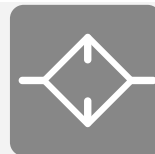


Screen and filter elements type HFC, HF, HFE

Product documentation



For mounting in threaded holes

Operating pressure p_{\max} :

700 bar

Flow rate Q_{\max} :

100 lpm

Flow direction:

any



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1**Screen and filter elements type HFC, HF, HFE**

Screen filters and filter elements are used to protect hydraulic components from coarser, occasionally occurring contamination in the hydraulic system. They are usually mounted directly in or on the pressure oil port (inlet, outlet) of the component to be protected.

The filter elements type HFC, HF and HFE are preferably used in small pressure oil circuits without significant flow rates, in which the oil column on the consumer side is more or less pushed back and forth. They are often sufficient to protect against malfunctions, but are no substitute for commercially available pressure filters and return line filters.

The screen filter type HFC is available as a screen disc with a hole diameter of 0.63 mm or as a filter element with a fine screen of 100 µm. It is divided into different sizes for common threaded connections or bores. The type HFE is designed with a screw-in element. The type HF is available as a cage.

Features and benefits

- Version as an installation kit or integrated in the housing
- Different sizes available
- Any flow direction

Intended applications

- Industrial hydraulics
- Mobile hydraulics
- Small pressure oil circuits, e.g. pilot control circuits, tension or clamping circuits



Screen and filter elements type HFC, HF, HFE

2 Available versions

2.1 Screw-in version (type HFC)

Circuit symbol



Ordering example

HFC 1/8

2.1.1 "Basic type"

2.1.1 Basic type

Type	Filter element	Ports ISO 228-1 or ISO fine thread DIN 13 or SAE J 514	Flow rate Q_{max} (lpm)
HFC 1/8	Screen disc hole \varnothing 0.6 mm, pitch 1.25	G 1/8	8
HFC 1/4		G 1/4	20
HFC 7/16-20 UNF		SAE-4 (7/16-20 UNF-2B)	
HFC 12		M12x1.5	
HFC 14		M14x1.5	
HFC 9/16-18 UNF		SAE-6 (9/16-18 UNF-2B)	25
HFC 3/8		G 3/8	30
HFC 16		M16x1.5	
HFC 18		M18x1.5	
HFC 1/2		G 1/2	50
HFC 20		M20x1.5	
HFC 22		M22x1.5	
HFC 3/4		G 3/4	100
HFC 27	M27x2		
HFC 1/4 F ¹⁾	Filter element with fine screen 100 μ m	G 1/4	15
HFC 14 F		M14x1.5	
HFC 3/8 F		G 3/8	25

1) If installed in consumer ports A and B of directional valve banks VB 01A..., F..., C... according to D 7300, BWN(H) 1.. according to D 7470 B/1 or BVZP 1 according to D 7785 B: Flatter filter bowl required. Specify when ordering: "with filter bowl 6406 017".

2.2 Housing version (type HF, HFE)

Circuit symbol



Ordering example

HF 1
HFE 1/4

2.2.1 "Basic type"

2.2.1 Basic type

Type	Filter element	Ports ISO 228-1 G1 - G2	Flow rate Q _{max} (lpm)
Housing with same-sized threads on both sides			
HF 1	Strainer hole Ø, pitch 0.5x1.25	G 1/4 A - G 1/4	12
HF 2		G 3/8 A - G 3/8	25
HF 1 F	Filter cage 100 µm	G 1/4 A - G 1/4	10
HF 2 F		G 3/8 A - G 3/8	20
HFE 1/4 F	with screw-in filter element	G 1/4 A - G 1/4	12
HFE 3/8 F		G 3/8 A - G 3/8	18
HFE 1/4	with screw-in strainer	G 1/4 A - G 1/4	20
HFE 3/8		G 3/8 A - G 3/8	30
HFE 1/2		G 1/2 A - G 1/2	50
HFE 3/4		G 3/4 A - G 3/4	100
Reduction housing			
HFE 3/8 - 1/4	with screw-in strainer	G 3/8 A - G 1/4	20
HFE 1/2 - 3/8		G 1/2 A - G 3/8	30
HFE 3/4 - 1/2		G 3/4 A - G 1/2	50

3 Parameters

3.1 General data

Design	Screen and filter elements for screwing in or in housing shape
Material	Stainless steel (screen discs)
Surface protection	Surface electro-galvanised
Attachment	in or on the pressure oil port (inlet, outlet) of the hydraulic device to be protected
Flow direction	any <ul style="list-style-type: none"> ▪ Type HF 1F, HF 2F: preferably from threaded hole G2 → tapped journal G1
Hydraulic fluid	Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 1500 mm ² /s Optimal operating range: approx. 10 - 500 mm ² /s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C. Not suitable for HETG such as rapeseed oil and water-glycol solutions, e.g. HFA and HFC.
Cleanliness level	ISO 4406 <u>20/17/14</u>
Temperatures	Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40°C is permissible (observe start viscosities) as long as the steady-state temperature is at least 20K higher during subsequent operation. Start temperature: down to -20°C is permissible (observe start viscosities) as long as the steady-state temperature is at least 20 K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

3.2 Weight

Housing version

Type

HF 1	= 0.1 kg
HF 2	= 0.15 kg
HF 1	= 0.1 kg
HF 2 F	= 0.15 kg
HFE 1/4 F	= 0.07 kg
HFE 3/8 F	= 0.07 kg
HFE 1/4	= 0.07 kg
HFE 3/8	= 0.07 kg
HFE 1/2	= 0.1 kg
HFE 3/4	= 0.15 kg
HFE 3/8 - 1/4	= 0.07 kg
HFE 1/2 - 3/8	= 0.1 kg
HFE 3/4 - 1/2	= 0.15 kg

3.3 Pressure and volumetric flow

Operating pressure

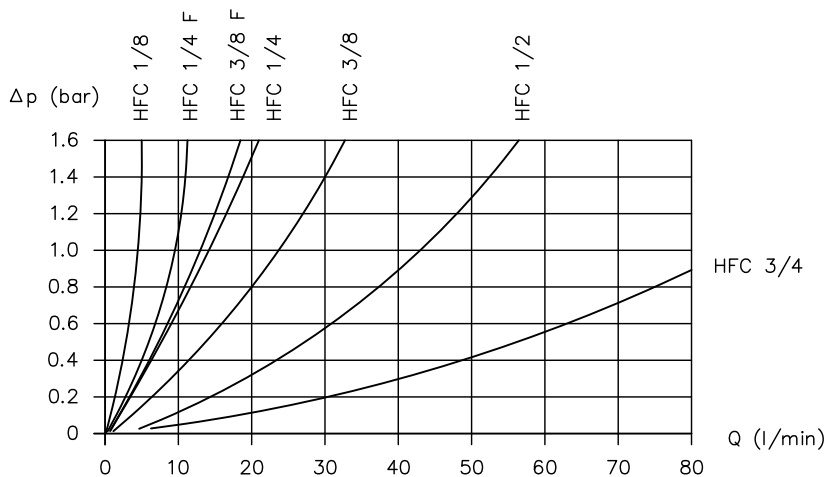
$p_{\max} = 700$ bar (screw-in version)
 $p_{\max} = 500$ bar (screw-in version)

3.4 Characteristic lines

Oil viscosity approx. $60 \text{ mm}^2/\text{s}$, valid for dirt-free screen

Type HFC and HFE

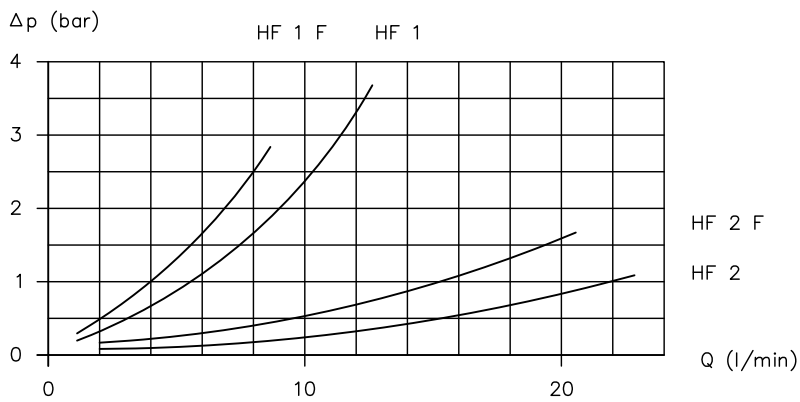
Δp -Q characteristics



max. permissible pressure difference:
 $\Delta p \approx 1.4$ to 1.6 bar

Type HF

Δp -Q characteristics



max. permissible pressure difference:

HF 1: $\Delta p \approx 3$ bar

HF 2: $\Delta p \approx 1.5$ bar

HF 1F: $\Delta p \approx 3$ bar ($G_2 \rightarrow G_1$)

HF 2F: $\Delta p \approx 1.5$ bar ($G_2 \rightarrow G_1$)

HF 1F: $\Delta p \approx 2$ bar ($G_1 \rightarrow G_2$)

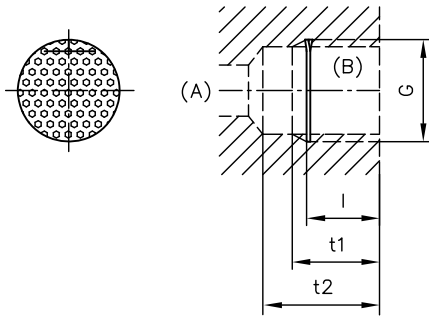
HF 2F: $\Delta p \approx 1$ bar ($G_1 \rightarrow G_2$)

4 Dimensions

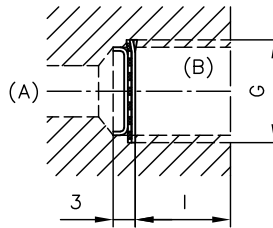
All dimensions in mm, subject to change.

4.1 Screw-in version (type HFC)

HFC
Version with screen disc



HFC..F
version with filter element



Type	Ports ISO 228-1 or ISO fine thread DIN 13 T6 or SAE J 514	l ¹⁾	t1	
	G			
HFC 1/8	G 1/8	12		
HFC 1/4	G 1/4	12		
HFC 7/16-20 UNF	SAE-4 (7/16-20 UNF-2B)	12		
HFC 12	M12x1.5	12		
HFC 14	M14x1.5	12		
HFC 9/16-18 UNF	SAE-6 (9/16-18 UNF-2B)	12		
HFC 3/8	G 3/8	12	approx. t1, t2 in ISO 228-1 or DIN 3852 or UNF according to ISO11926-1	
HFC 16	M16x1.5	12		
HFC 18	M18x1.5	13 ²⁾		
HFC 1/2	G 1/2	15 ²⁾		
HFC 20	M20x1.5	15 ²⁾		
HFC 22	M22x1.5	15 ²⁾		
HFC 3/4	G 3/4	17 ²⁾		
HFC 27	M27x2	17 ²⁾		
HFC 1/4 F	G 1/4	12		12 + 3 ³⁾
HFC 14 F	M14x1.5	12		12 + 3 ³⁾
HFC 3/8 F	G 3/8	12		12 + 3 ³⁾

1) Smallest possible thread length

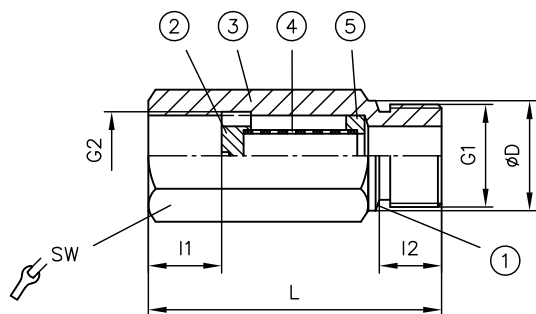
2) Thread compared to ISO 228-1 or DIN 13T6 by 1 mm deeper

3) For proper assembly: It is essential to adhere to the dimension for the thread outlet. It may be smaller, but not larger.

4.2 Housing version (type HF, HFE)

HF, HFE

Housing with same-sized threads on both sides

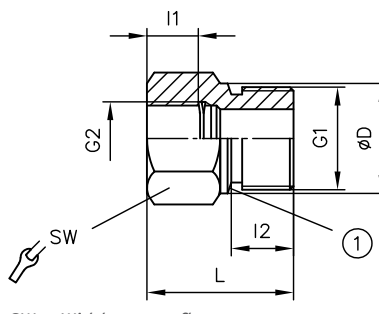


SW = Width across flats

- 1 Sealing edge
- 2 Threaded washer
- 3 Steel housing
- 4 Strainer
- 5 Guide ring

HFE

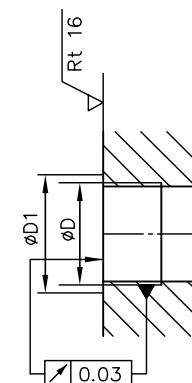
Reduction housing



SW = Width across flats

- 1 Sealing edge

Mounting hole



$\varnothing D1 = \varnothing D + 0.5$ to 1 mm

Type	Ports ISO 228-1		L	ØD	l1	l2	SW
	G1	G2					
Housing with same-sized threads on both sides							
HF 1	G 1/4 A	G 1/4	50	19	16	12	19
HF 2	G 3/8 A	G 3/8	58	22	15	12	22
HF 1 F	G 1/4 A	G 1/4	50	19	16	12	19
HF 2 F	G 3/8 A	G 3/8	58	22	15	12	22
HFE 1/4 F	G 1/4 A	G 1/4	35	19	12	12	19
HFE 3/8 F	G 3/8 A	G 3/8	35	22	12	12	22
HFE 1/4	G 1/4 A	G 1/4	35	19	12	12	19
HFE 3/8	G 3/8 A	G 3/8	35	22	12	12	22
HFE 1/2	G 1/2 A	G 1/2	40	27	14	14	27
HFE 3/4	G 3/4 A	G 3/4	45	32	16	16	32
Reduction housing							
HFE 3/8 - 1/4	G 3/8 A	G 1/4	38	22	12	12	22
HFE 1/2 - 3/8	G 1/2 A	G 3/8	36	28	12	14	27
HFE 3/4 - 1/2	G 3/4 A	G 1/2	41	32	14	16	32

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
 - ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).



DANGER

Sudden movement of the hydraulic drives when disassembled incorrectly

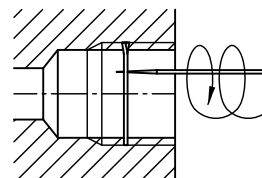
Risk of serious injury or death

- ▶ Depressurise the hydraulic system.
- ▶ Perform safety measures in preparation for maintenance.

5.2.1 Assembly process

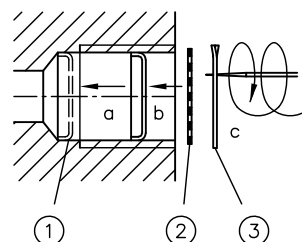
Assemble screen disc

1. Insert screen disc into the threaded hole, screw it in with a scriber or similar suitable tool up to the thread run-out.



Assemble filter element

1. Insert the inner support body (filter bowl), push it to the bottom of the hole.
2. Carefully slide in the filter disc.
3. Screw in the outer support body (screen disc) with a suitable tool.



- 1 Filter bowl
- 2 Filter disc
- 3 Screen disc

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.

The instructions for the complete technical system must also always be followed.

DAMAGE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.

CAUTION

Overloading components due to incorrect pressure settings.

Risk of minor injury.

- Pay attention to the maximum operating pressure of the pump and the valves.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

DAMAGE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level [see Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1 Oil recommendations](#)

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

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