

## Filters for industrial process technology

### PiP K10

Cartridge filter housing

#### 1. Features

##### High-performance filters for modern process systems

Filtration Group GmbH can call on a long history of experience in the production of high-quality filters and cartridges for hydraulic filtration. This know-how is also leveraged for other applications, such as the filtration of washing fluids for cleaning components.

Increasingly strict requirements are specified regarding the cleanliness of industrial parts - and thus the washing fluids.

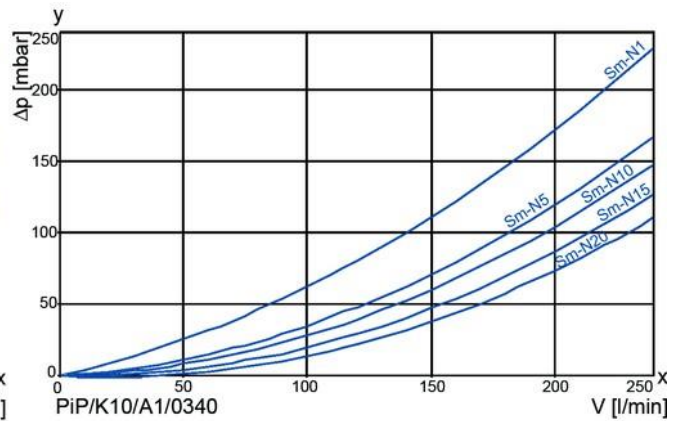
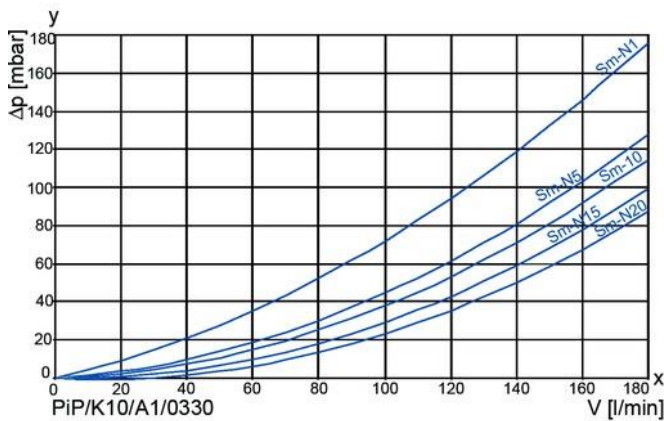
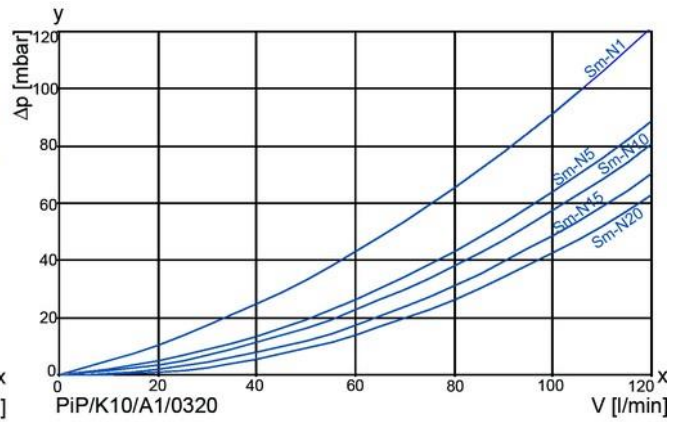
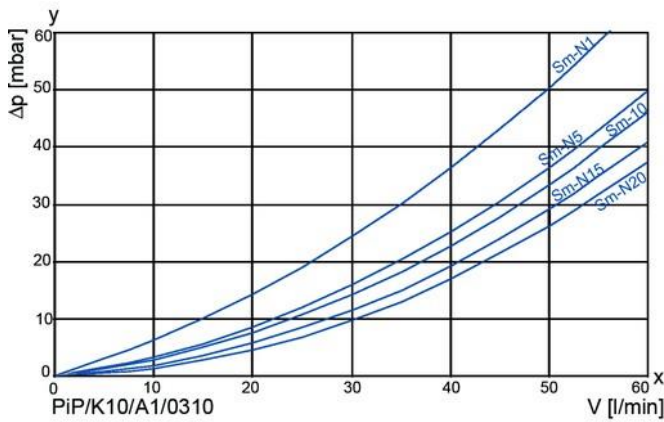
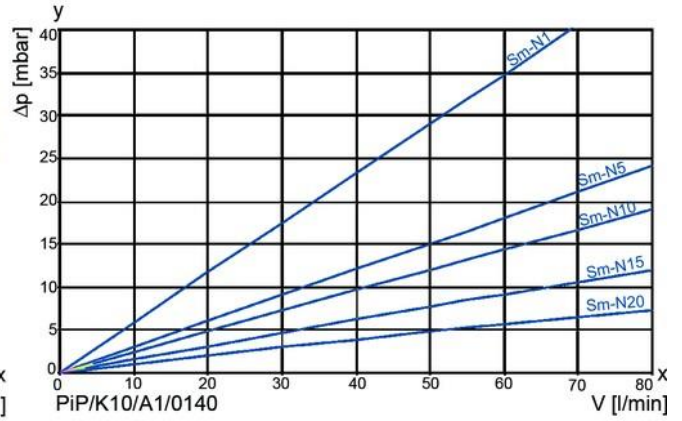
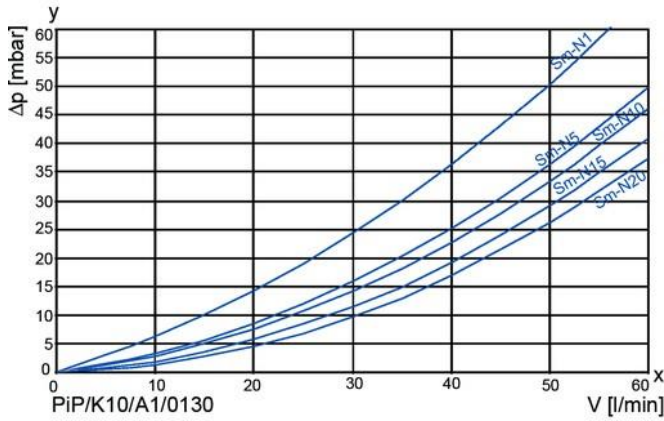
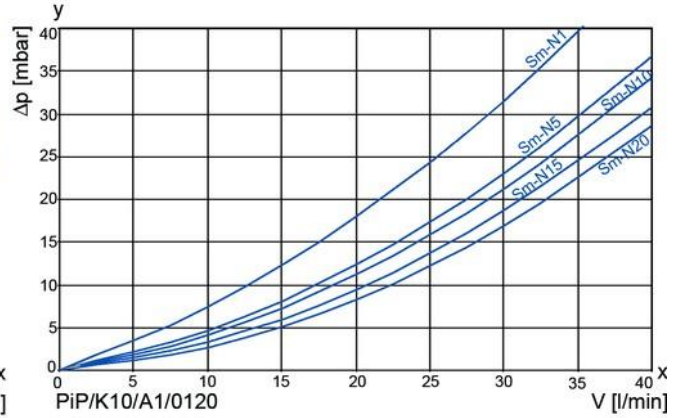
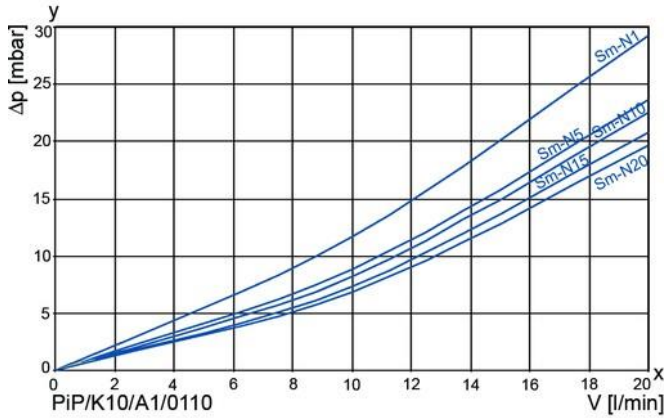
The filters and filter materials are suitable for all popular washing media used to clean components.

These filter housings are manufactured completely from stainless steel and installed in a wide variety of process filtration systems.

- Low space requirement thanks to compact construction
- Minimal pressure loss due to flow optimized design of components
- Visual/electrical/digital maintenance indicator
- DIN flanges
- Easy adaptation to higher dirt load by fitting a taller top housing part and longer cartridge - with no need to convert the system
- Equipped with high-efficient Sm-N filter cartridges
- High differential pressure stability and dirt holding capacity of the cartridges for optimum operating lifetime
- Guaranteed separation rates acc. to ISO 16889 multi-pass test
- Filter cartridges freely accessible when top part of housing is lifted off
- Worldwide distribution



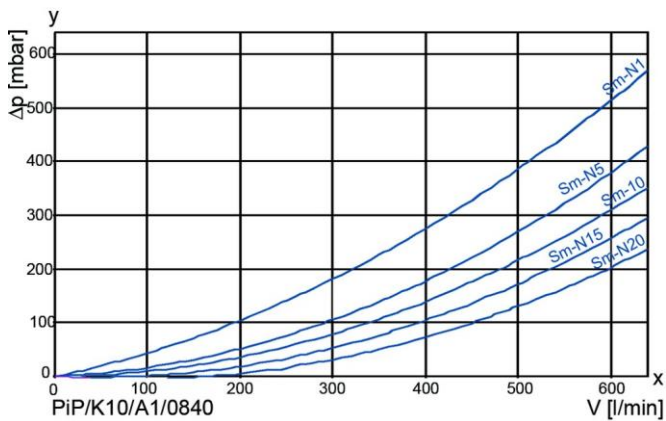
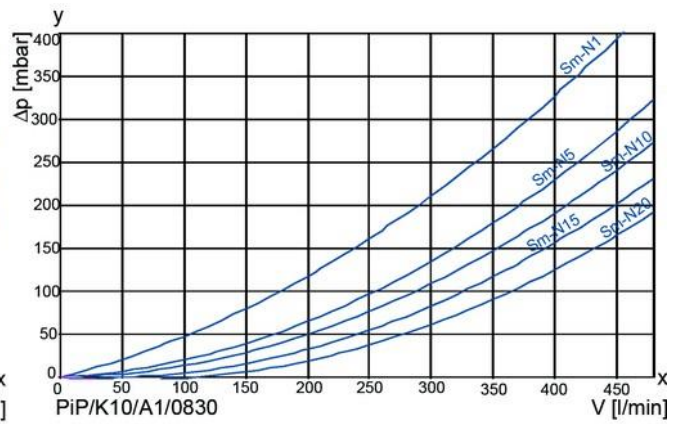
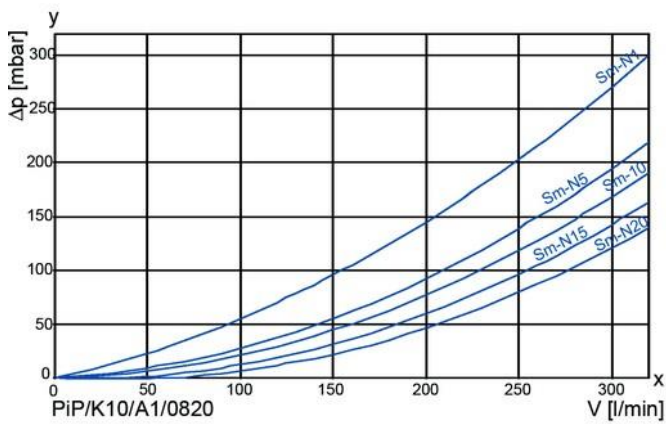
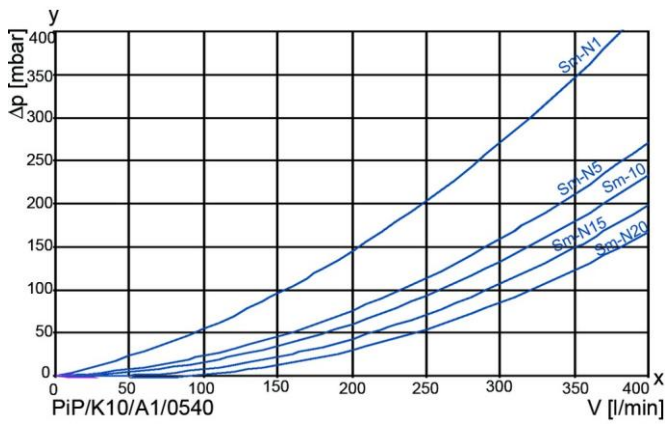
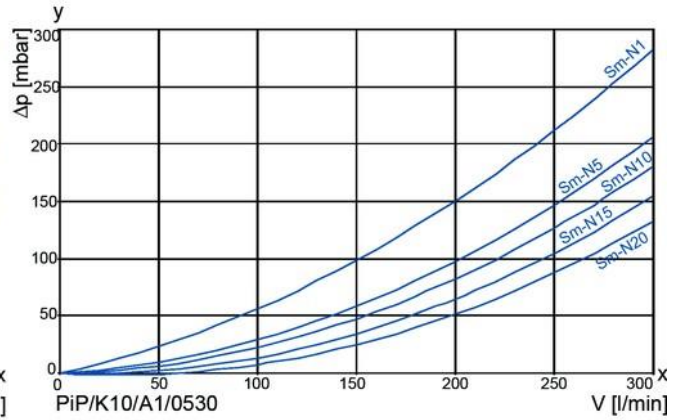
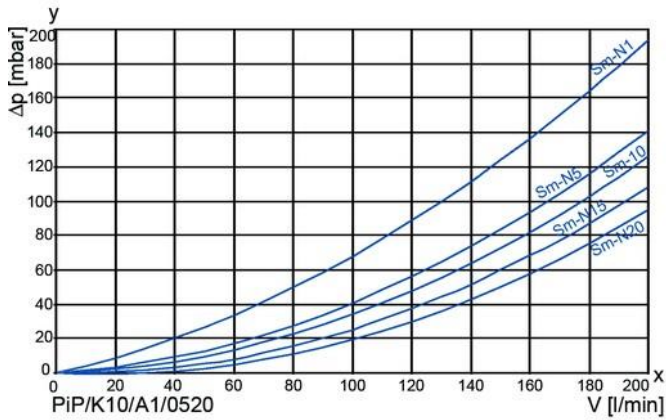
## 2. Flow rate/pressure drop curve complete filters with single or three-cartridge configuration



x = flow rate [l/min]

y =  $\Delta p$  [mbar]

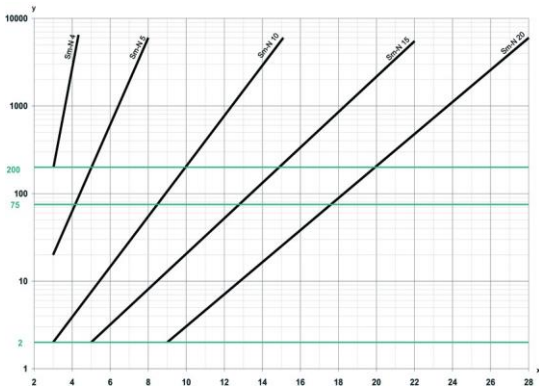
## 2. Flow rate/pressure drop curve complete filter with five or eight-cartridge configuration



x = flow rate [l/min]

y =  $\Delta p$  [mbar]

### 3. Separation grade characteristics



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

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

### 4. Filter performance data

testet according to ISO 16889 (Multipass-Test)

Sm-N elements with max.  $\Delta p$  3 bar

Sm-N	1	$\beta_{4(C)}$	$\geq$	3000
Sm-N	5	$\beta_{5(C)}$	$\geq$	200
Sm-N	10	$\beta_{10(C)}$	$\geq$	200
Sm-N	15	$\beta_{15(C)}$	$\geq$	200
Sm-N	20	$\beta_{20(C)}$	$\geq$	200

values guaranteed up to 2.2 bar differential pressure

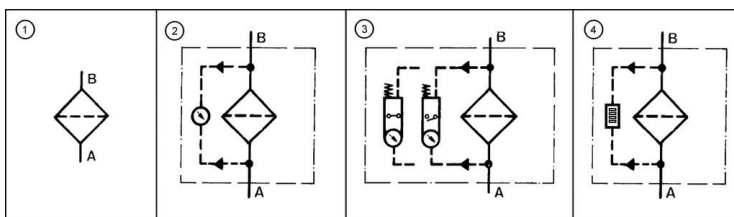
Degree of filtration acc. NIST-definition (ISO 11171); equivalent to ACFTD-definition (ISO 4402:1991)  $\leq 1 \mu\text{m}$

### 5. Quality assurance

Filtration Group GmbH 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. Type number key and order numbers

### 7.1 Type number key PiP filter housings

#### Type

**PiP** Filter for industrial process technology

#### Design

**K10** Filter housing, max. 10 bar operating pressure

#### Housing lock

**F** Bracket, flat-gasket DIN 32676

**O** Bracket, o-ring seal

#### Cartridge spigot

**A** Double o-ring (SOE 222)

**B** Bayonet, double o-ring (SOE 226)

#### Cartridge type

**0** Open at one end (SOE) without centre point

**1** Open at one end(SOE) with centre point

#### No. of cartridges

**01** 1 cartridge

**03** 3 cartridges

**05** 5 cartridges

**08** 8 cartridges

#### Cartridge length

**10** 10 "

**20** 20 "

**30** 30 "

**40** 40 "

#### Connection

**G** Flange DIN EN 1092-1

**M** Thread

#### Housing fixing

**F** Tri-pod

**S** Bracket

**H** Support angle

#### Maintenance indicator

**010** without

**068** visual

**069** electrical

**161** digital

PiP/ K10 F/ A- 1/ 03 20/ G/ F- 069 Example for ordering

### 7.2 Order numbers PiP filter housings

Nominal size NG [l/min]	No. of cartridges	Order number	Type	①	②	③	④
				with cavity for indicator	with visual indicator	with electr. indicator	with digital in- dicator
25	1	70340535	PiP/K10F/A-1/0110/G/H-010				
		70330162	PiP/K10F/A-1/0110/G/H-068				
		70330201	PiP/K10F/A-1/0110/G/H-069				
		70330202	PiP/K10F/A-1/0110/G/H-161				
		70340602	PiP/K10F/A-1/0110/M/H-010				
		70340604	PiP/K10F/A-1/0110/M/H-068				
		70340605	PiP/K10F/A-1/0110/M/H-069				
		70340606	PiP/K10F/A-1/0110/M/H-161				
50	1	70340536	PiP/K10F/A-1/0120/G/H-010				
		70330163	PiP/K10F/A-1/0120/G/H-068				
		70330203	PiP/K10F/A-1/0120/G/H-069				
		70330204	PiP/K10F/A-1/0120/G/H-161				

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



## 7.2 Order numbers PiP filter housings

Nominal size NG [l/min]	No. of cartridges	Order number	Type	① with cavity for indicator	② with visual indicator	③ with electr. indicator	④ with digital in- dicator
75	1	70340537	PiP/K10F/A-1/0130/G/F-010				
		70330165	PiP/K10F/A-1/0130/G/F-068				
		70330206	PiP/K10F/A-1/0130/G/F-069				
		70330207	PiP/K10F/A-1/0130/G/F-161				
100	1	70340538	PiP/K10F/A-1/0140/G/F-010				
		70330167	PiP/K10F/A-1/0140/G/F-068				
		70330208	PiP/K10F/A-1/0140/G/F-069				
		70330209	PiP/K10F/A-1/0140/G/F-161				
75	3	70340540	PiP/K10F/A-1/0310/G/F-010				
		70330168	PiP/K10F/A-1/0310/G/F-068				
		70330210	PiP/K10F/A-1/0310/G/F-069				
		70330211	PiP/K10F/A-1/0310/G/F-161				
150	3	70340541	PiP/K10F/A-1/0320/G/F-010				
		70330169	PiP/K10F/A-1/0320/G/F-068				
		70330212	PiP/K10F/A-1/0320/G/F-069				
		70330213	PiP/K10F/A-1/0320/G/F-161				
225	3	70340542	PiP/K10F/A-1/0330/G/F-010				
		70330173	PiP/K10F/A-1/0330/G/F-068				
		70330215	PiP/K10F/A-1/0330/G/F-069				
		70330216	PiP/K10F/A-1/0330/G/F-161				
300	3	70340543	PiP/K10F/A-1/0340/G/F-010				
		70330174	PiP/K10F/A-1/0340/G/F-068				
		70330217	PiP/K10F/A-1/0340/G/F-069				
		70330218	PiP/K10F/A-1/0340/G/F-161				
250	5	70340545	PiP/K10F/A-1/0520/G/F-010				
		70330175	PiP/K10F/A-1/0520/G/F-068				
		70330219	PiP/K10F/A-1/0520/G/F-069				
		70330220	PiP/K10F/A-1/0520/G/F-161				
375	5	70340546	PiP/K10F/A-1/0530/G/F-010				
		70330176	PiP/K10F/A-1/0530/G/F-068				
		70330221	PiP/K10F/A-1/0530/G/F-069				
		70330222	PiP/K10F/A-1/0530/G/F-161				
500	5	70340547	PiP/K10F/A-1/0540/G/F-010				
		70330177	PiP/K10F/A-1/0540/G/F-068				
		70330223	PiP/K10F/A-1/0540/G/F-069				
		70330224	PiP/K10F/A-1/0540/G/F-161				

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

## 7.2 Order numbers PiP filter housings

Nominal size NG [l/min]	No. of cartridges	Order number	Type	①	②	③	④
				with cavity for indicator	with visual indicator	with electr. indicator	with digital in- dicator
400	8	70340548	PiP/K10F/A-1/0820/G/F-010				
		70330178	PiP/K10F/A-1/0820/G/F-068				
		70330225	PiP/K10F/A-1/0820/G/F-069				
		70330226	PiP/K10F/A-1/0820/G/F-161				
600	8	70340549	PiP/K10F/A-1/0830/G/F-010				
		70330179	PiP/K10F/A-1/0830/G/F-068				
		70330227	PiP/K10F/A-1/0830/G/F-069				
		70330228	PiP/K10F/A-1/0830/G/F-161				
800	8	70340550	PiP/K10F/A-1/0840/G/F-010				
		70330180	PiP/K10F/A-1/0840/G/F-068				
		70330229	PiP/K10F/A-1/0840/G/F-069				
		70330230	PiP/K10F/A-1/0840/G/F-161				

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

## 7.3 Order numbers PiP filter elements\*

Nominal size NG [l/min]	recommended volume flow [l/min]	Order number	Type	Filter material	max. $\Delta p$ [bar]	Filter surface [cm <sup>2</sup> ]
25	10	70323913	PiP/A-1/10-Sm-N 1	Sm-N 1	3	2580
	15	70323950	PiP/A-1/10-Sm-N 5	Sm-N 5		
	20	70323970	PiP/A-1/10-Sm-N 10	Sm-N 10		
	23	70323983	PiP/A-1/10-Sm-N 15	Sm-N 15		
	25	70324006	PiP/A-1/10-Sm-N 20	Sm-N 20		
50	20	70324081	PiP/A-1/20-Sm-N 1	Sm-N 1	3	5270
	30	70324087	PiP/A-1/20-Sm-N 5	Sm-N 5		
	40	70324094	PiP/A-1/20-Sm-N 10	Sm-N 10		
	46	70324099	PiP/A-1/20-Sm-N 15	Sm-N 15		
	50	70324103	PiP/A-1/20-Sm-N 20	Sm-N 20		
75	30	70324106	PiP/A-1/30-Sm-N 1	Sm-N 1	3	8270
	45	70324466	PiP/A-1/30-Sm-N 5	Sm-N 5		
	60	70324479	PiP/A-1/30-Sm-N 10	Sm-N 10		
	69	70324486	PiP/A-1/30-Sm-N 15	Sm-N 15		
	75	70324490	PiP/A-1/30-Sm-N 20	Sm-N 20		
100	40	70324563	PiP/A-1/40-Sm-N 1	Sm-N 1	3	11000
	60	70324575	PiP/A-1/40-Sm-N 5	Sm-N 5		
	80	70324589	PiP/A-1/40-Sm-N 10	Sm-N 10		
	92	70326186	PiP/A-1/40-Sm-N 15	Sm-N 15		
	100	70326194	PiP/A-1/40-Sm-N 20	Sm-N 20		

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

## 8. Technical specification

### Housing

<b>Housing material:</b>	1.4403/1.4571 media contact 1.4301 no media contact
<b>Seal material:</b>	FPM/PTFE
<b>Nominal/test pressure:</b>	10/13 bar (145/188 psi)
<b>Temperature range:</b>	-10 to +90 °C (other temperature ranges on request)

<b>Maintenance indicator setting:</b>	$\Delta p 2.2 \pm 0,3$ bar
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### Electrical data of electrical maintenance indicator

<b>Max. voltage:</b>	AC 250 V/DC 200 V
<b>Max. current:</b>	1 A
<b>Contact load:</b>	70 W
<b>Type of protection:</b>	IP 65 in inserted and secured status
<b>Contact:</b>	normally open/normally closed
<b>Cable sleeve:</b>	M20x1.5

### Electrical data of digital maintenance indicator

<b>Max. voltage:</b>	AC/DC 12 bis 32 V
<b>Contact load approx.:</b>	2 VA/W
<b>Type of protection:</b>	IP 65 acc. DIN EN 60529
<b>Contacts:</b>	2 floating relay contacts, programmable as normally open (NO) or normally closed (NC)
<b>Connection:</b>	2x plug connection M12

Technical data is subject to change without notice!

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. Further indicator details about digital maintenance indicator are available in the maintenance indicator data sheet or manual instruction PiS 3170.

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.

The filter housings (pressure equipment) in standard design according pressure equipment-directive 97/23/EG are applicable for

a) fluids whose vapour pressure comes up to max. 0.5 bar above the standard atmospheric pressure (1013 mbar) at the permissible temperature (art. 3/1.1/b).

b) fluids of liquid group 2 (art.9) with max. 90 °C.

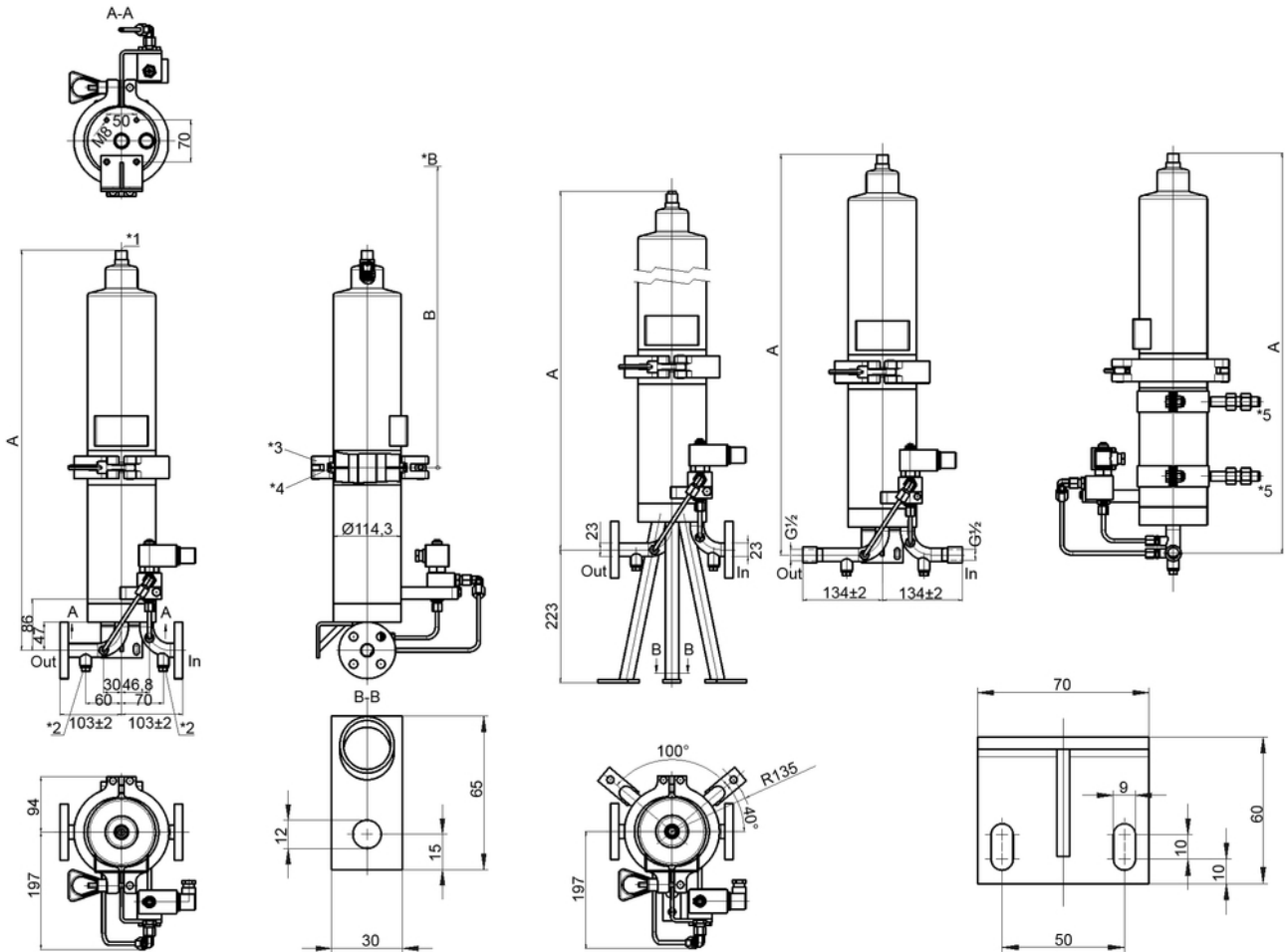
Filter design and production is made according pressure equipment-directive 97/23/EG art. 3, paragraph 3.

For this kind of filter housings, no CE-conformity declaration according to 97/23/EG can be issued.

The standard design can be used for all current cleaning fluids in the process technology. This contains the most hydrous, neutral, basic, acid and hydrocarbon cleaners. With amine-containing cleaners, the exact operating conditions (concentration as well as temperature) have to be clarified in advance. Other applications and media only available on request and if necessary after laboratory investigation.



## 9. Dimensions



All dimensions in mm.

Type	A	B
PiP/K10F/.../0110/...	485	225
PiP/K10F/.../0120/...	721	690
PiP/K10F/.../0130/...	1216	1235
PiP/K10F/.../0140/...	1468	1735

In = inlet

Out = outlet

\*B = height required for element removal

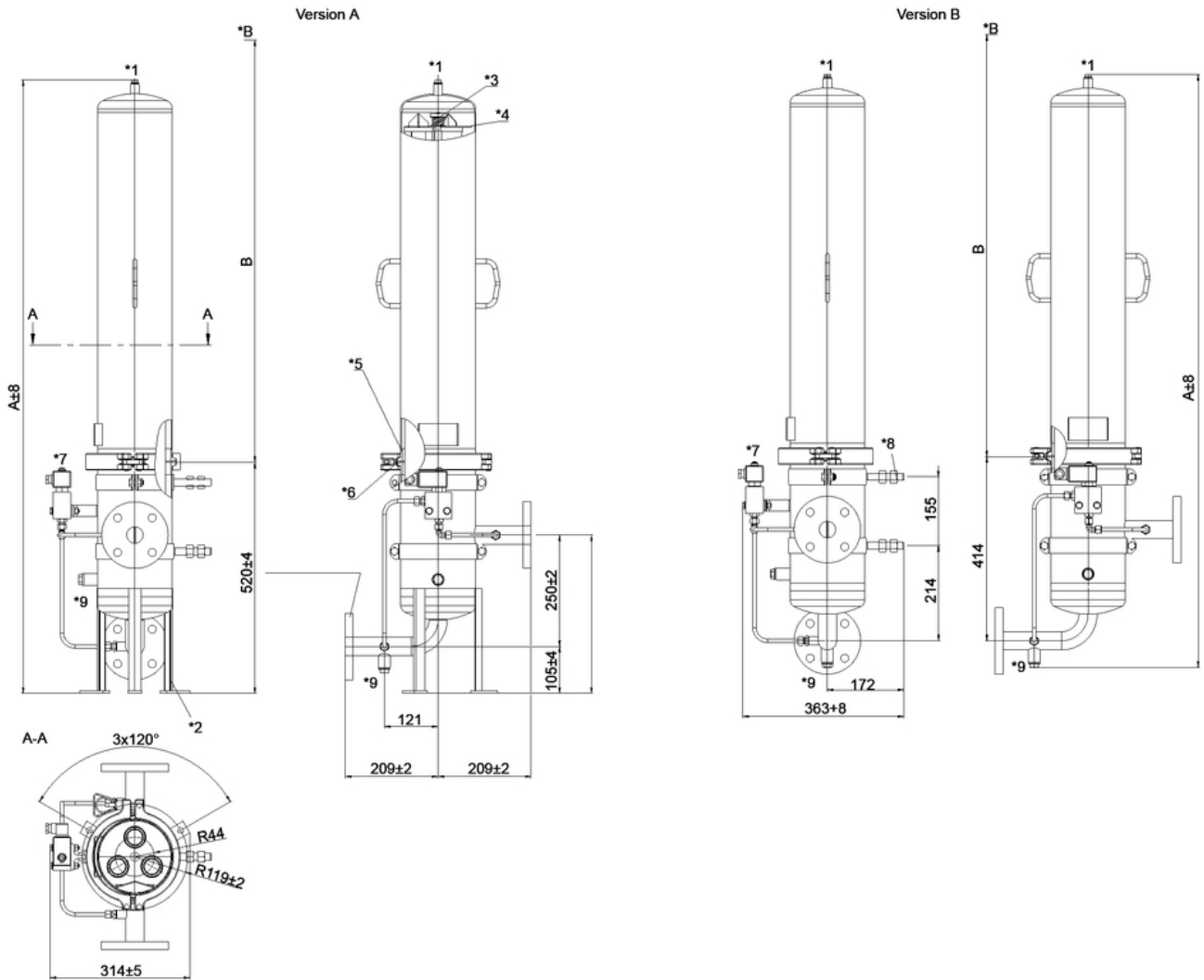
\*1 = vent screw G $\frac{1}{4}$

\*2 = drain screw G $\frac{1}{4}$

\*3 = housing flange

\*4 = sealing and bracket

\*5 = fixing optional



All dimensions in mm.

Type	Version A		Version B	
	A	B	A	B
PiP/K10F/.../0310/...	624	306	576	306
PiP/K10F/.../0320/...	857	542	809	542
PiP/K10F/.../0330/...	1129	814	1081	814
PiP/K10F/.../0340/...	1381	1066	1333	1066

In = inlet

Out = outlet

\*B = height required for element removal

\*1 = vent screw G $\frac{1}{4}$

\*2 = fixing

\*3 = clamping screw

\*4 = element holder

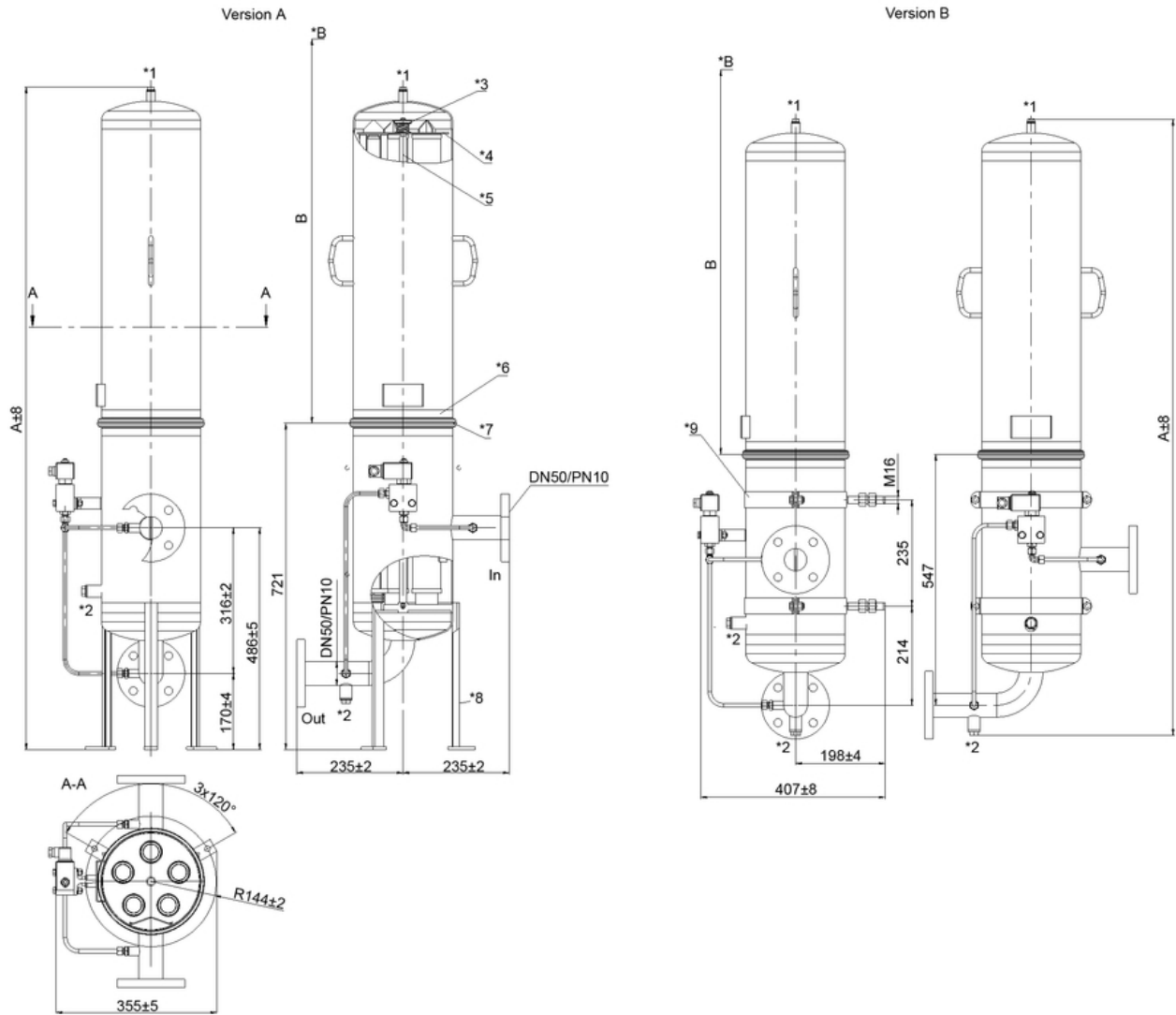
\*5 = housing flange

\*6 = sealing and bracket

\*7 = maintenance indicator

\*8 = fixing variable  $\pm 15$

\*9 = drain screw G $\frac{1}{2}$



All dimensions in mm.

Type	Version A		Version B	
	A	B	A	B
PiP/K10F/.../0520/...	914	542	772	542
PiP/K10F/.../0530/...	1213	814	1044	814
PiP/K10F/.../0540/...	1465	1066	1296	1066

In = inlet

Out = outlet

\*B = height required for element removal

\*1 = vent screw G $\frac{1}{4}$

\*2 = drain screw G $\frac{1}{2}$

\*3 = clamping screw

\*4 = element holder

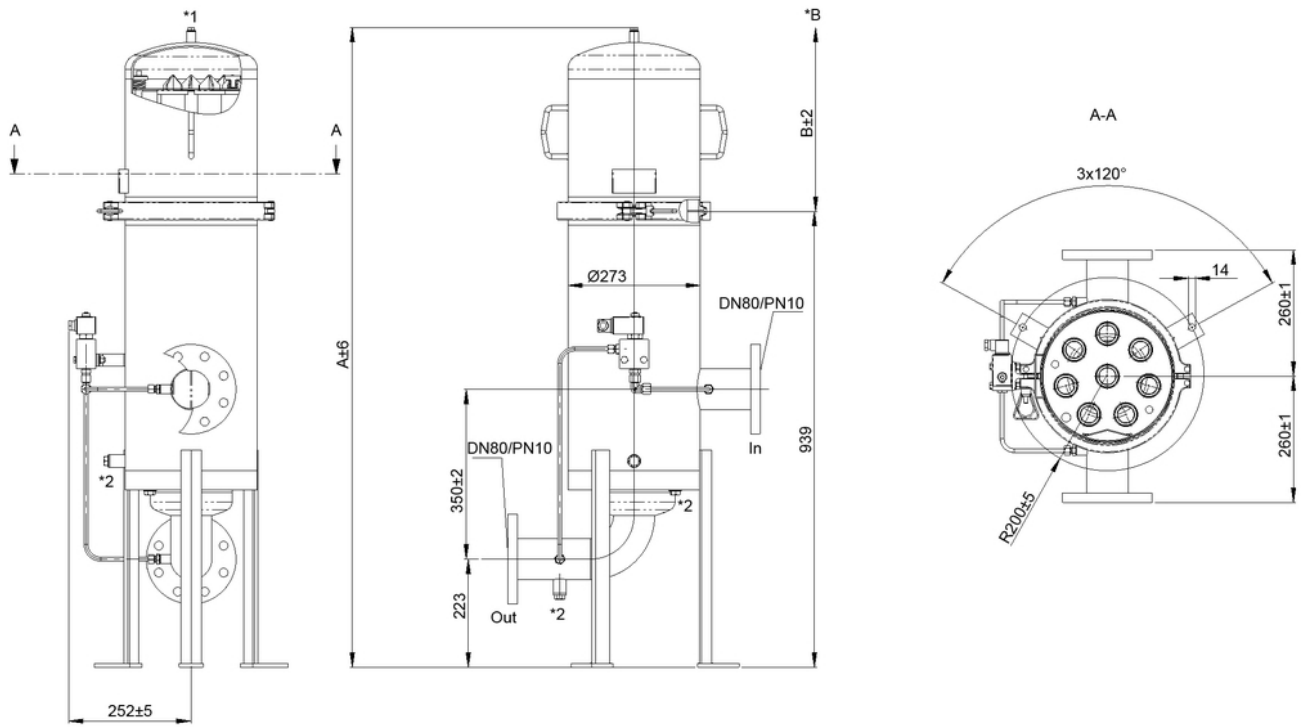
\*5 = distance piece

\*6 = housing flange

\*7 = sealing and bracket

\*8 = fixing

\*9 = fixing variable  $\pm 15$



All dimensions in mm.

Type	A	B
PiP/K10F/.../0820/...	1070	550
PiP/K10F/.../0830/...	1310	815
PiP/K10F/.../0840/...	1565	1155

In = inlet

Out = outlet

\*B = height required for element removal

\*1 = vent screw G $\frac{1}{4}$

\*2 = fixing

## 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. The maintenance indicator must be visible.

### 10.2 Connecting the electrical maintenance indicator

1. 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 (see data sheet PiS 3192/2.2).
2. Filter with a digital differential gauge and analog signal outlet, can be integrated into an existing system control. The programming of the PiS 3170 has to be made according to parameter sheet enclosed, in order to ensure an element replacement at 2.2 bar (see data sheet/manual instruction PiS 3170).

### 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. Filter with a digital differential gauge, analogue signal outlet and switch contact:  
The signal for element replacement can be displayed via the switch contact or the analog signal output and a system control unit.
3. Filters without maintenance indicator:  
The filter element should be replaced when a differential pressure of 2.2 bar is reached. Afterwards follow instructions of the manufacturer.
4. Please always ensure that you have original Filtration Group GmbH spare elements in stock: Disposable elements (Sm-N) cannot be cleaned.

### 10.4 Element replacement

1. Stop system and relieve filter from pressure.
2. Discharge the filter housing completely.
3. Open clamps or black flange screws.
4. Remove cover carefully.
5. With filter housings with more cartridge configuration, loose and remove the elements' holding plate/fixing.
6. Pull the filter element out of its spigot by turning and light listing.
7. Make sure that the order number on the spare element corresponds to the order number of the filter name-plate.
8. For insertion of the new elements, lightly bathe the o-rings with the medium to be filtered.
9. Attach and fix the elements' holding plate/fixing.
10. Check O-ring on the filter housing for damage. Replace, if necessary.
11. Attach the cover carefully and close with the clamp or with black flange tighten the screws.
12. Close the drain plug and vent the filter completely.
13. After venting, check the housing on leak tightness.

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