

# Breathing filter

Type FEF 0, FEF 1

**RD 51513**

Edition: 2021-04



- ▶ Size 0 ... 1
- ▶ Flow, max.: 400 l/min [106 gpm]
- ▶ Connection up to DN 30, up to DN 55
- ▶ Operating temperature -30 °C to +100 °C [-22 °F to 212 °F]

## Features

- ▶ Special highly efficient filter materials
- ▶ Air filtration in hydraulic and lubricating oil tanks
- ▶ Prevention of initial damage of pumps, bearings and system components
- ▶ Filter rating optional 10 µm [10 micron] (paper) or 3 µm [3 micron] (micro glass)

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**Ordering code****Breathing filter Type FEF 0**

01	02	03	04	05	06
<b>FEF</b>	<b>0</b>	<b>-</b>	<b>P10</b>	<b>/</b>	<b>F</b>
				<b>-</b>	<b>0</b>
					<b>-</b>
					<b>0</b>

**Design**

01	Filling and breathing filter	<b>FEF</b>
02	Size	<b>0</b>

**Filter rating in  $\mu\text{m}$** 

03	<b>Nominal</b>	Filter paper, not cleanable	<b>P10</b>
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**Seal**

04	Fibre	<b>F</b>
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**Material**

05	Galvanized steel	<b>0</b>
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**Supplementary information**

06	without	<b>0</b>
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## Ordering code

### Breathing filter Type FEF 1

01	02	03	04	05	06	07	08					
FEF	1	-	2X	/	-	M	-	K	-	ES100	-	

#### Design

01	Filling and breathing filter	<b>FEF</b>
02	Size	<b>1</b>

#### Component series

03	<b>Component series 20 ... 29</b> (20 ... 29: unchanged installation and connection dimensions)	<b>2X</b>
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#### Filter rating in µm

04	<b>Absolute</b>	Micro glass, not cleanable	<b>H3V3</b>
	<b>Nominal</b>	Filter paper, not cleanable	<b>P10</b>

#### Seal

05	NBR seals	<b>M</b>
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#### Material

06	CED-coated steel	<b>K</b>
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#### Supplementary information

07	Filling strainer, length 100 mm [3.94 in]	<b>ES100</b>
08	Chain	<b>KT</b>
	Side clip	<b>L</b>
	Backflow prevention	<b>R</b>

## Order example and Preferred types<sup>1)</sup>

### Order example

### Preferred types

Material number	Description	Material number	Description
<b>R928052084</b>	FEF1-2X/H3V3-M-K-ES100-L	<b>R928052084</b>	FEF1-2X/H3V3-M-K-ES100-L
		<b>R928052088</b>	FEF1-2X/H3V3-M-K-ES100
		<b>R928052102</b>	FEF1-2X/P10-M-K-ES100
		<b>R928052112</b>	FEF1-2X/H3V3-M-K-ES100-R
		<b>R928058351</b>	FEF1-2X/H3V3-M-K-ES100-KT
		<b>R928058352</b>	FEF1-2X/P10-M-K-ES100-KT
<b>R928018808</b>	FEF 0 P10-F00	<b>R928018808</b>	FEF 0 P10-F00

<sup>1)</sup> Further versions are available on request.

## Function, section

Combination of flange-mounting filling filter and cap removable over the bayonet lock as air breather with internal filter element. The filter element must be exchanged with the cap. The breathing filters are used in hydraulic systems for filtration of the suction air of the fluid tank. They are designed for installation on fluid tanks.

Depending on the process cycles, the air and contamination are drawn into the fluid tank. By use of our breathing filters, air circulation at the fluid tank can still be ensured and the system be protected against contamination.

They basically consist of a cap (1) with bayonet lock including filter element (2) as well as a base (3) with filling strainer (4) for mounting at the tank.

Via the bayonet lock, the cap (1) is connected to the base (3). The contaminated air flow is directed via opening (A) through the filter element and into the fluid tank (T). Before entering the fluid tank, any air is filtered. The out-flowing air is also directed through the filter element.

### Type FEF 0

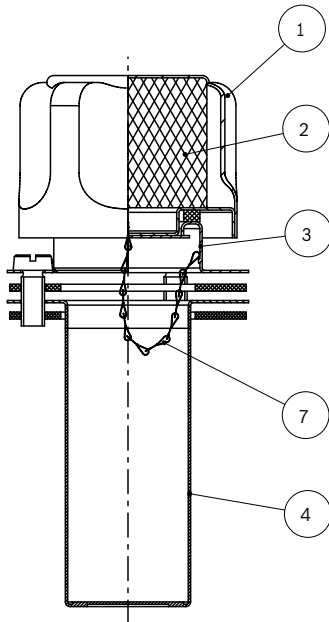
By default, the cap (1) is connected via a chain (7) to the base (3).

### Type FEF 1

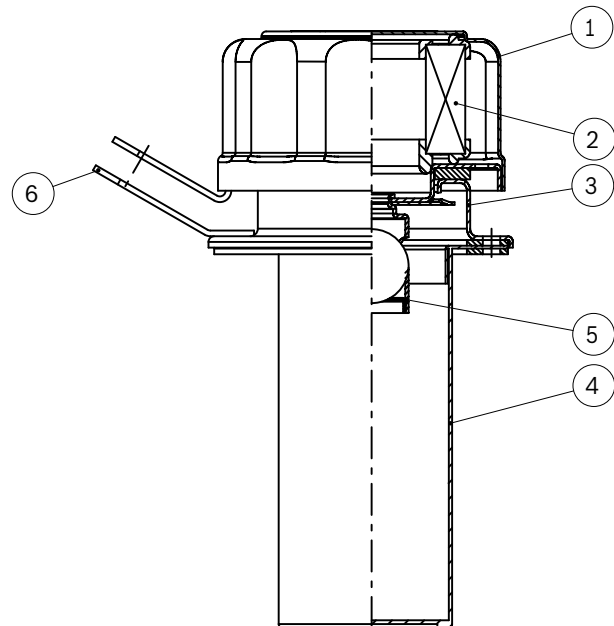
The filter is optionally available with return flow protection (amending specification of R (5)). Additionally, a configuration with lockable lateral clip (amending specification of L (6)) can be realized. The cap (1) can also be connected to the base (3) via a chain (amending specification of KT) to prevent loss of the cap.

The scope of delivery of both breathing filters includes slotted hexagon socket head cap screws, galvanized, M5x12 DIN84 4.8.

### Type FEF 0



### Type FEF 1



## Technical data

(For applications outside these parameters, please consult us!)

General			
Installation position		Vertical	
Operating temperature range	°C [°F]	-30...+100 [- 22...+212]	
Ambient temperature range	°C [°F]	-30...+100 [- 22...+212]	
Storage conditions	°C [°F]	-30...+100 [- 22...+212]	
Connection	<b>NG</b>	<b>0</b>	<b>1</b>
	Standard	up to DN 30	up to DN 55
Material	▶ Cap	Galvanized steel Fibers (organic or inorganic); Polyurethane end disks	CED-coated steel Fibers (organic or inorganic); Polyurethane end disks
	▶ Seals	NBR-bound cellulose fibers	NBR
	▶ Flange	Galvanized steel	CED-coated steel
	▶ Filling strainer	Galvanized steel / rating 800 µm	Galvanized steel / rating 500 µm
	▶ Hexagon socket head cap screw	Cylinder head screw M5x12 DIN84 Material 4.8	
Weight	kg [lbs]	0,17 [0.37]	0,32 [0.71]

## Compatibility with permitted hydraulic fluids

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oil	HLP	NBR	DIN 51524



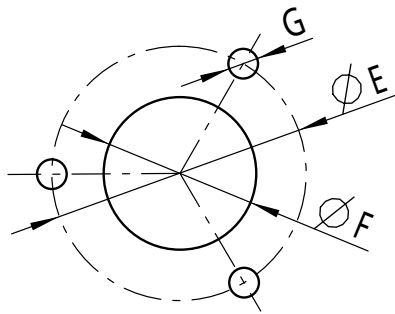
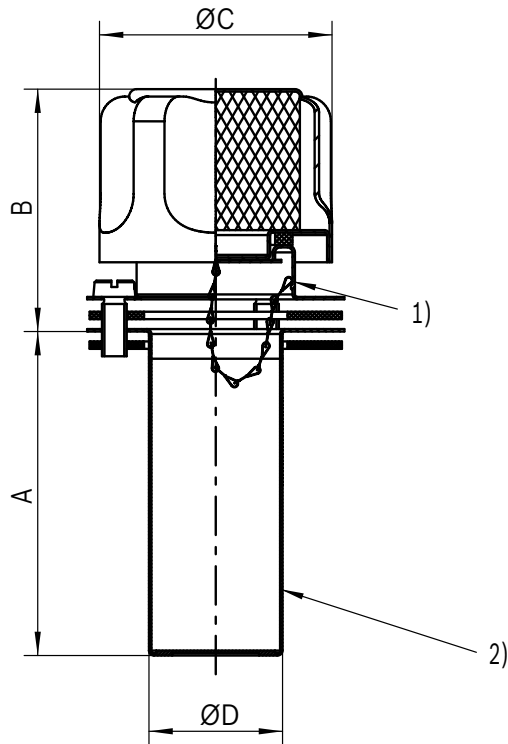
### Important information on hydraulic fluids:

- ▶ For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us.

The following table shows the areas of application of the breathing and air bleed filter in hydraulic systems.

Type	Capacity fluctuation		Comment
	Maximum air flow at a pressure differential of 0,01 bar [0.15 psi] l/min [gpm] at pure element		
	Standard hydraulic range	Use in potentially explosive areas (see directive 2014/34/EU (ATEX))	
FEF 0 P10-F00	42 l/min [11.1 gpm]	21 l/min [5.5 gpm]	–
FEF1-2X/*-M-K-ES100	400 l/min [106 gpm]	200 l/min [52.8 gpm]	* Includes all variants except versions with R
FEF1-2X/*-M-K-ES100-R	85 l/min [22.5 gpm]	42 l/min [11.1 gpm]	* Includes all variants including versions with R

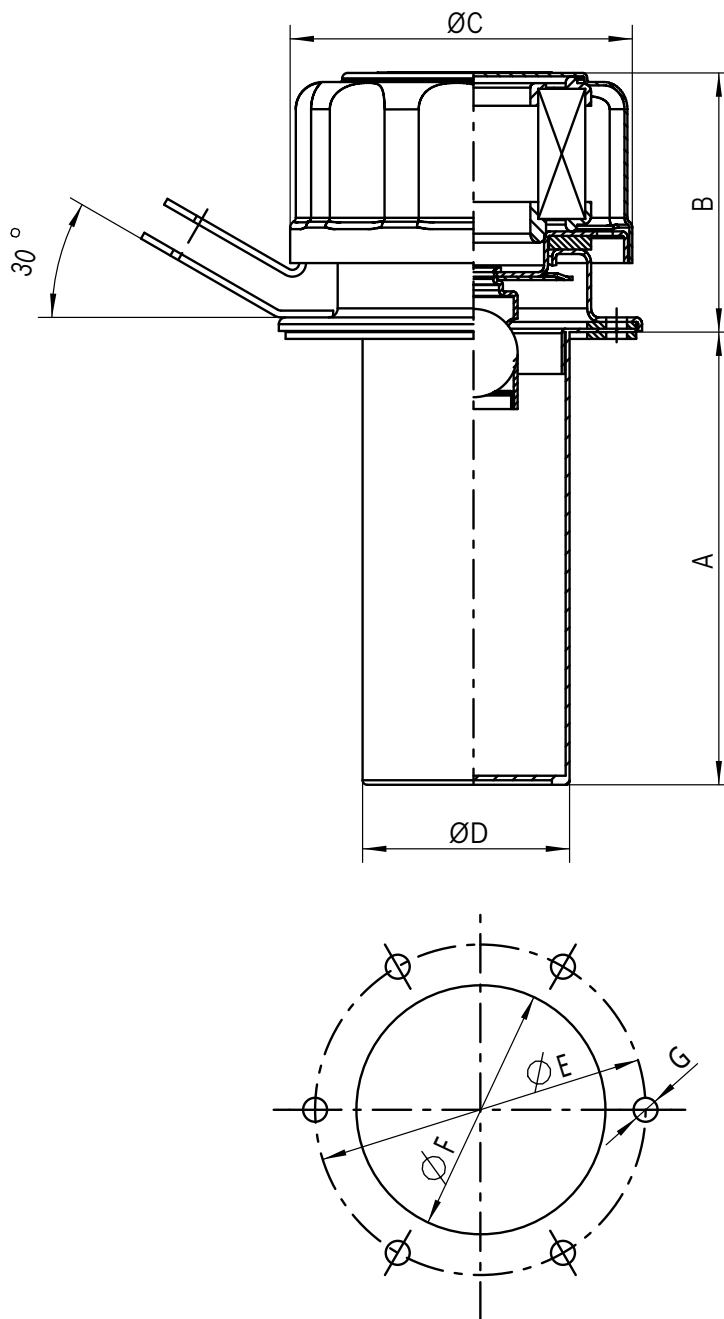
**Dimensions: FEF 0**  
(dimensions in mm [inch])



- 1) Chain with rivet secured at flange and air breather
- 2) Filter rating 800 µm [800 micron]

A	B	Ø C	Ø D	Ø E	Ø F	G
66 [2.6]	42,5 [1.67]	47 [1.85]	27 [1.06]	41 [1.61]	30 [1.18]	M5

**Dimensions: FEF 1**  
(dimensions in mm [inch])



A	B	Ø C	Ø D	Ø E	Ø F	G
100 [3.94]	56 [2.2]	81 [3.19]	49 [1.93]	73 [2.87]	55 [2.17]	M5

## Mounting, Commissioning, Maintenance

### Mounting

- ▶ Filter connection must correspond to the hole pattern (DIN 24557-2) at the tank.
- ▶ Position the seal on the hole pattern at the tank, insert the filling strainer and apply the second seal.
- ▶ Over the flange, all parts are fitted at the tank. For this purpose, the screws included in the scope of delivery (see tightening torques) must be used.
- ▶ Screw-in the cap in clockwise direction (see tightening torques).
- ▶ We recommend a minimum clearance of 140 mm [5.51 inch] between filter and oil level.

### Tightening torques

Cap		FEF...
Tightening torque with $\mu_{\text{total}} = 0.14$	Nm [lb-ft]	30 [22]
Screws M5	Nm [lb-ft]	0,9 [0.66]

### Commissioning

For commissioning of the system, no measures must be taken regarding the breathing filter.

### Maintenance

Exchanging the cap:

The cap with integrated filter element must be replaced at least every 6 months. The degree of contamination of the filter element can be indicated by means of vacuum monitoring at the tank (see accessories). We recommend changing the cap at an underpressure of 0.05 bar [0.73 psi].

### Exchanging the cap

Filter application range	Environmental conditions medium dust content	Maintenance interval
General mechanical engineering	9...25 mg/m <sup>3</sup> [0.05...0.14 oz/in <sup>3</sup> ]	4000 h
Heavy industry	50...80 mg/m <sup>3</sup> [0.29...0.46 oz/in <sup>3</sup> ]	3000 h
Mobile hydraulics	30...100 mg/m <sup>3</sup> [0.17...0.58 oz/in <sup>3</sup> ]	3000 h



## Directives and standardization

### Product validation

Hengst filters, the filter elements built into them and filter accessories are tested and quality-monitored according to different ISO test standards:

Filtration performance test (multipass test)	ISO 16889:2008-06
Compatibility with hydraulic fluid	ISO 2943:1998-11

The development, manufacture and assembly of Hengst industrial filters and Hengst filter elements is carried out within the framework of a certified quality management system in accordance with ISO 9001:2015.

### Classification according to the Pressure Equipment Directive

Hengst FEF1 breathing and air bleed filters according to data sheet 51513 are not classified as devices or components according to Pressure Equipment Directive 2014/68/EU (PED).

### Use in potentially explosive areas according to directive 2014/34/EU:

This filter is not classified as device or component according to directive 2014/34/EU and does not bear a CE mark. It has been proven with the ignition risk analysis that this breathing filter does not have own ignition sources according to DIN EN ISO 80079-36.

The filter can be used for the following potentially explosive atmospheres:

	Zone suitability	
	1	2
Gas	1	2
Dust	21	22

Breathing filter			
Use/assignment		Gas 2G	Dust 2D
Assignment		Ex h IIC T4...T1 Gb	Ex h IIC T100°C...T450°C Db <sup>1)</sup>
Minimum conductivity of the medium	pS/m min	300	
Dust accumulation	max	–	0,5 mm [0.019 inch]

<sup>1)</sup> The temperature depends on the temperature of the medium in the filter and must not exceed the value specified here.

## Intended use

This filter consists of a filter cap with bayonet lock and filter element, base and filling strainer which serve as components in the sense of the EC Machinery Directive 2006/42/EC in hydraulic machinery for the separation of dirt particles.

This filter may be used under the following boundary conditions and limits:

- ▶ Only in systems with fluids of group 2, according to Pressure Equipment Directive 2014/68/EU.
- ▶ Only according to the application and environmental conditions in the section "Technical data"
- ▶ Only in compliance with the specified performance limits in the section "Technical data"; extended operational durability/load cycles on request
- ▶ Only with hydraulic fluids and the intended seals according to the section „Compatibility with hydraulic fluids“
- ▶ Use in potentially explosive areas according to the section „Directives and standardization“.
- ▶ The notes regarding the operating modes according to the section „Assembly, commissioning, maintenance“ must be observed.
- ▶ Compliance with application and environmental conditions according to the technical data.
- ▶ Compliance with the specified performance limits.
- ▶ Use in the original condition, without damage.
- ▶ For any maintenance including replacement of the filter cap, original Hengst spare parts must always be used.
- ▶ Repair by the customer, particularly at pressurized components, is inadmissible.
- ▶ This filter is exclusively intended for professional use and not for private use.
- ▶ The filter cap may only be used as spare part if it is combined with the original Hengst base.
- ▶ Regarding the installation position, it must be ensured that the filter cap is always aligned to „12 o'clock“.

## Improper use

Any use deviating from the intended use is improper and thus not admissible.

Improper use of the filters includes:

- ▶ Incorrect storage
- ▶ Incorrect transport
- ▶ Lack of cleanliness during storage, assembly and operation
- ▶ Incorrect installation
- ▶ Use of inappropriate/non-admissible hydraulic fluids
- ▶ Exceedance of the specified maximum pressures and load cycles
- ▶ Operation outside the approved temperature range
- ▶ Installation and operation in an inadmissible device group or category
- ▶ Operation outside the specified limits for the operating voltage, see the section „Technical data“

Hengst Filtration GmbH does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

Hengst Filtration GmbH  
Hardtwaldstr. 43  
68775 Ketsch, Germany  
Phone +49 (0) 62 02 / 6 03-0  
hydraulicfilter@hengst.de  
www.hengst.com

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