

HYDAC

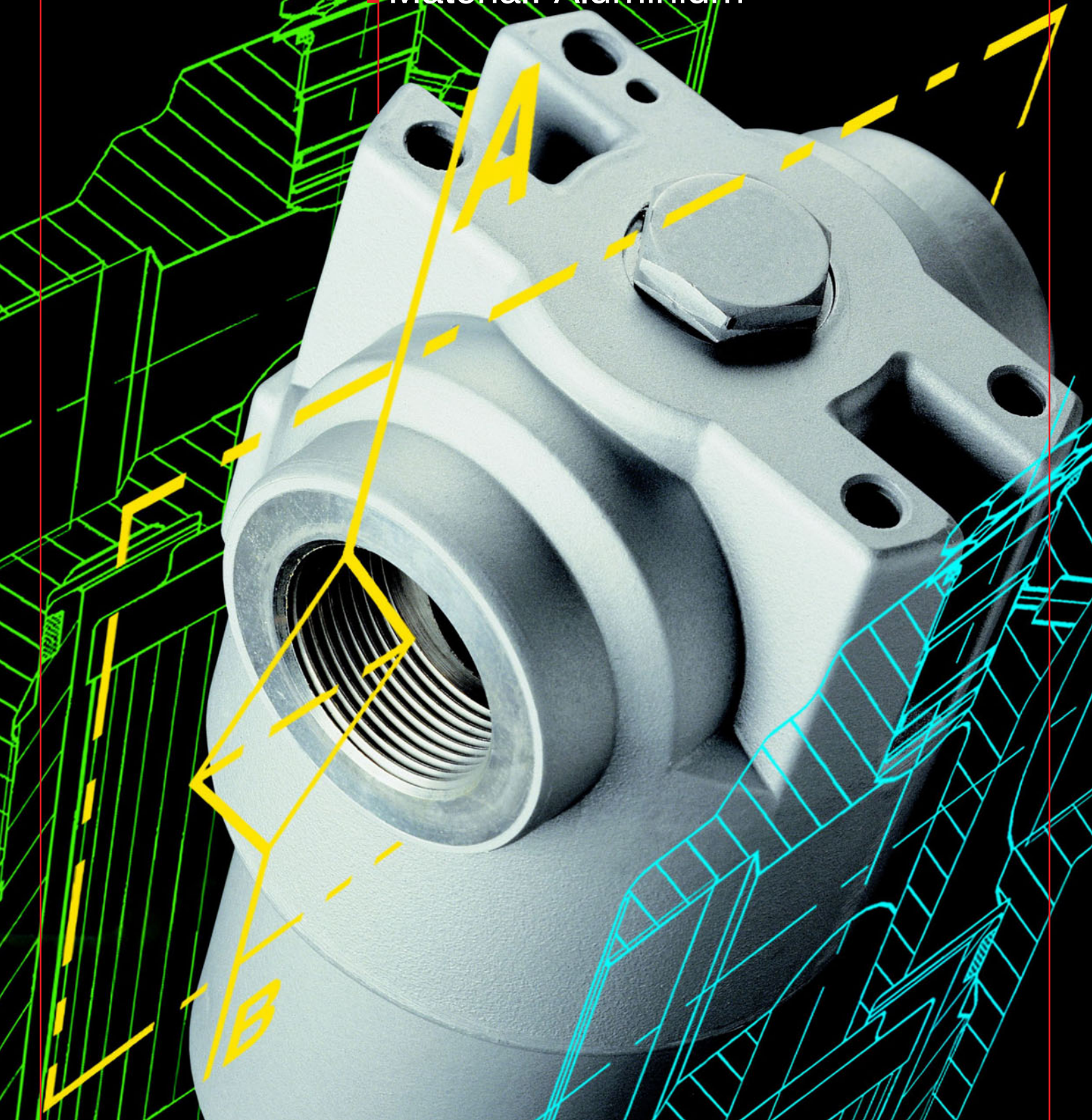
INTERNATIONAL

Inline Filter LF

Flow rates up to 700 l/min

Pressure range up to 100 bar

Material: Aluminium



1. TECHNICAL SPECIFICATIONS

1.1 FILTER HOUSING

Construction

The filter housing is designed according to international regulations. It consists of a filter head and a screw-in filter bowl.

The standard equipment is as follows:

- Port for clogging indicator in the filter head
- Mounting bore holes in the head
- Pressure release/oil drain plug (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 according to international standards guarantee reliable operation of the filter.

HYDAC filters are validated and their quality is continuously monitored according to the following standards:

- DIN ISO 2941:
Verification of collapse / burst resistance
 - DIN ISO 2942:
Verification of fabrication integrity and determination of first bubble point
 - DIN ISO 2943:
Verification of material compatibility with fluids
 - ISO 3724:
Verification of flow fatigue characteristics
 - ISO 3968:
Evaluation of pressure drop versus flow characteristics
 - ISO 4572/ISO16889:
Multi-pass method for evaluating filtration performance
- 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®(BN3HC): | 25 bar |
| Betamicon®(BH3HC): | 210 bar |
| Wire mesh (W/HC, W): | 30 bar |
| Stainless steel fibre (V): | 210 bar |

1.3 CLOGGING INDICATORS

(Example)

VM 5 D . 0 /-L220

Type of indicator

VM differential pressure measurement up to 210 bar operating pressure

Pressure setting

5 5 bar standard, others on request

Indicator type

B. = visual
C. = electrical
D. = visual/electrical

Modification number

0 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)
-W filter suitable for oil-water emulsions (HFA, HFC)

For further details and other types of clogging indicator, please see **brochure, no. E 7.050../.**

1.4 SEALS

Perbunan (=NBR)

1.5 SPECIAL MODELS AND ACCESSORIES

- bypass valve built into the head, separate from the main flow
- oil drain plug up to size 240
- seals in FPM (Viton), EPDM
- test and approval certificates

1.6 SPARE PARTS

See Original Spare Parts List and Maintenance Instructions.

1.7 COMPATIBILITY WITH OPERATING FLUIDS

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

As inline filter

Temperature range

-30 °C to +100 °C
(Size 660: -30 °C to -10 °C:
 $p_{max}=75$ bar)

Pressure setting of the clogging indicator

$\Delta p_a = 5$ bar -0.5 bar

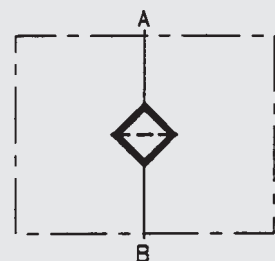
Other pressure settings on request!

Cracking pressure of the bypass valve

$\Delta p_o = 6$ bar +0.6 bar

Other cracking pressures on request!

Hydraulic symbol



3. MODEL CODE (also order example)

LF BN/HC 60 I C 10 D 1 . X /-L24

3.1. COMPLETE FILTER

Filter type _____

LF

Filter material of element _____

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

Size, filter and/or element _____

LF: 30/ 60/ 110/ 160/ 240/ 330/ 660

Operating pressure _____

I = 100 bar

Type / Size of port _____

Type	Port	Filter size						
		30	60	110	160	240	330	660
B	G 1/2	●						
C	G 3/4		●	●				
E	G1 1/4				●	●		
F	G1 1/2						●	●

Filtration rating in µm _____

BN3HC, BH3HC, V : 3, 5, 10, 20
 W; 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

Modification number _____

X the latest version is always supplied

Supplementary details _____

B. bypass cracking pressure, B3 = 3 bar, B6 = 6 bar (without details = without bypass)
 L... light with appropriate voltage (24V, 48V, 110V, 220V)
 LED 2 light emitting diodes up to 24 volt
 SO 184 pressure release/oil drain plug (size 330 and above)
 V FPM (Viton) seals
 W suitable for oil-water emulsions HFA, HFC
 (only required when using a clogging indicator, or V or W/HC elements)

3.2. REPLACEMENT ELEMENT (also order example)

0330 D 010 BN3HC /-V

Size _____

0030, 0060, 0110, 0160, 0240, 0330, 0660

Type _____

D

Filtration rating in µm _____

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

Filter material _____

BN3HC, BH3HC, V, W/HC, W

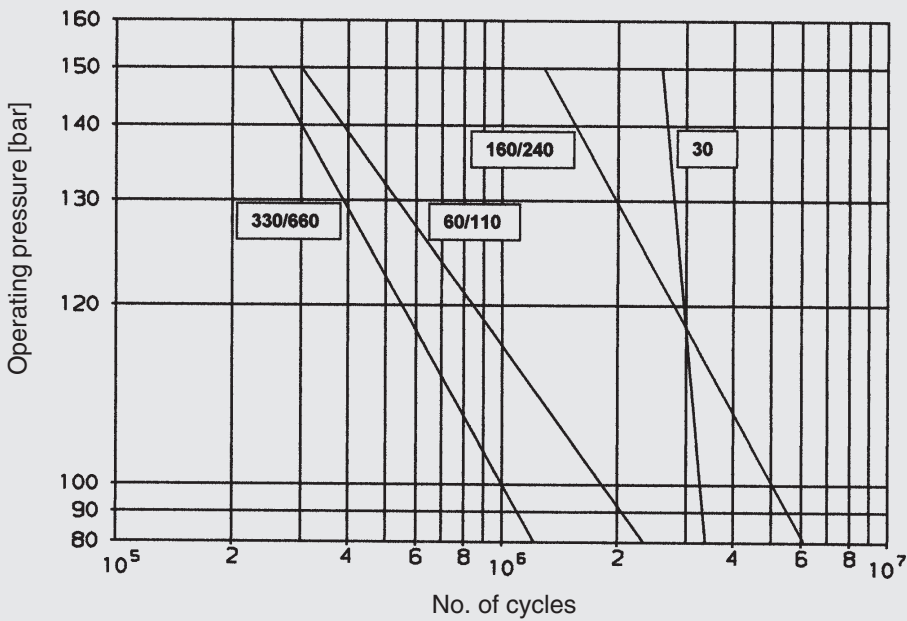
Supplementary details _____

V = FPM (Viton) seals
 W = suitable for oil-water emulsions HFA/HFC (only necessary for V and W/HC elements)

4. FILTER SPECIFICATIONS

	LF
Nominal pressure	100
Fatigue resistance	At nominal pressure 10^6 cycles from 0 to nominal pressure (for other pressures see diagram)
Temperature range	-30 °C to +100 °C
Pressure setting VA: Δp_a	5 bar
Type of clogging indicator	VM
Material of filter head	Al
Material of filter bowl	Al (size 660: steel)
Cracking pressure of bypass valve	6 bar
Sizes	30, 60, 110, 160, 240, 330, 660

FATIGUE RESISTANCE



5. FILTER CALCULATION / SIZING

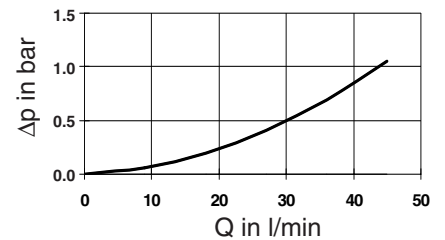
The total pressure drop of a filter at a certain flow rate is the sum of the housing Δp and element Δp .

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

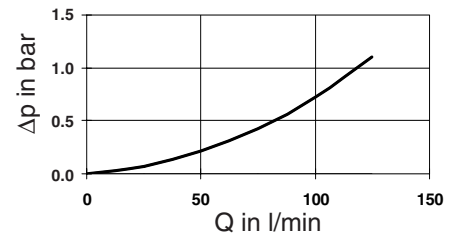
5.1. Δp -Q HOUSING GRAPHS BASED ON ISO 3968

The housing graphs apply to mineral oil with a density of 0.86 kg/dm^3 and a kinematic viscosity of $30 \text{ mm}^2/\text{s}$. In this case, the differential pressure changes proportionally to the density.

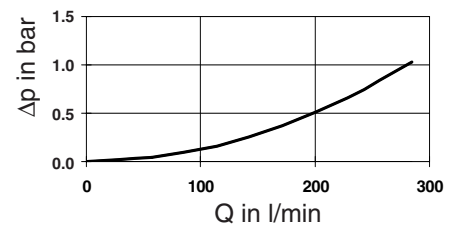
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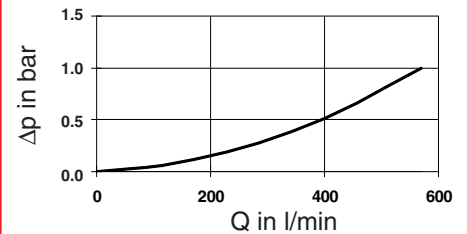
Size 60-110



Size 160-240

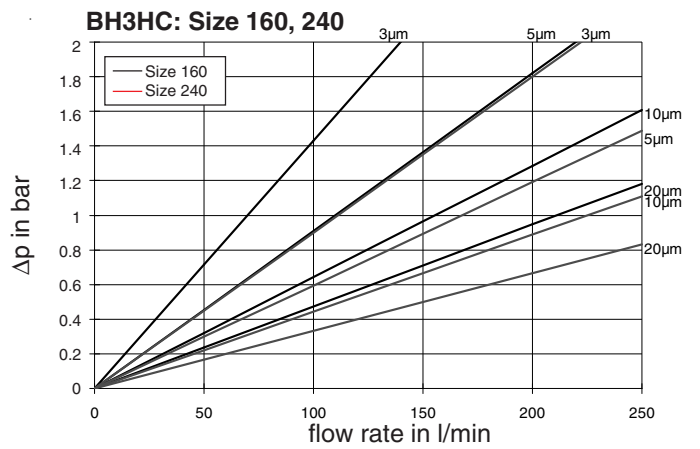
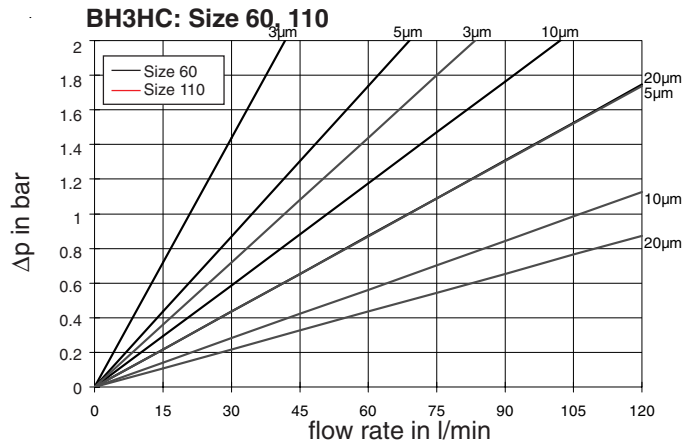
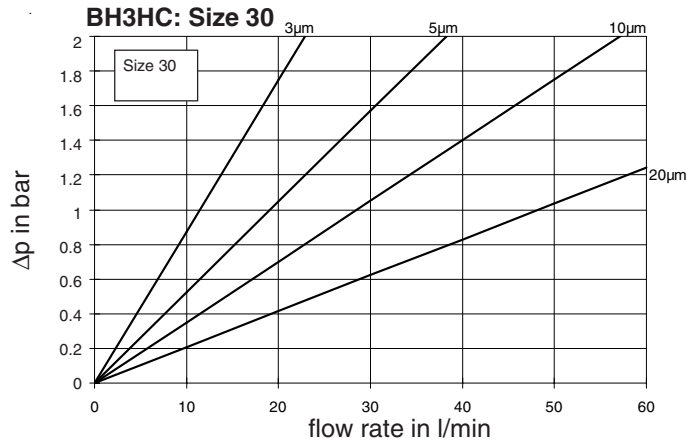
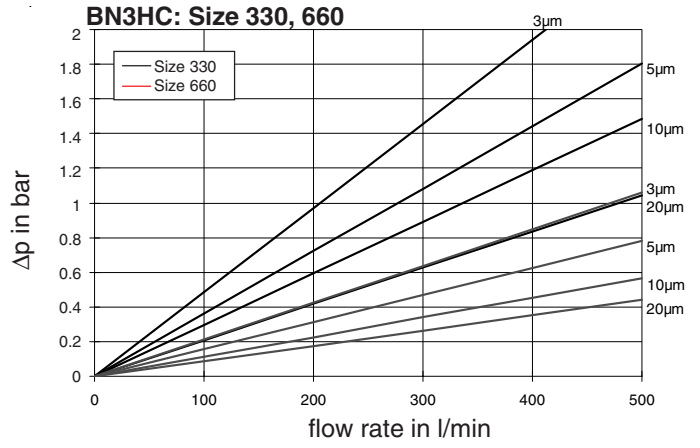
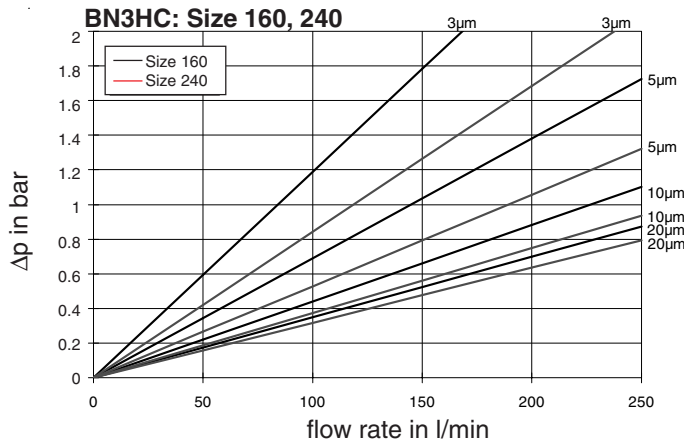
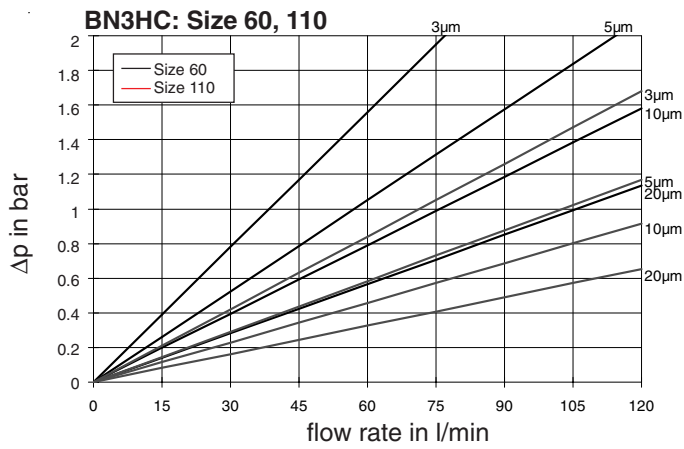
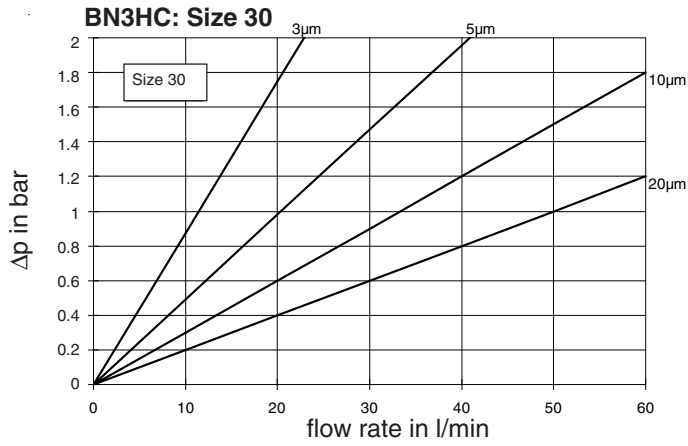


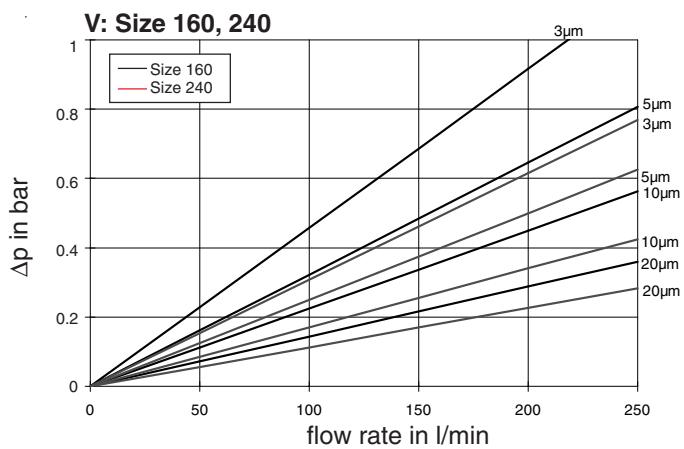
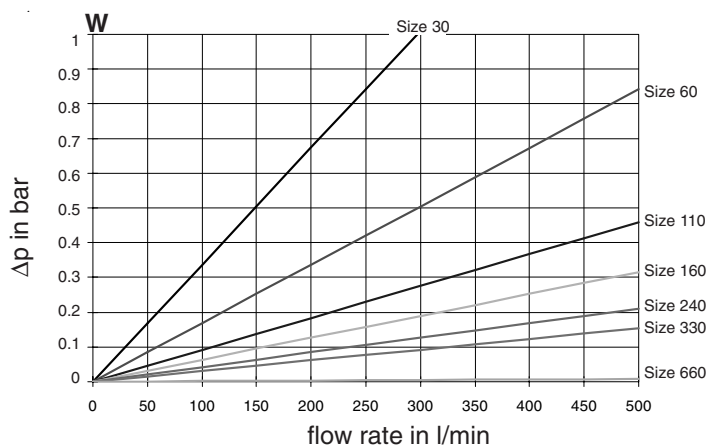
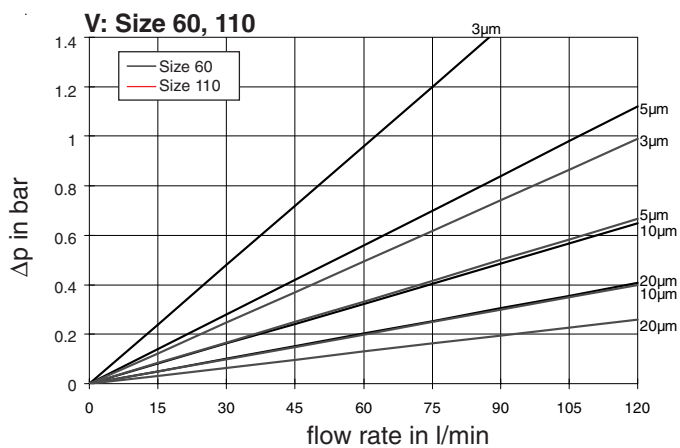
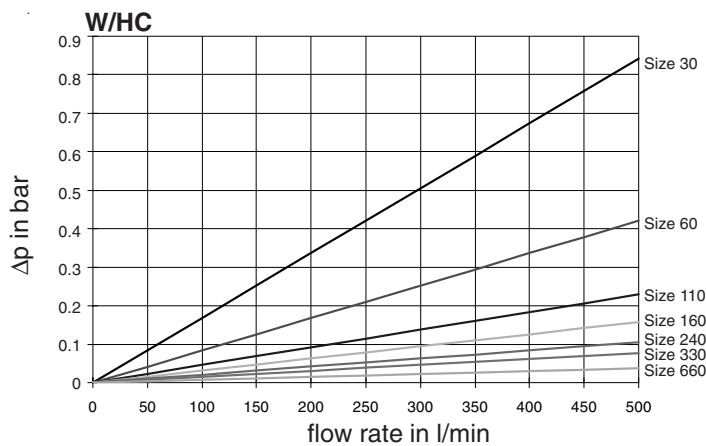
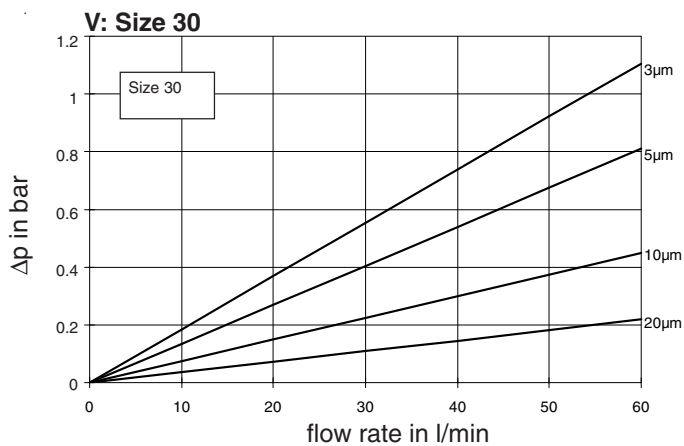
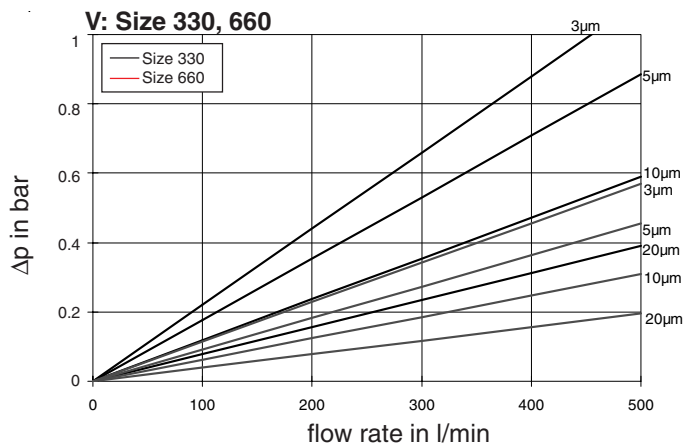
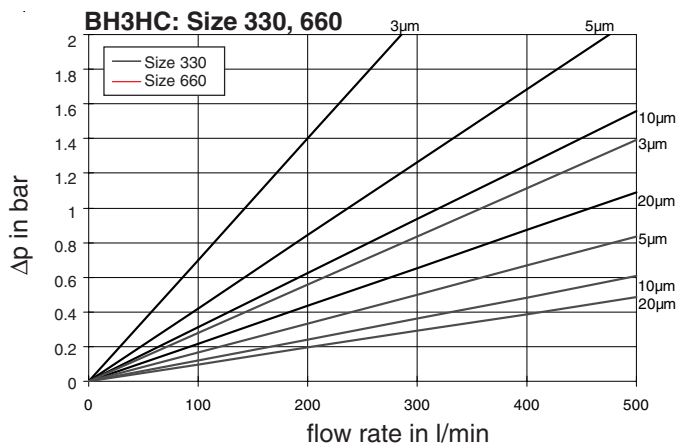
Size 330-660



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.).





5.3. EXAMPLE

General

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

$\Delta p_{\text{housing}}$ = to be taken from Point 5.1.

$\Delta p_{\text{element}}$ = element pressure drop at flow rate Q and viscosity = 30 mm²/s taken from Point 5.2.

Example

System parameters:

Q = 200 l/min; LF 330 with BN3HC element (20μm);
viscosity = 68 mm²/s

$$\Rightarrow \Delta p_{\text{housing}} = 0.2 \text{ bar}$$

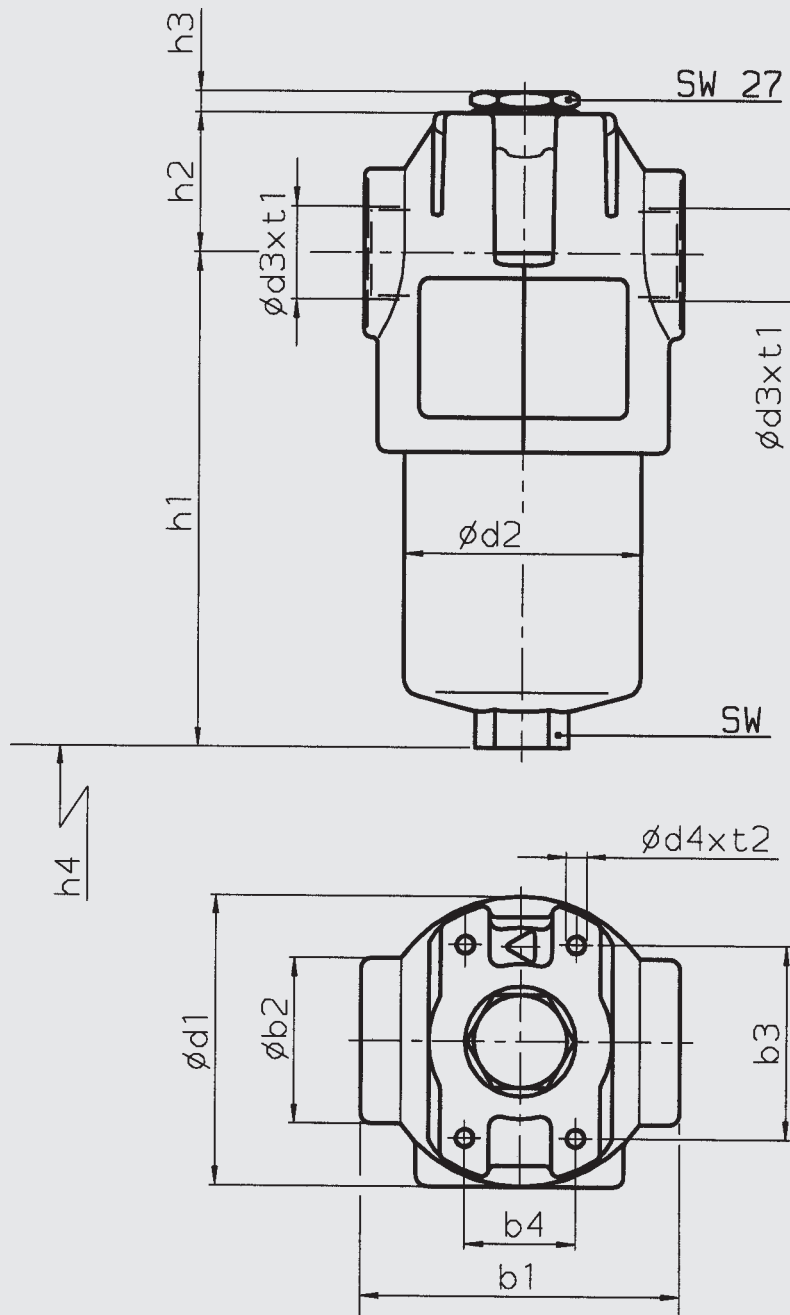
$$\Delta p_{\text{element}} = 0.4 \times \frac{68 \text{ mm}^2/\text{s}}{30 \text{ mm}^2/\text{s}} = 0.91 \text{ bar}$$

$$\Delta p_{\text{total}} = \underline{\underline{1.11 \text{ bar}}}$$

For ease of calculation, our FSP Filter Sizing Program is available and can be downloaded from our website homepage www.hydac.com.

6. DIMENSIONS

6.1. LF



Type size	b1	b2	b3	b4	d1	d2	d3	d4	h1	h2	h3	h4	SW	t1	t2	Weight incl. element in kg	Volume of pressure chamber [l]
30	69	36	45	30	67	52	G ½	M5	134	31	7	75	24	15	8	0.8	0.13
60	90	48	56	32	84	68	G ¾	M6	146	39	6	75	27	17	9	1.5	0.20
110	90	48	56	32	84	68	G ¾	M6	214	39	6	75	27	17	9	1.8	0.33
160	125	65	85	35	116	95	G1¼	M10	199	46	6	95	32	21	14	3.7	0.60
240	125	65	85	35	116	95	G1¼	M10	259	46	6	95	32	21	14	4.3	0.80
330	159	85	115	60	160	130	G1½	M12	261	52	6	105	36	23	17	8.0	1.50
660	159	85	115	60	160	127	G1½	M12	426	52	6	105	36	23	17	17.6	3.00

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.