MAHLE

Driven by performance

Duplex Filter
Pi 241

Nominal pressure 40 bar (580 psi), nominal size up to 300

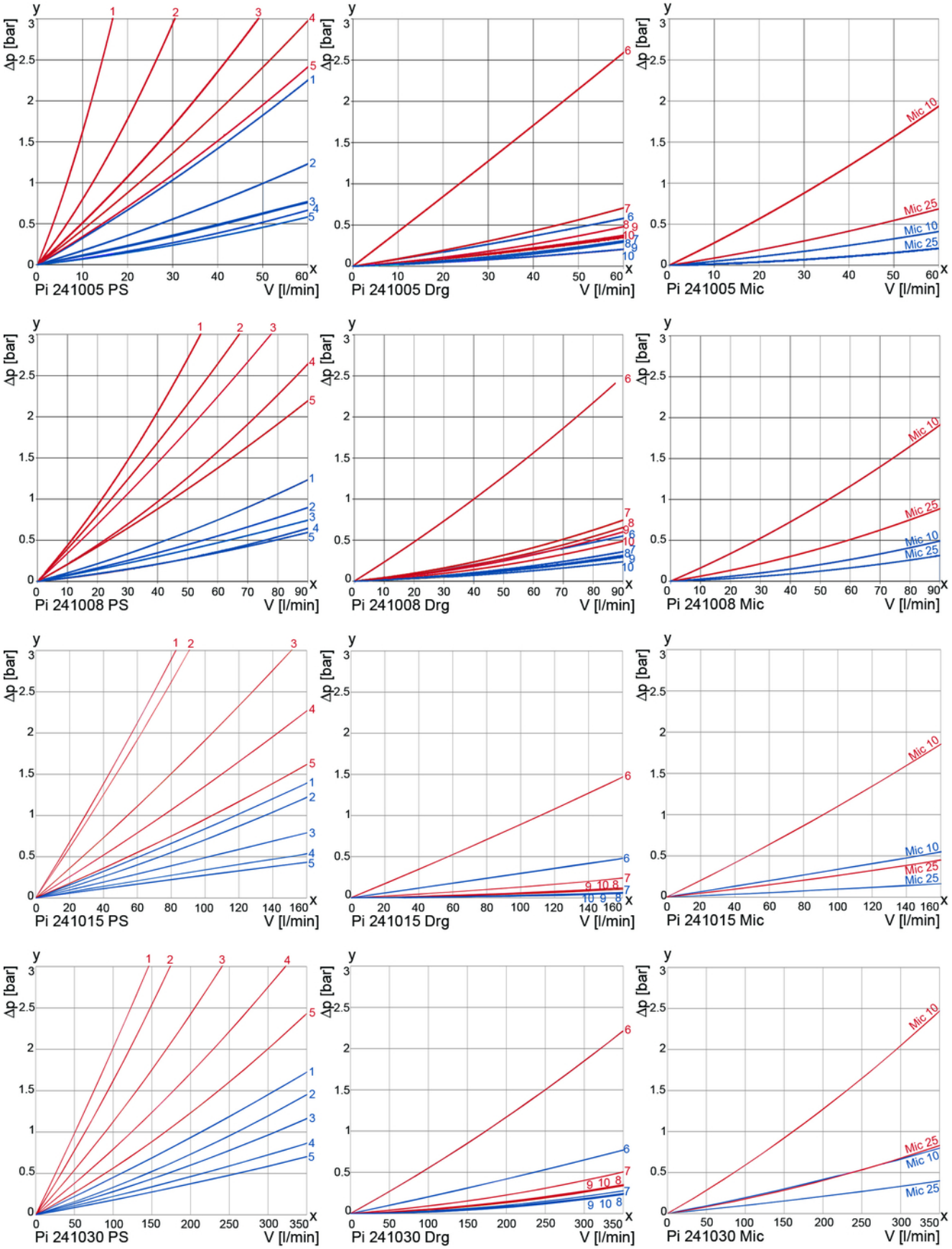
1. Features

High performance filters for modern hydraulic, lubrication and fuel systems

- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Constantly flow clearance opening
- Ball switching unit
- Visual/electrical/electronic maintenance indicator
- Flanged and threaded connections
- Variable operating and mounting possibilities
- International certificates of examinations
- Extensive range of accessories
- Quality filters, easy to service
- Equipped with highly efficient MAHLE filter elements
- 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

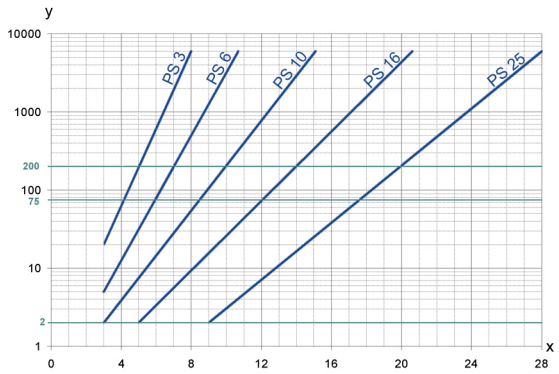
190 mm²/s
33 mm²/s



y = differential pressure∆ p [bar]
x = flow rate V [l/min]

1 = PS 3	3 = PS 10	5 = PS 25	7 = Drg 25	9 = Drg 60
2 = PS 6	4 = PS 16	6 = Drg 10	8 = Drg 40	10 = Drg 100

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. Δ p 20 bar

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

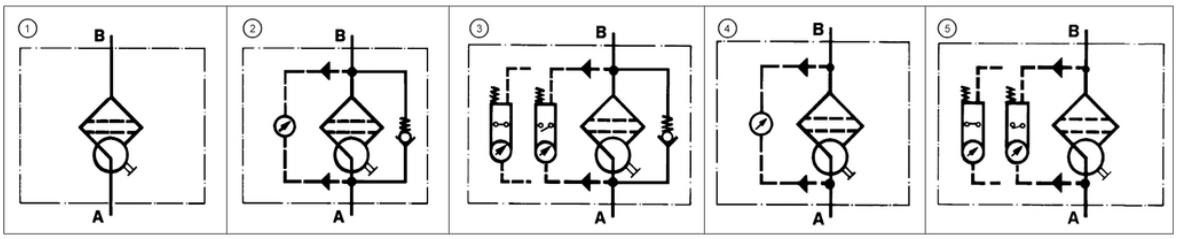
values guaranteed up to
10 bar differential pressure

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



7. Type number key and order numbers

7.1 Type number key housings

Type							
241	Duplex filter						
	Nominal size [l/min]						
	005	NG 50					
	008	NG 80					
	015	NG 150					
	030	NG 300					
		Connection					
		1	SAE flange				
		4	Thread connection				
			Clearance opening				
			C	1" DN 25	(NG 50 - NG 80)		
			F	2" DN 50	(NG 150 - NG 300)		
				Seal material*			
				N	NBR		
				F	FPM		
				C	CR		
					Housing code*		
					-046	with screw plug	
					-057	with bypass and visual indicator	
					-058	with bypass and electrical indicator	
					-068	with visual indicator	
					-069	with electrical indicator	
						Special equipment*	
						M	Magnet
Pi 241	**008/**	**1**	**C/**	**N**	**-069/**	**M**	Example for ordering

*Other types on request

Example for ordering filters:

1. Filter housing	2. Filter element
V = 80 l/min, connection 1" SAE, seal NBR and visual/electrical maintenance indicator Type: Pi 241008/1C/N-069 Order number: 70535442	PS 10 Type: Pi 23008 AN PS 10 Order number: 70518877

7.2 Order numbers housings

Nominal size NG [l/min]	Order number	Type	① with blank plug for indicator	② with bypass and visual indicator	③ with bypass and electrical indicator	④ with visual indicator	⑤ with electrical indicator
50	70525737	Pi 241005/1C/N-046	■				
	70535419	Pi 241005/1C/N-057		■			
	70535420	Pi 241005/1C/N-058			■		
	70535421	Pi 241005/1C/N-068				■	
	70535422	Pi 241005/1C/N-069					■
80	70535438	Pi 241008/1C/N-046	■				
	70535439	Pi 241008/1C/N-057		■			
	70535440	Pi 241008/1C/N-058			■		
	70535441	Pi 241008/1C/N-068				■	
	70535442	Pi 241008/1C/N-069					■

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

7.2 Order numbers housings

Nominal size NG [l/min]	Order number	Type	① with blank plug for indicator	② with bypass and visual indicator	③ with bypass and electrical indicator	④ with visual indicator	⑤ with electrical indicator
150	70543016	Pi 241015/1F/N-046	■				
	70543017	Pi 241015/1F/N-057		■			
	70543018	Pi 241015/1F/N-058			■		
	70543019	Pi 241015/1F/N-068				■	
	70543020	Pi 241015/1F/N-069					■
300	70543021	Pi 241030/1F/N-046	■				
	70543022	Pi 241030/1F/N-057		■			
	70543023	Pi 241030/1F/N-058			■		
	70543024	Pi 241030/1F/N-068				■	
	70543025	Pi 241030/1F/N-069					■

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

7.3 Filter elements (a wider range of element types is availble on request)

Nominal size NG [l/min]	Order number	Type	Filter material	max. Δp [bar]	Filter surface [cm²]
50	70526314	Pi 21005 AN PS 3	PS 3	20	820
	70526312	Pi 22005 AN PS 6	PS 6		820
	70526310	Pi 23005 AN PS 10	PS 10		820
	70526308	Pi 24005 AN PS 16	PS 16		820
	70526302	Pi 25005 AN PS 25	PS 25		820
80	70518885	Pi 21008 AN PS 3	PS 3	20	1445
	70518881	Pi 22008 AN PS 6	PS 6		1445
	70518877	Pi 23008 AN PS 10	PS 10		1445
	70518873	Pi 24008 AN PS 16	PS 16		1445
	70518863	Pi 25008 AN PS 25	PS 25		1445
150	70519044	Pi 21015 AN PS 3	PS 3	20	4240
	70519042	Pi 22015 AN PS 6	PS 6		4240
	70519040	Pi 23015 AN PS 10	PS 10		4240
	70519038	Pi 24015 AN PS 16	PS 16		4240
	70519036	Pi 25015 AN PS 25	PS 25		4240
300	70519106	Pi 21030 AN PS 3	PS 3	20	6890
	70519104	Pi 22030 AN PS 6	PS 6		6890
	70519102	Pi 23030 AN PS 10	PS 10		6890
	70519198	Pi 24030 AN PS 16	PS 16		6890
	70519196	Pi 25030 AN PS 25	PS 25		6890

8. Technical specifications

Design:	Duplex filter
Nominal pressure:	
Pi 241005-241008	10^7 load changes 40 bar (580 psi)
Pi 241015-241030	2x 10^6 load changes 40 bar (580 psi)
Test pressure:	60 bar (870 psi)
Temperature range:	-10 °C to +120 °C Survival temperature -40 °C (other temperature ranges on request)
Bypass setting:	Δ p 35 bar ± 10 %
Filter housing material:	EN-GJS-400
Switch parts material:	EN-GJS-400/Stainless steel
Sealing material:	NBR/AL
Maintenance indicator setting:	Δ p 2.2 bar ± 10 %
Electrical data of maintenance indicator:	
Maximum voltage:	250 V AC/200 V DC
Maximum current:	1 A
Contact load:	70 W
Type of protection:	IP 65 in inserted and secured status
Contact:	normally open/closed
Cable sleave:	M20x1.5

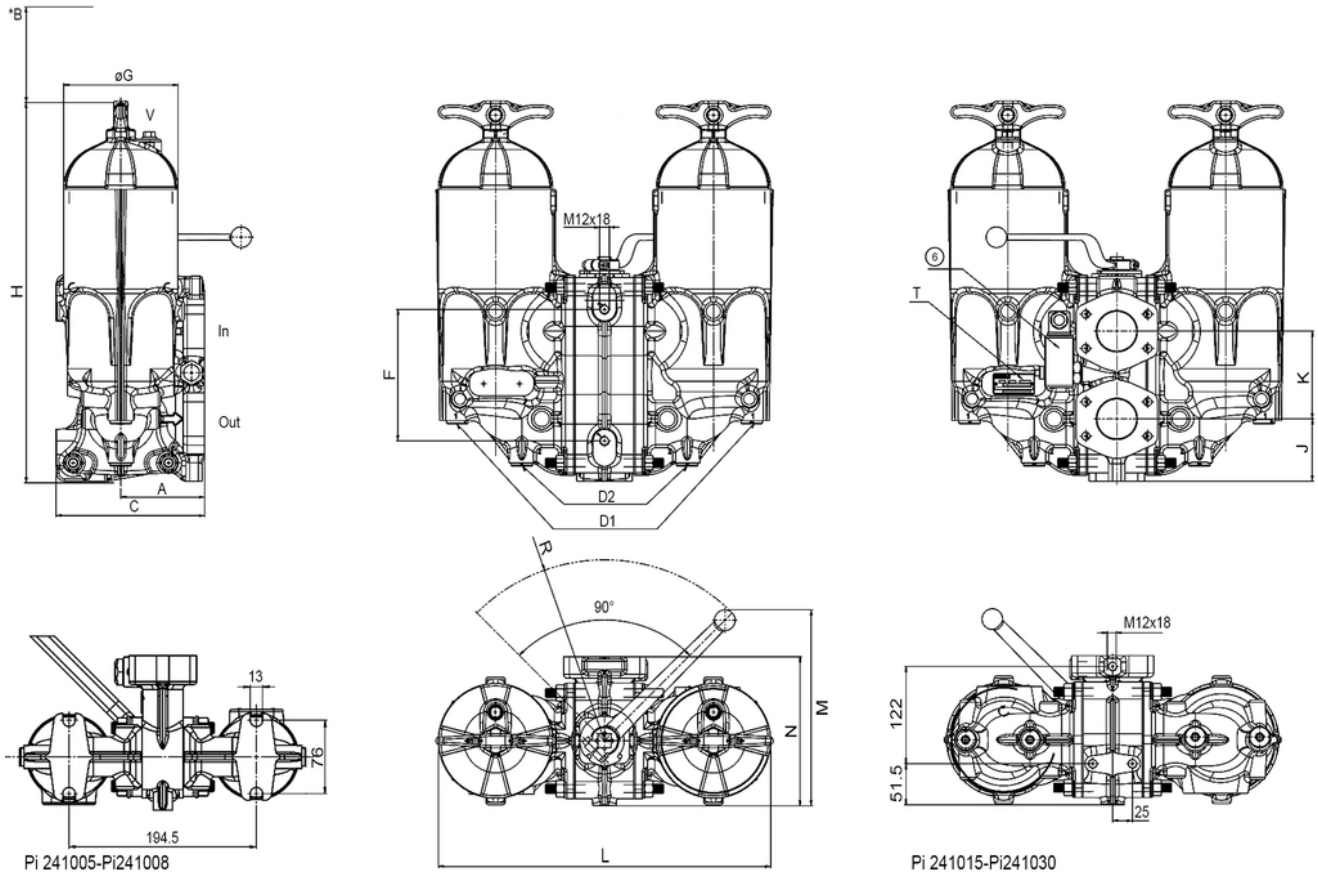
The switching function can be changed by turning the electric upper part by 180° (normally closed contact or normally open contact). The state on delivery is a normally closed contact. By inductivity in the direct current circuit the use of suitable protection circuit should be considered. Further maintenance indicator details and designs are available in the maintenance indicator data sheet.

We draw attention to the fact that all values indicated are average values which do not always occur in specific cases of application. Our products are continually being further developed. Values, dimensions and weights can change as a result of this. Our specialized department will be pleased to offer you advice.

We recommend you to contact us concerning applications of our filters in areas governed by the EU Directive 94/9 EC (ATEX 95). The standard version can be used for liquids based on mineral oil (corresponding to the fluids in Group 2 of Directive 97/23 EC Article 9). If you consider to use other fluids please contact us for additional support.

Subject to technical alteration without prior notice.

9. Dimensions



In	Inlet	D2	Drain outlet clean side G¼
Out	Outlet	T	Type plate
V	Venting G¼	⑥	Maintenance indicator optional
D1	Drain outlet dirt side G¼	*B	Clearance

9. Dimensions

All dimensions in mm.

Type	Connections*	A	B	C	E SW	F	øG	H	J	K	L	M	N	R	Weight [kg]
241005	SAE DN25/G1	105.0	110	160	27	80	88	248	53.5	80	296	216	160	223	16
241008	SAE DN25/G1	105.0	160	160	27	80	88	286	53.5	80	296	216	160	223	18
241015	SAE DN50/G2	105.5	150	187	32	165	144	387	78.0	110	418	246	167	227	41
241030	SAE DN50/G2	105.5	240	187	32	165	144	477	78.0	110	418	246	167	227	47

* Other connections on request

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 housing. The maintenance indicator ⑥ 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. The state on delivery is a normally closed contact.

10.3 When should the filter element be replaced?

1 . 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.
2 . 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.
3 . Please always ensure that you have original MAHLE spare elements in stock: Disposable elements cannot be cleaned.

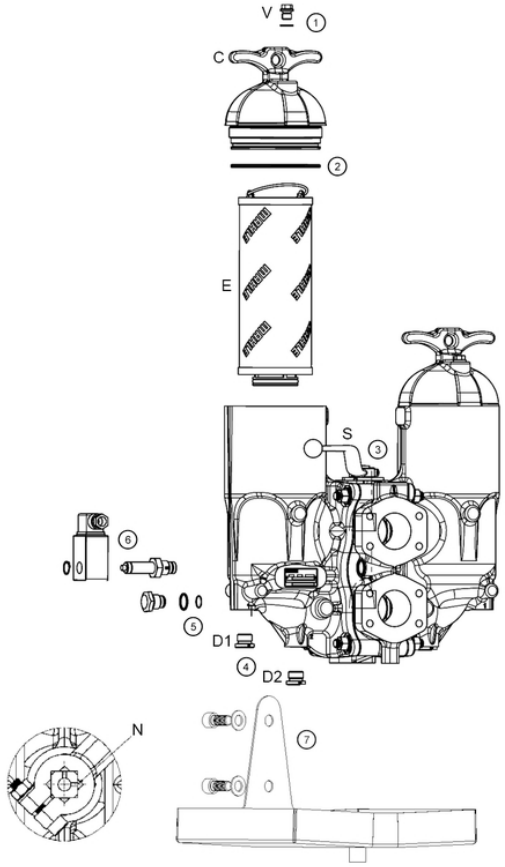
10.4 Element replacement

Note: Elements may only be replaced by people who are familiar with the function of the filter. When replacing elements, appropriate safety clothing (protective goggles, gloves, safety shoes) must be worn.

Note: The maintenance indicator monitors the filter side in operation. This is indicated by notches (N) on the switching shaft. Before carrying out filter maintenance, switch off the housing to be serviced.

1 . Move switching lever (S) completely to the stop.
2 . Loosen vent plug (V) on the filter side now shut down by 2-3 turns.
Warning: The shift lever may not, from now until the screwing back in of the filter housing, be activated under any circumstances!
3 . Remove drain plug (D1) and allow the medium to drain.
4 . Remove drain plug (D2) and allow the medium to drain.
5 . Unscrew filter cover (C) by turning in anti-clockwise direction.
6 . Lift out filter element (E) from above.
7 . Check seal ② on filter cover.We recommend replacement in any case.
8 . Make sure that the order number on the spare element corresponds to the order number of the filter name plate (T). Remove the element packaging and insert the element into the housing with the closed side facing upwards.
9 . Push the element carefully into the holding fixture and tighten cover against stop.
10 . Screw in drain plugs and tighten (30-35 Nm).
11 . When filling the filter chamber, move the switching lever to the middle position until the medium flows out of the vent bore bubble-free. Tighten vent plug (30-35 Nm)
12 . Check the serviced filter chamber for leaks.
13 . Move the switching lever back to stop position and put the serviced filter chamber out of operation again.

11. Spare parts and accessories lists



Order numbers for spare parts		
Position	**Type**	**Order number**
① - ④	Seal kit for housing	
	Pi 241 005 - Pi 241 008	
	NBR	70535673
	FPM	70535674
	CR	70535676
	Pi 241 015 - Pi 241 030	
	NBR	70575730
	FPM	70575731
	CR	70575732
⑤	Seal kit for maintenance indicator	
	NBR	77760309
	FPM	77760317
	CR	70535788

Order numbers for accessories		
Position	**Type**	**Order number**
⑥	Maintenance indicator	
	Visual PiS 3098/2.2	77669971
	Visual/electrical PiS 3097/2.2	77669948
	Electrical upper section only	77536550
⑦	Oil drip pan	
	Pi 241 005 - Pi 241 008	70550102
	Pi 241 015 - Pi 241 030	70576337
	SAE welding counter-flange 3000 psi incl. O-Ring and mounting screws	
	SAE 1" NBR	70535781
	SAE 2" NBR	70527145
	Drain plugs with permanent magnet	
	G¼"	70535672

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