

High Pressure Filter

Pi 410

Operating pressure 315 bar, Nominal size 20–63

1. Features

Efficient filters for modern hydraulic systems

- Modular design
- Minimal pressure loss
- Compact design
- Visual / electrical / electronic differential pressure indication
- Connection according to DIN 24340

Quality filters, easy to service

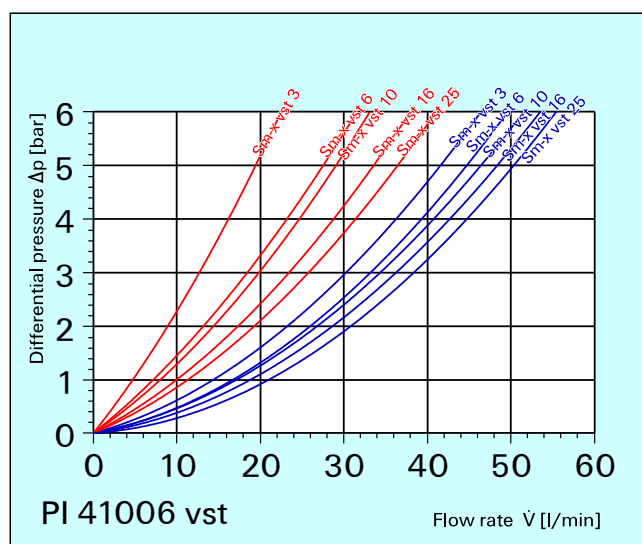
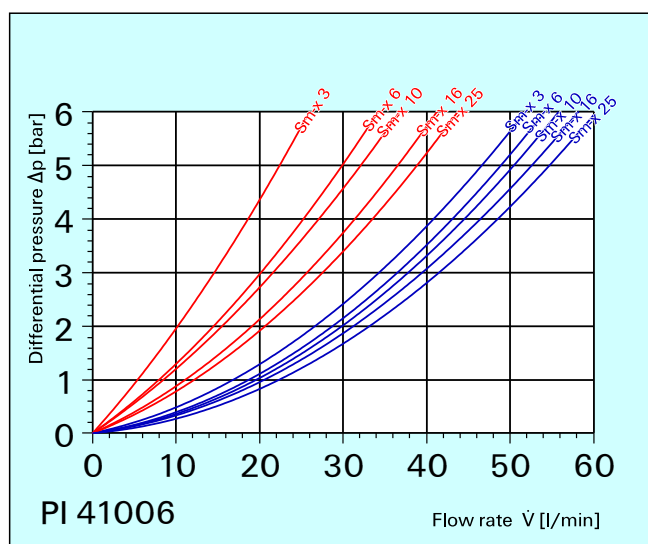
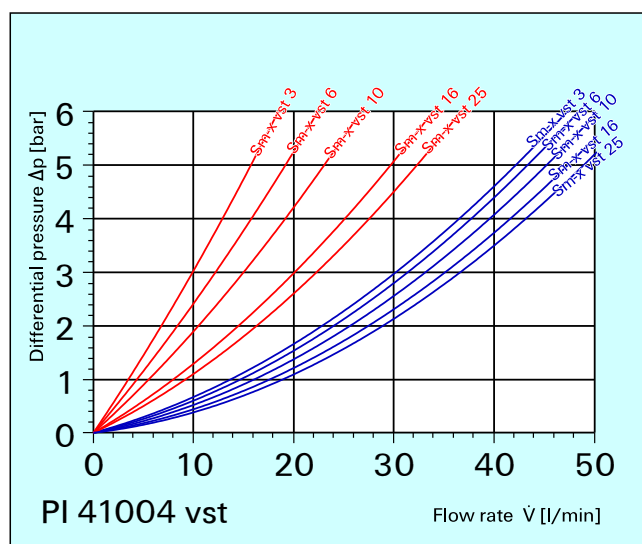
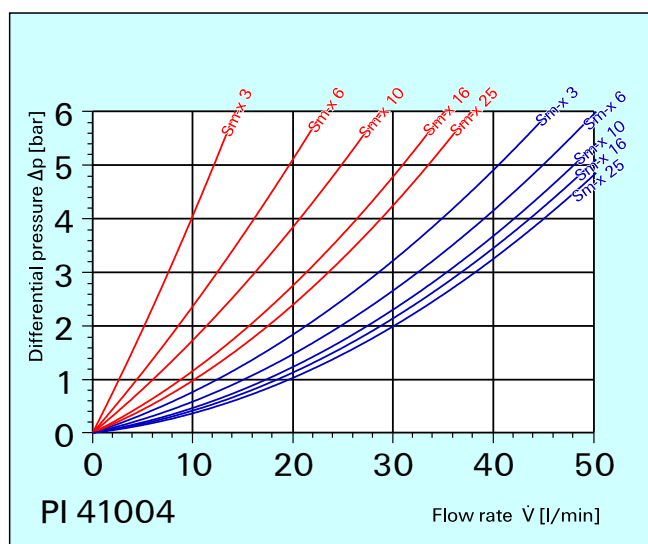
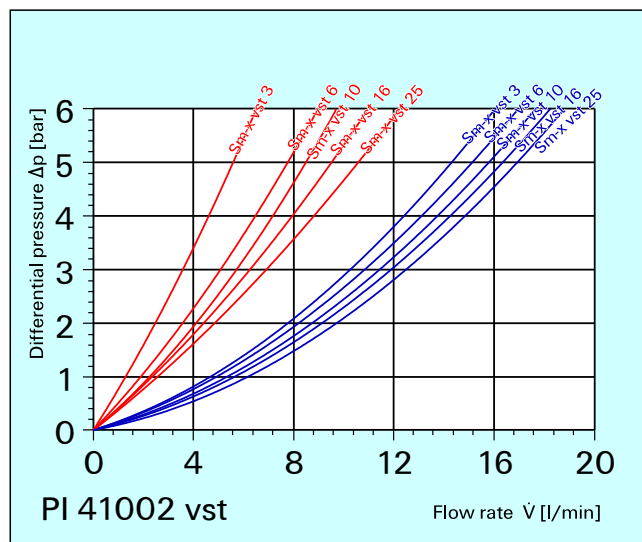
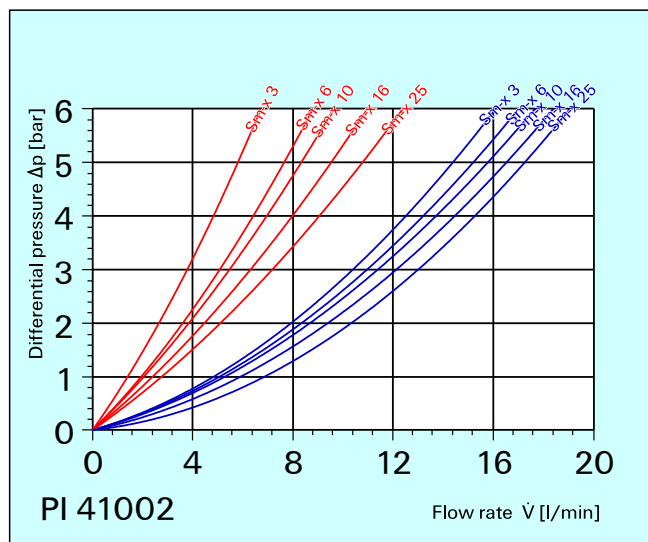
- Highly efficient Sm-x filter elements
- β -rated elements per ISO 4572
- Large dirt holding capacity and high differential pressure stability providing optimal element service life
- 100% bubble-point tested elements

World-wide sales

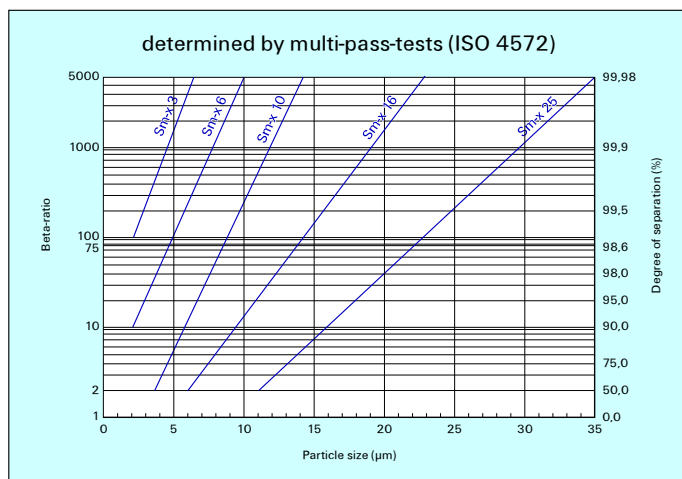


2. Flow rate/pressure drop curve compl. filter

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 16	$\beta_{16} \geq 75$
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 16	$\beta_{16} \geq 75$
Sm-x vst 25	$\beta_{25} \geq 75$

at 16 bar differential pressure

Example for ordering filters:

- Housing design $\dot{V} = 40$ l/min, electrical indication
Type-no. **Pi 41004-15**
- Filter element Sm-x 3
Type-no. **Pi 21004 DN**

Order-no. **793.760.0**

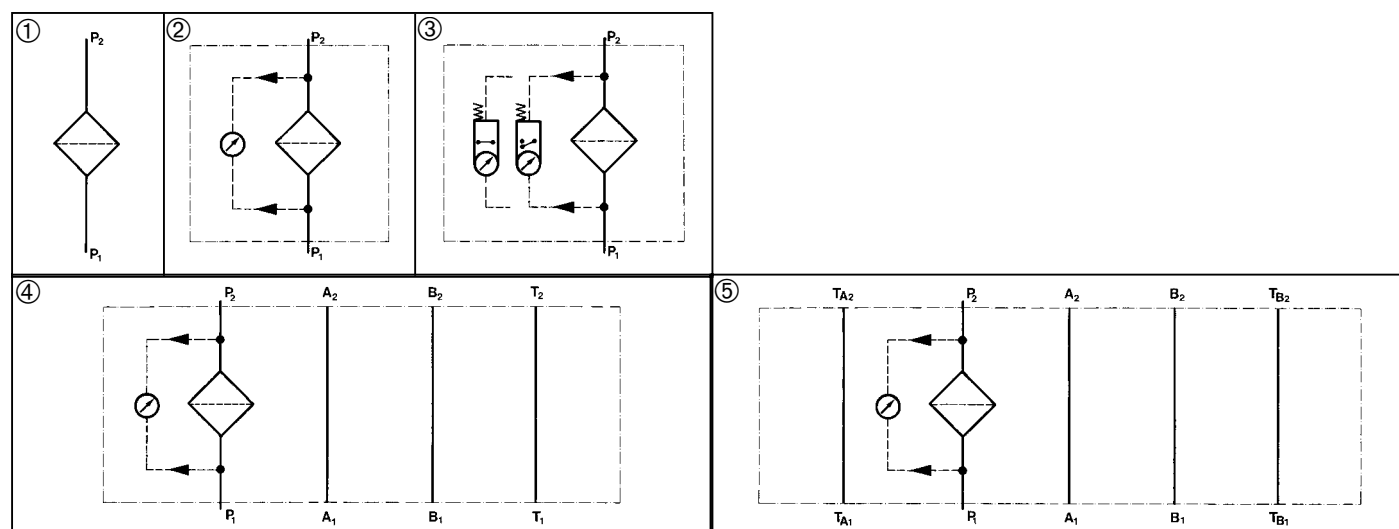
Order-no. **826.092.9**

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 filter elements: Evaluation of pressure drop versus flow
ISO 4572	Hydraulic filter elements: Testing of filter performance (multi-pass-test)

6. Symbols



7. Order numbers

7.1 Housing design						7.2 Filter elements* () = filter surface area [] = type number										
Order number	Type number	Nominal size (NG)	①	②	③		Δp 20 bar					Δp 210 bar				
			with blind plug for VA	with visual indicator	with visual/electr. indicator		Sm-x 3	Sm-x 6	Sm-x 10	Sm-x 16	Sm-x 25	Sm-x vst 3	Sm-x vst 6	Sm-x vst 10	Sm-x vst 16	Sm-x vst 25
		20	④			}	(250 cm²)	(250 cm²)	(250 cm²)	(250 cm²)	(250 cm²)	(205 cm²)	(205 cm²)	(205 cm²)	(205 cm²)	(205 cm²)
793.754.3	Pi 41002-46						[852 243 Sm-x 3]	[852 243 Sm-x 6]	[852 243 Sm-x 10]	[852 243 Sm-x 16]	[852 243 Sm-x 25]	[852 243 Sm-x vst 3]	[852 243 Sm-x vst 6]	[852 243 Sm-x vst 10]	[852 243 Sm-x vst 16]	[852 243 Sm-x vst 25]
793.755.0	Pi 41002-14						768.540.7	821.603.8	774.032.7	821.605.3	768.541.5	768.542.3	821.604.6	768.543.1	821.606.1	768.544.9
793.756.8	Pi 41002-15															
		40	⑤			}	(540 cm²)	(540 cm²)	(540 cm²)	(540 cm²)	(540 cm²)	(445 cm²)	(445 cm²)	(445 cm²)	(445 cm²)	(445 cm²)
793.761.8	Pi 41004-46						[Pi 21004 DN]	[Pi 22004 DN]	[Pi 23004 DN]	[Pi 24004 DN]	[Pi 25004 DN]	[Pi 71004 DN]	[Pi 72004 DN]	[Pi 73004 DN]	[Pi 74004 DN]	[Pi 75004 DN]
793.759.2	Pi 41004-14						826.092.9	796.085.9	792.557.1	826.093.7	826.094.5	821.607.9	796.015.6	792.565.4	821.608.7	821.609.5
793.760.0	Pi 41004-15															
		63	⑤			}	(910 cm²)	(910 cm²)	(910 cm²)	(910 cm²)	(910 cm²)	(780 cm²)	(780 cm²)	(780 cm²)	(780 cm²)	(780 cm²)
793.764.2	Pi 41006-46						[Pi 21006 DN]	[Pi 22006 DN]	[Pi 23006 DN]	[Pi 24006 DN]	[Pi 25006 DN]	[Pi 71006 DN]	[Pi 72006 DN]	[Pi 73006 DN]	[Pi 74006 DN]	[Pi 75006 DN]
793.762.6	Pi 41006-14						826.096.0	796.086.7	792.558.9	826.097.8	826.098.6	821.613.7	796.014.9	792.566.2	821.614.5	821.615.2
793.763.4	Pi 41006-15															

*other element executions available on request

8. Specifications

Design:	vertical line mounting
Operating pressure:	315 bar
Test pressure:	410 bar
Temperature range:	-10 °C to +120 °C (other temperature ranges on request)
Filter head material:	steel
Filter bowl material:	steel
Material of seals:	NBR / PTFE / CU
Activating pressure of visual / electrical differential pressure indicator:	Δp 5 bar ± 10 %
Electrical data of contamination indicator:	
Maximum voltage:	230 V ~ / =
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 Ø 6-10

If desired, electrical indicator may be supplied with a light. 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.

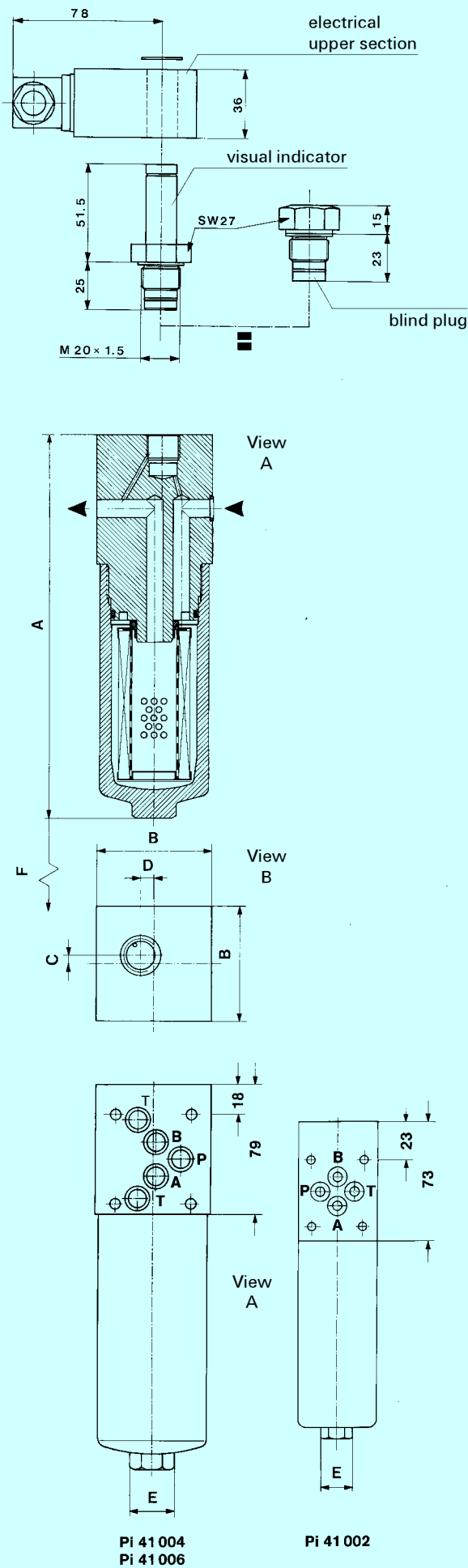
Inductivity in the direct current may require the use of a signal eraser.

For further information and options also see our leaflet, contamination indicators!

9. Dimensions

All dimensions in mm

Type Dimension	Pi 41002	Pi 41004	Pi 41006
A	241	235	295
B	48	70	70
C	3	5	5
D	2	8	8
E	SW 17	SW 27	SW 27
F	50	50	50
hole pattern DIN 24340	A 6	A 10	A 10
O-ring Ø	9,25 x 1,78	12 x 2	12 x 2
Weight kg	2,65	5,00	5,70



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.

Please note the indicated flow direction.

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.

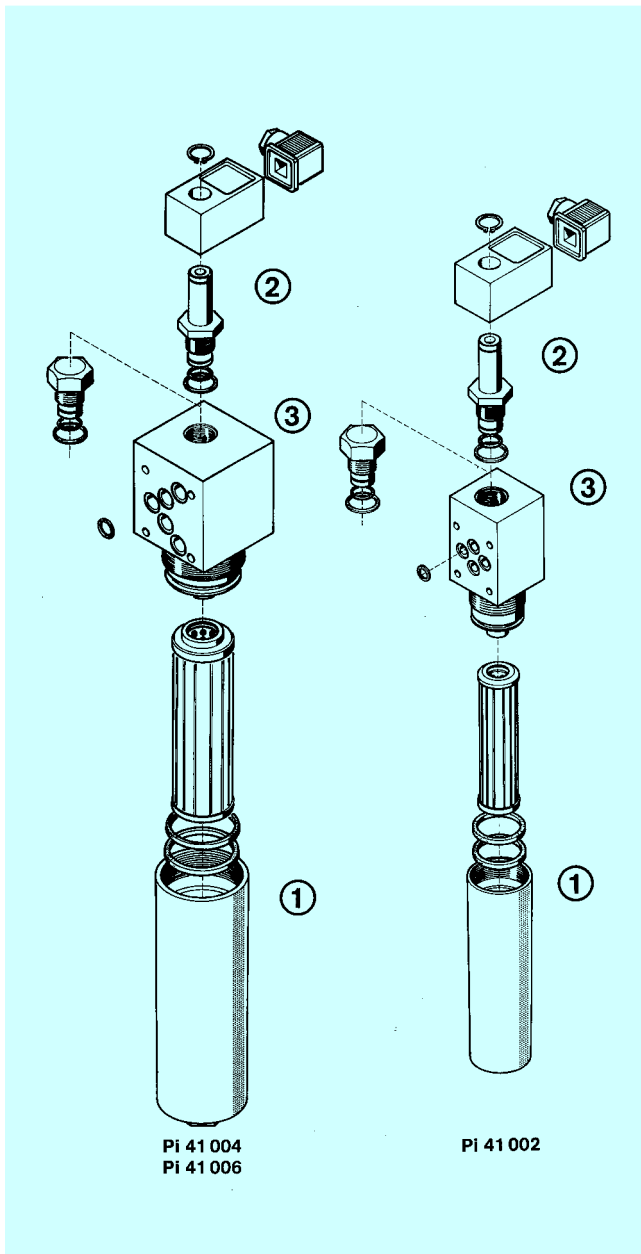
10.3 When must the filter element be replaced?

- 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 for 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 and back-up ring on the filter head for damage. Replace, if necessary.
- Make sure that the part number on the spare element corresponds with the part number on 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 1/4 turn.

Subject to technical alteration.



11. Spare parts list

Pos.	type no./housing		
	Pi 41002	Pi 41004-41006	
①	Seal kit NBR 799.686.1 FPM 799.687.9 EPDM 799.688.7	Seal kit NBR 799.689.5 FPM 799.690.3 EPDM 799.691.1	
②	Contamination indicator visual 766.991.4 Pis 3093/5 bar	electrical 766.986.4 Pis 3092/5 bar	electrical upper section only 753.655.0
③	Seal kit for contamination indicator NBR 776.027.5 FPM 776.028.3 EPDM 776.029.1		



MAHLE
Industriefilter

KNECHT Filtergruppe

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