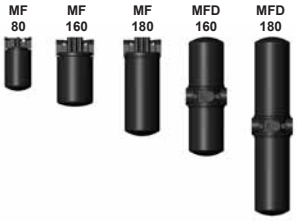
Spin-On Filter MF/MFD
up to 300 l/min, up to 8 bar



1. TECHNICAL SPECIFICATIONS

1.1 FILTER HOUSING

Construction

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

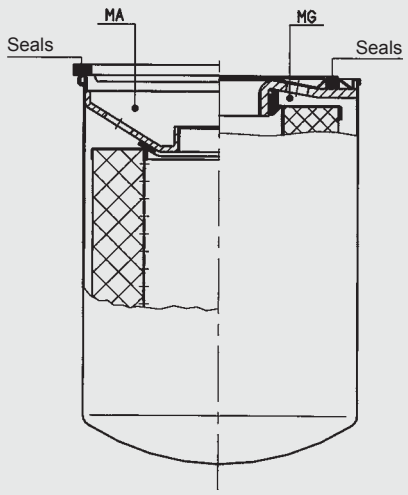
Standard equipment:

- with bypass valve

1.2 FILTER CARTRIDGES

MG: Cartridge connection thread, to ISO 228
Sealing on inside
(Note: the seal on the 0080 MA cartridge is also on the inside!)

MA: Cartridge connection, UN thread sealing on the outside



1.3 FILTER SPECIFICATIONS

Nominal pressure	8 bar
Temperature range	-30 °C to +100 °C
Pressure setting of clogging indicator: Δp_a	Type E: 0 to 16 bar Type F: 1.5 or 2 bar Type UE: 0 to -1.0 bar Type UF: -0.2 bar
Type of clogging indicator	VMF (return line indication)
Material of filter head	Aluminium
Material of filter cartridge	Sheet steel
Cracking pressure of bypass valve	1.7 bar (standard for size 80) 2 bar (standard for size 160/180)

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

Without bypass or with other bypass cracking pressures

1.7 SPARE PARTS

See Original Spare Parts List

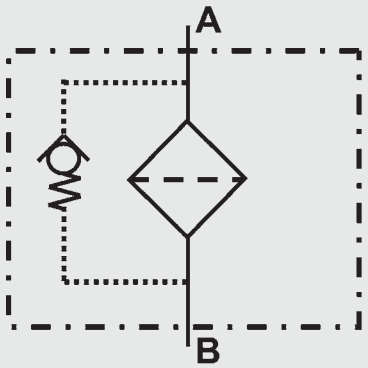
1.8 CERTIFICATES AND APPROVALS

On request

1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- Hydraulic oils to 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



E 7.301.16/03.12

2. MODEL CODE (also order example)

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

2.1 COMPLETE FILTER

Filter type
MF (all sizes; 1 filter cartridge)
MFD (sizes 160 and 180; 2 filter cartridges)

Filter material
BN Betamicron®
P Paper (only MF 80 and MF/MFD 160)

Size of filter or cartridge
MF: 80, 160, 180
MFD: 160, 180

Operating pressure
A 8 bar

Type of cartridge connection
G thread to ISO 228 (G ¾ on size 80; G 1¼ on size 160/180)
U UN thread (1-12 UNF, 1½ x 16 UN-2B)

Type and size of port

Type	Connection	Filter size		
		80	160	180
C	G ¾	MF	–	–
E	G1 ¼	–	MF	MF
F	G1 ½	–	MFD	MFD

Filtration rating in µm
BN 3, 5, 10, 20
P 10

Type of clogging indicator
A steel blanking plug in indicator port
E pressure gauge
F pressure switch
(pressure indicators)
UE vacuum gauge
UF vacuum switch
(vacuum indicators)
for other clogging indicators see brochure no. 7.050../..

Type code
0
1 - 8 see Point 2.4

Modification number
X the latest version is always supplied

Supplementary details
B. cracking pressure of bypass (e.g. B0.2 = 0.2 bar; B0.25 = 0.25 bar)
KB without bypass valve (only for size 160/180)

2.2 REPLACEMENT CARTRIDGE

0160 MA 010 BN

Size
0080, 0160, 0180

Type
MG for filters with cartridge connection G (= thread to ISO 228); paper filter material only (exception: MF 80: 20 BN)
MA for filters with cartridge connection U (= UN thread)

Filtration rating in µm
BN 003, 005, 010, 020 (for MF 80: MA = only 10 µm; MG = 20 µm)
P 010

Filter material
BN, P

2.3 REPLACEMENT CLOGGING INDICATOR

VMF 2 F . X

Type of indicator
VMF return line pressure indicator

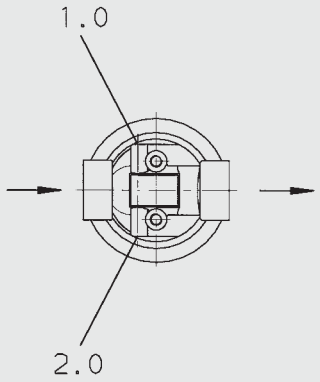
Pressure setting
2 2 bar standard for size 160/180
1.5 1.5 bar standard for size 80
(see Point 1.3)

Type of clogging indicator
F (see Point 2.1)

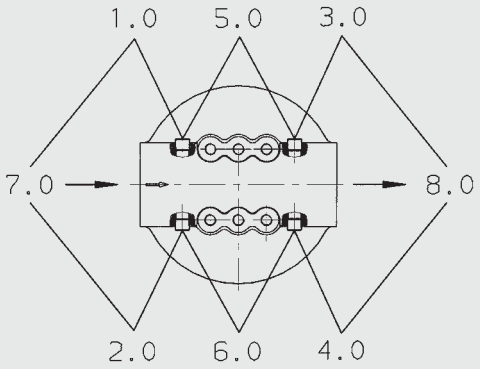
Modification number
X the latest version is always supplied

2.4 MOUNTING POSITION OF THE CLOGGING INDICATOR

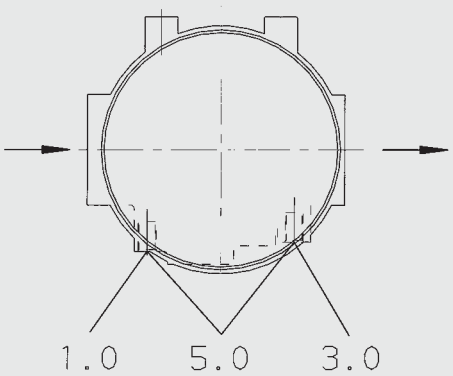
MF 80



MF 160/180



MFD 160/180



For MF-Filter

Type code	Mounting position of clogging indicator	Application of complete filter	Type of indicator	Specials
0.X	Without clogging indicator, blanking plug in all indicator ports			–
1.X	Filter inlet: on left	Return line filter	Pressure indicator	–
2.X	Filter inlet: on right	Return line filter	Pressure indicator	–
3.X	Filter outlet: on left	Suction filter	Vacuum indicator	Only for sizes 160 and 180, on versions: - with bypass cracking pressure 0.2 bar (.../-B0.2) - without bypass valve (.../-KB)
4.X	Filter outlet: on right	Suction filter	Vacuum indicator	Only for sizes 160 and 180, on versions: - with bypass cracking pressure 0.2 bar (.../-B0.2) - without bypass valve (.../-KB)
5.X	Filter inlet & outlet: on left	Pressure filter	Pressure and vacuum indicator	–
6.X	Filter inlet & outlet: on right	Pressure filter	Pressure and vacuum indicator	–
7.X	Filter inlet: on right and left	Return line filter	Pressure indicator	–
8.X	Filter outlet: on right and left	Suction filter	Vacuum indicator	Only for sizes 160 und 180, on versions: - with bypass cracking pressure 0.2 bar (.../-B0.2) - without bypass valve (.../-KB)

For MFD filters

Type code	Mounting position of clogging indicator	Application of complete filter	Type of indicator	Specials
0.X	Without clogging indicator, blanking plug in all indicator ports			–
1.X	Filter inlet: on right	Return line filter	Pressure indicator	–
3.X	Filter outlet: on right	Suction filter	Vacuum indicator	Only on versions: - with bypass cracking pressure 0.2 bar (.../-B0.2) - without bypass valve (.../-KB)
5.X	Filter inlet & outlet: on right	Pressure filter	Pressure and vacuum indicator	–

2.5 CARTRIDGE SELECTION TABLE

Filter type MF

Size 80	Cartridge
MF P 80 AGC 10 ...	0080 MG 010 P
MF BN 80 AUC 10 ...	0080 MA 010 BN
MF BN 80 AGC 20 ...	0080 MG 020 BN
Size 160	**Cartridge**
MF P 160 AGE 10...	0160 MG 010 P
MF BN 160 AUE 3...	0160 MA 003 BN
MF BN 160 AUE 5...	0160 MA 005 BN
MF BN 160 AUE 10...	0160 MA 010 BN
MF BN 160 AUE 20...	0160 MA 020 BN
Size 180	**Cartridge**
MF BN 180 AUE 3...	0180 MA 003 BN
MF BN 180 AUE 5...	0180 MA 005 BN
MF BN 180 AUE 10...	0180 MA 010 BN
MF BN 180 AUE 20...	0180 MA 020 BN

Filter type MFD

Size 80	Cartridge
–	not available
–	not available
–	not available
Size 160	**Cartridge**
MFD P 160 AGF 10...	0160 MG 010 P
MFD BN 160 AUF 3...	0160 MA 003 BN
MFD BN 160 AUF 5...	0160 MA 005 BN
MFD BN 160 AUF 10...	0160 MA 010 BN
MFD BN 160 AUF 20...	0160 MA 020 BN
Size 180	**Cartridge**
MFD BN 180 AUF 3...	0180 MA 003 BN
MFD BN 180 AUF 5...	0180 MA 005 BN
MFD BN 180 AUF 10...	0180 MA 010 BN
MFD BN 180 AUF 20...	0180 MA 020 BN

2.6 CHANGING THE CARTRIDGE

Filter cartridge type MG:

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

3. FILTER CALCULATION / SIZING

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

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

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

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

(*see point 3.2)

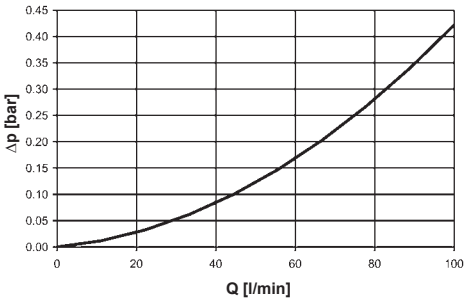
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

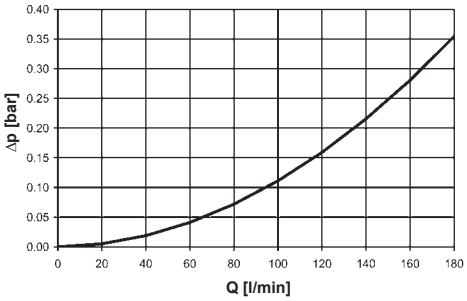
3.1 Δp-Q HOUSING CURVES BASED ON ISO 3968

The housing curves apply to mineral oil with a density of 0.86 kg/dm³ and a kinematic viscosity of 30 mm²/s. In this case, the differential pressure changes proportionally to the density.

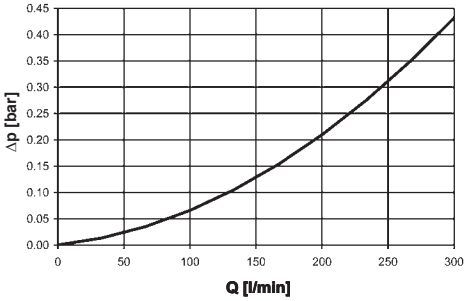
MF 80



MF 160, 180



MFD 160, 180



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 mm²/s. The pressure drop changes proportionally to the change in viscosity.

BN	Filtration rating			
	3 µm	5 µm	10 µm	20 µm
80	–	–	4.3	2.5
160	4.3	3.6	2.0	1.1
180	2.2	1.9	1.1	0.6

3.3 SIZING GUIDELINES

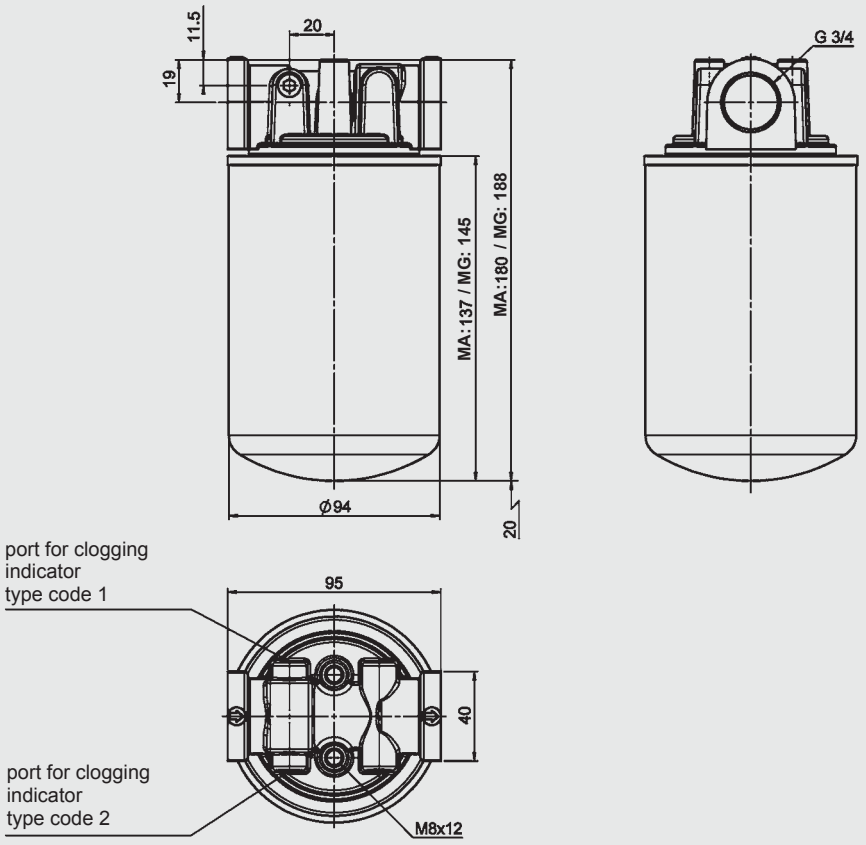
Filters should be calculated on the basis of a total differential pressure with clean element and at operating temperature; for use as:

Suction filter:	0.03 - 0.05 bar
Return line filter:	0.3 - 0.5 bar
Pressure filter:	0.3 - 0.5 bar

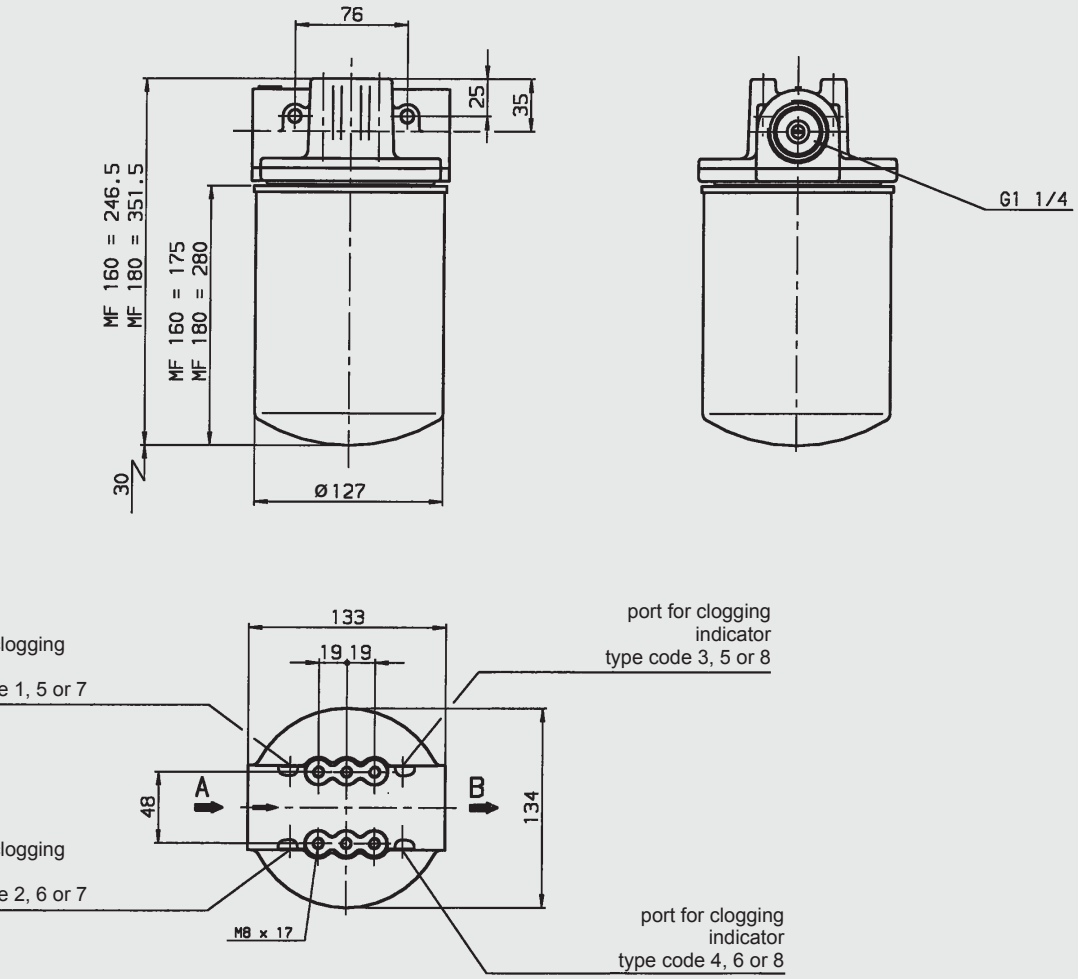
However, cold start conditions must be taken into account.

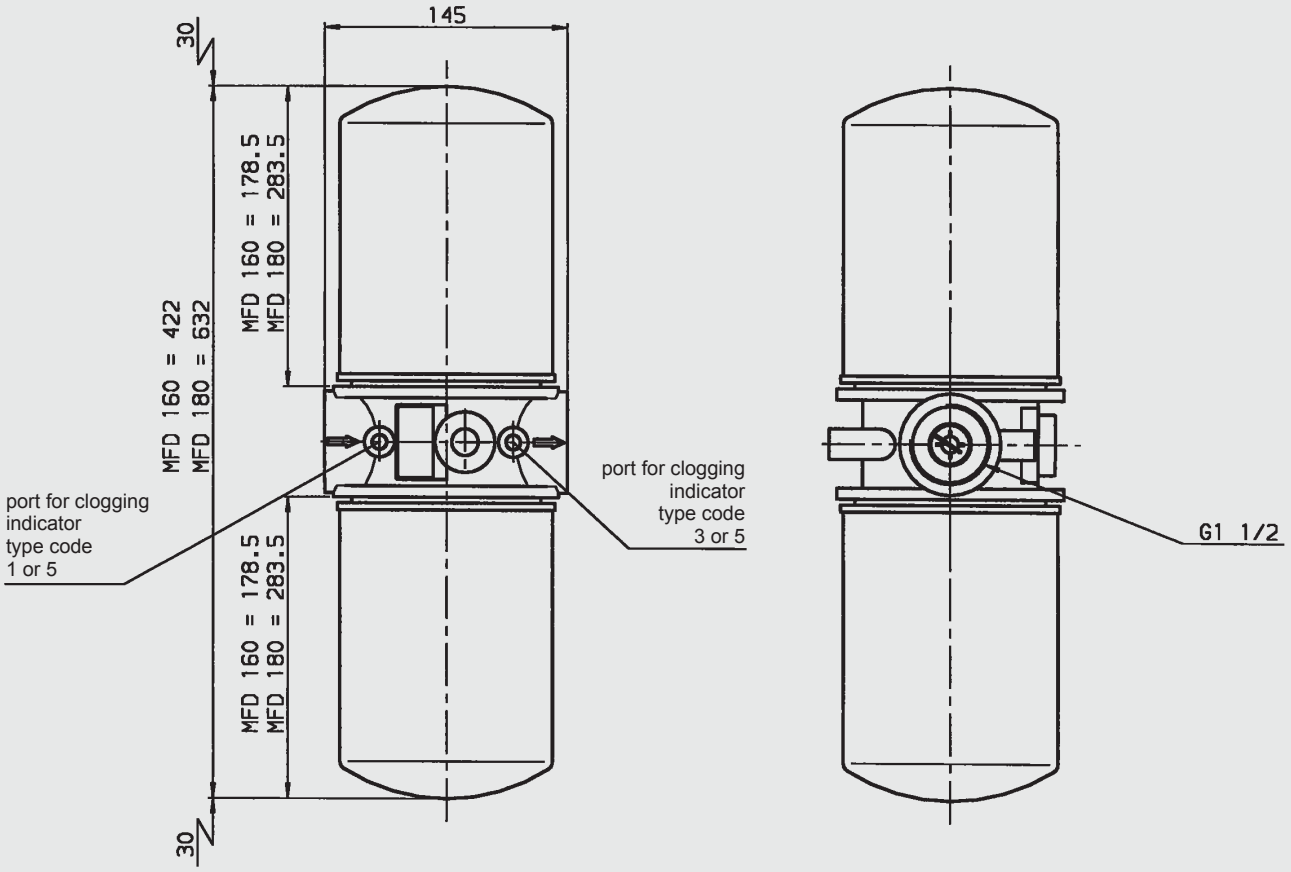
4. DIMENSIONS

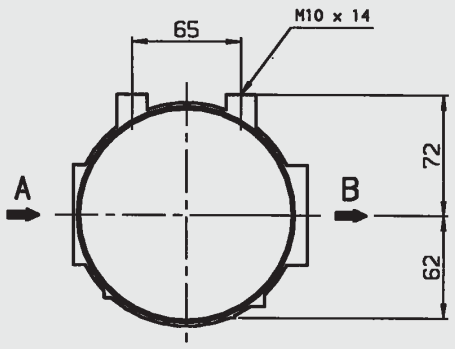
MF 80



MF 160/180







Summary

Filter type	Port size Inlet / Outlet	Port size Cartridge	Weight incl. element [kg]	Vol. of pressure chamber [l]
MF 80	G¾	G¾, 1-12 UNF	0.9	1.00
MF 160	G1¼	G1¼, 1⅝x16 UN-2B	2.3	2.00
MF 180	G1¼	1⅝x16 UN-2B	2.8	3.30
MFD 160	G1½	G1¼, 1⅝x16 UN-2B	3.7	4.00
MFD 180	G1½	1⅝x16 UN-2B	4.5	6.60

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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