

High Pressure Filter

Pi 410

Nominal pressure 315 bar (4480 psi), nominal size 20-63

1. Features

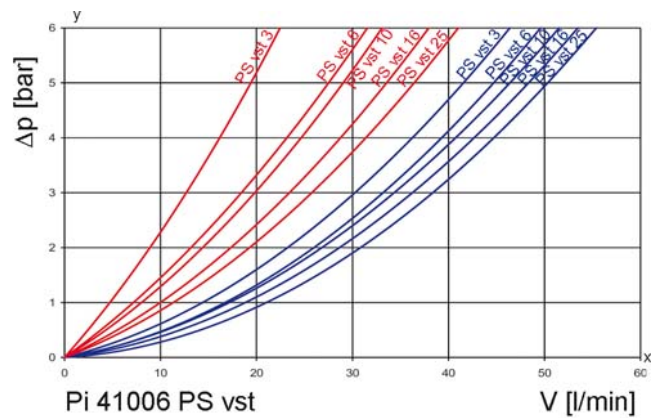
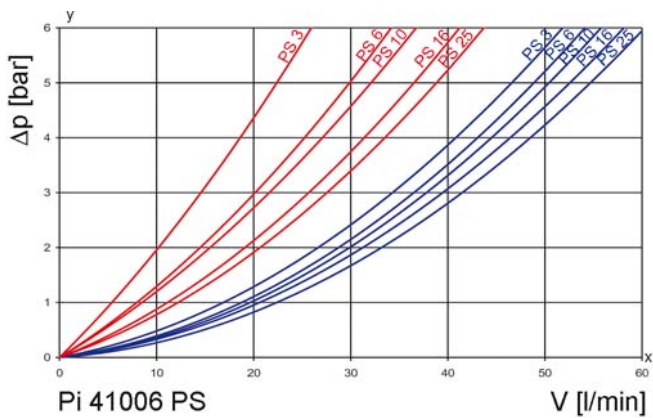
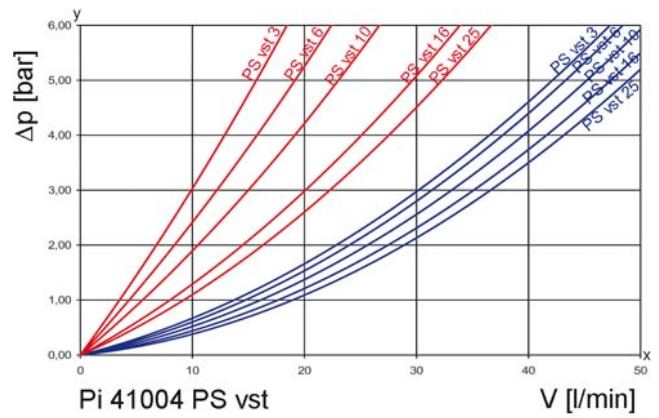
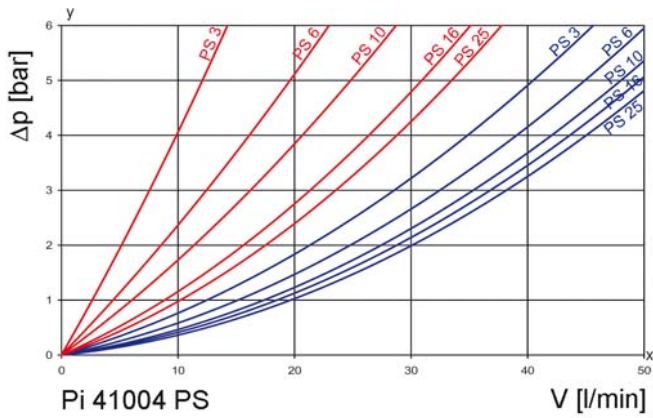
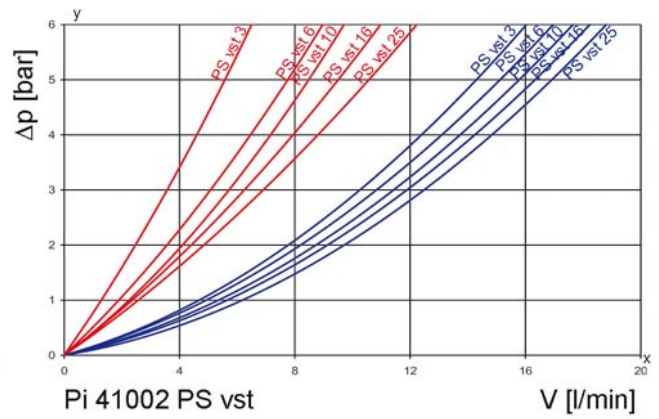
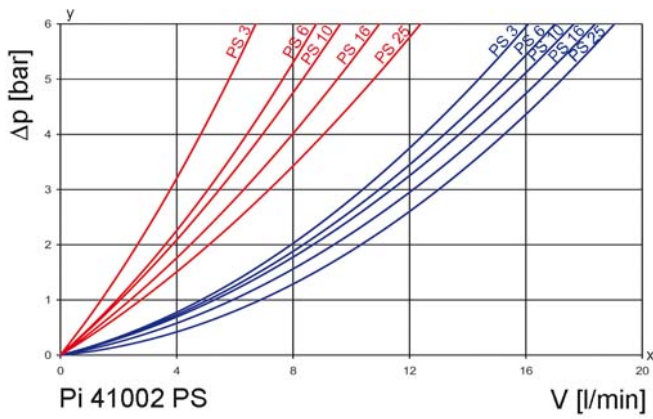
High performance filters for modern hydraulic systems

- Provided for valve block installation
- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance indicator
- Connections according DIN 24340
- Quality filters, easy to service
- Equipped with highly efficient glass fibre PS filter elements
- Nominal sizes 40 and 63 equipped with filter elements according to DIN 24550
- Beta rated elements according to ISO 16889 multipass test
- Elements with high differential pressure stability and dirt holding capacity
- Worldwide distribution



2. Flow rate/pressure drop curve complete filter

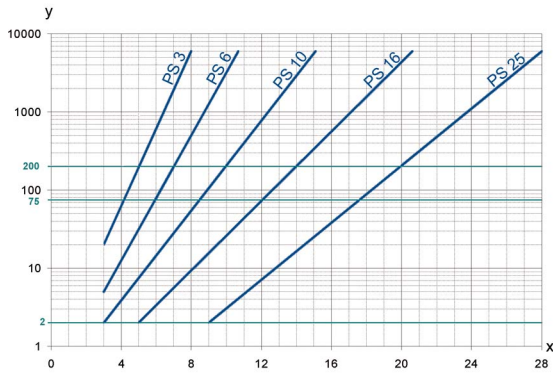
190 mm²/s
33 mm²/s



y = differential pressure Δp [bar]

x = flow rate V [l/min]

3. Separation grade characteristics



y = beta -value
x = particle size [μm]

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. Δp 20 bar

PS	3	$\beta_{5(C)} \geq 200$
PS	6	$\beta_{7(C)} \geq 200$
PS	10	$\beta_{10(C)} \geq 200$
PS	16	$\beta_{15(C)} \geq 200$
PS	25	$\beta_{20(C)} \geq 200$

values guaranteed up to
10 bar differential pressure

PS vst elements with
max. Δp 210 bar

PS vst	3	$\beta_{5(C)} \geq 200$
PS vst	6	$\beta_{7(C)} \geq 200$
PS vst	10	$\beta_{10(C)} \geq 200$
PS vst	16	$\beta_{15(C)} \geq 200$
PS vst	25	$\beta_{20(C)} \geq 200$

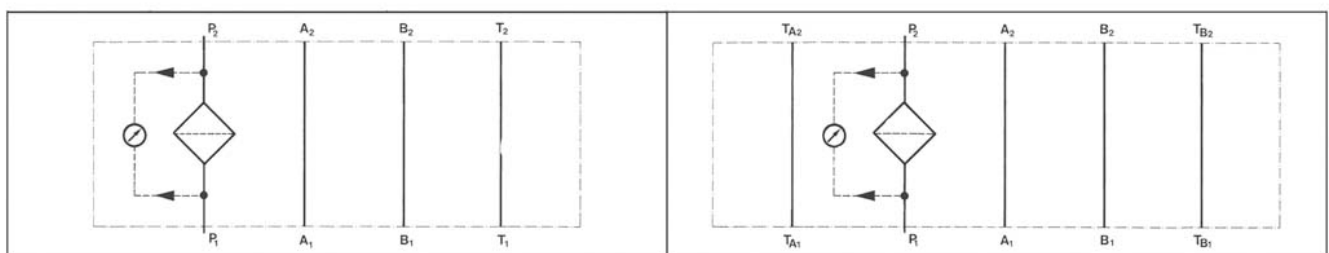
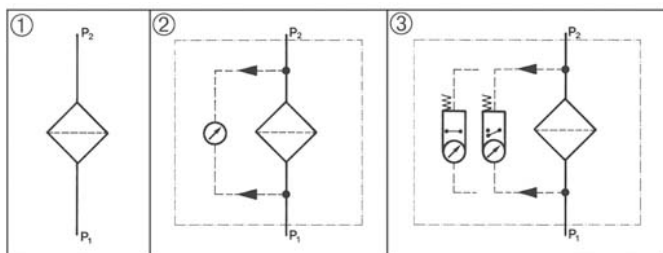
values guaranteed up to
20 bar differential pressure

5. Quality assurance

MAHLE filters and filter elements are produced according to the following international standards:

Norm	Designation
DIN ISO 2941	Hydraulic fluid power filter elements; verification of collapse/burst resistance
DIN ISO 2942	Hydraulic fluid power filter elements; verification of fabrication integrity
DIN ISO 2943	Hydraulic fluid power filter elements; verification of material compatibility with fluids
DIN ISO 3723	Hydraulic fluid power filter elements; method for end load test
DIN 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 10771.1	Fatigue pressure testing of metal containing envelopes in hydraulic fluid applications
ISO 16889	Hydraulic fluid power filters; multipass method for evaluation filtration performance of a filter element

6. Symbols



NG 20

NG 40-63

7. Order numbers

Example for ordering filters:

1. Filter housing	2. Filter element
V = 40 l/min, visual/electrical indicator Type: Pi 41004-015/Order number: 77937600	PS 3 Type: Pi 21004 DN PS 3/Order number: 78260929

7.1 Housing design

NG [l/min]	Order number	Type	① with indicator cavity	② with visual indicator	③ with electrical indicator
20	77937543	Pi 41002-046			
	77937550	Pi 41002-014			
	77937568	Pi 41002-015			
40	77937618	Pi 41004-046			
	77937592	Pi 41004-014			
	77937600	Pi 41004-015			
63	77937642	Pi 41006-046			
	77937626	Pi 41006-014			
	77937634	Pi 41006-015			

The collapse pressure of the element must not be exceeded.

7.2 Filter elements (a wider range of element types is available on request)

NG [l/min]	Order number	Type	Filter material	max. Δp [bar]	Filter surface [cm²]
20	77685407	852 243 PS 3	PS 3	20	305
	78216038	852 243 PS 6	PS 6		305
	77740327	852 243 PS 10	PS 10		305
	78216053	852 243 PS 16	PS 16		305
	77685415	852 243 PS 25	PS 25		305
	77685423	852 243 PS vst 3	PS vst 3	160	275
	78216046	852 243 PS vst 6	PS vst 6		275
	77685431	852 243 PS vst 10	PS vst 10		275
	78216061	852 243 PS vst 16	PS vst 16		275
	77685449	852 243 PS vst 25	PS vst 25		275
40	78260929	Pi 21004 DN PS 3	PS 3	20	475
	77960859	Pi 22004 DN PS 6	PS 6		475
	77925571	Pi 23004 DN PS 10	PS 10		475
	78260937	Pi 24004 DN PS 16	PS 16		475
	78260945	Pi 25004 DN PS 25	PS 25		475
	78216079	Pi 71004 DN PS vst 3	PS vst 3	210	445
	77960156	Pi 72004 DN PS vst 6	PS vst 6		445
	77925654	Pi 73004 DN PS vst 10	PS vst 10		445
	78216087	Pi 74004 DN PS vst 16	PS vst 16		445
	78216095	Pi 75004 DN PS vst 25	PS vst 25		445
63	78260960	Pi 21006 DN PS 3	PS 3	20	835
	77960867	Pi 22006 DN PS 6	PS 6		835
	77925589	Pi 23006 DN PS 10	PS 10		835
	78260978	Pi 24006 DN PS 16	PS 16		835
	78260986	Pi 25006 DN PS 25	PS 25		835
	78216137	Pi 71006 DN PS vst 3	PS vst 3	210	780
	77960149	Pi 72006 DN PS vst 6	PS vst 6		780
	77925662	Pi 73006 DN PS vst 10	PS vst 10		780
	78216145	Pi 74006 DN PS vst 16	PS vst 16		780
	78216152	Pi 75006 DN PS vst 25	PS vst 25		780

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. Preferably the filter should be installed with the filter housing pointing downwards.

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.

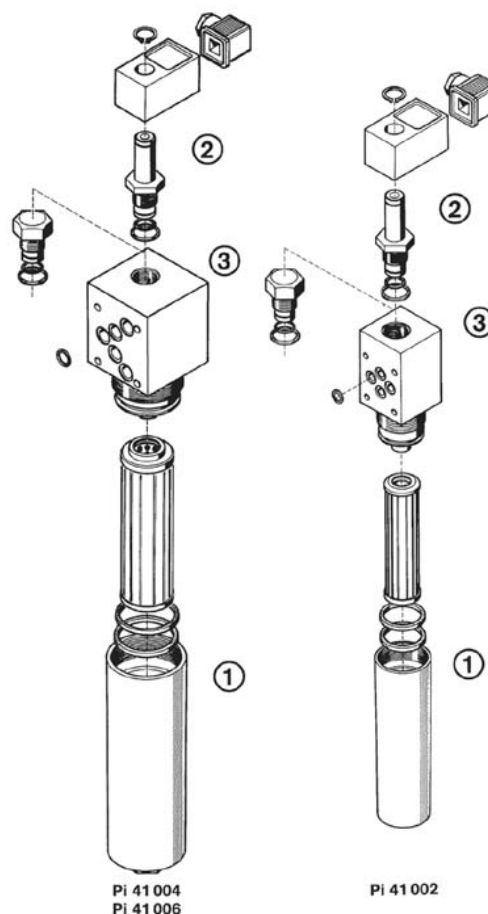
The electrical section can be inverted to change from normally open position to normally closed position or vice versa.

10.3 When should the filter element be replaced?

- 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.
- 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.
- Please always ensure that you have original MAHLE spare elements in stock: Disposable elements (PS) cannot be cleaned.

10.4 Element replacement

- Stop system and relieve filter from pressure.
- Unscrew the filter housing by turning counter-clockwise. Clean the housing using a suitable cleaning solvent.
- Remove the filter element by pulling down carefully.
- Check O-ring and spigot for damage. Replace, if necessary.
- Make sure that the order number on the spare element corresponds to the order number of the filter name-plate. To ensure no contamination occurs during the exchange of the element first open the plastic bag and push the element over the spigot in the filter head. Now remove plastic bag.
- Lightly lubricate the thread of the filter housing and screw onto the filter head completely. After that unscrew the filter housing 1/8 to 1/2 turn.



11. Spare parts list

Order numbers for spare parts		
Position	Type	Order number
①	Seal kit	
	Pi 41002	
	NBR	77996861
	FPM	77996879
	EPDM	77996887
	Pi 41004 - Pi 41006	
	NBR	77996895
	FPM	77996903
②	EPDM	77996911
	Maintenance indicator	
	Visual PiS 3093/5	77669914
	Electrical PiS 3092/5	77669864
③	Electrical upper section only	77536550
	Seal kit for maintenance indicator	
	NBR	77760275
	FPM	77760283
	EPDM	77760291

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