HYDAC INTERNATIONAL

Inline Filter HDF
Inline Filter for Reversible Flow HDFF
up to 380 l/min, up to 280 (420) 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. HDFF filters (on request) are suitable for flow in both directions.

Standard equipment:

- port in L-configuration
- without bypass valve
- port for a clogging indicator in filter head

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
Betamicron® (BH4HC): 210 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	280 (420) bar
Fatigue strength	0 to 280 bar (min. 10^6 cycles) 0 to 420 bar (min. 250,000 cycles)
Temperature range	-30 °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 indication up to 420 bar operating pressure)
Pressure setting of clogging indicator	5 bar for HDF (others on request) 8 bar for HDFF (others on request)
Cracking pressure of bypass only for HDF filters (optional)	6 bar (others on request)

1.4 SEALS

NBR (= Perbunan)

1.5 INSTALLATION

Inline filter with or without reversible oil flow

1.6 SPECIAL MODELS AND ACCESSORIES

- Seals in FPM, EPDM
- With bypass valve (only HDF filter) *1
- With No-Element valve (only HDF filter in L-configuration) *1
- With oil drain plug

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

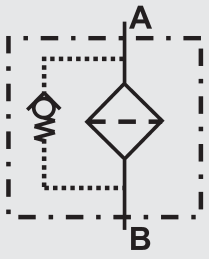
*1 Bypass valve and No-Element valve cannot be combined!

1.10 IMPORTANT INFORMATION

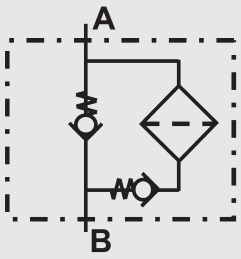
- Filter housings must be earthed.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

Symbol for hydraulic systems

HDF



HDFF



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2. MODEL CODE (also order example)

HDF ON 450 O L E 10 D 1 . X /-L24

2.1 COMPLETE FILTER

Filter type
HDF or HDFF (HDFF on request)

Filter material
ON Optimicron®
BH/HC Betamicron® (BH4HC)

Size of filter or element
HDF/HDFF: 300, 450, 650, 900

Operating pressure
O 280 bar

Head type
L Flow path in L-configuration (standard version)

Type and size of connection

Type	Connection	300	450	650	900
D	G 1	●	●	●	●
E	G1 ¼	●	●	●	●
F	G1 ½	●	●	●	●

Filtration rating in µm
ON: 1, 3, 5, 10, 15, 20
BH/HC: 3, 5, 10, 20

Type of clogging indicator
Y plastic blanking plug in indicator port
A steel blanking plug in indicator port
BM 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
B. bypass cracking pressure (e.g. B6 = 6 bar); without details = without bypass valve
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"
NEV No-Element valve (only for HDF filters in L-configuration
SO184 pressure release/oil drain screw
V FPM seals

2.2 REPLACEMENT ELEMENT

0450 D 010 ON /-V

Size
0300, 0450, 0650, 0900

Type
D

Filtration rating in µm
ON: 001, 003, 005, 010, 015, 020
BH4HC: 003, 005, 010, 020

Filter material
ON, BH4HC

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 (for HDF filters)
8 standard 8 bar (for HDFF filters)
] others on request

Type of clogging indicator (see Point 2.1)

Modification number
X the latest version is always supplied

Supplementary details
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:

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

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

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

(*see Point 3.2)

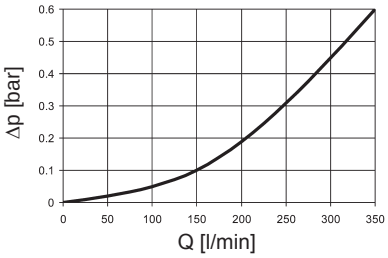
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

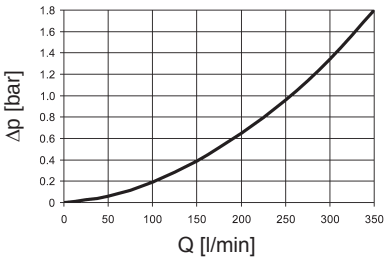
3.1 Δp-Q HOUSING CURVES BASED ON ISO 3968

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.

HDF



HDF with NEV



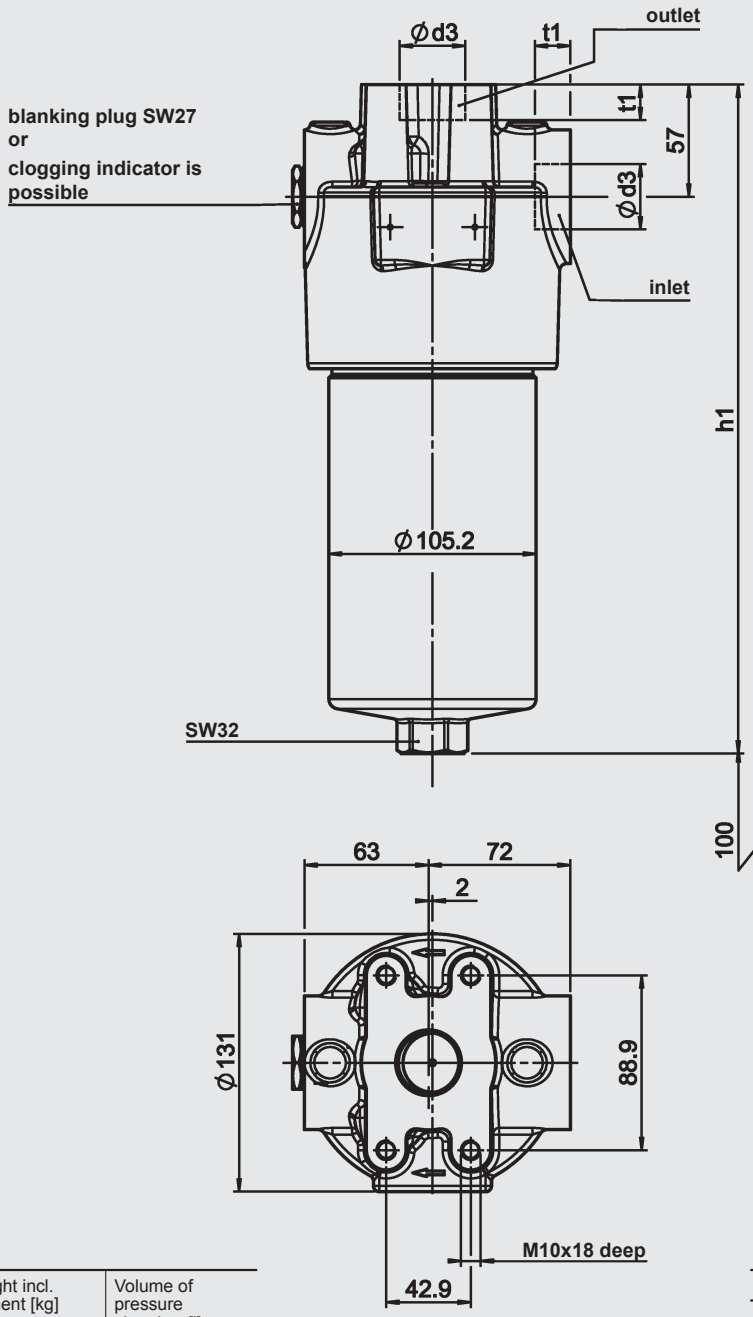
3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

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.

HDF /	ON					
HDFF	1 µm	3 µm	5 µm	10 µm	15 µm	20 µm
300	14.6	8.90	7.13	4.88	2.80	2.61
450	7.30	4.45	3.52	2.39	1.40	1.26
650	4.46	2.69	2.20	1.47	0.86	0.81
900	3.37	2.10	1.67	1.10	0.65	0.63

HDF /	BH4HC			
HDFF	3 µm	5 µm	10 µm	20 µm
300	16.0	8.9	7.1	3.3
450	7.8	4.3	3.4	1.6
650	4.7	2.6	2.1	1.0
900	3.5	2.0	1.6	0.7

4. DIMENSIONS



HDF/ HDFF	h1	Weight incl. element [kg]	Volume of pressure chamber [l]
300	246	11.2	0.8
450	339	13.1	1.4
650	460	16.2	2.1
900	558	21.5	2.7

Ød3	t1
G1	18
G1 1/4	20
G1 1/2	22

NOTE

The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact HYQUIP.