

## Return Line Filter HF4R up to 450 l/min, up to 10 bar



### 1. TECHNICAL SPECIFICATIONS

#### 1.1 FILTER HOUSING

##### Construction

The filter housings are designed in accordance with international regulations. They consist of a filter head, filter bowl and a bolt-on cover plate.

Standard equipment:

- bypass valve
- connection for a clogging indicator

#### 1.2 FILTER ELEMENTS

HYDAC filter elements are validated and their quality is constantly monitored according to the following standards:

- ISO 2941
- ISO 2942
- ISO 2943
- ISO 3724
- ISO 3968
- ISO 11170
- ISO 16889

Filter elements are available with the following pressure stability values:

Betamicon® (BN):	10 bar
Stainl. steel wire mesh (W/HC):	10 bar
Paper (P)	10 bar

#### 1.3 FILTER SPECIFICATIONS

Nominal pressure	10 bar
Fatigue strength	At nominal pressure 10 <sup>6</sup> cycles from 0 to nominal pressure
Temperature range	-30 °C to +100 °C
Material of filter head	Aluminium
Material of filter bowl	Steel
Type of clogging indicator	VMF (return line indication)
Pressure setting of clogging indicator	2 bar (others on request)
Bypass cracking pressure	3 bar (others on request)

#### 1.4 SEALS

NBR (=Perbunan)

#### 1.5 MOUNTING

Inline filter

#### 1.6 SPECIAL MODELS AND ACCESSORIES

- Without bypass valve
- Without port for clogging indicator

#### 1.7 SPARE PARTS

See Original Spare Parts List

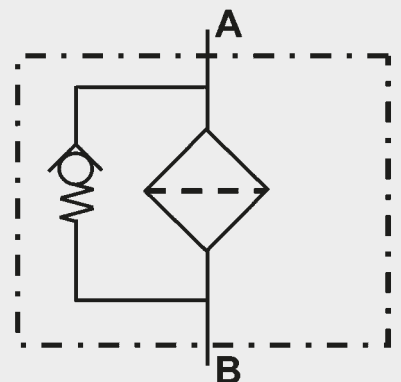
#### 1.8 CERTIFICATES AND APPROVALS

On request

#### 1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- Hydraulic oils H to HLPD DIN 51524
- Lubrication oils DIN 51517, API, ACEA, DIN 51515, ISO 6743
- Compressor oils DIN 51506
- Biodegradable operating fluids VDMA 24568 HETG, HEES, HEPG
- Fire-resistant fluids HFA, HFB, HFC and HFD
- Operating fluids with high water content (> 50 % water content) on request

#### Symbol for hydraulic systems



## 2. MODEL CODE (also order example)

**HF4R BN 09 G 3 C 1 . X /12 V-B6**

### 2.1 COMPLETE FILTER

**Filter type** \_\_\_\_\_

HF4R

**Filter material of elements** \_\_\_\_\_

BN Betamicon (BN)  
W Wire mesh  
P Paper

**Size of filter or element** \_\_\_\_\_

09 9"  
18 18"  
27 27"

**Connection** \_\_\_\_\_

G threaded port  
F flange port

**Filtration rating in µm** \_\_\_\_\_

BN : 3, 5, 10, 20  
W/HC : 25, 74, 149  
P : 10, 20

**Type of clogging indicator** \_\_\_\_\_

W without port (no clogging indicator)  
A steel blanking plug in indicator port  
B visual } for other clogging indicators,  
C electrical } see brochure no. 7.050../..  
D visual and electrical }  
J electrical switch (Brad Harrison 5 Pin Mini)  
J4 electrical switch (Brad Harrison 4 Pin Micro)

**Type code** \_\_\_\_\_

1 1 inlet  
2 2 inlets

**Modification number** \_\_\_\_\_

X the latest version is always supplied

**Supplementary details**

0 BSPP 1¼"  
3 NPT 1½"  
12 SAE-24-O-ring boss  
16 SAE 1½" flange (210 bar)

B. bypass cracking pressure (e.g. B1 = 1 bar); without details = without bypass valve  
L... light with appropriate voltage (24, 48, 110, 220 Volt) ] only for clogging indicator  
LED 2 light emitting diodes up to 24 Volt ] type "D"  
V FPM seals  
W suitable for HFA and HFC emulsions

### 2.2 REPLACEMENT ELEMENT

**5.03.09 D 03 BN /-V**

**Size** \_\_\_\_\_

09 9"  
18 18"  
27 27"

**Type** \_\_\_\_\_

D

**Filtration rating in µm** \_\_\_\_\_

BN : 03, 05, 10, 20  
W/HC : 25, 74, 149  
P : 10, 20

**Filter material** \_\_\_\_\_

BN, W/HC, P

**Supplementary details** \_\_\_\_\_

V, W (for descriptions, see point 2.1)

### 2.3 REPLACEMENT CLOGGING INDICATOR

**VMF 2 D . X /-L24**

**Type of indicator** \_\_\_\_\_

VMF Return line pressure indicator

**Pressure setting** \_\_\_\_\_

2 standard 2 bar, others on request

**Type of clogging indicator** \_\_\_\_\_

D (see point 2.1)

**Modification number** \_\_\_\_\_

X the latest version is always supplied

**Supplementary details** \_\_\_\_\_

L..., LED, V, W (for descriptions, see point 2.1)

### 3. FILTER CALCULATION / SIZING

The total pressure drop of a filter at a certain flow rate Q is the sum of the housing  $\Delta p$  and the element  $\Delta p$  and is calculated as follows:

$$\Delta p_{\text{total}} = \Delta p_{\text{housing}} + \Delta p_{\text{element}}$$

$$\Delta p_{\text{housing}} = (\text{see Point 3.1})$$

$$\Delta p_{\text{element}} = Q \cdot \frac{SK^*}{1000} \cdot \frac{\text{viscosity}}{30}$$

(\*see point 3.2)

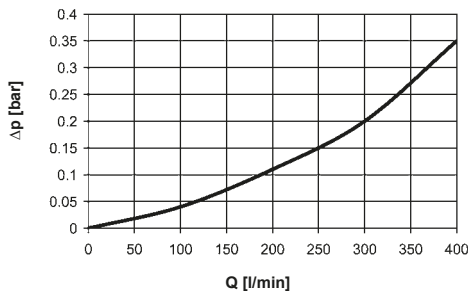
For ease of calculation, our Filter Sizing Program is available on request free of charge.

**NEW:** Sizing online at [www.hydac.com](http://www.hydac.com)

#### 3.1 $\Delta p$ -Q HOUSING CURVES BASED ON ISO 3968

The housing curves apply to mineral oil with a density of 0.86 kg/dm<sup>3</sup> and a kinematic viscosity of 30 mm<sup>2</sup>/s. In this case, the differential pressure changes proportionally to the density.

##### HF4R

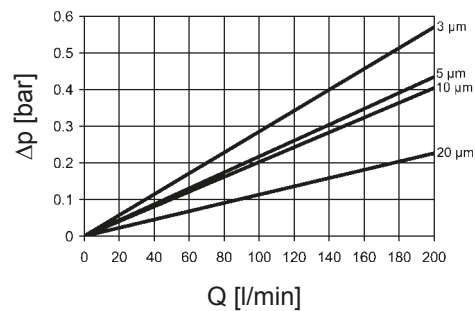


### 3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

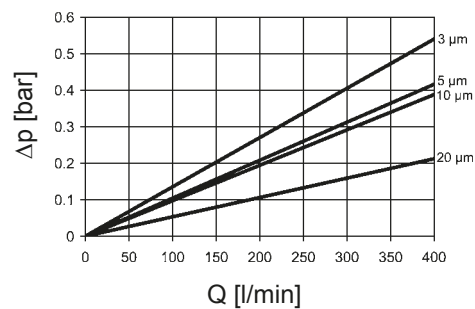
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm<sup>2</sup>/s. The pressure drop changes proportionally to the change in viscosity.

HF4R	BN				W
	3 μm	5 μm	10 μm	20 μm	-
09	2.85	2.17	2.02	1.13	0.128
18	1.35	1.04	0.97	0.53	0.073
27	0.88	0.67	0.62	0.35	0.036

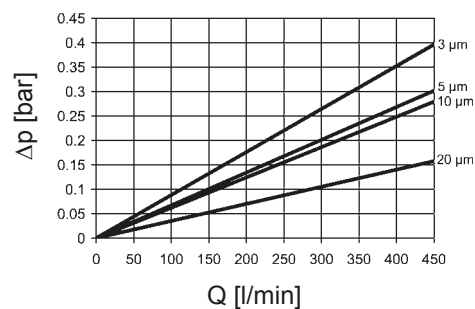
#### 09 BN:



#### 18 BN:

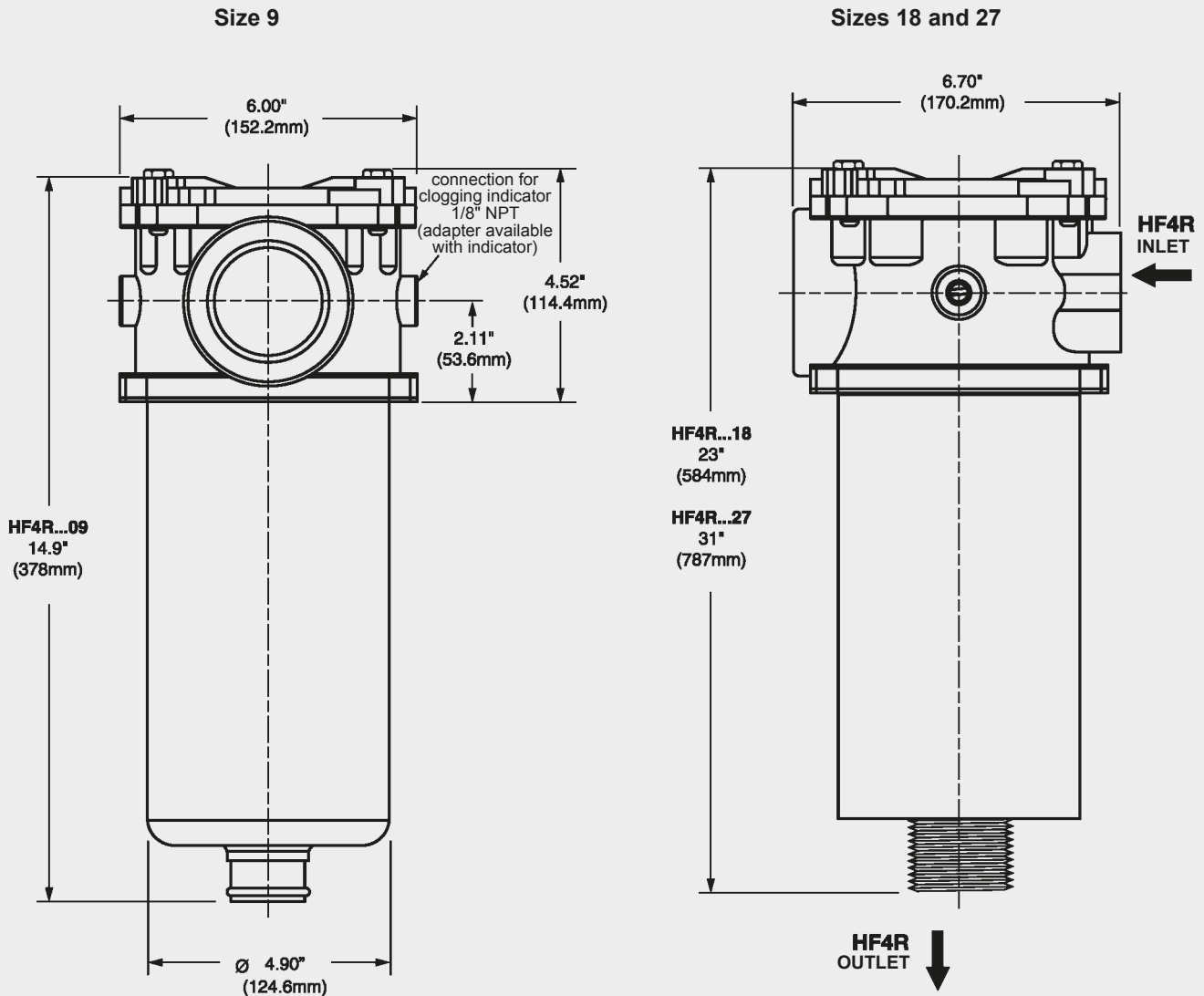


#### 27 BN:

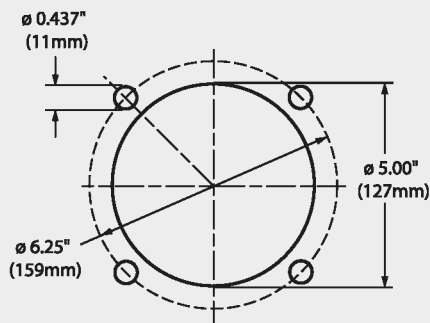


## 4. DIMENSIONS

### HF4R



### Mounting specifications



HF4R	Weight incl. element [kg]
09	4.53
18	6.58
27	8.44

### 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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