

Duplex Filter

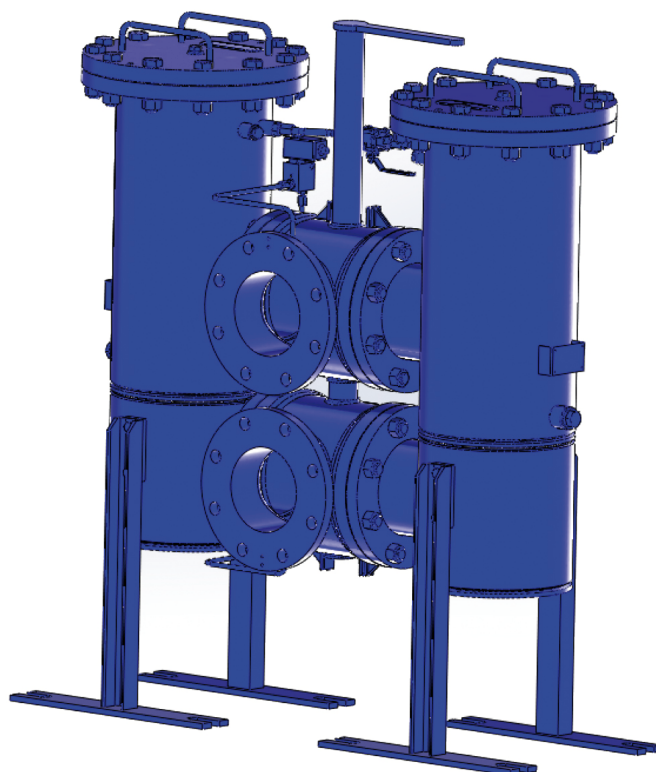
Pi 251

Nominal pressure 10/16 bar (140/230 psi), nominal size 2000

1. Features

High performance filters for modern hydraulic, lubrication and fuel systems

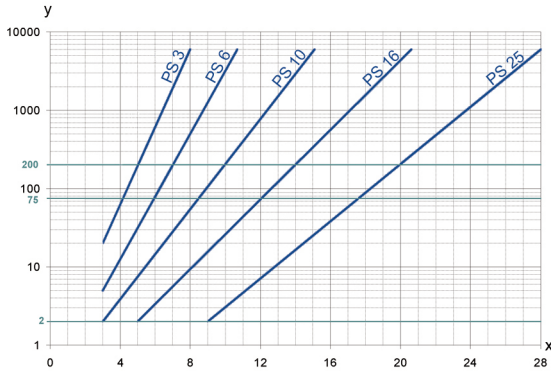
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance indicator
- Extensive range of accessories
- Quality filters, easy to service
- Equipped with highly efficient PS filter elements
- Beta rated elements according to ISO 16889 multipass test
- Elements with high differential pressure stability and dirt holding capacity
- Worldwide distribution



2. Flow rate/pressure drop curve complete filter

Please contact us for general expert advice.

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. Δp 20 bar

PS 3 $\beta_{5(\#)} \geq 200$

PS 6 $\beta_{7(\#)} \geq 200$

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

PS 16 $\beta_{15(C)} \geq 200$

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

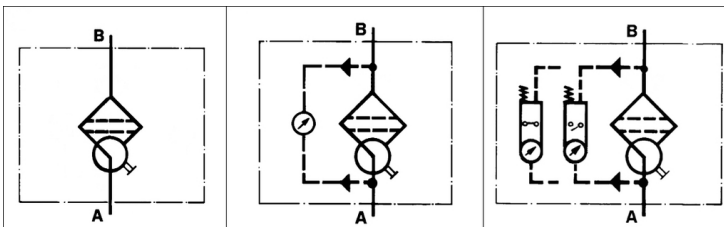
values guaranteed up to
10 bar differential pressure

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-multi-passmethod for evaluation filtration performance of a filter element

6. Symbols



7. Type number key and order numbers

7.1 Type number key housings

Type								
251	Duplex filter							
Nominal size								
0200	NG 2000							
Connection								
2	DIN flange							
3	ANSI flange							
Nominal width								
H	DN 80/3"							
I	DN 100/4"							
J	DN 125/5"							
K	DN 150/6"							
Nominal pressure								
1	10 bar/140 psi							
2	16 bar/230 psi							
Switch								
C	Double disc valve							
Seal material								
N	NBR							
F	FPM							
Housing code*								
060	no options							
068	with visual indicator							
069	with electrical indicator							
Special equipment								
3.1	Inspection certificate 3.1 according to DIN EN 10204							
A	Cover lifting tool							
M	Magnet							
Pi 251	0200/	2	K/	2	C/	N	-069 /3.1	Example for ordering

Other types on request

Example for ordering filter:

1. Filter housing	2. Filter element
<p>V = 2000 l/min, connection DIN DN 100, seal NBR, nominal pressure 16 bar, double disc valve switch and visual/electrical maintenance indicator</p> <p>Type: Pi 251 0200/2I/2C//N-069</p> <p>Order number: 70604105</p>	<p>PS 10 NBR</p> <p>Type: Pi 23008 AN PS 10</p> <p>Order number: 70518877</p>

7.2 Order numbers housings

Nominal size NG [l/min]	Order number	Type	Number of elements per filter side	① no options	② with visual indicator	③ with electrical indicator
2000	72350189	Pi 251 0200/2H/2C/N-060	1			
	72350190	Pi 251 0200/2H/2C/N-068				
	72350192	Pi 251 0200/2H/2C/N-069				
2000	70604103	Pi 251 0200/2I/2C/N-060	1			
	70604104	Pi 251 0200/2I/2C/N-068				
	70604105	Pi 251 0200/2I/2C/N-069				

7.2 Order numbers housings

Nominal size NG [l/min]	Order number	Type	Number of elements per filter side	① no options	② with visual indicator	③ with electrical indicator
2000	72350193	Pi 251 0200/2J/2C/N-060	1			
	72350194	Pi 251 0200/2J/2C/N-068				
	72350195	Pi 251 0200/2J/2C/N-069				
2000	72350196	Pi 251 0200/2K/2C/N-060	1			
	72350198	Pi 251 0200/2K/2C/N-068				
	72350199	Pi 251 0200/2K/2C/N-069				

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

Nominal size NG [l/min]	Order number	Type	Filter material	max. Δp [bar]	Filter surface [cm²]
2000	70561113	Pi 21200 AN PS 3	PS 3	20	40140
	70561152	Pi 22200 AN PS 6	PS 6		40140
	70561158	Pi 23200 AN PS 10	PS 10		40140
	70561161	Pi 24200 AN PS 16	PS 16		40140
	70561163	Pi 25200 AN PS 25	PS 25		40140

8. Technical specifications

Design	Duplex filter
Nominal pressure:	10 bar or 16 bar 150 psi or 230 psi
Temperature range:	
Operating temperature:	-10 °C up to +100 °C
Survival temperature:	-40 °C (other temperature ranges on request)
Filter housing material:	welded steel
Double disc valve material:	EN-GJS-400
Sealing material:	NBR/C4400
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:	IP65 in inserted and secured status
Contact:	normally open/closed
Cable sleeve:	M20x1.5

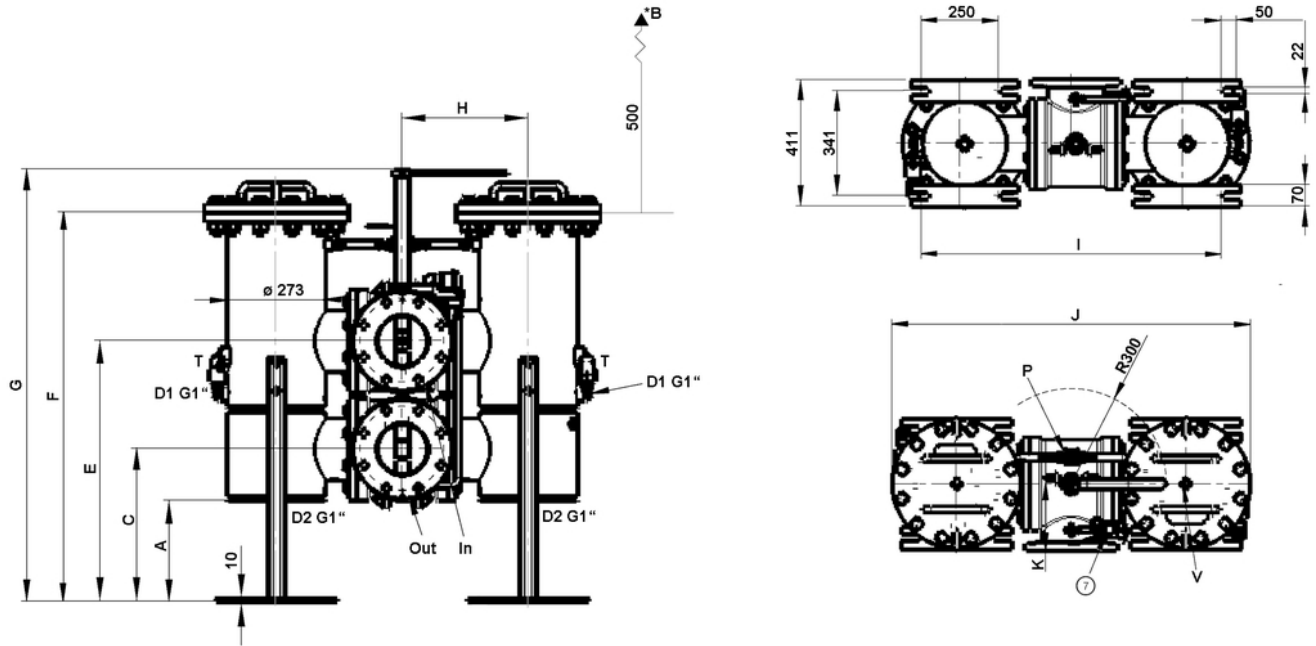
The switching function can be changed by turning the electric upper part by 180° (normally closed contact or normally open contact). The state on delivery is a normally closed contact. By inductivity in the direct current circuit the use of suitable protection circuit should be considered. Further maintenance 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
Out = Outlet

D1 Drain clean side G1
D2 Drain outlet dirt side G1

P Pressure balance valve
T Type plate

V Venting G $\frac{1}{2}$
⊙ Maintenance indicator

*B Clearance

All dimensions in mm.

Type	Connection	A	C	E	F	G	H	I	J	K
Pi2510200/2H/2	DN 80	299	408	638	1046	1211	324	898	1053	170
Pi2510200/2I/2	DN 100	286	408	658	1059	1199	332	914	1069	180
Pi2510200/2J/2	DN 125	303	438	708	1102	1234	362	974	1129	200
Pi2510200/2K/2	DN 150	289	438	748	1116	1240	362	974	1129	210

10. Installation, operating and maintenance instructions

10.1 Filter installation

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 ☉ 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.

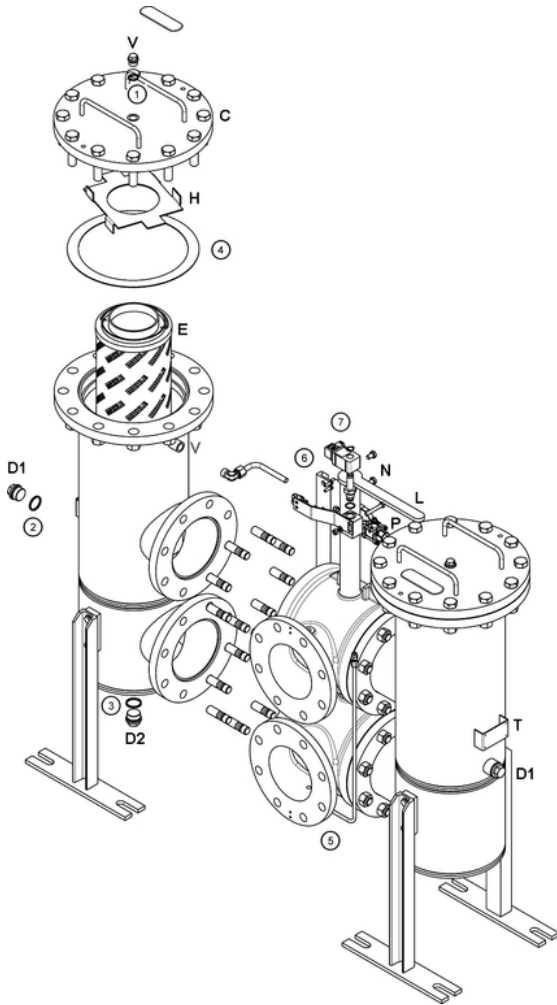
Note: The maintenance indicator monitors the filter side in operation. This is indicated by notches (N) on the switching shaft. Before carrying out filter maintenance, switch off the housing to be serviced.

1. Open pressure compensating valve (P).
2. Move switching lever (L) completely to the stop.
3. Close pressure compensating valve.
4. 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 (step 13), be activated under any circumstances!

5. Remove drain plug (D1) and allow the medium to drain.
6. Remove drain plug (D2) and allow the medium to drain.
7. Loosen screws at cover (C) and replace cover.
8. Remove element fixing (H) and pull out the filter element (E) upwards.
9. Check seal (2) on filter cover. We recommend replacement in any case.
10. 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 open side facing downwards.
11. Fit new filter element carefully, element fixing and cover. Tighten screws (observe tightening torque).
12. Screw in drain plugs and tighten.
13. Open pressure compensating valve for filling the filter chamber. Close pressure compensating valve until the medium flows out of the vent bore bubble-free.
14. Tighten vent plug.
15. Open pressure compensating valve again. Close pressure compensating valve after having checked if the housing is tight.

11. Spare parts and accessories lists



Order numbers for spare parts and accessories		
Position	Type	Order number
① - ④	Seal kit for element change (per chamber)	
	D-Satz Pi 251 0200 E NBR	70602830
	D-Satz Pi 251 0200 E FPM	70604080
① - ⑤	Seal kit for housing NG 2000	
	DN 80	
	NBR	70604082
	FPM	70604083
	DN 100	
	NBR	70604100
	FPM	70604101
	DN 125	
	NBR	70601686
	FPM	70604078
	DN 150	
	NBR	70601687
FPM	70604079	
⑥	Seal kit for maintenance indicator	
	NBR	77760309
	FPM	77760317
⑦	Maintenance indicator	
	Visual PiS 3098/2.2	77669971
	Electrical PiS 3097/2.2	77669948
	Electrical upper section only	77536550

MAHLE

Driven by performance

MAHLE Industriefiltration GmbH
Schleifbachweg 45
D-74613 Öhringen
Phone +49 7941 67-0
Fax +49 7941 67-23429
industrialfiltration@mahle.com
www.mahle.com
72336736.04/2015