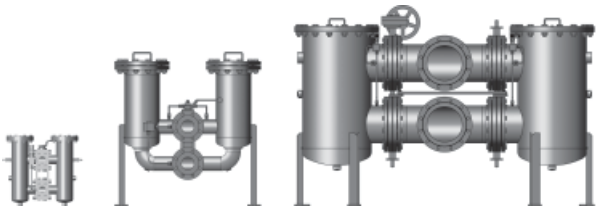
Process Inline Filter, Change-Over PRFLD

PRFLD-503 PRFLD-130x PRFLD-520x



1. TECHNICAL SPECIFICATIONS

1.1 GENERAL

Inline filters, types PRFL and duplex inline filters 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.

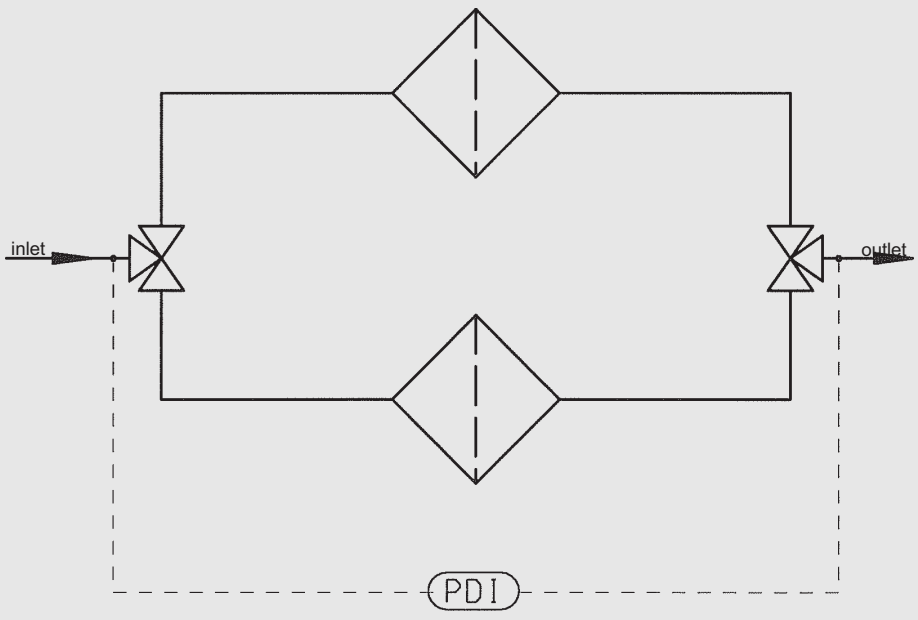
Depending on the required cleanliness level, various filter materials with different filtration ratings can be used. By using clogging indicators which monitor the differential pressure, the condition of the filter can be determined at any time. Some filter materials can be cleaned and reused, therefore 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
DN 50	●		●				
DN 80		●	●				
DN 100			●	●			
DN 150				●	●		
DN 200				●	●	●	
DN 250					●	●	●
DN 300						●	●

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

1.3 CIRCUIT DIAGRAM



2. FILTER SPECIFICATIONS

2.1 SUMMARY OF TECHNICAL SPECIFICATIONS OF FILTER HOUSINGS (STANDARD CONFIGURATION)

Series	Types	Connection size			Materials						Pressure range*			Temp-erature	Weight	Volume
							Carbon steel									
		SAE	Pipe thread G	DIN DN	Stainless steel	Cast stainless steel	Welded without int. corrosion protection	Welded with int. corrosion protection	Cast without int. corrosion protection	Cast with int. corrosion protection	PN16	PN25	PN40	[°C]	[kg]	[l]
50x	503	2"	2"	50	●	●					●		●	-10 to 90	46	2 x 4
	504									●		●				
	505								●			●				
85x	853	3"	3"	80	●	●						●			90	2 x 9.5
	854									●		●				
	855								●			●				
130x	1303	–	–	50 / 80 / 100	●						●				180	2 x 20
	1304							●			●					
	1305						●				●					
250x	2503			100 / 150 / 200	●						●				300	2 x 46
	2504							●			●					
	2505						●				●					
520x	5203			150 / 200 / 250	●						●				660	2 x 118
	5204							●			●					
	5205						●				●					
650x	6503			200 / 250 / 300	●						●				800	2 x 213
	6504							●			●					
	6505						●				●					
1500x	15003			250 / 300	●						●				920	2 x 433
	15004							●			●					
	15005						●				●					

* Other pressure ranges for welded versions on request.

2.2 FURTHER SPECIFICATIONS OF THE STANDARD FILTER HOUSING

2.2.1 **Seal materials**
FPM (Viton), asbestos-free gasket

2.2.2 **Corrosion protection, external**
2-coat primer (not required for stainless steel filters)

2.2.3 **Corrosion protection, internal**
2K epoxy coating (not required for stainless steel filters)

2.2.4 **Documentation**
Operating and maintenance instructions

2.3 SUMMARY OF TECHNICAL SPECIFICATIONS OF FILTER ELEMENTS

Series	No. of filter elements / housing	Filter element type	Filter area [cm²] / housing		Filter materials and filtration ratings [µm]				Permiss. Diff. pressure across element
			Slotted tube	Pleated materials	Betamicron® (glass fibre)	Chemicron® (Metallfaservlies)	Wire mesh	Slotted tube	[bar]
50x	1	L-503-...	667	5665	3, 5, 10, 20	1, 3, 5, 10, 20	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		Not avail-able			
130x	1	L-1303-...	1890	16825					
250x	3	L-853-...	3900	33513					
520x	4	L-1303-...	7860	68300					
650x	5	L-1303-...	9450	84125					
1500x	10	L-1303-...	18900	168250					

2.4 OPTIONAL VERSIONS

There is a range of optional versions available for the Process Inline Filter PRFLD. 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 microswitches

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

PRFLD - 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 = Chemicron® (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) (Chemicron®)
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 = Chemicron® metal fibre (only size L503)

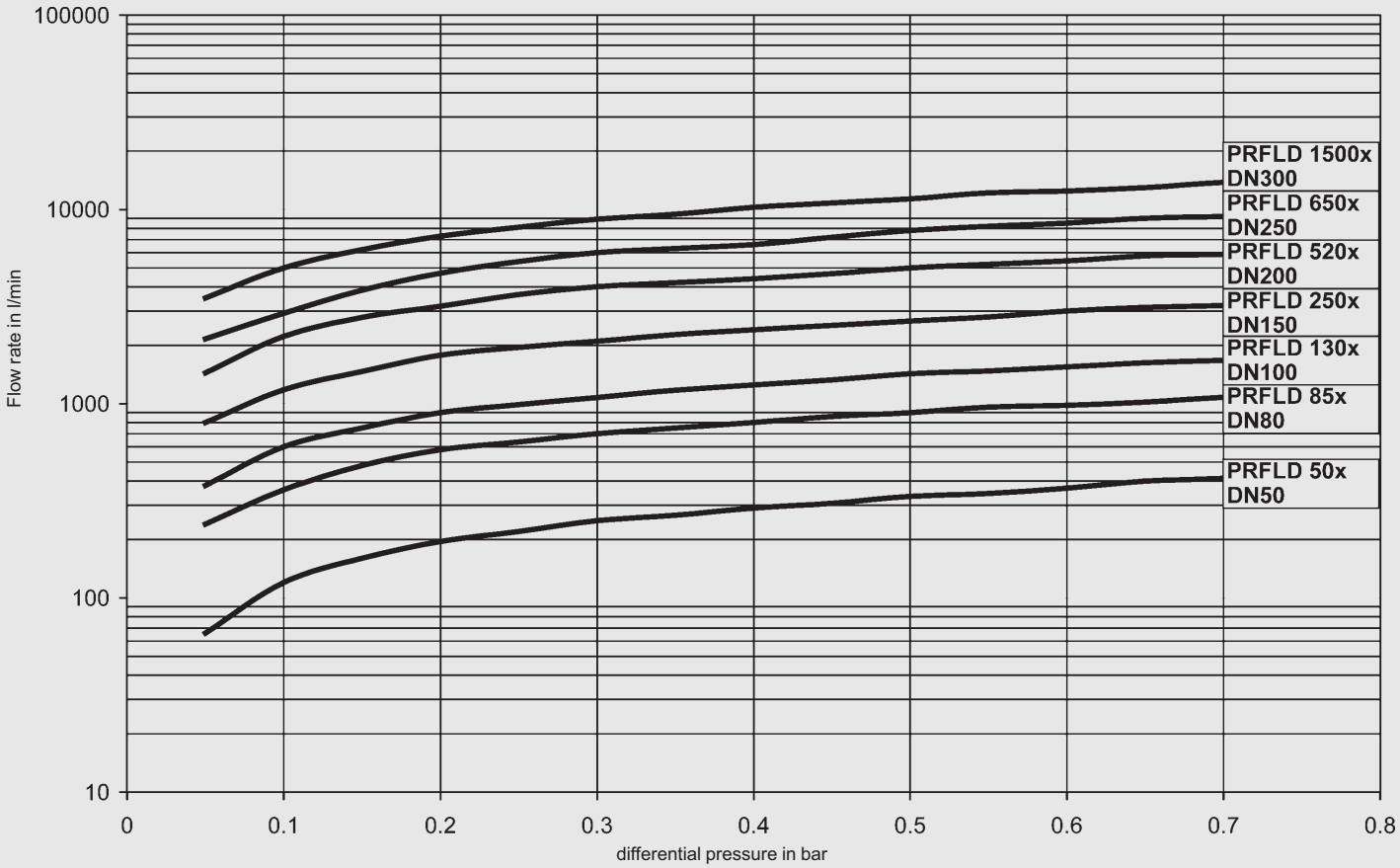
Filtration rating in µm
Betamicron® 3, 5, 10, 20 (absolute)
Chemicron® 1, 3, 5, 10, 20 (absolute)
Wire mesh 25, 40, 60, 100, 150, 200, 250
Slotted tube 50, 100, 200, 300, 500, 1000, 2000, 3000

Seal material
V = Viton

4. FILTER CALCULATION / SIZING

4.1 PRESSURE DROP CURVES FOR HOUSING

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 ratings given in the model code for these qualities are 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), Chemicron® (metal fibre):
  Absolute retention rate

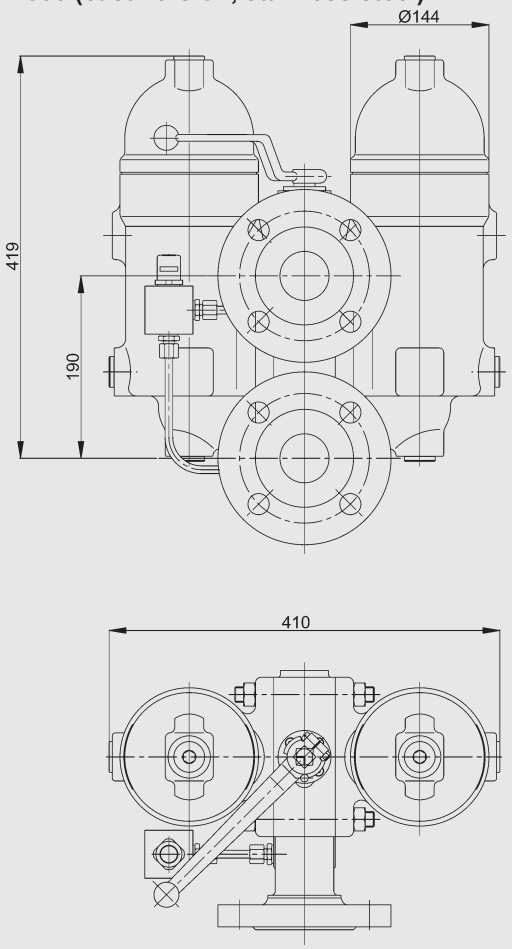
  The rates given in the brochure are determined by the multi-pass test carried out on the HYDAC test rig, based on ISO 4572 (multi-pass test for the determination and proof of the filtration performance, extended to finest filtration).

  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 (β_x = 100), which denotes absolute filtration.

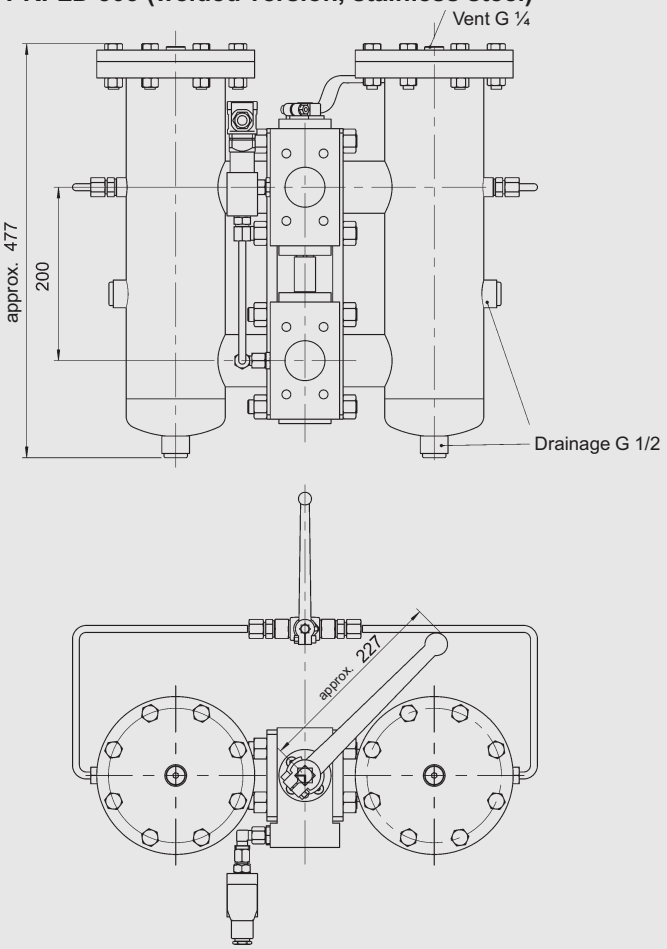
5. DIMENSIONS

5.1 FILTER HOUSING

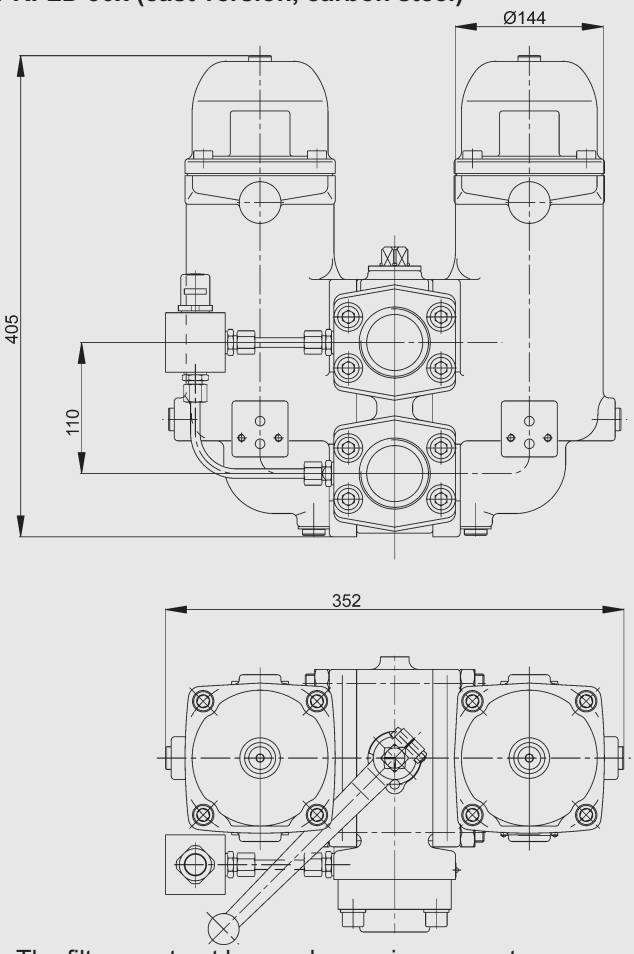
PRFLD 503 (cast version, stainless steel)



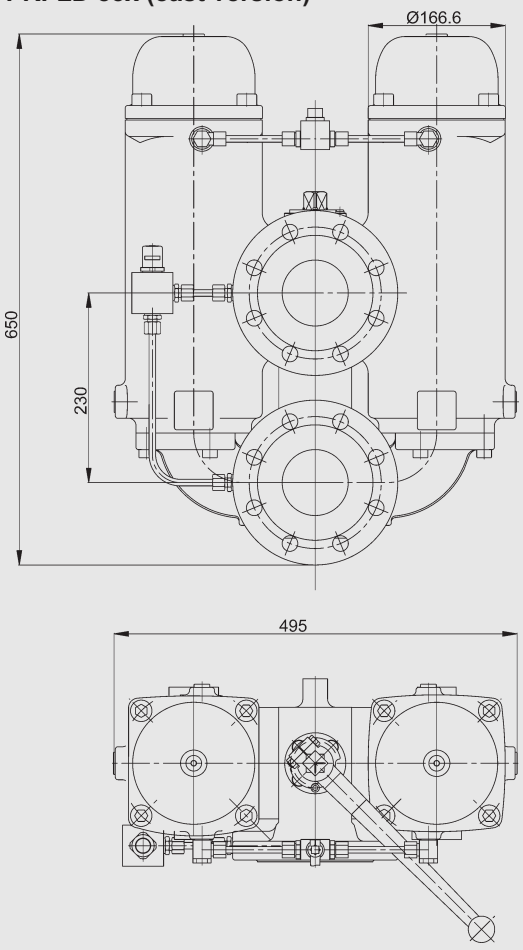
PRFLD 503 (welded version, stainless steel)



PRFLD 50x (cast version, carbon steel)

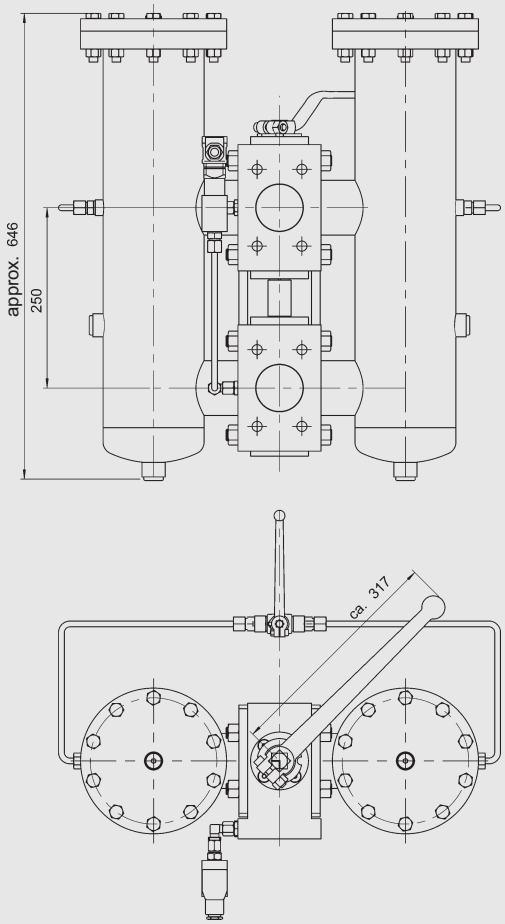


PRFLD 85x (cast version)

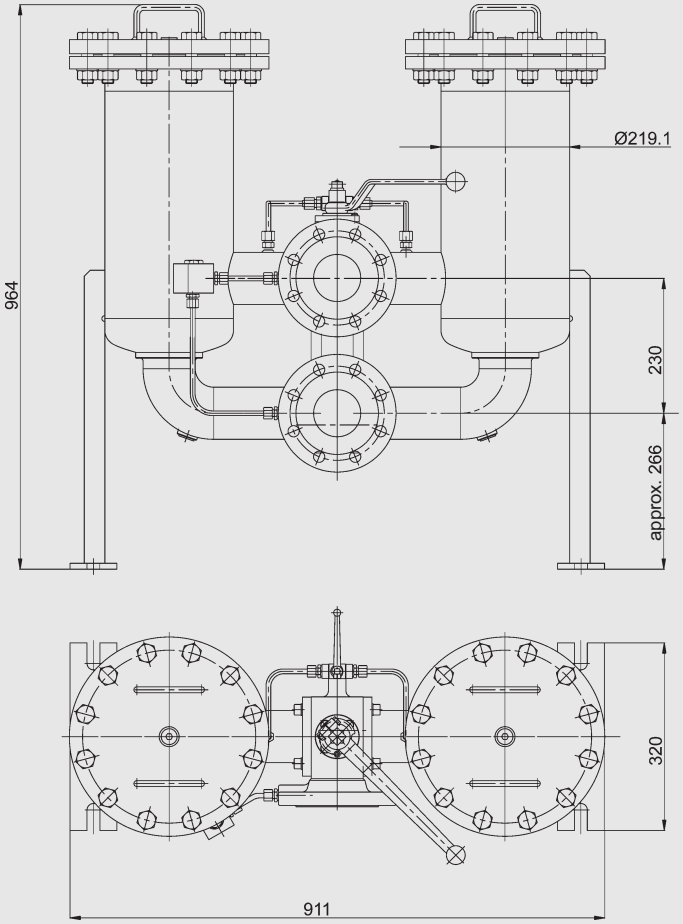


– The filter must not be used as a pipe support
– The dimensions quoted have ± 5 mm tolerances

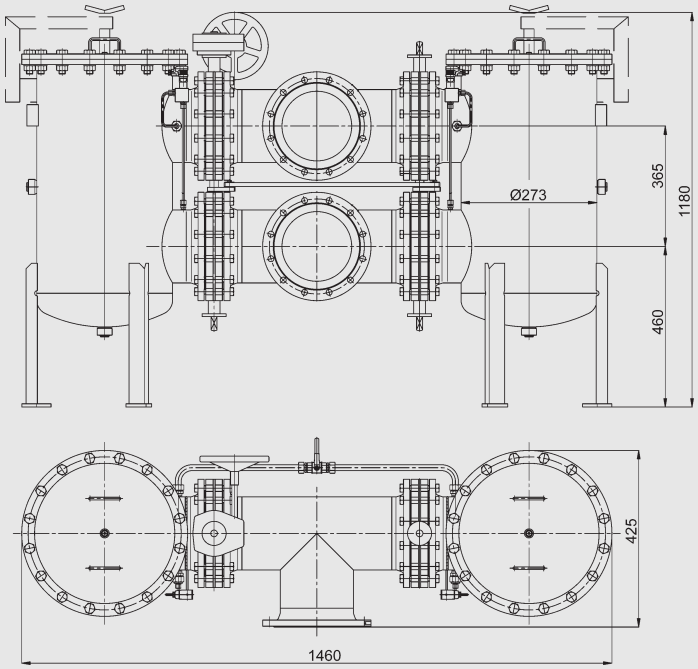
PRFLD 853 (welded version, stainless steel)



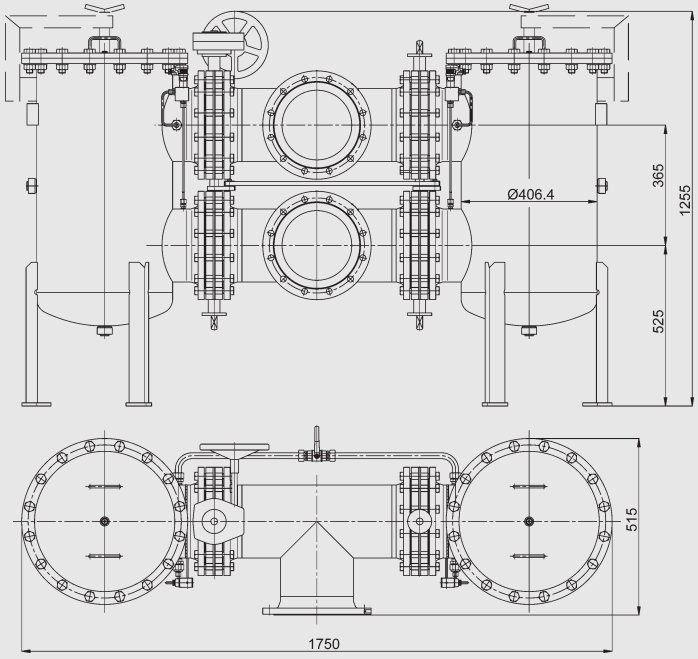
PRFLD 130x



PRFLD 250x

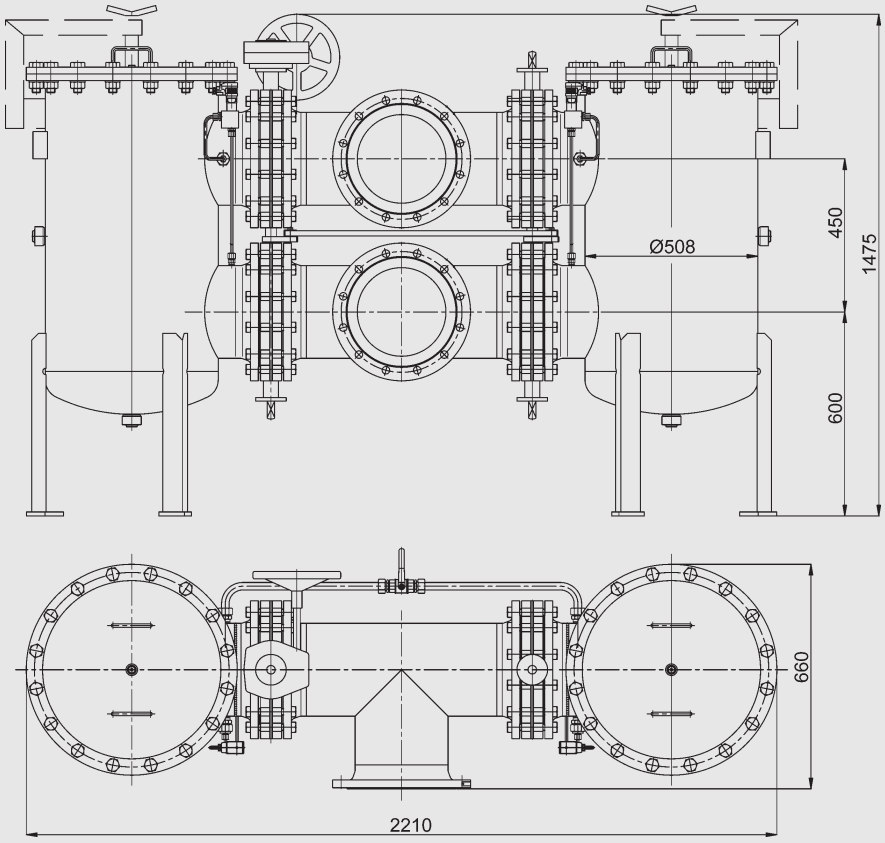


PRFLD 520x

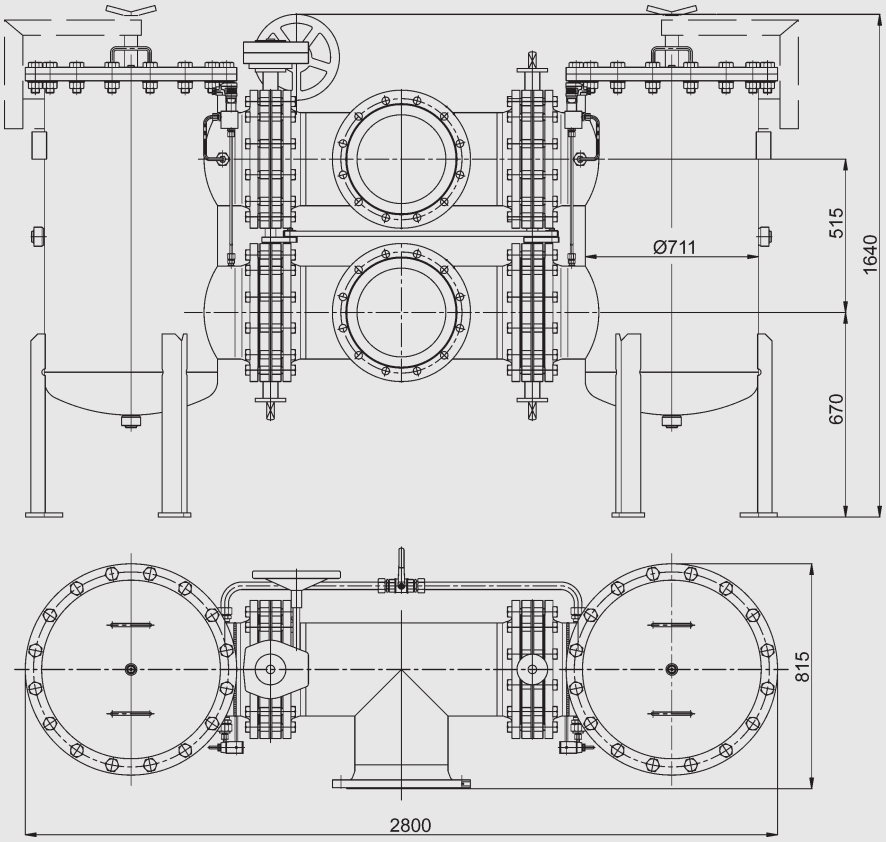


– The filter must not be used as a pipe support
– The dimensions quoted have ± 5 mm tolerances

PRFLD 650x



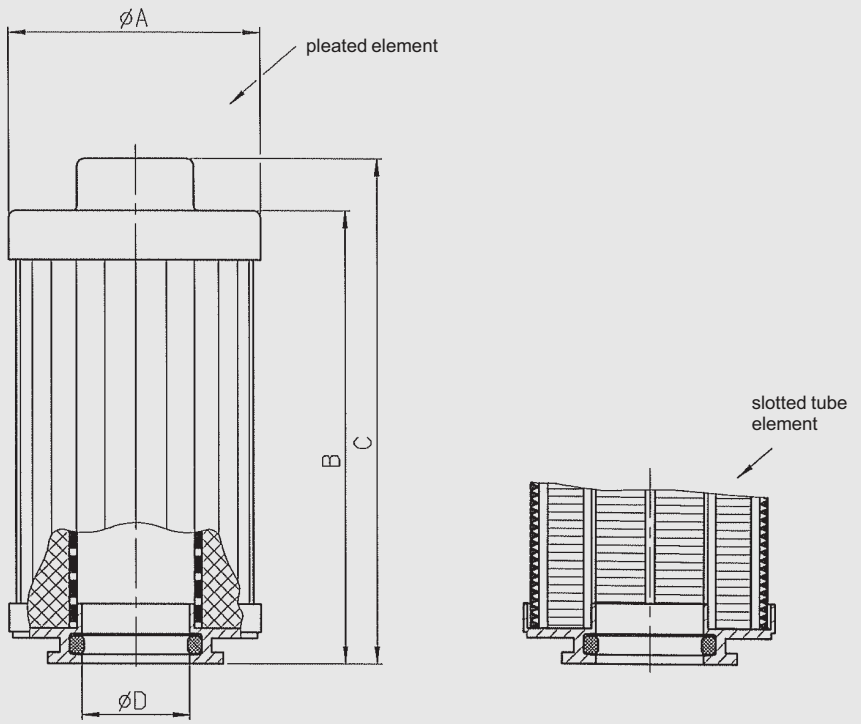
PRFLD 1500x



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

Series	Flange	A	B	C	D	E	F	G	No. of elements	Element size
520x	DN 200	600	1265	525	365	406.4	490	510	4 off	L-1303
650x	DN 250	750	1380	600	450	508	490	620	5 off	L-1303
1500x	DN 300	1000	1510	670	515	711	490	830	10 off	L-1303

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.

HYDAC Process Technology GmbH
Am Wrangelflöz 1
D-66538 Neunkirchen
Tel.: 0 68 21 / 86 90 - 0
Fax: 0 68 21 / 86 90 - 200
Internet: www.hydac.com
E-Mail: prozess-technik@hydac.com