-095										
-096										
-097										

7.3 Connection executions

Nominal size (NG)	Standard-connection according DIN 24550 part 1	Further executions					
		/1	/2	/3	/4	/5	/6
160	G 1¼	G 1½	DN 38				
250	G 1½		DN 38	G 1¼			
400	DN 51	G 1½			G 2	DN 64	
630	DN 64	G 1½			G 2		DN 51
1000	DN 76						

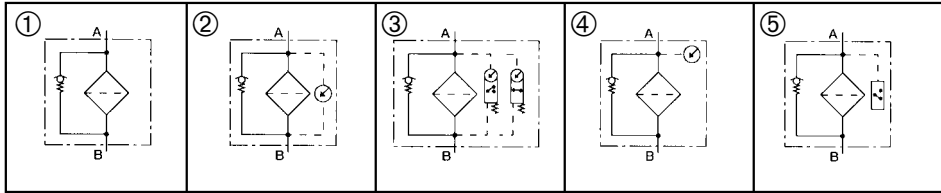
DN 38 \cong SAE 1½"
 DN 51 \cong SAE 2"
 DN 64 \cong SAE 2½"
 DN 76 \cong SAE 3"
 3000 psi

5. Test regulations

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

Norm	Designation
ISO 2941	Hydraulic-fluid power-Filter elements-Verification of collapse / burst resistance
ISO 2942	Hydraulic-fluid power-Filter elements-Verification of fabrication integrity and determination of the first bubble point
ISO 2943	Hydraulic-fluid power-Filter elements-Verification of material compatibility with fluids
ISO 3723	Hydraulic fluid power-Filter elements-Method for end load test
ISO 3724	Hydraulic fluid power-Filter elements-Verification of flow fatigue characteristics
ISO 3968	Hydraulic fluid power-Filters-Evaluation of pressure drop versus flow characteristics
ISO 10 771.1	Fatigue pressure testing of metal containig envelopes in hydraulic fluid applications.
ISO 16 889	Hydraulic Fluidpower filters-Multi-pass method for evaluation filtration performance of a filterelement

6. Symbols



7.2 Filter elements

() = filter surface area

	Mic 10 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
	Pi 13 016 RN (3750 cm ²)	Pi 21 016 RN (3750 cm ²)	Pi 22 016 RN (3750 cm ²)	Pi 23 016 RN (3750 cm ²)	Pi 24 016 RN (3750 cm ²)	Pi 25 016 RN (3750 cm ²)
	Pi 13 025 RN (6050 cm ²)	Pi 21 025 RN (6050 cm ²)	Pi 22 025 RN (6050 cm ²)	Pi 23 025 RN (6050 cm ²)	Pi 24 025 RN (6050 cm ²)	Pi 25 025 RN (6050 cm ²)
	Pi 13 040 RN (9450 cm ²)	Pi 21 040 RN (8250 cm ²)	Pi 22 040 RN (8250 cm ²)	Pi 23 040 RN (8250 cm ²)	Pi 24 040 RN (8250 cm ²)	Pi 25 040 RN (8250 cm ²)
	Pi 13 063 RN (15550 cm ²)	Pi 21 063 RN (13515 cm ²)	Pi 22 063 RN (13515 cm ²)	Pi 23 063 RN (13515 cm ²)	Pi 24 063 RN (13515 cm ²)	Pi 25 063 RN (13515 cm ²)
	Pi 13 100 RN (18700 cm ²)	Pi 21 100 RN (18700 cm ²)	Pi 22 100 RN (18700 cm ²)	Pi 23 100 RN (18700 cm ²)	Pi 24 100 RN (18700 cm ²)	Pi 25 100 RN (18700 cm ²)

7.4 Sealing material

N = NBR
F = FPM
E = EPDM

7.5 Example for ordering filters

Type no.	Housing design	Execution	Sealing material	+ filter element
Pi 50016 – = NG 160	056/ = with bypass valve 3,5 bar	2 = DN 38	–N = NBR	+ Pi 25016 RN = return line filter element Sm-x 25 with NBR sealing

8. Specifications

Design:	tank mounting filter
Nominal pressure:	10 bars
Test pressure:	13 bars
Temperature range:	-10 °C to +120 °C (other temperature ranges on request)
Bypass opening pressure:	Δp 3,5 bar \pm 10%
Filter head material:	GD Al/G Al
Filter bowl material:	St.
Filter cover material:	GD Al/G Al
Activating pressure of visual/ electrical pressure indicator:	Δp 2,2 bar \pm 0,3
Electrical specifications of 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:	normally open/normally closed
Cable connection:	M 16

The electrical indicator function can be changed from the Normally Open position to the Normally Closed position or vice 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 suppressor.

For further information and executions please see our leaflet Contamination Indicators.

Standard design for liquid group 2 according pressure equipment-directive 97/23/EU artikel 9).

Please contact us in case of using other media.

Pos 1 - Visual contamination indicator

Pos 2 - El. upper section connector
according DIN 43650
Execution: Pis 3085, 3106, 3125

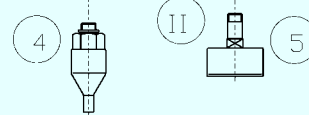
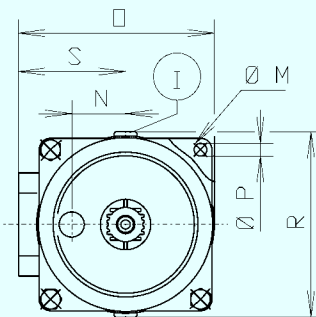
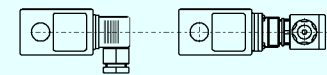
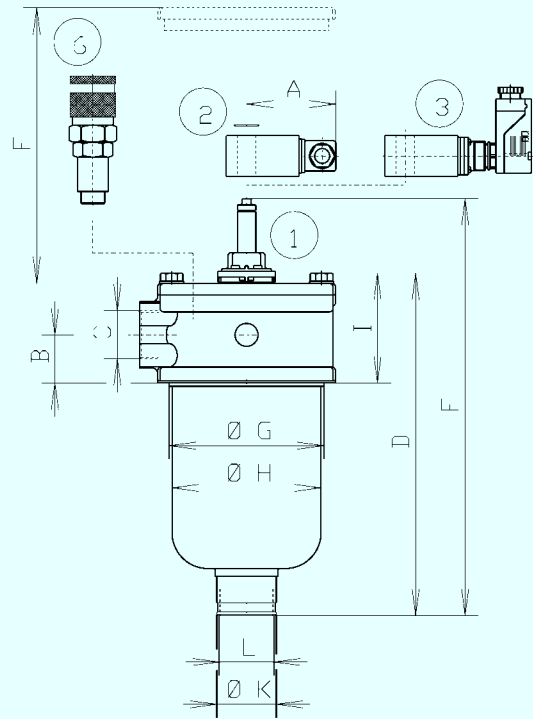
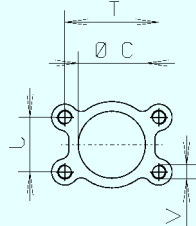
Pos 3 - El. upper section connector
according DIN 43651
Execution: Pis 3103, 3120, 3120, 3123

Pos 4 - Pressure gauge

Pos 5 - Pressure gauge 0 to 6 bar

Pos 6 - Filling coupling

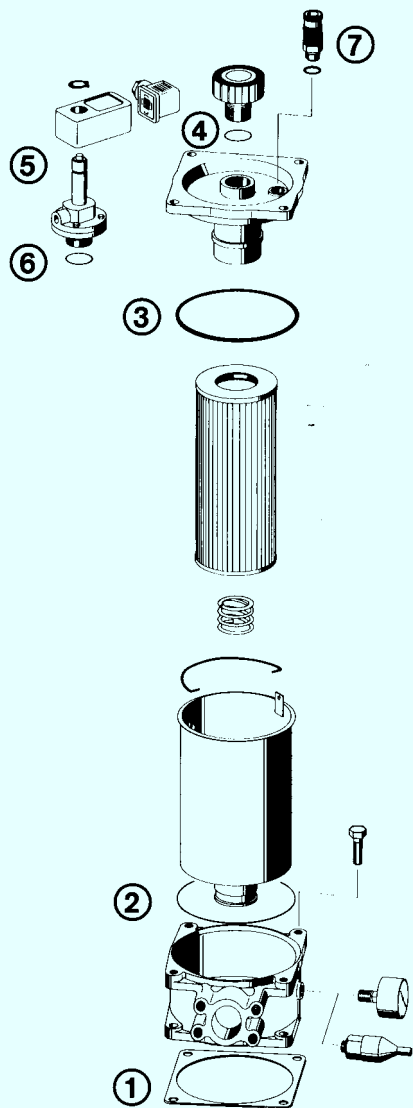
Pos 4 + 5 can be mounted at I or II alternatively



9. Dimensions

Dimension Type	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V	Weight
Pi 50 016-...	78	42	see 7.3	299	364	180	135	130	96	52	G 1 ½	185	47	171	11	162	93,5	70	35,7	M 12	3,2 kg
Pi 50 025-...	78	42		349	414	270	135	130	96	52	G 1 ½	185	47	171	11	162	93,5	70	35,7	M 12	3,4 kg
Pi 50 040-...	78	57		427	489	270	175,5	163	120	70	G 2	220	60	214	11	212	108	77,8	42,9	M 12	6,4 kg
Pi 50 063-...	78	57		577	639	420	175,5	163	120	70	G 2	220	60	214	11	212	108	89	50,8	M 12	6,9 kg
Pi 50 100-...	78	72		577	636	420	200	190	149	-	G 3	250	70	255	11	240	135	106	62	M 16	11,1 kg

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 bowl,
- the mounting hole in the tank top is not excessively large, to ensure proper sealing.
- the filter is free of tension after installation.

Preferably the filter should be installed with the filter bowl pointing downwards. In this position the visual pressure indicator is accessible and visible.

10.2 Connecting the electrical pressure indicator

The electrical pressure 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 vice versa.

10.3 When must the filter element be replaced?

- Filters equipped with visual and/or electrical pressure indicators: 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 pressure indicator: the filter element should be replaced after 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 (Mic or Sm-x) cannot be cleaned.

10.4 Element replacement

- Stop system and relieve filter from pressure.
- Remove cover, screws then lift off cover.
- Remove filter bowl and filter element by pulling upwards.
- Remove filter element with a side-to-side motion.
- Clean the filter bowl with a suitable medium.
- Check O-rings on filter cover and filter bowl for damage. Replace, if necessary.
- Make sure that the part number on the spare element corresponds with the part number on the filter name-plate.
- Remove filter element from the plastic bag and reassemble filter in reverse order (items 6-1).

11. Spare parts list

Pos.	Type/Order-No.
①	Sealkit for filter housing
	NG 160/250 NG 400/630 NG 1000
	NBR 822.790.2 822.793.6 822.796.9
	FPM 822.791.0 822.794.4 822.797.7
④	EPDM 822.792.8 822.795.1 822.798.5
⑤	Contamination indicator
	visual electrical electrical Pressure Pressure Switch
	773.780.2 773.803.2 upper part Gauge Normally Normally
	only only only 838.199.8 closed opened
Pis 3084/ Pis 3085/ 753.655.0 784.584.5 787.059.5	
	2.2 bar 2.2 bar
⑥	Seal kit for contamination indicator
	NBR 838.338.2
	FPM 838.339.0
	EPDM 838.340.8
⑦	Quick-release coupling 796.513.0

Subject to technical alteration without prior notice.

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