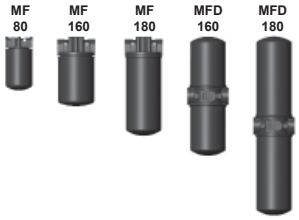
Spin-On Filter MF/MFD
up to 300 l/min, up to 8 bar



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.

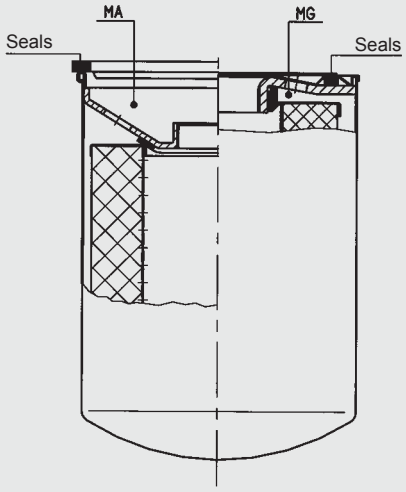
Standard equipment:

- 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

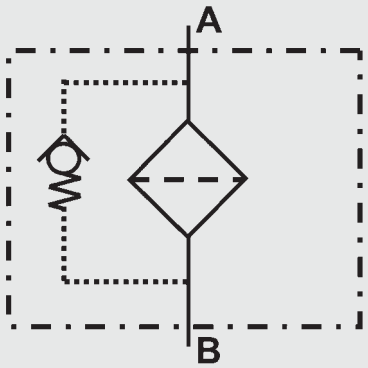
1.8 CERTIFICATES AND APPROVALS

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



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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

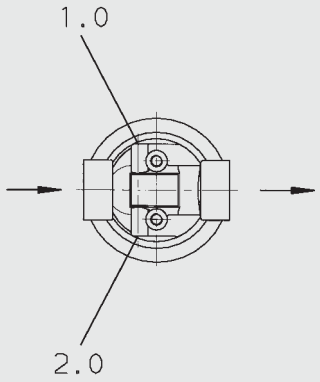
Pressure setting
2 2 bar standard for size 160/180
1.5 1.5 bar standard for size 80
(see Point 1.3)

Type of clogging indicator
F (see Point 2.1)

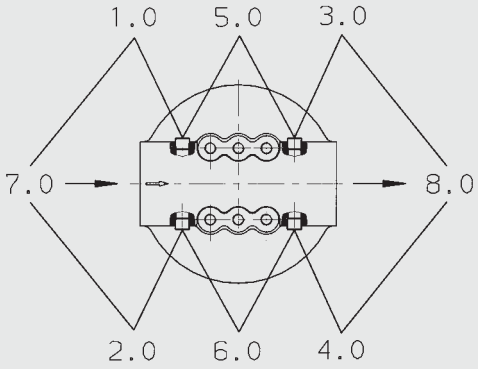
Modification number
X the latest version is always supplied

2.4 MOUNTING POSITION OF THE CLOGGING INDICATOR

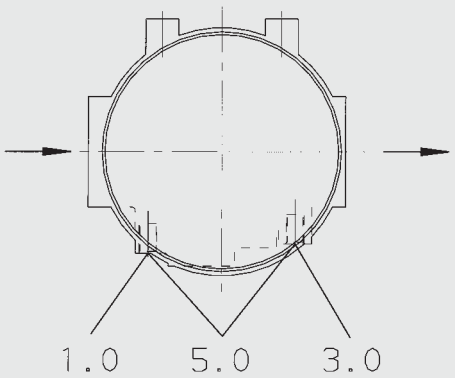
MF 80



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)

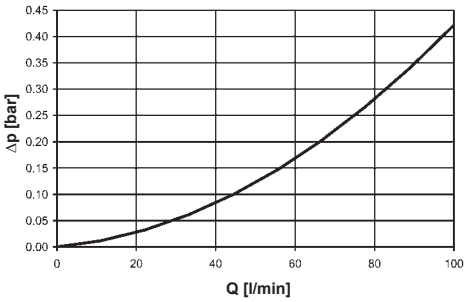
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

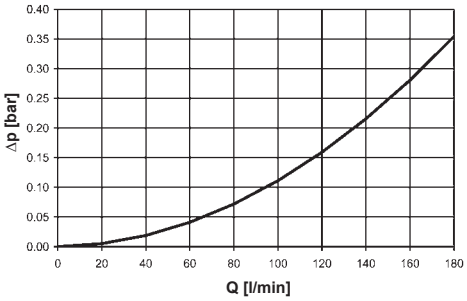
3.1 Δp-Q HOUSING CURVES BASED ON ISO 3968

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.

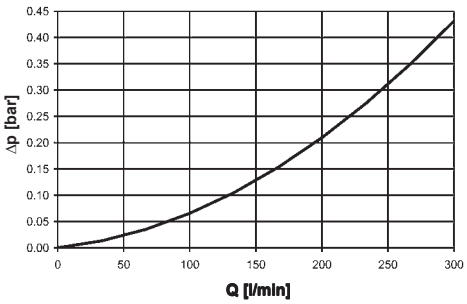
MF 80



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

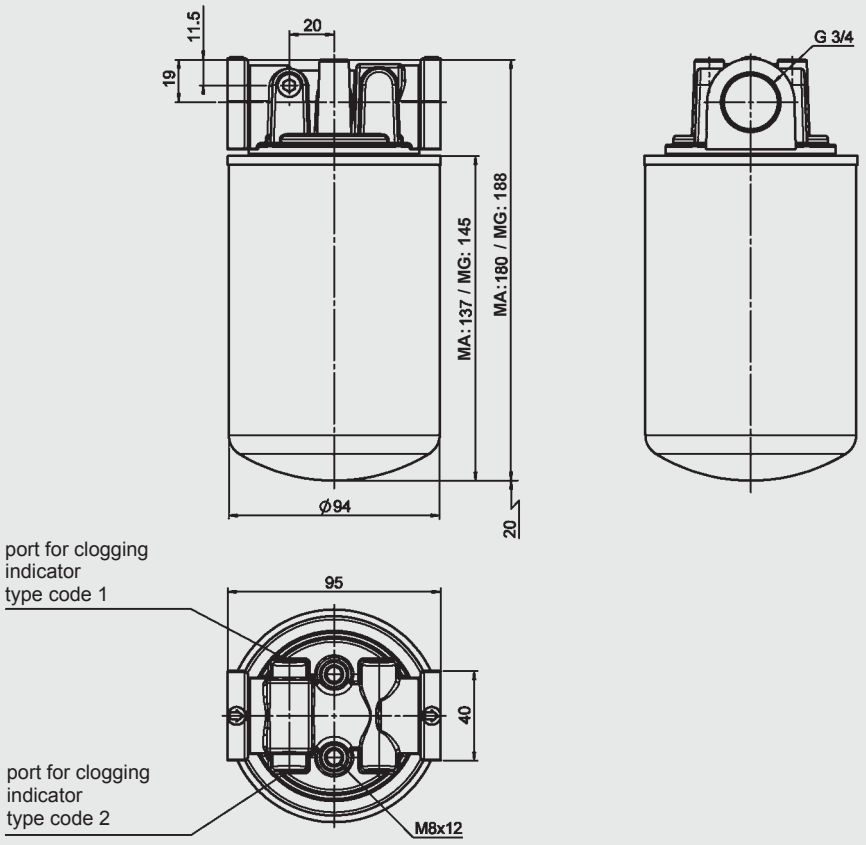
Filters should be calculated on the basis of a total differential pressure with clean element and at operating temperature; for use as:

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

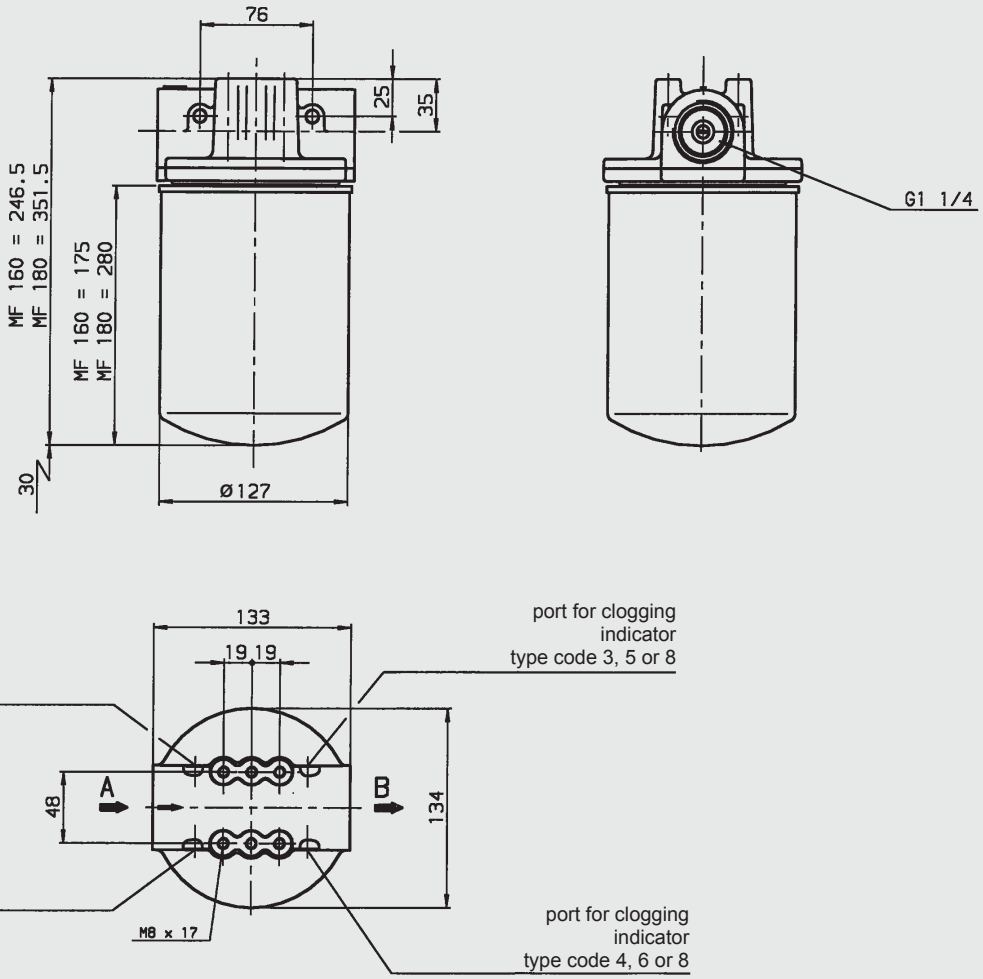
However, cold start conditions must be taken into account.

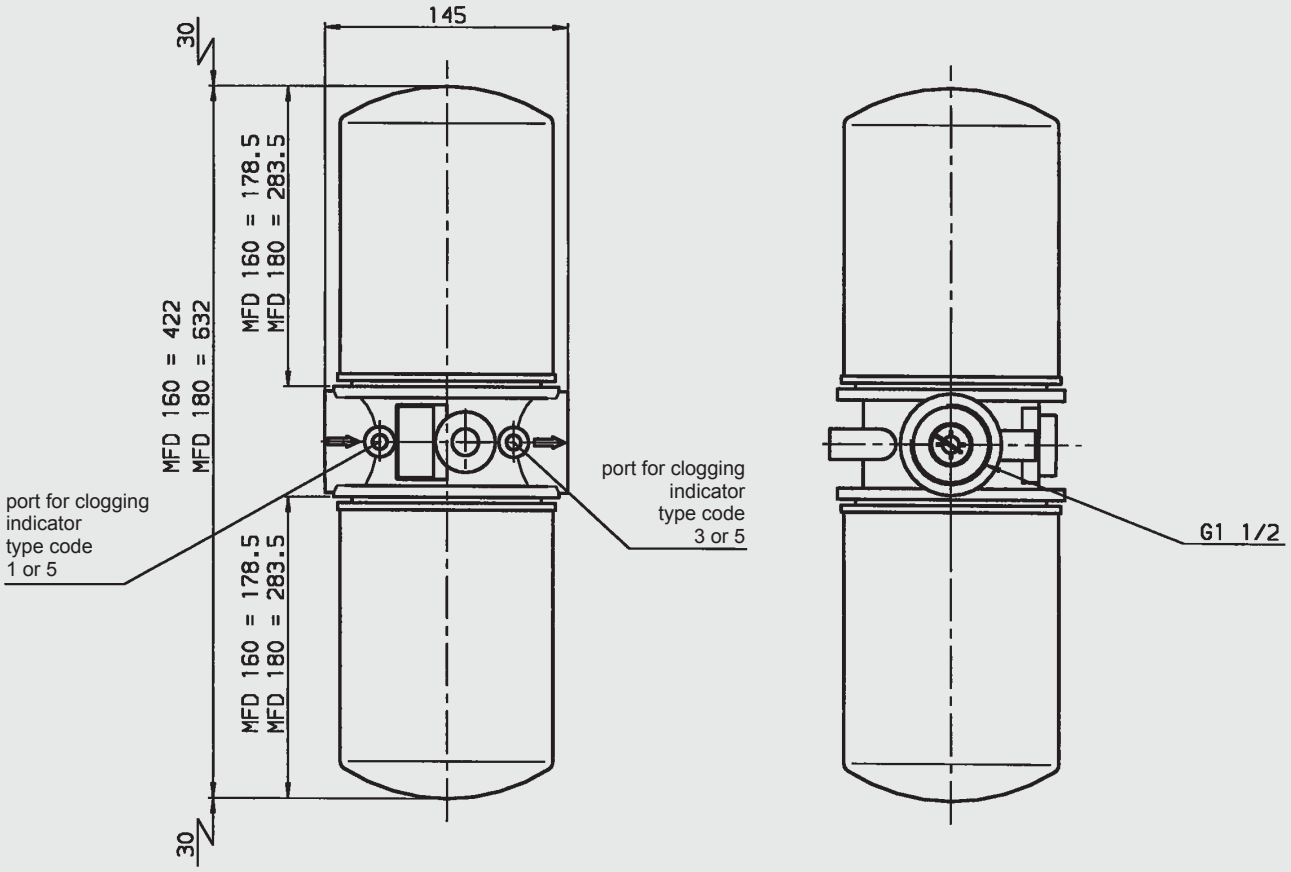
4. DIMENSIONS

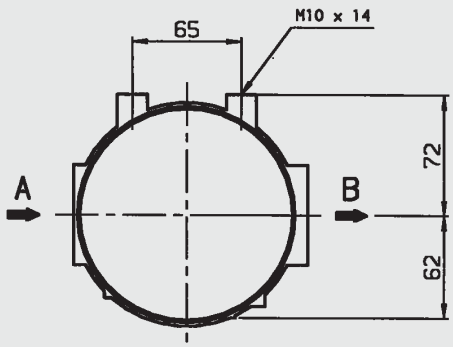
MF 80



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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Tel.: 0 68 97 / 509-01
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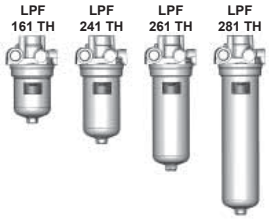
Internet: www.hydac.com
E-mail: filter@hydac.com

Inline Filter LPF
With Integrated Thermal Bypass Valve up to 140 l/min, up to 50 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 and a screw-in filter bowl. Standard equipment:

- with integrated thermal bypass valve
- with 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

Contamination retention capacities in g

	Betamicron® (BN4HC)			
LPF/-TH	3 µm	5 µm	10 µm	20 µm
161	15.2	16.8	20.2	22.9
241	25.1	27.8	33.5	37.9
261	38.8	43.0	51.7	58.5
281	62.4	69.2	83.2	94.1

Filter elements are available with the following pressure stability values:

Betamicron® (BN4HC): 25 bar
Mobilemicron (MM): 10 bar

1.3 SEALS

Perbunan (= NBR)

1.4 INSTALLATION

As inline filter

1.5 SPECIAL MODELS AND ACCESSORIES

- Seals in FPM, EPDM
- No clogging indicator port

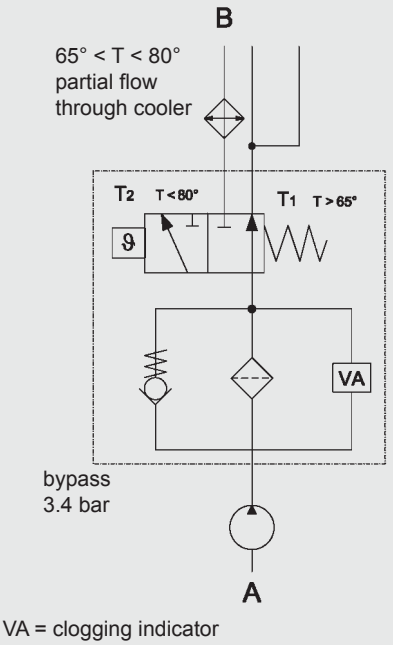
1.6 FILTER SPECIFICATIONS

Nominal pressure	50 bar
Fatigue strength	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-10 °C to +100 °C
Material of filter head	Aluminium
Material of filter bowl	Aluminium
Type of clogging indicator	VM (differential pressure measurement up to 210 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Bypass cracking pressure	3.4 bar

1.7 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 HFC and HFD
- Operating fluids with high water content (>50% water content) on request

Symbol for hydraulic systems



VA = clogging indicator

1.8 FILTER CALCULATION / SIZING

Curves on request!

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.

	(BN4HC)			
	3 µm	5 µm	10 µm	20 µm
161	13.4	10.4	6.5	3.5
241	8.1	6.3	3.9	2.1
261	5.2	4.1	2.5	1.4
281	3.3	2.5	1.6	0.9

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2. MODEL CODE

2.1 COMPLETE FILTER

Type	Filter material	Size	Pressure range	Type of connection	Filtration rating [µm]	Type of clogging indicator*	Type code	Modification number	Supplementary details
LPF	**BN/HC =** Betamicron® Glass fibre **MM =** Mobilemicron (synthetic fibre)	**161** **241** **261** **281**	**G =** 50 bar	**I** = 1/16-12UN **Z** = customer specific (other connections on request)	**BN/HC:** **3,5,10,20** **MM:** **8, 10, 15**	**A** = steel blanking plug in indicator port **B** = visual **C** = electrical **D** = visual/ electrical	**1**	**.x =** The latest version is always supplied	TH = with integrated thermal bypass It is essential to quote this code! V = FPM seal L.. = light with appropr. voltage (24, 48 110, 220 Volt)

* for other clogging indicators see brochure no. 7.050../..

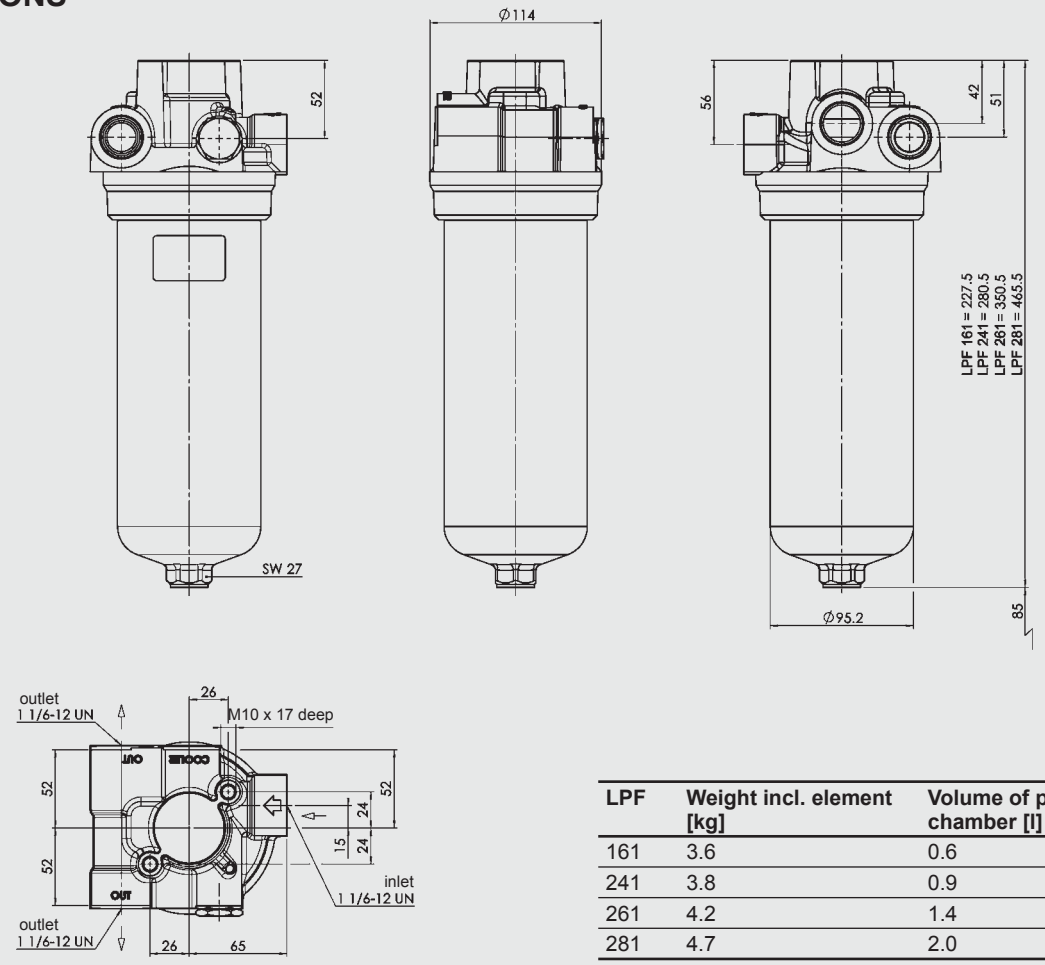
2.2 REPLACEMENT ELEMENT

Size	Type	Filtration rating [µm]	Filter material	Supplementary details
0161 **0241** **0261** **0281**	**RD =** Return line element for pressure filter	**BN4HC:** 3, 5, 10, 20 **MM:** 8, 10, 15	**BN4HC** **MM**	**B3.4 =** with bypass valve (cracking press. 3.4 bar) **B6 =** with bypass valve (cracking press. 6 bar) **KB =** without bypass valve

2.3 REPLACEMENT CLOGGING INDICATOR

Type	Pressure setting	Type of clogging indicator*	Modification number	Supplementary details
VM	**5 =** standard 5 bar	**W** = no port, no indicator **B** = visual **C** = electrical **D** = visual/ electrical	**.x =** The latest version is always supplied	**-V =** FPM seal

3. DIMENSIONS



LPF	Weight incl. element [kg]	Volume of pressure chamber [l]
161	3.6	0.6
241	3.8	0.9
261	4.2	1.4
281	4.7	2.0

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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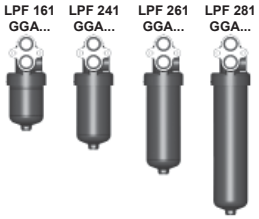
Inline Filter LPF
Flange-Mounted, With Integrated Cooler Bypass Valve up to 260 l/min, up to 50 bar



1. TECHNICAL SPECIFICATIONS

1.1 FILTER HOUSING

Construction

The filter housings are designed in accordance with international regulations. They consist of a filter head and a screw-in filter bowl. The built-in check valve in the filter head supplies partial flow to the cooler.

Standard equipment:

- cooler 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

Contamination retention capacities in g

	Betamicron® (BN4HC)			
LPFGGA	3 µm	5 µm	10 µm	20 µm
161	15.2	16.8	20.2	22.9
241	25.1	27.8	33.5	37.9
261	38.8	43.0	51.7	58.5
281	62.4	69.2	83.2	94.1

Filter elements are available with the following pressure stability values:

Betamicron® (BN4HC):	20 bar
Mobilemicron (MM):	10 bar

1.3 SEALS

Perbunan (= NBR)

1.4 INSTALLATION

As inline filter

1.5 SPECIAL MODELS AND ACCESSORIES

- Seals in FPM, EPDM
- Without clogging indicator connection

1.6 FILTER SPECIFICATIONS

Nominal pressure	50 bar
Fatigue strength	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-10 °C to +120 °C
Material of filter head	EN-GJS-400
Material of filter bowl	Aluminium
Type of clogging indicator	VM (differential pressure measurement up to 210 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Bypass cracking pressure	3.4 bar

1.7 SPARE PARTS

See Original Spare Parts List

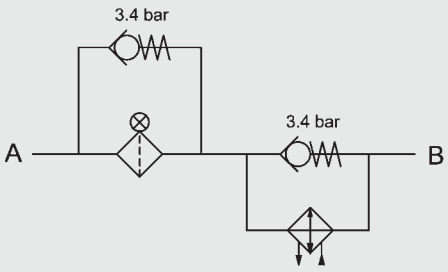
1.8 CERTIFICATES AND APPROVALS

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 HFC and HFD
- Operating fluids with high water content (>50% water content) on request

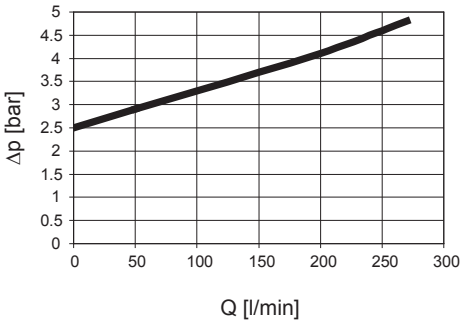
Symbol for hydraulic systems



1.10 FILTER CALCULATION / SIZING

GRAPHS FOR COMPLETE FILTER

The total pressure drop graph applies to mineral oil with a density of 0.86 kg/dm³ and a kinematic viscosity of 30mm²/s.



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.

	Betamicron® (BN4HC)			
	3 µm	5 µm	10 µm	20 µm
161	13.4	10.4	6.5	3.5
241	8.1	6.3	3.9	2.1
261	5.2	4.1	2.5	1.4
281	3.3	2.5	1.6	0.9

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2. MODEL CODE

2.1 COMPLETE FILTER

Type	Filter material	Size	Pressure range	Inlet / outlet to cooler	Type of connection	Filtration rating [µm]	Type of clogging indicator*	Type code	Modification number	Supplementary details
LPF	**BN/HC =** Betamicron® (glass fibre) **MM =** Mobilemicron (synthetic fibre)	**161** **241** **261** **281**	**G =** 50 bar	**G =** M27x2	**A =** 2 mounting holes	**BN/HC: 3, 5, 10, 20** **MM: 8, 10, 15**	**W =** no indic. port **A =** steel plug in indicator port **B =** visual **C =** electrical **D =** visual/ electrical	**1**	**.x =** The latest version is always supplied	V = FPM seal L.. = light with appropr. voltage (24, 48 110, 220 Volt)

* for other clogging indicators see brochure no. 7.050../..

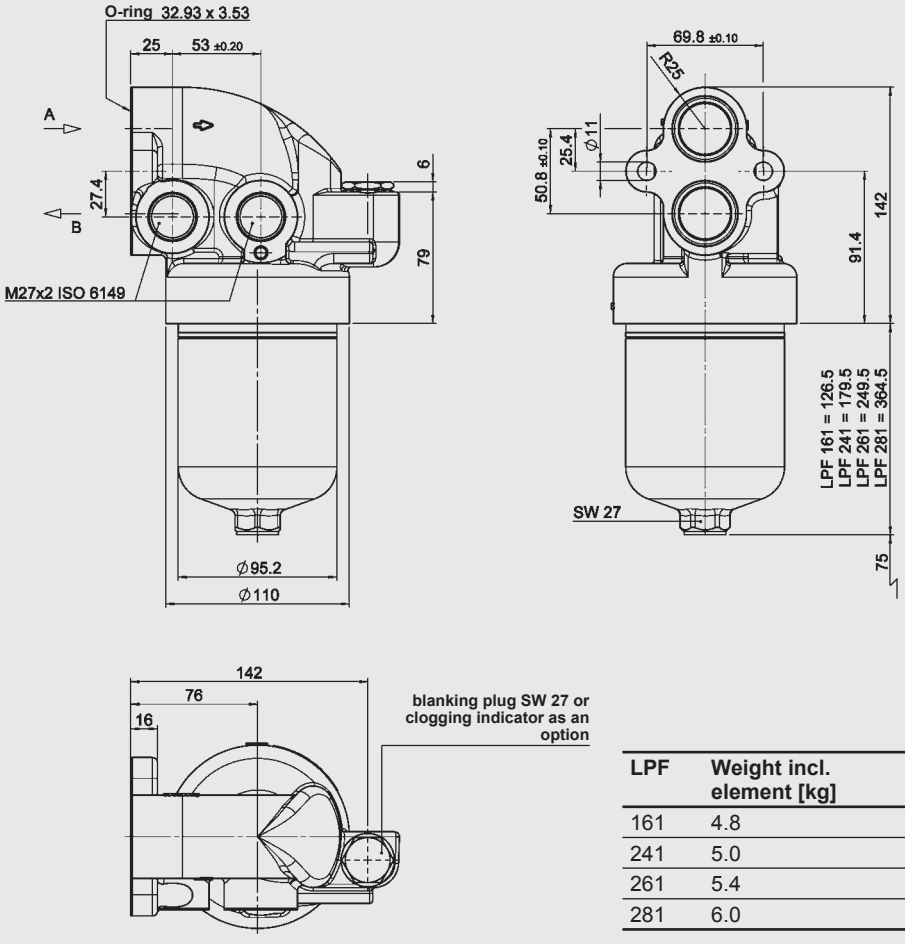
2.2 REPLACEMENT ELEMENT

Size	Type	Filtration rating [µm]	Filter material	Supplementary details
0161 **0241** **0261** **0281**	**RD =** Return line element for pressure filter	**BN4HC =** 003, 005, 010, 020 **MM =** 008, 010, 015	**BN4HC =** Betamicron® **MM =** Mobilemicron	**B3.4 =** with bypass valve (cracking press. 3.4 bar) **B6 =** with bypass valve (cracking press. 6 bar) **KB =** without bypass valve

2.3 REPLACEMENT CLOGGING INDICATOR

Type	Pressure setting	Type of clogging indicator*	Modification number	Supplementary details
VM	**5 =** standard 5 bar	**W =** no port, no indicator **B =** visual **C =** electrical **D =** visual/ electrical	**.x =** The latest version is always supplied	**-V =** FPM seal

3. DIMENSIONS



LPF	Weight incl. element [kg]	Vol. of pressure chamber [l]
161	4.8	0.6
241	5.0	0.9
261	5.4	1.4
281	6.0	2.0

NOTE

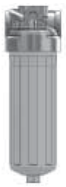
The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

HYDAC FILTERTECHNIK GMBH
Industriegebiet
D-66280 Sulzbach/Saar
Tel.: 0 68 97 / 509-01
Fax: 0 68 97 / 509-300
Internet: www.hydac.com
E-Mail: filter@hydac.com

Inline Filter MFX
up to 130 l/min, up to 50 bar

MFX 100

MFX 200



1. TECHNICAL SPECIFICATIONS

1.1 FILTER HOUSING

Construction

The filter housings are designed in accordance with international regulations. They consist of a filter head and a screw-in filter bowl.

Standard equipment:

- usually 4 possible positions for a clogging indicator
- with bypass valve

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 16889

Contamination retention capacities in g

	Betamicron® (BN4HC)		
MFX	5 µm	10 µm	20 µm
100	27.8	27.8	28.8
200	47.4	47.4	49.4

Filter elements are available with the following pressure stability values:

Betamicron® (BN4HC):	10 bar
ECOmicron® (ECON2):	10 bar
Mobilemicron (MM):	10 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	50 bar
Fatigue strength (without BF clogging indicator)	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-30 °C to +100 °C (-10 °C to +80 °C by BF clogging indicator)
Material of filter head	Aluminium
Material of filter bowl	Aluminium
Type of clogging indicator	VM (Diff. pressure indicator up to 210 bar operating pressure) VL (Diff. pressure indicator up to 50 bar operating pressure)
Setting pressure of the clogging indicator	Standard 2.5 bar, optional 1 bar (others on request)
Bypass cracking pressure	Standard 3.5 bar, optional 1.7 bar (others on request)

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

Seals in FPM,
EPDM (on request)

1.7 SPARE PARTS

See Original Spare Parts List

1.8 CERTIFICATES AND APPROVALS

On request

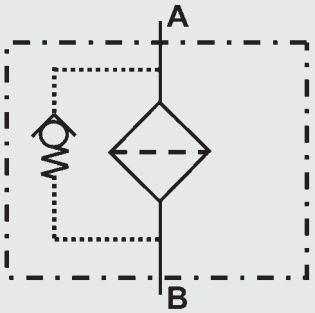
1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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 HFC and HFD
- Operating fluids with high water content (>50% water content) on request

1.10 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



2. MODEL CODE (also order example)

MFX BN/HC 100 G I 10 BF 4 . X /-B3.5

2.1 COMPLETE FILTER

Filter type
MFX

Filter material of element
BN/HC Betamicron® (BN4HC)
ECO/N ECOmicron® (ECON2)
MM Mobilemicron

Size of filter or element
MFX: 100, 200

Operating pressure
G = 50 bar

Type and size of connection

Type	Connection	Filter size 100	200
C	G ¾	●	●
D	G 1	●	●
E	M26 x 1.5	●	●
I	1 1/16-12 UN	●	●
K	1 5/16-12 UN	●	●
L	M33 x 2	●	●

Filtration rating in µm
BN/HC, ECO/N : 5, 10, 20
MM : 8, 10, 15

Type of clogging indicator
W without port (no clogging indicator)
A plastic blanking plug in indicator port
B visual
C electrical
D visual and electrical
] for other clogging indicators, see brochure no. 7.050../..
BF visual, mobile (only on type codes 3.X and 4.X)

Type code
1-4 see point 2.5 – Mounting position of the clogging indicator

Modification number
X the latest version is always supplied

Supplementary details
B3.5 standard: bypass cracking pressure 3.5 bar
B. special bypass cracking pressure (B1.7 = 1.7 bar)
] A bypass is essential and must be selected!
L... light with appropriate voltage (24, 48, 110, 220 Volt)
LED 2 light emitting diodes up to 24 Volt
] only for clogging indicators type "D"
V FPM seals (on request)
W suitable for HFA and HFC emulsions

2.2 Preferred models

MFX ..... 100/200 G C .... BF 4.X/-B3.5
MFX ..... 100/200 G C .... W 0.X/-B3.5
MFX ..... 100/200 G C .... A 2.X/-B3.5

MFX ..... 100/200 G D .... BF 4.X/-B3.5
MFX ..... 100/200 G D .... W 0.X/-B3.5
MFX ..... 100/200 G D .... A 2.X/-B3.5

2.3 REPLACEMENT ELEMENT

0100 MX 010 BN4HC /-B3.5

Size
0100, 0200

Type
MX

Filtration rating in µm
BN4HC, ECON2 : 005, 010, 020
MM : 008, 010, 015

Filter material
BN4HC, ECON2, MM

Supplementary details
V, W (for description, see point 2.1)
B3.5 standard: bypass opening pressure 3.5 bar
B. special bypass cracking pressure (B1.7 = 1.7 bar)
] A bypass valve is essential and must be selected!

2.4 REPLACEMENT CLOGGING INDICATOR

VM 2.5 D . X /-L24

Type of indicator
VM Diff. pressure indicator up to 210 bar operating pressure
VL Diff. pressure indicator type "BF" up to 50 bar operating pressure and max. operating temperature of 80 °C

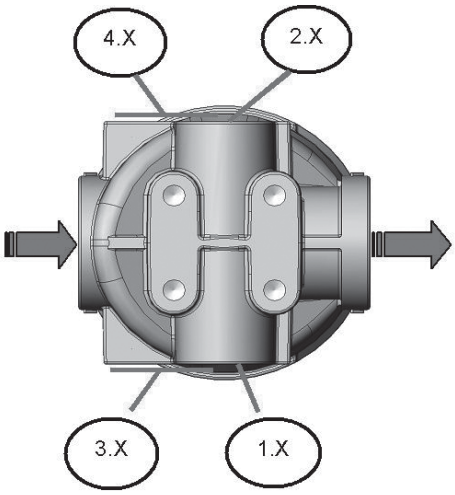
Pressure setting
2.5 standard 2.5 bar, others on request

Type of clogging indicator (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)

2.5 TYPE CODE: MOUNTING POSITION OF THE CLOGGING INDICATOR



Type code 3.X and 4.X only possible with indicator type "BF"!

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:

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

$\Delta p_{housing}$ = given in diagrams (see point 3.1)

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

(*see point 3.2)

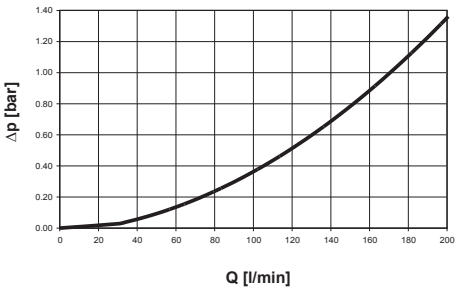
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

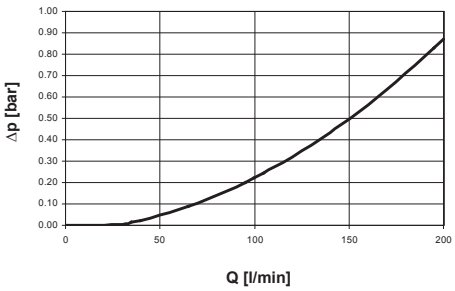
3.1 Δp-Q HOUSING CURVES BASED ON ISO 3968

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.

MFX 100/200: G 3/4



MFX 100/200: G1



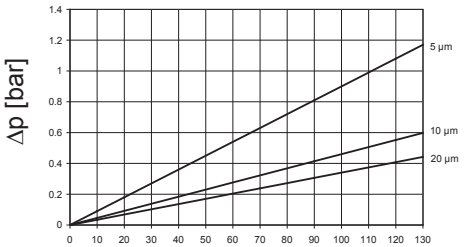
3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

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.

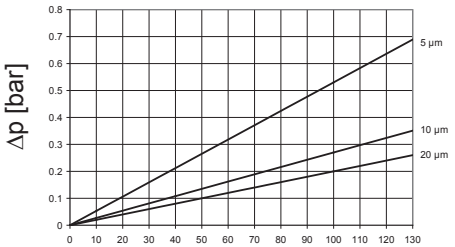
	ECON2			MM*	
	5 µm	10 µm	20 µm	10 µm	15 µm
100	10.00	6.50	4.80	2.70	2.20
200	5.90	3.80	2.80	1.60	1.30

* 8 µm values on request!

BN4HC: MFX 100

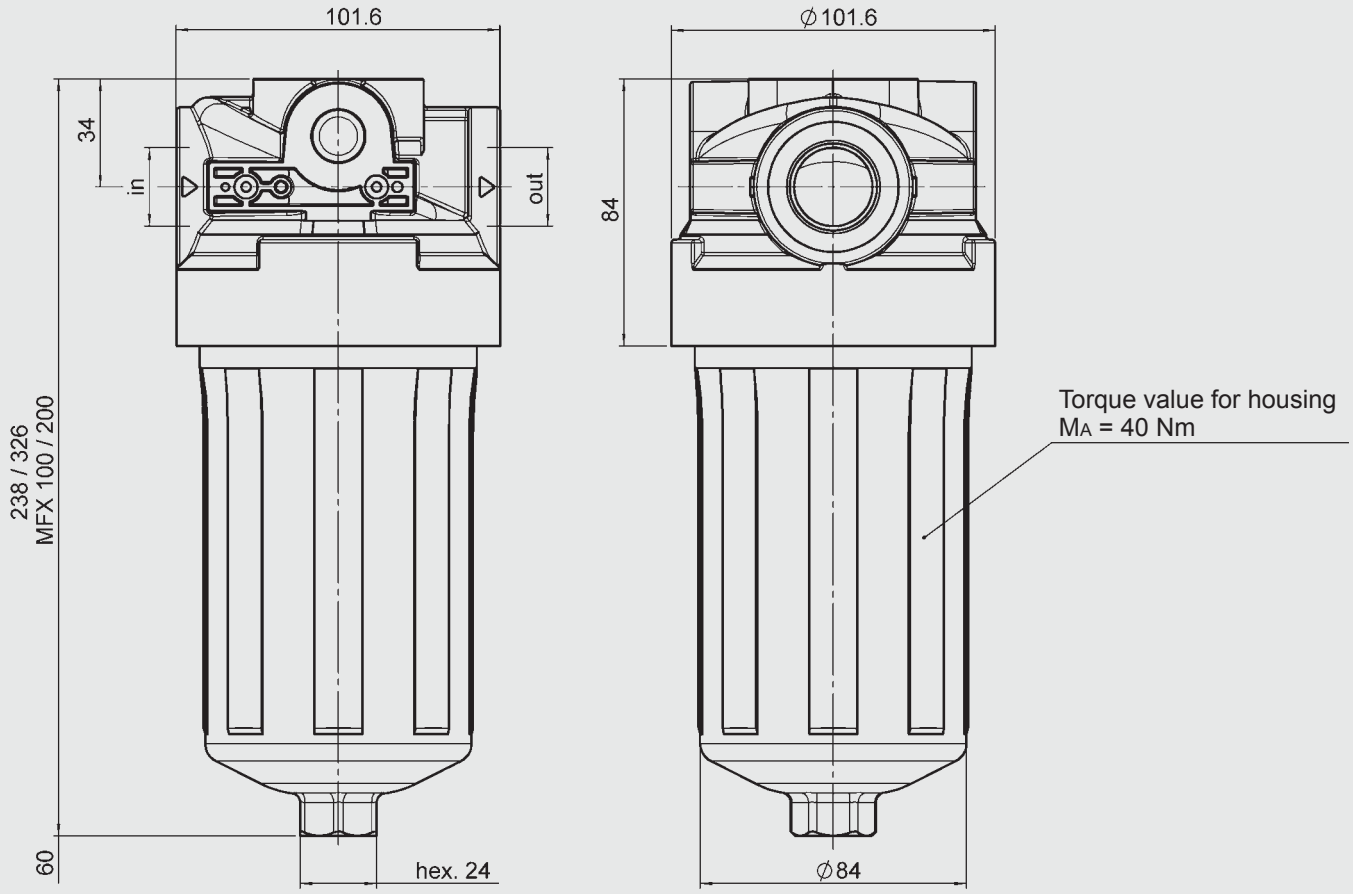


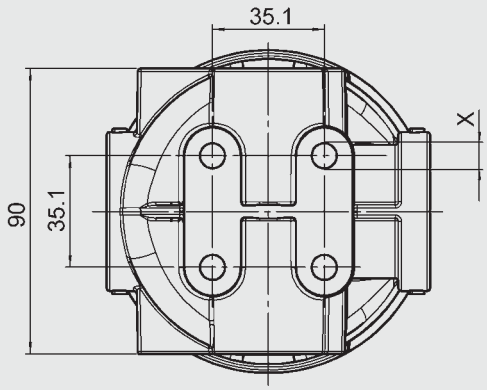
BN4HC: MFX 200



4. DIMENSIONS

MFX 100/200





MFX 100/200...	Mounting x
...G C...	M10 – 13 [0.5] deep
...G D...	M10 – 13 [0.5] deep
...G E...	M10 – 13 [0.5] deep
...G I...	3/8 – 16 UNC, 13 [0.5] deep
...G K...	3/8 – 16 UNC, 13 [0.5] deep
...G L...	M 10 – 13 [0.5] deep

MFX	Weight incl. element [kg]	Volume of pressure chamber [l]
100	1.46	0.71
200	1.74	1.12

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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Tel.: 0 68 97 / 509-01
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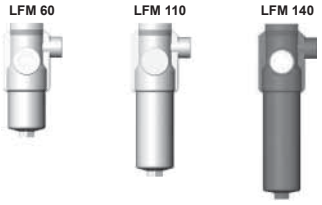
Internet: www.hydac.com
E-mail: filter@hydac.com

Inline Filter LFM with Differential Pressure Relief Valve

up to 120 l/min, up to 63 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 and a screw-in filter bowl.

Standard equipment:

- with differential pressure controlled relief 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

Contamination retention capacities in g

	Betamicron® BN4HC			
LFM	3 µm	5 µm	10 µm	20 µm
60	6.5	7.3	7.8	8.0
110	13.8	15.5	16.4	16.9
140	18.1	20.3	21.5	22.2

Filter elements are available with the following pressure stability values:
Betamicron® (BN4HC): 20 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	63 bar
Fatigue strength	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-30 °C to +100 °C (LFM 140: -30 °C to -10 °C: p_{max}=31.5 bar)
Material of filter head	Aluminium
Material of filter bowl	Aluminium (steel for LFM 140)
Type of clogging indicator	VM (differential pressure measurement up to 210 bar operating pressure)
Pressure setting of the clogging indicator	2 bar (others on request)
Bypass cracking pressure	3.5 bar (others on request)

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

Pressure release / oil drain plug (SO184)

1.7 SPARE PARTS

See Original Spare Parts List

1.8 CERTIFICATES AND APPROVALS

On request

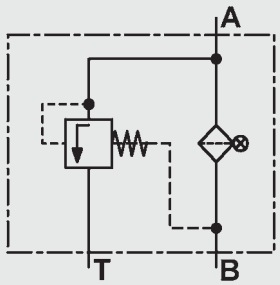
1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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

1.10 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



2. MODEL CODE (also order example)

LFM BN/HC 110 F C 10 D 1 . X /-L24

2.1 COMPLETE FILTER

Filter type
LFM

Filter material of element
BN/HC Betamicron® (BN4HC)

Size of filter or element
LFM: 60, 110, 140

Operating pressure
F = 63 bar

Type and size of connection

Type	Port	Filter size		
		60	110	140
C	G ¾	●	●	●

Filtration rating in µm
BN/HC: 3, 5, 10, 20

Type of clogging indicator
Y plastic blanking plug in indicator port
A steel blanking plug in indicator port
B visual
C electrical
D visual and electrical
for other clogging indicators, see brochure no. 7.050../..

Type code
1

Modification number
X the latest version is always supplied

Supplementary details
DBV5.5 opening pressure of pressure relief valve 5.5 bar
L... light with appropriate voltage (24, 48, 110, 220 Volt)
LED 2 light-emitting diodes up to 24 Volt
SO184 pressure release/oil drain screw
V FPM seals
only for clogging indicators type "D"

2.2 REPLACEMENT ELEMENT

0110 D 010 BN4HC /-V

Size
0060, 0110, 0140

Type
D

Filtration rating in µm
BN4HC: 003, 005, 010, 020

Filter material
BN4HC

Supplementary details
V (for descriptions, see point 2.1)

2.3 REPLACEMENT CLOGGING INDICATOR

VM 2 D . X /-L24

Type
VM differential pressure indicator up to 210 bar oper. pressure

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 (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 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)

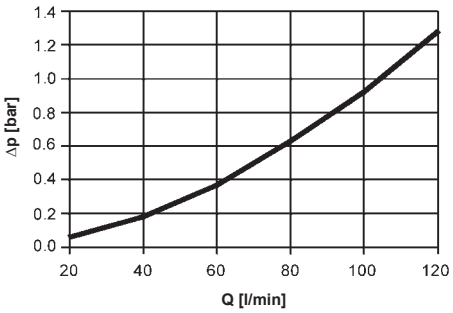
For ease of calculation, our Filter Sizing Program is available on request free of charge.

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.

LFM 60/110/140

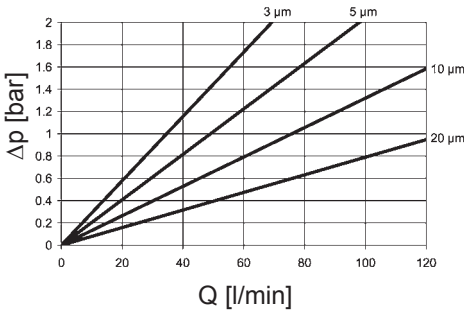


3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

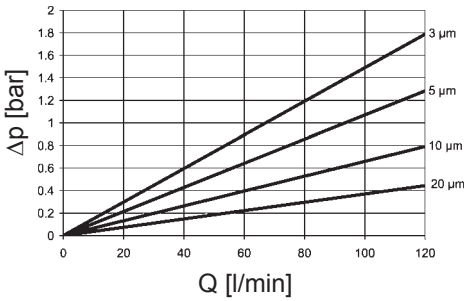
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity.

LFM	BN4HC			
	3 µm	5 µm	10 µm	20 µm
60	28.9	20.4	13.2	7.9
110	14.9	10.7	6.6	3.7
140	12.8	8.2	4.8	2.9

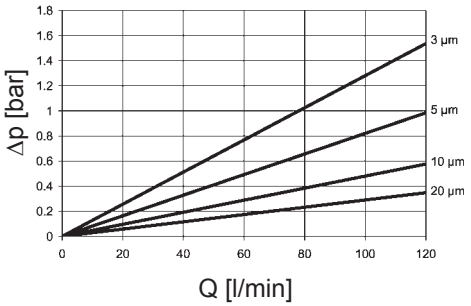
BN4HC: LFM 60



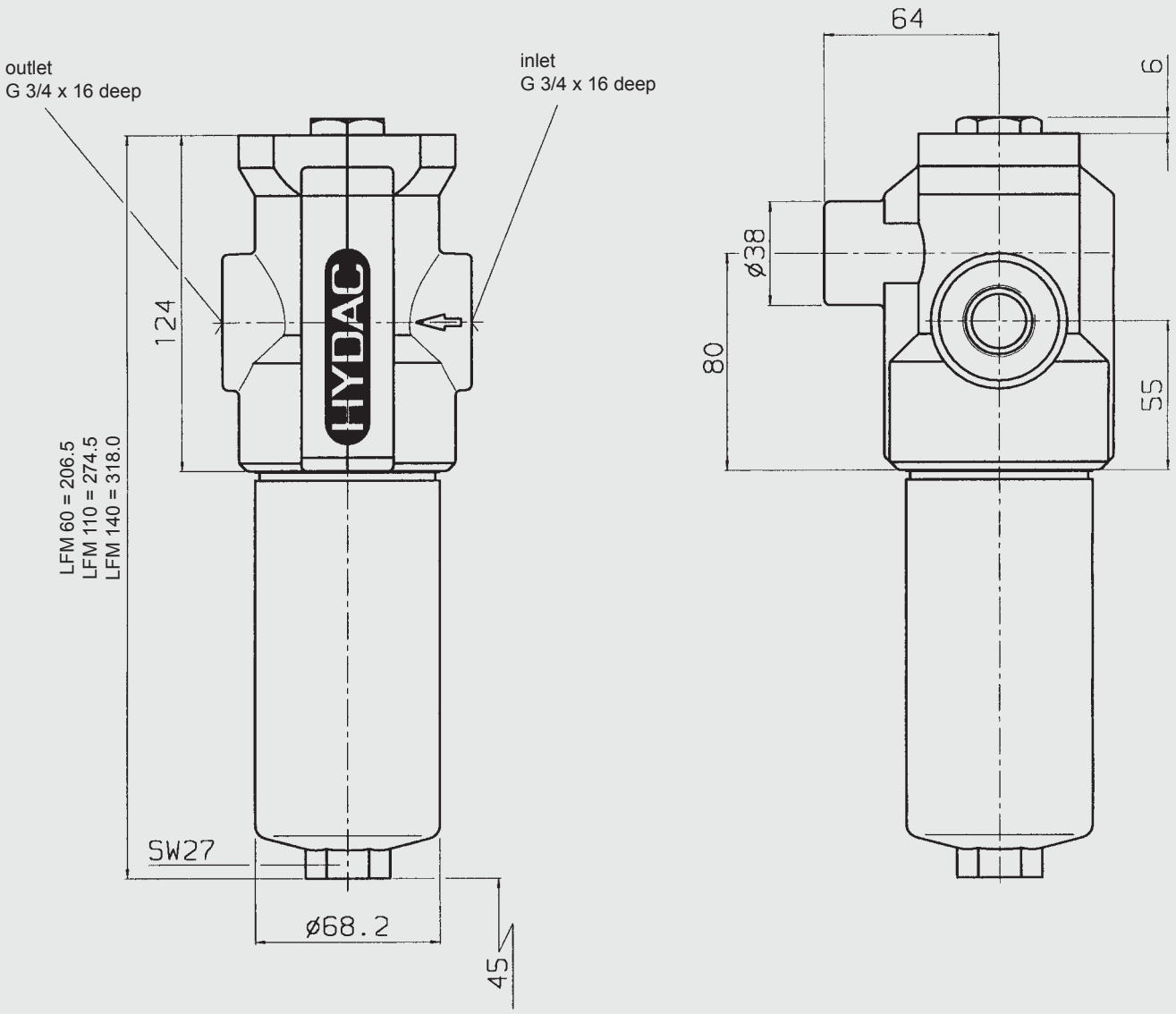
BN4HC: LFM 110

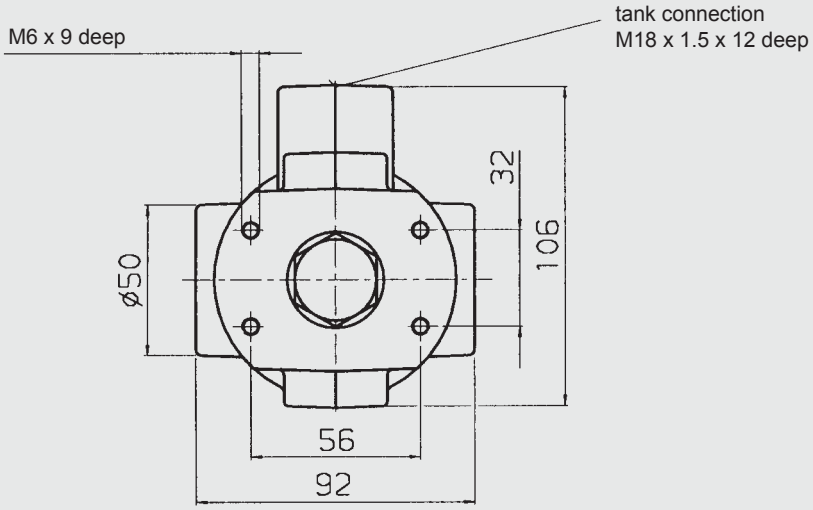


BN4HC: LFM 140



4. DIMENSIONS





LFM	Weight incl. element [kg]	Vol. of pressure chamber [l]
60	1.9	0.20
110	2.3	0.33
140	4.5	0.40

NOTE

The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

HYDAC FILTERTECHNIK GMBH
Industriegebiet
D-66280 Sulzbach/Saar, Germany
Tel.: 0 68 97 / 509-01
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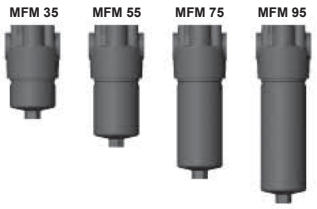
Internet: www.hydac.com
E-mail: filter@hydac.com

Inline Filter MFM
up to 100 l/min, up to 280 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 and a screw-in filter bowl.

Standard equipment:

- bypass valve
- connection for a clogging indicator on the top of the head (4 mounting holes)
- filters are supplied phosphated and primed

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

Contamination retention capacities in g

	Betamicron® BN4HC			
MFM	3 µm	5 µm	10 µm	20 µm
35	7.2	8.1	8.6	8.8
55	14	15.8	16.6	17.2
75	21.6	24.3	25.7	26.5
95	27.5	30.9	32.7	33.7

Filter elements are available with the following pressure stability values:
Betamicron® (BN4HC): 20 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	280 bar
Fatigue strength	0...280 bar, min. 10^7 cycles 0...320 bar, min. 10^5 cycles
Temperature range	-10 °C to +100 °C (-30 °C to -10 °C: p_{max}= 140 bar)
Material of filter head	EN-GJS-400-15
Material of filter bowl	Steel
Type of clogging indicator	VD (differential pressure measurement up to 420 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Bypass cracking pressure	7 bar (others on request)

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

Connection for a clogging indicator on the side of the head (3 mounting holes)

1.7 SPARE PARTS

See Original Spare Parts List

1.8 CERTIFICATES AND APPROVALS

On request

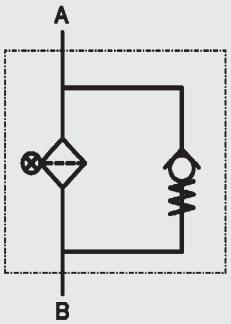
1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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
- Operating fluids with high water content (>50% water content) on request

1.10 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



2. MODEL CODE (also order example)

MFM BN/HC 55 O D 10 D 4 . X /-L24-B7

2.1 COMPLETE FILTER

Filter type
MFM

Filter material
BN/HC Betamicron® (BN4HC)

Size of filter or element
MFM: 35, 55, 75, 95

Operating pressure
O = 280 bar

Type and size of connection

Type	Connection	Filter size			
		35	55	75	95
A	M18 x 1.5	●	●	●	●
B	G ½	●	●	●	●
E	M22 x 1.5	●	●	●	●
H	G ¾	●	●	●	●

Filtration rating in µm
BN/HC: 3, 5, 10, 20

Type of clogging indicator
W without port (no clogging indicator)
A plastic blanking plug in indicator port
B visual
C electrical
D visual and electrical
] for other clogging indicators, see brochure no. 7.050../..

Type code
3 clogging indicator port on side of head - 3 mounting holes
4 clogging indicator port on top of head - 4 mounting holes

Modification number
X the latest version is always supplied

Supplementary details
B7 standard: bypass cracking pressure 7 bar
L... light with appropriate voltage (24, 48, 110, 220 Volt)
LED 2 light-emitting diodes up to 24 Volt
] only for clogging indicators type "D"
V FPM seals
W suitable for HFA and HFC emulsions
WAL right-angled bracket for side mounting, inlet on left (only possible for type code 4.x)
WAR right-angled bracket for side mounting, inlet on right (only for type code 4.x)

2.2 REPLACEMENT ELEMENT

0055 D 010 BN4HC /-V

Size
0035, 0055, 0075, 0095

Type
D

Filtration rating in µm
BN4HC: 003, 005, 010, 020

Filter material
BN4HC

Supplementary details
V (for descriptions, see point 2.1)

2.3 REPLACEMENT CLOGGING INDICATOR

VD 5 D . X /-L24

Type of indicator
VD differential pressure indicator up to 450 bar operating pressure

Pressure setting
5 standard 5 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 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)

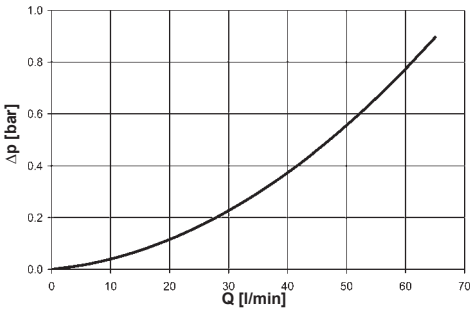
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

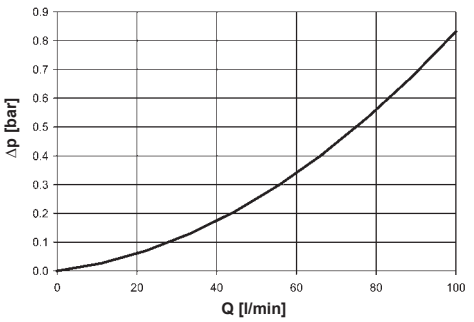
3.1 Δp-Q HOUSING CURVES BASED ON ISO 3968

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.

MFM - Port M18 x 1.5 / G ½



MFM - Port M22 x 1.5 / G ¾

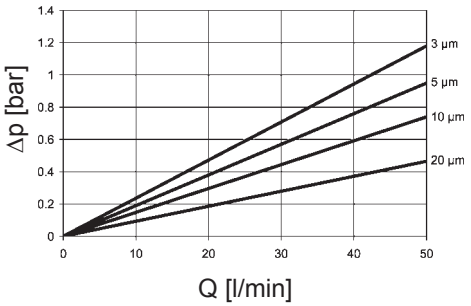


3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

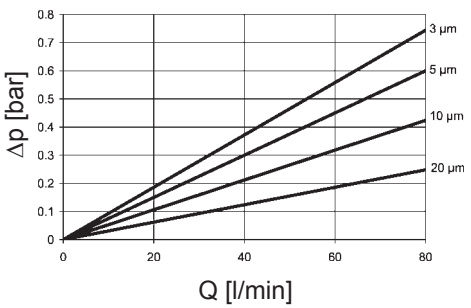
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity.

MFM	BN4HC			
	3 µm	5 µm	10 µm	20 µm
35	23.6	19.0	14.8	9.3
55	13.7	11.0	8.1	4.8
75	9.3	7.5	5.3	3.1
95	7.5	6.0	4.1	2.4

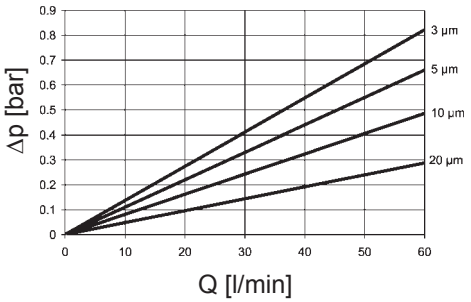
BN4HC: MFM 35



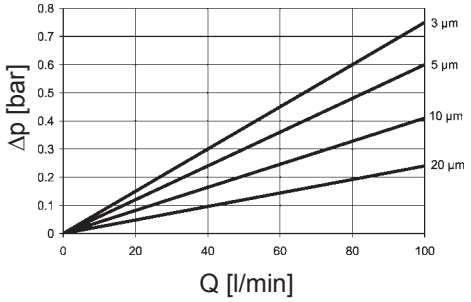
BN4HC: MFM 75



BN4HC: MFM 55

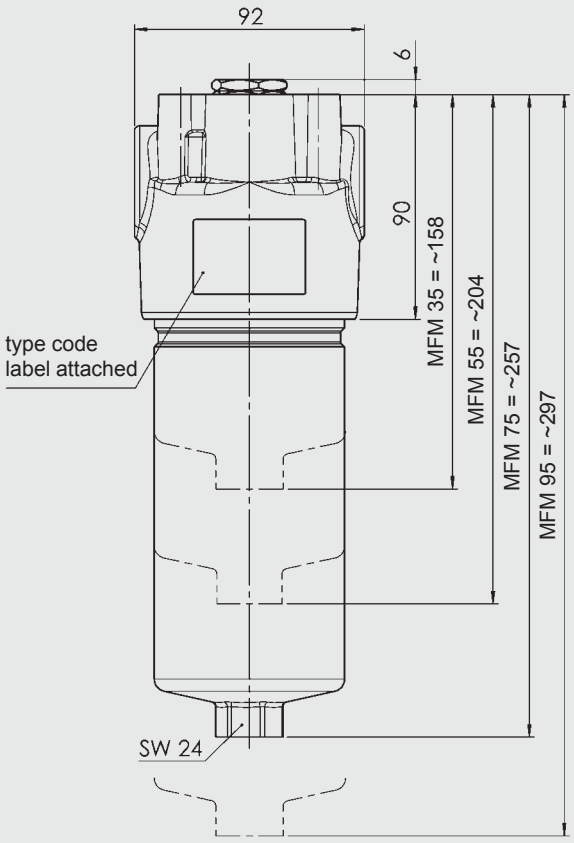


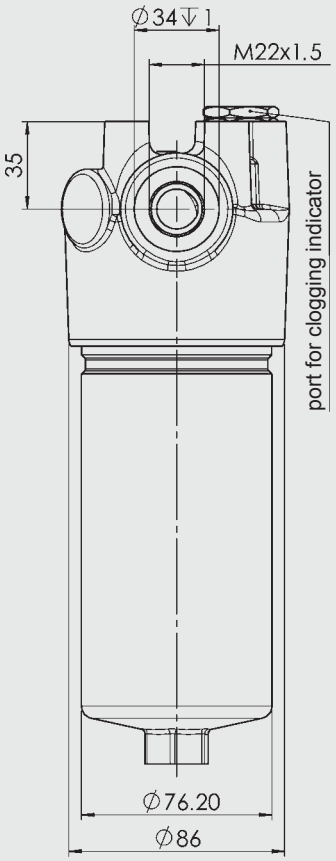
BN4HC: MFM 95



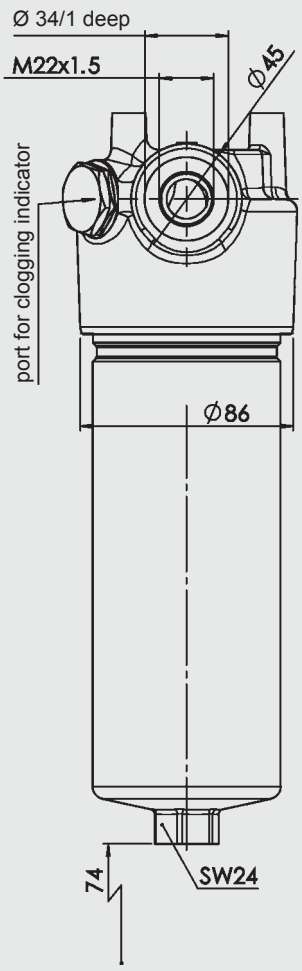
4. DIMENSIONS

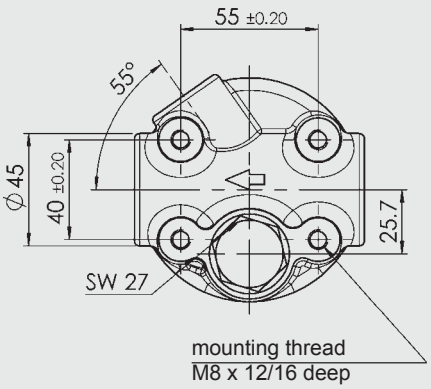
STANDARD VERSION 4.X

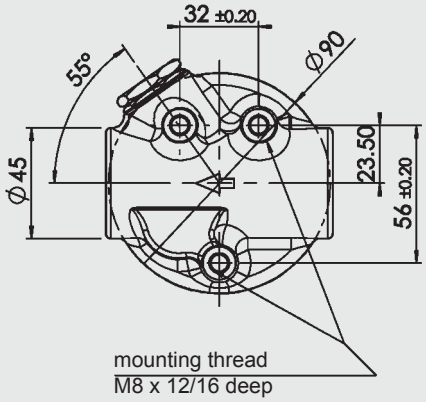




SPECIAL VERSION 3.X







MFM	Weight incl. element [kg]	Vol. of pressure chamber [l]
35	3.7	0.24
55	4.2	0.39
75	4.7	0.56
95	5.1	0.69

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.

HYDAC FILTERTECHNIK GMBH
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Tel.: 0 68 97 / 509-01
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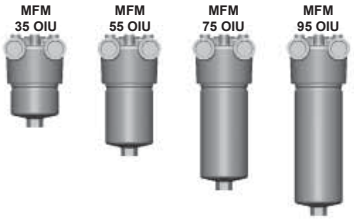
Internet: www.hydac.com
E-mail: filter@hydac.com

Inline Filter MFM
Inlet and Outlet on Same Side up to 100 l/min, up to 280 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 and a screw-in filter bowl.
Standard equipment:

- with bypass valve
- without clogging indicator connection (3 mounting holes)
- filters are supplied phosphated and primed

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

Contamination retention capacities in g

	Betamicron® (BN4HC)			
MFM	3 µm	5 µm	10 µm	20 µm
35	7.2	8.1	8.6	8.8
55	14.0	15.8	16.6	17.2
75	21.6	24.3	25.7	26.5
95	27.5	30.9	32.7	33.7

Filter elements are available with the following pressure stability values:

Betamicron® (BN4HC): 20 bar
Other filtration ratings on request.

1.3 SEALS

Perbunan (= NBR)

1.4 INSTALLATION

As inline filter

1.5 SPECIAL MODELS AND ACCESSORIES

Port for clogging indicator in head

1.6 FILTER SPECIFICATIONS

Nominal pressure	280 bar
Temperature range	-10 °C to +100 °C (-30 °C to -10 °C: p_{max}= 140 bar)
Material of filter head	EN-GJS 400-15
Material of filter bowl	Cold extruded steel
Type of clogging indicator	VD (differential pressure measurement up to 420 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Bypass cracking pressure	7 bar (others on request)

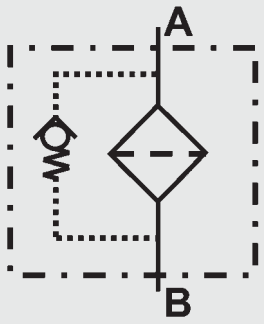
1.7 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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
- Operating fluids with high water content (>50% water content) on request

1.8 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



1.9 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:

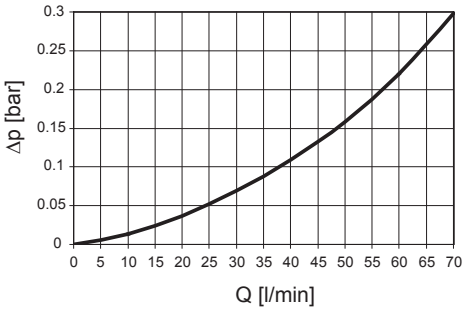
$\Delta p_{total} = \Delta p_{housing} + \Delta p_{element}$

$\Delta p_{housing}$ = please refer to the housing curve

$\Delta p_{element}$ = Q • SK*/1000 • viscosity/30 (*gradient coefficient)

HOUSING CURVE

The housing curves apply to mineral oil with a density of 0.86 kg/dm³ and a kinematic viscosity of 30mm²/s.



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.

	(BN4HC)			
	3 µm	5 µm	10 µm	20 µm
35	23.6	19.0	14.8	9.3
55	13.7	11.0	8.1	4.8
75	9.3	7.5	5.3	3.1
95	7.5	6.0	4.1	2.4

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2. MODEL CODE

2.1 COMPLETE FILTER

Type	Filter material	Size	Pressure range	Type of connection	Filtration rating [µm]	Type of clogging indicator*	Type code	Modification number	Supplementary details
MFM	**BN/HC** = Betamicron®	**35** **55** **75** **95**	**O** = 280 bar	**A** = M18x1.5 **B** = G 1/2 **D** = M22x1.5 **H** = G 3/4 **Z** = customer-specific	**3** **5** **10** **20**	**W** = without port, no clogging indicator **A** = steel plug in indicator port **B** = visual **C** = electrical **D** = visual/ electrical	**3** = 3 mounting holes	**.x** = The latest version is always supplied	**B7** = standard cracking pressure of bypass 7 bar **OIU** = standard: outlet and inlet on same side It is essential to include this information! V = FPM seal

* for other clogging indicators see brochure no. 7.050../..

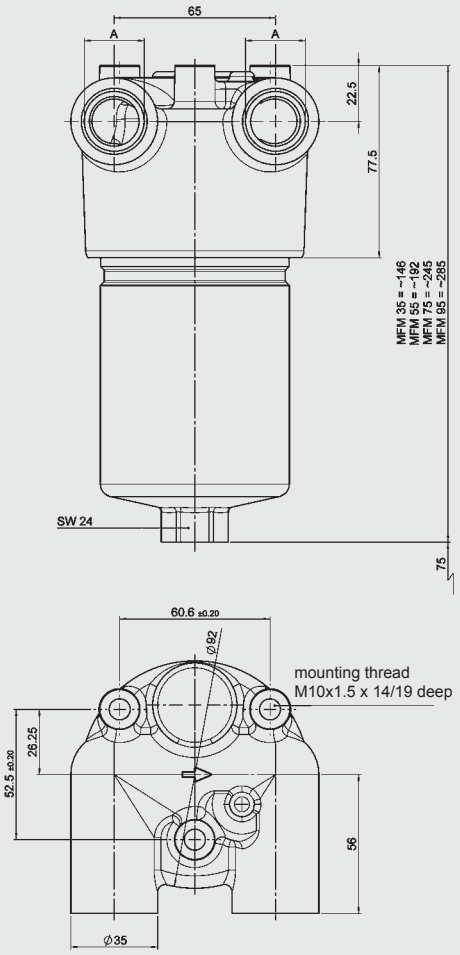
2.2 REPLACEMENT ELEMENT

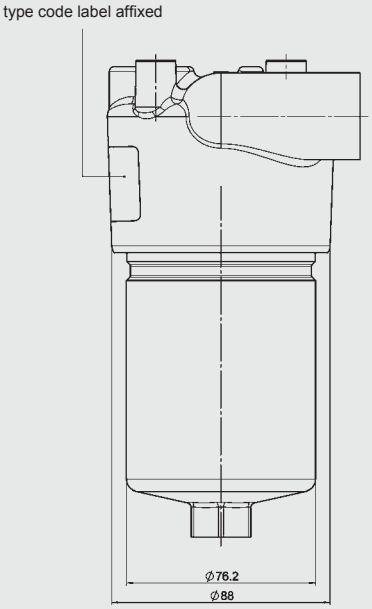
Size	Type	Filtration rating [µm]	Filter material	Supplementary details
0035 **0055** **0075** **0095**	**E**	**003** **005** **010** **020**	**BN4HC** = Betamicron®	**V** = FPM seal

2.3 REPLACEMENT CLOGGING INDICATOR

Type	Pressure setting	Type of clogging indicator*	Modification number	Supplementary details
VD	**5** = standard 5 bar	**A** = steel plug in indicator port **B** = visual **C** = electrical **D** = visual/ electrical	**.x** = The latest version is always supplied	**V** = FPM seal

3. DIMENSIONS





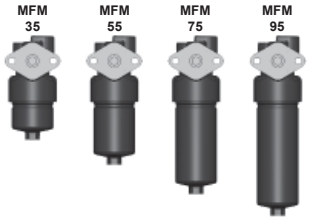
MFM	A	Weight incl. element [kg]	Volume of pressure chamber [l]
35	M18 x 1.5 G ½ M22 x 1.5 G 3/4	3.7	0.24
55		4.2	0.39
75		4.7	0.56
95		5.1	0.69

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.

HYDAC FILTERTECHNIK GMBH
Industriegebiet
D-66280 Sulzbach/Saar
Tel.: 0 68 97 / 509-01
Fax: 0 68 97 / 509-300
Internet: www.hydac.com
E-Mail: filter@hydac.com

Inline Filter MFM
Ports in L-configuration up to 100 l/min, up to 280 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 and a screw-in filter bowl.
Standard equipment:

- with bypass valve
- without clogging indicator connection
- filters are supplied phosphated and primed

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

Contamination retention capacities in g

	Betamicron® (BN4HC)			
MFM	3 µm	5 µm	10 µm	20 µm
35	7.2	8.1	8.6	8.8
55	14.0	15.8	16.6	17.2
75	21.6	24.3	25.7	26.5
95	27.5	30.9	32.7	33.7

Filter elements are available with the following pressure stability values:

Betamicron® (BN4HC): 20 bar

1.3 SEALS

Perbunan (= NBR)

1.4 INSTALLATION

As inline filter

1.5 SPECIAL MODELS AND ACCESSORIES

Port for clogging indicator in head

1.6 FILTER SPECIFICATIONS

Nominal pressure	280 bar
Temperature range	-10 °C to +100 °C (-30 °C to -10 °C: p_{max}= 140 bar)
Material of filter head	EN-GJS 400-15
Material of filter bowl	Cold extruded steel
Type of clogging indicator	VD (differential pressure measurement up to 420 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Bypass cracking pressure	7 bar (others on request)

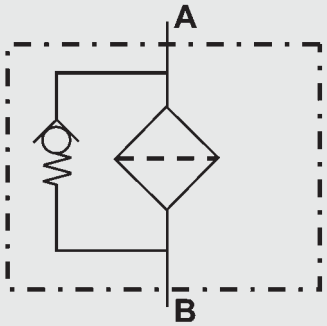
1.7 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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
- Operating fluids with high water content (>50% water content) on request

1.8 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



1.9 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:

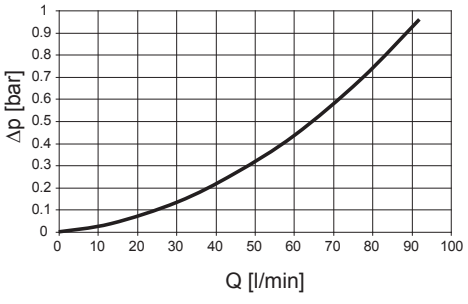
$\Delta p_{total} = \Delta p_{housing} + \Delta p_{element}$

$\Delta p_{housing}$ = please refer to the housing curve

$\Delta p_{element}$ = Q • SK*/1000 • viscosity/30 (*gradient coefficient)

HOUSING CURVE

The housing curves apply to mineral oil with a density of 0.86 kg/dm³ and a kinematic viscosity of 30mm²/s.



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.

	(BN4HC)			
	3 µm	5 µm	10 µm	20 µm
35	23.6	19.0	14.8	9.3
55	13.7	11.0	8.1	4.8
75	9.3	7.5	5.3	3.1
95	7.5	6.0	4.1	2.4

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2. MODEL CODE

2.1 COMPLETE FILTER

Type	Filter material	Size	Pressure range	Head design	Type of connection	Filtration rating [µm]	Type of clogging indicator*	Type code	Modification number	Supplementary details
MFM	**BN/HC** = Betamicron®	**35** **55** **75** **95**	**O** = 280 bar	**L** = flow in L-configu-ration	**A** = M18x1.5 **B** = G 1/2 **D** = M22x1.5 **Inlet:** bore d15 with O-ring seal	**3** **5** **10** **20**	**W** = without port, no clogging indicator **A** = steel plug in indicator port **B** = visual **C** = electrical **D** = visual/ electrical	**1**	**.x** = The latest version is always supplied	**B7** = standard cracking pressure of bypass 7 bar It is essential to include this information! **V** = FPM seal

2.2 REPLACEMENT ELEMENT

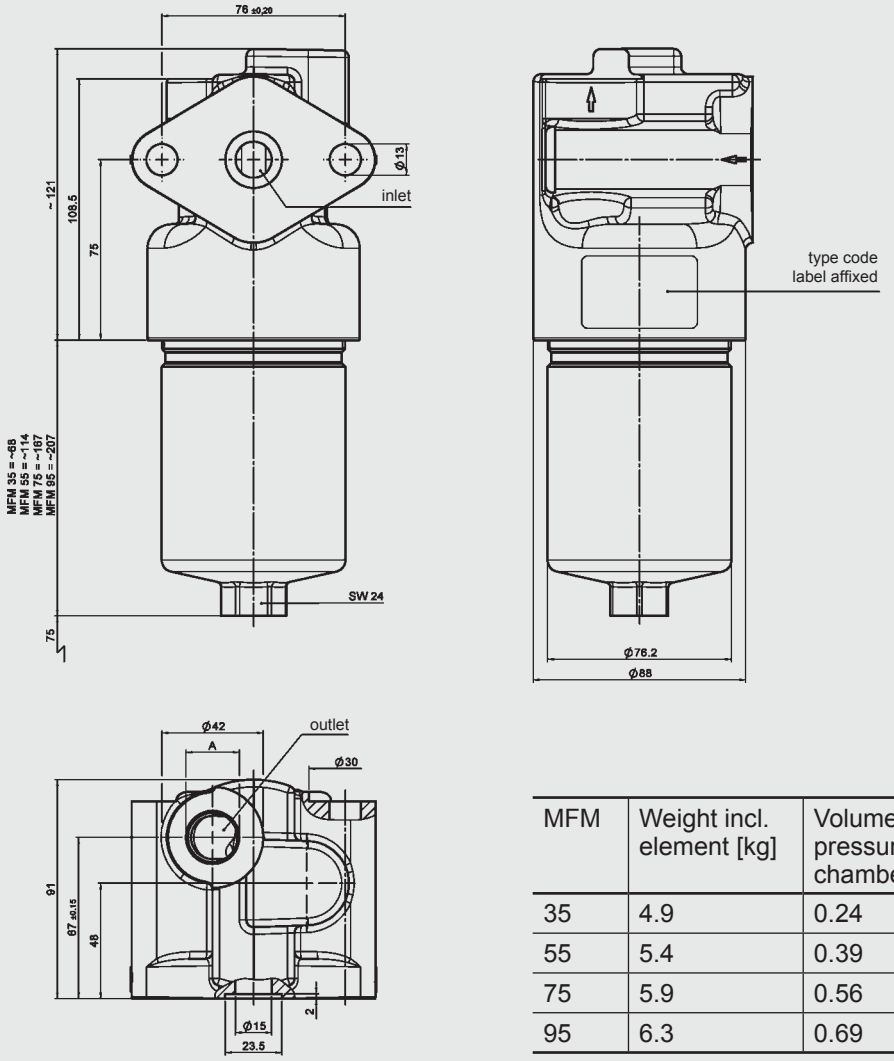
Size	Type	Filtration rating [µm]	Filter material	Supplementary details
0035 **0055** **0075** **0095**	**D**	**003** **005** **010** **020**	**BN4HC** = Betamicron®	**V** = FPM seal

* for other clogging indicators see brochure no. 7.050../..

2.3 REPLACEMENT CLOGGING INDICATOR

Type	Pressure setting	Type of clogging indicator*	Modification number	Supple-mentary details
VD	**5** = standard 5 bar	**A** = steel plug in indicator port **B** = visual **C** = electrical **D** = visual/ electrical	**.x** = The latest version is always supplied	**V** = FPM seal

3. DIMENSIONS



MFM	Weight incl. element [kg]	Volume of pressure chamber [l]
35	4.9	0.24
55	5.4	0.39
75	5.9	0.56
95	6.3	0.69

NOTE

The information in this brochure relates to the operating conditions and applications described.
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Industriegebiet
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Tel.: 0 68 97 / 509-01
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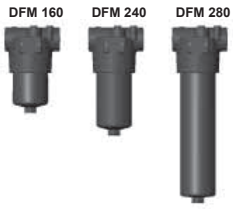
E-Mail: filter@hydac.com

Pressure Filter DFM with Differential Pressure Relief Valve

up to 280 l/min, up to 400 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 and a screw-in filter bowl.

Standard equipment:

- differential pressure controlled relief 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

Contamination retention capacities in g

	Betamicron® BH4HC			
DFM	3 µm	5 µm	10 µm	20 µm
160	12.9	12.6	13.9	15.9
240	21.6	21.1	23.2	26.5
280	48.1	47.1	51.8	59.1

Filter elements are available with the following pressure stability values:
Betamicron® (BH4HC): 210 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	400 bar
Fatigue strength	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-30 °C to +100 °C (-30 °C to -10 °C: p_{max}= 200 bar)
Material of filter head	EN-GJS-400-15
Material of filter bowl	Steel
Type of clogging indicator	VD (differential pressure measurement up to 420 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Cracking pressure of differential pressure controlled relief valve	20 bar (others on request) **NOTE:** On request, BN4HC elements (pressure stability up to 20 bar) can also be used at lower cracking pressures.

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

With pressure release / oil drain plug (SO184)

1.7 SPARE PARTS

See Original Spare Parts List

1.8 CERTIFICATES AND APPROVALS

On request

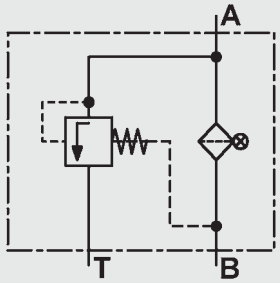
1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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

1.10 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



2. MODEL CODE (also order example)

DFM BH/HC 240 S E 10 D 1 . X /-L24

2.1 COMPLETE FILTER

Filter type
DFM

Filter material of element
BH/HC Betamicron® (BH4HC)

Size of filter or element
DFM: 160, 240, 280

Operating pressure
S = 400 bar

Type and size of connection

Type	Port	Filter size		
		160	240	280
E	G1 ¼	●	●	●

Filtration rating in µm
BH/HC : 3, 5, 10, 20

Type of clogging indicator
Y plastic blanking plug in indicator port
A steel blanking plug in indicator port
B visual
C electrical
D visual and electrical
] for other clogging indicators, see brochure no. 7.050../..

Type code
1

Modification number
X the latest version is always supplied

Supplementary details
L... light with appropriate voltage (24, 48, 110, 220 Volt)
LED 2 light-emitting diodes up to 24 Volt
SO184 pressure release/oil drain screw
V FPM seals
] only for clogging indicators type "D"

2.2 REPLACEMENT ELEMENT

0240 D 010 BH4HC /-V

Size
0160, 0240, 0280

Type
D

Filtration rating in µm
BH4HC: 003, 005, 010, 020

Filter material
BH4HC

Supplementary details
V (for descriptions, see point 2.1)

2.3 REPLACEMENT CLOGGING INDICATOR

VD 5 D . X /-L24

Type
VD Diff. pressure indicator up to 420 bar oper. pressure

Pressure setting
5 standard 5 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 (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 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)

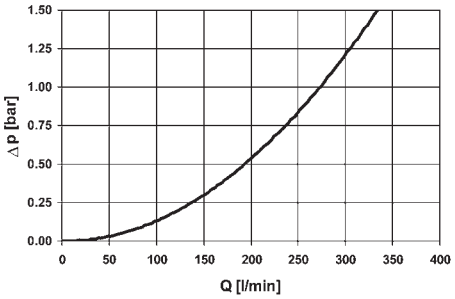
For ease of calculation, our Filter Sizing Program is available on request free of charge.

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.

DFM 160/240/280

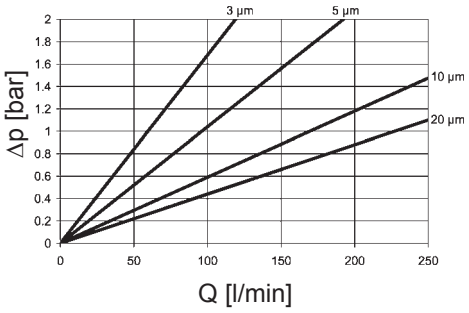


3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

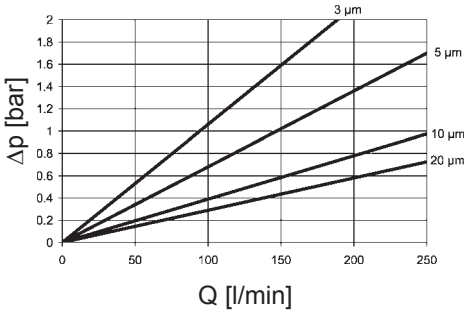
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity.

DFM	BH4HC			
	3 µm	5 µm	10 µm	20 µm
160	16.8	10.4	5.9	4.4
240	10.6	6.8	3.9	2.9
280	5.7	3.4	1.8	1.6

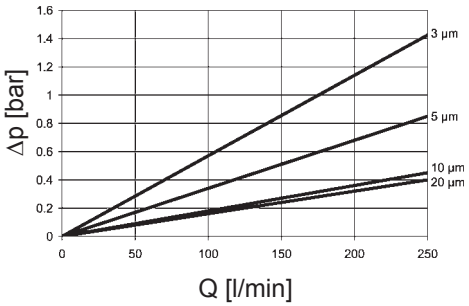
BH4HC: DFM 160



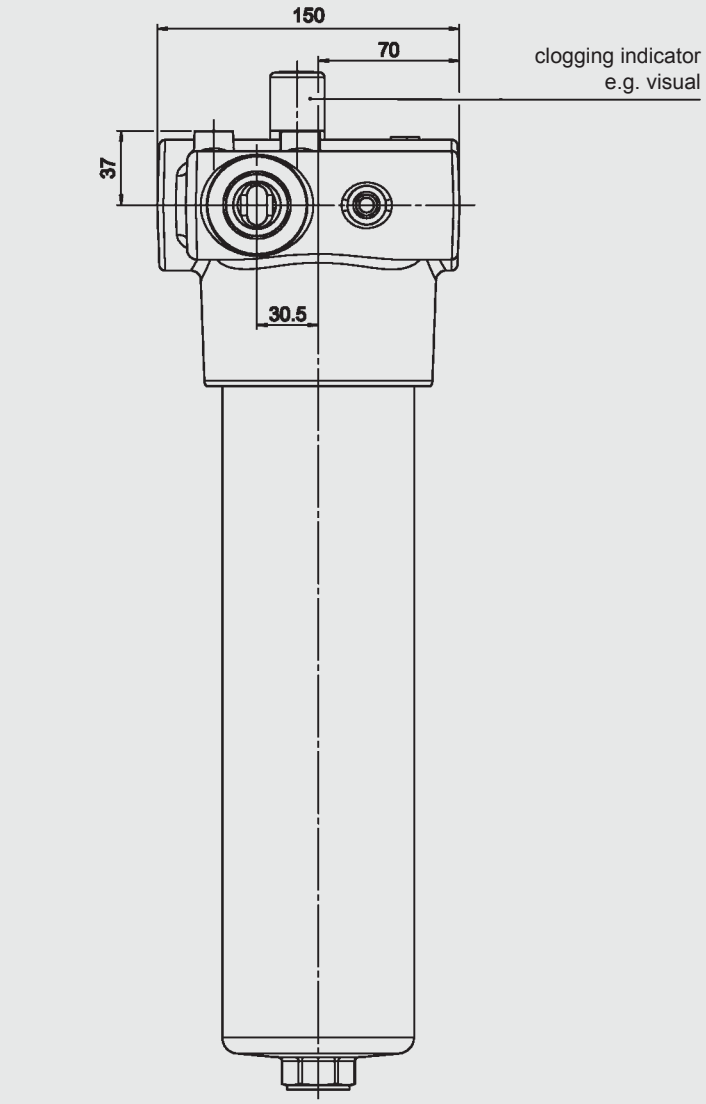
BH4HC: DFM 240

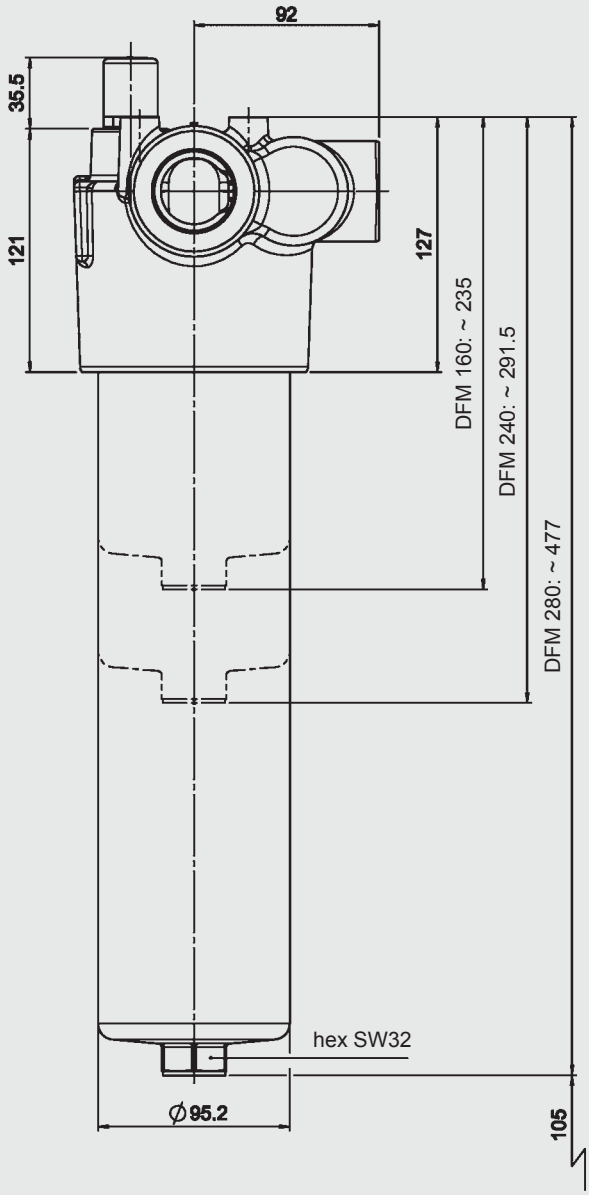


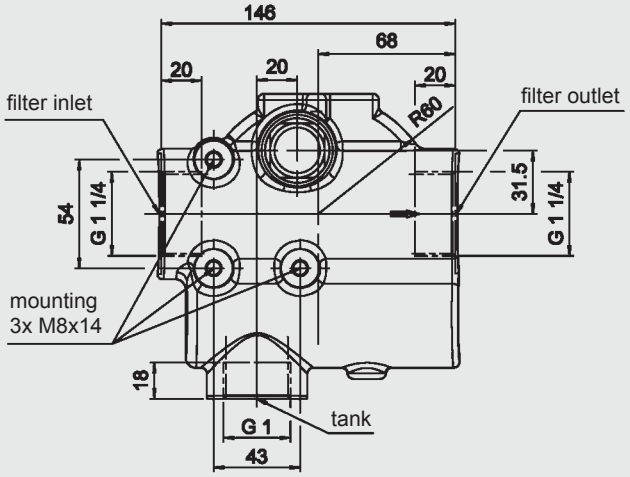
BH4HC: DFM 280



4. DIMENSIONS







DFM	Weight incl. element [kg]	Volume of pressure chamber [l]
160	11.0	0.6
240	12.5	0.8
280	17.1	1.45

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.

HYDAC FILTERTECHNIK GMBH
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Tel.: 0 68 97 / 509-01
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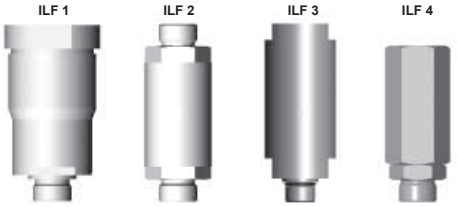
Internet: www.hydac.com
E-mail: filter@hydac.com

Inline Filter ILF
up to 120 l/min, up to 350 bar



1. TECHNICAL SPECIFICATIONS

1.1 FILTER HOUSING

Construction

The filter housings are designed in accordance with international regulations. They consist of a filter housing and a screw-in cover plate.

Standard equipment:

- without bypass valve (only ILF 1, ILF 3 and ILF 4)
- with bypass valve (only ILF 2 and ILF 3)

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 16889

Filter elements are available with the following pressure stability values:

Betamicron® (BN4HC):	20 bar
Betamicron® (BH4HC):	210 bar
Wire mesh (W):	up to 100 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	ILF 1, 2, 3: 350 bar The permitted operating pressure will be reduced according to the max. permitted value of the threaded connection used! ILF 4: 160 bar
Fatigue strength	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-10 °C to +100 °C
Material of filter housing and cover plate	ILF 1, 2, 3: Steel 52-3 ILF 4: Aluminium
Cracking pressure of bypass: optional:	ILF 2: 5.5 bar ILF 3: 3 or 6 bar

1.4 SEALS

Perbunan (= NBR)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

- bypass valve for ILF 3
- others on request see original spare parts list

1.7 SPARE PARTS

See Original Spare Parts List

1.8 CERTIFICATES AND APPROVALS

On request

1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

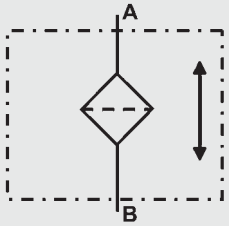
- Hydraulic oils H to HLPD DIN 51524
- Lubrication oils DIN 51517, API, ACEA, DIN 51515, ISO 6743
- Compressor oils DIN 51506
- Biodegradable operating fluids VDMA 24568 HETG, HEES, HEPG
- Operating fluids with high water content (>50% water content) on request

1.10 MAINTENANCE INSTRUCTIONS

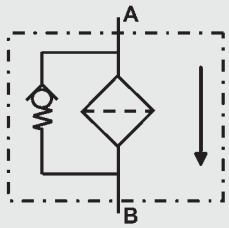
- Filter housings must be earthed.

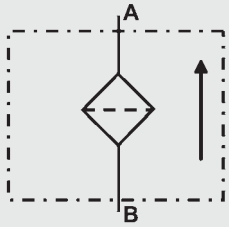
Symbol for hydraulic systems

ILF 1

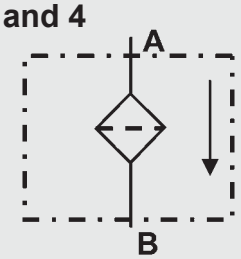


ILF 2





ILF 3 and 4



E 7.569.1/03.12

2. MODEL CODE (also order example)

ILF W 2 R F F 100 W 1 . X /-B5.5-IA

2.1 COMPLETE FILTER

Filter type
ILF

Filter material of element
W Wire mesh
BN/HC Betamicron® (only ILF 3)
BH/HC Betamicron® (only ILF 3)

Size of filter or element
ILF: 1, 2, 3, 4

Operating pressure
K = 160 bar (only ILF 4)
R = 350 bar
The permitted operating pressure will be reduced according to the max. permitted value of the threaded connection used!

Type and size of port - inlet

Type	Port	Filter size 1	2	3	4
A	M18x1.5	●	●		
B	G ½			X	
D	M22x1.5	●	●	●	
F	M24x1.5	●	●		●
H	M30x2		●		

NOTE:
Same port size at inlet and outlet (for ILF 1 and 2)
Please see Point 4 "Dimensions"!

X = only possible for female threads
(Supplementary detail code: II)

Type and size of port - outlet

Type	Port	Filter size 1	2	3	4
A	M18x1.5	●	●		
B	G ½			X	
D	M22x1.5	●	●	●	●
F	M24x1.5	●	●		
H	M30x2		●		

X = only possible for female threads
(Supplementary detail code: II)

Filtration rating in µm
BN/HC, BH/HC : 10, 20 (only ILF 3)
W : 40, 80[1], 100, 200 others on request

Type of clogging indicator
W without port, no clogging indicator

Type code
1

Modification number
X the latest version is always supplied

Supplementary details
B5.5 standard: bypass cracking pressure 5.5 bar = **required info for ILF 2**[2]
B3 or B6 = **required info for ILF 3** (if bypass valve is required!)
V FPM seals

Connection type = **Required info:**

inlet	outlet	Code
Female	Female	II
Female	Male	IA
Male	Female	AI
Male	Male	AA

NOTE:
Same port size at inlet and outlet (for ILF 1 and 2)
Please see Point 4 "Dimensions"!

[1] Only for ILF 4
[2] Not possible for ILF 1 and ILF 4

2.2 REPLACEMENT ELEMENT [1]

HE03119932 100 -W /-V

Size
0015 R[2]] only ILF 3
0015 D[2]]
HE1468 only ILF 1
HE03119932 only ILF 2

Filtration rating in µm
BN4HC, BH4HC : 10, 20 (only ILF 3)
W : 40, 100, 200 others on request

Filter material
BN4HC, BH4HC, W

Supplementary details
B3 standard: bypass opening pressure for R elements
B6 special bypass cracking pressure 6 bar (only for BN4HC elements)
V (for descriptions, see Point 2.1)

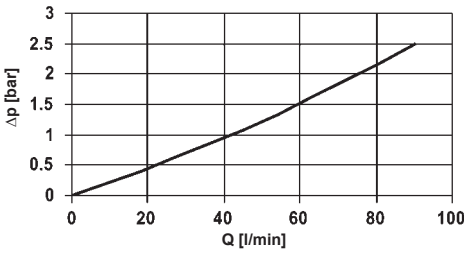
[1] Replacement element for ILF 4 on request!
[2] Replacement element 0015 R... (bypass version) or 0015 D... (version without bypass)

3. FILTER CALCULATION / SIZING

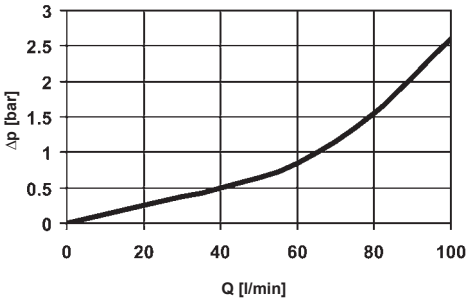
3.1 GRAPHS FOR COMPLETE FILTER

The curves apply to mineral oil with a density of 0.86 kg/dm³ and a kinematic viscosity of 30mm²/s.

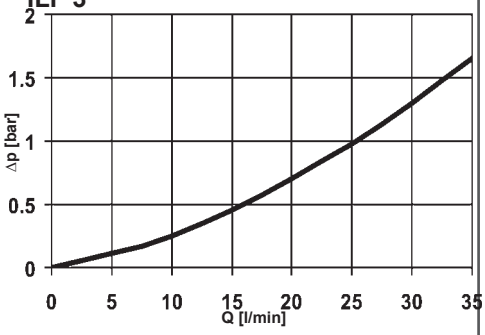
ILF 1



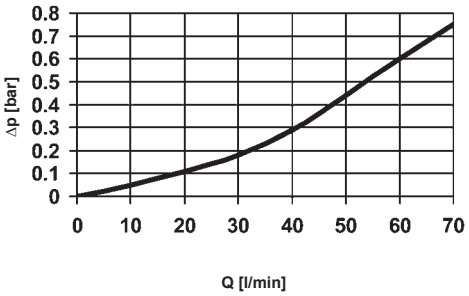
ILF 2



ILF 3

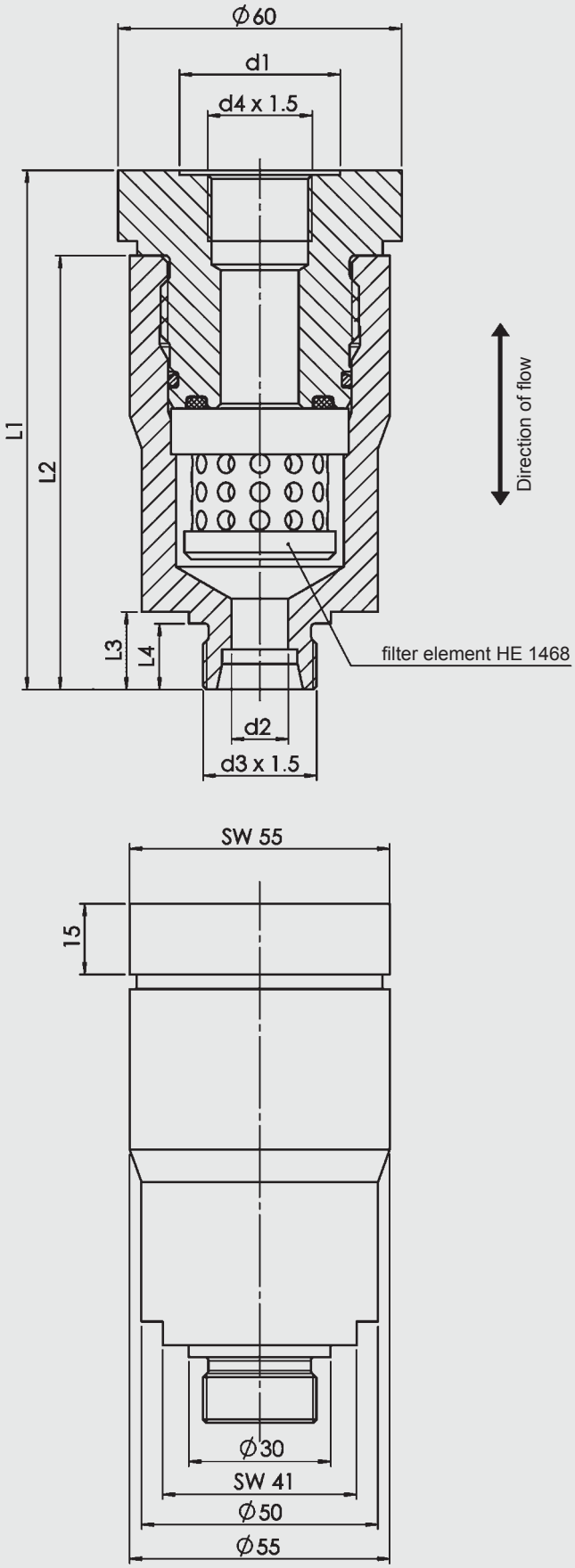


ILF 4



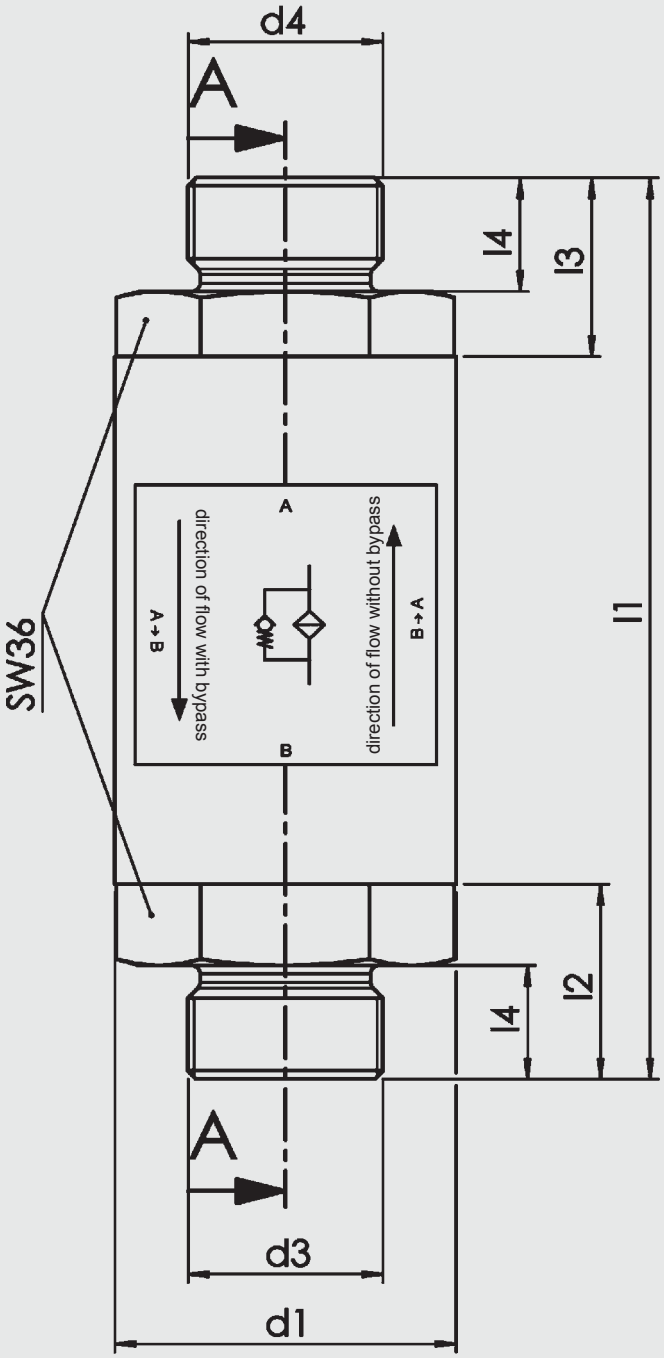
4. DIMENSIONS

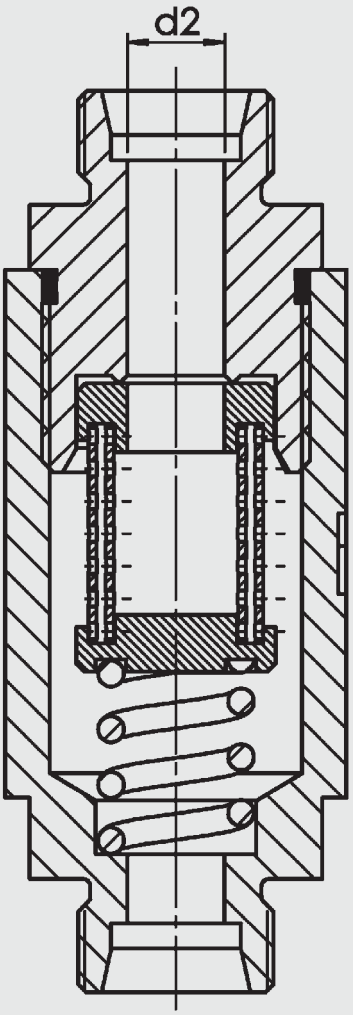
ILF 1



NF	d1	d2	d3	d4	L1	L2	L3	L4	Weight incl. element [kg]	Vol. of pressure chamber [l]
1	28	10	M18	M18	108	90	13.5	11	1.40	0.03
	34	12	M22	M22	109	91	14,5	12	1.39	
	34	12	M24	M24	110	92	16.5	14	1.39	

ILF 2



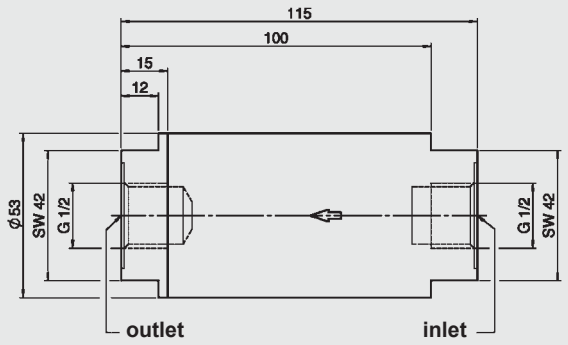


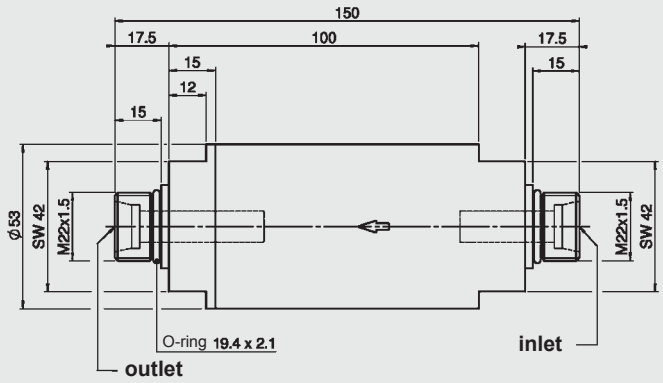
A-A

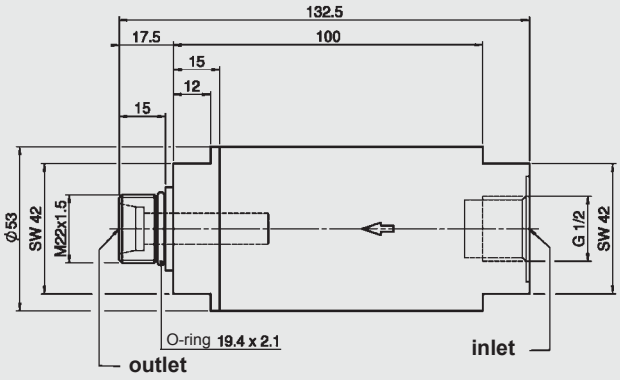
NF	d1	d2	d3	d4	L1	L2	L3	L4	Weight incl. element [kg]	Vol. of pressure chamber [l]
2	42	9	M18x1.5	M18x1.5	107	22	22	12	0.77	0.04
		12	M22x1.5	M22x1.5	111	24	22	14	0.78	
		12	M24x1.5*	M24x1.5*	111	24	22	14	0.79	
		12	M30x2	M30x2	115	26	24	16	0.83	

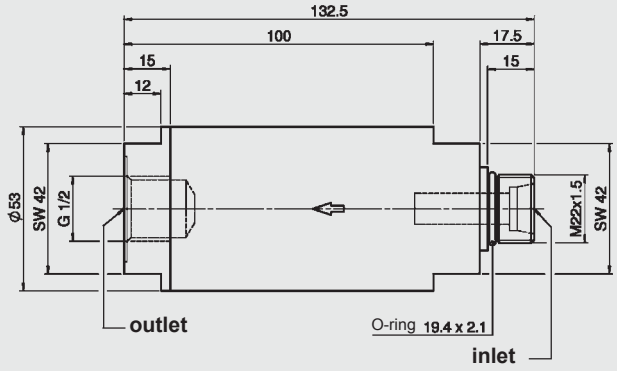
* Preferred types

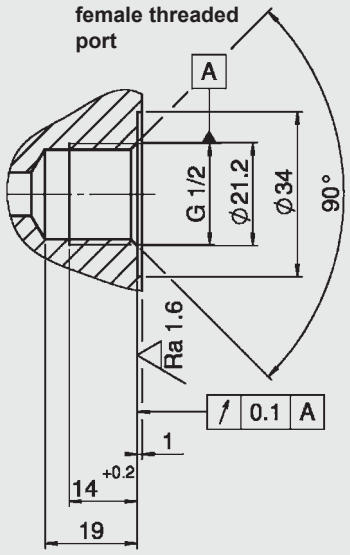
ILF 3





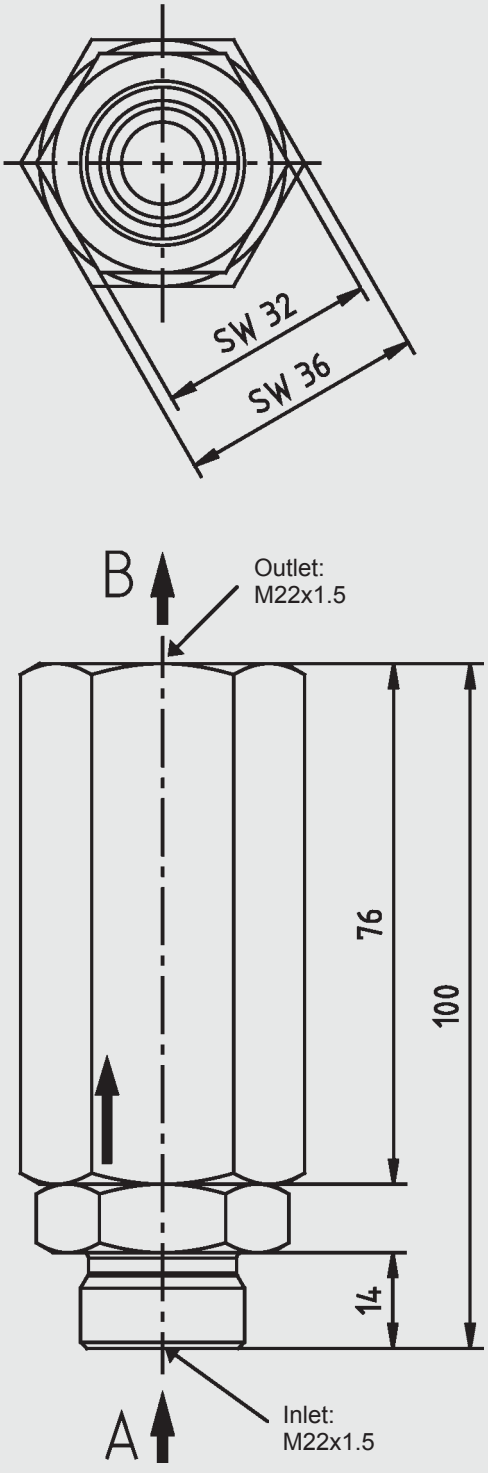






ILF	Weight incl. element [kg]	Vol. of pressure chamber [l]
3	approx. 1.4	0.07

ILF 4



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.

HYDAC FILTERTECHNIK GMBH
Industriegebiet
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Tel.: 0 68 97 / 509-01
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Internet: www.hydac.com
E-mail: filter@hydac.com

Pressure Filter HFM
up to 140 l/min, up to 400 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 and a screw-in filter bowl.

Standard equipment:

- bypass valve
- connection for a clogging indicator on the top of the head (4 mounting holes)

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

Contamination retention capacities in g

	Betamicron® BN4HC			
HFM	3 µm	5 µm	10 µm	20 µm
75	21.6	24.3	25.7	26.5
95	27.5	30.9	32.7	33.7

Filter elements are available with the following pressure stability values:
Betamicron® (BN4HC): 20 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	400 bar
Fatigue strength	At nominal pressure 10^6 cycles from 0 to nominal pressure
Temperature range	-10 °C to +100 °C (-30 °C to -10 °C: p_{max}= 200 bar)
Material of filter head	EN-GJS 400-15
Material of filter bowl	Cold extruded steel
Type of clogging indicator	VD (differential pressure measurement up to 420 bar operating pressure)
Pressure setting of the clogging indicator	5 bar (others on request)
Bypass cracking pressure	7 bar (others on request)

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

On request

1.7 SPARE PARTS

See Original Spare Parts List

1.8 CERTIFICATES AND APPROVALS

On request

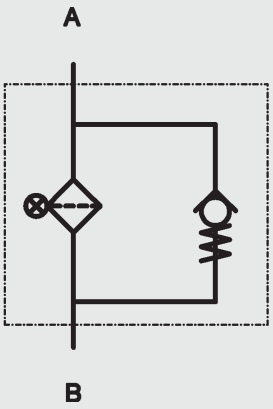
1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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
- Operating fluids with high water content (>50% water content) on request

1.10 MAINTENANCE INSTRUCTIONS

- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems



2. MODEL CODE (also order example)

HFM BN/HC 75 S J 10 D 1 . X /-L24

2.1 COMPLETE FILTER

Filter type
HFM

Filter material of element
BN/HC Betamicron® (BN4HC)

Size of filter or element
HFM: 75, 95

Operating pressure
S = 400 bar

Type and size of connection

Type	Port	Filter size	
		75	95
H	G ¾	●	●
J	G 1	●	●

Filtration rating in µm
BN/HC: 3, 5, 10, 20

Type of clogging indicator
W without port (no clogging indicator)
A plastic blanking plug in indicator port
B visual
C electrical
D visual and electrical
for other clogging indicators, see brochure no. 7.050../..

Type code
1

Modification number
X the latest version is always supplied

Supplementary details
B7 standard: bypass cracking pressure 7 bar
L... light with appropriate voltage (24, 48, 110, 220 Volt) — only for clogging indicators type "D"
LED 2 light-emitting diodes up to 24 Volt — only for clogging indicators type "D"
V FPM seals
W suitable for HFA and HFC emulsions

2.2 REPLACEMENT ELEMENT

0075 D 010 BN4HC /-V

Size
0075, 0095

Type
D

Filtration rating in µm
BN4HC: 003, 005, 010, 020

Filter material
BN4HC

Supplementary details
V (for descriptions, see point 2.1)

2.3 REPLACEMENT CLOGGING INDICATOR

VD 5 D . X /-L24

Type
VD differential pressure indicator up to 420 bar operating pressure

Pressure setting
5 standard 5 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 Δp and the element Δp and is calculated as follows:

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

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

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

(*see Point 3.2)

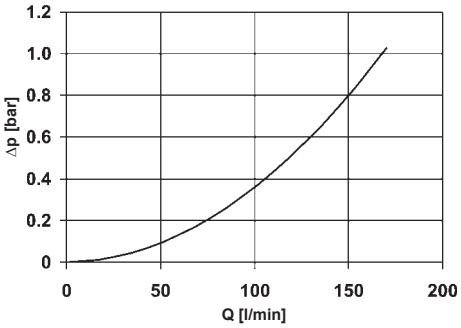
For ease of calculation, our Filter Sizing Program is available on request free of charge.

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.

HFM

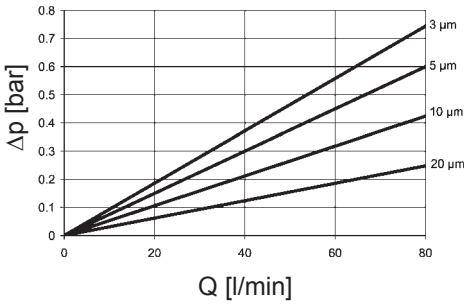


3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

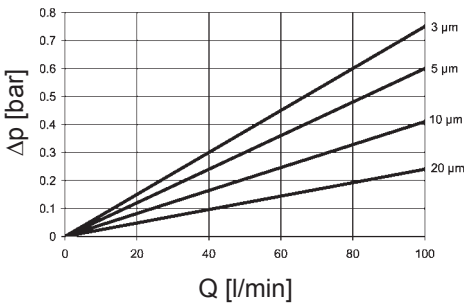
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity.

HFM	BN4HC			
	3 µm	5 µm	10 µm	20 µm
75	9.3	7.5	5.3	3.1
95	7.5	6.0	4.1	2.4

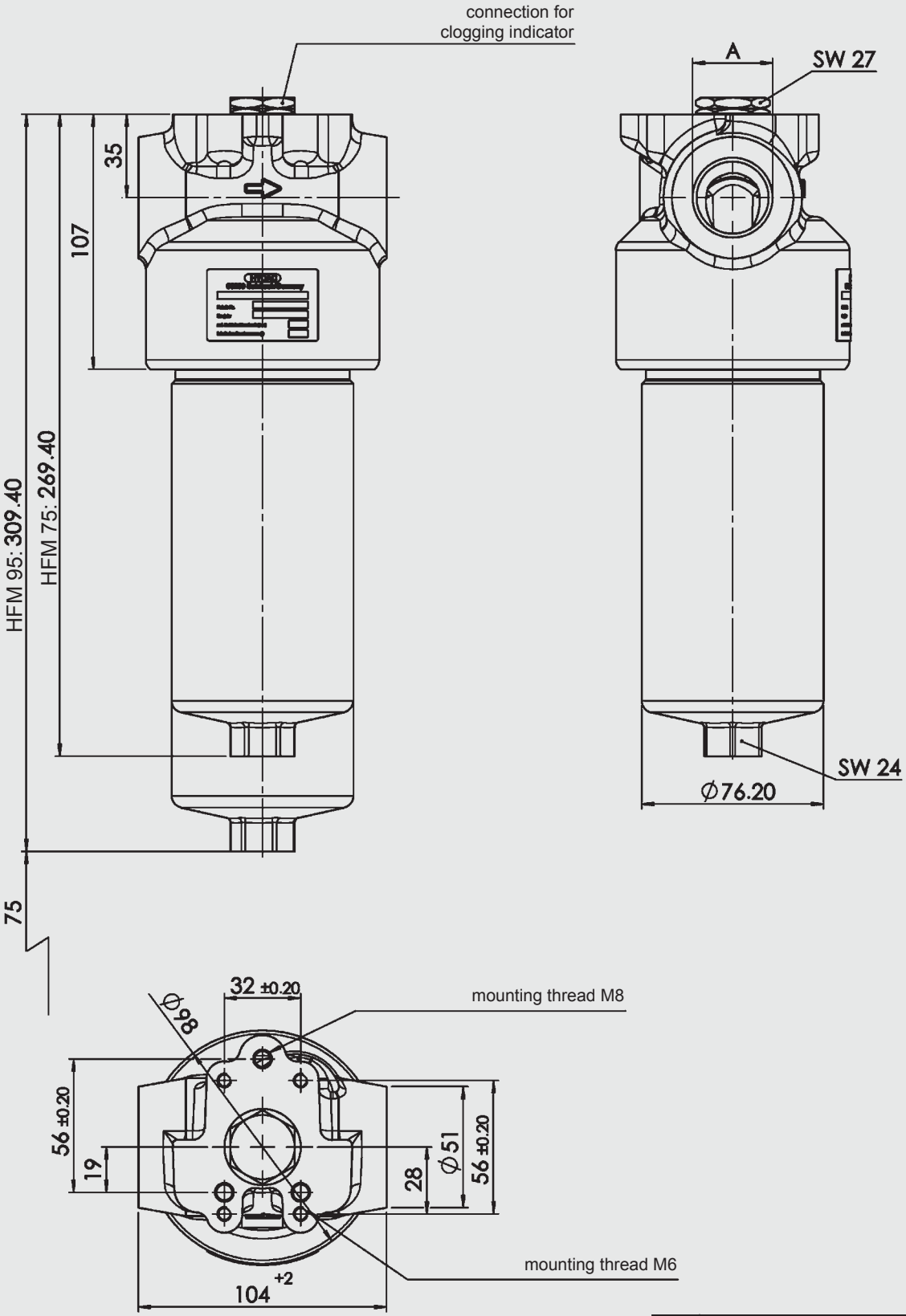
BN4HC: HFM 75



BN4HC: HFM 95



4. DIMENSIONS



HFM	Weight incl. element [kg]	Vol. of pressure chamber [l]
75	5.6	0.56
95	6.1	0.69

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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