

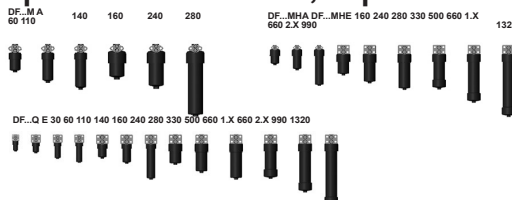
HYDAC

INTERNATIONAL



Pressure Filter DF...M A, DF...Q E, DF...MHA, DF...MHE

up to 550 l/min, up to 315 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:

- mounting holes in the filter head
- two-piece bowl for size DF...990 and above (optional for size DF...660 and above)
- drain screw with pressure relief (standard for size DF...330 and above)

1.2 FILTER ELEMENTS

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

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

Filter elements are available with the following pressure stability values:

Optimicron® (ON):	20 bar
Betamicon® (BH4HC):	210 bar
Optimicron® Pulse (ON/PS):	20 bar
Optimicron® Pulse (OH/PS):	210 bar
Wire mesh (W/HC):	20 bar
Stainless steel fibre (V):	210 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	DF...M A/MHA/MHE: 250 bar DF...Q E: 315 bar
Fatigue strength	10 ⁶ cycles (DF...M A/DF...Q E) 10 ⁸ cycles (DF...MHA/DF...MHE) from 0 to nominal pressure (for other pressures, see graph, Point 1.8)
Temperature range	-10 °C to +100 °C (-30 °C to -10 °C: p _{max} = 0.5 x nom. press.)
Material of filter head	EN-GJS-400-15 (DF...M A/DF...Q E) ADI (DF...MHA/DF...MHE)
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 bypass (optional)	6 bar (only DF...M A / Q E)

1.4 SEALS

NBR (=Perbunan)

1.5 INSTALLATION

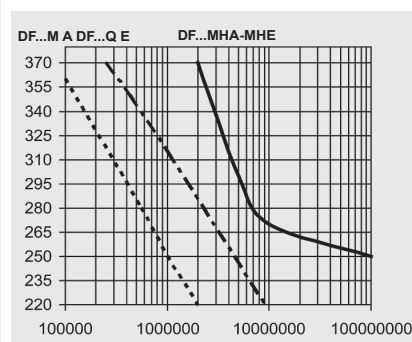
Pressure filter for flange mounting

1.6 SPECIAL MODELS AND ACCESSORIES

- Bypass valve built into the head, separate from the main flow
- Seals
- Test and approval certificates

See Original Spare Parts List

1.8 FATIGUE STRENGTH



1.9 CERTIFICATES AND APPROVALS

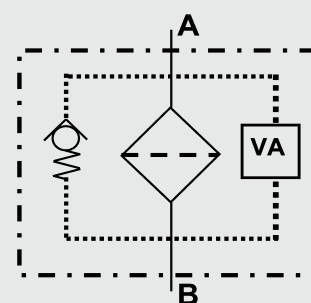
on request

1.10 COMPATIBILITY WITH

HYDRAULIC FLUIDS ISO 2943

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

Symbol for hydraulic systems



VA = clogging indicator

2. MODEL CODE (also order example)

DF ON 240 M H A 10 D 1 . X /-L24

2.1. COMPLETE FILTER

Filter type

DF... flange mounted

Filter material

ON Optimicron® ON/PS Optimicron® Pulse
BH/HC Betamicron® (BH4HC) OH/PS Optimicron® Pulse
W/HC Stainl. st. wire mesh
V Stainless steel fibre

Size of filter or element

M A: 60, 110, 140, 160, 240, 280
Q E: 30, 60, 110, 140, 160, 240, 280, 330, 500, 660, 990, 1320
MHA: 160, 240, 280
MHE: 330, 500, 660, 990, 1320

Operating pressure

M = 250 bar
Q = 315 bar

Application

No details: 10⁶ cycles
H: high duty cycle, 10⁸ cycles (only for DF...MHA / DF...MHE)

Type and size of connection

A 2 mounting holes
E 4 mounting holes

Filtration rating in µm

ON: 1, 3, 5, 10, 15, 20
BH/HC, ON/PS, OH/PS, V: 3, 5, 10, 20
W/HC: 25, 50, 100, 200

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 model with one-piece filter bowl (up to size 660)
2 model with two-piece filter bowl (size 660 and above)

Modification number

X the latest version is always supplied

Supplementary details

B. bypass cracking pressure (e.g. B6 = 6 bar); only possible for DF...M A / DF...Q E
L... light with appropriate voltage (24, 48, 110, 220 Volt) only for clogging indicators
LED 2 light emitting diodes up to 24 Volt type "D"
OAI outlet above inlet (only for DF...160, 240, 280 Q E)
SO184 pressure release/oil drain screw (only DF...60-240)
SO348 for operating pressure $p_{max} \leq 210$ bar (type of clogging indicator = VM)
V FPM seals
W suitable for HFA and HFC emulsions

2.2 REPLACEMENT ELEMENT

0240 D 010 ON /-V

Size

0030, 0060, 0110, 0140, 0160, 0240, 0280, 0330, 0500, 0660, 0990, 1320

Type

D

Filtration rating in µm

ON 001, 003, 005, 010, 015, 020
BH4HC, ON/PS, OH/PS, V: 003, 005, 010, 020
W/HC: 025, 050, 100, 200

Filter material

ON, BH4HC, ON/PS, OH/PS, V, W/HC

Supplementary details

V, W (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
VM Differential pressure indicator up to 210 bar operating pressure (only in conjunction with SO348)

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:

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

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

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

(*see Point 3.2)

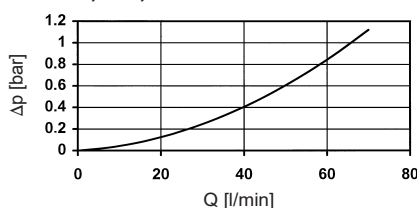
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

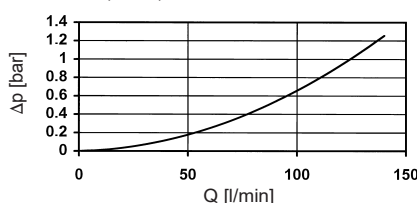
3.1 Δp -Q HOUSING CURVES BASED ON ISO 3968

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.

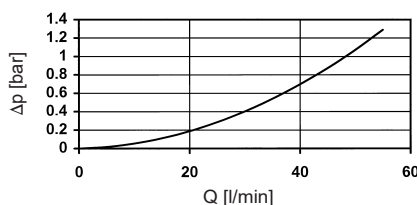
DF 60, 110, 140 M A



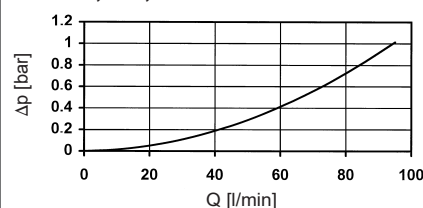
DF 160, 240, 280 M A / MHA



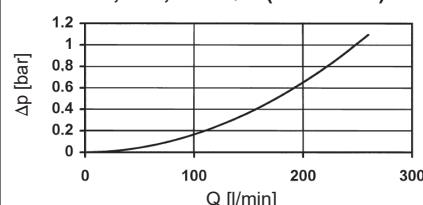
DF 30 Q E



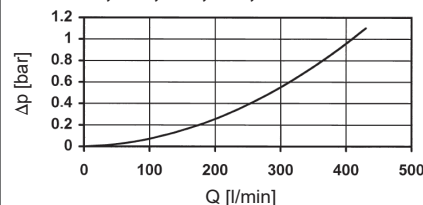
DF 60, 110, 140 QE



DF 160, 240, 280 Q E (also /-OAI)



DF 330, 500, 660, 990, 1320 Q E / MHE



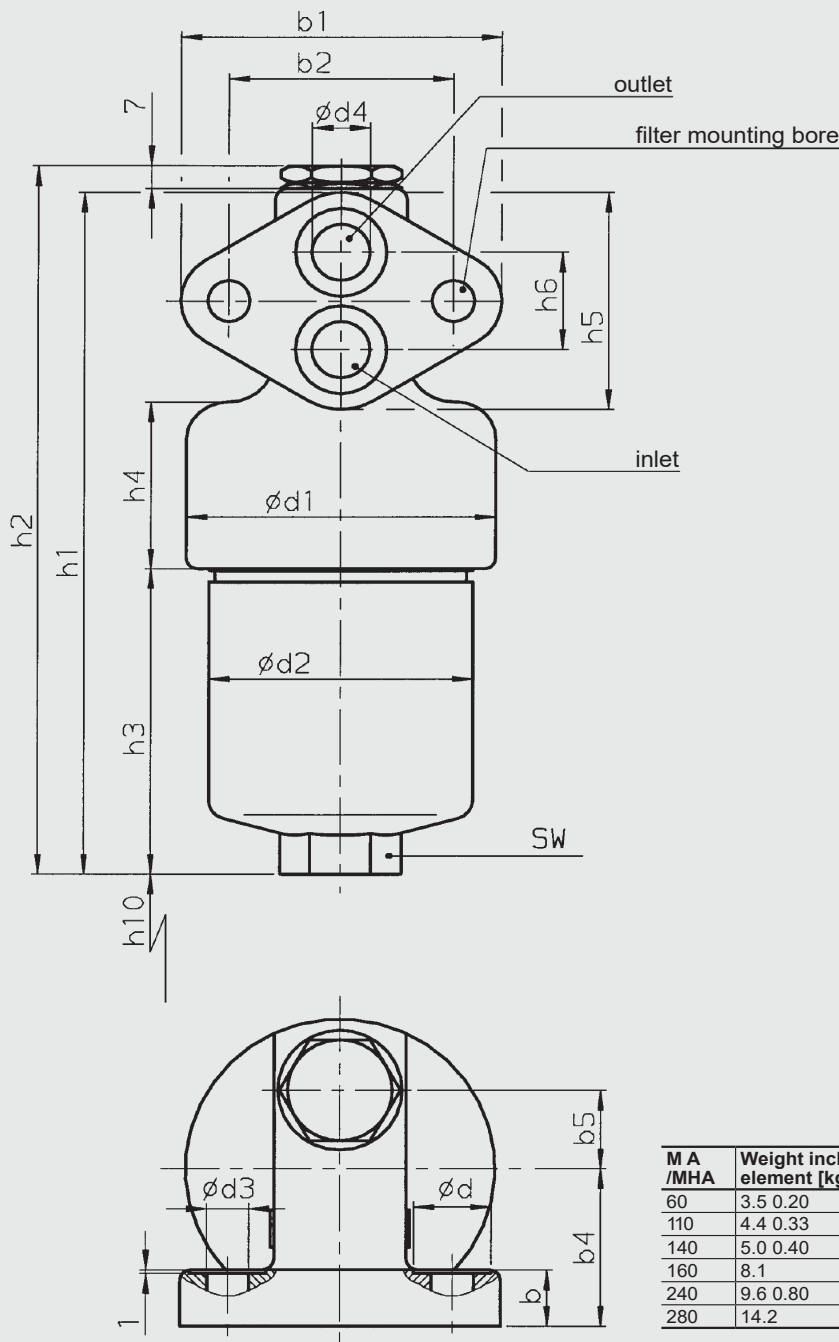
3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

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.

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4. DIMENSIONS

DF... MA: BG 60 - 280
DF... MHA: BG 160 - 280



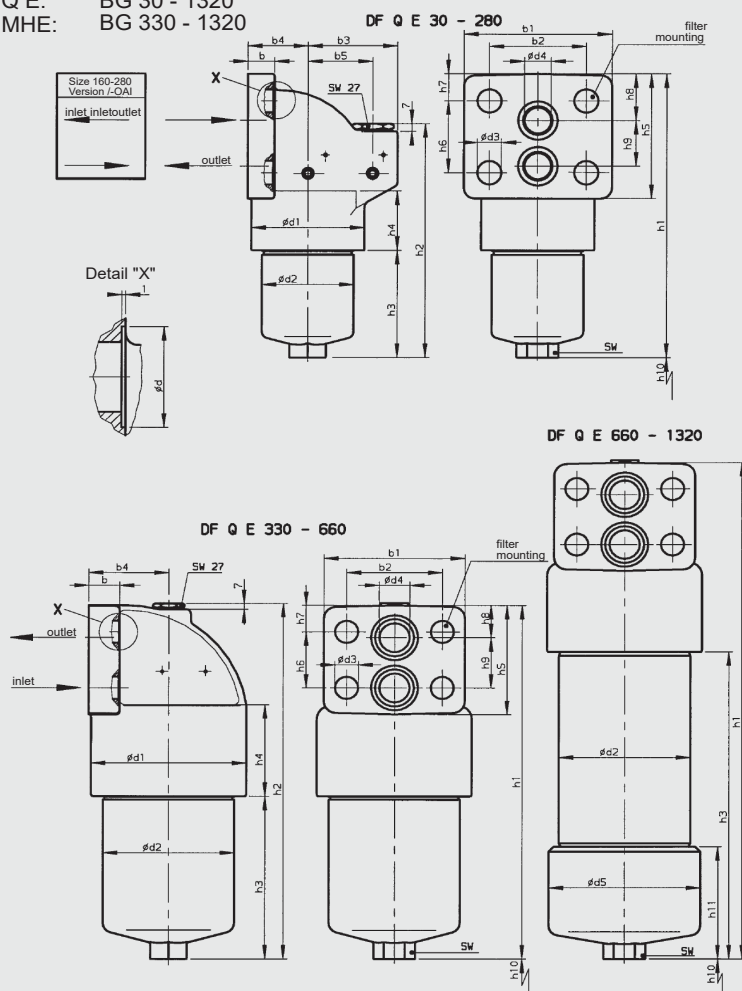
M A /MHA	Weight incl. element [kg]	Vol. of pressure chamber [l]
60	3.5	0.20
110	4.4	0.33
140	5.0	0.40
160	8.1	0.60
240	9.6	0.80
280	14.2	1.60

M A / MHA	b	b1	b2	b3	b4	b5 d	d1 d2 d3			d4 d5	h1	h2	h3	h4 h5		h6 h7		h8	h9 h10		h11 SW		O- ring ¹⁾			
60	15	83	58	-	42	21	20	80	68	11	15	-	185	192	83	45	58	26	45	-	-	-	75	-	27	19 x 2.5
110	15	83	58	-	42	21	20	80	68	11	15	-	252.5	259.5	150.5	58	26	-	-	-	-	75	-	27	19 x 2.5	
140	15	83	58	-	42	21	20	80	68	11	15	-	296	303	194	45	58	26	-	-	-	75	-	27	19 x 2.5	
160	20	83	58	-	60	26	20	116	95	13.5	15	-	232	239	107	79	58	26	-	-	-	85	-	32	19 x 2.5	
240	20	83	58	-	60	26	20	116	95	13.5	15	-	292	299	167	79	58	26	-	-	-	85	-	32	19 x 2.5	
280	20	83	58	-	60	26	20	116	95	13.5	15	-	474	481	349	79	58	26	-	-	-	85	-	32	19 x 2.5	

1) supplied

E 7.555.11/11.16

DF... Q E: BG 30 - 1320
DF... MHE: BG 330 - 1320



Q E / Weight incl. Vol. of pressure MHE element [kg] chamber [l]

30 2.9 0.13 60 5.2 0.20 110 6.1
0.33 140 6.7 0.40 160

12.3 30.60 240

13.7 30.80 280

18.1 31.60 330 22.9 1.50 500

27.3 2.30 660 30.9 3.00 660

34.1 38.00 990

2) 42.1 4.20

1320 2) 50.3 5.60

Q E Weight incl. Vol. of pressure /-OAI element [kg] chamber [l]

160 10.7 0.60 240 12.7 0.80

280 17.0 1.60

Q E / b b1 b2 b3 b4 b5 d d1 d2 d3 d4 d5 h1 h2 h3 h4 h5 h6 h7 h8 h9 h10 h11 SW O- MHE ring

1)

30 18 80 57 56 37 38 20 67 52 13 14 -197 176 78 48 76 45 15.5 30.5 28 75 -24 18 x 2.5 60 20 110 72 66 45 48 26 84 68 18 20 -217 181 83 45.5 94 55 19.5 34.5 35 75 -27 24 x 3 110 20 110 72 66 45 48 26 84 68 18 20 -284 248 150 45.5 94 55 19.5 34.5 35 75 -27 24 x 3 140 20 110 72 66 45 48 26 84 68 18 20 -328 292 194 45.5 94 55 19.5 34.5 35 75 -27 24 x 3 160

30 140 95 100 59 79 32 116 95 22 32 -280 222 117 61 110 60 25 31 52 85 -32 40 x 3.5 240

30 140 95 100 56 79 32 116 95 22 32 -340 282 177 61 110 60 25 31 52 85 -32 40 x 3.5 280

30 140 95 100 59 79 32 116 95 22 32 -522 464 359 61 110 60 25 31 52 85 -32 40 x 3.5 330 30 140 95 -79.5 - 32 154 130 23 30 -353 357 157 94 110 58 26 32 52 115 -36 40 x 3.5 500 30 140 95 -79.5 - 32 154 130 23 30 -446 450 250 94 110 58 26 32 52 115 -36 40 x 3.5 660 30 140 95 -79.5 - 32 154 130 23 30 -523 527 329 94 110 58 26 32 52 115 -36 40 x 3.5 660

30 140 95 -79.5 - 32 154 132 23 30 152 517 521 321 94 110 58 26 32 52 350 112 36 40 x 3.5 990

2) 30 140 95 -79.5 - 32 154 132 23 30 152 673 677 477 94 110 58 26 32 52 500 112 36 40 x 3.5

30 140 95 -79.5 - 32 154 132 23 30 152 839 843 643 94 110 58 26 32 52 670 112 36 40 x 3.5 Q E b b1 b2 b3 b4 b5 d d1 d2 d3 d4 d5 h1 h2 h3 h4 h5 h6 h7 h8 h9 h10 h11 SW O- /-OAI ring

1)

160 30 140 95 83 84 59 32 116 95 22 32 -284 239 119 64 110 58 26 31 52 85 - 32 40 x 3.5 240 30 140 95 83 84 59 32 116 95 22 32 -344 299 179 64 110 58 26 31 52 85 - 32 40 x 3.5 280 30 140 95 83 84 59 32 116 95 22 32 -526 481 361 64 110 58 26 31 52 85 - 32 40 x 3.5

1) supplier / 2) two-piece bowl version / 3) not OAI

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.