

Duplex Filter

Pi 211

Nominal pressure 40 bar (570 psi), nominal size 800 and 1100

1. Features

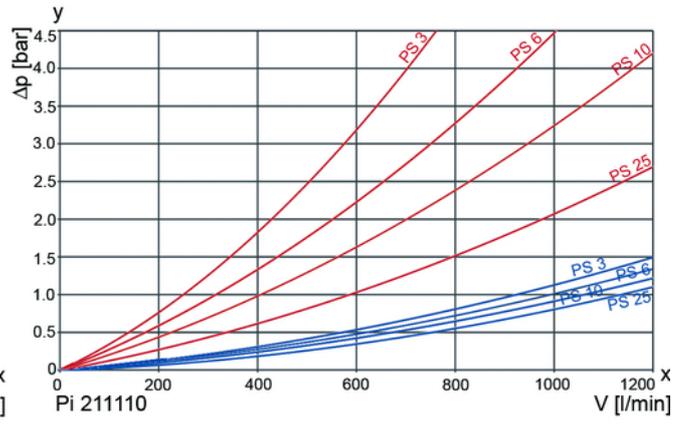
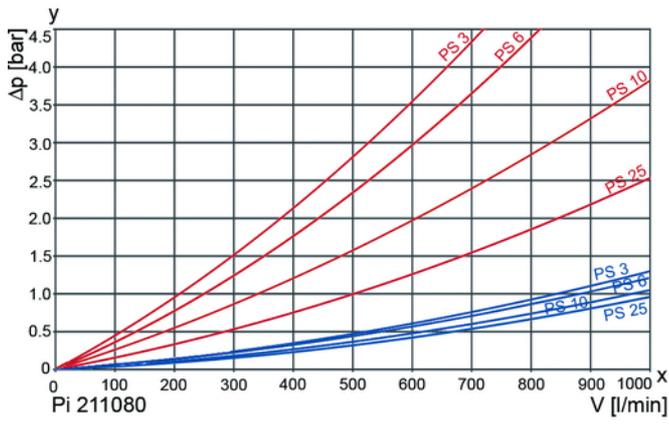
High performance filters for modern hydraulic systems

- Modular system
- Compact design
- Minimal pressure drop through optimal flow design
- Visual/electrical/electronic maintenance indicator
- 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
- Worldwide distribution



2. Flow rate/pressure drop curve complete filter

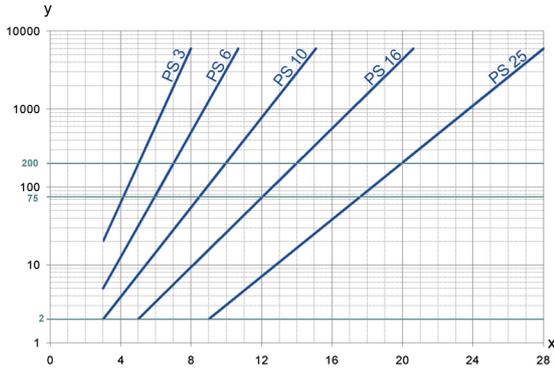
190 mm²/s
33 mm²/s



y = differential pressure Δp [bar]

x = flow rate V [l/min]

3. Separation grade characteristics



y = beta-value
x = particle size [μm]

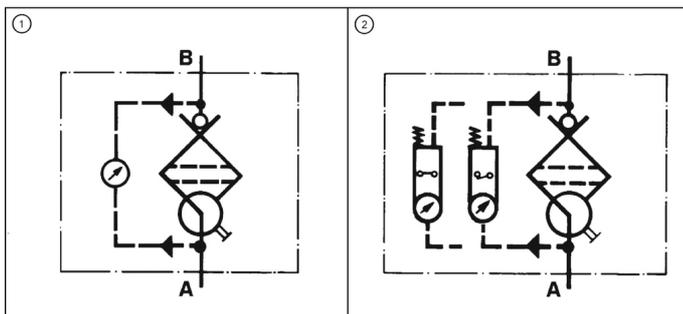
determined by multipass tests (ISO 16889)
calibration according to ISO 11171 (NIST)

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 of material compatibility with fluids
DIN ISO 3723	Hydraulic fluid power filter elements, methods 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



4. Filter performance data

tested according to ISO 16889 (multipass test)

PS elements with
max. Δp 20 bar

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

values guaranteed up to
10 bar differential pressure

7. Order numbers

Example for ordering filters:

1. Housing design	2. 2x Filter element with bypass
V = 800 l/min and visual/electrical maintenance indicator Type: Pi 211080-069 Order number: 70514415	PS 25 Type: 852 094 PS 25/V3.5 Order number: 70514489

7.1 Housing design				
Nominal size NG	Order number	Type	③ with visual indicator	④ with electrical indicator
800	70514414	Pi 211080-068		
	70514415	Pi 211080-069		
1100	70514410	Pi 211110-068		
	70514411	Pi 211110-069		

If bypass is requested, it can be realized with appropriate filter element.

7.2 Filter elements*					
Nominal size NG [l/min]	Order number	Type	Filter material	max. Δp [bar]	Filterfläche [cm ²]
800 without bypass	70527011	852 094 PS 3	PS 3	20	31200
	70527014	852 094 PS 6	PS 6		
	70527016	852 094 PS 10	PS 10		
	70527019	852 094 PS 25	PS 25		
800 with bypass	70514474	852 094 PS 3/V3.5	PS 3		
	70514480	852 094 PS 6/V3.5	PS 6		
	70514484	852 094 PS 10/V3.5	PS 10		
	70514489	852 094 PS 25/V3.5	PS 25		
1100 without bypass	70527061	852 095 PS 3	PS 3	20	39690
	70527064	852 095 PS 6	PS 6		
	70527082	852 095 PS 10	PS 10		
	70527085	852 095 PS 25	PS 25		
1100 with bypass	70514577	852 095 PS 3/V3.5	PS 3		
	70514580	852 095 PS 6/V3.5	PS 6		
	70514582	852 095 PS 10/V3.5	PS 10		
	70514586	852 095 PS 25/V3.5	PS 25		

* A wider range of element types is available on request.

8. Technical specifications

Design:	line mounting filter
Nominal pressure:	10 ⁷ load changes 40 bar (570 psi)
Test pressure:	60 bar (850 psi)
Temperature range:	-10 °C to +120 °C (other temperature ranges on request)
	Minimum viscosity of the fluid: 10 mm ² /s (if viscosity of the fluid < 10 mm ² /s on request)
Bypass Setting (in the element):	Δ p 3.5 bar ± 10 %
Filter head material:	GGG
Filter housing material:	St
Filter cover material:	GGG
Sealing material:	NBR
Maintenance indicator setting:	Δ p 2.2 bar ± 0.3 bar
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 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.

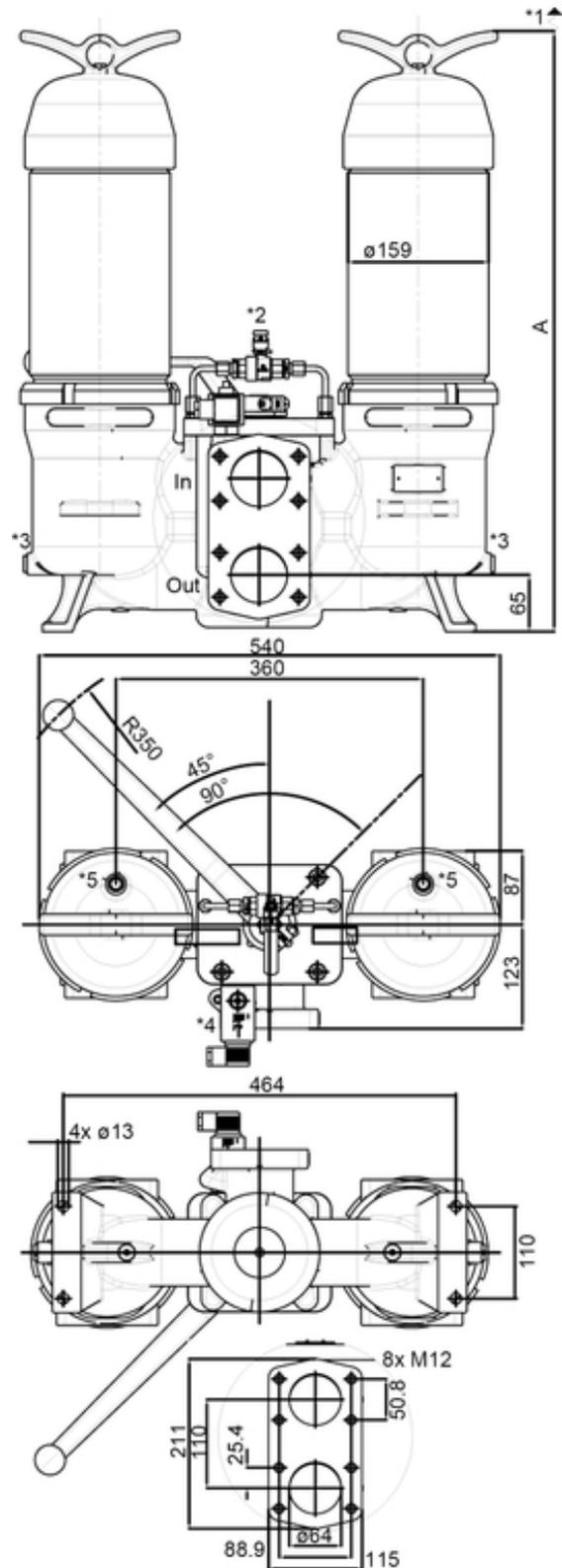
We draw attention to the fact that all values indicated are average values which do not always occur in specific cases of application. Our products are continually being further developed. Values, dimensions and weights can change as a result of this. Our specialized department will be pleased to offer 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.

In = Inlet	*2 Pressure equalization valve
Out = Outlet	*3 Drain screw G ¹ / ₄
*1 Clearance B	*4 Maintenance indicator
	*5 Vent screw

DN64 according to SAE2¹/₂" 3000 psi



9. Dimensions

All dimensions in mm.

Type	Connection	A	B	Weight [kg]
Pi 211080	DN 64	1200	785	150
Pi 211110	DN 64	1465	1085	180

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 maintenance indicator (*4) 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 to normally closed position or vice versa.

10.3 When should the filter element be replaced?

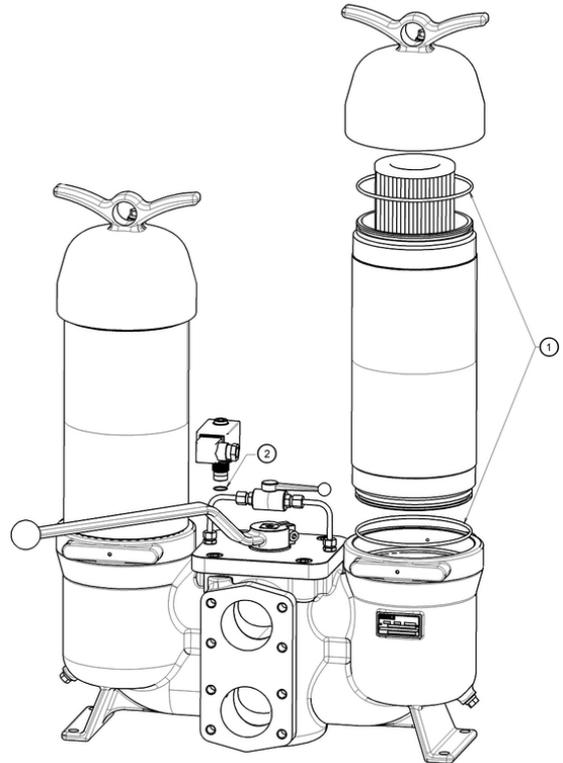
- Filters equipped with visual and electrical maintenance indicator (*4) :
During cold starts, the indicator may give a warning signal. Press the red button of the visual indicator once again only after operating temperature has been reached. If the red button immediately pops up again and/or the electrical signal has not switched off after reaching operating temperature the filter element must be replaced after the end of the shift.
- 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.
- Please always ensure that you have original Filtration Group spare elements in stock: disposable elements (PS) cannot be cleaned.

10.4 Element replacement

Note: The maintenance indicator (*4) monitors the filter side in operation, which is identified by the position of the switching lever catch. The change-over transfer valve must be switched prior filter servicing. Now the signal of the maintenance indicators cancelled and the red button can be repressed again.

- Operate and hold pressure equalizing lever (*2) located behind switching lever. Pull catch knob and swivel switching lever. Place through or drip pan underneath to collect leaving oil. Close pressure equalization valve.
- Loosen vent screw (*5) of the filter side not in use by 2-3 turns; max. until contact is made with the safety stop.
- Remove drain plug (*3) in housing bottom and drain oil.
- Unscrew filter cover counter-clockwise.
- Lift out filter element.
- Check seal on filter cover. We recommend replacement in any case.
- 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.

- Push the element carefully over the spigot and tight cover until full stop. Back off the cover 1/8 turn.
- Tighten drain plug (*3) housing bottom.
- To refill the filter chamber, operate only the pressure equalizing Lever (*2), until fluid emerges bubble-free from the drain cavity.
- Tight vent screw (*5). Check vent screw (*5) for leakage by actuating the equalizing Lever (*2) again.



11. Spare parts list

Order numbers for spare parts		
Position	Type	Order number
①	Seal kit for housing	
	NBR	70318468
	FPM	70318469
	EPDM	70318471
	Maintenance indicator	
	Visual PiS 3098/2,2	77669971
	Visual/electrical PiS 3097/2,2	77669948
	Electrical upper section only	77536550
②	Seal kit for maintenance indicator	
	NBR	77760309
	FPM	77760317
	EPDM	77760325