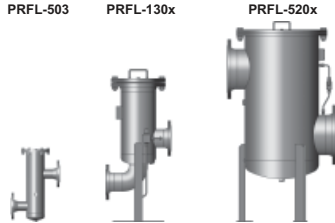




Process Inline Filter PRFL



1. TECHNICAL SPECIFICATIONS

1.1 GENERAL

Inline filters, type PRFL and duplex inline filters, type PRFLD, are designed for process engineering and chemical plants. They are suitable for filtering solid contamination from water-based media. The choice of eight standard sizes means that a suitable filter can be found for the particular application.

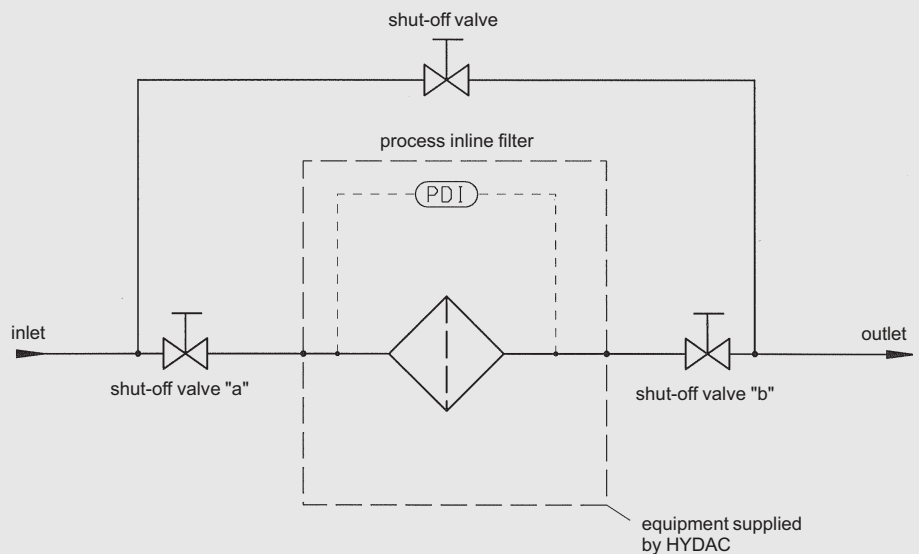
According to the required cleanliness level, various filter materials with different filtration ratings can be used. By using clogging indicators which monitor the differential pressure, the condition of the filter can be determined at any time. Some filter materials can be cleaned and reused, therefore reducing operating costs. Filter housings are available in carbon steel with an internal epoxy coating and in stainless steel.

1.2 SUMMARY OF AVAILABLE SIZES AND CONNECTIONS

Connection size	Series							
	50x	85x	130x	250x	520x	650x	1500x	2500x
DN 50	●		●					
DN 80		●	●					
DN 100			●	●				
DN 150				●	●			
DN 200				●	●	●		
DN 250					●	●	●	
DN 300						●	●	
DN 400							●	
DN 500							●	●
DN 600								●
DN 700								●

The selection of the connection size depends on the level of contamination of the fluid and the associated filter area.

1.3 CIRCUIT DIAGRAM



2. FILTER SPECIFICATIONS

2.1 SUMMARY OF TECHNICAL DATA ON FILTER HOUSINGS (STANDARD CONFIGURATION)

Series	Types	Connection size			Materials						Pressure range*	Temperature	Weight	Volume					
		SAE	Pipe thread G	DIN DN	Stainless steel	Cast stainless steel	Carbon steel												
							Welded without int. corrosion protection	Welded with int. corrosion protection	Cast without int. corrosion protection	Cast with int. corrosion protection									
											[°C]	[kg]	[l]						
50x	503	2"	2"	50	●	●						●	●	-10 to 90	19	3.9			
	504										●	●							
	505												●						
85x	853	3"	-	80	●	●						●	●	38	9.5				
	854												●			●			
	855															●			
130x	1303	-	-	50 / 80 / 100	●							●	●	80	20				
	1304												●			●			
	1305															●	●		
250x	2503	-	-	100 / 150 / 200	●							●	●	130	46				
	2504												●			●			
	2505															●	●		
520x	5203	-	-	150 / 200 / 250	●							●	●	300	118				
	5204															●	●		
	5205																●	●	
650x	6503	-	-	200 / 250 / 300	●							●	●	360	213				
	6504															●	●		
	6505																●	●	
1500x	15003	-	-	250 / 300 / 400 / 500	●							●	●	460	433				
	15004																●	●	
	15005																	●	●
2500x	25003	-	-	500 / 600 / 700	●							●	●	990	1330				
	25004																	●	●
	25005																		●

* Other pressure ranges for welded versions on request.

2.2 FURTHER SPECIFICATIONS OF THE FILTER HOUSING (STANDARD CONFIGURATION)

2.2.1 Seal materials

FPM (Viton), asbestos-free gasket

2.2.2 Corrosion protection, external

2-coat primer (not required for stainless steel housings)

2.2.3 Corrosion protection, internal

2K-epoxy primer (not required for stainless steel housings)

2.2.4 Documentation

Operating and maintenance instructions

2.3 SUMMARY OF TECHNICAL SPECIFICATIONS FOR FILTER ELEMENTS

Series	No. of filter elements	Filter element type	Filter area [cm ²]		Filter materials and filtration ratings [µm]				Permiss. Diff. pressure across element [bar]
			Slotted tube	Pleated materials	Betamicon® (glass fibre)	Chemicon® (metal fibre)	Wire mesh	Slotted tube	
50x	1	L-503-...	667	5665	3, 5, 10, 20	Not available	25, 40, 60, 100, 150, 200, 250	50, 100, 150, 200, 250, 300, 400, 500, 1000, 2000, 3000	25
85x	1	L-853-...	1300	11171					
130x	1	L-1303-...	1890	16825					
250x	3	L-853-...	3900	33513					
520x	4	L-1303-...	7560	67300					
650x	5	L-1303-...	9450	84125					
1500x	10	L-1303-...	18900	168250					
2500x	17	L-2603-...	64426	572050					

2.4 OPTIONAL VERSIONS

There is a range of optional versions available for the Process Inline Filter PRFL. For technical details and prices, please contact our Technical Sales Department at Head Office.

2.4.1 Housing manufacture

- AD Notices / PED 97/23/EC
- ASME Code Design (with or without U-Stamp)

2.4.2 Flange connections

- ANSI
- JIS

2.4.3 Housing materials

- Various qualities of stainless steel*
- Various qualities of carbon steel*

* not for cast versions

2.4.4 Materials of internal parts and elements

- Various qualities of stainless steel
- Various qualities of carbon steel
- Various qualities of Duplex/ Superduplex

2.4.5 Cover plate lifting devices

- Stainless steel version
- Carbon steel version

2.4.6 Seal materials

- Various seal materials on request, depending on the resistance to the fluid

2.4.7 Corrosion protection and external finishes

- RAL colours according to customer requirement (for carbon steel qualities)
- Various multi-layer coatings

2.4.8 Differential pressure monitoring

- Visual
- Electrical
- Visual-electrical
- Differential pressure gauge with 2 micro switches

2.4.9 Documentation

- Manufacturer's test certificates
- Material certificates 3.1 according to DIN EN 10204
- 3rd parties (TÜV, ABS, Lloyds, etc)
- Welding procedure specifications (WPS) / Procedure Qualification Record (PQR)
- Inspection plan
- and many others on request

Further optional models on request.

3. MODEL CODE

PRFL - BN - 1303 - AF3 - 10 - 0 - 1 - X

3.1 INLINE FILTER PRFL / PRFLD

Type

PRFL = Inline filter
PRFLD = Inline filter duplex (change-over)

Material of filter element

BN = Betamicron®
D = wire mesh (cleanable)
S = slotted tube (cleanable), end cap: polyamide, bonded
SW = slotted tube (cleanable), end cap: stainless steel, welded
M = Chemicon® (only size 50x)

Size

50x = DN 50
85x = DN 80
130x = DN 50 / 80 / 100
250x = DN 100 / 150 / 200
520x = DN 150 / 200 / 250
650x = DN 200 / 250 / 300
1500x = DN 250 / 300 / 400 / 500
2500x = DN 500 / 600 / 700 (only for single PRFL)

End code x

x = 3 stainless steel housing
x = 4 housing carbon steel + epoxy internal coating
x = 5 housing carbon steel without coating

Type of connection (see table)

F = flange to DIN followed by nominal width e.g. F100
AF = flange to ANSI followed by nominal width in inches
G = threaded connection followed by nominal width in inches (only for size PRFLD 504/505)
S = SAE connection followed by nominal width in inches (only possible up to 3")
SC = SAE connection with mating flange and welding end

Filtration rating in µm

3, 5, 10, 20 (absolute) (Betamicron®)
1, 3, 5, 10, 20 (absolute) (Chemicon®)
25, 40, 60, 100, 150, 200, 250, 500 (wire mesh)
50, 100, 200, 300, 500, 1000, 2000, 3000 (slotted tube)

Equipment

0 = without additional equipment
1 = cover plate lifting device
2 = vent and drain ball valve

Type of clogging indicator

0 = without clogging indicator
1 = visual indicator PVD 2 B.1
2 = visual-electrical indicator PVD 2 D.0
3 = visual-electrical-analogue indicator V01
4 = visual-analogue indicator in aluminium with 2 adjustable contacts (0...4 bar)
5 = visual-analogue indicator in stainless steel with 2 adjustable contacts (0...4 bar)
6 = electrical differential pressure switch PVD 2 C.0

Modification number

X = the latest version is always supplied

Supplementary details

Drawing number for special equipment

3.2 INLINE FILTER ELEMENT

L - 1303 - D - 100 - V

Element construction

Inline filter element

Size

113, 503, 853, 1303, 2603

Material of filter element

D = wire mesh
S = slotted tube, end cap: polyamide, bonded
SW = slotted tube, end cap: stainless steel, welded
BN3HC = Betamicron® glass fibre
M = Chemicon® metal fibre (only size L503)

Filtration rating in µm

Betamicron® 3, 5, 10, 20 (absolute)
Chemicon® 1, 3, 5, 10, 20 (absolute)
Wire mesh 25, 40, 60, 100, 150, 200, 250
Slotted tube 50, 100, 200, 300, 500, 1000, 2000, 3000

Seal material

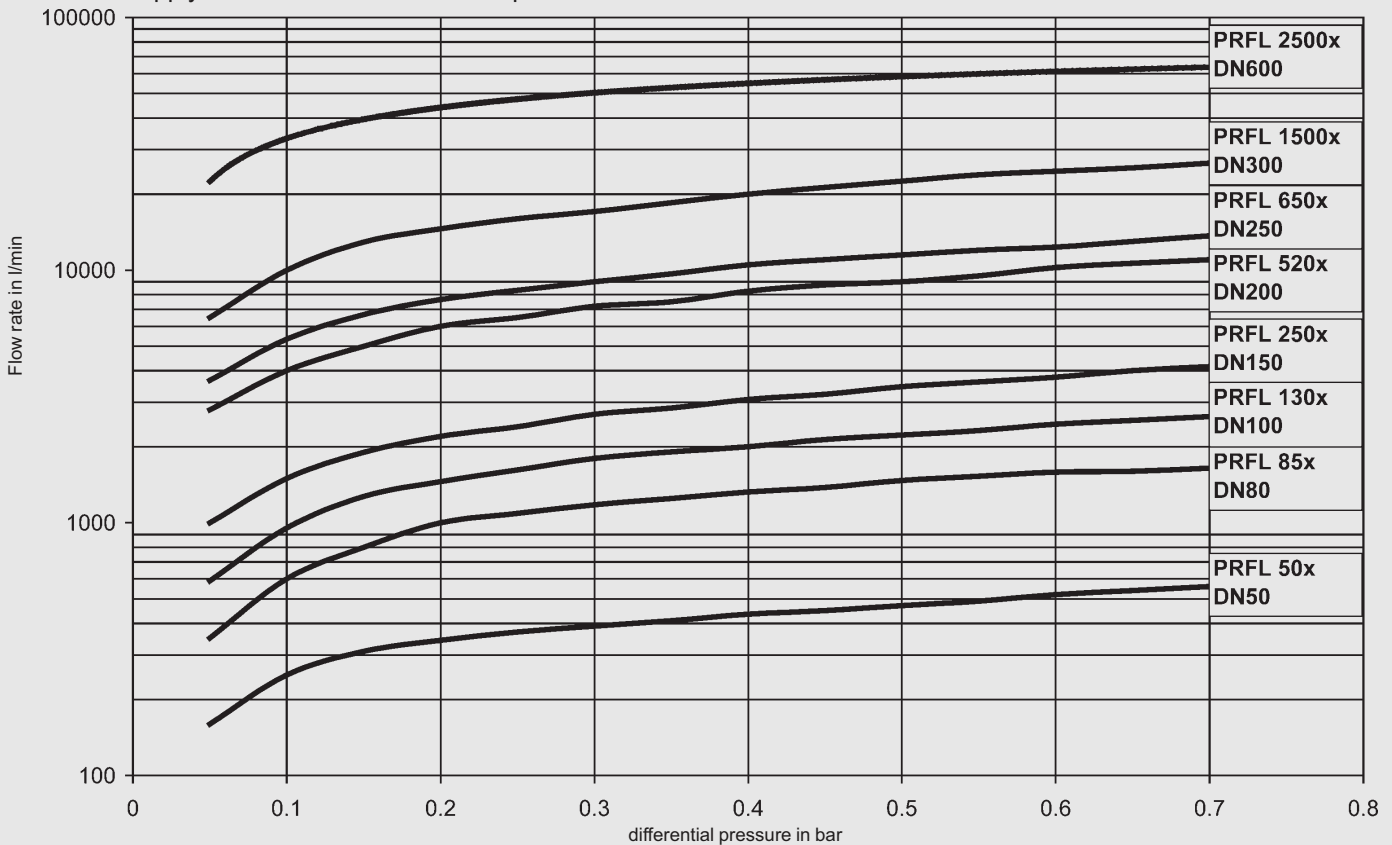
V = Viton

4. FILTER CALCULATION / SIZING

4.1 PRESSURE DROP CURVES FOR HOUSING

For filter elements in wire mesh (all filtration ratings) and for slotted tubes 100 µm, the housing curves apply to the total pressure drop. For 50 µm slotted tubes approx. 30% must be added to the housing pressure drop.

The curves apply to water at 20 °C or fluids up to 15 mm²/s!



In order to be able to size the filter correctly, the following design data should be available:

- Flow rate
- Type of medium
- Materials / resistance
- Viscosity
- Required filtration rating
- Particulate loading in the fluid
- Type of contamination
- Operating pressure
- Operating temperature

Use the pressure drop curves to calculate the Process Inline Filters PRFL and PRFLD. Generally speaking, an initial Δp (clean condition of the filter) of > 0.2 bar should not be exceeded. The pressure drop curves apply to filtration ratings of 100 - 3000 µm slotted tube. For 50 µm filtration rating approx. 30% must be added to the given housing pressure drop.

A further factor in the calculation is the flow velocity through the flange inlet. It should not exceed 4 m/s.

4.2 FILTRATION PERFORMANCE

- Retention rates for wire mesh and slotted tubes:

Nominal retention rates

The filtration rating given in the model code is based on a HYDAC factory standard filter test.

This test is carried out by introducing a large amount of dust (ISO MTD) at the beginning of the filter test and subsequently separating the contamination particles over 1 hour.

The test filter must retain 90 - 95 % of all particles larger than the given filtration rating.

- Retention rates for Betamicron® (glass fibre), Chemicon® (metal fibre):

Absolute retention rate.

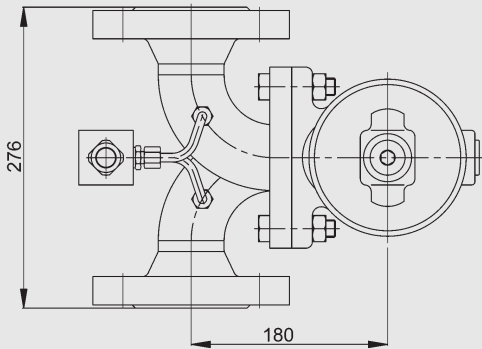
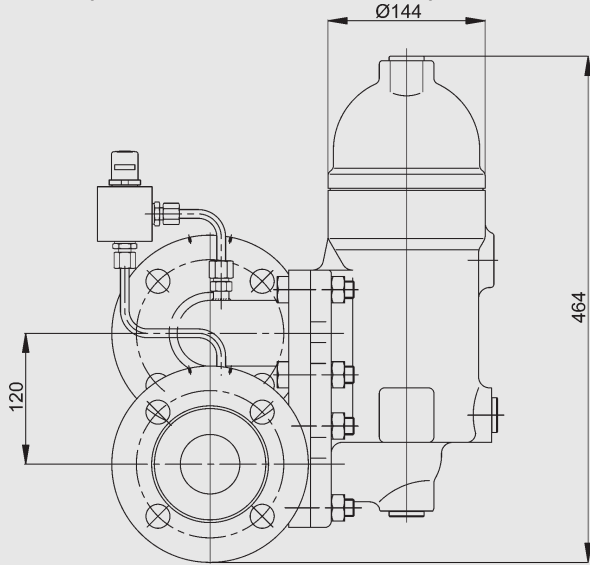
The filtration rates given in the brochure are determined by the multi-pass test carried out on the HYDAC test rig, based on ISO 4572 (multi-pass test for the determination and proof of the filtration performance, extended to finest filtration).

In this test at least 99 % of all particles larger than the given filtration rating must be retained and this up to the max. permissible differential pressure across the filter element. A filtration rate of 99 % corresponds to a β_x value of 100 ($\beta_x = 100$), which denotes absolute filtration.

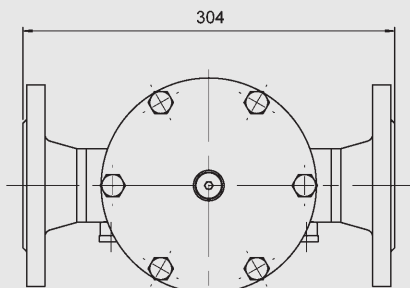
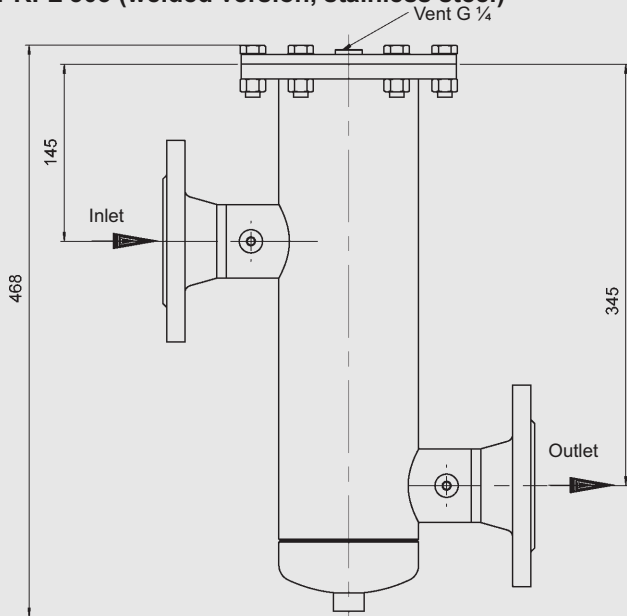
5. DIMENSIONS

5.1 FILTER HOUSING

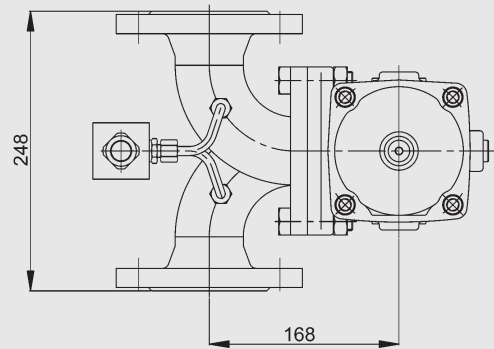
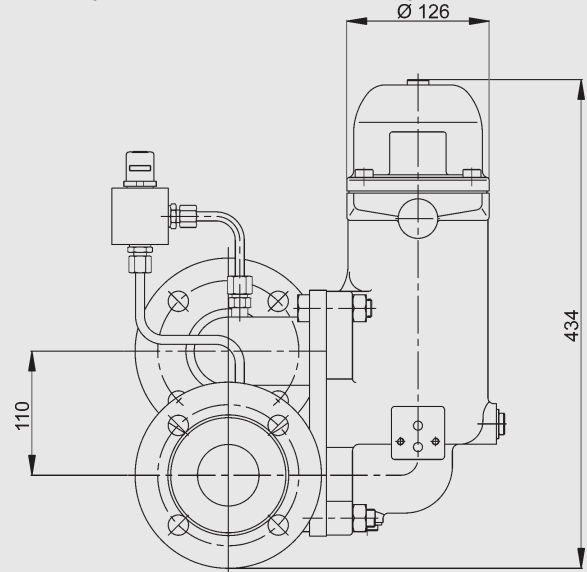
PRFL 503 (cast version, stainless steel)



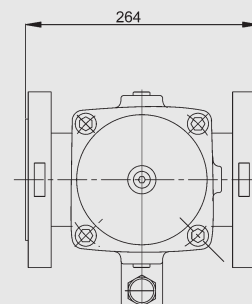
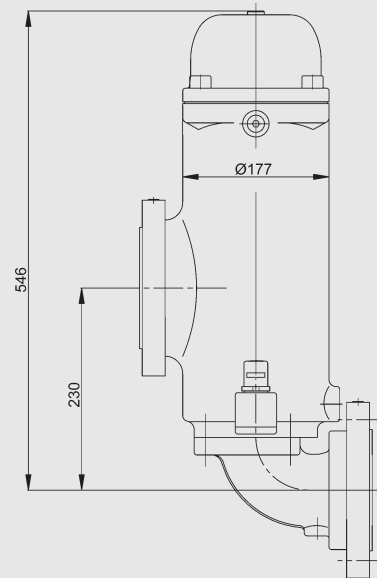
PRFL 503 (welded version, stainless steel)



PRFL 504 (cast version, carbon steel)

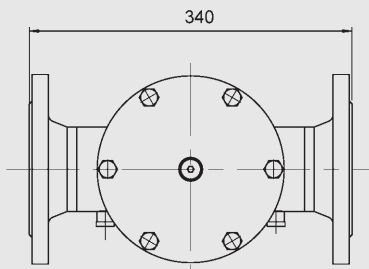
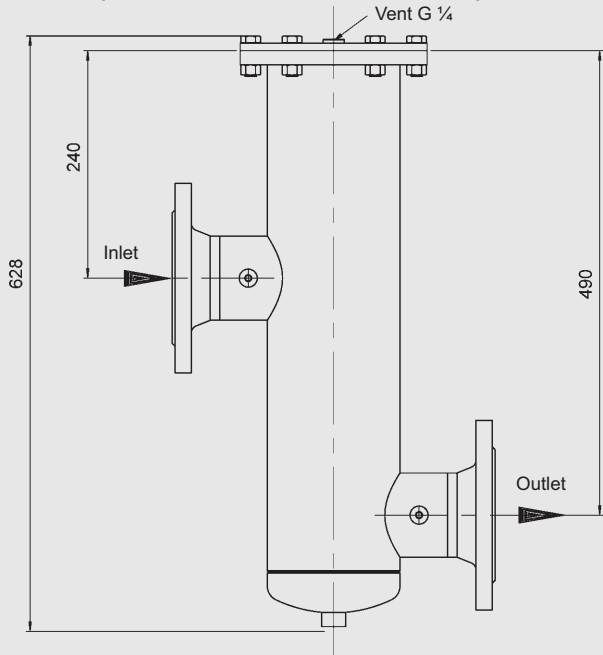


PRFL 85x (cast version)

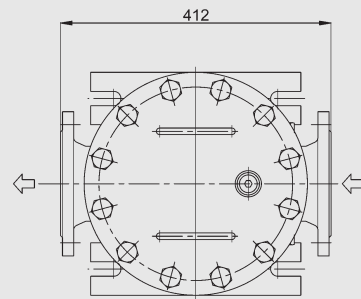
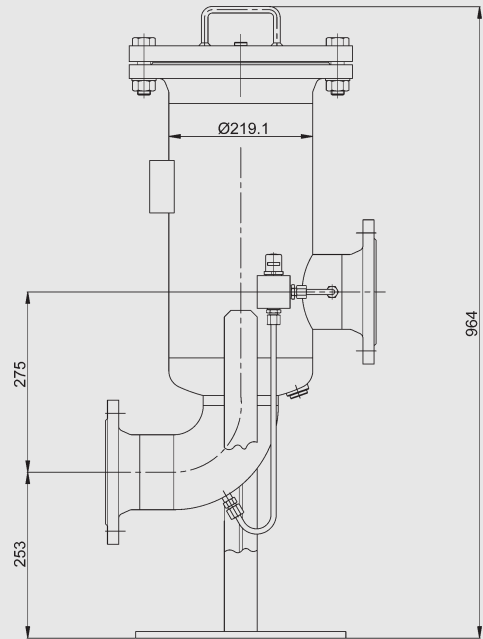


- The filter must not be used as a pipe support
- The dimensions quoted have ± 5 mm tolerances

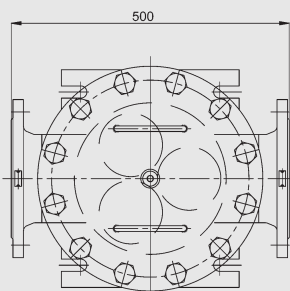
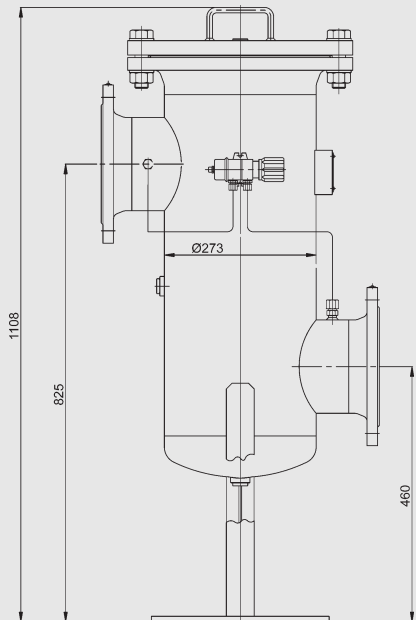
PRFL 853 (welded version, stainless steel)



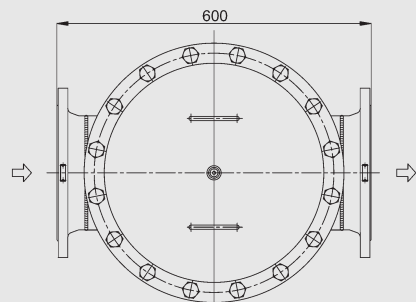
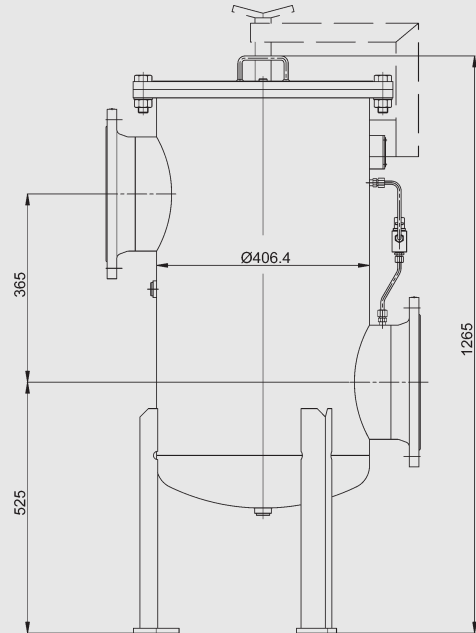
PRFL 130x



PRFL 250x

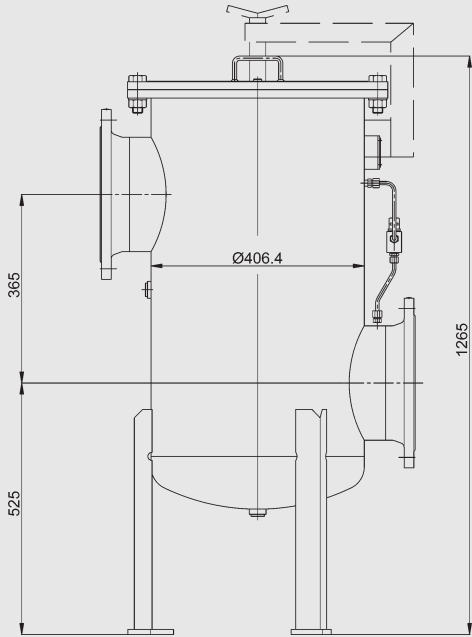


PRFL 520x

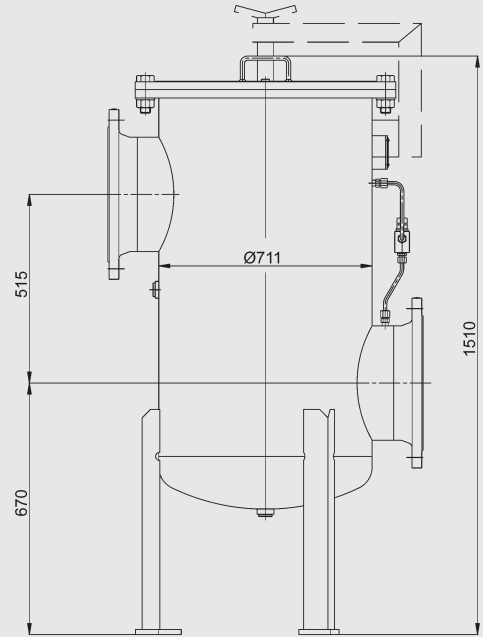


- The filter must not be used as a pipe support
- The dimensions quoted have ± 5 mm tolerances

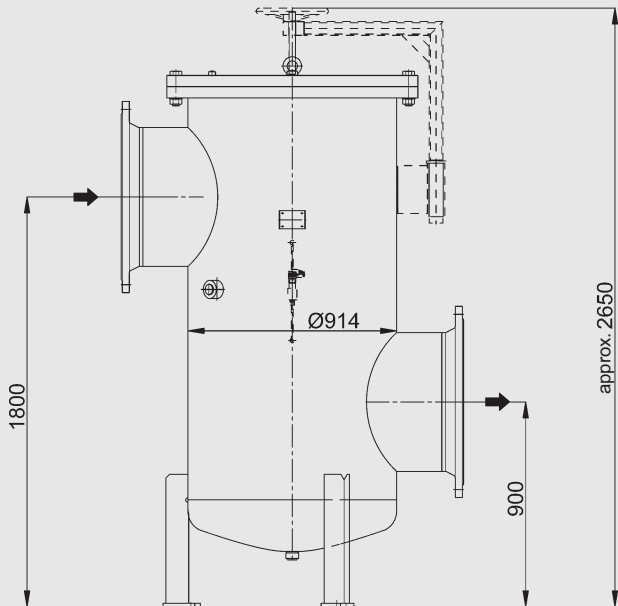
PRFL 650x



PRFL 1500x

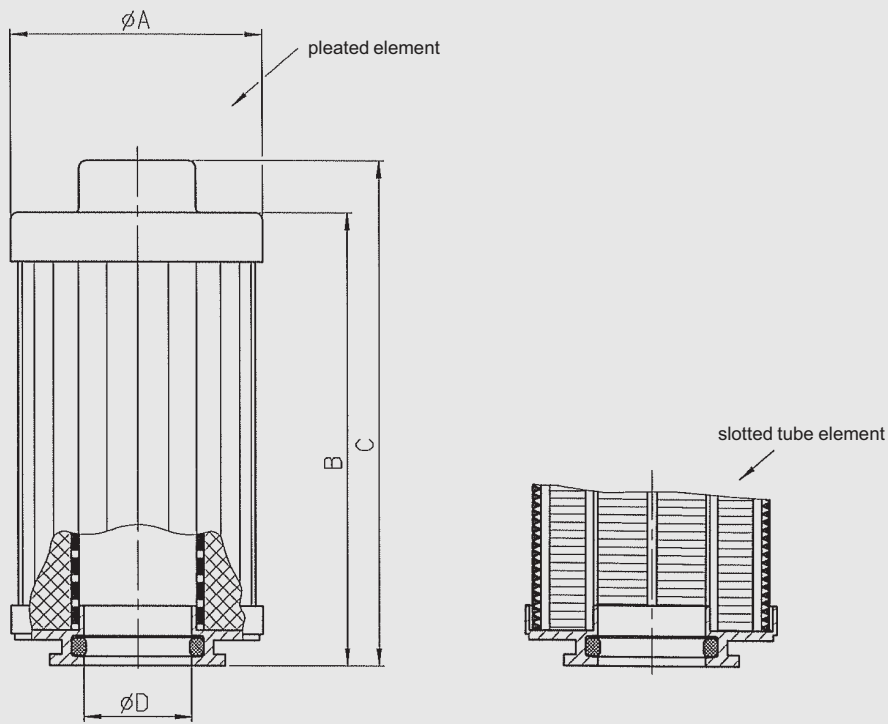


PRFL 2500x



- The filter must not be used as a pipe support
- The dimensions quoted have ± 5 mm tolerances

5.2 DIMENSIONS OF ELEMENTS



Size	A	B	C
L-503	95	263	276
L-853	114	394	414
L-1303	143	458	483
L-2603	143	897	822

NOTE

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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