Filtration Group®
Filtering The World

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Tank top return-line filter
Pi 5000

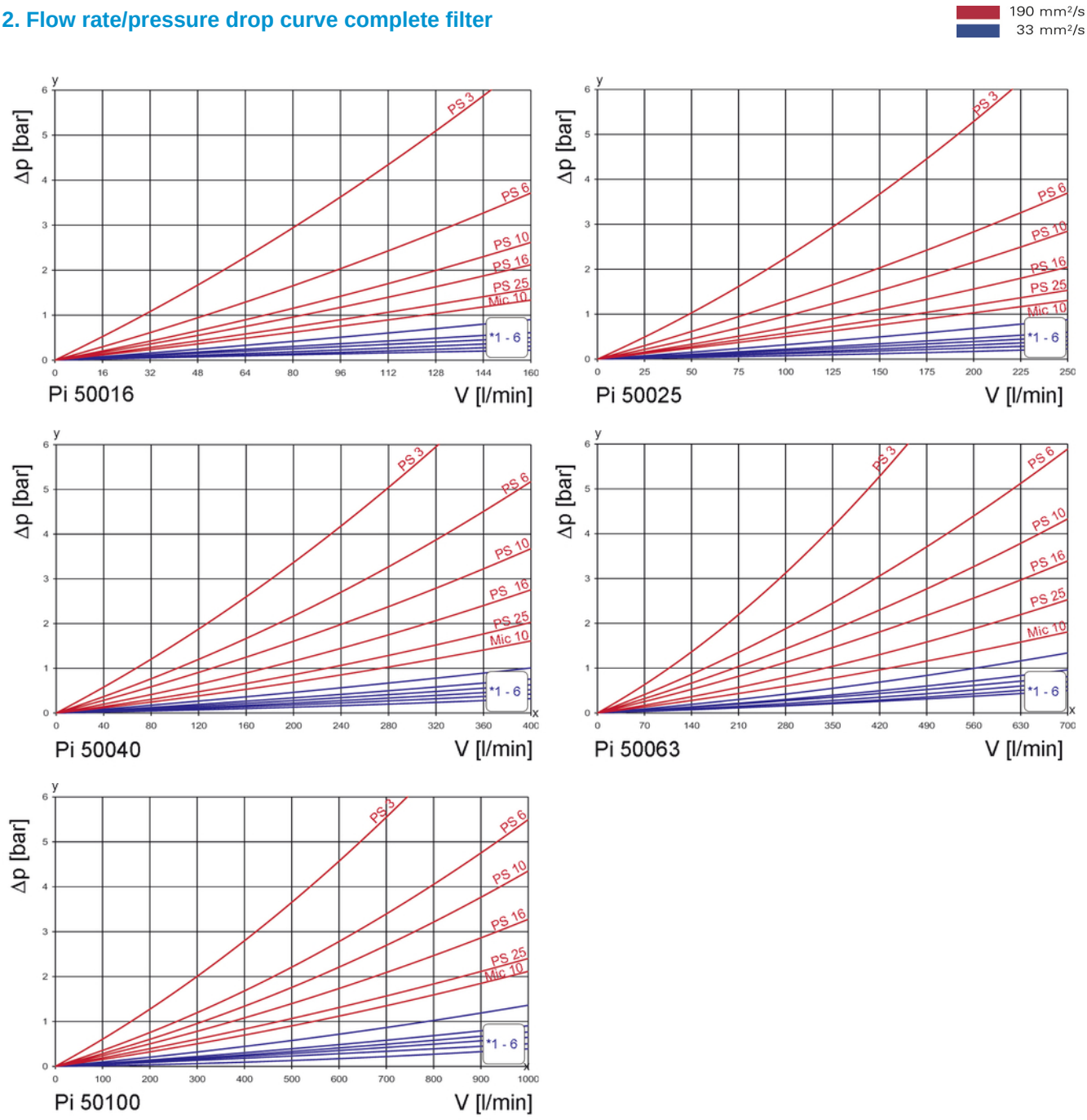
Nominal size 160 up to 1000
according to DIN 24550

1. Features

High performance filters for modern hydraulic systems

- Provided for tank top installation
- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance indicator
- Threaded or flanged connections
- Quality filters, easy to service
- Equipped with highly efficient glass fibre PS filter elements
- Beta rated elements according to ISO 16889 multipass test
- Elements with high differential pressure stability and dirt holding capacity
- NPT- and SAE-connections on request
- Worldwide distribution

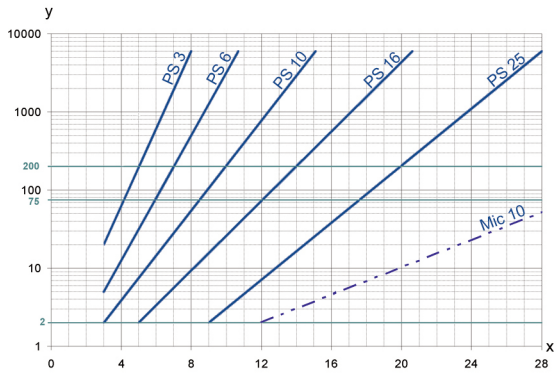
2. Flow rate/pressure drop curve complete filter



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

*1 - 6
1. PS 3
2. PS 6
3. PS 10
4. PS 16
5. PS 25
6. Mic 10

3. Separation grade characteristics



y = beta-value
x = particle size [µm]

determined by multipass tests (ISO 16889)
calibration according to ISO 1171 (NIST)

4. Filter performance data

tested according to ISO 16889 (multipass test)

PS elements with
max. Δ p 10 bar

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

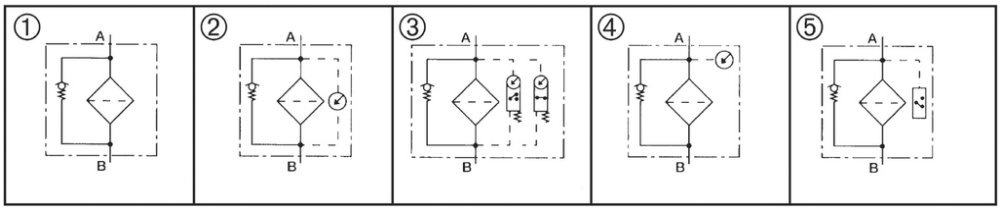
values guaranteed up to
10 bar differential pressure

5. Quality assurance

Filtration Group 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 material compatibility with fluids
DIN ISO 3723	Fluidtechnik-Hydraulik Filterelemente; 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. Order numbers

Example for ordering filters:

1. Housing design	2. Filter element
Bypass valve 3.5 bar, Connection execution 2 = DN 38 Type: Pi 50016-056/NG 160	PS 25 NBR Type: Pi 2516 RN

7.1 Housing design* Pi 50016- Pi 50025 - Pi 50040 - Pi 50063 - Pi 50100-

Nominal size NG [l/min]	Hous-ing code	① with bypass valve 3.5 bar	① with indicator cavity	② with visual main-tenance indicator 2.2 bar	③ with electrical main-tenance indicator 2.2 bar	④ with pressure gauge (DM)	⑤ with pressure switch normally open (DSS)	⑤ with pressure switch normally closed (DSO)	with filling connection (BA)
160 250 400 630 1000	- 047	■	■						
	- 056	■							
	- 057	■		■					
	- 058	■			■				
	- 059	■				■			
	- 050	■					■		
	- 052	■						■	
	- 092	■							■
	- 093	■		■					■
	- 094	■		■	■				■
	- 095	■				■			■
	- 096	■					■		■
	- 097	■						■	■

* a wider range of executions is available on request

7.2 Connection executions

Nominal size NG [l/min]	Type	Standard connection according DIN 24550 part 1	/1	/2	/3	/4	/5	/6
160	Pi 50016-...	G1¼	G1½	DN 38				
250	Pi 50025-...	G1½		DN 38	G1¼			
400	Pi 50040-...	DN 51	G1½			G2	DN 64	
630	Pi 50063-...	DN 64	G1½			G2		DN 51
1000	Pi 50100-...	DN 76						

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

7.3 Filter elements*					
Nominal size NG [l/min]	**Order number**	**Type**	**Filter material**	**max. Δ p [bar]**	**Filter surface [cm²]**
160	77925035	Pi 13016 RN Mic 10 NBR	Mic 10	**10**	3750
	77924137	Pi 21016 RN PS 3 NBR	PS 3		3750
	77964067	Pi 22016 RN PS 6 NBR	PS 6		3750
	77924145	Pi 23016 RN PS 10 NBR	PS 10		3750
	77963648	Pi 24016 RN PS 16 NBR	PS 16		3750
	77960230	Pi 25016 RN PS 25 NBR	PS 25		3750
250	77925043	Pi 13025 RN Mic 10 NBR	Mic 10	**10**	6050
	77924152	Pi 21025 RN PS 3 NBR	PS 3		6050
	77964075	Pi 22025 RN PS 6 NBR	PS 6		6050
	77924160	Pi 23025 RN PS 10 NBR	PS 10		6050
	77963655	Pi 24025 RN PS 16 NBR	PS 16		6050
	77960248	Pi 25025 RN PS 25 NBR	PS 25		6050
400	77925050	Pi 13040 RN Mic 10 NBR	Mic 10	**10**	9450
	77924178	Pi 21040 RN PS 3 NBR	PS 3		8250
	77964083	Pi 22040 RN PS 6 NBR	PS 6		8250
	77924186	Pi 23040 RN PS 10 NBR	PS 10		8250
	77963663	Pi 24040 RN PS 16 NBR	PS 16		8250
	77960255	Pi 25040 RN PS 25 NBR	PS 25		8250
630	77925068	Pi 13063 RN Mic 10 NBR	Mic 10	**10**	15500
	77924194	Pi 21063 RN PS 3 NBR	PS 3		13515
	77964091	Pi 22063 RN PS 6 NBR	PS 6		13515
	77924202	Pi 23063 RN PS 10 NBR	PS 10		13515
	77963671	Pi 24063 RN PS 16 NBR	PS 16		13515
	77960263	Pi 25063 RN PS 25 NBR	PS 25		13515
1000	77925076	Pi 13100 RN Mic 10 NBR	Mic 10	**10**	18335
	77924210	Pi 21100 RN PS 3 NBR	PS 3		18335
	77964109	Pi 22100 RN PS 6 NBR	PS 6		18335
	77924228	Pi 23100 RN PS 10 NBR	PS 10		18335
	77963689	Pi 24100 RN PS 16 NBR	PS 16		18335
	77960271	Pi 25100 RN PS 25 NBR	PS 25		18335

*a wider range of element types is available on request

8. Technical specifications

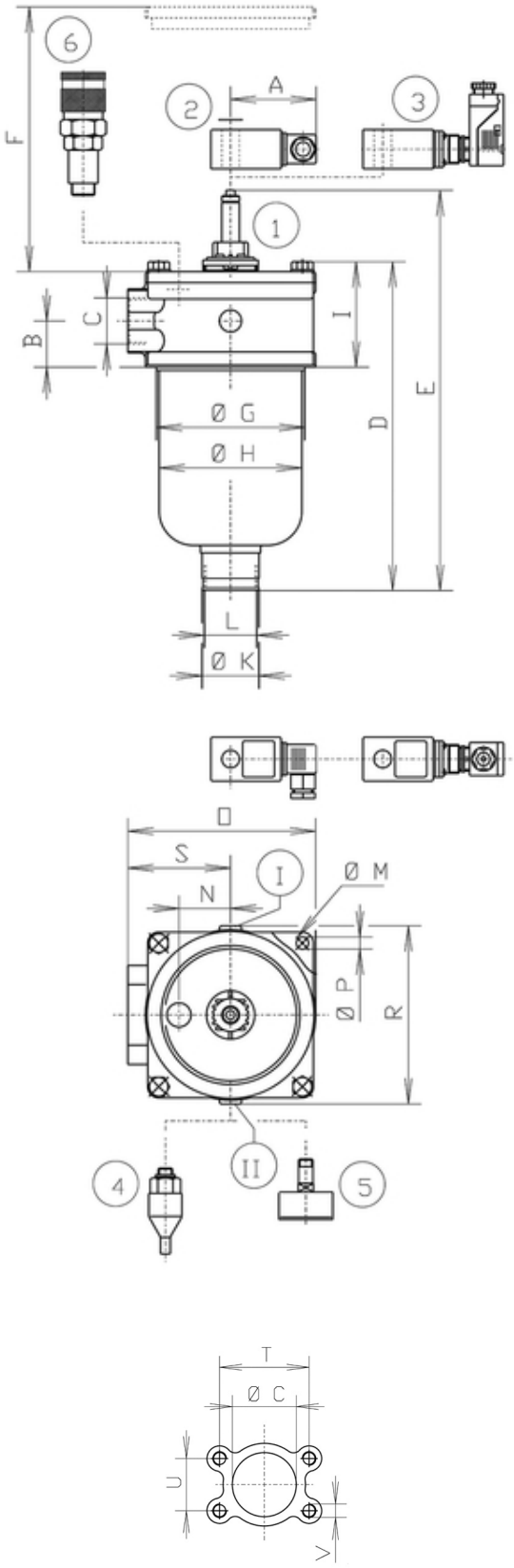
Design:	tank top installation
Nominal pressure.:	10 bar (140 psi)
Test pressure:	13 bar (180 psi)
Temperature range:	- 10 °C to +80 °C
	(other temperature ranges on request)
Bypass setting:	Δ p 3.5 bar ± 10 %
Filter head material:	GD Al
Filter housing material:	St.
Filter cover material:	GD Al/G Al
Maintenance 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 and 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.



1 = Standard maintenance indicator visual PiS 3084
1 + 2 = Standard maintenance indicator electrical PiS 3085
3 = Further executions see data sheet maintenance indicator
4 = Pressure switch
4 + 5 = Can be mounted at I or II alternatively
5 = Pressure gauge
6 = Coupling for filling

9. Dimensions

All Dimensions except "L" in mm.

Type	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V	Weight [kg]
Pi 50016 - ...	78	42	see 7.2	298	361	180	135.0	130	96	52	G1½	185	47	171	11	183	93.5	70	35.7	M12	3.2
Pi 50025 - ...	78	42		391	454	270	135.0	130	96	52	G1½	185	47	171	11	183	93.5	70	35.7	M12	3.4
Pi 50040 - ...	78	57		427	489	270	175.5	163	120	70	G2	220	56	216	11	218	110	77.8	42.9	M12	6.4
Pi 50063 - ...	78	57		577	639	420	175.5	163	120	70	G2	220	56	216	11	218	110	89	50.8	M12	6.9
Pi 50100 - ...	78	72		579	639	420	200.0	190	151	-	G3	250	70	257	11	256	135	106	62.0	M16	11.1

10. Installation, operating and maintenance instructions

10.1 Filter installation

When installing the filter make sure that:

a) that sufficient space is available to remove filter element and filter housing,

b) the mounting hole in the tank top is not excessively large, to ensure proper sealing,

c) the filter is free of tension after installation

Preferably the filter should be installed with the filter housing pointing downwards. In this position the maintenance indicator is accessible and visible.

10.2 Connecting the electricalmaintenance indicator

The electrical maintenance indicator is connected via a 2-pole appliance plug according to DIN EN 17 5301-803 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 must the filter element be replaced?

1 . Filters equipped with visual and/or electrical maintenance indicator:
   During cold starts, the indicator may give a warning signal. Press the 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.
2 . Filters without maintenance indicator:
   The filter element should be replaced after trial run or flushing of the system. Afterward folow instructions of the manufacturer.
3 . Please always ensure that you have original Filtration Group spare elements in stock: Disposable elements (PS and Mic) cannot be cleaned.

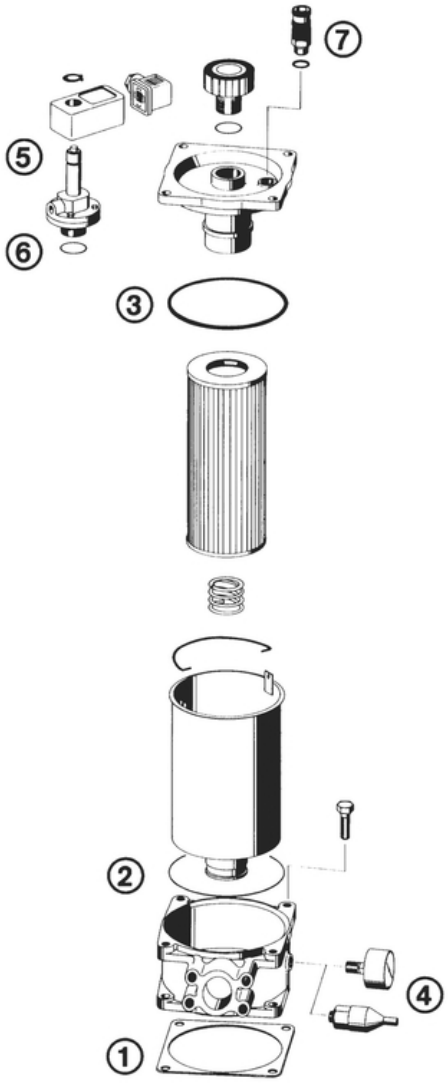
10.4 Element replacement

1 . Stop system and relieve filter from pressure.
2 . Unscrew cover, turning counter-clockwise.
3 . Remove filter housing and filter element by pulling upwards.
4 . Remove filter element with a side-to-side motion.
5 . Clean the housing using a suitable cleaning solvent.
6 . Check O-ring on filter cover and filter housing for damage. Replace, if necessary.
7 . Make sure that the order number on the spare element corresponds to the order number of the filter name-plate.
8 . Remove filter element from the plastic bag and reassemble filter in reverse order (items 1 to 6).

Subject to technical alteration without prior notice.

11. Spare parts list

Order numbers for spare parts		
Position	**Type**	**Order number**
① to ③	Seal kit for housing	
	NG 160/250	
	NBR	78227902
	FPM	78227910
	EPDM	78227928
	NG 400/630	
	NBR	78227936
	FPM	78227944
	EPDM	78227951
	NG 1000	
	NBR	78227969
	FPM	78227977
	EPDM	78227985
④	Pressure gauge	78381998
	Pressure gauge normally open	77845845
	Pressure gauge normally closed	77870595
⑤	Maintenance indicator	
	Visual PiS 3084/2,2	77737802
	Electrical PiS 3085/2,2	77738032
	Electrical upper section only	77536550
⑥	Seal kit for maintenance indicator + blind plug	
	NBR	78383382
	FPM	78383390
	EPDM	78383408
⑦	Quick-release coupling	77965130



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Tank top return-line filter
Pi 5000

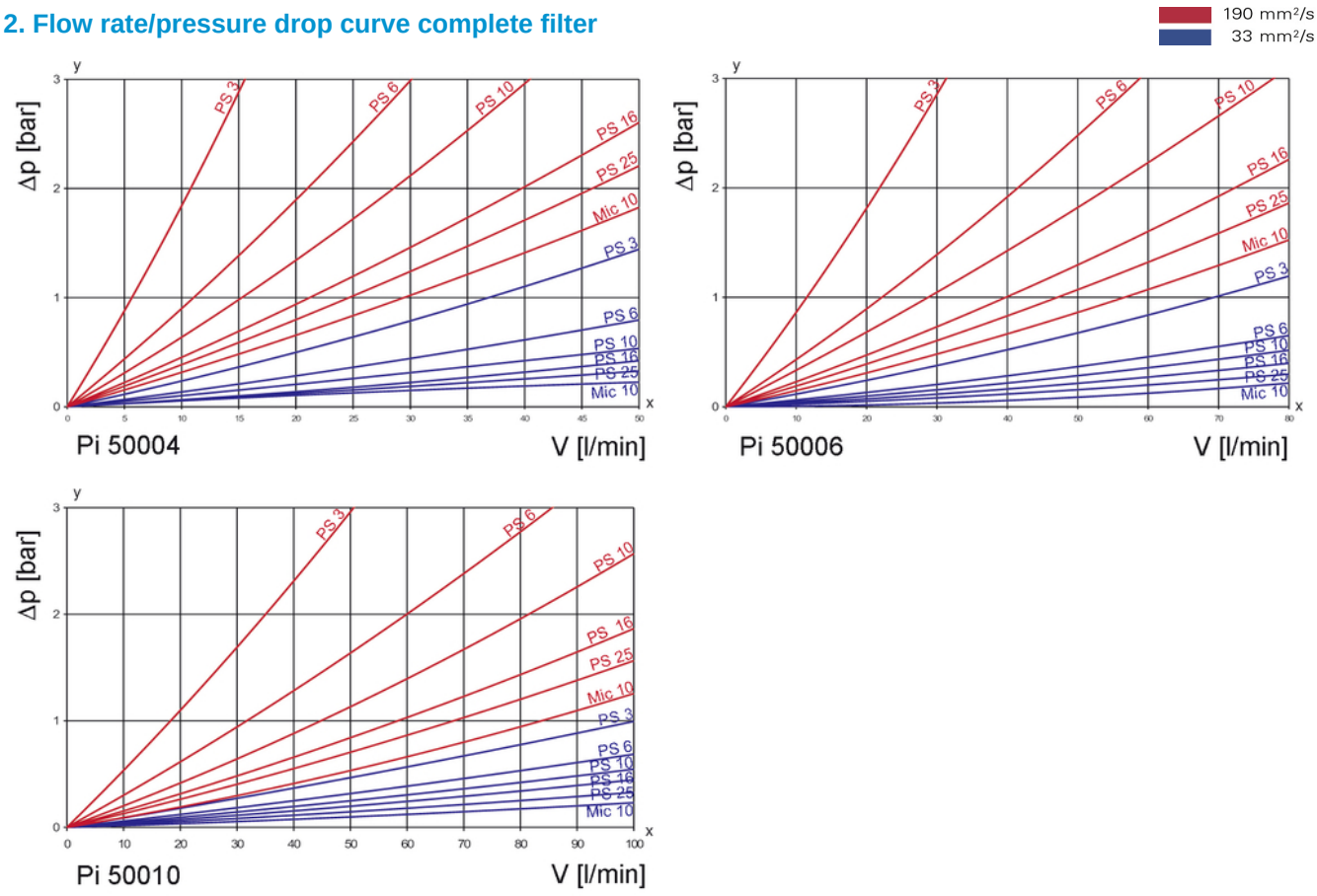
Nominal size 40 up to 100
according to DIN 24550

1. Features

High performance filters for modern hydraulic system

- Provided for tank top installation
- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance indicator
- Threaded connections
- Quality filters, easy to service
- Equipped with highly efficient Mic or PS filter elements
- Beta rated elements according to ISO 16889 multipass test
- Elements with high differential pressure stability and dirt holding capacity
- NPT- and SAE-connections on request
- Worldwide distribution

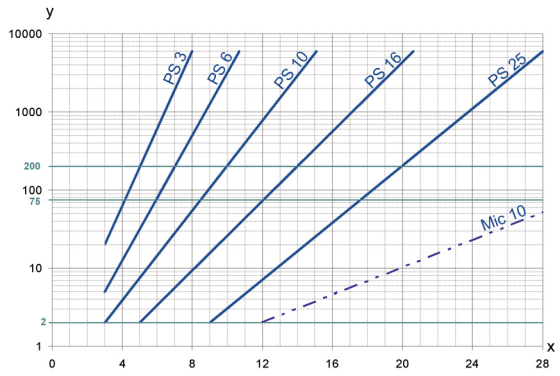
2. Flow rate/pressure drop curve complete filter



y = differential pressure Δ p [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. Δ p 10 bar

PS	3	β_3	$\geq$200
PS	6	β_6	$\geq$200
PS	10	β_{10}	$\geq$200
PS	16	β_{16}	$\geq$200
PS	25	β_{25}	$\geq$200

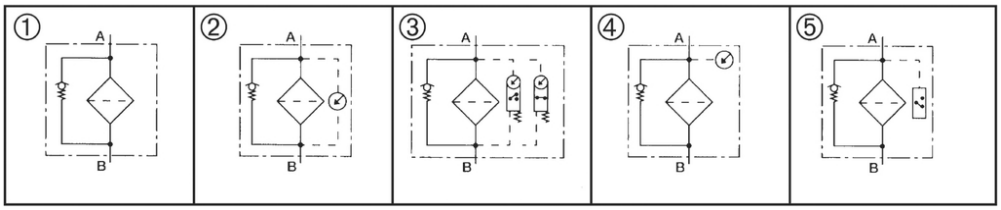
values guaranteed up to
10 bar differential pressure

5. Quality assurance

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

Norm	Designation
DIN ISO 2 941	Hydraulic fluid power filter elements; verification of collapse/burst resistance
DIN ISO 2 942	Hydraulic fluid power filter elements; verification of fabrication integrity
DIN ISO 2 943	Hydraulic fluid power filter elements; verification of material compatibility with fluids
DIN ISO 3 723	Hydraulic fluid power filter elements; method for end load test
DIN ISO 3 724	Hydraulic fluid power filter elements; verification of flow fatigue characteristics
ISO 3 968	Hydraulic fluid power-filters-evaluation of pressure drop versus flow characteristics
ISO 10 771.1	Fatigue pressure testing of metal containing envelopes in hydraulic fluid applications
ISO 16 889	Hydraulic fluid power filters-multi-passmethod for evaluation filtration performance of a filter element

6. Symbols



7. Order numbers

Example for ordering filters:

1. Filter housing	2. Filter element
Housing design = Bypass valve 3.5 bar Pressure switch normally closed (DSS) Type: Pi 50006-050 = NG 63	Type: Pi 25006 RN = PS 25

7.1 Housing design*

Nominal size NG [l/min]	Housing code	① with bypass valve 3.5 bar	② with visual indicator 2.2 bar	③ with electr. indicator 2.2 bar	④ with pressure gauge (DM)	⑤ with pressure switch normally closed (DSS)	⑤ with pressure switch normally open (DSO)	with breather MIC-element (BE-MIC)	with breather Sm-L-element (BE-SML)	with filling con-nection (BA)	with anti spillage sleeve
50004 50006 50010	- 056	■									
	- 057	■	■								
	- 058	■	■	■							
	- 059	■			■						
	- 050	■									
	- 052	■					■				
	- 076	■	■					■			■
	- 077	■	■						■		■
	- 078	■	■	■				■			■
	- 079	■	■	■					■		■
	- 080	■			■			■			■
	- 081	■			■				■		■
	- 082	■				■		■			■
	- 083	■				■			■		■
	- 084	■					■	■			■
	- 085	■					■		■		■
	- 086	■			■			■		■	■
	- 087	■			■				■	■	■
	- 088	■				■		■		■	■
	- 089	■				■			■	■	■
	- 090	■					■	■		■	■
	- 091	■					■		■	■	■

* a wider range of executions is available on request.

7.2 Filter elements*					
Nominal size NG [l/min]	**Order number**	**Type**	**Filter material**	**max. Δ p [bar]**	**Filter surface [cm²]**
40	77925001	Pi 13004 RN Mic 10 NBR	Mic 10	**10**	900
	77962210	Pi 15004 RN Mic 25 NBR	Mic 25		900
	77923998	Pi 21004 RN PS 3 NBR	PS 3		820
	77964034	Pi 22004 RN PS 6 NBR	PS 6		820
	77924004	Pi 23004 RN PS 10 NBR	PS 10		820
	77962244	Pi 24004 RN PS 16 NBR	PS 16		820
	77960206	Pi 25004 RN PS 25 NBR	PS 25		820
63	77925019	Pi 13006 RN Mic 10 NBR	Mic 10	**10**	1585
	77962228	Pi 15006 RN Mic 25 NBR	Mic 25		1585
	77924012	Pi 21006 RN PS 3 NBR	PS 3		1445
	77964042	Pi 22006 RN PS 6 NBR	PS 6		1445
	77924020	Pi 23006 RN PS 10 NBR	PS 10		1445
	77962251	Pi 24006 RN PS 16 NBR	PS 16		1445
	77960214	Pi 25006 RN PS 25 NBR	PS 25		1445
100	77925027	Pi 13010 RN Mic 10 NBR	Mic 10	**10**	2610
	77962236	Pi 15010 RN Mic 10 NBR	Mic 25		2610
	77924038	Pi 21010 RN PS 3 NBR	PS 3		2380
	77940844	Pi 22010 RN PS 6 NBR	PS 6		2380
	77924046	Pi 23010 RN PS 10 NBR	PS 10		2380
	77962269	Pi 24010 RN PS 16 NBR	PS 16		2380
	77960222	Pi 25010 RN PS 25 NBR	PS 25		2380

* a wider range of element types is available on request

8. Technical specifications

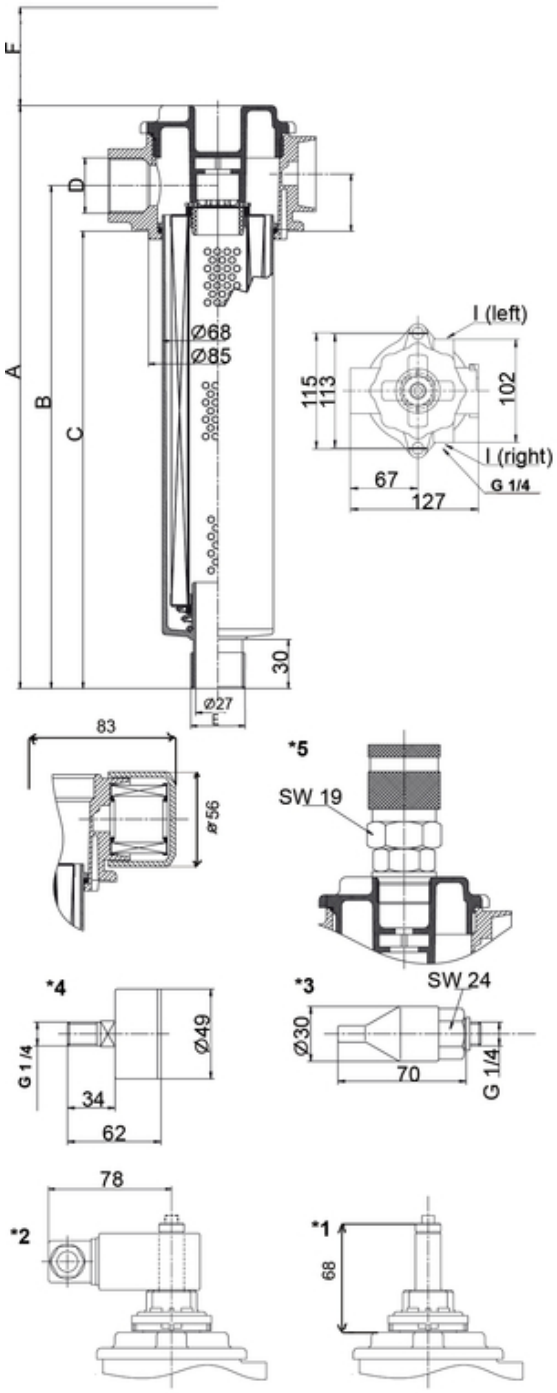
Design:	tank top installation
Nominal pressure:	10 bar (140 psi)
Test pressure:	13 bar (180 psi)
Temperature range:	-10 °C to +80 °C
	(other temperature ranges on request)
Bypass setting:	3.5 bar ± 10%
Filter head material:	GD Al
Filter housing material:	plastic
Sealing material:	plastic
Maintenance indicator setting PiS 3084/85:	2.2 bar ± 10 %
Electrical data of maintenance indicator:	
Max. voltage:	250 V AC/200 V DC
Max. 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.

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.

Recommended max. flow rate of the filling unit at viscosity of 500 mm²/ s and a degree of filtration 3 µm: NG 40 = 8 l /min, NG 63 = 15 l /min, NG 100 = 25 l /min.



1 = Standard maintenance indicator visual PiS 3084
1 + 2 = Standard maintenance indicator electrical PiS 3085
3 = Pressure switch
4 = Pressure gauge 0 to 6 bar
5 = Quick release coupling for filing

9. Dimensions

All dimensions except "D" in mm.

Type	A	B	C	D*	E DIN 2999	F	Weight [kg]
Pi 50004	208	159	131	G1	G1	100	0.65
Pi 50006	268	219	191	G1	G1	130	0.68
Pi 50010	358	309	281	G1	G1	200	0.74

*NPT- and SAE- connections on request

10. Installation, operating and maintenance instructions

10.1 Filter installation

When installing the filter make sure that:
a) that sufficient space is available to remove filter element and filter housing,
b) the mounting hole in the tank top is not excessively large, to ensure proper sealing,
c) the filter is free of tension after installation
Preferably the filter should be installed with the filter housing pointing downwards. Inthis 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 EN 17 5301-803 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 must the filter element be replaced?

1 . Filters equipped with visual and/or electrical pressure indicator: During cold starts, the indicator may give a warning signal. Press the 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.
2 . Filters without pressure indicator:
The filter element should be replaced after trial run or flushing of the system. Afterward follow instructions of the manufacturer.
3 . Please always ensure that you have original MAHLE spare elements in stock: Disposable elements (PS and Mic) cannot be cleaned.

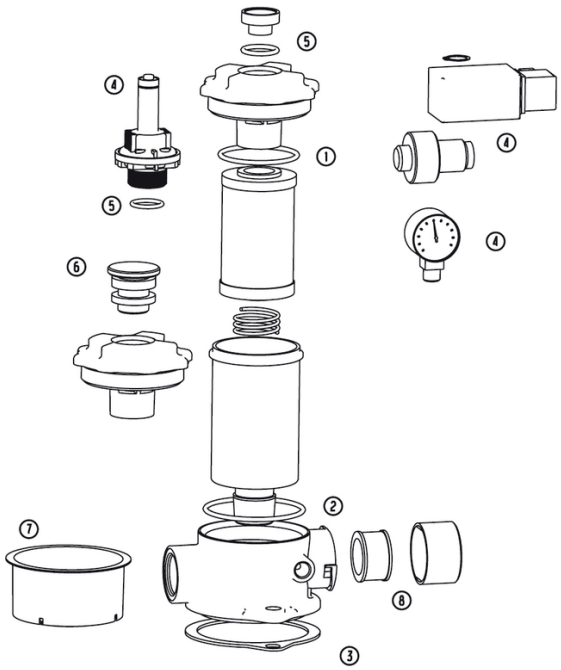
10.4 Element replacement

1 . Stop system and relieve filter from pressure.
2 . Unscrew cover, turning counter-clockwise.
3 . Remove filter housing and filter element by pulling upwards.
4 . Remove filter element with a side-to-side motion.
5 . Clean the housing using a suitable cleaning solvent.
6 . Check O-ring on filter cover and filter housing for damage. Replace, if necessary.
7 . Make sure that the order number on the spare element corresponds to the order number of the filter name-plate.
8 . Remove filter element from the plastic bag and reassemble filter in reverse order (items 1 to 6).

Subject to technical alteration without prior notice.

11. Spare parts list

Order numbers for spare parts		
Pos.	**Type**	**Order number**
	Pi 50004-50010	
① - ③	Seal kit for housing	
	Without air breather	
	NBR	77999709
	FPM	77999725
	EPDM	77999741
	With air breather	
	NBR	77999717
	FPM	77999733
	EPDM	77999758
④	Maintenance indicator	
	Visual PiS 3084/ 2.2 bar	77737802
	Electrical PiS 3085/ 2.2 bar	77738032
	Electrical upper section only	77536550
	Pressure Gauge	70521417
	Pressure switch normally closed	77845845
	Pressure switch normally open	77870595
⑤	Seal kit for maintenance indicator	
	NBR	77760218
	FPM	77760226
	EPDM	77760234
⑥	Thread connection for filling	77969017
	Quick release coupling	77965130
⑦	Anti spillage sleeve	77927643
⑧	Air breather element	
	Paper 852 514 Mic	77687692
	Glas fibre 852 514 Sm-L	77643562



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Tank Top Return-Line Filter
Pi 530

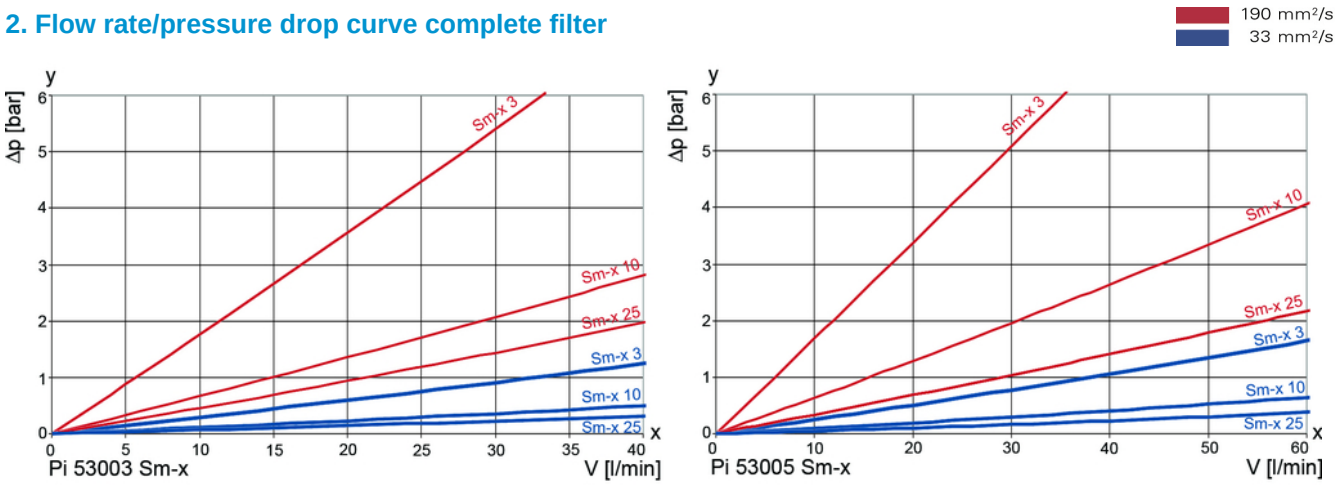
Nominal size 35 and 50

1.Features

High performance filters for modern hydraulic systems

- Provided for tank top installation
- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance control
- Threaded alt. hose connections
- Quality filters, easy to service
- Equipped with highly efficient glass fibre Sm-x filter
- Beta rated elements according to ISO 16889 multipass test
- Elements with high differential pressure stability and dirt holding capacity
- Worldwide distribution

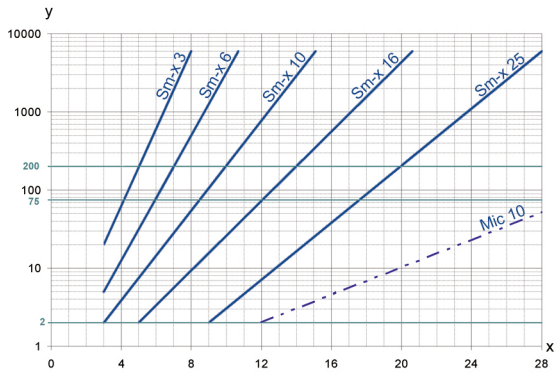
2. Flow rate/pressure drop curve complete filter



y = differential pressure p [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)

Sm-x-elements with
max. Δ p 10 bar

Sm-x	3	$\beta_{5(C)} \geq 200$
Sm-x	10	$\beta_{10(C)} \geq 200$
Sm-x	25	$\beta_{20(C)} \geq 200$

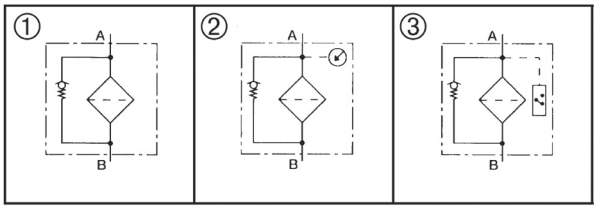
values guaranteed up to
5 bar differential pressure

5. Quality assurance

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

Norm	Designation
DIN ISO 2 941	Hydraulic fluid power filter elements; verification of collapse/burst resistance
DIN ISO 2 942	Hydraulic fluid power filter elements; verification of fabrication integrity
DIN ISO 2 943	Hydraulic fluid power filter elements; verification of material compatibility with fluids
DIN ISO 3 723	Hydraulic fluid power filter elements; method for end load test
DIN ISO 3 724	Hydraulic fluid power filter elements; verification of flow fatigue characteristics
ISO 3 968	Hydraulic fluid power-filters-evaluation of pressure drop versus flow characteristics
ISO 10 771.1	Fatigue pressure testing of metal containing envelopes in hydraulic fluid applications
ISO 16 889	Hydraulic fluid power filters-multi-passmethod for evaluation filtration performance of a filter element

6. Symbols



7. Order numbers

Example for ordering filters:

1. Housing design	2. Filter element
Housing NG 35 with hose connection, bypass valve, breather and pressure gauge Type: Pi 53003/1-141	Mic 10 Type: 852 939 Mic 10

7.1 Housing design

Nominal size NG [l/min]	Type	Version filter head	① with bypass 1.5 bar	with breather	② with bypass and gauge	③ with pressure switch normally closed	③ with pressure switch normally open
35	Pi 53003/1-009	Filter head PA 6 with hose-connection DN20	■				
	Pi 53003/1-020		■	■			
	Pi 53003/1-144		■		■		
	Pi 53003/1-145		■			■	
	Pi 53003/1-146		■				■
	Pi 53003/1-141		■	■	■		
	Pi 53003/1-142		■	■		■	
	Pi 53003/1-143		■	■			■
	Pi 53003/2-009	Al-filter head G½	■				
	Pi 53003/2-020		■	■			
50	Pi 53005/1-009	Filter head PA 6 with hose-connection DN20	■				
	Pi 53005/1-020		■	■			
	Pi 53005/1-144		■		■		
	Pi 53005/1-145		■			■	
	Pi 53005/1-146		■				■
	Pi 53005/1-141		■	■	■		
	Pi 53005/1-142		■	■		■	
	Pi 53005/1-143		■	■			■
	Pi 53005/2-009	Al-filter head G½	■				
	Pi 53005/2-020		■	■			

7.2 Filter elements*

Nominal size NG [l/min]	Order number	Type	Filter material	max. Δ p [bar]	Filter surface [cm²]
35	78309387	852 939 Mic 10	Mic 10	5	870
	78206781	852 939 Mic 25	Mic 25		
	79312117	852 588 Sm-x 3	Sm-x 3	10	650
	79312125	852 588 Sm-x 10	Sm-x 10		
	79312133	852 588 Sm-x 25	Sm-x 25		
50	78309395	852 940 Mic 10	Mic 10	5	1100
	79312315	852 940 Mic 25	Mic 25		
	79312158	852 945 Sm-x 3	Sm-x 3	10	810
	79312166	852 945 Sm-x 10	Sm-x 10		
	79312174	852 945 Sm-x 25	Sm-x 25		

* a wider range of element types is available on request

7.3 Breather element (only for filter head PA 6, batch size 3 pcs.)				
Nominal size NG [l/min]	**Order number**	**Type**	**Filter material**	**Filter surface [cm²]**
35	78206831	852 937	Mic	40
50				

8. Technical Specifications

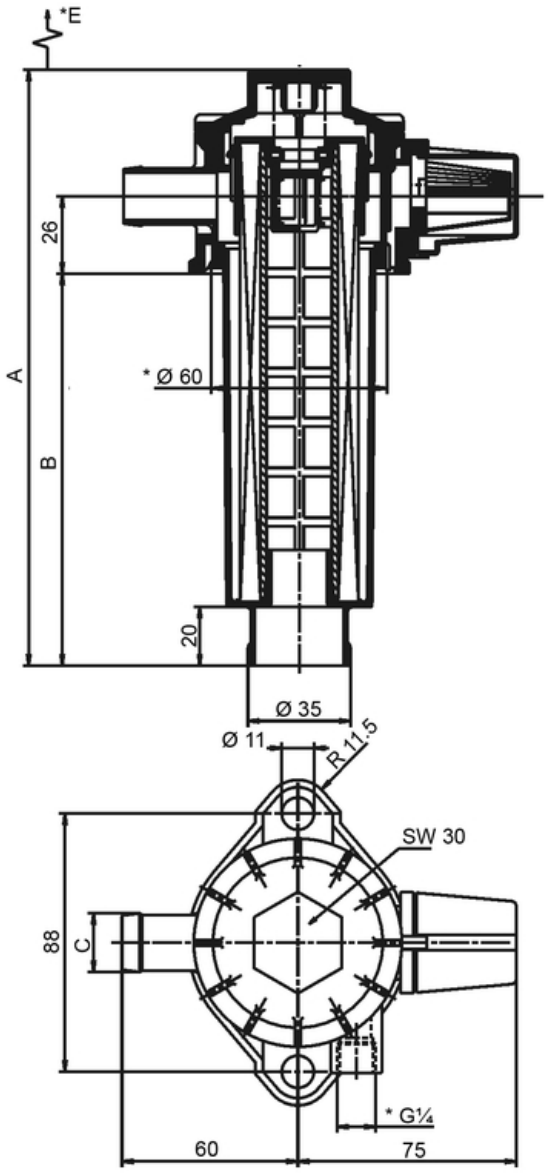
Design:	tank mounting filter
Nominal pressure:	6 bar (90 psi)
Test pressure:	9 bar (130 psi)
Temperature range:	-10 °C to +80 °C
	(other temperature ranges on request)
Bypass setting:	Δ p 1.5 bar
Filter head material:	plastic-PA 6/Al
Filter housing material:	plastic PA 6
Filter cover material:	plastic PA 6
Indication range of pressure gauge:	0 to 4 bar
Activating pressure of pressure switch:	1.2 bar
Electrical data of pressure switch:	
Max. voltage:	42 V
Max. current	2 A
Contact load:	100 VA
Type of protection:	IP 65 - with protection cap
Contact:	normally open/closed
Electrical connection:	AMP 6,3 DIN 46248 connector according to DIN 46247, connection method 2-pole

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.

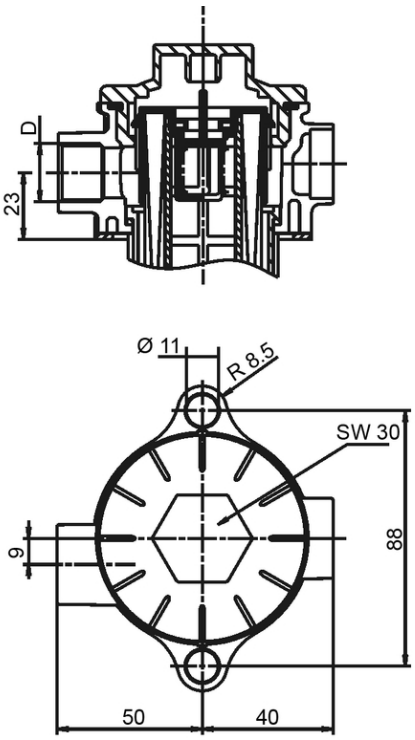
We recommend to contact us concerning applications of our filters in areas governed by the EU Directive 94/9 EC (ATEX 95). The standard version can be used for liquids based on mineral oil (corresponding to the fluids in Group 2 of Directive 97/23 EC Article 9). If you consider to use other fluids please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

Subject to technical alteration without prior notice.

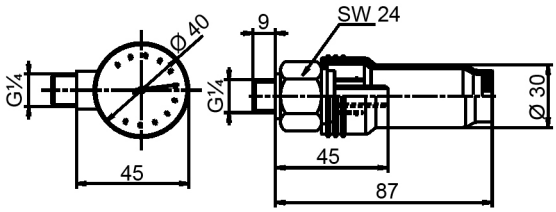
9. Dimensions



Version with filter head PA 6



Version with filter head Al



*E= Minimum clearance for filter element removal

* Ø 60= Mounting hole Ø 60

*G¼= Option

All dimensions except "D" in mm.

Type	A	B	C	D	E
Pi 53003/1	203	133,5	DN20	-	130
Pi 53003/2	203	135,5	-	G½	130
Pi 53005/1	241	171,5	DN20	-	180
Pi 53005/2	241	173,0	-	G½	180

10. Installation, operating and maintenance instructions

10.1 Filter installation

When installing the filter make sure that :

a) Sufficient space is available to remove filter element and filter housing

b) The mounting hole in the tank top is not excessively large, to ensure proper sealing,

c) The filter is free of tension after installation, max. torque 7 Nm.

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

10.2 Connecting the electrical pressure switch

The electrical pressure switch is connected via connectors according to DIN 46247.

10.3 When should the filter element be replaced?

1 . Filters equipped with pressure gauge:
When the dynamic pressure reaches 1.2 bar (red/green indication), the filter element must be replaced.

2 . Filters equipped with pressure switch:
During cold starts, the pressure switch may give a signal.
If the electrical signal has not switched off after reaching operating temperature, the filter element must be replaced after the end of the shift.

3 . Filters without indicator:
The filter element should be replaced after trial run or flushing of the system.
Afterwards follow instructions of manufacturer.

4 . Please, always ensure that you have original Filtration Group spare elements in stock: Disposable elements (MIc, Sm-x) cannot be cleaned.

10.4 Element replacement

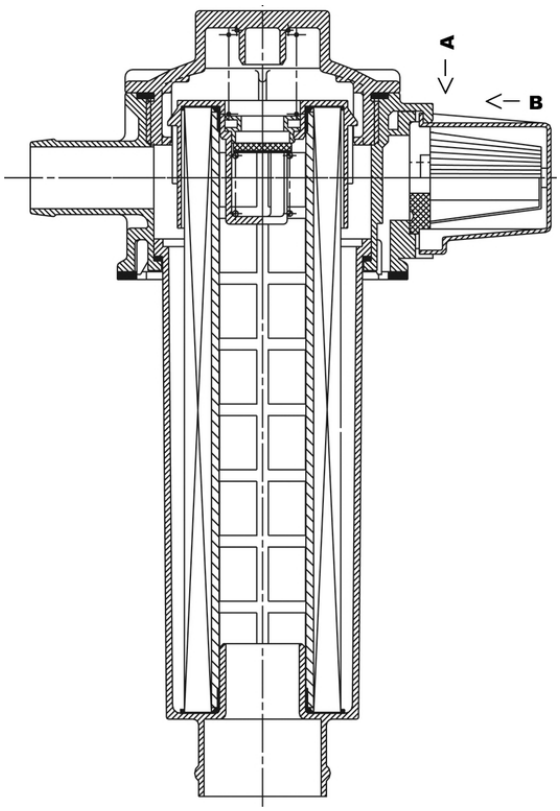
1 . Stop system and relieve filter from pressure.
2 . Unscrew cover, turning counter-clockwise.
3 . Remove filter housing and filter element by pulling upwards.
4 . Remove filter element with a side-to-side motion.
5 . Clean the filter housing with a suitable medium.
6 . Check O-rings on filter cover and filter housing for damage. Replace, if necessary.
7 . Make sure that the order number on the spare element corresponds to the order number of the filter name-plate.
8 . Remove filter element from plastic bag and reassemble in reverse order (items 1 to 4). The cover have to tightened with max. 20 Nm.
9 . Contaminated Mic elements can be reduced to ashes. Sm-x filter elements must be disposed in another way.

10.5 Replacement of air breather filter element (plastic filter head only)

1 . Push slightly on the lid and air breather element downwards (lid A).
2 . Remove lid and element from the lower hook.
3 . Pull out element from the lid.
4 . Install new element in the lid.
5 . Installation in reverse order.
6 . Check correct position of the lid.

Note: Filter element and air breather element should be always replaced at the same time.

Subject to technical alteration without prior notice.



11. Spare parts list

Order numbers for spare parts	
Type	**Order number**
Seal kit NBR	
Pi 530.../1	78309072
Pi 530.../2	78206062
Pressure gauge	79358326
Pressure switch	
normally closed	77870587
normally open	77863814
Breather element for Pi 530.../1 (batch size 3 pcs.)	78206831

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Suction return line filter
Pi 550

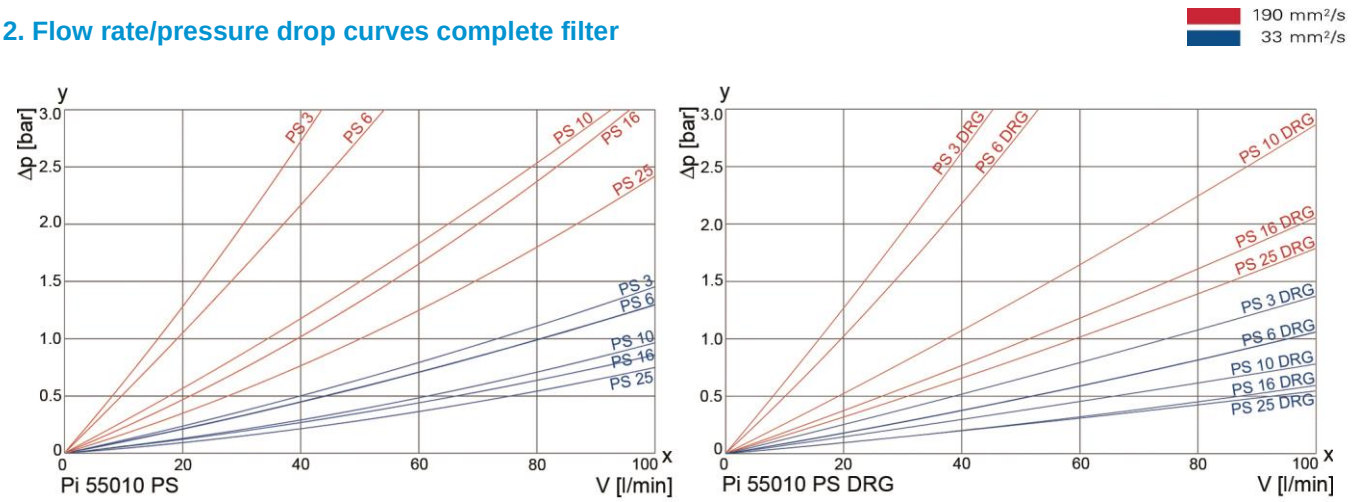
Nominal pressure 10 bar, nominal size 100

1. Features

High-performance filters for modern stationary and mobile hydraulic systems

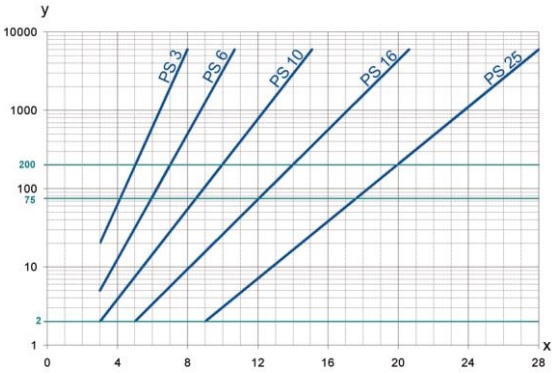
- Provided for tank top installation
- Very low overall height since suction and return line connections are very close together
- Minimum pressure drop through optimum flow design
- Electrical maintenance indicator
- Version with threaded connectors
- Service-friendly
- Equipped with highly efficient PS filter elements, with optional feeding filter stage
- Optional elements with filtration of the feeding volume flow available
- Beta rated elements according to ISO 16889 multipass test
- High dirt holding capacity thanks to large filter surface
- Worldwide distribution

2. Flow rate/pressure drop curves complete filter



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 in accordance with ISO 11171 (NIST)

4. Filter performance data

tested in accordance with ISO 16889 (multipass test)

PS elements with
max. Δp 20 bar

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

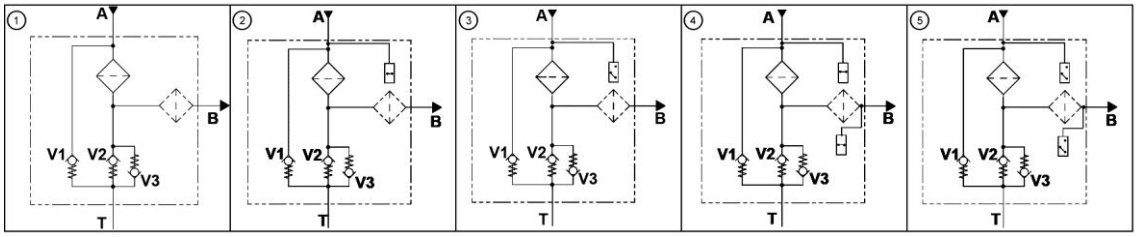
up to 10 bar differential pressure up to 20 bar differential pressure

5. Quality assurance

FGC filters and filter elements are manufactured and/or tested in compliance with 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 evaluating filtration performance of a filter element

6. Symbols



V1 = bypass valve
V2 = preloaded valve
V3 = feeding valve

7. Order numbers

Example for ordering filters:

1. Filter housing	2. Filter element
V=100 l/min Type: Pi 55010/01/-200 Order number: 72338649	PS 10 DRG Type: Pi 852 101 PS 10 DRG Order number: 70530136

7.1 Housing design

Nominal size NG [l/min]	Order number	Type	① without DS	② DSO	③ DSS	④ DSO/USO	⑤ DSS/USS
100	72338649	Pi 55010/01/-200	■				
	72338651	Pi 55010/01/-201		■			
	72338652	Pi 55010/01/-202			■		
	72338654	Pi 55010/01/-203				■	
	72338655	Pi 55010/01/-204					■

All versions with bypass valve 3.5 bar, preloaded valve 0.5 bar and feeding valve

DSO Pressure switch normally closed Δp 2,2 bar
DSS Pressure switch normally open Δp 2,2 bar
USO Ported vacuum switch normally closed Δp 0,2 bar
USS Ported vacuum switch normally open Δp 0,2 bar

7.2 Filter elements (other element versions on request)

Nominal size NG [l/min]	Order number	Type designation	Filter material	max. Δp [bar]	Filter surface [cm²]
100	72397561	852 101 PS 3	PS 3	10	1800
	72397562	852 101 PS 6	PS 6		
	70530086	852 101 PS 10	PS 10		
	70530087	852 101 PS 16	PS 16		
	72397563	852 101 PS 25	PS 25		
	72397565	852 101 PS 3 DRG	PS 3 DRG		1800
	72397566	852 101 PS 6 DRG	PS 6 DRG		
	70530136	852 101 PS 10 DRG	PS 10 DRG		
	70530137	852 101 PS 16 DRG	PS 16 DRG		
	72397567	852 101 PS 25 DRG	PS 25 DRG		

8. Technical data

Design:	Suction return line filter
Nominal pressure Pi 55010	10 bar
Test pressure Pi 55010	15 bar
Temperature range:	-30 °C to +100 °C
	Survival temperature -40 °C
	(other temperature ranges on request)
Charging pressure:	Δp 0.5 bar
Switching pressure vacuum switch:	200 mbar
Switching pressure dynamic pressure switch:	2.2 bar
Bypass opening pressure:	Δp 3.5 bar
Filter head material:	AL
Filter housing material:	PA
Sealing material:	NBR

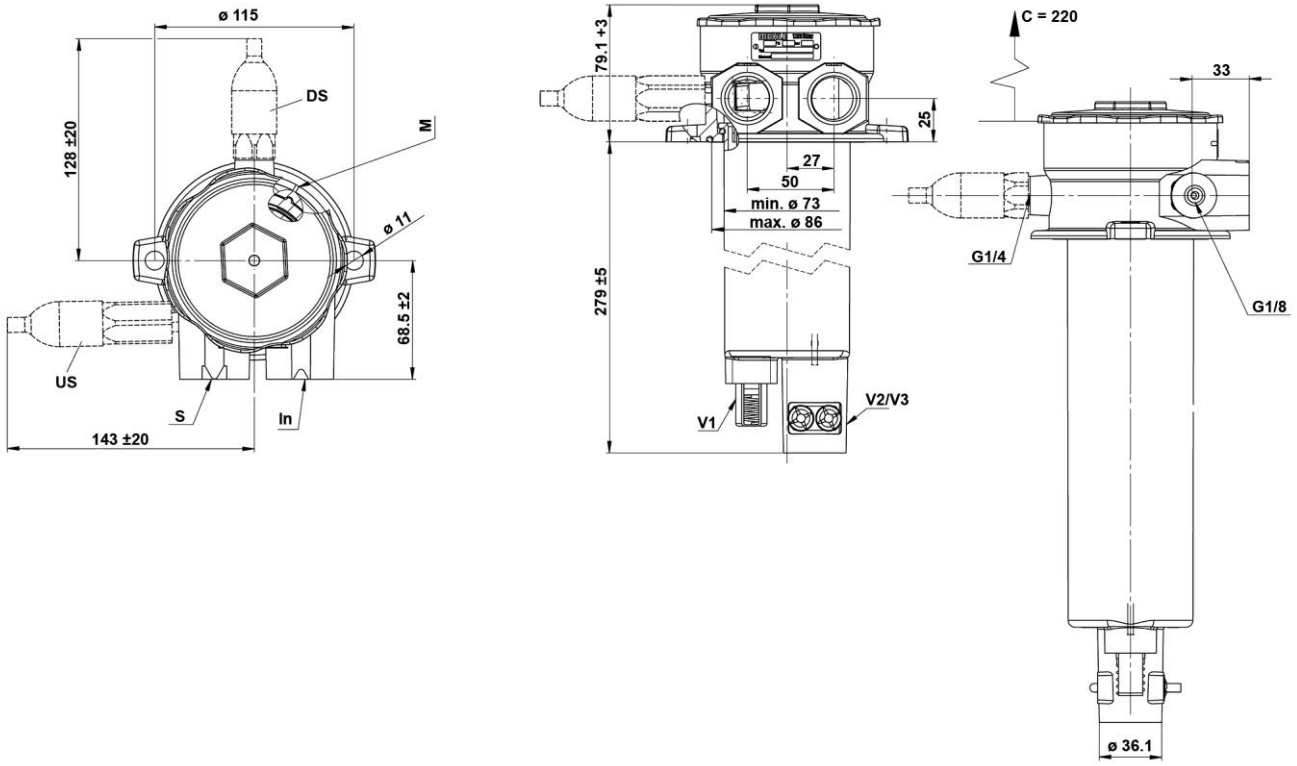
The maintenance indicator data sheet contains further details and other maintenance indicator versions.

We draw attention to the fact that all values indicated are average values. Our products are continually being further developed. Values, dimensions and weights can change as a result of this. Our specialist department would be pleased to offer you advice.

We recommend you contact us concerning applications for 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). Please contact us if you intend using other media.

Subject to technical alteration without notice.

9. Dimensions



C = dismantling height required 220 mm
DS = pressure switch
US = vacuum switch
In = inlet
M = marking for housing installation
S = suction connection
V1 = bypass valve
V2 = preloaded valve
V3 = feeding valve

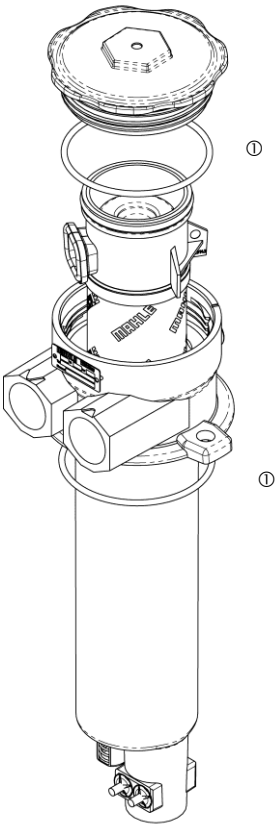
10. Installation, operating and maintenance instructions

10.1 Filter installation
When installing the filter, make sure that
a) sufficient space is available to remove the filter element and the filter housing,
b) the filter mounting hole in the tank top is not excessively large, to ensure proper sealing,
c) the filter is free of tension after installation. Preferably the filter should be installed with the filter housing pointing downwards. In this position the optical dynamic pressure indicator is accessible and visible.

10.2 Connection of the electrical dynamic pressure indicator
The electrical dynamic pressure indicator is connected via a blade terminal 2x6.3x0.8. The electrical vacuum pressure switch is connected via a blade terminal 2x6.3x0.8.

10.3 When must the filter element be replaced?
1. Filters equipped with electrical dynamic pressure indicator: There may be an electrical signal during cold starts. If the electrical signal does not go out at operating temperature, the filter element has to be replaced after the end of the shift.
2. Filters without dynamic pressure indicator: The filter element should be replaced after the trial run or flushing of the system. Afterwards follow the manufacturer's instructions.
3. Always make sure you have original FGC spare elements in stock. Disposable elements (PS and Mic) cannot be cleaned.

10.4 Element replacement
1. Stop the system and relieve the filter from pressure.
2. Unscrew the filter housing by turning counter-clockwise.
3. Pull the filter housing with element upwards and out.
4. Remove the filter element by moving it gently backwards and forwards.
5. Clean the filter housing with a suitable medium.
6. Check the O-rings on the filter cover and the filter housing for damage. Replace these if necessary.
7. Make sure that the order number on the spare element corresponds to the order number on the filter name plate.
8. Remove the filter element from the plastic sleeve and reassemble the filter in reverse order (points 1-4).



11. Spare parts list

Order numbers for spare parts		
Position	**Designation**	**Order number**
①	**Pi 55010**	
	Seal kit for housing	
	NBR	72355714
	Fluororubber	72355715
	EPDM	72355716

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