

Low Pressure Filter

Pi 1500

Operating pressure 10 (25) bar, Nominal size up to 600
Filter elements according DIN 24550

1. Features

Efficient filters for modern hydraulic systems

- Modular design principle
- Compact design
- Minimal pressure drop
- Optical/electrical/electronic contamination control
- Threaded or SAE 4 bolt flange connection

Quality filters, easy to service

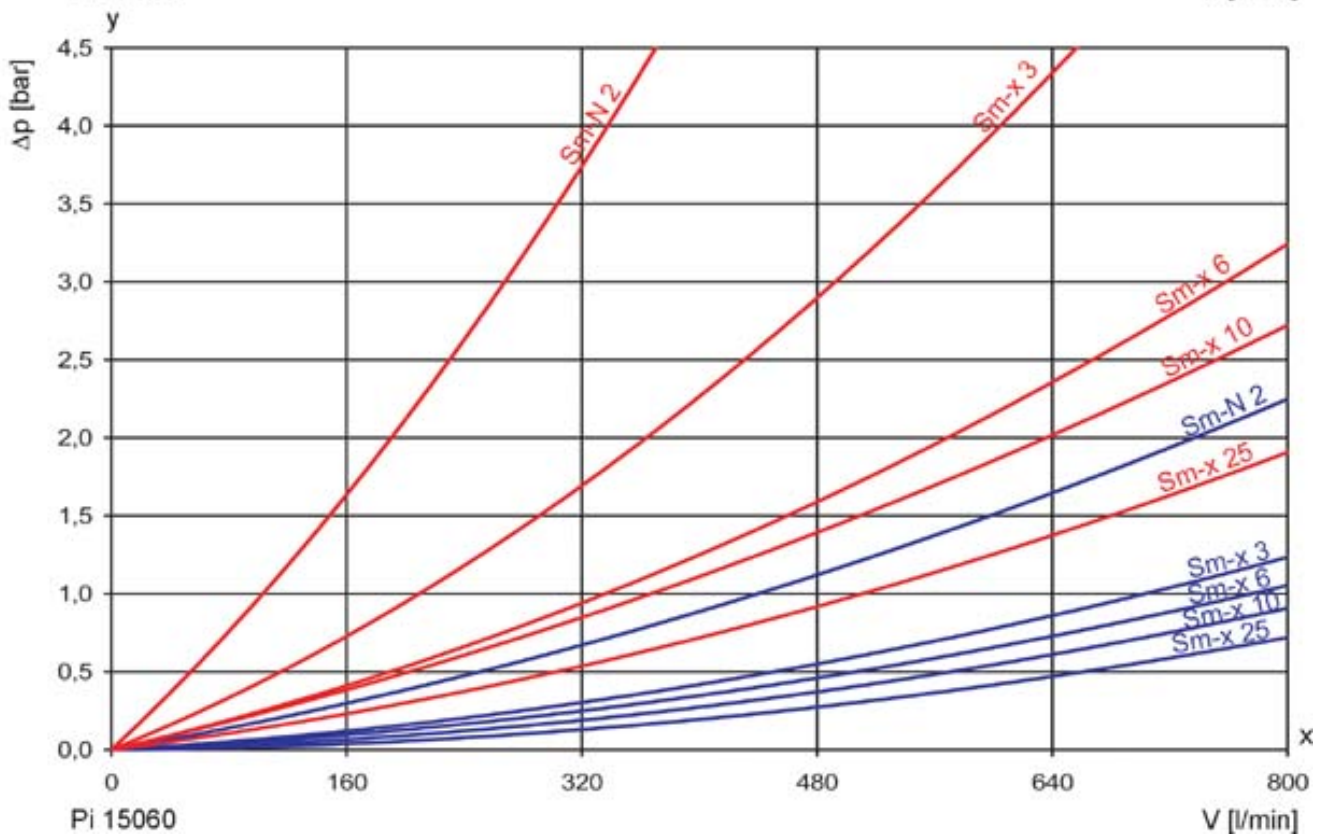
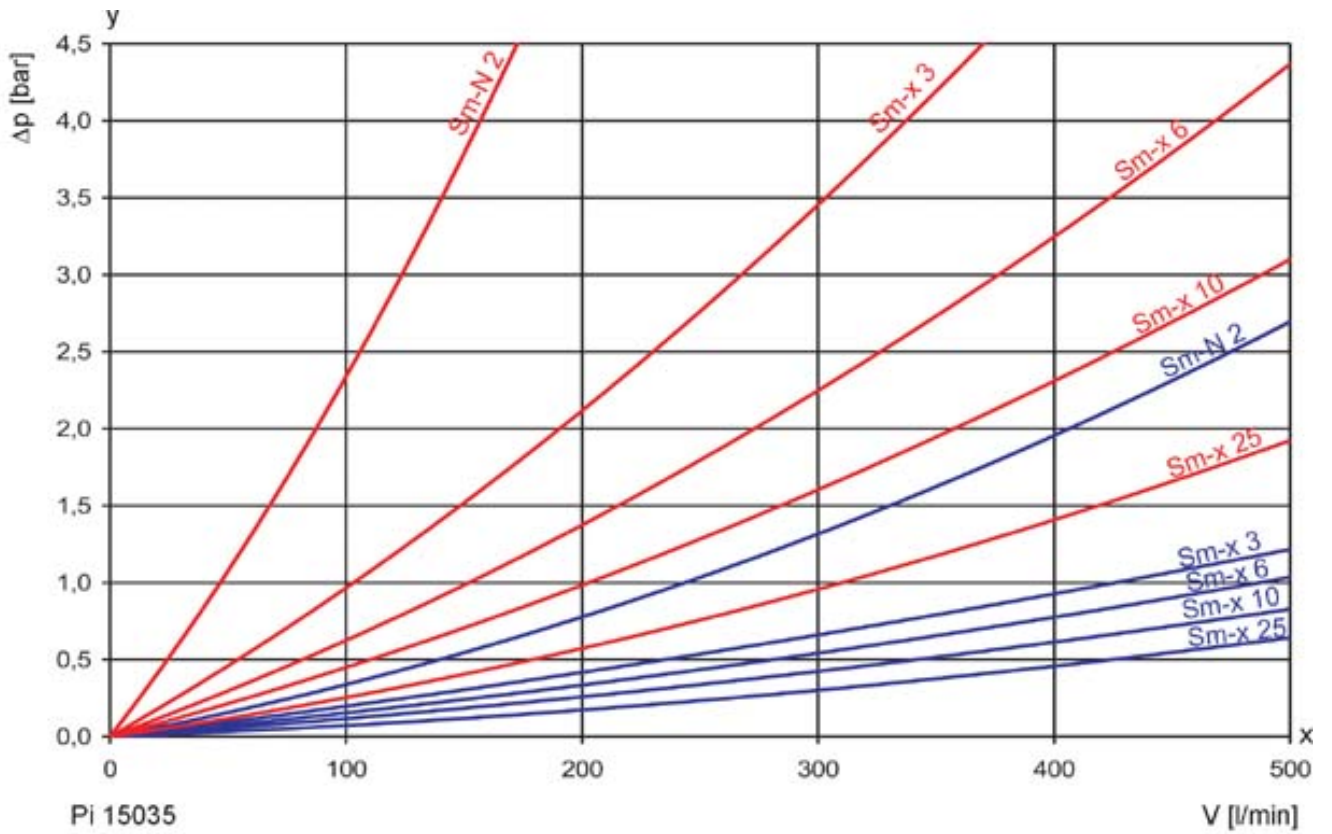
- Equipped with highly efficient Sm-x- oder Sm-N 2 filter elements
- β -valued elements per ISO 16889
- High dirt holding capacity and differential pressure stability providing optimal service life

Worldwide distribution



2. Flow rate/pressure drop curve complete filter

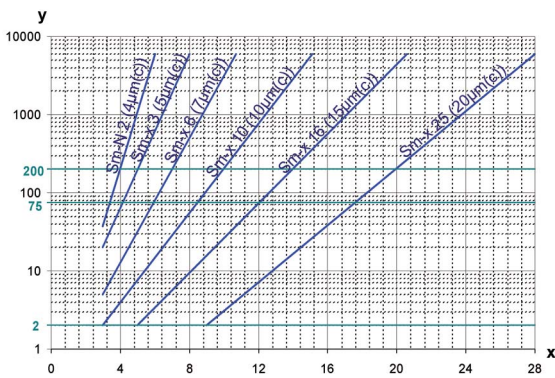
■ 190 mm²/s (25° E)
■ 33 mm²/s (4,5° E)



y = differential pressure Δp [bar]

x = flow rate V [l/min]

3. Separation characteristics



y = beta-ratio
x = particle size [µm]

determined by multipass test (ISO 16889)
calibration according to ISO 11171 (NIST)

4. Filter performance data

measured according to ISO 16889 (multipass test)

Sm-x-/ Sm-N 2 elements with

Δp 10 bar

Sm-N	2	$\beta_{4(C)}$	≥ 200
Sm-x	3	$\beta_{5(C)}$	≥ 200
Sm-x	6	$\beta_{7(C)}$	≥ 200
Sm-x	10	$\beta_{10(C)}$	≥ 200
Sm-x	16	$\beta_{15(C)}$	≥ 200
Sm-x	25	$\beta_{20(C)}$	≥ 200

up to 10 bar differential pressure

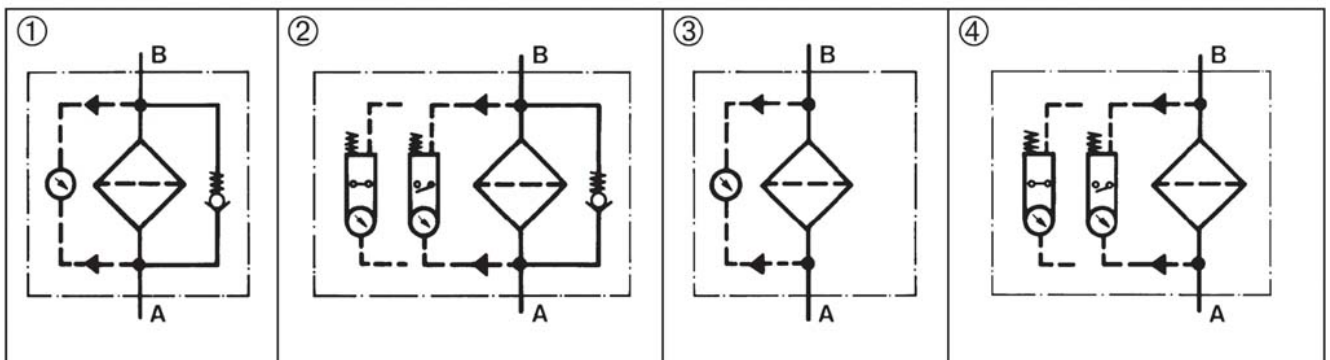
The filter element Sm-N 2 is an element with a very large dirt holding capacity, especially for bypass filtration.

5. Quality assurance

MAHLE filter and filter elements are manufactured respectively, tested in accordance 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 2923	Hydraulic fluid power filter elements; method for end load test
DIN ISO 2924	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
V = 350 l/min, Bypass, electrical contamination indicator, Operating pressure 10 bar Type: Pi 15035/10-058 Order number: 76101778	Sm-x 10 Type: Pi 23063 RN Sm-x 10 Order number: 77924202

7.1 Housing design							
Nominal size NG [l/min]	Order number	Type	Operating pressure [bar]	① with bypass valve and optical indicator	② with bypass valve and electrical indicator	③ with optical indicator	④ with electrical indicator
350	76101760	Pi 15035/10-057	10				
	76101778	Pi 15035/10-058					
	76101786	Pi 15035/10-068					
	76101794	Pi 15035/10-069					
	76101851	Pi 15035/ 25-057	25				
	76101869	Pi 15035/ 25-058					
600	76101802	Pi 15060/10-057	10				
	76101810	Pi 15060/10-058					
	76101828	Pi 15060/10-068					
	76106353	Pi 15060/10-069					
	76101877	Pi 15060/25-057	25				
	76101885	Pi 15060/25-058					

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

7.2 Filter elements*						
Nominal size NG [l/min]	Order number	Type	Filter material	Number	Collapse pressure [bar]	Filter surface [cm ²]
350	76112650	Pi 2S063 RN SM-N 2	Sm-N 2	1	10	8850
	77924194	Pi 21063 RN SM-x 3	Sm-x 3	1		13515
	77964091	Pi 22063 RN SM-x 6	Sm-x 6	1		13515
	77924202	Pi 23063 RN SM-x 10	Sm-x 10	1		13515
	77963671	Pi 24063 RN SM-x 16	Sm-x 16	1		13515
	77960263	Pi 25063 RN SM-x 25	Sm-x 25	1		13515
600	76112650	Pi 2S063 RN SM-N 2	Sm-N 2	2	10	8850 x 2
	77924194	Pi 21063 RN SM-x 3	Sm-x 3	2		13515 x 2
	77964091	Pi 22063 RN SM-x 6	Sm-x 6	2		13515 x 2
	77924202	Pi 23063 RN SM-x 10	Sm-x 10	2		13515 x 2
	77963671	Pi 24063 RN SM-x 16	Sm-x 16	2		13515 x 2
	77960263	Pi 25063 RN SM-x 25	Sm-x 25	2		13515 x 2

* further elements available upon request.

8. Specifications

Operating pressure:	10/25 bar*
Temperature range:	- 10 °C to + 120 °C (other temperature ranges on request)
Bypass opening pressure:	Δp 3.5 bar \pm 10 %
Filter head material:	GAL
Filter bowl material:	St
Sealing material:	NBR
Activating pressure of optical/ electrical differential pressure indicator:	Δp 2.2 bar \pm 10 %
Electrical data of differential pres- sure indicator:	
Maximum voltage:	250 V AC/200 V DC
Maximum current on contact:	1 A
Inrush current:	70 W
Type of protection:	IP 65 when inserted and secured

Contact: bistable
Cable connection: M 20 x 1.5
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.
The use of quenching circuits must be checked in the case of inductivity in the DC current circuit. The contamination indicator data sheet contains further information and additional contamination indicator versions.

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.

9. Dimensions

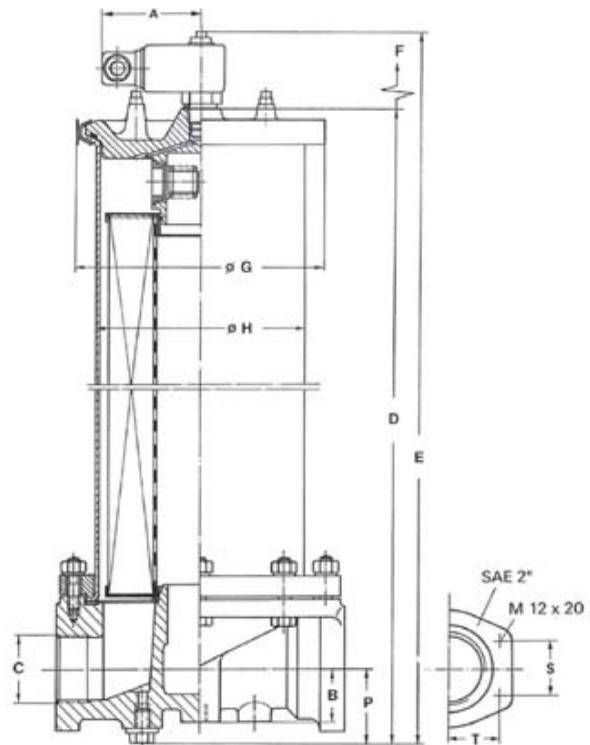
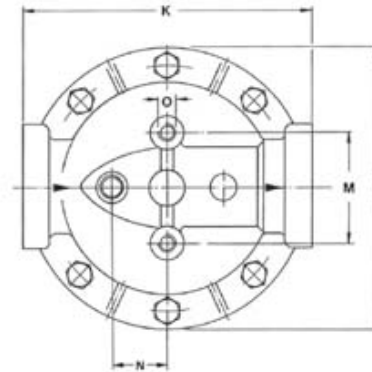
All dimensions except "C" und "O" in mm.

Dimension	Pi 15035	Pi 15060
A	78	78
B	42	42
C	G 1½	SAE 2" *
D	607	1035
E	643	1068
F	425	850
G	190	190
H	164	164
I	225	225
K	230	230
M	90	90
N	44	44
O	M 12 x 20	M 12 x 20
P	59	59
S	-	42.9
T	-	77.8
Weight [kg]	17.1	27.1

* Standard pressure series hole pattern 3000 PSI

When using our filters in areas which are to be classified according to EU Directive 94/9 EC (ATEX 95), we recommend prior discussion with us. 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 consult with us if using other media. Subject to technical alteration without prior notice.

* Housing with nominal pressure 10 bar are fitted standard with an air bleeder valve.



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.

10.2 Connecting the electrical contamination indicator

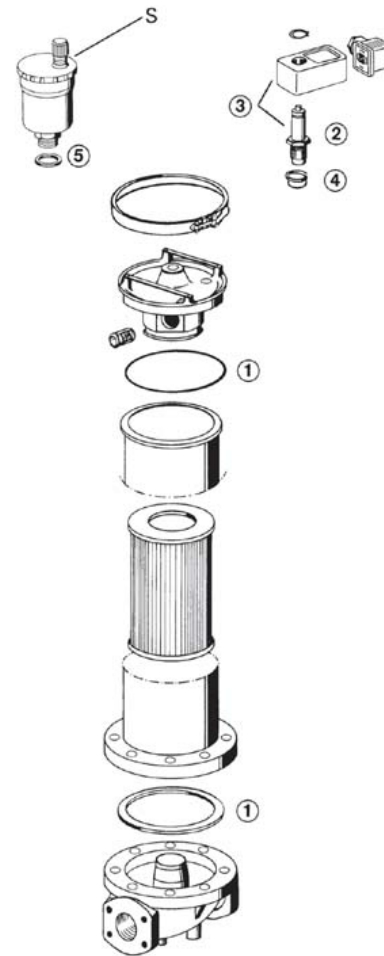
The electrical indicator is connected via a 2-pole appliance plug according to DIN EN 175301–803 with poles marked 1 and 2. The electrical section can be inverted to change from normally open position to normally closed position or vice versa.

10.3 When must the filter element be replaced?

- Filters equipped with optical 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-N 2) cannot be cleaned.

10.4 Element replacement

- Stop system and relieve filter from pressure.
- Loosen quick-action clamp, remove cover, and open drain valve. Housing completely vented.
- Remove filter element from the filter bowl. Remove spacer sleeve at Pi 15060. After proper cleaning please use again.
- Check seals for damages. Replace, if necessary.
- Make sure that the part number on the spare element corresponds with the part number on the filter label. It is necessary to replace always both elements of Pi 15060. Remove the plastic bag and push element over the spigot in the filter head. Attach sleeve on Pi 15060 and fit second element.
- Close drain valve, relocate cover, and close the quick-action clamp. Filters are automatically vented via the air bleeder valve, the protection cap has to be turned 2 times for being open.



11. Spare parts list

Order numbers for spare parts		
Position	Type	Order number
①	Seal kit	
	NBR	77831407
	FPM	77831415
	EPDM	77831423
② ③	Contamination indicator	
	Optical PiS 3098/2.2	77669971
	Electrical PiS 3097/2.2	77669948
	Electrical upper section only	77536550
④	Seal kit for differential pressure indicator PiS 3098/2.2 + PiS 3097/2.2	
	NBR	77760309
	FPM	77760317
	EPDM	77760325
⑤	Air bleeder valve	79352519
	Adapter for filter elements (Pi 15060)	76102073

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