

HYDAC

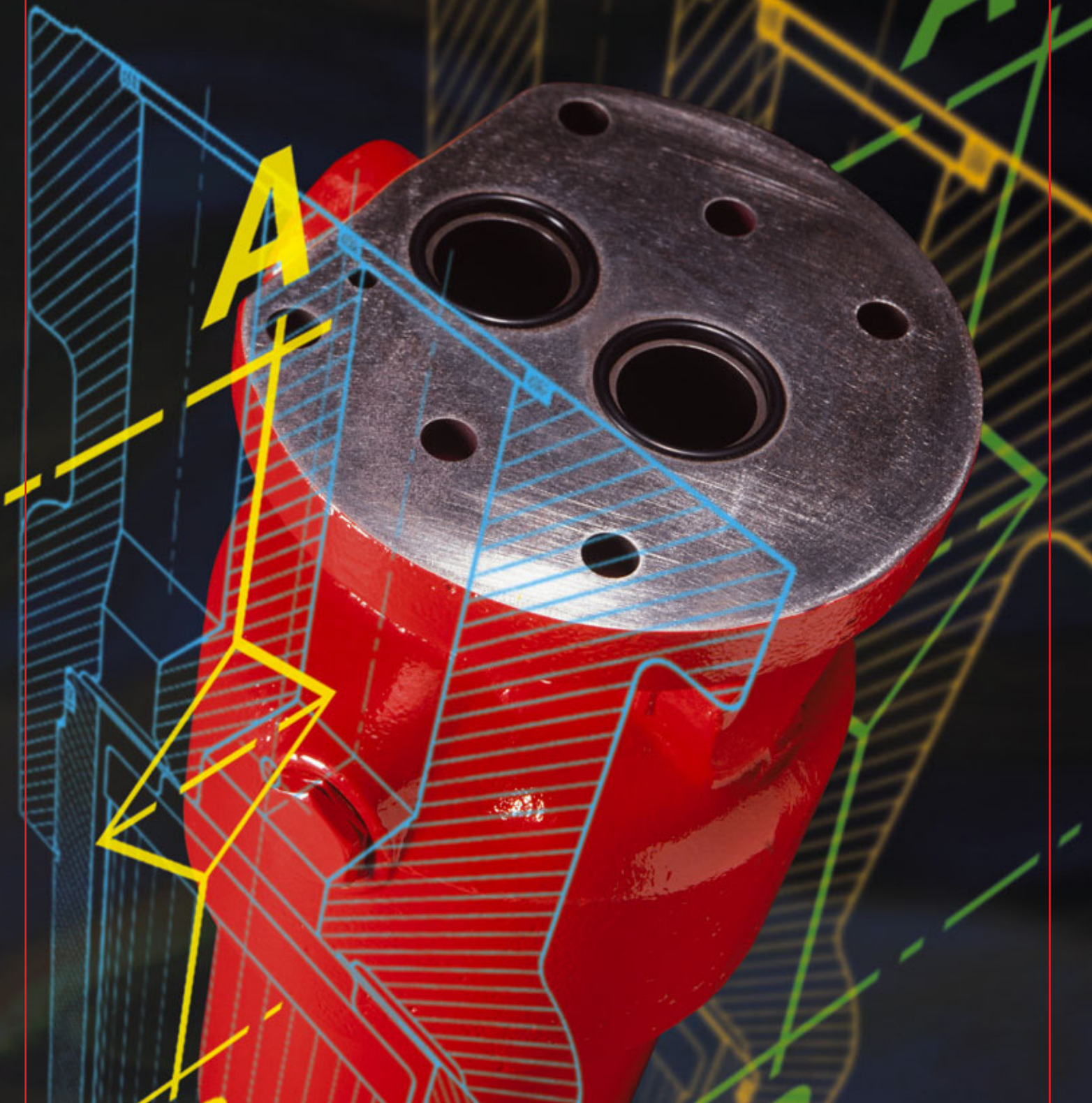
INTERNATIONAL

**High Pressure Filters
For Manifold Block
Mounting DFP**

Flow rates up to 660 l/min

Pressure range up to 315 bar

Material: EN-GJS 400-15 (SG Iron)/ Steel



1. DESCRIPTION

1.1. FILTER HOUSING

Construction

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

Standard specification:

- Without clogging indicator
- 2-piece bowl for size 990 and above
- Oil drain plug with pressure relief (for size 330 and above)

1.2. FILTER ELEMENTS

Original HYDAC filter elements guarantee reliable function and protect hydraulic components and systems which are sensitive to contamination from wear and tear.

Performance and quality tests in accordance with international standards guarantee reliable operation of the filter.

Hydac filters are validated and their quality is continuously monitored according to the following standards.

- ISO 2941:
Verification of collapse / burst resistance
 - ISO 2942:
Verification of fabrication integrity and determination of first bubble point test
 - ISO 2943:
Verification of material compatibility with fluids
 - ISO 3724:
Verification of flow fatigue characteristics
 - ISO 3968:
Evaluation of differential pressure versus flow characteristics
 - ISO 16889:
Multi-pass method for evaluating filtration performance of a filter element
- In addition to guaranteeing retention and flow rate characteristics, the filter elements have excellent structural stability. The careful construction and mechanically stable support of the filter media guarantee above-average beta value stability and flow fatigue characteristics of the filter elements.
- The filter elements are available with the following collapse/burst stability values:
- | | |
|---------------------------|-----------|
| Betamicon® (BH3HC) | : 210 bar |
| Stainless steel fibre (V) | : 210 bar |
| Betamicon® (BN3HC) | : 25 bar |
| Wire mesh (W) | : 25 bar |

1.3. CLOGGING INDICATORS

	VD	5	C	X	/-V
Type of indicator _____					
VD	differential pressure indicator				
Pressure setting _____					
5	5 bar = standard (others on request)				
Indicator type code (options) _____					
B/BM	= visual				
C	= electrical				
D	= visual/electrical				
Modification number _____					
X	the latest version is always supplied				
Supplementary details _____					
-V	Viton				
-LED	2 light-emitting diodes up to 24 volt				
-L..	light with corresponding voltage (24, 48, 110, 220 volt)				

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

1.4. SEALS

Perbunan (= NBR) or Viton
(= FPM for HFD oils).

1.5. SPECIAL MODELS AND ACCESSORIES

- bypass valve

1.6. SPARE PARTS

See Original Spare Parts List and Maintenance Instructions.

1.7. COMPATIBILITY WITH OPERATING FLUIDS TO DIN ISO 2943:

- Hydraulic oils H to HLPD to DIN 51524
- Lubrication oils to DIN 51517, APJ, ACEA, DIN 51515, ISO 6743
- Compressor oils to DIN 51506
- Rapidly biodegradable operating fluids to VDMA 24568 HETG, HEES, HEPG
- Non-flam operating fluids HFC and HFD
- Operating fluids with high water content (>50 % water content) on request

For further details on filter elements:

Brochure no.: E 7.200../..

2. GENERAL

Mounting

Manifold block mounting

Temperature range

-10 °C to +100 °C

Other temperature ranges on request.

Pressure setting of the differential pressure clogging indicator

$\Delta p_a = 5 \text{ bar} -10 \%$

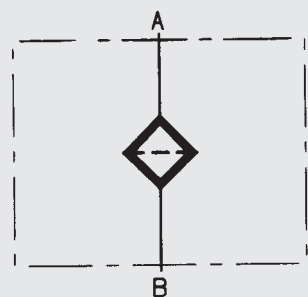
Other pressure settings on request.

Cracking pressure of bypass valve

$\Delta p_o = 6 \text{ bar} +10 \%$

Other cracking pressures on request.

Circuit diagram



3. MODEL CODE

(also order example)

DFP BH/HC 60 Q B 10 D 1 . X /-L24

3.1. COMPLETE FILTER

Filter type _____

DFP

Filter material of element _____

- BH/HC Betamicron® (BH3HC)
- BN/HC Betamicron® (BN3HC)
- W Stainless steel wire mesh
- V Stainless steel fibre

Size/Housing material _____

EN-GJS 400-15(SG iron)/Steel: 60, 110, 140, 160, 240, 280,
330, 500, 660, 990, 1320

Operating pressure _____

Q = 315 bar (all sizes)

Type of connection / Connection size _____

Type of connection	Filter size	Filter size										
		60	110	140	160	240	280	330	500	660	990	1320
B Ø 17.5		●	●	●								
C Ø 21.4					●	●	●					
D Ø 41								●	●	●	●	●

Filtration rating in µm _____

BH3HC, BN3HC, V : 3, 5, 10, 20
W : 25, 50, 100, 200

Type of clogging indicator _____

- A steel blanking plug in indicator port
 - BM visual indicator
 - C electrical indicator
 - D combined visual/electrical indicator
- for other clogging indicators, see brochure no. E 7.050../.

Type code _____

- 1 version with 1-piece bowl
- 2 version with 2-piece bowl

Modification number _____

X the latest version is always supplied

Supplementary details _____

- V FPM seals, filter suitable for rapidly biodegradable oils and phosphate ester (HFD-R)
- W NBR seals, filter suitable for oil-water emulsions (HFA, HFC) (only for V or W elements)
- L... light with corresponding voltage (24V, 48V, 110V, 220V)] only on clogging
- LED 2 light-emitting diodes up to 24 volt] indicators type D
- B6 with bypass valve, cracking pressure 6 bar
- SO184 pressure release / oil drain plug (up to size 280)

3.2. REPLACEMENT ELEMENT

0060 D 010 BH3HC /-V

Size _____

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

Type _____

D

Filtration rating in µm _____

BH3HC, BN3HC, V : 3, 5, 10, 20
W : 25, 50, 100, 200

Filter material _____

BH3HC, BN3HC, W, V

Supplementary details _____

- V = FPM seals, element suitable for rapidly biodegradable oils and phosphate ester (HFD-R)
- W = NBR seals, element suitable for oil-water emulsions (HFA, HFC) (only necessary for V and W elements)

4. FILTER SPECIFICATIONS

Filter type	Element size	No. of elements	Weight [kg] incl. element
60	0060 D...	1	5.1
110	0110 D...	1	6.0
140	0140 D...	1	6.6
160	0160 D...	1	9.1
240	0240 D...	1	10.4
280	0280 D...	1	14.7
330	0330 D...	1	21.0
500	0500 D...	1	25.5
660	0660 D...	1	29.0
990	0990 D...	1	39.2
1320	1320 D...	1	47.1

5. FILTER CALCULATION / SIZING

The total pressure drop of a filter at a certain flow rate is the sum of the housing Δp and the element Δp .

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

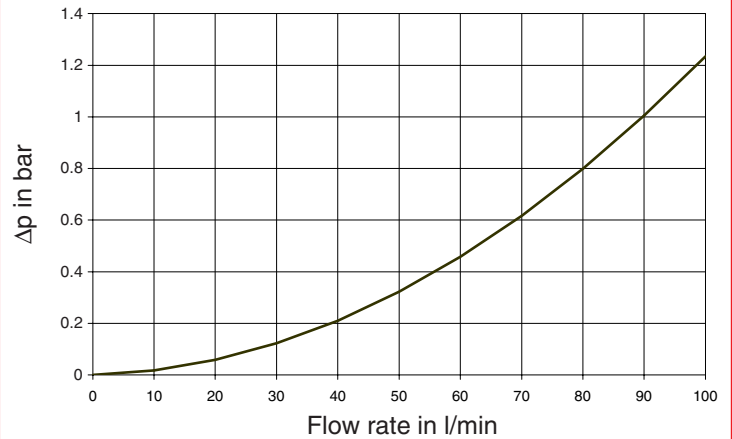
It must be stressed that all of the technical documentation from HYDAC Filtrertechnik always states the total housing pressure drop.

5.1. ΔP -Q HOUSING GRAPHS TO ISO 3968

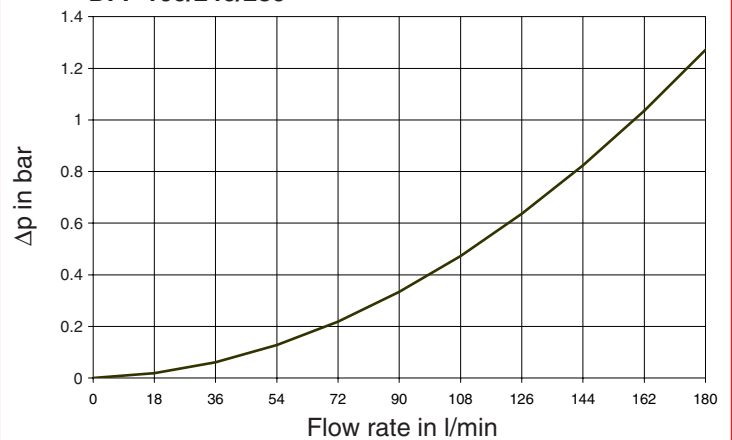
The housing graphs apply to mineral oil with a density of 0.86 kg/dm^3 and a kinematic viscosity of $30 \text{ mm}^2/\text{s}$ for the largest possible width per size.

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

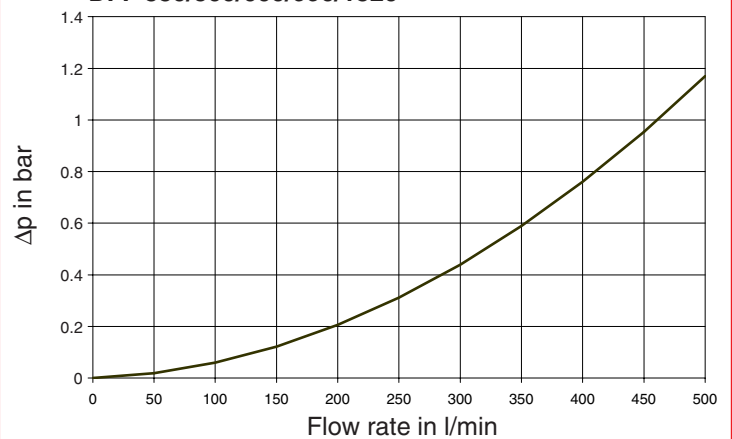
DFP 60/110/140



DFP 160/240/280



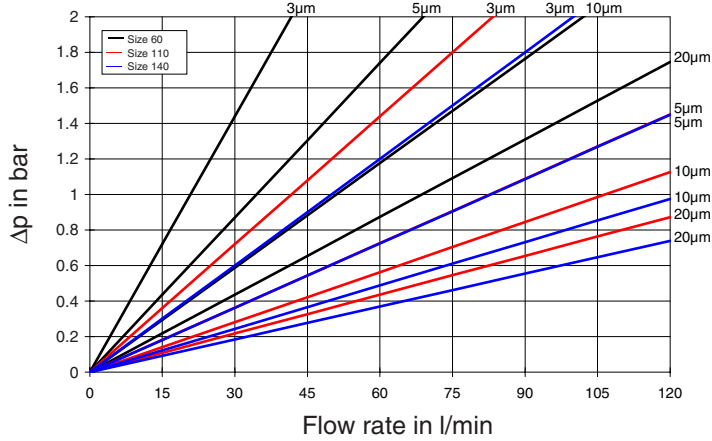
DFP 330/500/660/990/1320



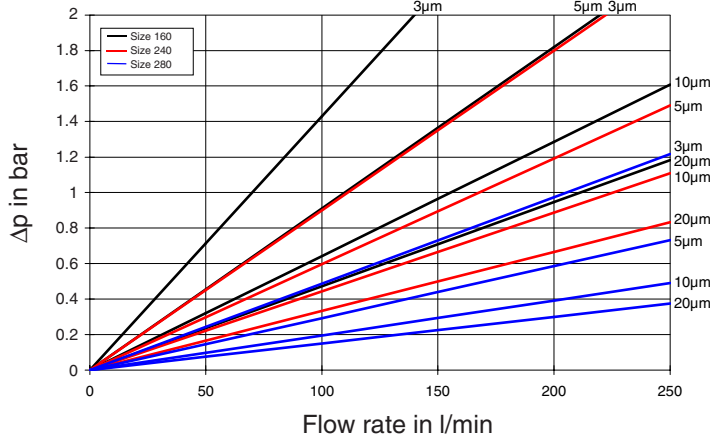
5.2. ΔP -Q GRAPHS - FILTER ELEMENTS
 The element graphs apply to mineral oil with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity (see Example 5.3.).

BH3HC

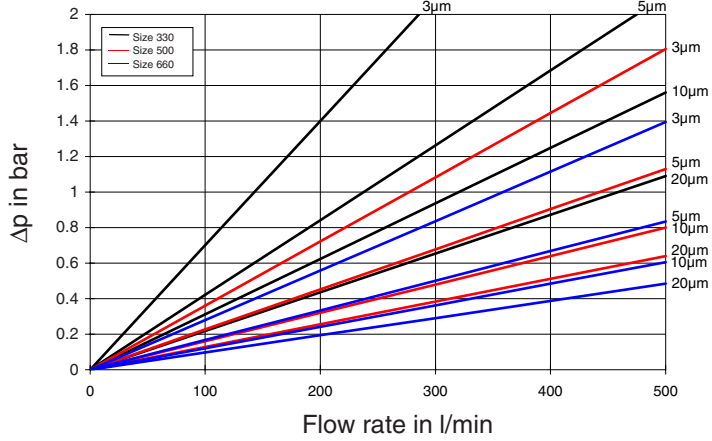
Size 60/110/140



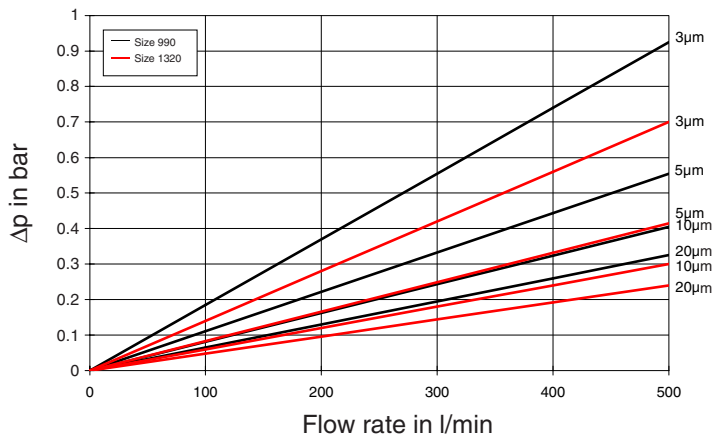
Size 160/240/280



Size 330/500/660

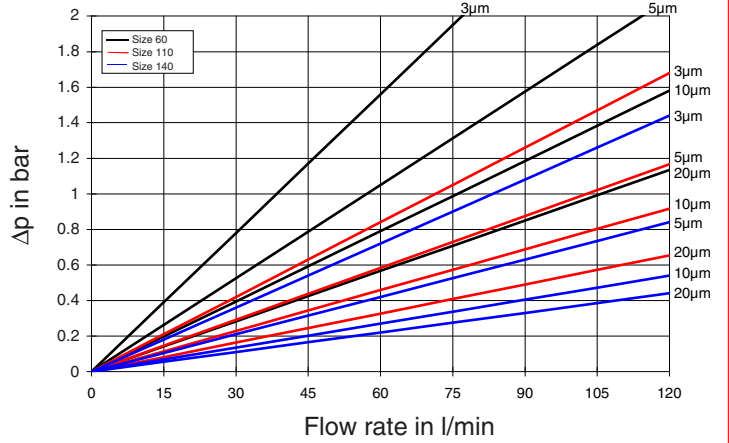


Size 990/1320

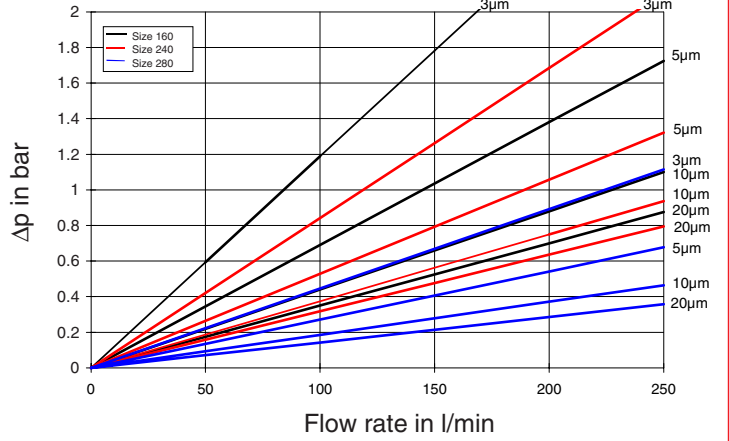


BN3HC

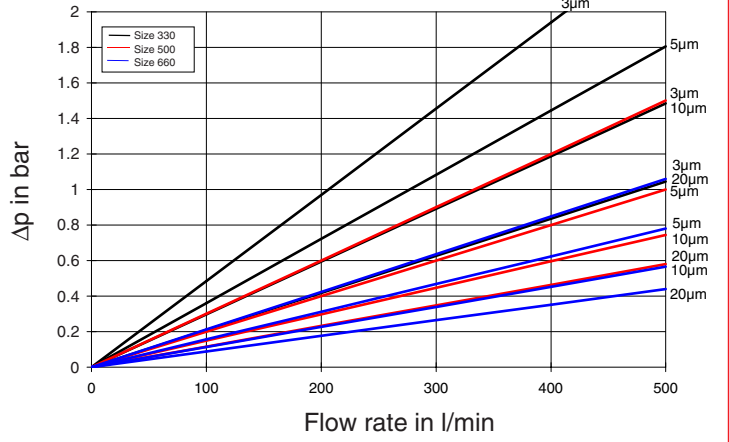
Size 60/110/140



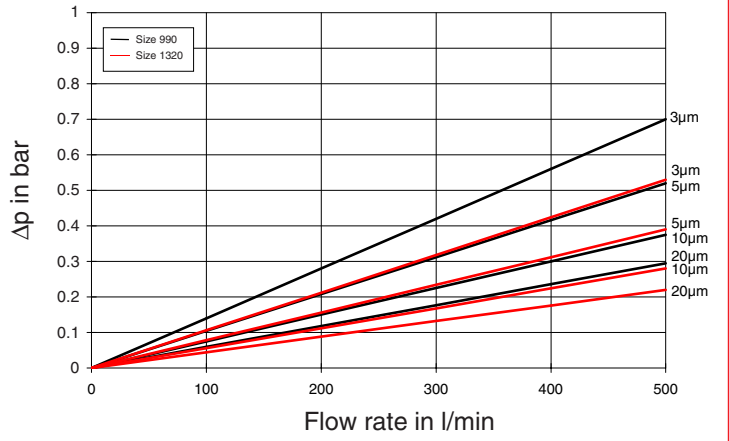
Size 160/240/280



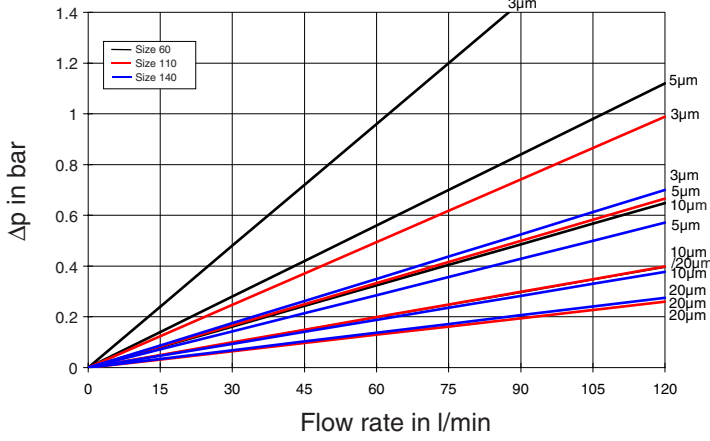
Size 330/500/660



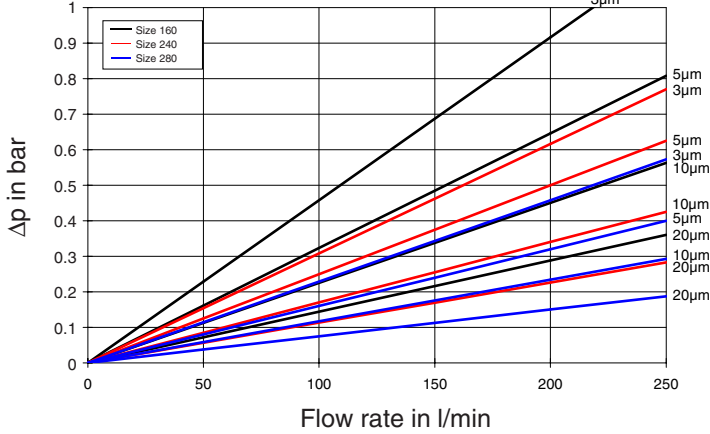
Size 990/1320



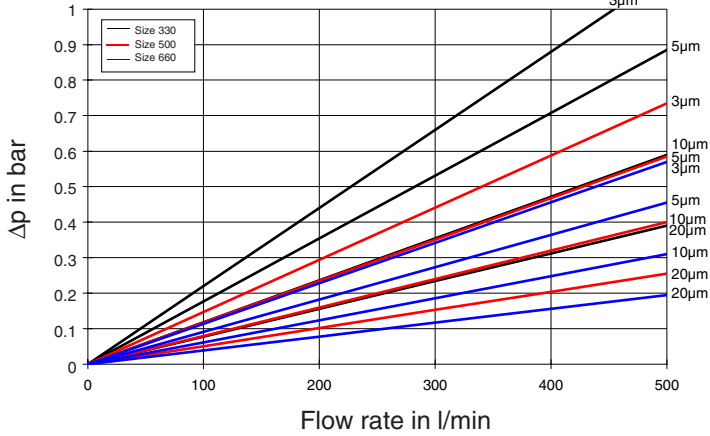
V
Size 60/110/140



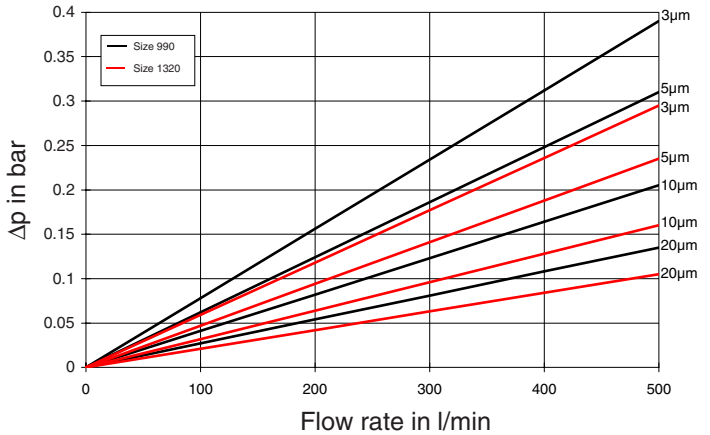
Size 160/240/280



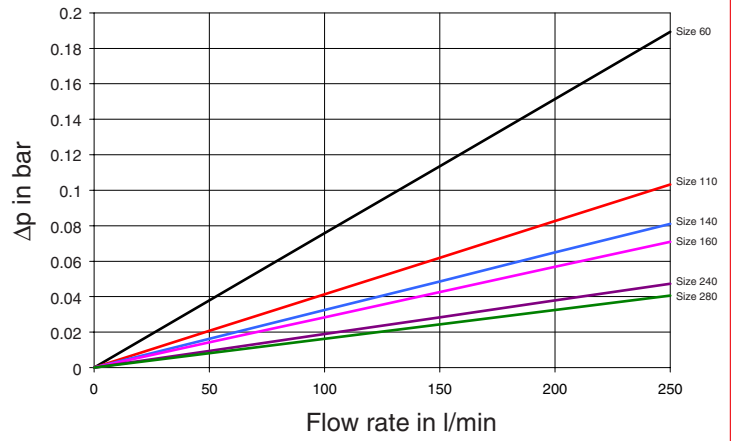
Size 330/500/660



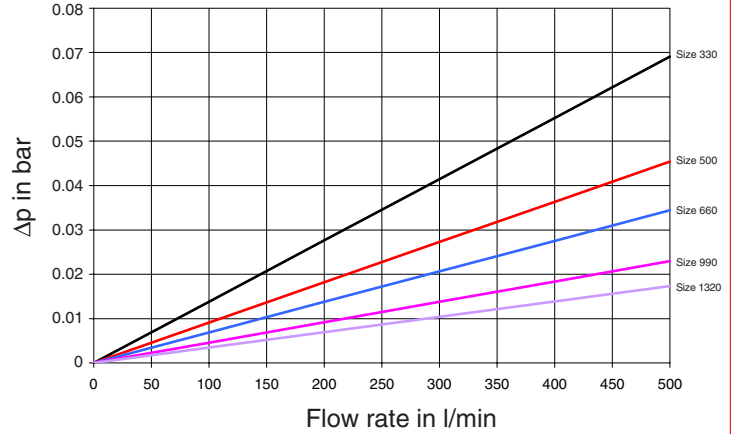
Size 990/1320



W
Size 60-280



Size 330-1320



5.3. EXAMPLE

General

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

$\Delta p_{\text{housing}}$ = determined from point 5.1.

$\Delta p_{\text{element}}$ = element pressure drop at flow rate Q and viscosity = 30 mm²/s according to point 5.2.

Example

System data:

Q = 50 l/min; DFP 140 with BH3HC element (10 μm);
viscosity = 46 mm²/s

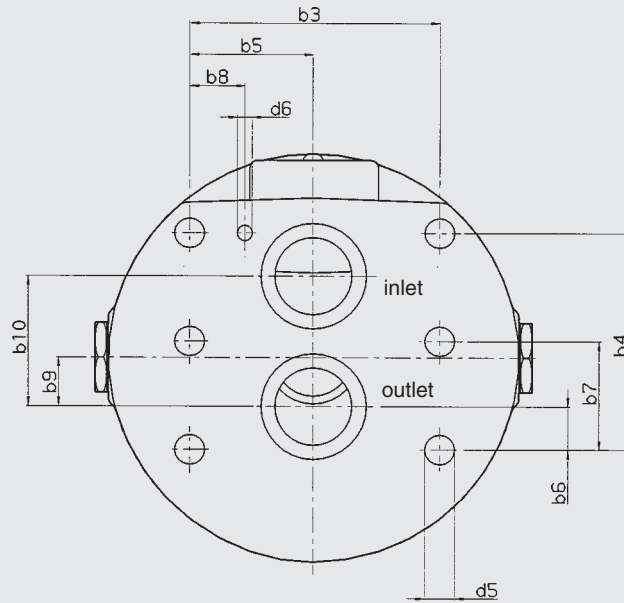
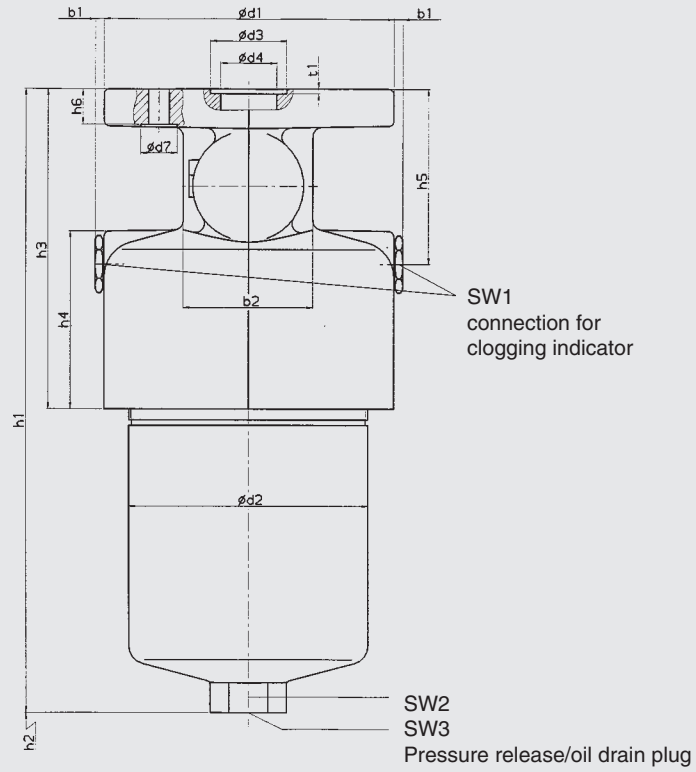
$$\Rightarrow \Delta p_{\text{housing}} = 0.32 \text{ bar (DFP 140)}$$

$$\Delta p_{\text{element}} = 0.42 \cdot \frac{46 \text{ mm}^2/\text{s}}{30 \text{ mm}^2/\text{s}} = 0.65 \text{ bar}$$

$$\Delta p_{\text{total}} = \underline{\underline{0.97 \text{ bar}}}$$

For ease of calculation, our Filter Sizing Program is available, and can be ordered via our website www.hydac.com.

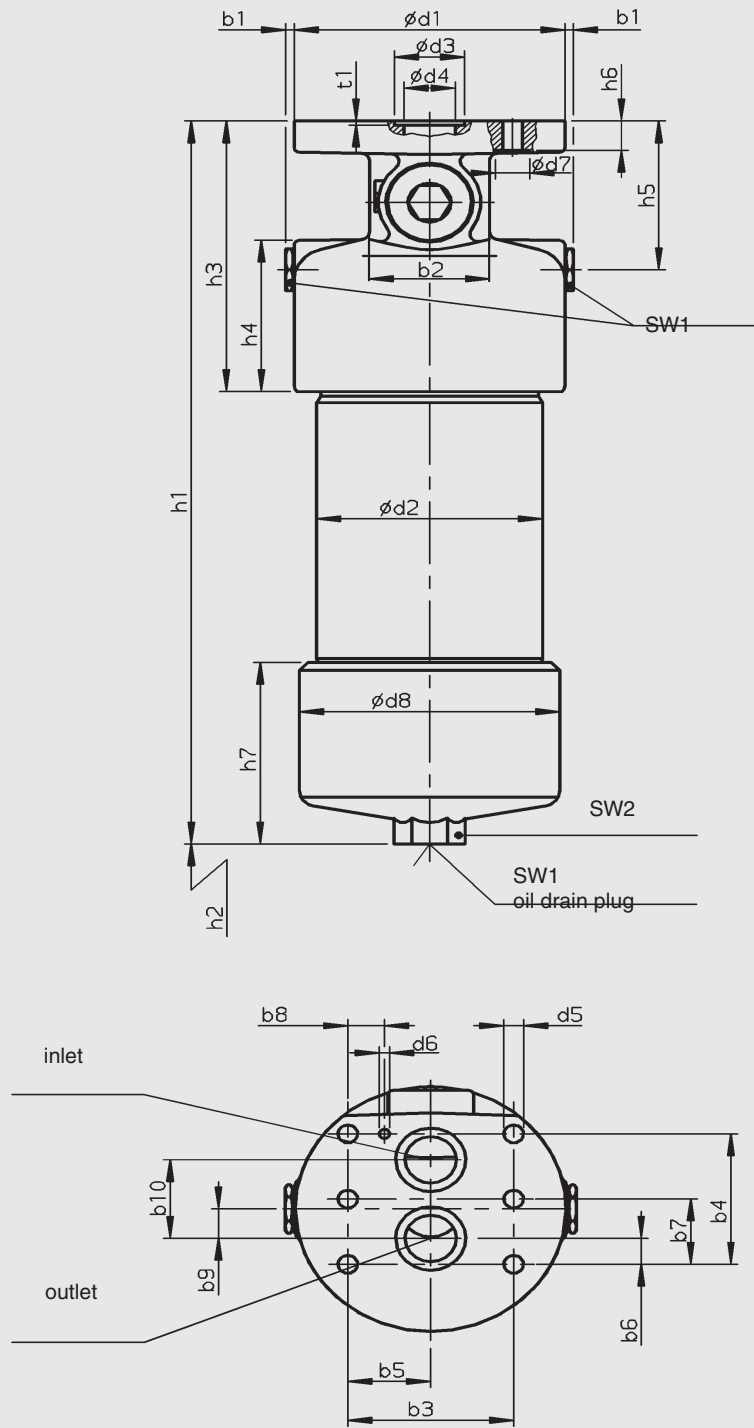
6.2. DFP 330 - 660



Size	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	d1	d2	d3
DFP 330	5	70	96.8	84.1	48.4	16.7	42.05	21.4	19	50.7	158	130	41
DFP 500													
DFP 660													

Size	d4	d5	d6	d7	h1	h2	h3	h4	h5	h6	t1	SW1	SW2	SW3
DFP 330	30	11.5	6	20	339.5	95	174.5	98	96	19	2.6	27	36	10
DFP 500					432.5									
DFP 660					510.0									

6.3. DFP 990 - 1320 (TWO-PIECE BOWL VERSION)



Size	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	d1	d2	d3	d4
DFP 990	5	70	96.8	84.1	48.4	16.7	42.05	21.4	19	50.7	158	130	41	30
DFP 1320														

Size	d5	d6	d7	d8	h1	h2	h3	h4	h5	h6	h7	t1	SW1	SW2	SW3
DFP 990	11.5	6	20	152	660	500	174.5	98	96	19	112	2.6	27	36	10
DFP 1320					826	670									

7. NOTE

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