

Low Pressure Filter

Pi 2300

Operating pressure 25 (40) bar, Nominal size up to 2000
according DIN 24550

1. Features

Efficient filters for modern hydraulic systems

- Modular design
- Compact design
- Minimal pressure loss
- Visual / electrical / electronic differential pressure indication
- SAE 3 bolt flange ports
- Inlet sideways at the sight or at the bottom, outlet sideways

Quality filters, easy to service

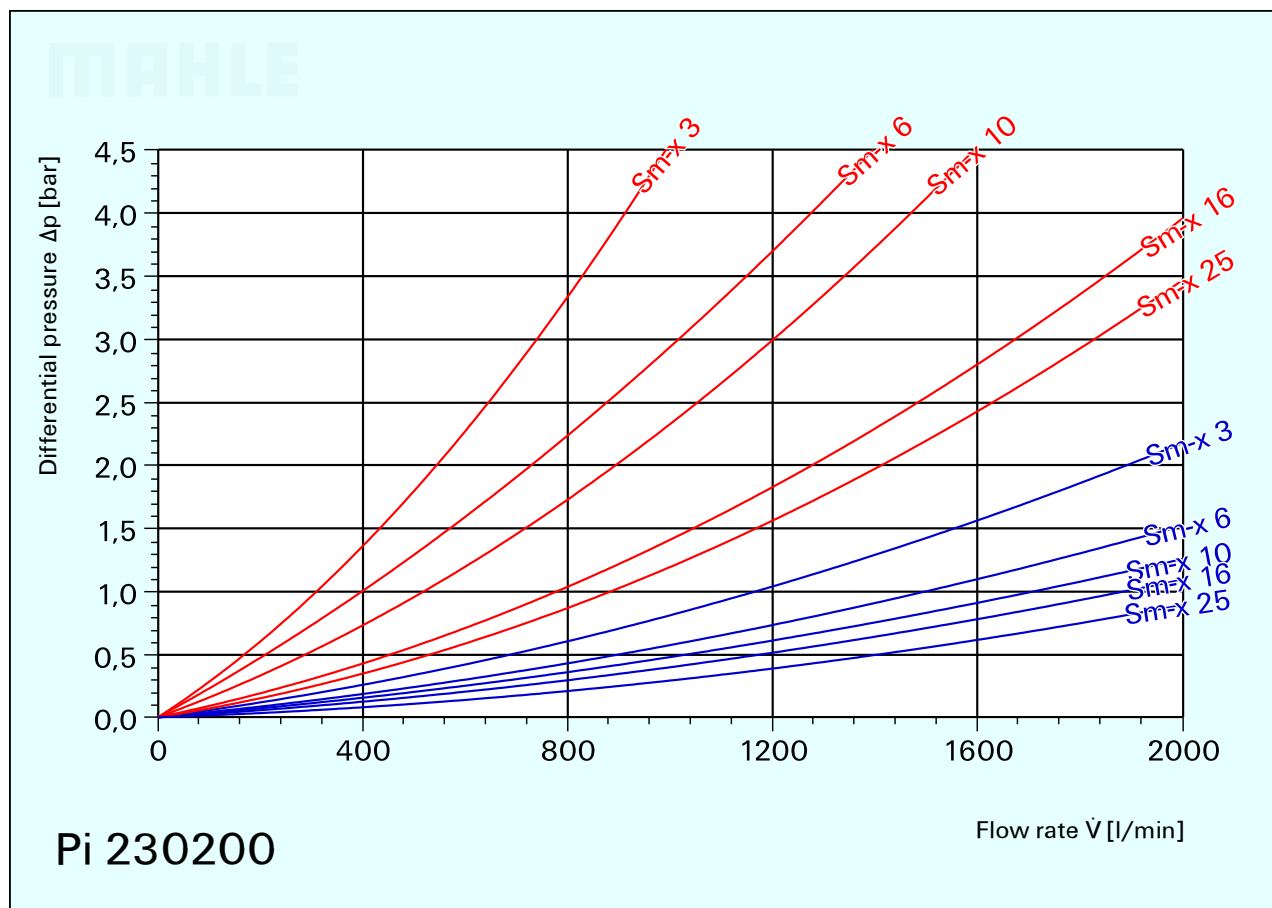
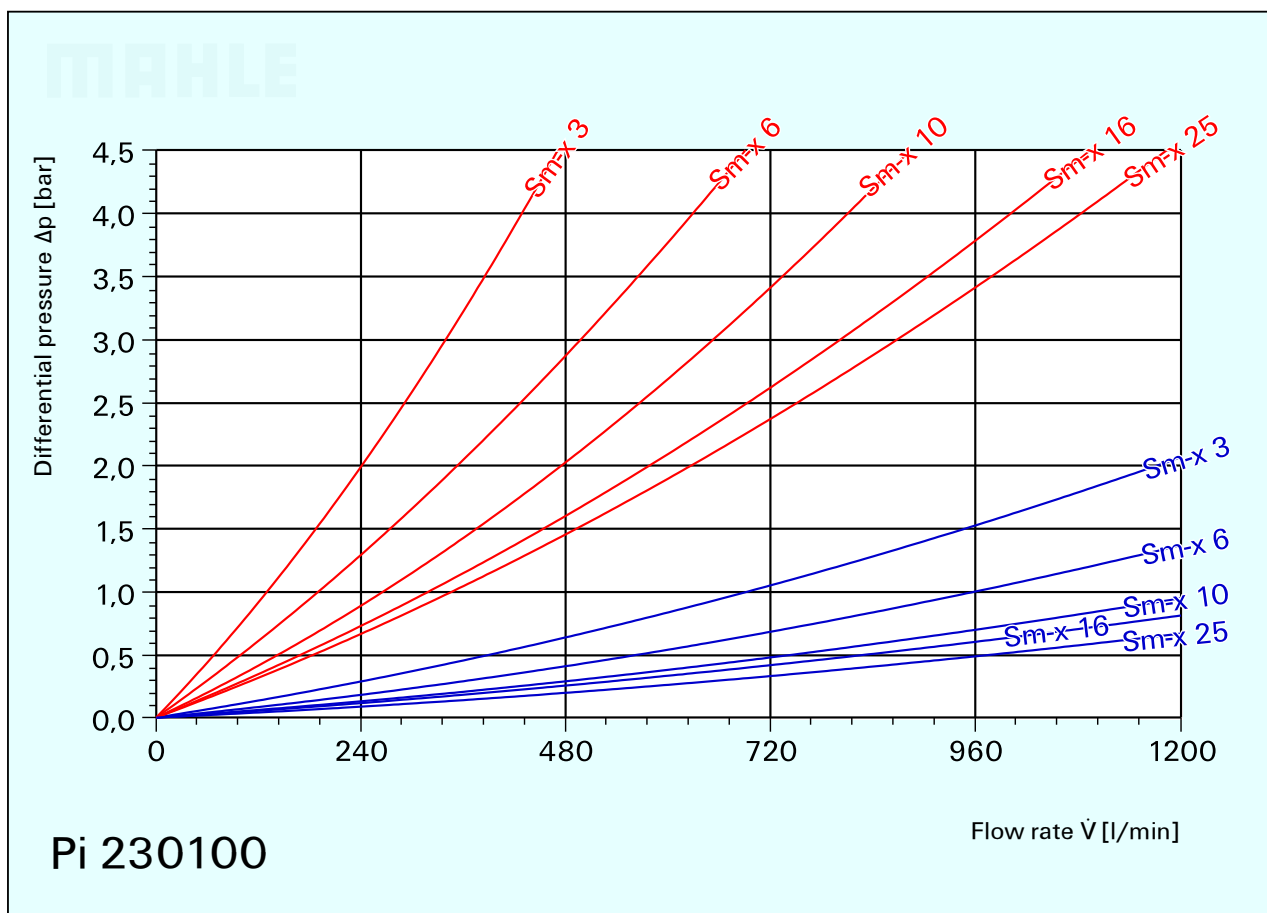
- Highly efficient Sm-x or Sm-N2 filter elements
- β -rated elements per ISO 16 889
- Large dirt holding capacity and high differential pressure stability providing optimal element service life
- Maintainable with toggle-lock for easy element change

World-wide sales

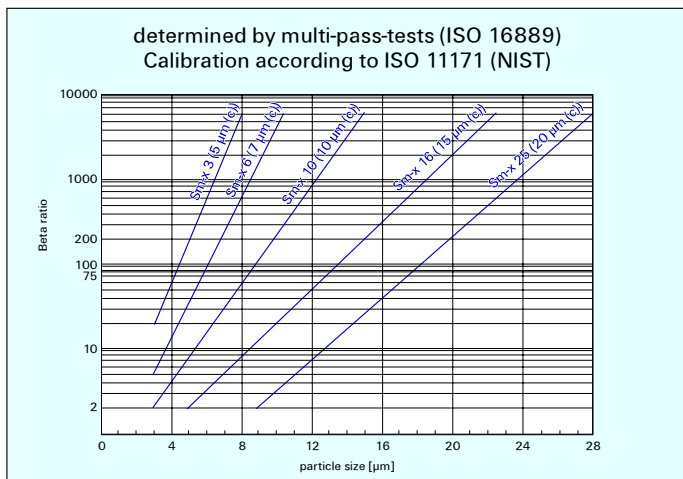


2. Flow rate / pressure drop curve compl. filter

■ 190 mm²/s (25 ° E)
■ 33 mm²/s (4,5 ° E)



3. Separation characteristics



4. Filter performance data

tested according to ISO 16 889 (multi-pass-test)

Sm-x elements
with Δp 10 bar

Sm-x 3	$\beta_{5(c)} \geq 200$
Sm-x 6	$\beta_{7(c)} \geq 200$
Sm-x 10	$\beta_{10(c)} \geq 200$
Sm-x 16	$\beta_{15(c)} \geq 200$
Sm-x 25	$\beta_{20(c)} \geq 200$

at 10 bar differential
pressure

Example for ordering filters:

1. Housing design

$\dot{V}$ = 1000 l/min, bypass, electrical indication, inlet at the bottom

Type-no. **Pi 230100/11-058**

Order-no. **632.112.9**

2. Filter element

Sm-x 10

Type-no. **Pi 23100 RN Sm-x 10**

Order-no. **792.422.8**

Attention: At a nominal size of 2000, 2 filter elements per housing are required!

7. Part Numbers

7.1 Housing design

Order-no.	Type-no.	Inlet	Nominal size NG [l/min]	① with bypass with visual indicator	② with bypass with electrical indicator	③ with visual indicator	④ with electrical indicator	
632.108.7	Pi 230100/11-057	at the bottom	1000					1
632.112.9	Pi 230100/11-058							
632.116.0	Pi 230100/11-068							
632.120.2	Pi 230100/11-069							
632.109.5	Pi 230100/21-057	at the sight	1000					1
632.113.7	Pi 230100/21-058							
632.117.8	Pi 230100/21-068							
632.121.0	Pi 230100/21-069							
632.110.3	Pi 230200/11-057	at the bottom	2000					2
632.114.5	Pi 230200/11-058							
632.118.6	Pi 230200/11-068							
632.122.8	Pi 230200/11-069							
632.111.1	Pi 230200/21-057	at the sight	2000					2
632.115.2	Pi 230200/21-058							
632.119.4	Pi 230200/21-068							
632.123.6	Pi 230200/21-069							

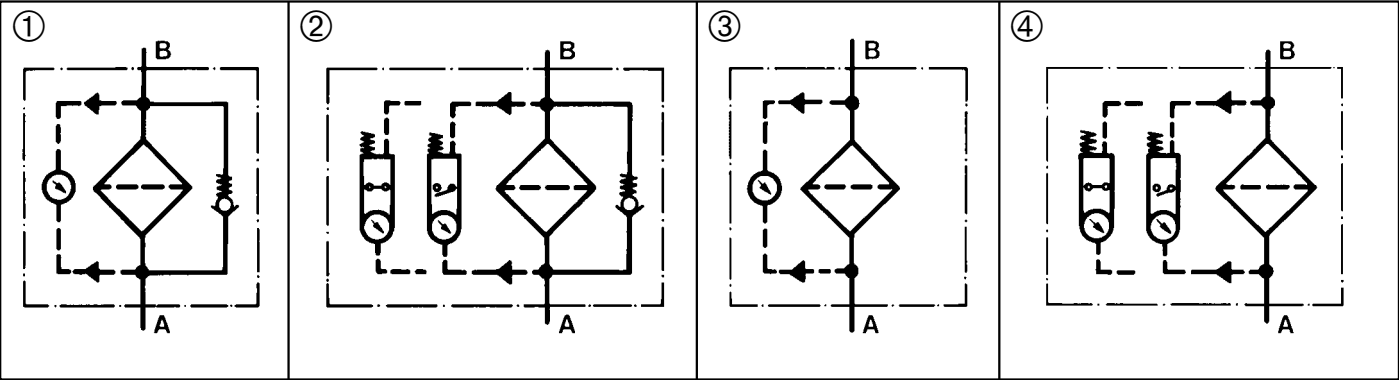
When filter with non bypass configuration is selected, the collapse pressure of the element may not be exceeded.

5. Test regulations

MAHLE filter elements are manufactured respectively, tested in accordance with the following international standards:

Norm	Designation
ISO 2941	Hydraulic-fluid power-Filter elements-Verification of collapse / burst resistance
ISO 2942	Hydraulic-fluid power-Filter elements-Verification of fabrication integrity and determination of the first bubble point
ISO 2943	Hydraulic-fluid power-Filter elements-Verification of material compatibility with fluids
ISO 3723	Hydraulic fluid power-Filter elements-Method for end load test
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 10 771.1	Fatigue pressure testing of metal containig envelopes in hydraulic fluid applications.
ISO 16 889	Hydraulic Fluidpower filters-Multi-pass method for evaluation filtration performance of a filterelement

6. Symbols



7.2 Filter elements standard* () = filter surface [] = type number

	Sm-x 3 Δp 10 bar	Sm-x 6 Δp 10 bar	Sm-x 10 Δp 10 bar	Sm-x 16 Δp 10 bar	Sm-x 25 Δp 10 bar
1	(18760 cm²)	(18760 cm²)	(18760 cm²)	(18760 cm²)	(18760 cm²)
	792.421.0	796.410.9	792.422.8	796.368.9	796.027.1
	[Pi 21100 RN Sm-x 3]	[Pi 22100 RN Sm-x 6]	[Pi 23100 RN Sm-x 10]	[Pi 24100 RN Sm-x 16]	[Pi 25100 RN Sm-x 25]
2	2x (18760 cm²)	2x (18760 cm²)	2x (18760 cm²)	2x (18760 cm²)	2x (18760 cm²)
	792.421.0	796.410.9	792.422.8	796.368.9	796.027.1
	[Pi 21100 RN Sm-x 3]	[Pi 22100 RN Sm-x 6]	[Pi 23100 RN Sm-x 10]	[Pi 24100 RN Sm-x 16]	[Pi 25100 RN Sm-x 25]

*further elements available upon request

8. Specifications

Nominal pressure (10 ⁷ LW):	25 bar*
Nominal pressure (statical):	40 bar
Temperature range:	-10 °C to +120 °C (other temperature ranges on request)
Bypass valve opening pressure:	Δp 3,5 bar $\pm$ 10 %
Filter head material:	GAl
Filter bowl material:	AL
Sealing material:	NBR
Activating pressure of visual/electrical differential pressure indicator:	Δp 2,2 bar $\pm$ 0,3 bar
Electrical data of differential pressure indicator:	
Maximum voltage:	230 V $\sim$ / =
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:	M 16

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 executions please see our leaflet "contamination indicators".

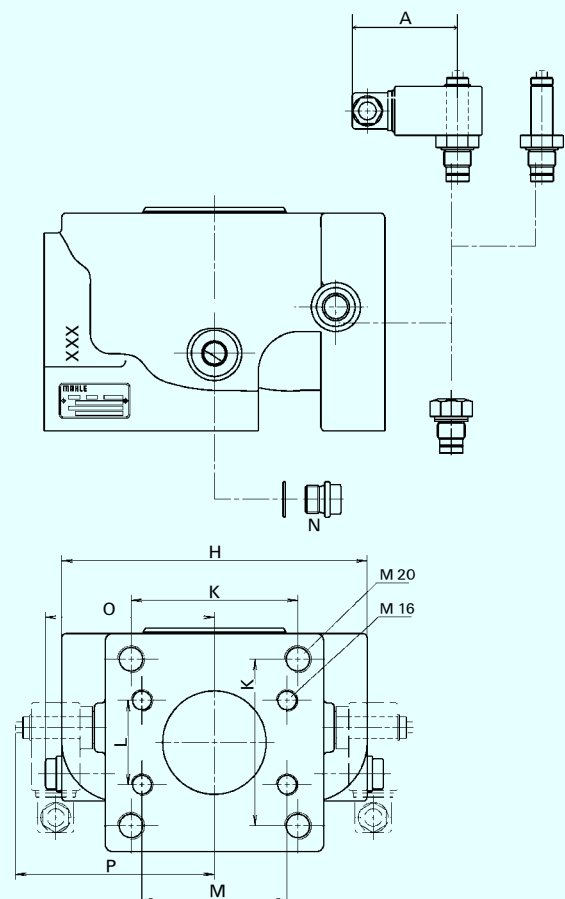
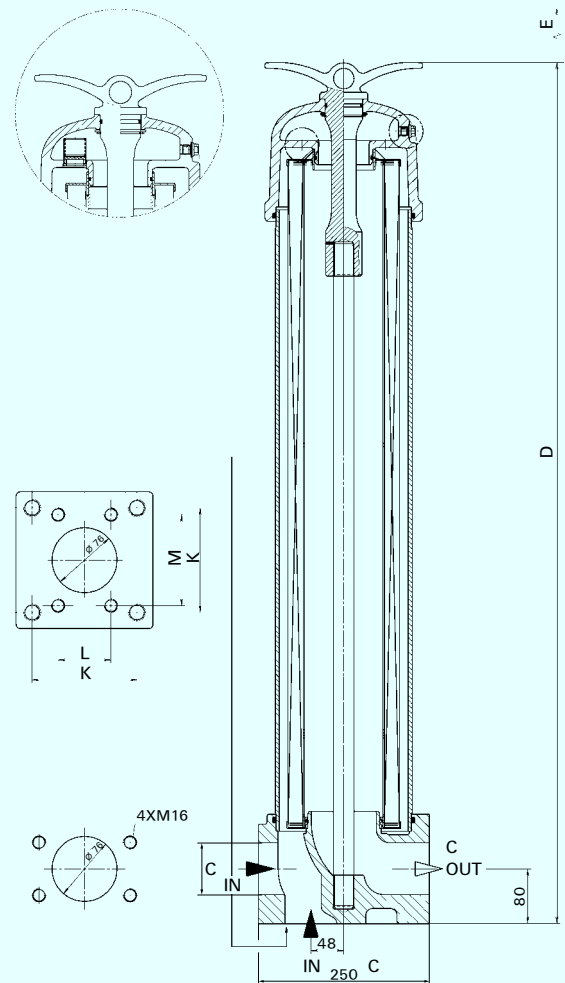
Filters compatible with standard mineral oils. (according to fluids of group 2 of guideline 97/23 EG, art. 9)

Please contact us in case of using other media.

9. Dimensions

All dimensions (except "C" and "O") in mm

Dimension \ Type	Pi 23040	Pi 23080
A	78	78
B	80	80
C	SAE 3", 3000 psi	SAE 3", 3000 psi
D	710	1260
E	770	770
F	230	230
G	200	200
H	224	224
I	250	250
K	122,3	122,3
L	61,9	61,9
M	104,4	104,4
N	G ½	G ½
O	124	124
P	146	146
Weight (kg)	29	38



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.
The contamination indicator must be visible.

10.2 Connecting the electrical contamination indicator

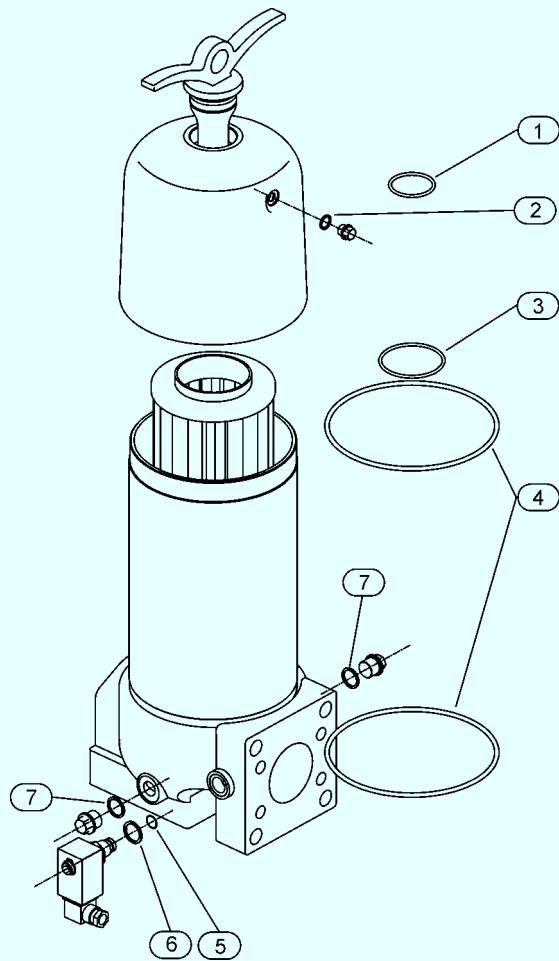
The electrical indicator is connected via a 2-pole appliance plug according to DIN 43650 with poles marked 1 and 2.
The electrical section can be inverted to change from Normally Open position to Normally Closed position or visa versa.

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 or 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, Sm-N2 cannot be cleaned.

10.4 Element replacement

- Stop system and relieve filter from pressure.
- Loosen toggle, remove cover, and open drain valve. Housing completely vented.
- Remove filter element from the filter bowl. With filter type Pi 230200 remove the spacer sleeve from the elements clean and reuse.
- Check seal for damages, replace if necessary.
- Make sure that the part number on the spare element corresponds with the part number on the filter label. With the filter type Pi 230200 always change both elements. Remove the plastic bag and push element over the spigot in the filter head. With filter type Pi 230200 put the sleeve on the element. On this, telescope the second element and locate it.
- Close drain valve. Put the thumb screw together with the cover on the centre rod and tighten strong. Filter must be bled!



11. Spare Parts List

Pos.	Housing design	
①	Seal kit	
	NBR	632.124.4
	FPM	632.125.1
	EPDM	632.126.9
② ③	Differential pressure indicator	
	visual	visual/electrical
	766.997.1	766.994.8
	Pis 3098 / 2,2	Pis 3097 / 2,2
④	Seal kit for differential pressure indicator	
	Pis 3098 / 2,2 + Pis 3097/2,2	
	NBR	776.030.9
	FPM	776.031.7
	EPDM	776.032.5

MAHLE

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