

## Suction Filter

Pi 200

Nominal size up to 90

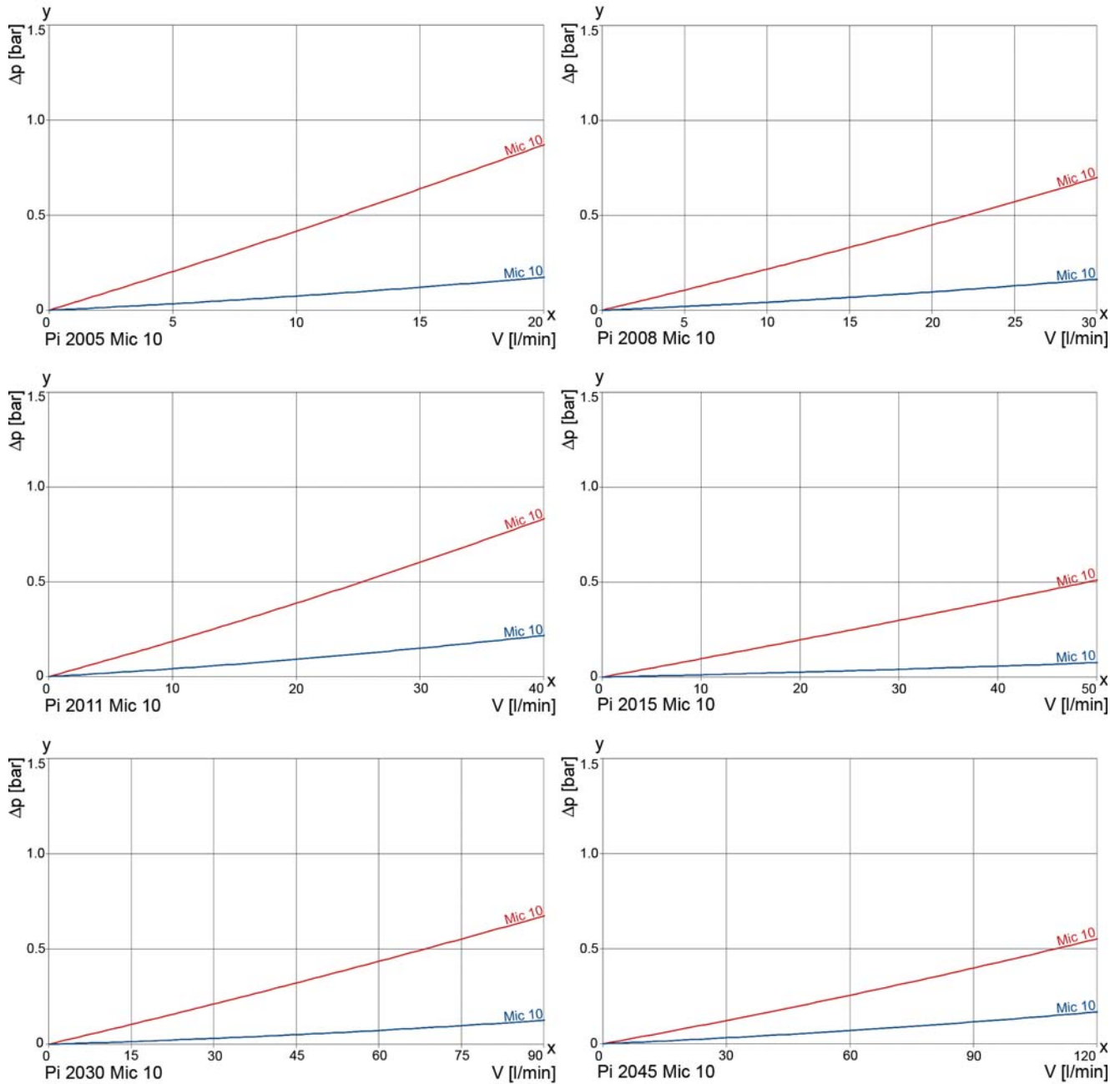
### 1. Features

#### High performance filters for modern hydraulic systems

- Provided for pipe 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 dirt holding capacity
- NPT and SAE connections on request
- Worldwide distribution

## 2. Flow rate/pressure drop curve (filter housing incl. element)

190 mm<sup>2</sup>/s  
33 mm<sup>2</sup>/s

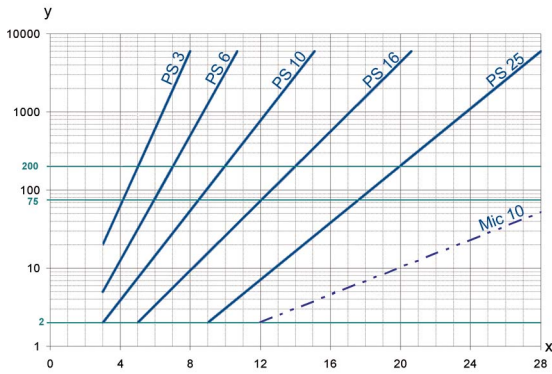


y = differential pressure  $\Delta p$  [bar]

x = flow rate  $V$  [l/min]

PS elements on request.

### 3. Separation grade characteristics



y = beta-value

x = particle size [ $\mu\text{m}$ ]

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.  $\Delta p$  20 bar

PS 10  $\beta_{10(C)} \geq 200$

PS 25  $\beta_{20(C)} \geq 200$

values guaranteed up to 10

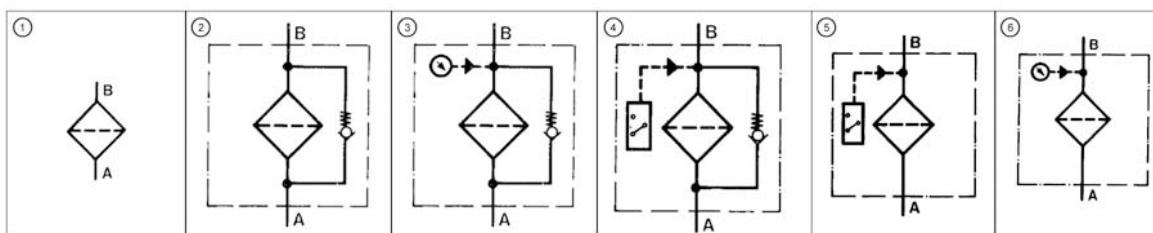
bar differential pressure

### 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. Order numbers

Example for ordering filters:

1. Filter housing	2. Filter element
V=16 l/min and vacuum switch	PS 25
Type: Pi 2008-065	Type: Pi 4108 PS 25
Order number: 77736937	Order number: 77680457

### 7.1 Housing design

Nominal size NG [l/min]	Order number	Type	① no options	② with bypass valve	③ with bypass valve and vacuum gauge	④ with bypass valve and vacuum switch	⑤ with vacuum switch	⑥ with vacuum gauge
10	77665144	Pi 2005-060						
	77665151	Pi 2005-067						
	77736903	Pi 2005-062						
	77736911	Pi 2005-061						
	77736895	Pi 2005-065						
	77736887	Pi 2005-066						
16	77665235	Pi 2008-060						
	77665268	Pi 2008-067						
	77665243	Pi 2008-062						
	77736945	Pi 2008-061						
	77736937	Pi 2008-065						
	77665250	Pi 2008-066						
22	78205114	Pi 2011-060						
	70361602	Pi 2011-067						
	70361595	Pi 2011-062						
	79767013	Pi 2011-061						
	79373077	Pi 2011-065						
	76374318	Pi 2011-066						
30	77840580	Pi 2015-060						
	N.N.	Pi 2015-067						
	N.N.	Pi 2015-062						
	N.N.	Pi 2015-061						
	76387880	Pi 2015-065						
	N.N.	Pi 2015-066						
60	77665474	Pi 2030-060						
	77735921	Pi 2030-067						
	77665482	Pi 2030-062						
	77665490	Pi 2030-061						
	77665508	Pi 2030-065						
	77735939	Pi 2030-066						
90	77664881	Pi 2045-060						
	77736986	Pi 2045-067						
	77664907	Pi 2045-062						
	77664899	Pi 2045-061						
	77664915	Pi 2045-065						
	77736978	Pi 2045-066						

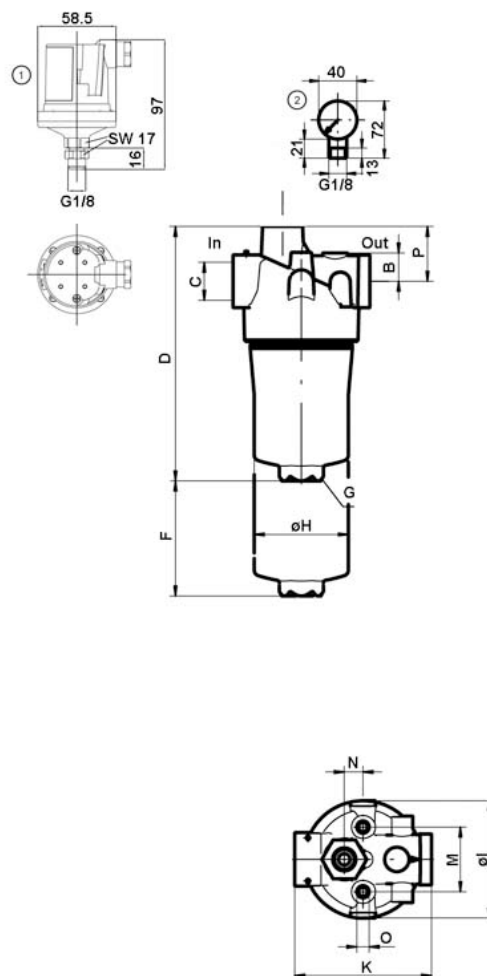
When filter with non bypass configuration is selected, the collapse pressure of the element must not be exceeded.

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

Nominal size NG [l/min]	Order number	Type	Filter material	max. $\Delta p$ [bar]	Filter surface [cm <sup>2</sup> ]
<b>10</b>	77680325	Pi 3105 PS 10	PS 10	<b>20</b>	590
	77680440	Pi 4105 PS 25	PS 25		590
	77576630	Pi 1105 Mic 10	Mic 10		640
<b>16</b>	77680341	Pi 3108 PS 10	PS 10	<b>20</b>	1150
	77680457	Pi 4108 PS 25	PS 25		1150
	77680085	Pi 1108 Mic 10	Mic 10		1250
<b>22</b>	77680333	Pi 3111 PS 10	PS 10	<b>20</b>	1700
	77680465	Pi 4111 PS 25	PS 25		1700
	77680093	Pi 1111 Mic 10	Mic 10		1800
<b>30</b>	77680358	Pi 3115 PS 10	PS 10	<b>20</b>	2425
	77680473	Pi 4115 PS 25	PS 25		2425
	77680101	Pi 1115 Mic 10	Mic 10		2565
<b>60</b>	77680366	Pi 3130 PS 10	PS 10	<b>20</b>	4620
	77680481	Pi 4130 PS 25	PS 25		4620
	77680119	Pi 1130 Mic 10	Mic 10		4885
<b>90</b>	77680374	Pi 3145 PS 10	PS 10	<b>20</b>	6865
	77680499	Pi 4145 PS 25	PS 25		6865
	77680127	Pi 1145 Mic 10	Mic 10		7265

## 8. Technical specifications

Design:	in-line suction filter
Nominal pressure: Pi 2005 - 2011	63 bar (910 psi)
Pi 2015 - 2045	25 bar (360 psi)
Test pressure: Pi 2005 - 2011	82 bar (1190 psi)
Pi 2015 - 2045	33 bar (480 psi)
Temperature range:	-10 °C to +120 °C (other temperature ranges on request)
Bypass setting:	$\Delta p$ 0.25 bar $\pm$ 10 %
Filter head material:	GDAL
Filter housing material:	AL/St
Sealing material:	NBR/AL
Indicating range	
vacuum gauge:	-1 bar to -1.5 bar
Pressure setting vacuum switch:	-200 mbar
Electrical data of vacuum switch PiS 3070:	
Max. voltage:	230 V AC/DC
Max. current:	6 A
Contact:	change-over switch
Electrical connections:	AMP 6.3 DIN 46248 for bushings according to DIN 46247
Fitting position:	any fitting positions possible (fitting position has to be defined when ordering indicators with defined switch point)
Type of protection:	IP 00 without protecting cap IP 54 with protecting cap



In = Inlet  
Out = Outlet

1 = Vacuum switch  
2 = Vacuum gauge

Subject to technical alteration without prior notice.

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.

## 9. Dimensions

All dimensions except "C" in mm.

Type	B	C*	D	F	G SW	H	I	K	M	N	O	P	Weight [kg]
Pi 2005	19	G½	177	80	27	66	80	95	45	13.0	M8x10	37.5	0.9
Pi 2008	19	G¾	253	80	27	66	80	95	45	13.0	M8x10	37.5	1.0
Pi 2011	19	G¾	335	80	27	66	80	95	45	13.0	M8x10	37.5	1.1
Pi 2015	30	G1¼	244	110	32	109	128	150	60	24.5	M12x15	43.5	2.1
Pi 2030	30	G1¼	360	110	32	109	128	150	60	24.5	M12x15	43.5	2.4
Pi 2045	30	G1¼	475	110	24	109	128	150	60	24.5	M12x15	43.5	6.5

\* NPT and SAE 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. Preferably the filter should be installed with the filter housing pointing downwards.

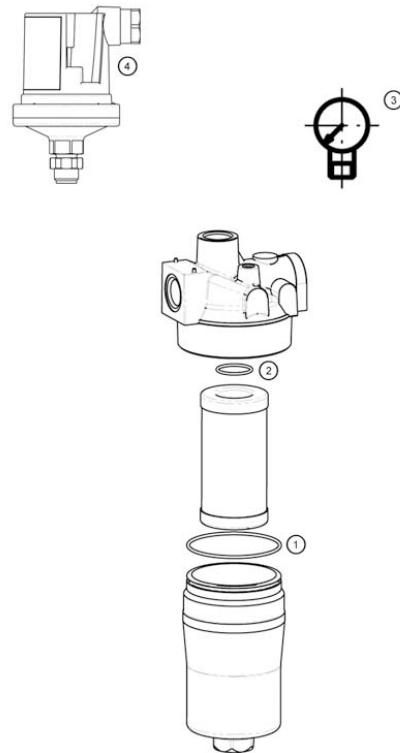
The maintenance indicator must be visible.

### 10.2 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. If vacuummeter shows > 0,2 bar or the electrical signal has not switched off after reaching operating temperature, the filter element must be replaced or cleaned after the end of the shift. Please always ensure that you have original MAHLE spare elements in stock: Disposable elements (Mic or PS) cannot be cleaned.

### 10.3 Element replacement

1. Stop system and relieve filter from pressure.
2. Unscrew the filter housing by turning counter-clockwise. Clean the housing using a suitable cleaning solvent.
3. Remove element by pulling down carefully.
4. Check O-ring on the filter housing for damage. Replace, if necessary.
5. 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.
6. Lightly lubricate the threads of the filter housing a little bit and screw into the filter head. Maximum tightening torque for NG 50 to 110 = 60 Nm.



## 11. Spare parts list

Order numbers of spare parts		
Position	Type	Order number
① to ②	Seal kit for housing	
	<b>Pi 2005 - Pi 2011</b>	
	NBR	77550213
	FPM	77845795
	EPDM	77845803
	<b>Pi 2015 - Pi 2045</b>	
	NBR	77550221
	FPM	77845811
	EPDM	77845829
③	Vacuum gauge	
	NG 40 G 1/8	76345763
④	Vacuum switch	
	PiS 3070	77669724

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