HYDAC INTERNATIONAL

# Inline filters NF up to 3500 l/min, up to 25 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 threaded cover plate. Standard equipment:

- with bypass valve
- port for 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) | | | |
|---|---|---|---|---|
| NF Elemente | 3 µm | 5 µm | 10 µm | 20 µm |
| 160 1x0160R | 18.6 | 20.7 | 24.9 | 28.1 |
| 240 1x0240R | 29.3 | 32.5 | 39.1 | 44.2 |
| 280 1x0280R | 62.3 | 69.0 | 83.0 | 93.9 |
| 330 1x0330R | 38.4 | 42.6 | 51.2 | 57.9 |
| 500 1x0500R | 58.9 | 65.3 | 78.6 | 88.9 |
| 750 1x0750R | 147.1 | 163.0 | 196.1 | 221.9 |
| 950 1x0950R | 130.0 | 144.1 | 173.3 | 196.1 |
| 13xx 1x1300R | 181.0 | 200.7 | 241.4 | 273.1 |
| 26xx 1x2600R | 369.4 | 409.4 | 492.5 | 557.2 |
| 5240 2x2600R | 738.8 | 818.8 | 985.0 | 1114.4 |
| 7840 3x2600R | 1108.2 | 1228.2 | 1477.5 | 1671.6 |
| 10440 4x2600R | 1477.6 | 1637.6 | 1970.0 | 2228.8 |

Filter elements are available with the following pressure stability values:

| | |
|---|---|
| Betamicron® (BN4HC): | 20 bar |
| Stainl. steel wire mesh (W/HC): | 20 bar |
| Stainless steel fibre (V): | 30 bar |
| ECOmicron® (ECON2): | 10 bar |
| Paper (P/HC): | 10 bar |
| Betamicron®/Aquamicron® (BN4AM): | 10 bar |
| Aquamicron® (AM): | 10 bar |

### 1.3 FiLTER SPECiFiCATiONS

| | |
|---|---|
| Nominal pressure | 25 bar |
| Max. operating pressure | 30 bar at max. $10_6$ cycles |
| Temperature range | -10 °C to +100 °C |
| Material of filter head | Aluminium |
| Material of tube (housing) | Steel up to NF 750<br>Aluminium for NF 950 and above |
| Material of cover plate Aluminium | |
| Type of clogging indicator | VM (differential pressure measurement) |
| Pressure setting of the clogging indicator | 2 bar (others on request) |
| Bypass cracking pressure | 3 bar (others on request) |

### 1.4 SEALS

NBR (= Perbunan)

### 1.5 MOUNTiNG

As inline filter

### 1.6 SPECiAL MODELS AND ACCESSORiES

- Mounting bracket for NF 1310, 1340, 2610, 2640
- Mounting flange for NF 1340/2640
- Filling connection for NF 330, 500, 750, 950, 1350, 2650 on the contaminated side
- Foot bracket option for NF 160-750, 950, 1350, 2650
- Quick release coupling on the filling connection for NF 160, 240, 280
- Check valve on the clean side for NF 160, 240, 280
- For applications up to 40 bar, please make separate request! (only for NF 950, 1350, 2650)
- NF filter as tank-top return line filter (type code 1.x) and as inline filter (horizontal inlet flange at top, outlet vertical; (type code 3.x) on request

### 1.7 SPARE PARTS

See Original Spare Parts List

### 1.8 CERTiFiCATES AND APPROVALS

On request

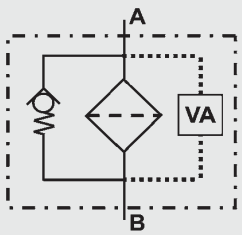
### 1.9 COMPATiBiLiTY WiTH HYDRAULiC FLUiDS iSO 2943

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

### 1.10 iMPORTANT iNFORMATiON

- Filter housings must be earthed.
- When using visual clogging indicators, the BM version (visual with manual reset) only should be used.
- 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**




VA = clogging indicator

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## 2. MODEL CODE (also order example)

NF BN/HC 2640 D P 10 D 2 . X /-L24

### 2.1 COMPLETE FILTER

**Filter type**
NF

**Filter material of element**
BN/HC: Betamicron® (BN4HC) P/HC: Paper ECO/N: ECOmicron® (ECON2) BN/AM: Betamicron®/Aquamicron® W/HC: Stainless steel wire mesh AM: Aquamicron®
V: Stainless steel fibre

**Size of filter or element**
NF: 160, 240, 280, 330, 500, 750, 950, 1310, 1340, 1350, 2610, 2640, 2650, 5240, 7840, 10440

**Operating pressure**
D = 25 bar

**Type and size of port**

| Type | Port | Filter size 160 | 240 | 280 | 330 | 500 | 750 | 950 | 1310 | 1340 | 1350 | 2610 | 2640 | 2650 | 5240 | 7840 | 10440 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | G1¼ | ●● | ● | | | | | | | | | | | | | | |
| K | SAE DN 40 (1½") | | | | | ● | ● | ● | | | | | | | | | |
| L | SAE DN 50 (2") | | | | | | | | | ● | | | | ● | | ● | |
| M | SAE DN 65 (2½") | | | | | | | | | ●● | | | | | | ● | |
| N | SAE DN 80 (3") | | | | | | | | | ● | | | | ● | | ● | |
| P | SAE DN 100 (4") | | | | | | | | | ● | □ | ● | ● | □ | ● | ● | ● | ● | ● |

□ = Discontinued model

**Filtration rating in µm**
BN/HC, ECO/N, V:3, 5, 10, 20 BN/AM: 3, 10 P/HC: 10, 20
W/HC: 25, 50, 100, 200 AM: 40

**Type of clogging indicator**
A with steel blanking plug in indicator port
BM visual for other clogging indicatorsC electrical see brochure no. 7.050../..D visual and electrical

**Type code (TKZ)**
2

**Modification number**
X the latest version is always supplied

**Supplementary details**
B. special cracking pressure of bypass (e. g.: B6 = 6 bar); no details = standard 3 bar
EM manual vent with shut-off valve
EP permanent vent via Minimess hose
FF mounting flange for NF 1340/2640
KB without bypass valve only for clogging indicatorsL... light with appropriate voltage (24, 48, 110, 220 Volt) LED 2 light emitting diodes up to 24 Volt type "D"

SB4 filling line with Ø 4 mm orifice
SL each filter housing can be shut-off individually
V FPM seals

### 2.2 REPLACEMENT ELEMENT

2600 R 010 BN4HC /-V

**Size**
0160, 0240, 0280, 0330, 0500, 0750, 0950, 1300, 2600

**Type**
R

**Filtration rating in µm**
BN4HC, ECON2, V: 003, 005, 010, 020 BN4AM: 003, 010 P/HC: 010, 020
W/HC: 025, 050, 100, 200 AM: 040

**Filter material**
BN4HC, ECON2, V, W/HC, BN4AM, AM, P/HC

**Supplementary details**
V (for descriptions, see point 2.1)

### 2.3 REPLACEMENT CLOGGiNG iNDiCATOR

VM 5 D . X /-L24

**(iMPORTANT: the clogging indicator must not be screwed into the cover plate)**

**Type** ~~VM differential pressure~~ indicator

**Pressure setting**
2 2 bar (5 = 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 (for descriptions, see point 2.1)

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## 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)

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

(*see point 3.2)

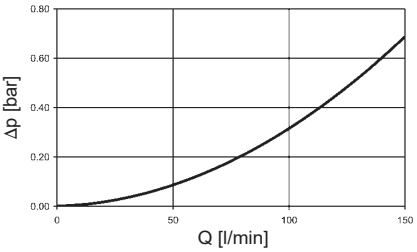
For ease of calculation, our Filter Sizing Program is available on request free of charge.

**NEW:** Sizing online at www.hydac.com

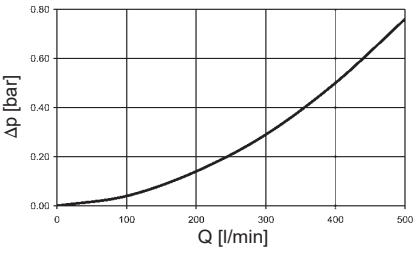
### 3.1 Δp-Q HOUSiNG CURVES BASED ON iSO 3968

The housing curves apply to mineral oil with a density of 0.86 kg/dm³ and a kinematic viscosity of 30mm²/s. In this case, the differential pressure changes proportionally to the density.

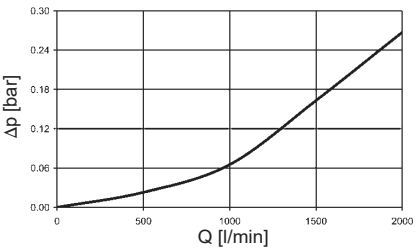
**NF 160, 240, 280**



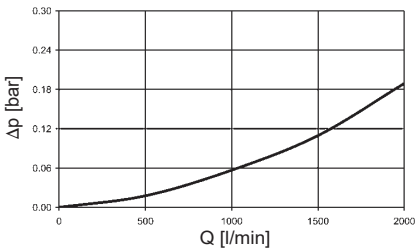

**NF 330, 500, 750**



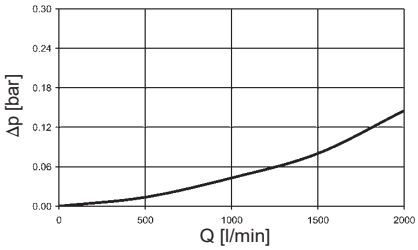

**NF 1310, 2610 NF 1340, 2640 NF 950, 1350, 2650**



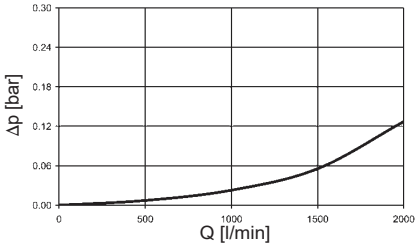

**NF 5240**




**NF 7840**




**NF 10440**

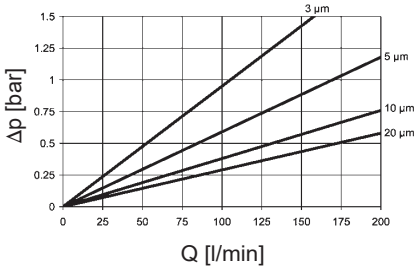


### 3.2 GRADiENT COEFFiCiENTS (SK) FOR FiLTER ELEMENTS

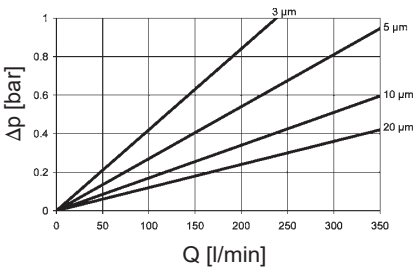
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity.

| | V | | | | W/HC | ECON2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 3 µm | 5 µm | 10 µm | 20 µm | – | 3 µm | 5 µm | 10 µm | 20 µm |
| 160 | 4.9 | 3.5 | 2.4 | 1.5 | 0.338 | 9.5 | 5.9 | 3.8 | 2.9 |
| 240 | 3.2 1.7 | 2.6 | | 1.2 | 0.225 | 6.2 | 3.8 | 2.6 | 1.8 |
| 280 | 1.4 | 1.1 | 0.7 | 0.5 | 0.115 | 3.1 | 2.2 | 1.6 | 1.0 |
| 330 | 2.1 1.1 0.8 | | .7 | | 0.162 | 4.2 | 2.7 | 1.7 | 1.2 |
| 500 | 1.5 | 1.2 | 0.8 | 0.5 | 0.108 | 3.0 | 1.9 | 1.3 | 0.8 |
| 750 | 0.6 | 0.5 | 0.3 | 0.2 | 0.049 | 1.3 | 0.9 | 0.6 | 0.4 |
| 950 | 0.7 | 0.6 | 0.4 | 0.2 | 0.054 | 1.2 | 0.8 | 0.5 | 0.4 |
| 1300 | 0.5 | 0.4 | 0.3 | 0.2 | 0.045 | 0.8 | 0.6 | 0.4 | 0.3 |
| 2600 | 0.3 | 0.2 | 0.1 | 0.1 | 0.018 | 0.4 | 0.3 | 0.2 | 0.1 |

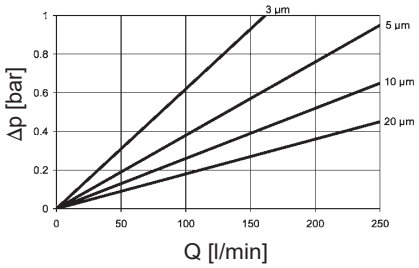
**BN4HC: 160 R...**



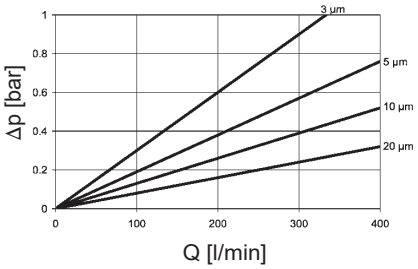

**BN4HC: 330 R...**



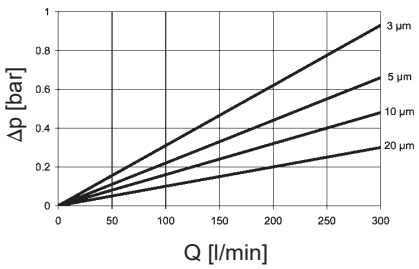

**BN4HC: 240 R...**



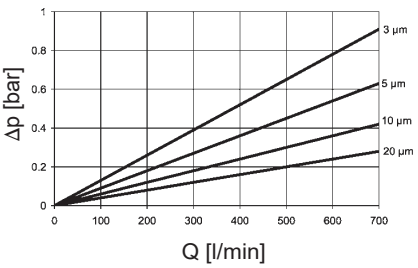

**BN4HC: 500 R...**



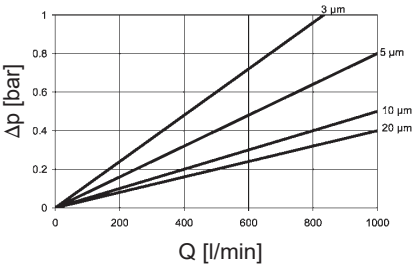

**BN4HC: 280 R...**



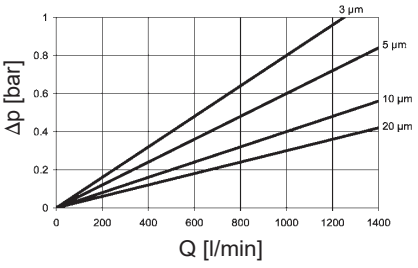

**BN4HC: 750 R...**



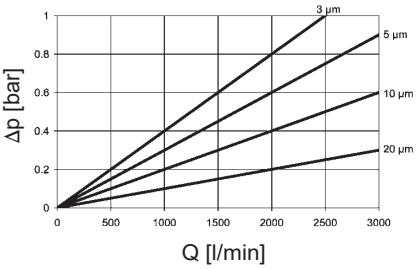

**BN4HC: 950 R...**




**BN4HC: 1300 R...**

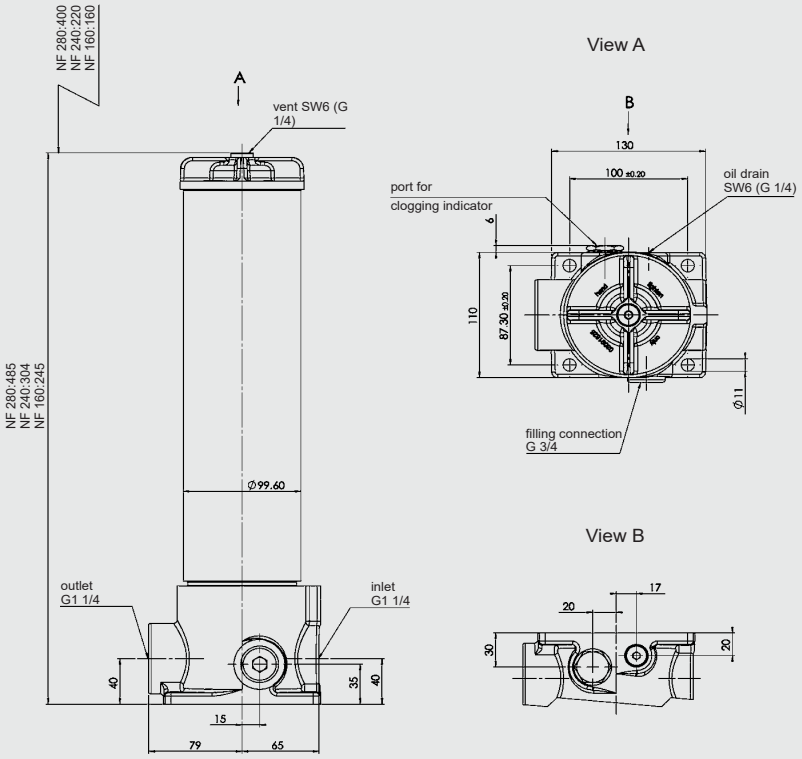



**BN4HC: 2600 R...**

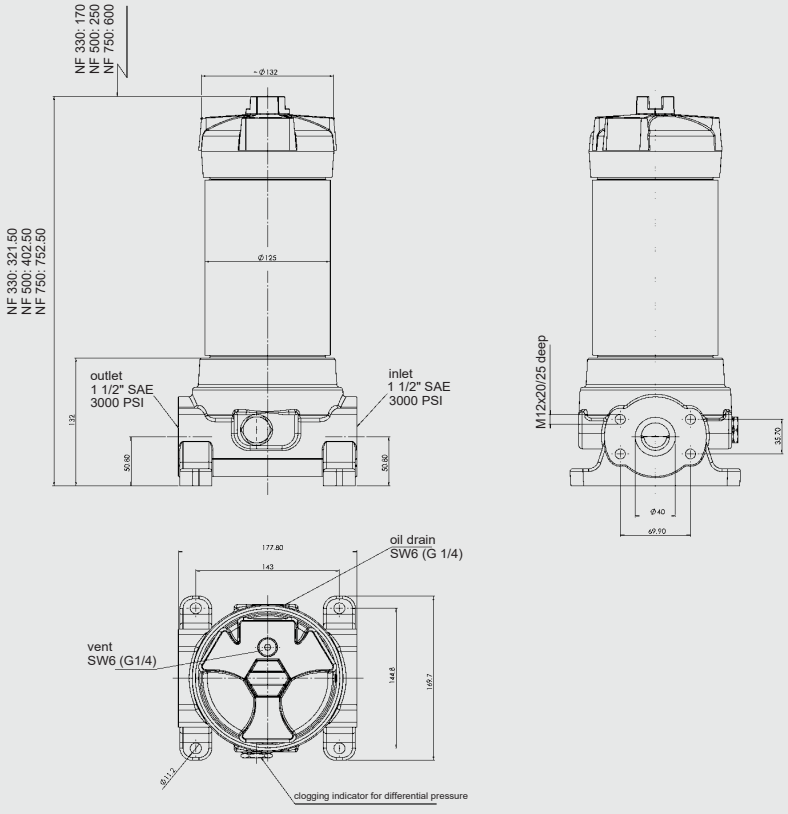


## 4. DiMENSiONS

NF 160-280



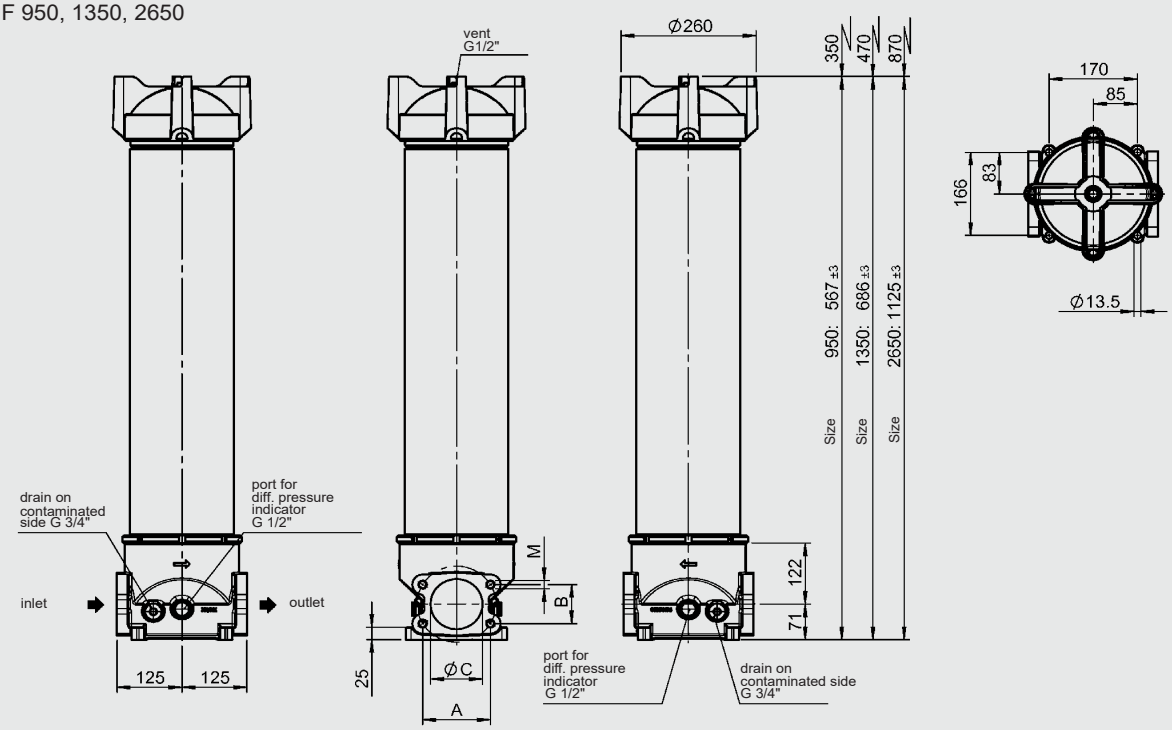

NF 330-750



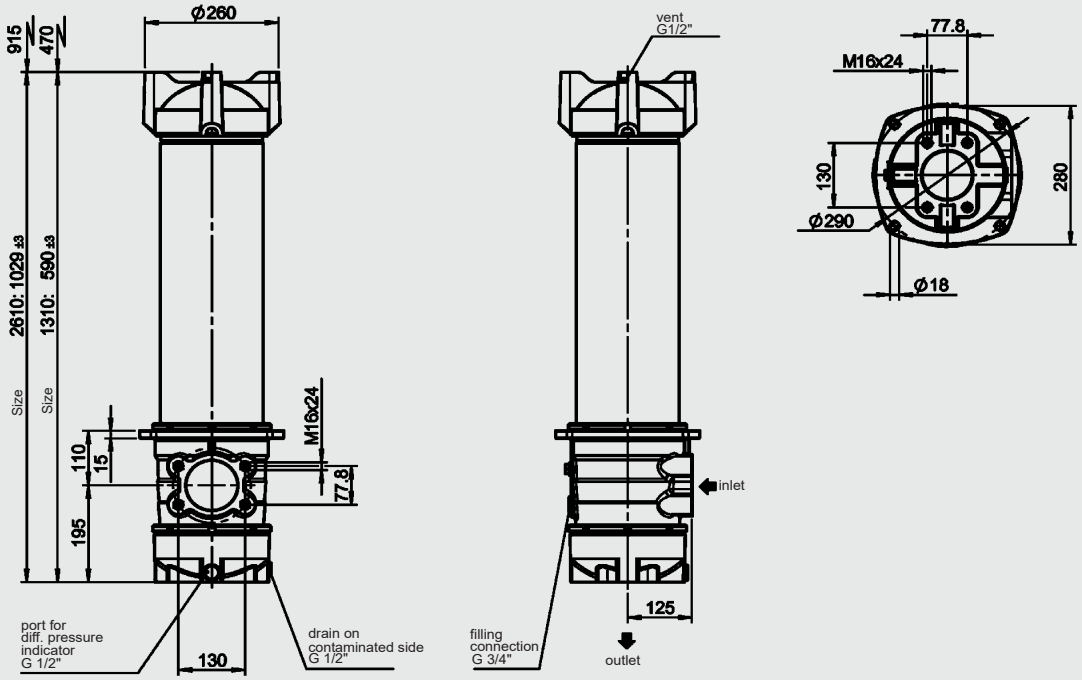

| NF | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---|---|---|---|
| 160 | 1x0160 R... | 4.5 | 0.8 |
| 240 | 1x0240 R... | 5.6 | 1.1 |
| 280 | 1x0280 R... | 9.1 | 2.1 |

| NF No. of Weight incl. Vol. of pressure elements element [kg] chamber [l] 330 1x0330 R... 7.8 2.05 | | | |
|---|---|---|---|
| 500 | 1x0500 R... 9.0 2.80 | 750 | 1x0750 R... 14.1 6.08 |

NF 950, 1350, 2650




NF 1310/2610 ... 2.X (on request)




| Port | A | B | ØC | M |
|---|---|---|---|---|
| SAE DN 50 (2") | 77.8 | 42.9 | 50 | M12x15 |
| SAE DN 65 (2½") | 88.9 | 50.8 | 65 | M12x15 |
| SAE DN 80 (3") | 106.4 | 62.9 | 75 | M16x24 |
| SAE DN 100 (4") | 130.2 | 77.8 | 100 | M16 |

| NF | No. of elements | Weight incl. chamber [kg] | Vol. of pressure element [l] |
|---|---|---|---|
| 1310...2.X | 1x1300 R... | 17 | 14 |

| NF | No. of elements | Weight incl. chamber [kg] | Vol. of pressure element [l] |
|---|---|---|---|
| 950 | 1x0950 R... | 16 | 10 |
| 1350 | 1x1300 R... | 18 | 13 |
| 2650 | 1x2600 R... | 25 | 25 |

| NF | No. of elements | Weight incl. chamber [kg] | Vol. of pressure element [l] |
|---|---|---|---|
| 2610...2.X | 1x2600 R... | 23 | 25 |

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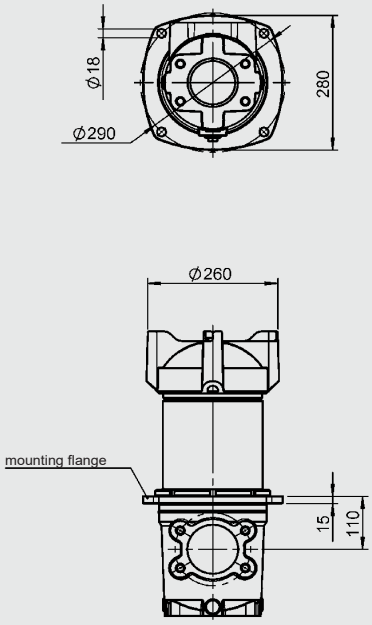
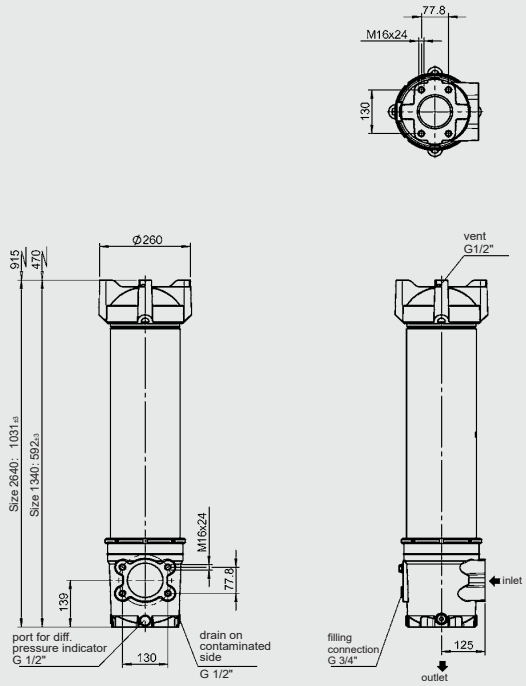
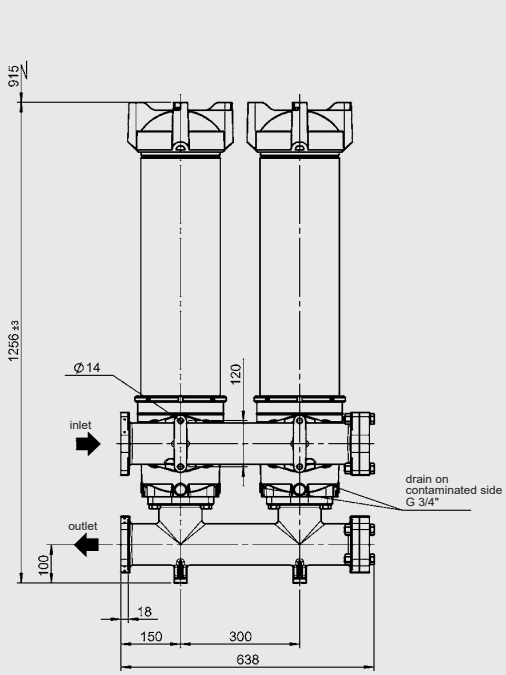
NF 1340/2640 ... 2.X/-FF

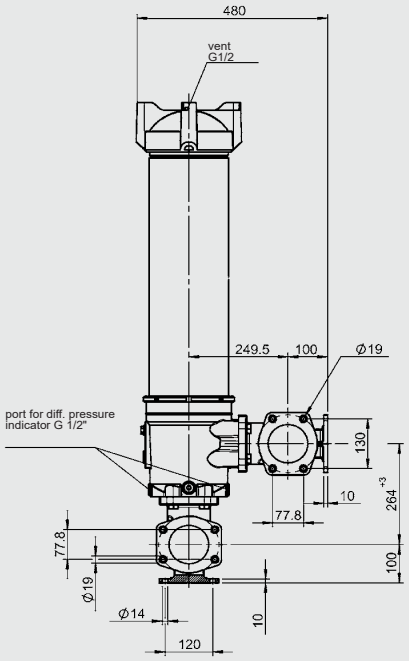



NF 1340/2640 ... 2.X




NF 5240 ... 2.X



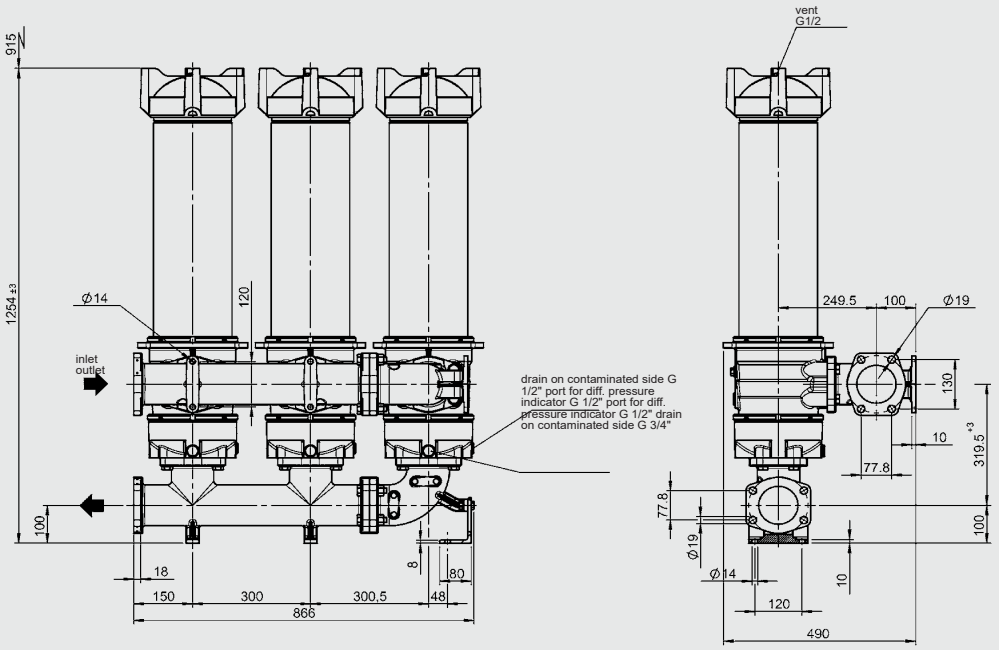




| NF | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---|---|---|---|
| 1340...2.X | 1x1300 R... | 17 | 14 |

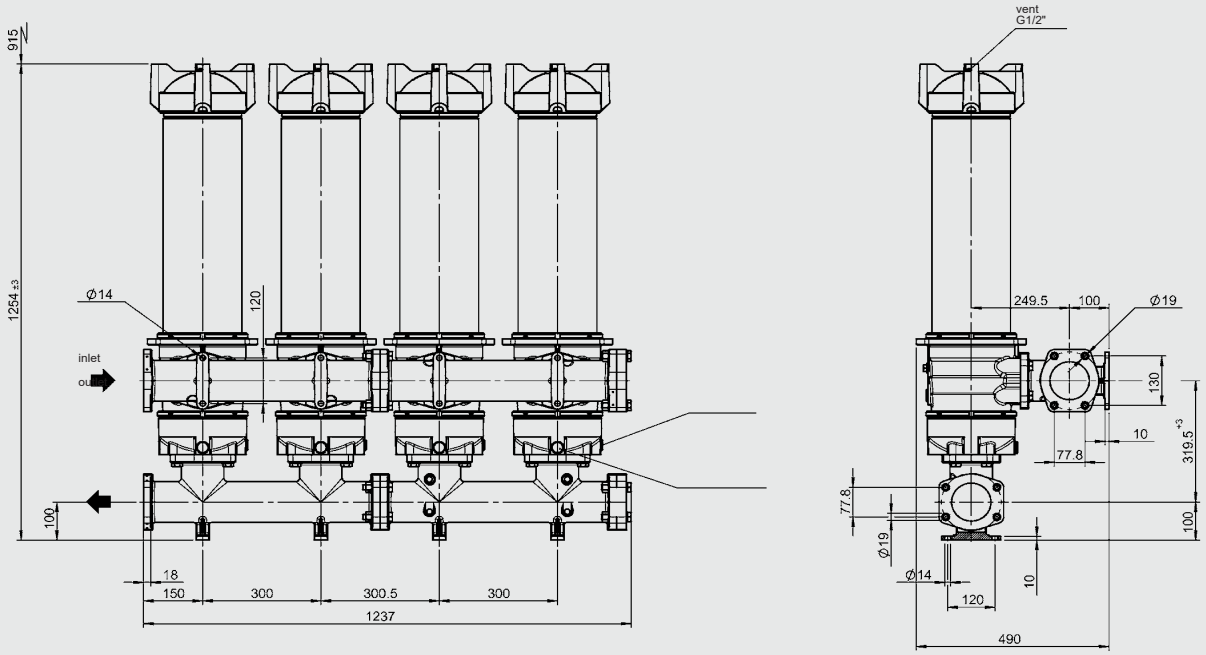
| NF | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---|---|---|---|
| 5240...2.X | 2x2600 R... | 90 | 60 |

| NF | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---|---|---|---|
| 2640...2.X | 1x2600 R... | 23 | 25 |

NF 7840 2.x




NF 10440 2.x




| NF | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---|---|---|---|
| 7840 | 3x2600 R... | 125 | 88 |

| NF | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---|---|---|---|
| 10440 | 4x2600 R... | 180 | 120 |

## 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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