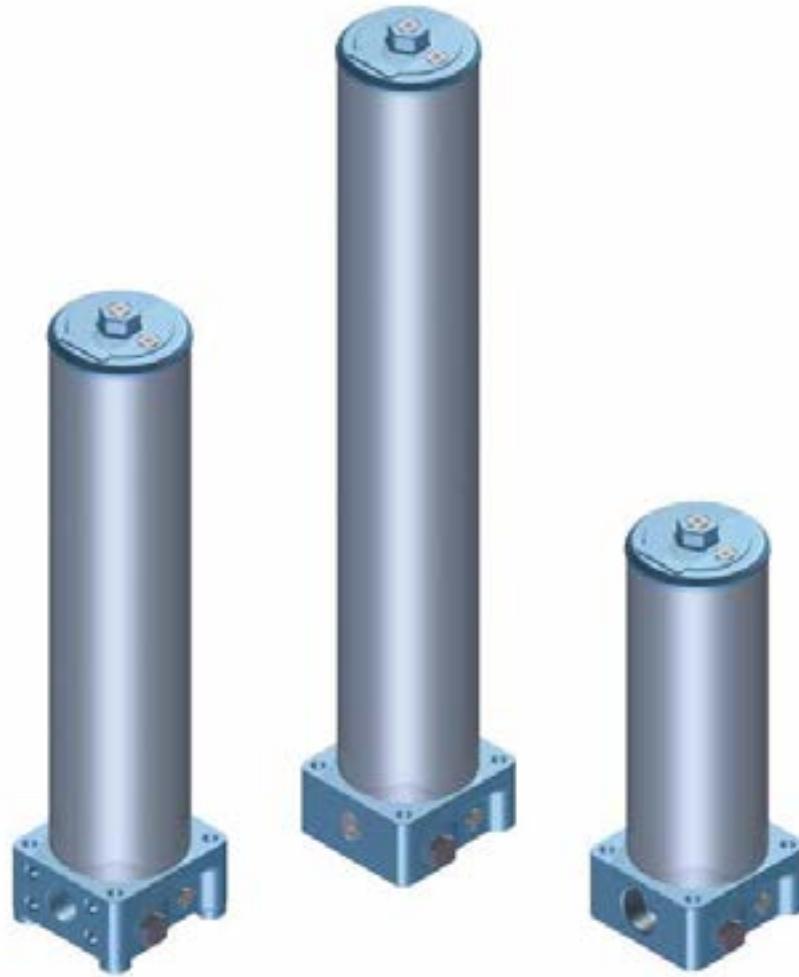


# FHF325 series

Maximum pressure up to 350 bar - Flow rate up to 500 l/min

Filter housing according to SAE J2066 for HF4 filter elements



# FILTER SIZING

## Corrective factor

The correct filter sizing have to be based on the variable pressure drop depending by the application. For example, for the return filter the pressure drop have to be in the range 0.4 - 0.6 bar.

The pressure drop calculation is performed by adding together the value of the housing with the value of the filter element. The pressure drop in the housing is proportional to the fluid density ( $\text{kg}/\text{dm}^3$ ); all the graphs in the catalogue are referred to mineral oil with density of  $0.86 \text{ kg}/\text{dm}^3$ .

The filter element pressure drop is proportional to its viscosity ( $\text{mm}^2/\text{s}$ ), the corrective factor Y is related to an oil viscosity different than  $30 \text{ mm}^2/\text{s}$ .

### Sizing data for single cartridge, head at top

$\Delta pc$  = Filter housing pressure drop [bar]

$\Delta pe$  = Filter element pressure drop [bar]

**Y** = Multiplication factor Y (see correspondent table), depending on the filter element size, on the filter element lenght and on the filter media

**Q** = flow rate ( $\text{l}/\text{min}$ )

**V1 reference viscosity** =  $30 \text{ mm}^2/\text{s}$  (cSt)

**V2** = operating viscosity in  $\text{mm}^2/\text{s}$  (cSt)

$$\Delta pe = Y : 1000 \times Q \times (V2/V1)$$

$$\Delta p_{\text{Tot.}} = \Delta pc + \Delta pe$$

### Calculation examples with HLP Mineral oil Variation in viscosity

**Application data:**

Top tank return filter

Filter with in-line connections

Pressure  $P_{\text{max}} = 10 \text{ bar}$

Flow rate  $Q = 120 \text{ l}/\text{min}$

Viscosity  $V_2 = 46 \text{ mm}^2/\text{s}$  (cSt)

Oil viscosity =  $0.86 \text{ kg}/\text{dm}^3$

Required filtration efficiency =  $25 \mu\text{m}$  with absolute filtration

With bypass valve and 1 1/4" inlet connection

From the working pressure and the flow rate we understand it should be possible using the following top tank return filter series: MPT, MPH and FRI. Let's proceed with MPT series.

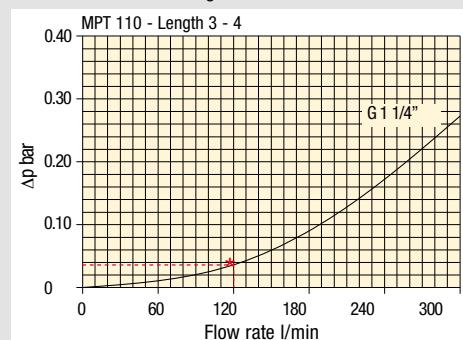
The size 20 doesn't achieve the required flow rate, therefore we have to consider the size 100. The final version of size 100 (101, 104, 110, 120 and 114) will be then defined in function of the mounting characteristics.

$\Delta pc = 0.03 \text{ bar}$  ( $*$  see graphic below, considering size 100 with the max available lenght to get the lowest pressure drop)

$$\Delta pe = (2.0 : 1000) \times 120 \times (46/30) = 0.37 \text{ bar}$$

$$\Delta p_{\text{Tot.}} = 0.03 + 0.37 = 0.4 \text{ bar}$$

The selection is correct because the total pressure drop value is inside the admissible range for top tank return filters. It is of course possible trying to find a different solution, according to the mounting position or to other commercial need, repeating the previous steps while using a different series or lenght.



### Filter housings $\Delta p$ pressure drop.

The curves are plotted using mineral oil with density of  $0.86 \text{ kg}/\text{dm}^3$  in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

**Corrective factor Y, to be used for the filter element pressure drop calculation.  
The values depend to the filter size and lenght and to the filter media.**

Reference viscosity  $30 \text{ mm}^2/\text{s}$

### Return filters

Filter element <b>Type</b>	<b>Absolute filtration H Series</b>					<b>Nominal filtration N Series</b>			
	<b>A03</b>	<b>A06</b>	<b>A10</b>	<b>A16</b>	<b>A25</b>	<b>P10</b>	<b>P25</b>	<b>M25 M60 M90</b>	
<b>MF 020</b>	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	4.40
	2	29.20	24.12	8.00	7.22	5.00	3.33	2.85	2.00
	3	22.00	19.00	6.56	5.33	4.33	1.68	1.44	1.30
<b>MF 030</b> <b>MFX 030</b>	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	3.40
<b>MF 100</b> <b>MFX 100</b>	1	28.20	24.40	8.67	8.17	6.88	4.62	3.96	1.25
	2	17.33	12.50	6.86	5.70	4.00	3.05	2.47	1.10
	3	10.25	9.00	3.65	3.33	2.50	1.63	1.32	0.96
	4	6.10	5.40	2.30	2.20	2.00	1.19	0.96	0.82
<b>MF 180</b> <b>MFX 180</b>	1	3.67	3.05	1.64	1.56	1.24	1.18	1.06	0.26
<b>MF 190</b> <b>MFX 190</b>	2	1.69	1.37	0.60	0.49	0.44	0.35	0.31	0.11
<b>MF 400</b> <b>MFX 400</b>	1	3.20	2.75	1.39	1.33	1.06	0.96	0.87	0.22
	2	2.00	1.87	0.88	0.85	0.55	0.49	0.45	0.13
	3	1.90	1.60	0.63	0.51	0.49	0.39	0.35	0.11
<b>MF 750</b> <b>MFX 750</b>	1	1.08	0.84	0.49	0.36	0.26	0.21	0.19	0.06
<b>CU 025</b>	78.00	48.00	28.00	24.00	9.33	9.33	8.51	1.25	
<b>CU 040</b>	25.88	20.88	10.44	10.00	3.78	3.78	3.30	1.25	
<b>CU 100</b>	15.20	14.53	5.14	4.95	2.00	2.00	0.17	1.10	
<b>CU 250</b>	3.25	2.55	1.55	1.35	0.71	0.71	0.59	0.25	
<b>CU 630</b>	1.96	1.68	0.85	0.72	0.42	0.42	0.36	0.09	
<b>CU 850</b>	1.06	0.84	0.42	0.33	0.17	0.17	0.13	0.04	
<b>MR 100</b>	1	19.00	17.00	6.90	6.30	4.60	2.94	2.52	1.60
	2	11.70	10.80	4.40	4.30	3.00	2.94	2.52	1.37
	3	7.80	6.87	3.70	3.10	2.70	2.14	1.84	1.34
	4	5.50	4.97	2.60	2.40	2.18	1.72	1.47	1.34
	5	4.20	3.84	2.36	2.15	1.90	1.60	1.37	1.34
<b>MR 250</b>	1	5.35	4.85	2.32	1.92	1.50	1.38	1.20	0.15
	2	4.00	3.28	1.44	1.10	1.07	0.96	0.83	0.13
	3	2.60	2.20	1.08	1.00	0.86	0.77	0.64	0.12
	4	1.84	1.56	0.68	0.56	0.44	0.37	0.23	0.11
<b>MR 630</b>	1	3.10	2.48	1.32	1.14	0.92	0.83	0.73	0.09
	2	2.06	1.92	0.82	0.76	0.38	0.33	0.27	0.08
	3	1.48	1.30	0.60	0.56	0.26	0.22	0.17	0.08
	4	1.30	1.20	0.48	0.40	0.25	0.21	0.16	0.08
	5	0.74	0.65	0.30	0.28	0.13	0.10	0.08	0.04
<b>MR 850</b>	1	0.60	0.43	0.34	0.25	0.13	0.12	0.09	0.03
	2	0.37	0.26	0.23	0.21	0.11	0.08	0.07	0.03
	3	0.27	0.18	0.17	0.17	0.05	0.04	0.04	0.02
	4	0.23	0.16	0.13	0.12	0.04	0.03	0.03	0.02

**Corrective factor Y, to be used for the filter element pressure drop calculation.**

The values depend to the filter size and lenght and to the filter media.

Reference viscosity 30 mm<sup>2</sup>/s

### Suction filters

Filter element	Nominal filtration N Series	
	P10	P25
<b>SF 250</b>	65	21

### Return / Suction filters

Filter element	Absolute filtration		
	A10	A16	A25
<b>RSX 116</b>	1   5.12	4.33	3.85
	2   2.22	1.87	1.22
<b>RSX 165</b>	1   2.06	1.75	1.46
	2   1.24	1.05	0.96
	3   0.94	0.86	0.61

### Low & Medium pressure filters

Filter element	Absolute filtration N-W Series					Nominal filtration N Series		
	A03	A06	A10	A16	A25	P10	P25	M25
<b>CU 110</b>	1   16.25	15.16	8.75	8.14	5.87	2.86	2.65	0.14
	2   12.62	10.44	6.11	6.02	4.15	1.60	1.49	0.12
	3   8.57	7.95	5.07	4.07	2.40	1.24	1.15	0.11
	4   5.76	4.05	2.80	2.36	1.14	0.91	0.85	0.05
<b>CU 210</b>	1   5.30	4.80	2.00	1.66	1.32	0.56	0.43	0.12
	2   3.44	2.95	1.24	1.09	0.70	0.42	0.35	0.09
	3   2.40	1.70	0.94	0.84	0.54	0.33	0.23	0.05
<b>DN</b>	016   7.95	7.20	3.00	2.49	1.98	0.84	0.65	0.18
	025   5.00	4.53	1.89	1.57	1.25	0.53	0.41	0.11
	040   3.13	2.66	1.12	0.98	0.63	0.38	0.32	0.08
<b>CU 400</b>	2   3.13	2.55	1.46	1.22	0.78	0.75	0.64	0.19
	3   2.15	1.70	0.94	0.78	0.50	0.40	0.34	0.10
	4   1.60	1.28	0.71	0.61	0.40	0.34	0.27	0.08
	5   1.00	0.83	0.47	0.34	0.20	0.24	0.19	0.06
	6   0.82	0.58	0.30	0.27	0.17	0.22	0.18	0.05
	<b>CU 900</b>   1   0.86	0.63	0.32	0.30	0.21	-	-	0.05
<b>CU 950</b>	2   1.03	0.80	0.59	0.40	0.26	-	-	0.05
	3   0.44	0.40	0.27	0.18	0.15	-	-	0.02
<b>MR 630</b>	7   0.88	0.78	0.36	0.34	0.16	0.12	0.96	0.47

# FILTER SIZING Corrective factor

**Corrective factor Y, to be used for the filter element pressure drop calculation.**

**The values depend to the filter size and lenght and to the filter media.**

Reference viscosity 30 mm<sup>2</sup>/s

## High pressure filters

Filter element	Absolute filtration N - R Series					Nominal filtration N Series
	A03	A06	A10	A16	A25	
Type	A03	A06	A10	A16	A25	M25
<b>HP 011</b>	1 332.71	250.07	184.32	152.36	128.36	-
	2 220.28	165.56	74.08	59.13	37.05	-
	3 123.24	92.68	41.48	33.08	20.72	-
	4 77.76	58.52	28.37	22.67	16.17	-
<b>HP 039</b>	1 70.66	53.20	25.77	20.57	14.67	4.90
	2 36.57	32.28	18.00	13.38	8.00	2.90
	3 26.57	23.27	12.46	8.80	5.58	2.20
<b>HP 050</b>	1 31.75	30.30	13.16	12.3	7.29	1.60
	2 24.25	21.26	11.70	9.09	4.90	1.40
	3 17.37	16.25	8.90	7.18	3.63	1.25
	4 12.12	10.75	6.10	5.75	3.08	1.07
	5 7.00	6.56	3.60	3.10	2.25	0.80
<b>HP 065</b>	1 58.50	43.46	23.16	19.66	10.71	1.28
	2 42.60	25.64	16.22	13.88	7.32	1.11
	3 20.50	15.88	8.18	6.81	3.91	0.58
<b>HP 135</b>	1 20.33	18.80	9.71	8.66	4.78	2.78
	2 11.14	10.16	6.60	6.38	2.22	1.11
	3 6.48	6.33	3.38	3.16	2.14	1.01
<b>HP 320</b>	1 10.88	9.73	5.02	3.73	2.54	1.04
	2 4.40	3.83	1.75	1.48	0.88	0.71
	3 2.75	2.11	1.05	0.87	0.77	0.61
	4 2.12	1.77	0.98	0.78	0.55	0.47
<b>HP 500</b>	1 4.44	3.67	2.30	2.10	1.65	0.15
	2 3.37	2.77	1.78	1.68	1.24	0.10
	3 2.22	1.98	1.11	1.09	0.75	0.08
	4 1.81	1.33	0.93	0.86	0.68	0.05
	5 1.33	1.15	0.77	0.68	0.48	0.04

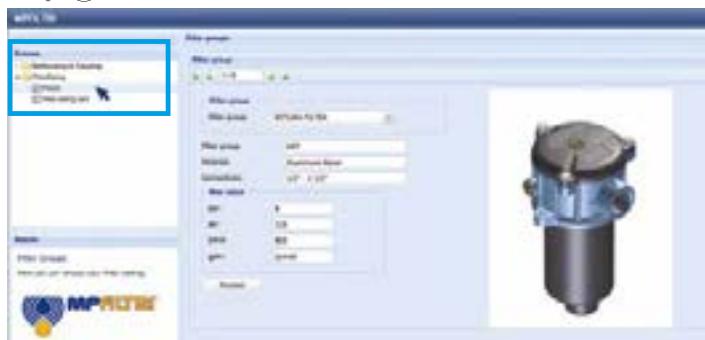
## Stainless steel high pressure filters

Filter element	Absolute filtration N Series				
	A03	A06	A10	A16	A25
Type	A03	A06	A10	A16	A25
<b>HP 011</b>	1 332.71	250.07	184.32	152.36	128.36
	2 220.28	165.56	74.08	59.13	37.05
	3 123.24	92.68	41.48	33.08	20.72
	4 77.76	58.52	28.37	22.67	16.17
<b>HP 039</b>	2 70.66	53.20	25.77	20.57	14.67
	3 36.57	32.28	18.00	13.38	8.00
	4 26.57	23.27	12.46	8.80	5.58
<b>HP 050</b>	1 31.75	30.30	13.16	12.3	7.29
	2 24.25	21.26	11.70	9.09	4.90
	3 17.37	16.25	8.90	7.18	3.63
	4 12.12	10.75	6.10	5.75	3.08
	5 7.00	6.56	3.60	3.10	2.25
<b>HP 135</b>	1 20.33	18.80	9.71	8.66	4.78
	2 11.14	10.16	6.60	6.38	2.22
	3 6.48	6.33	3.38	3.16	2.14
Filter element	Absolute filtration H - U Series				
	A03	A06	A10	A16	A25
	Type	A03	A06	A10	A16
	1	424.58	319.74	235.17	194.44
	2	281.06	211.25	94.53	75.45
<b>HP 011</b>	3	130.14	97.50	43.63	34.82
	4	109.39	82.25	36.79	29.37
<b>HP 039</b>	2 70.66	53.20	25.77	20.57	14.67
	3 36.57	32.28	18.00	13.38	8.00
	4 26.57	23.27	12.46	8.80	5.58
<b>HP 050</b>	1 47.33	34.25	21.50	20.50	14.71
	2 29.10	25.95	14.04	10.90	5.88
	3 20.85	19.50	10.68	8.61	4.36
	4 14.55	12.90	7.32	6.90	3.69
	5 9.86	9.34	6.40	4.80	2.50
<b>HP 135</b>	1 29.16	25.33	13.00	12.47	5.92
	2 14.28	11.04	7.86	7.60	4.44
	3 8.96	7.46	4.89	4.16	3.07

Filter element	Absolute filtration N Series					Nominal filtration N Series
	A03	A06	A10	A16	A25	
Type	A03	A06	A10	A16	A25	M25
<b>HF 320</b>	1 3.65	2.95	2.80	1.80	0.90	0.38
	2 2.03	1.73	1.61	1.35	0.85	0.36
	3 1.84	1.42	1.32	1.22	0.80	0.35

# Selection Software FILTER SIZING

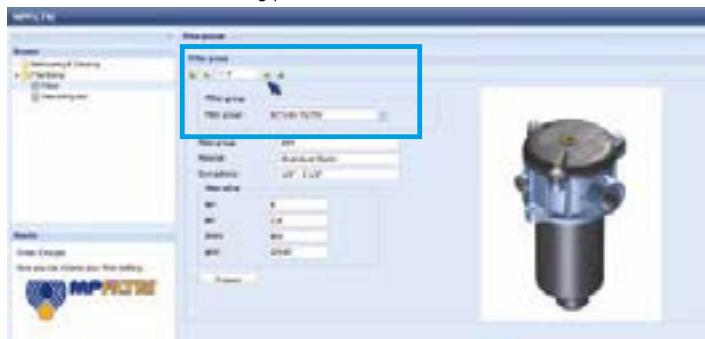
## Step ① Select "FILTERS"



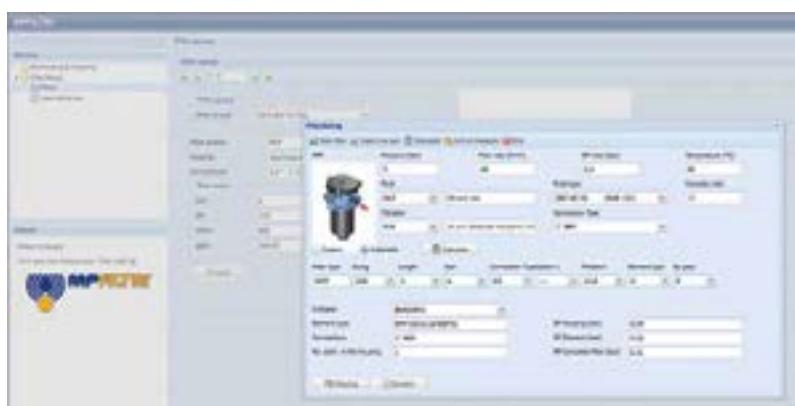
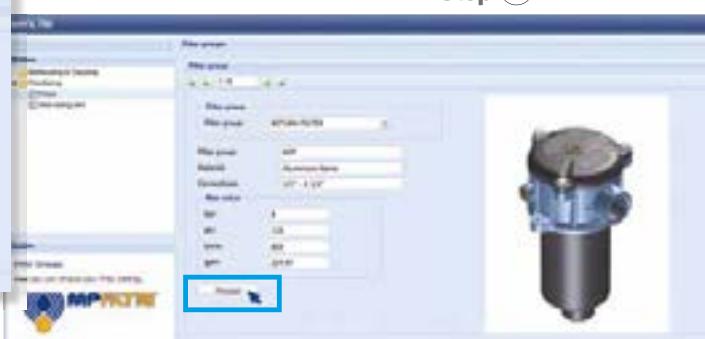
## Step ② Choose filter group (Return Filter, Pressure Filter, etc.)



## Step ③ Choose filter type (MPF, MPT, etc.) in function of the max working pressure and the max flow rate



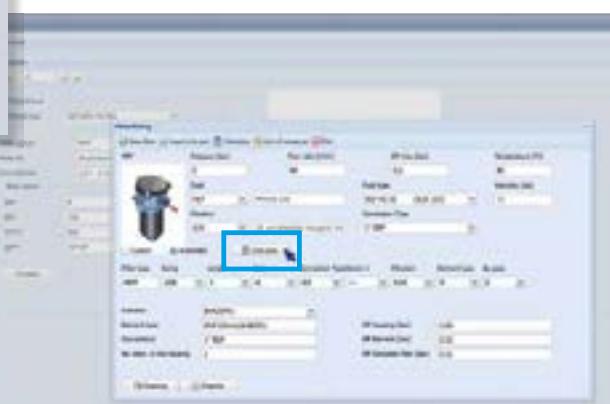
## Step ④ Push "PROCEED"



## Step ⑤

Insert all application data to calculate the filter size following the sequence:

- working pressure
- working flow rate
- working pressure drop
- working temperature
- fluid material and fluid type
- filtration media
- connection type



## Step ⑥

Push "CALCULATE" to have result;  
in case of any mistake, the system  
will advice which parameter is out  
of range to allow to modify/adjust  
the selection



## Step ⑦

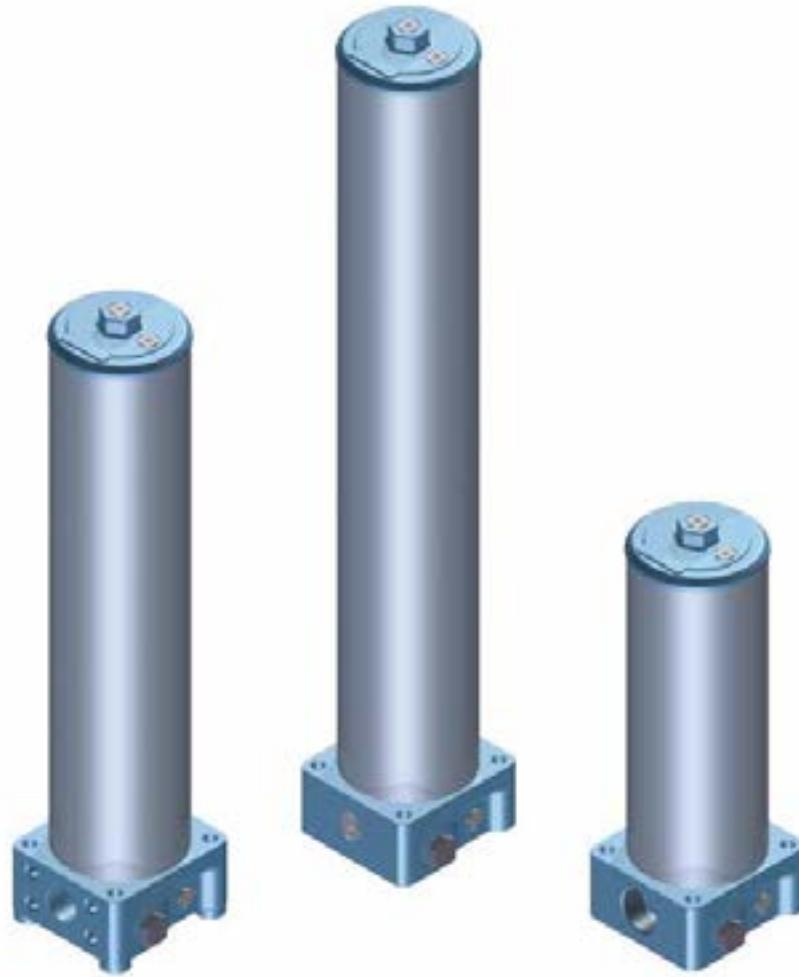
Download PDF  
Datasheet "Report.aspx" pushing the button "Drawing"



# FHF325 series

Maximum pressure up to 350 bar - Flow rate up to 500 l/min

Filter housing according to SAE J2066 for HF4 filter elements



# FHF325 GENERAL INFORMATION

## Filter housing according to SAE J2066 for HF4 filter elements

### Technical data

**High Pressure filters Maximum pressure up to 350 bar - Flow rate up to 500 l/min**

#### Filter housing materials

- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Cover: Cast iron (chemical heat treatment)
- Bypass valve: Brass - Steel

#### Pressure

- Working pressure: 35 MPa (350 bar)
- Test pressure: 52.5 MPa (525 bar)
- Burst pressure: 105 MPa (1050 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 35 MPa (350 bar)

#### Bypass valve

- Opening pressure 600 kPa (6 bar)
- Other opening pressures on request.

#### $\Delta p$ element type

- Microfibre filter elements - series N-R: 20 bar
- Wire mesh filter elements - series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

#### Seals

- Standard NBR series A
- Optional FPM series V

#### Temperature

From -25 °C to +110 °C

#### Connections

FHF 325: In-line threaded connection  
FHF 325: In-line flanged connection  
FHF 325: Manifold mounting

#### Note

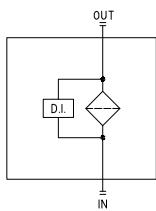
FHF filters are provided for vertical mounting

### Weights [kg] and volumes [dm<sup>3</sup>]

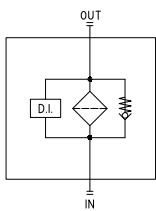
	Weights [kg]				Volumes [dm <sup>3</sup> ]			
	Length	1	2	3	Length	1	2	3
<b>FHF 325</b>		23.90	32.68	41.47		3.50	5.80	8.11

### Hydraulic symbols

Style **S**



Style **B**

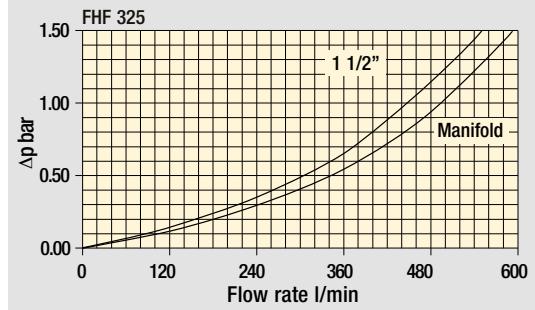


The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.

**Δp varies proportionally with density.**

Pressure drop

Filter housings Δp pressure drop



# FHF325

## Designation & Ordering code

### COMPLETE FILTER

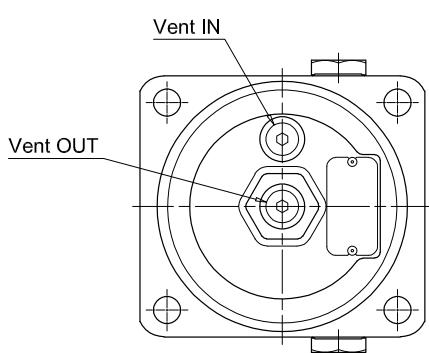
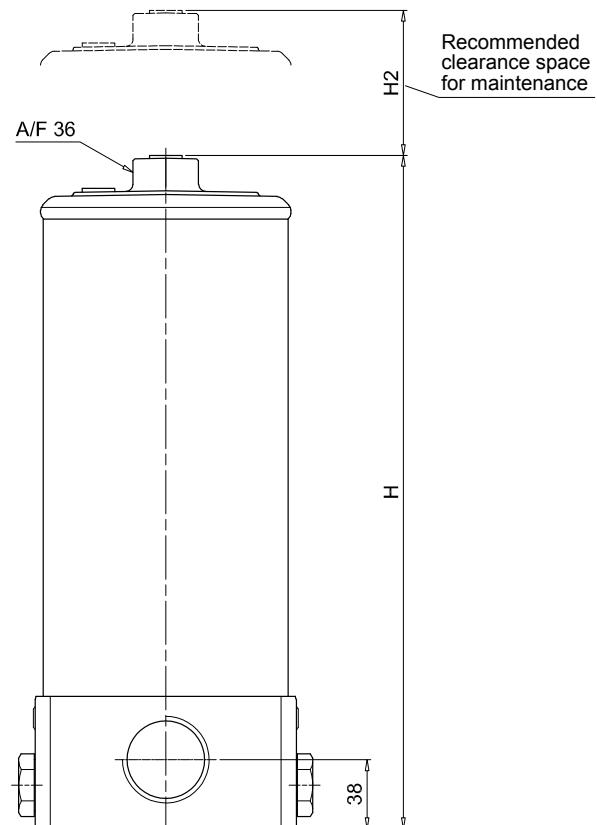
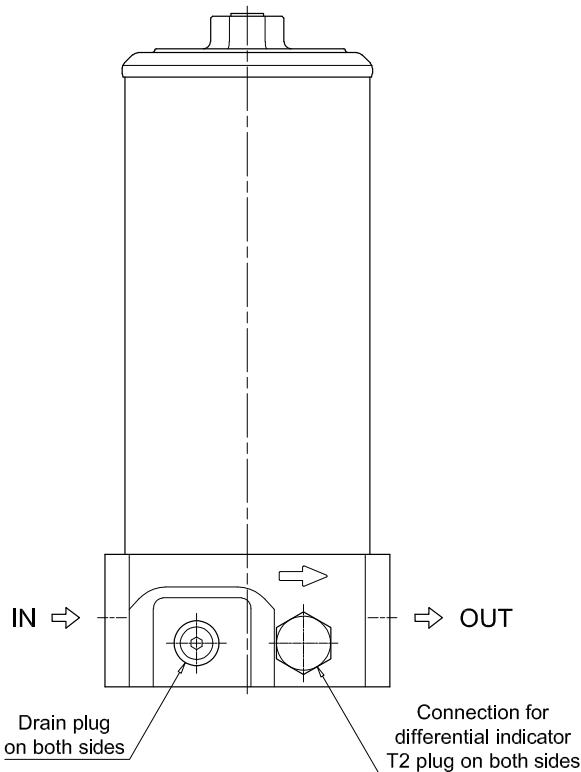
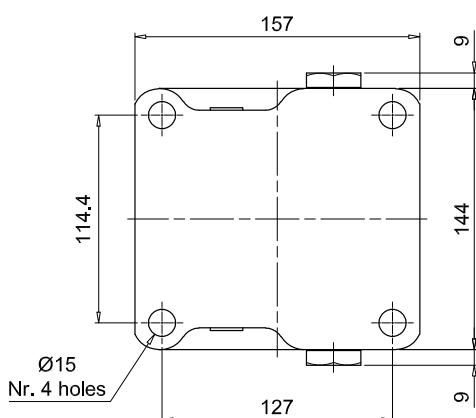
Series and size <b>FHF325</b>	Configuration example: FHF325 2 S A H 7 A10 N P01
Length 1   2   3	
Valves S Without bypass B With bypass 6 bar	
Seals A NBR V FPM	
Connections A G1 1/2" B 1 1/2" NPT C SAE 24 - 1 7/8" - 12 UN G 1 1/2" SAE 6000 psi/M H 1 1/2" SAE 6000 psi/UNC M Manifold ø1.38" N Manifold ø1.50"	
Connection for differential indicator 7 With two connections plugged on both sides	
Filtration rating (filter media) A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm	A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm M25 Wire mesh 25 µm
Element Δp N 20 bar	Execution P01 MP Filtri standard Pxx Customized

### FILTER ELEMENT

Element series and size <b>HF325</b>	Configuration example: HF325 2 A10 A N P01
Element length 1   2   3	
Filtration rating (filter media) A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm	A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm M25 Wire mesh 25 µm
Seals A NBR V FPM	Element Δp N 20 bar
Execution P01 MP Filtri standard Pxx Customized	

### ACCESSORIES

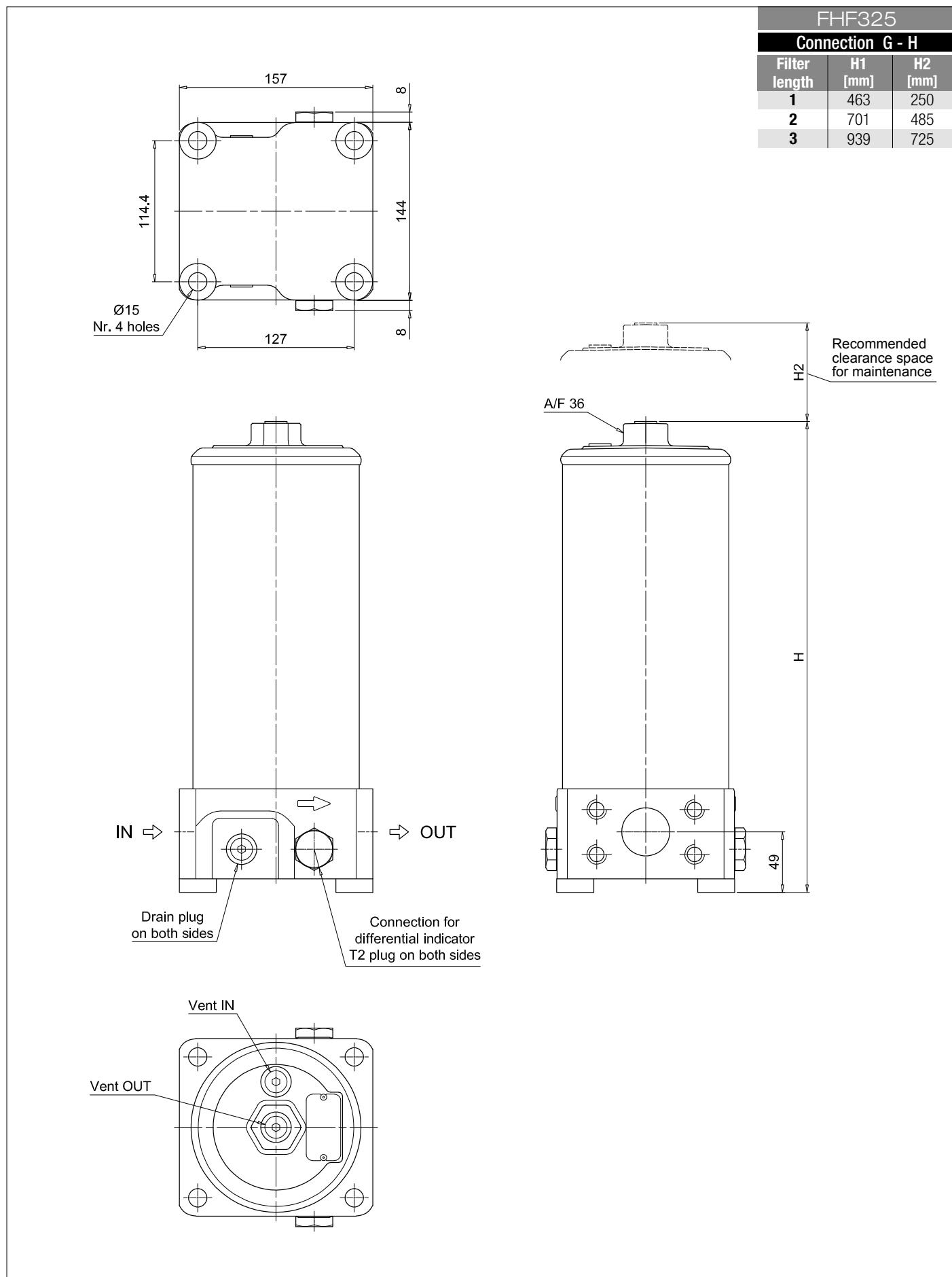
Differential indicators	page	page	
DEA Electrical differential indicator	517	DTA Electronic differential indicator	520
DEM Electrical differential indicator	517-518	DVA Visual differential indicator	520
DLA Electrical / visual differential indicator	518-519	DVM Visual differential indicator	520
DLE Electrical / visual differential indicator	519		
Additional features	page		
T2 Plug	521		



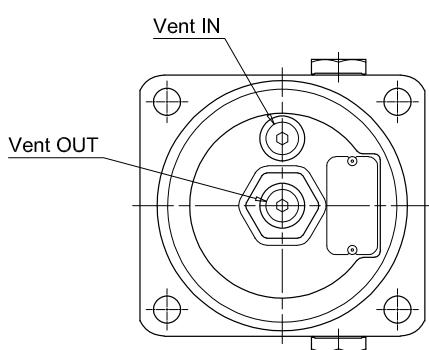
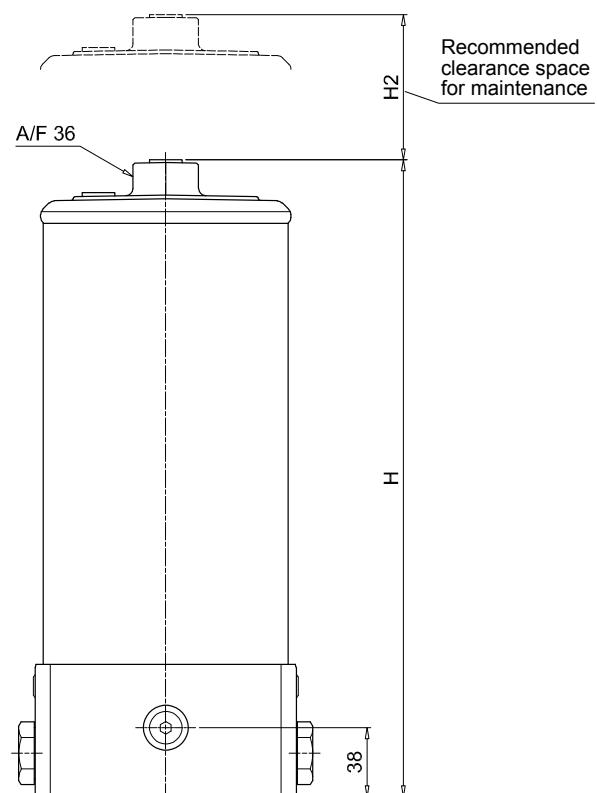
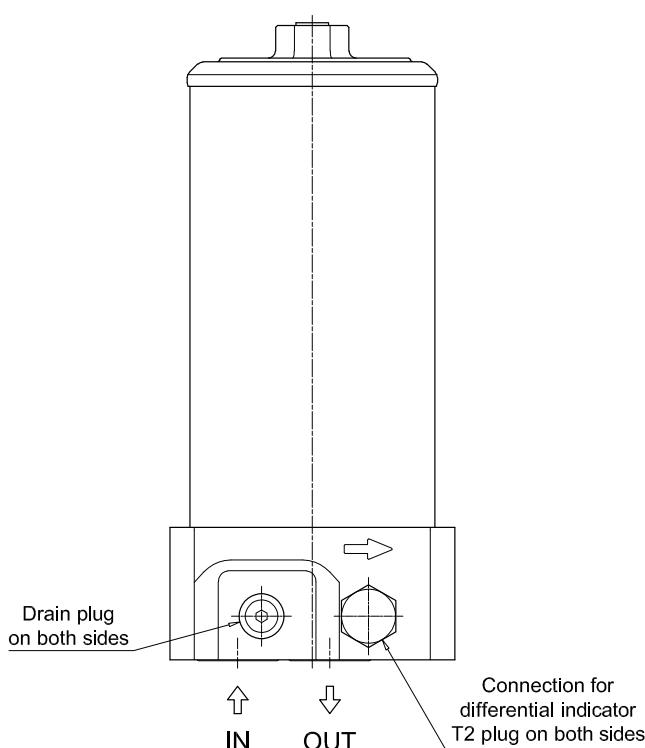
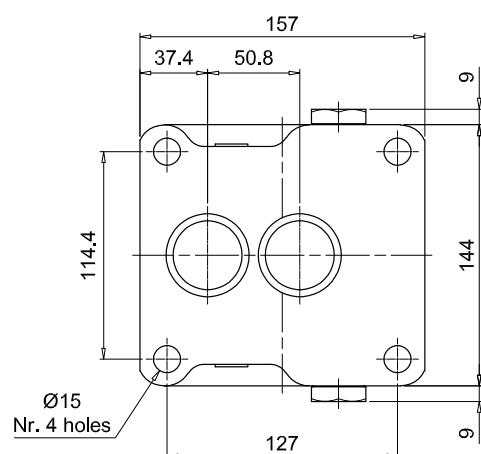
FHF325		
Connection A - B - C		
Filter length	H1 [mm]	H2 [mm]
1	452	250
2	690	485
3	928	725

# FHF325

## Dimensions



FHF325		
Connection M - N		
Filter length	H1 [mm]	H2 [mm]
1	452	250
2	690	485
3	928	725

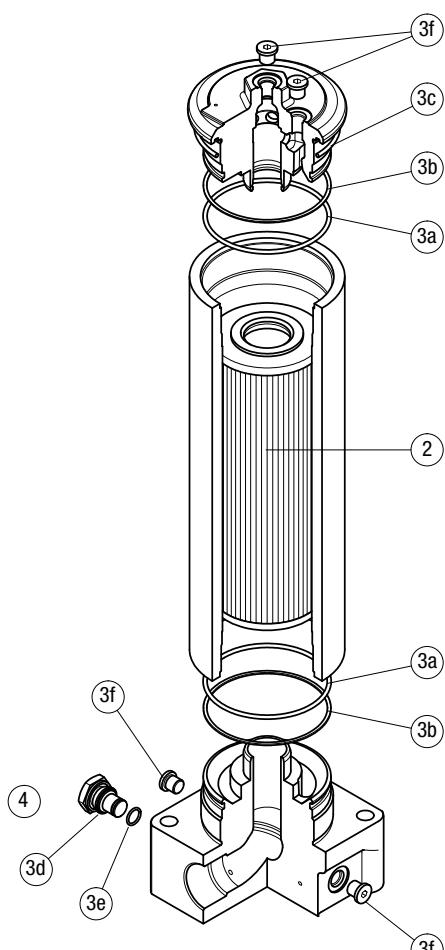


# FHF325 SPARE PARTS

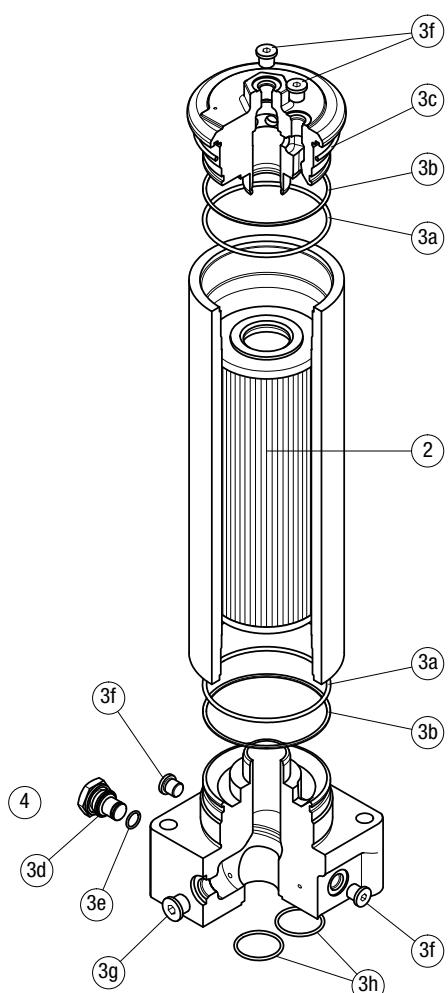
Filter housing according to SAE J2066 for HF4 filter elements

Order number for spare parts

**FHF 325**  
Connections  
A - B - C - G - H



**FHF 325**  
Connections  
M - N



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 2 pc.
Filter series	Filter element	Seal Kit code number	Indicator connection plug
<b>FHF 325</b> <b>A-B-C-G-H</b>	See order table	NBR FPM	NBR FPM
		02050588 02050589	T2H T2V

Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 2 pc.
Filter series	Filter element	Seal Kit code number	Indicator connection plug
<b>FHF 325</b> <b>M-N</b>	See order table	NBR FPM	NBR FPM
		02050590 02050591	T2H T2V