

The HYDAC logo is presented in a white, rounded rectangular box with a red border, set against a black background. The word "HYDAC" is written in a bold, white, sans-serif font.

# INTERNATIONAL

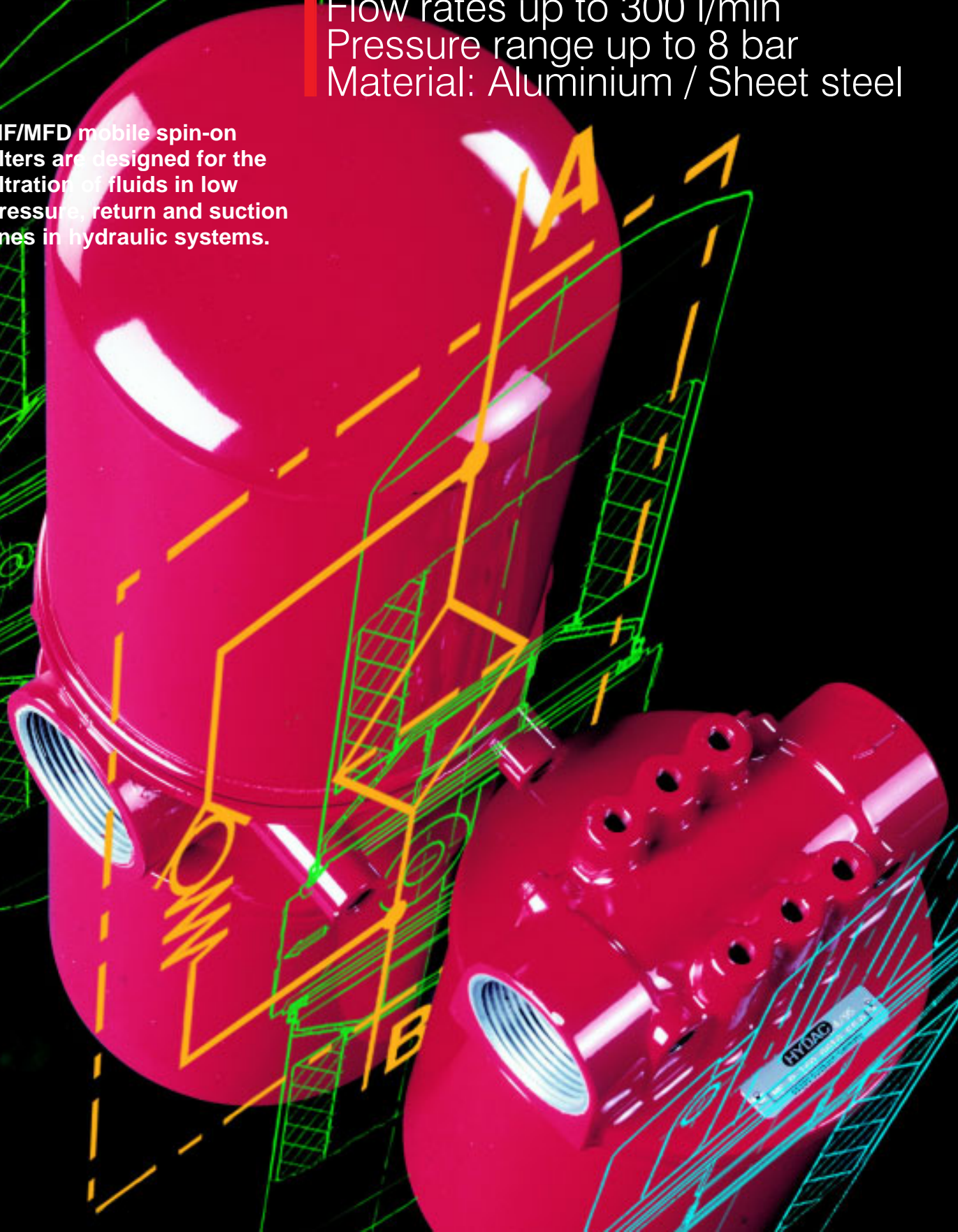
## Mobile Spin-On Filter MF/MFD

Flow rates up to 300 l/min

Pressure range up to 8 bar

Material: Aluminium / Sheet steel

MF/MFD mobile spin-on filters are designed for the filtration of fluids in low pressure, return and suction lines in hydraulic systems.



# 1. TECHNICAL SPECIFICATIONS

## 1.1. FILTER HOUSING

### Construction

The mobile spin-on filter consists of a filter head with a built-in bypass valve and a screw-on filter cartridge.

## 1.2. FILTER ELEMENTS

MG: Cartridge connection thread to ISO 228  
Sealing on the inside

MA: Cartridge connection UN thread  
Sealing on the outside

MU: Cartridge connection UN thread  
Sealing on the inside

### Fluid compatibility

Suitable for mineral oils, lubrication oils, non-flam fluids, synthetic and rapidly biodegradable oils.

## 1.3. CLOGGING INDICATORS

VMF 0.2 UF .0

Type of indicator  
VMF

Pressure setting  
See point 2

Indicator type  
E. = pressure gauge  
F. = pressure switch  
UE. = vacuum gauge  
UF. = vacuum switch

Modification number  
0 = the latest version is always supplied

For further details on clogging indicators, please see **brochure, no. E 7.050../.**

## 1.4. SEALS

Perbunan (=NBR)

## 1.5. SPECIAL MODELS AND ACCESSORIES

– Filter without bypass valve

## 1.6. SPARE PARTS

See Original Spare Parts List and Maintenance Instructions.

# 2. GENERAL

## Mounting

As inline filter

## Temperature range

-30 °C to +100 °C

## Pressure setting of the differential pressure clogging indicator

Typ E: 0 to 16 bar

Typ F: 2 bar -0.2 bar  
1.5 bar -0.2 bar

Typ UE: 0 to -1.0 bar

Typ UF: -0.2 bar

Other pressure settings on request

## Cracking pressure of the bypass valve

MF 80

$\Delta p_o = 1.7 \text{ bar} + 10\%$  (standard)

MF 160/180

$\Delta p_o = 2 \text{ bar} + 10\%$  (standard)

$\Delta p_o = 0.2 \text{ bar}$  (as suction filter)

KB

MFD 160/180

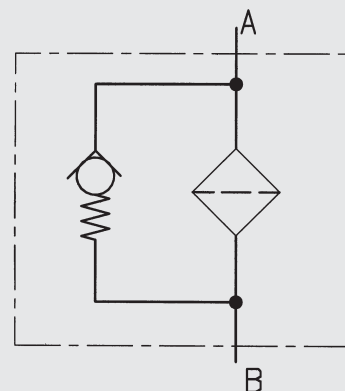
$\Delta p_o = 1.7 \text{ bar}$  (standard)

$\Delta p_o = 0.25 \text{ bar}$  (as suction filter)

KB

Other cracking pressures on request

## Hydraulic symbol



### 3. MODEL CODE

(also order example)

#### 3.1. COMPLETE FILTER

**MF BN 160 A G E 10 F 1 .X /-KB**

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

MF (all sizes) (1 element)  
MFD (sizes 160 and 180) (2 elements)

**Filter material of element** \_\_\_\_\_

BN Betamicron®  
P Paper

**Housing material / Size** \_\_\_\_\_

Aluminium/sheet steel : 80, 160, 180

**Operating pressure** \_\_\_\_\_

A 8 bar (all sizes)

**Type of cartridge connection** (see tables under Point 4) \_\_\_\_\_

G thread to ISO 228 (G ¾, G 1¼)  
U UN thread (1-12 UNF, 1½x16 UN-2B)

**Type and size of port** \_\_\_\_\_

Type	Port	Filter size		
		80	160	180
C	G 3/4	MF	–	–
E	G1 1/4	–	MF	MF
F	G1 1/2	–	MFD	MFD

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

BN 3, 5, 10, 20  
P 10

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

A	without indicator, steel blanking plug in indicator port	] pressure indicators	} for other clogging indicators see brochure no. E 7.050../..
E	pressure gauge		
F	pressure switch		
UE	vacuum gauge	] vacuum indicators	
UF	vacuum switch		

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

0  
1  
2  
3  
4 see point 3.3  
5  
6  
7  
8

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

X the latest version is always supplied

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

KB blocked bypass valve (not possible for size 80)  
B. special bypass cracking pressure (B0.2 = 0.2 bar, B0.25 = 0.25 bar)  
B1.7 always state when ordering MF 80  
SO 348 operating pressure max. 0 bar

#### 3.2. REPLACEMENT ELEMENT

**0160 MA 010 BN**

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

0080, 0160, 0180

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

MG (only for sizes 80 and 160)  
MA (only for sizes 160 and 180)  
MU (only for size 80)

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

BN: 3, 5, 10, 20 (10 µm and 20 µm only for size 80)  
P: 10

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

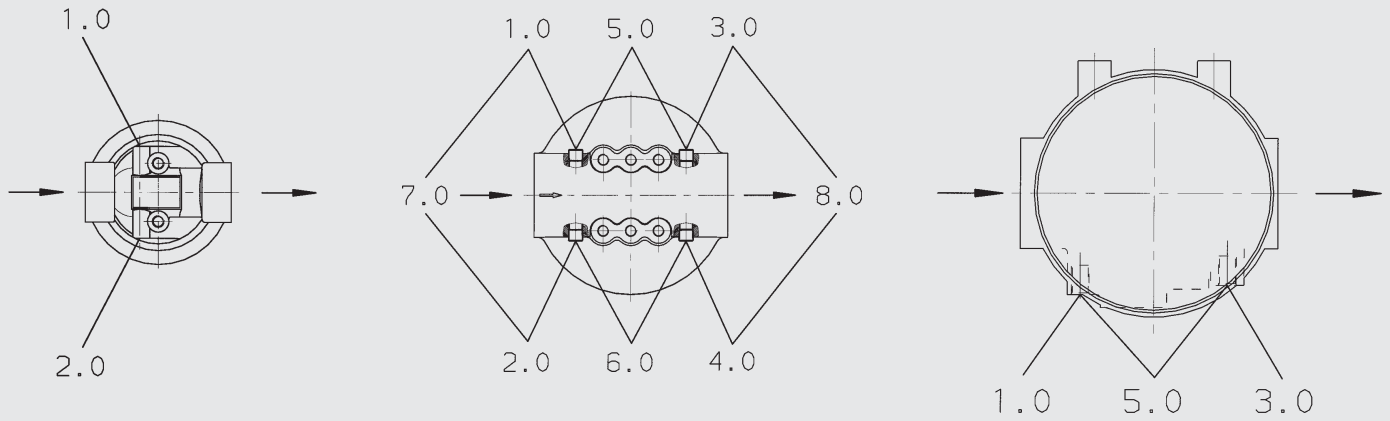
BN, P

### 3.3. MOUNTING POSITION OF THE CLOGGING INDICATOR

MF 80

MF 160/180

MFD 160/180



#### For MF filters

Type code	Mounting position of the clogging indicator	Application of the complete filter	Type of the indicator	Specials
0.0	Without clogging indicator	–	–	–
1.0	On filter inlet Left-hand side	Return line filter	Pressure indicator	–
2.0	On filter inlet Right-hand side	Return line filter	Pressure indicator	–
3.0	On filter outlet Left-hand side	Suction filter	Vacuum indicator	Only for sizes 160 and 180: - with bypass cracking pressure 0.2 bar (.../-B0.2) - with blocked bypass valve (.../-KB)
4.0	On filter outlet Right-hand side	Suction filter	Vacuum indicator	Only for sizes 160 and 180: - with bypass cracking pressure 0.2 bar (.../-B0.2) - with blocked bypass valve (.../-KB)
5.0	On filter inlet and outlet Left-hand side	Pressure filter	Pressure indicator	–
6.0	On filter inlet and outlet Right-hand side	Pressure filter	Pressure indicator	–
7.0	On filter inlet Right-hand and left-hand sides	Return line filter	Pressure indicator	–
8.0	On filter outlet Right-hand and left-hand sides	Suction filter	Vacuum indicator	Only for sizes 160 and 180: - with bypass cracking pressure 0.2 bar (.../-B0.2) - with blocked bypass valve (.../-KB)

#### For MFD filters

Type code	Mounting position of the clogging indicator	Application of the complete filter	Type of the indicator	Specials
0.0	Without clogging indicator	–	–	–
1.0	On filter inlet Right-hand side	Return line filter	Pressure indicator	–
3.0	On filter outlet Right-hand side	Suction filter	Vacuum indicator	Only for versions: - with bypass cracking pressure 0.2 bar (.../-B0.2) - with blocked bypass valve (.../-KB)
5.0	On filter inlet and outlet Right-hand side	Pressure filter	Pressure and vacuum indicator	

## 4. FILTER SPECIFICATIONS

Type of filter	Inlet / outlet port	Cartridge connection	Weight [kg] incl. element
MF 80	G ¾	G ¾ 1 – 12 UNF	0.9
MF 160	G 1¼	G 1¼, 1½x16 UN-2B	2.3
MF 180	G 1¼	1½x16 UN-2B	2.8
MFD 160	G 1½	G 1¼, 1½x16 UN-2B	3.7
MFD 180	G 1½	1½x16 UN-2B	4.5

### 4.1. CARTRIDGE SELECTION TABLE

Filter type				MF				MFD	
Port type				AGC	AUC	AGE	AUE	AGF	AUF
Cartridge				Thread to DIN 228 (Sealing on inside)	UN thread (Sealing on inside)	Thread to DIN 228 (Sealing on inside)	UN thread (Sealing on outside)	Thread to DIN 228 (Sealing on inside)	UN Thread (Sealing on outside)
Size	Type	Filt. rating	Material of filter						
0080	MU	010	P	–	●	–	–	–	–
0080	MG	010	P	●	–	–	–	–	–
0160	MG	010	P	–	–	●	–	●	–
0180	MA	010	P	–	–	–	●	–	●
0080	MG	010	BN	●	–	–	–	–	–
0080	MG	020	BN	●	–	–	–	–	–
0160	MA	003	BN	–	–	–	●	–	●
0160	MA	005	BN	–	–	–	●	–	●
0160	MA	010	BN	–	–	–	●	–	●
0160	MA	020	BN	–	–	–	●	–	●
0180	MA	003	BN	–	–	–	●	–	●
0180	MA	005	BN	–	–	–	●	–	●
0180	MA	010	BN	–	–	–	●	–	●
0180	MA	020	BN	–	–	–	●	–	●

- Type possible
- Type not possible

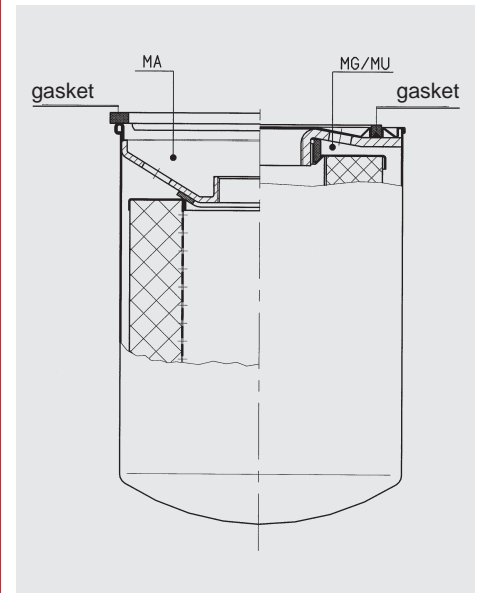
### 4.2. CHANGING THE CARTRIDGE

#### Filter cartridge type MG/MU:

Unscrew filter cartridge (using a strap wrench if necessary). Lubricate seal on the new cartridge (see sectional view below, right-hand side). Screw in new cartridge until contact is made with the sealing surface. Then hand-tighten. Check for leakage and tighten further if necessary.

#### Filter cartridge type MA:

Unscrew filter cartridge (using a strap wrench if necessary). Lubricate new seal and insert it into the filter head (see sectional view below, left-hand side). Screw in new cartridge until contact is made with the sealing surface. Then hand-tighten. Check for leakage and tighten further if necessary.



## 5. FILTER CALCULATION / SIZING

The total pressure drop of a filter at a certain flow rate is the sum of the housing  $\Delta p$  (including change-over valve!) and element  $\Delta p$ .

The pressure drop can be determined either with the aid of our HFS Filter Sizing Program, which is available free of charge, or by using the following graphs.

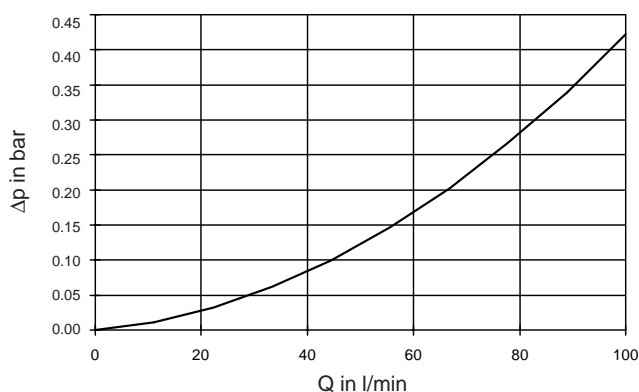
It must be stressed that all of the technical documentation from HYDAC Filtrertechnik always states the pressure drop of the complete filter, i.e. including the change-over valve.

### 5.1. $\Delta P$ -Q HOUSING GRAPHS TO ISO 3968

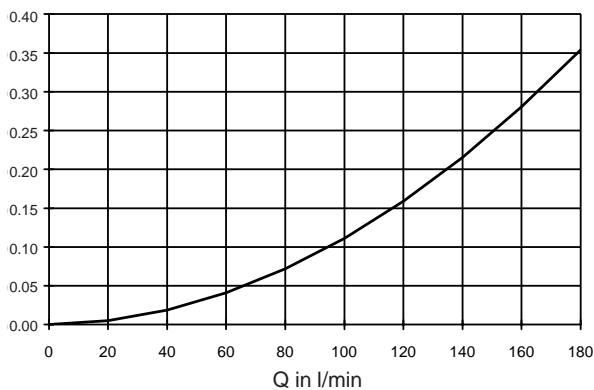
The housing graphs apply to mineral oil with a density of  $0.86 \text{ kg/dm}^3$  and a viscosity of  $30 \text{ mm}^2/\text{s}$ .

In this case, the differential pressure changes proportionally to the density.

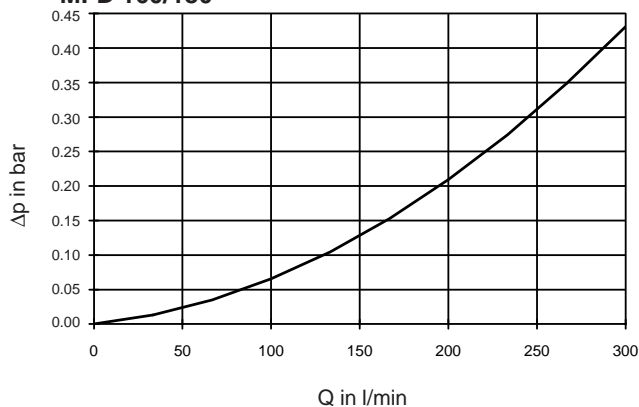
#### MF 80



#### MF 160/180



#### MFD 160/180



### 5.2. GRADIENT COEFFICIENT FOR ELEMENT PRESSURE DROP

The gradient coefficients apply to mineral oil with a kinematic viscosity of  $30 \text{ mm}^2/\text{s}$ .

Size	Filtration rating			
	3μm	5μm	10μm	20μm
0080 MU...P	–	–	0.0015	–
0160 MU...P	–	–	–	0.002
0160 MG...P	–	–	0.0016	–
0180 MA...P	–	–	0.0011	–
0160 MA...BN	0.0075	0.005	0.0036	0.0026
0180 MA...BN	0.005	0.0023	0.0021	0.0013

### 5.3. EXAMPLE

#### General

$$\Delta p_{\text{total}} = \Delta p_{\text{housing}} + \Delta p_{\text{element}} \cdot \frac{\text{viscosity (mm}^2/\text{s)}}{30 \text{ mm}^2/\text{s}}$$

$$\Delta p_{\text{housing}} = \text{determined in accordance with Point 5.1.}$$

$$\Delta p_{\text{element}} = \text{flow rate} \cdot \text{gradient coefficient}$$

#### Example

System parameters:

Q = 125 l/min; MF 160 with BN cartridge (10 μm);

Viscosity = 46 mm<sup>2</sup>/s

$$\Rightarrow \Delta p_{\text{housing}} = 0.17 \text{ bar (MF 160)}$$

$$\Delta p_{\text{element}} = 0.45 \text{ bar} \cdot \frac{46 \text{ mm}^2/\text{s}}{30 \text{ mm}^2/\text{s}} = 0.69 \text{ bar}$$

$$\Delta p_{\text{total}} = \Delta p_{\text{housing}} + \Delta p_{\text{element}} = \underline{\underline{0.86 \text{ bar}}}$$

### 5.4. CALCULATION CRITERIA

Filters should be calculated on the basis of a total differential pressure with clean element and at operating temperature; for use as:

Suction filter: 0.03 – 0.05 bar

Return line filter: 0.3 – 0.5 bar

Pressure filter: 0.3 – 0.5 bar

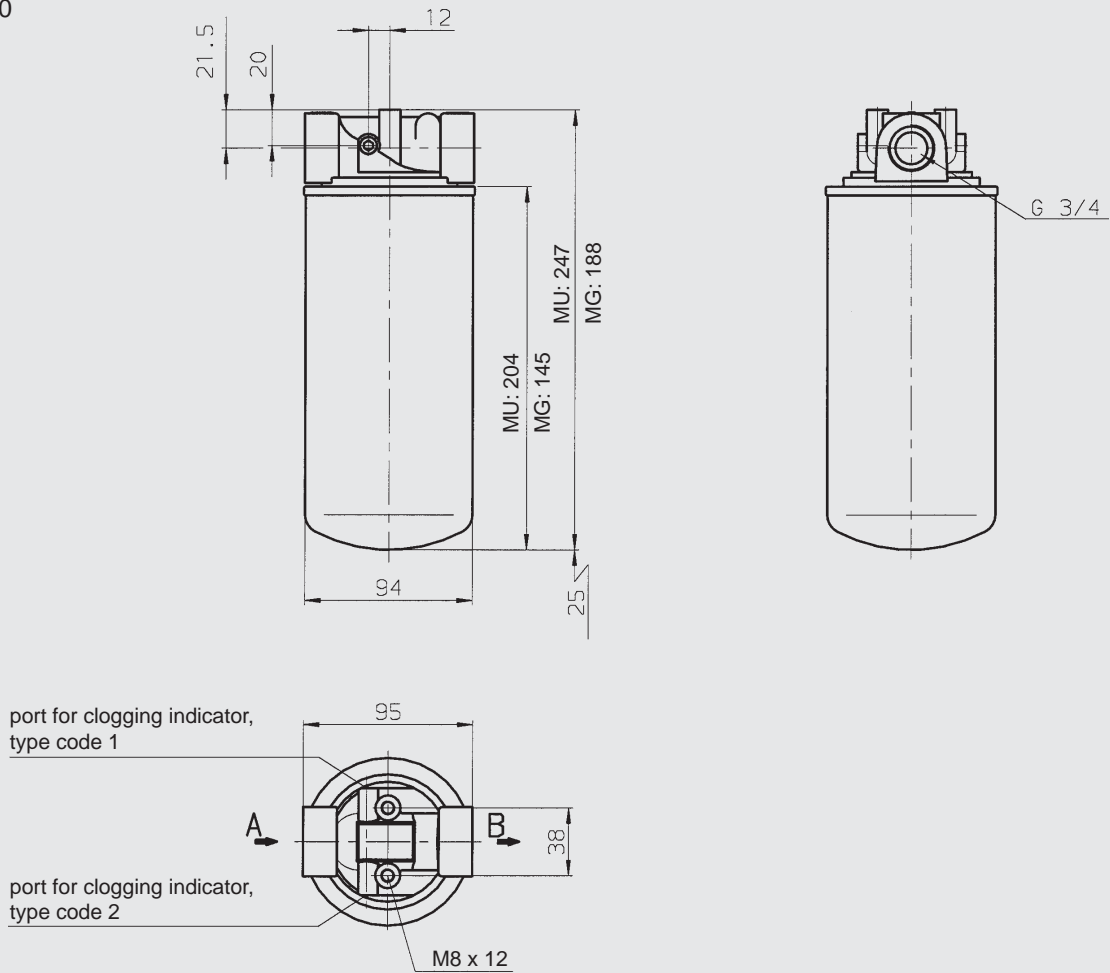
However, cold start conditions must be taken into account.

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

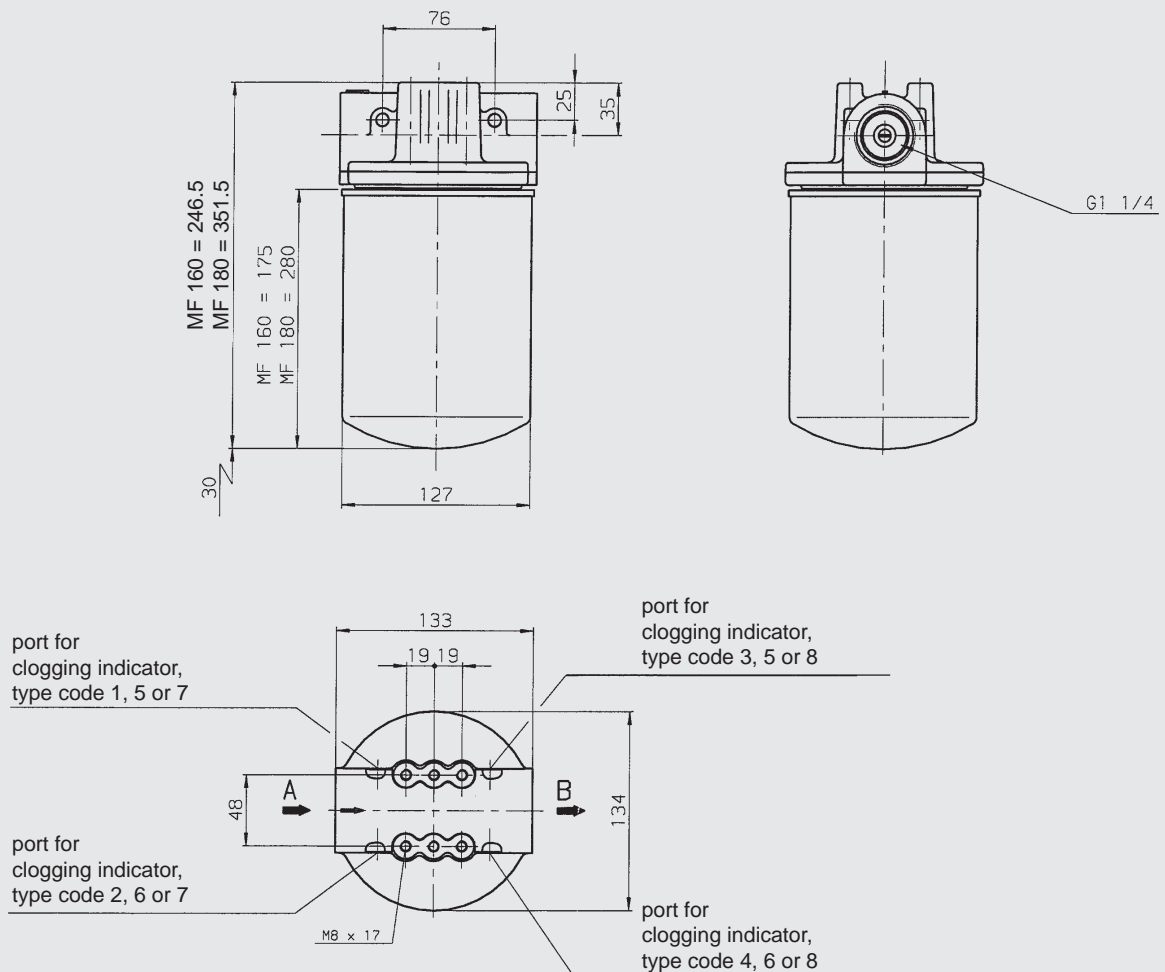
**NEW:** Sizing online at [www.hydac.com](http://www.hydac.com)

## 6. DIMENSIONS

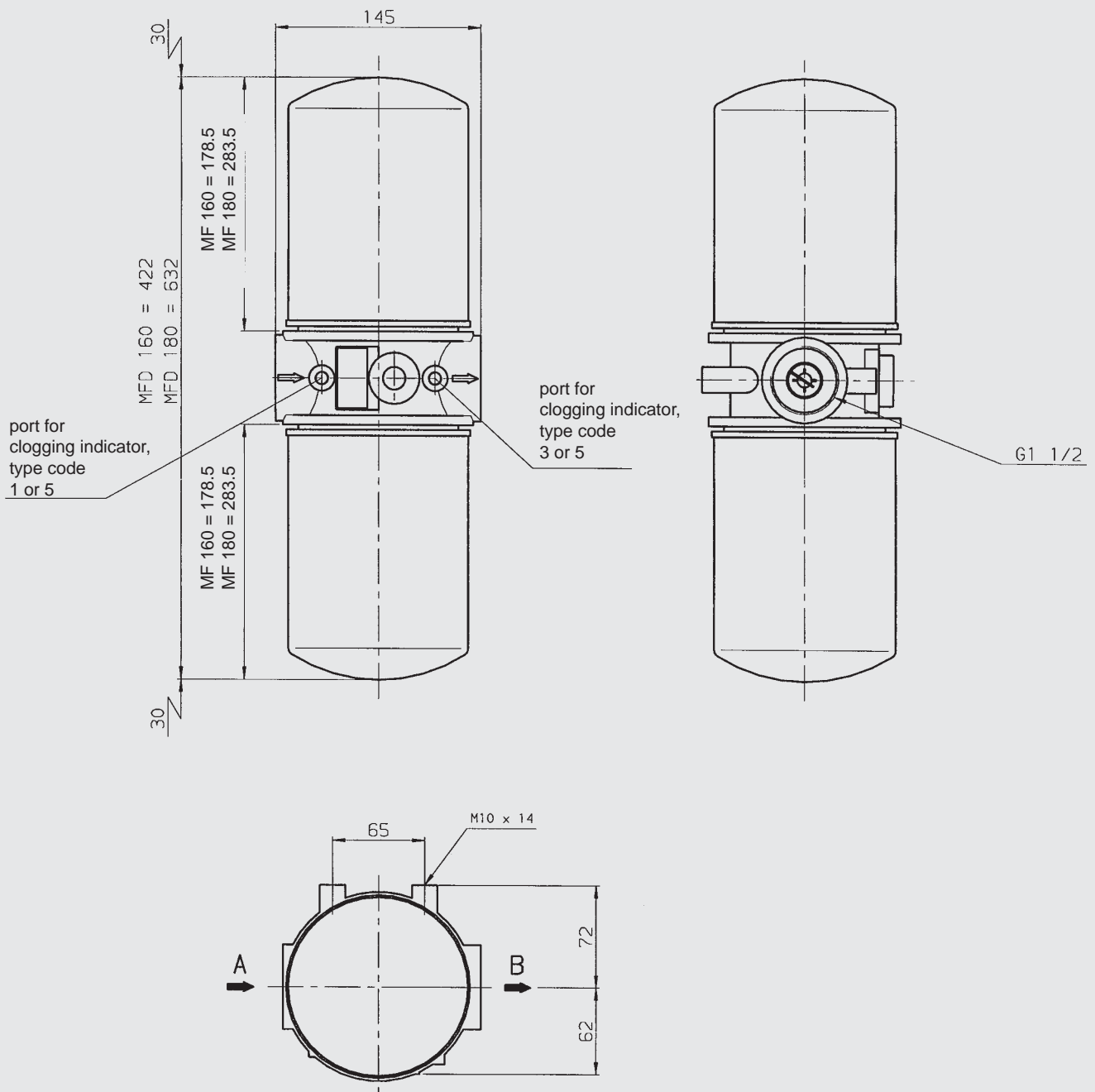
### 6.1. MF 80



### 6.2. MF 160/180



6.3. MFD 160 - 180



7. 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.

