



Low Pressure Filter

Pi 2000

Operating pressure 25 (63) bar, Nominal size up to 400
according to DIN 24550

1. Features

Efficient filters for modern hydraulic systems

- Modular design
- Minimal pressure loss
- Compact design
- Visual / electrical / electronical differential pressure indication
- Threaded ports

Quality filters, easy to service

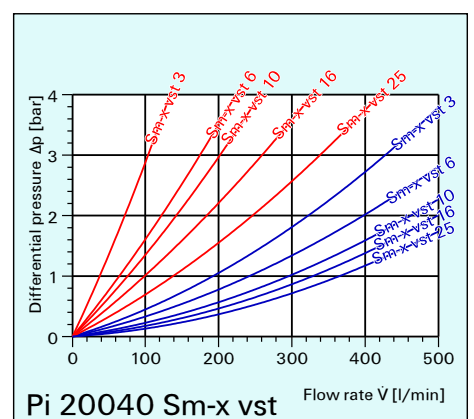
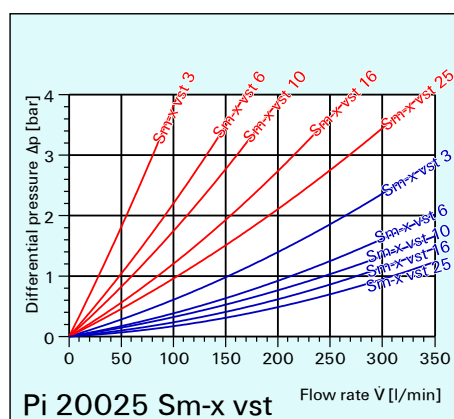
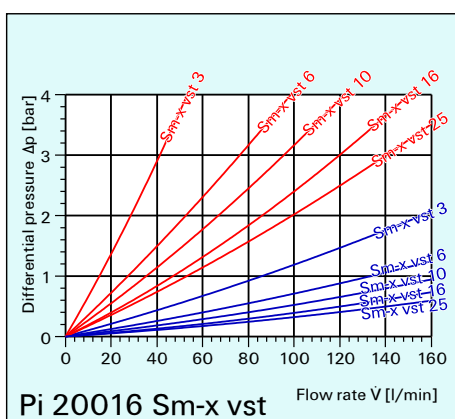
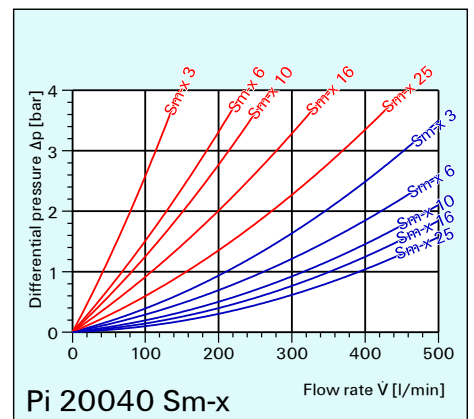
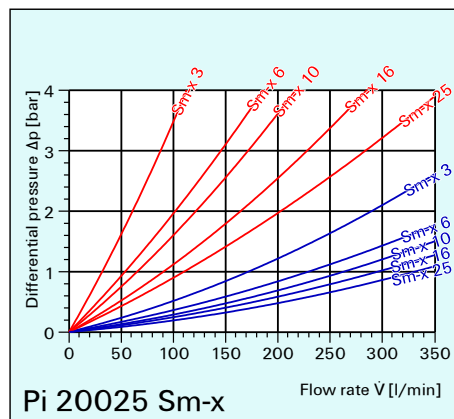
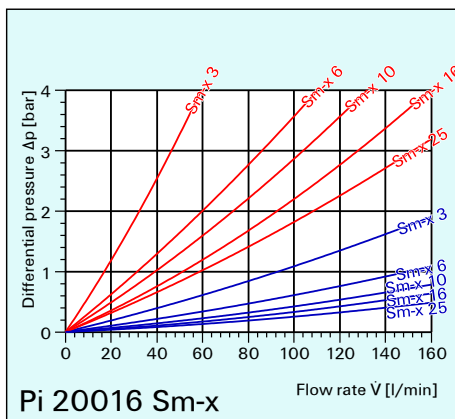
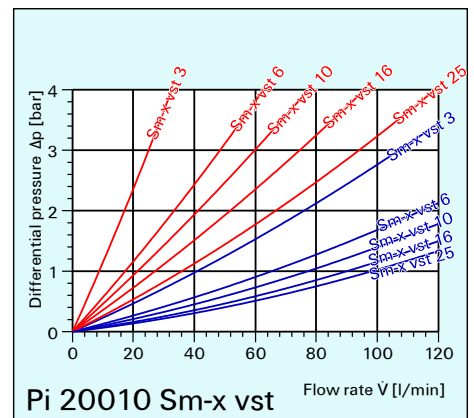
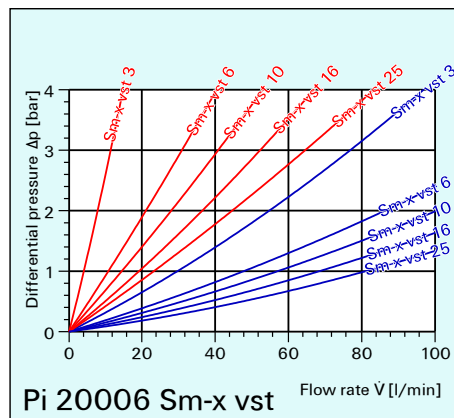
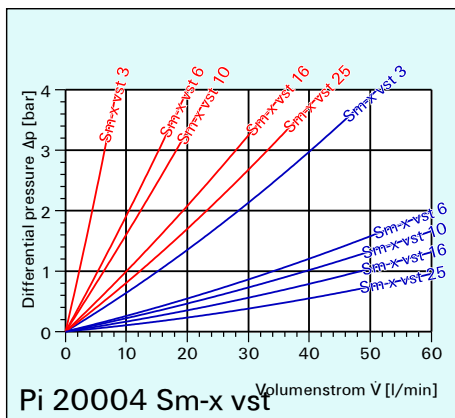
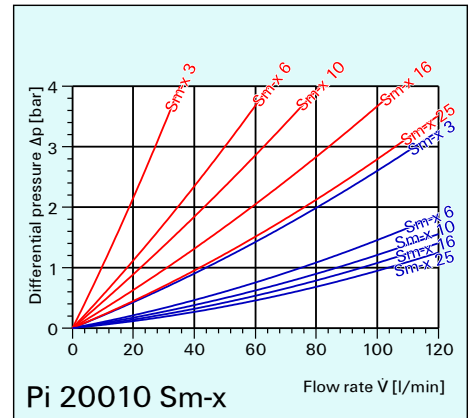
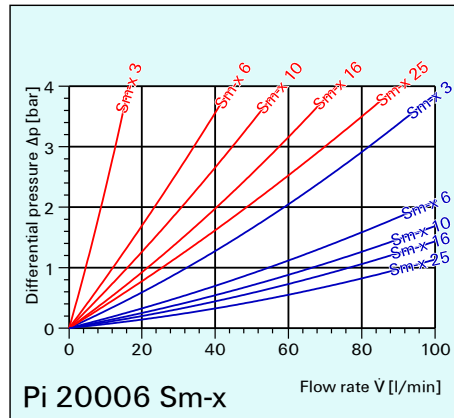
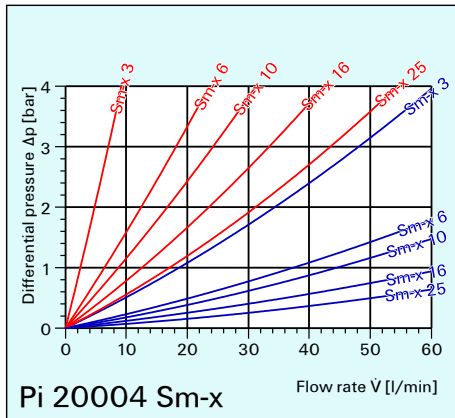
- Highly efficient Sm-x filter elements
- β -rated elements per ISO 4572
- Large dirt holding capacity and high differential pressure stability providing optimal element service life

World-wide sales

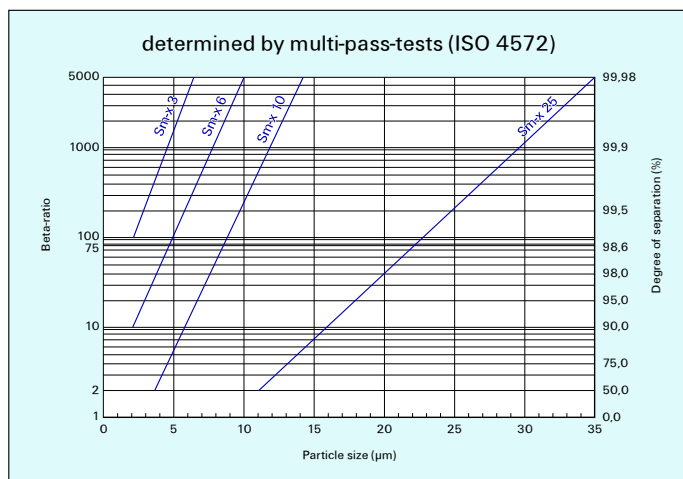


2. Flow rate / pressure drop curve compl. filter

190 mm²/s (25 ° E)
33 mm²/s (4,5 ° E)



3. Separation characteristics



4. Filter performance data

tested according to ISO 4572 (Multi-Pass-Test)

Sm-x elements
with Δp 20 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 7 bar differential pressure

Sm-x vst elements
with Δp 210 bar

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

at 16 bar differential pressure

Example for ordering filters:

- Housing design $\dot{V} = 100$ l/min, electrical indication
Type-no. **Pi 20010-069** Order-no. **826.503.5**
- Filter element Sm-x vst 3
Type-no. **Pi 71010 DN** Order-no. **822.748.0**

7. Order numbers

7.1 Housing design

Part number	Type number	Nominal size (NG)	① With indicator cavity	② With bypass valve and indicator cavity	③ With bypass valve and visual indicator	④ With bypass valve and electrical indicator	⑤ With visual indicator	⑥ With electrical indicator
611.697.4	Pi 20 004-060	40						
611.698.2	Pi 20 004-056							
932.839.4	Pi 20 004-057							
932.840.2	Pi 20 004-058							
932.841.0	Pi 20 004-068							
932.842.8	Pi 20 004-069							
611.699.0	Pi 20 006-060	63						
611.700.6	Pi 20 006-056							
611.701.4	Pi 20 006-057							
611.702.2	Pi 20 006-058							
611.703.0	Pi 20 006-068							
611.704.8	Pi 20 006-069							
611.705.5	Pi 20 010-060	100						
611.706.3	Pi 20 010-056							
932.843.6	Pi 20 010-057							
795.870.5	Pi 20 010-058							
932.844.4	Pi 20 010-068							
826.503.5	Pi 20 010-069							
611.707.1	Pi 20 016-060	160						
611.708.9	Pi 20 016-056							
611.709.7	Pi 20 016-057							
971.352.0	Pi 20 016-058							
611.410.2	Pi 20 016-068							
611.411.0	Pi 20 016-069							
611.412.8	Pi 20 025-060	250						
611.412.6	Pi 20 025-056							
932.845.1	Pi 20 025-057							
795.887.9	Pi 20 025-058							
932.846.9	Pi 20 025-068							
932.847.7	Pi 20 025-069							
611.414.1	Pi 20 040-060	400						
611.415.1	Pi 20 040-056							
971.439.5	Pi 20 040-057							
611.416.9	Pi 20 040-058							
611.417.7	Pi 20 040-068							
611.418.5	Pi 20 040-069							

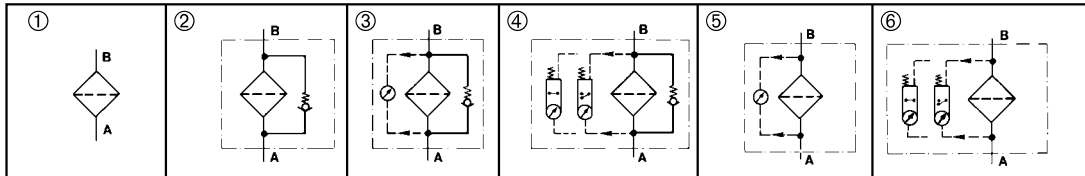
When filter with non bypass configuration is selected the collapse pressure of the element may not be exceeded.

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 3968.2	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 area [] = Type number

Sm-x 3 Δp 20 bar (540 cm²)	Sm-x 6 Δp 20 bar (540 cm²)	Sm-x 10 Δp 20 bar (540 cm²)	Sm-x 16 Δp 20 bar (540 cm²)	Sm-x 25 Δp 20 bar (540 cm²)	Sm-x vst 3 Δp 210 bar (440 cm²)	Sm-x vst 6 Δp 210 bar (440 cm²)	Sm-x vst 10 Δp 210 bar (440 cm²)	Sm-x vst 16 Δp 210 bar (440 cm²)	Sm-x vst 25 Δp 210 bar (440 cm²)
					[Pi 71 004 DN] 821.607.9	[Pi 72 004 DN] 796.015.6	[Pi 73 004 DN] 792.565.4	[Pi 74 004 DN] 821.608.7	[Pi 75 004 DN] 821.609.5
[Pi 21 004 DN] 826.092.9 (910 cm²)	[Pi 22 004 DN] 796.085.9 (910 cm²)	[Pi 23 004 DN] 792.557.1 (910 cm²)	[Pi 24 004 DN] 826.093.7 (910 cm²)	[Pi 25 004 DN] 826.094.5 (910 cm²)					
					[Pi 71 006 DN] 821.613.7	[Pi 72 006 DN] 796.014.9	[Pi 73 006 DN] 792.566.2	[Pi 74 006 DN] 821.614.5	[Pi 75 006 DN] 821.615.2
[Pi 21 006 DN] 826.096.0 (1490 cm²)	[Pi 22 006 DN] 796.086.7 (1490 cm²)	[Pi 23 006 DN] 792.558.9 (1490 cm²)	[Pi 24 006 DN] 826.097.8 (1490 cm²)	[Pi 25 006 DN] 826.098.6 (1490 cm²)					
					[Pi 71 010 DN] 822.748.0	[Pi 72 010 DN] 796.013.1	[Pi 73 010 DN] 792.567.0	[Pi 74 010 DN] 826.128.1	[Pi 75 010 DN] 821.616.0
[Pi 21 010 DN] 822.747.2 (2420 cm²)	[Pi 22 010 DN] 796.087.5 (2420 cm²)	[Pi 23 010 DN] 792.559.7 (2420 cm²)	[Pi 24 010 DN] 826.100.0 (2420 cm²)	[Pi 25 010 DN] 826.101.8 (2420 cm²)					
					[Pi 71 016 DN] 794.063.8	[Pi 72 016 DN] 796.012.3	[Pi 73 016 DN] 792.568.8	[Pi 74 016 DN] 826.979.7	[Pi 75 016 DN] 821.617.8
[Pi 21 016 DN] 826.103.4 (4020 cm²)	[Pi 22 016 DN] 796.082.6 (4020 cm²)	[Pi 23 016 DN] 792.560.5 (4020 cm²)	[Pi 24 016 DN] 826.104.2 (4020 cm²)	[Pi 25 016 DN] 826.105.9 (4020 cm²)					
					[Pi 71 025 DN] 794.064.6	[Pi 72 025 DN] 796.011.5	[Pi 73 025 DN] 792.569.6	[Pi 74 025 DN] 826.981.3	[Pi 75 025 DN] 821.618.6
[Pi 21 025 DN] 822.751.4 (6700 cm²)	[Pi 22 025 DN] 796.083.4 (6700 cm²)	[Pi 23 025 DN] 792.561.3 (6700 cm²)	[Pi 24 025 DN] 826.107.5 (6700 cm²)	[Pi 25 025 DN] 826.108.3 (6700 cm²)					
					[Pi 71 040 DN] 794.065.3	[Pi 72 040 DN] 796.010.7	[Pi 73 040 DN] 793.082.9	[Pi 74 040 DN] 826.982.1	[Pi 75 040 DN] 826.090.3
[Pi 21 040 DN] 822.752.2	[Pi 22 040 DN] 796.084.2	[Pi 23 040 DN] 792.562.1	[Pi 24 040 DN] 826.110.9	[Pi 25 040 DN] 826.111.7					

*Further elements available upon request.

8. Specifications

Design:	line mounting filter
Operating pressure:	25 bar*
Test pressure:	33 bar
Temperature range:	-10 °C to +120 °C (other temperature ranges on request)
Bypass opening pressure:	Δp 3,5 bar $\pm$ 10 %
Filter head material:	GDAL
Filter bowl material:	AL / St
Material of seals:	NBR / AL
Activating pressure of visual / electrical differential pressure indicator:	Δp 2,2 bar $\pm$ 0,3 bar
Electrical data of contamination 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.

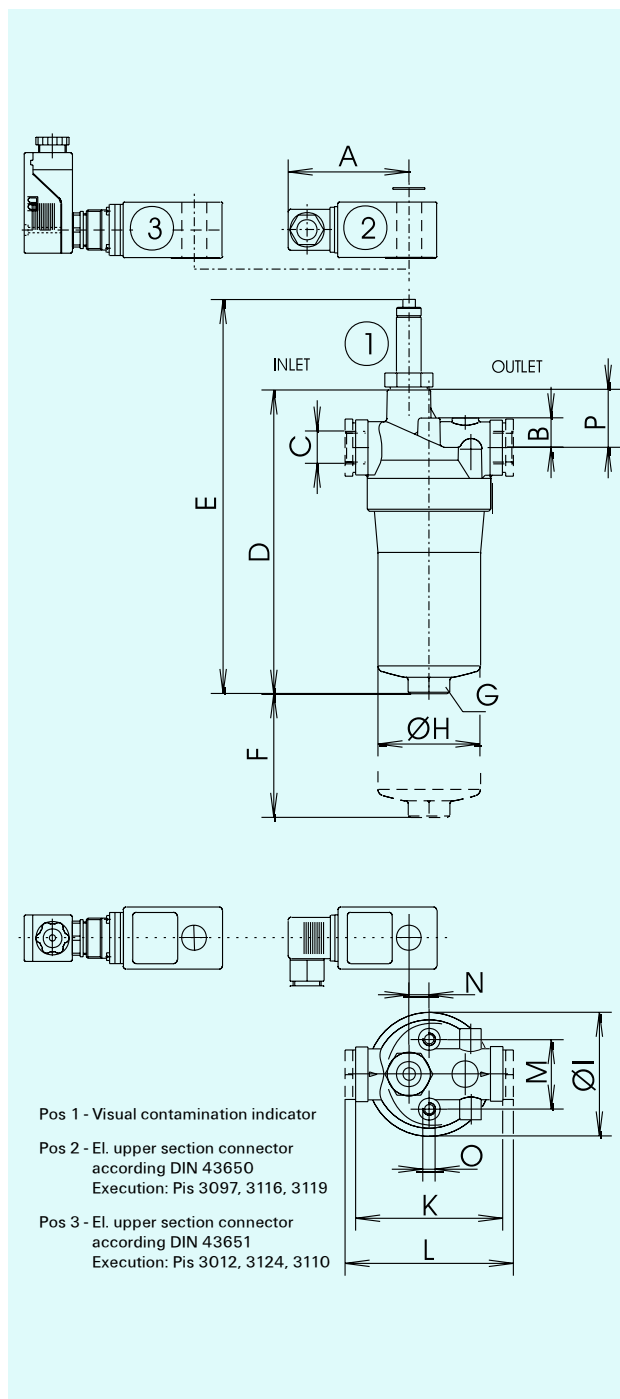
Inductivity in the direct current may require the use of a signal eraser.

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.

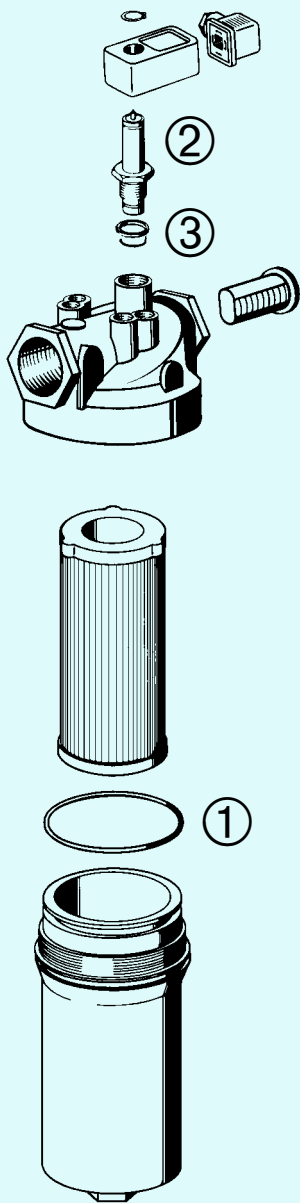
***Types Pi 20004.. – Pi 20010.. have an operating pressure of 63 bar, test pressure 82 bar.**



9. Dimensions

All dimensions (except "C") in mm

Dimension Type	A	B	C	D	E	F	G SW	H	I	K	L	M	N	O	P	Weight
Pi 20004	78	19	G ½	182	240	80	27	66	80	–	109	45	13	M 8 x 10	37,5	0,9 kg
Pi 20006	78	19	G ¾	242	300	80	27	66	80	95	–	45	13	M 8 x 10	37,5	1 kg
Pi 20010	78	19	G ¾	335	393	80	27	66	80	95	–	45	13	M 8 x 10	37,5	1,1 kg
Pi 20016	78	30	G 1 ¼	268	326	110	32	109	128	150	–	60	24,5	M 12 x 15	43,5	2,3 kg
Pi 20025	78	30	G 1 ¼	363	421	110	32	109	128	150	–	60	24,5	M 12 x 15	43,5	2,5 kg
Pi 20040	78	30	G 1 ¼	508	566	110	24	109	128	150	–	60	24,5	M 12 x 15	43,5	7,4 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. Preferable the filter should be installed with the filter bowl pointing downwards. 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 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) cannot be cleaned.

10.4 Element replacement

- Stop system and relieve filter from pressure.
- Unscrew the filter bowl by turning counter-clockwise. Clean the bowl using a suitable cleaning solvent.
- Remove filter element with a side-to-side motion.
- Check O-ring on the filter bowl and spigot for damage. Replace, if necessary.
- Make sure that the part number an the spare element corresponds with the part number of the filter label. Open the plastic bag and push element over the spigot in the filter head. Now remove plastic bag.
- Complete installation by screwing on the bowl, turning clockwise until it comes to a full stop. Back off the bowl $\frac{1}{8}$ to $\frac{1}{2}$ turn.

11. Spare parts list

Pos.	part number / housing		
	Pi 20004-Pi 20010	Pi 20016-Pi 20040	
①	Seal kit	Seal kit	
	NBR 932.848.5	NBR	935.761.7
	FPM 932.849.3	FPM	935.762.5
	EPDM 935.760.9	EPDM	935.763.3
②	Contamination indicator		
	visual	electrical	electrical upper
	766.997.1	766.994.8	section only
③	Seal kit for contamination indicator		
		NBR	776.030.9
		FPM	776.031.7
		EPDM	776.032.5

Subject to technical alteration without prior notice.



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