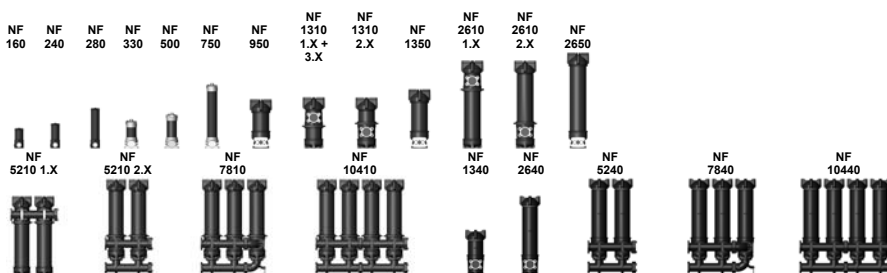




## Inline Filter or Tank Top Return Line Filter NF up to 3500 l/min, up to 25 bar



### 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
- connection for a 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    | Elements | 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  |
| 52XX  | 2x2600R  | 738.8  | 818.8  | 985.0  | 1114.4 |
| 78XX  | 3x2600R  | 1108.2 | 1228.2 | 1477.5 | 1671.6 |
| 104XX | 4x2600R  | 1477.6 | 1637.6 | 1970.0 | 2228.8 |

Filter elements are available with the following pressure stability values

|                                  |        |
|----------------------------------|--------|
| Betamicron® (BN4HC):             | 20 bar |
| 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   |
| Temperature range                      | -10 °C to +100 °C  |
| Material of filter head                | Aluminium  |
| Material of tube (housing)             | Steel (aluminium for NF 1300)  |
| Material of cover plate                | Aluminium  |
| Type of clogging indicator             | VM (differential pressure indicator; for inline mounting)<br>VR (return line indicator; for tank-top mounting) |
| Setting pressure of clogging indicator | 5 bar (others on request)  |
| Bypass cracking pressure               | 3 bar (others on request)  |

#### 1.4 SEALS

NBR (= Perbunan)

#### 1.5 MOUNTING

As inline filter or tank-top return line filter.

#### 1.6 SPECIAL MODELS AND ACCESSORIES

- Mounting bracket for NF 1310/2610
- 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 enquire separately! (only for NF 950, 1350, 2650)

#### 1.7 SPARE PARTS

See Original Spare Parts List

#### 1.8 CERTIFICATES AND APPROVALS

On request

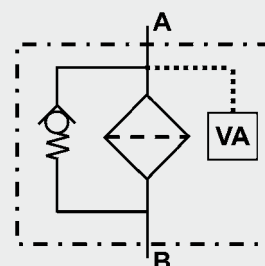
#### 1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

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

#### 1.10 IMPORTANT INFORMATION

- Filter housing 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



## 2. MODEL CODE (also order example)

NF BN/HC 2610 D P 10 D 2 . X /-L24

### 2.1 COMPLETE FILTER

Filter type

NF

Filter material of element

BN/HC: Betamicon® (BN4HC) P/HC: Paper V: stainless steel fibre

ECO/N: ECOmicron® (ECON2) BN/AM: Betamicon®/Aquamicron®

W/HC: Stainless steel wire mesh AM: Aquamicron®

Size of filter or element

NF: 160, 240, 280, 330, 500, 750, 950, 1310, 1340, 1350, 2610, 2640, 2650, 5210, 5240, 7810, 7840, 10410, 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 | 5210 | 5240 | 7810 | 7840 | 10410 | 10440 |
| E    | G1½             | •           | •   | •   |     |     |     |     |      |      |      |      |      |      |      |      |      |      |       |       |
| 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

BN4HC, 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 indicator

C electrical indicator

D visual and electrical indication

for other clogging indicators, see brochure no. E 7.050.../...

Type code

1 - Tank-top return line filter

• return line indicator VR

• inlet flange horizontal at top, outlet vertical - from size NF 5210: horizontal

• tank seal supplied

2 - Inline filter

• differential pressure indicator VM

• inlet flange horizontal at bottom, outlet vertical - from size NF 5210 horizontal, only for NF 950, 1350, 2650:

- differential pressure indicator VM

- inlet and outlet horizontal and opposite

3 - Inline filter

• differential pressure indicator VM

• inlet flange horizontal at top, outlet vertical

| Code | Filter size |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |       |       |
|------|-------------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|-------|-------|
|      | 160         | 240 | 280 | 330 | 500 | 750 | 950 | 1310 | 1340 | 1350 | 2610 | 2640 | 2650 | 5210 | 5240 | 7810 | 7840 | 10410 | 10440 |
| 1    |             |     |     |     |     |     |     | x    |      |      | x    |      |      | x    |      |      |      |       |       |
| 2    | •           | •   | •   | •   | •   | •   | •   | ○    | •    | •    | ○    | •    | •    | ○    | •    | ○    | •    | ○     | •     |
| 3    |             |     |     |     |     |     |     | ○    |      |      | ○    |      |      |      |      |      |      |       |       |

x = on request  
• = standard model  
○ = discontinued model

Modification number

X the latest version is always supplied

Supplementary details

B special cracking pressure of bypass valve (e. g.: B6 = 6 bar); no details = standard 3 bar

EM manual vent with shut-off valve

EP permanent vent via Minimes hose

KB without bypass valve

L... light with appropriate voltage (24, 48, 110, 220 Volt) ] only for clogging

LED 2 light emitting diodes up to 24 Volt ] indicators type D

SB4 filling line with Ø 4 mm orifice

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 (only for inline filter in version 2.X and 3.X)

VR return line indicator (only for tank-top filter in version 1.X)

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)

### 3. FILTER CALCULATION / SIZING

The total pressure drop of a filter at a certain flow rate Q is the sum of the housing  $\Delta p$  and element  $\Delta p$  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)

n = no. of elements (see point 1.2 filter elements)

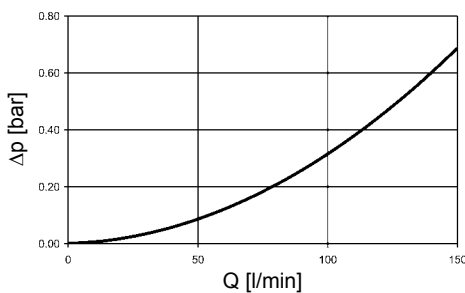
For ease of calculation, our Filter Sizing Program is available on request free of charge.

**NEW:** Sizing online at [www.hydac.com](http://www.hydac.com)

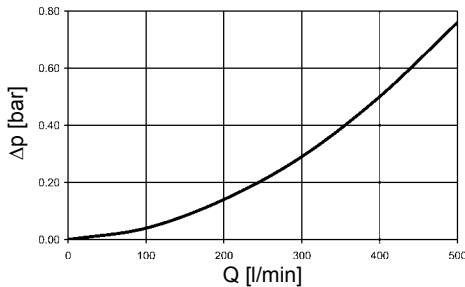
#### 3.1 $\Delta P$ -Q HOUSING GRAPHS BASED ON ISO 3968

The housing graphs apply to mineral oil with a density of 0.86 kg/dm<sup>3</sup> and a kinematic viscosity of 30 mm<sup>2</sup>/s. In this case, the differential pressure changes proportionally to the density.

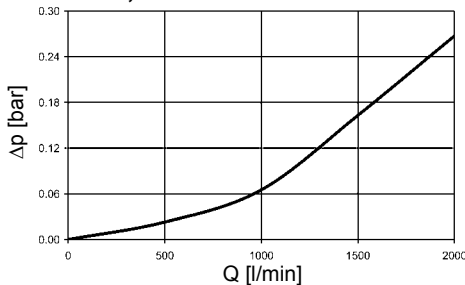
**NF 160, 240, 280 ... 2.0**



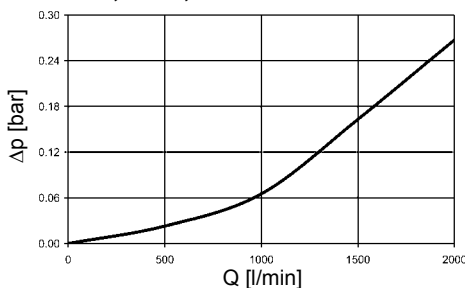
**NF 330, 500, 750 ... 2.0**



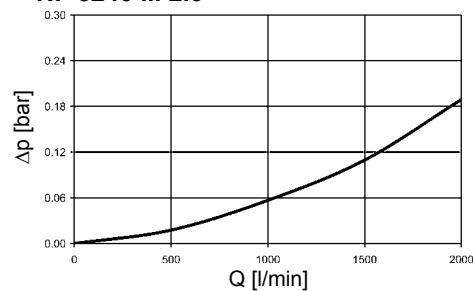
**NF 1310, 2610 ... 1.0 / 3.0**



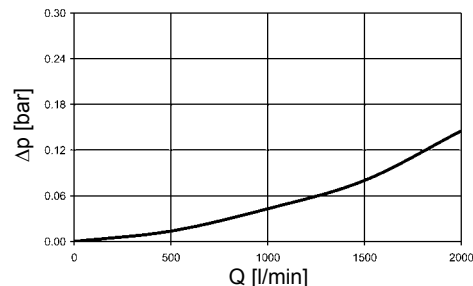
**NF 1310, 1340, 2610, 2640 ... 2.0**  
**NF 950, 1350, 2650 ... 2.0**



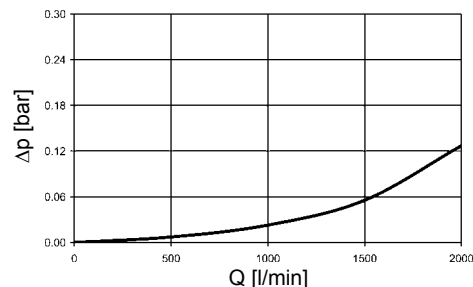
**NF 5210 ... 1.0 / 2.0**  
**NF 5240 ... 2.0**



**NF 7810 / 7840 ... 2.0**



**NF 10410 / 10440 ... 2.0**

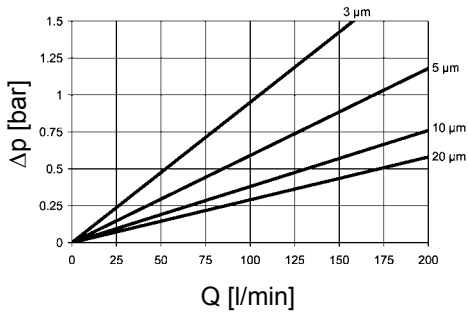


### 3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

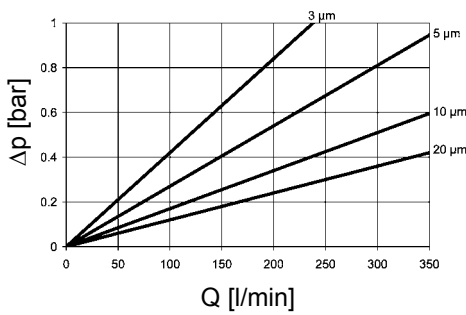
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm<sup>2</sup>/s. The pressure drop changes proportionally to the change in viscosity.

|      | V    |      |       |       | W/HC  | ECON2 |      |      |       |
|------|------|------|-------|-------|-------|-------|------|------|-------|
|      | 3 μm | 5 μm | 10 μm | 20 μm |       | -     | 3 μm | 5 μm | 10 μm |
| 160  | 4.9  | 3.5  | 2.4   | 1.5   | 0.338 | 9.5   | 5.9  | 3.8  | 2.9   |
| 240  | 3.2  | 2.6  | 1.7   | 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  | 1.7  | 1.1   | 0.8   | 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   |

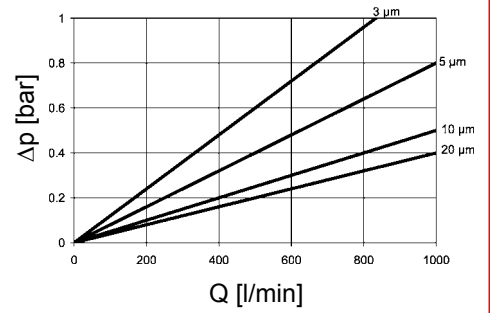
**BN4HC: 160 R...**



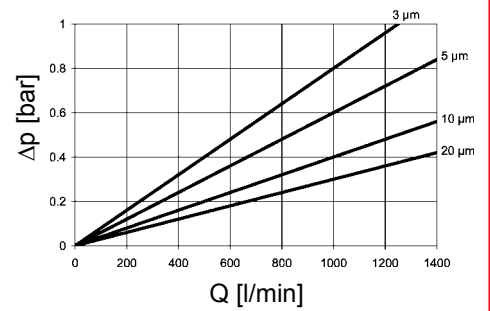
**BN4HC: 330 R...**



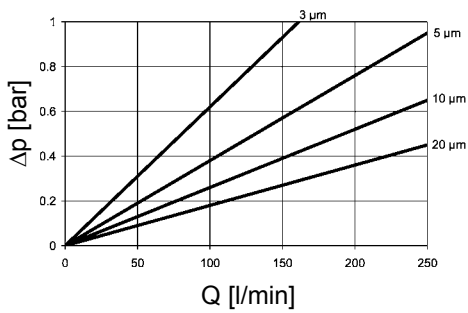
**BN4HC: 950 R...**



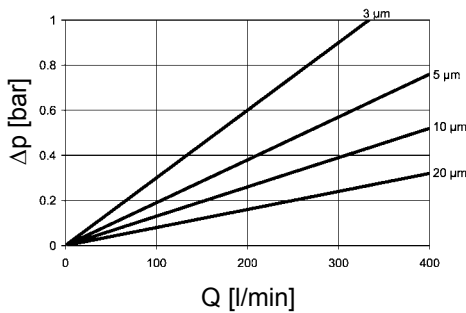
**BN4HC: 1300 R...**



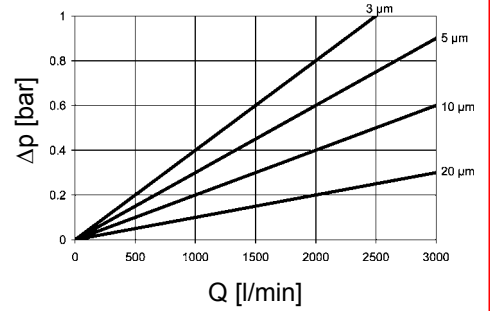
**BN4HC: 240 R...**



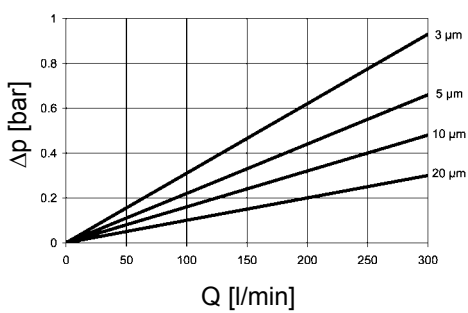
**BN4HC: 500 R...**



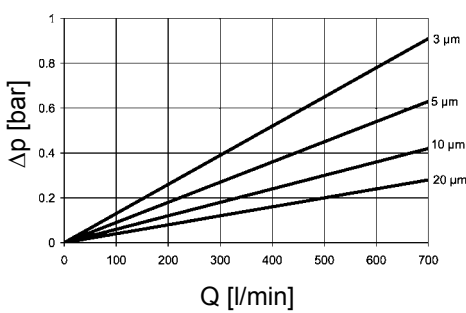
**BN4HC: 2600 R...**



**BN4HC: 280 R...**

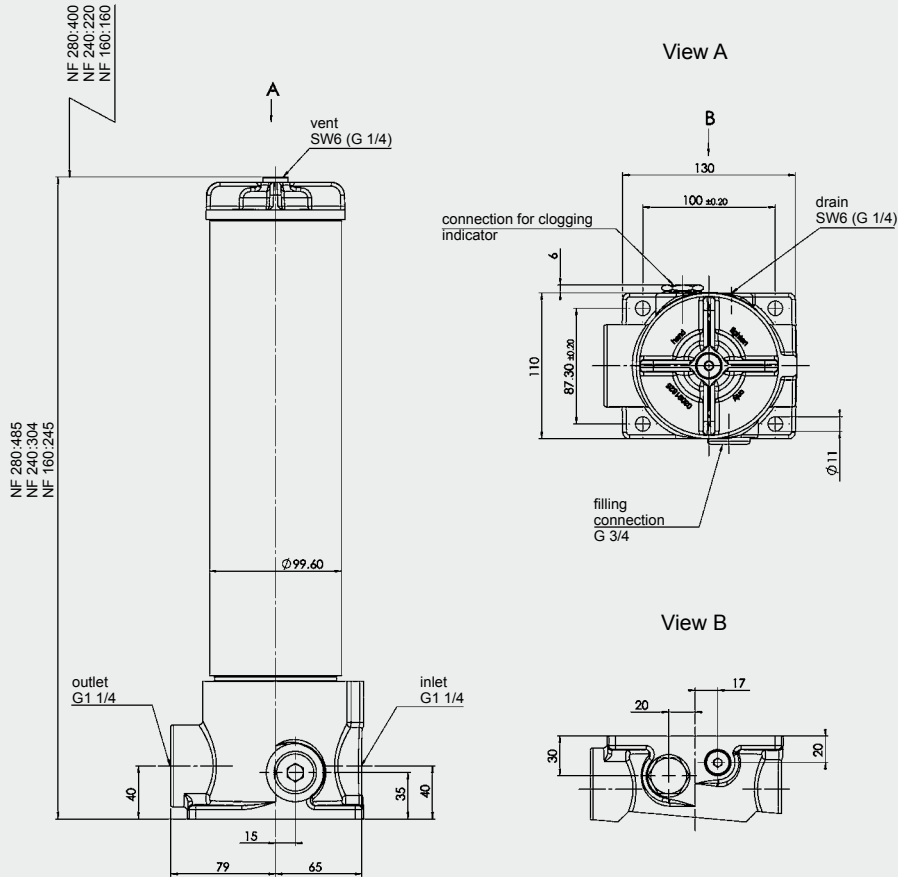


**BN4HC: 750 R...**

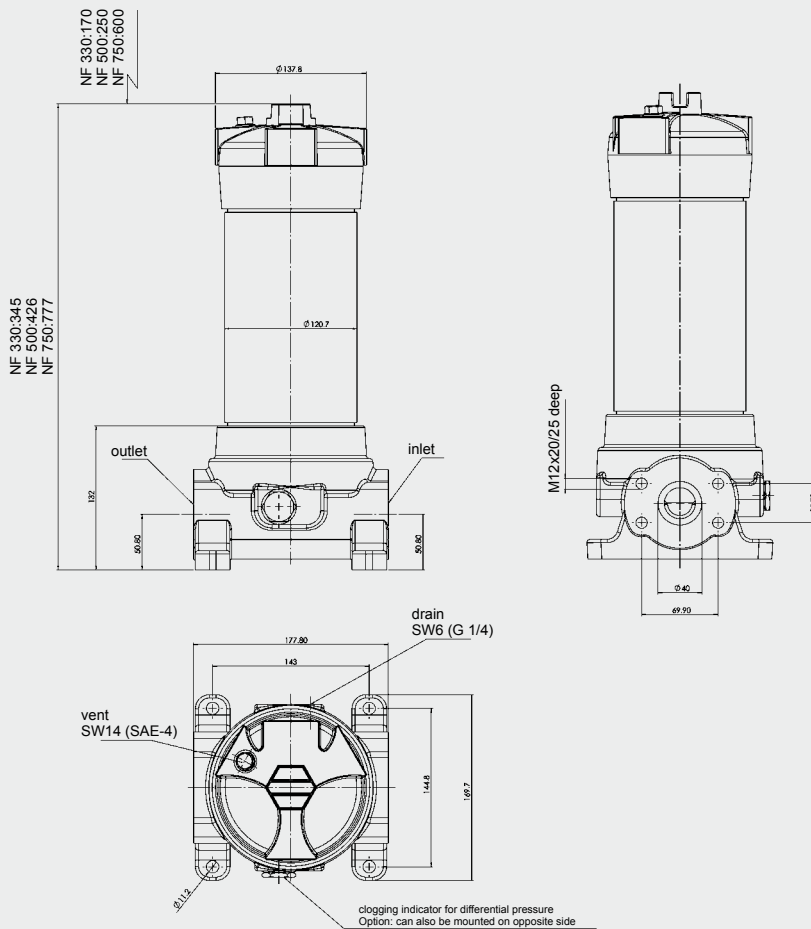


## 4. DIMENSIONS

NF 160-280



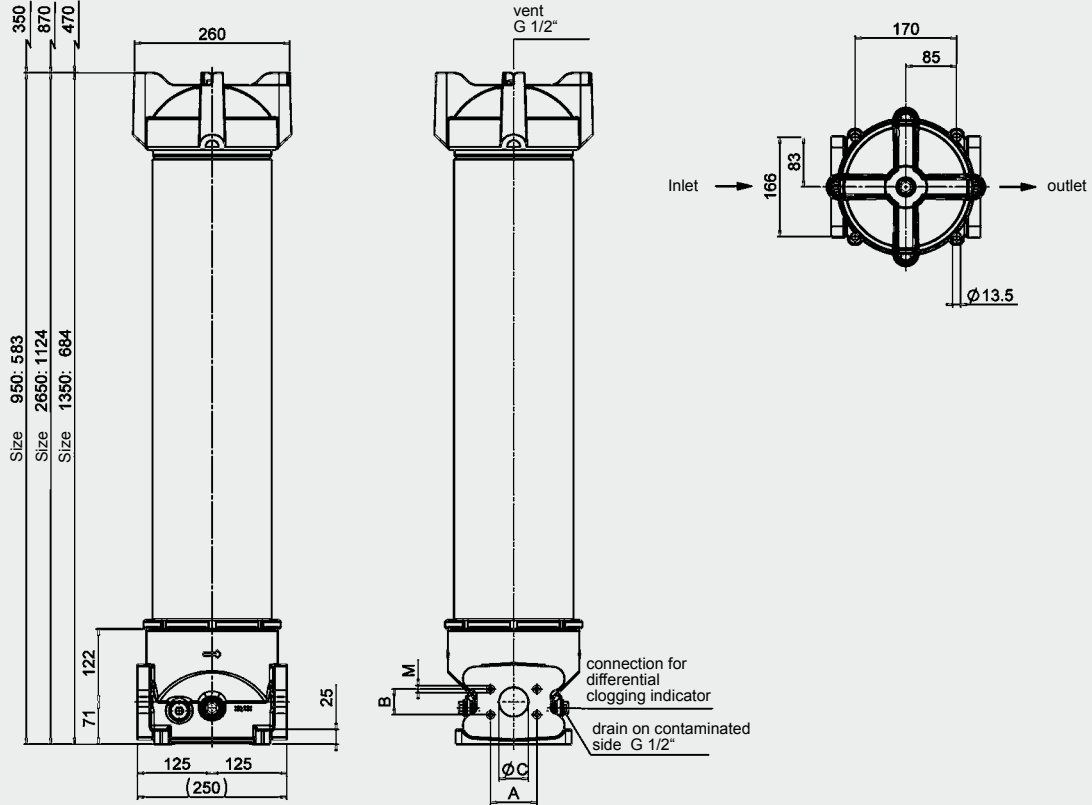
NF 330-750



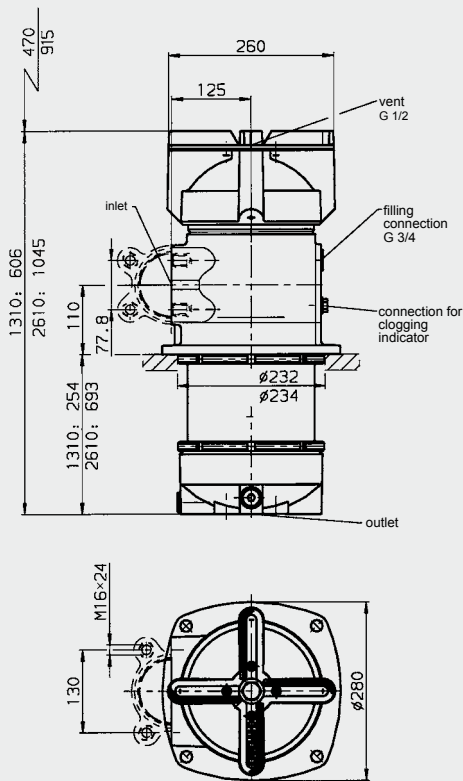
| NF  | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|-----|-----------------|---------------------------|------------------------------|
| 160 | 1x0160 R...     | 4.5                       | 0.8                          |
| 240 | 1x0240 R...     | 5.6                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

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

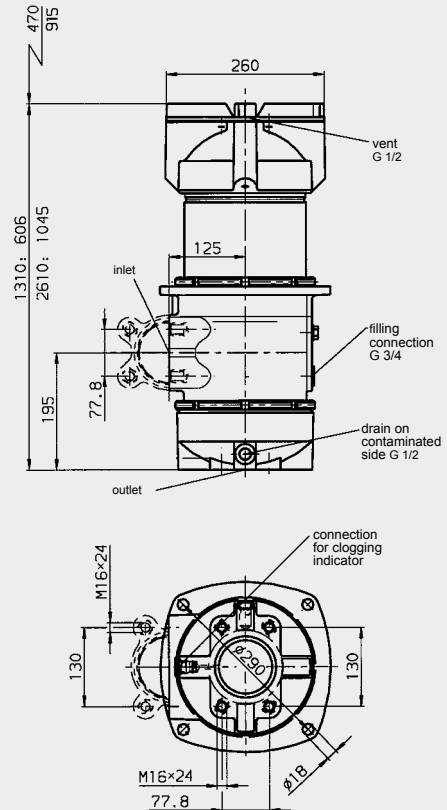
NF 950, 1350, 2650



NF 1310/2610 ... 1.X



NF 1310/2610 ... 2.X



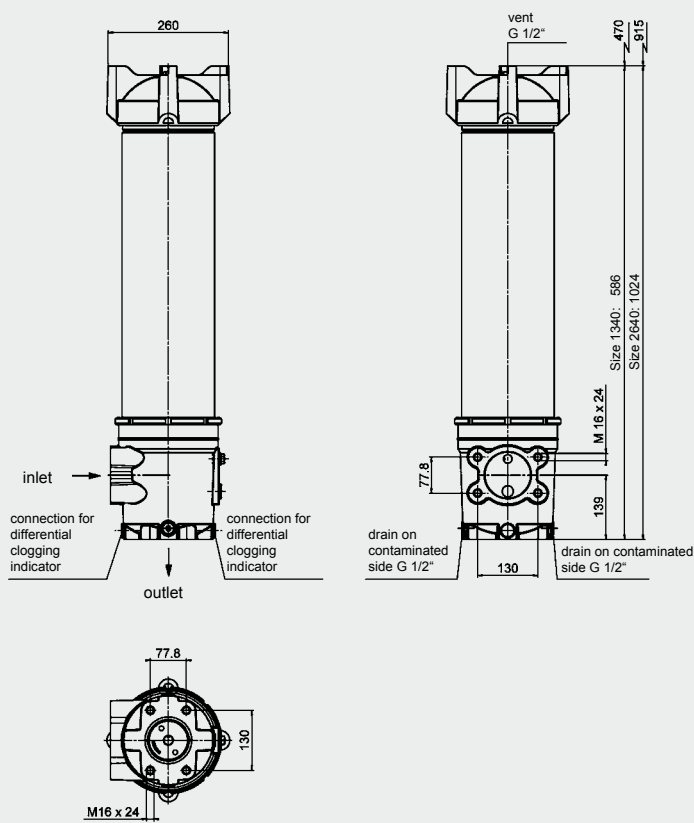
| Port            | A     | B    | ØC  | M      |
|-----------------|-------|------|-----|--------|
| SAE DN 50 (2")  | 77.8  | 42.9 | 50  | M12x15 |
| SAE DN 65 (2½") | 88.9  | 50.8 | 65  | M12x15 |
| SAE DN 80 (3")  | 106.4 | 62.9 | 75  | M16x24 |
| SAE DN 100 (4") | 130.2 | 77.8 | 100 | M16    |

| NF         | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber |
|------------|-----------------|---------------------------|--------------------------|
| 1310...1.X | 1x1300 R...     | 17                        | 14                       |
| 1310...2.X | 1x1300 R...     | 17                        | 14                       |
| 1340...2.X | 1x1300 R...     | 17                        | 14                       |

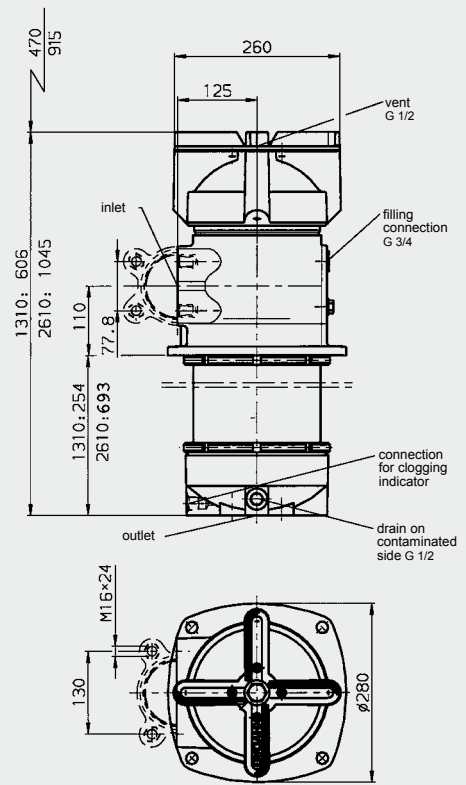
| NF   | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|------|-----------------|---------------------------|------------------------------|
| 950  | 1x0950 R...     | 16                        | 10                           |
| 1350 | 1x1300 R...     | 18             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

| NF         | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|------------|-----------------|---------------------------|------------------------------|
| 2610...1.X | 1x2600 R...     | 23                        | 25                           |
| 2610...2.X | 1x2600 R...     | 23                        | 25                           |
| 2640...2.X | 1x2600 R...     | 23                        | 25                           |

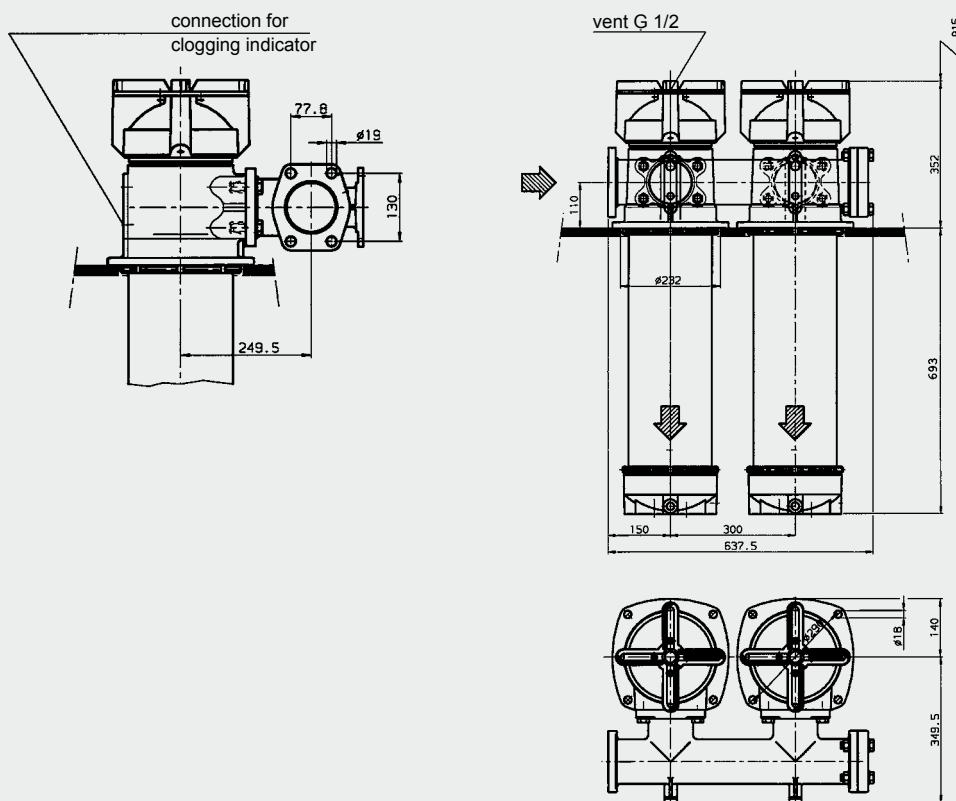
NF 1340/2640 ... 2.X  
Standard series



NF 1310/2610 ... 3.X  
On request



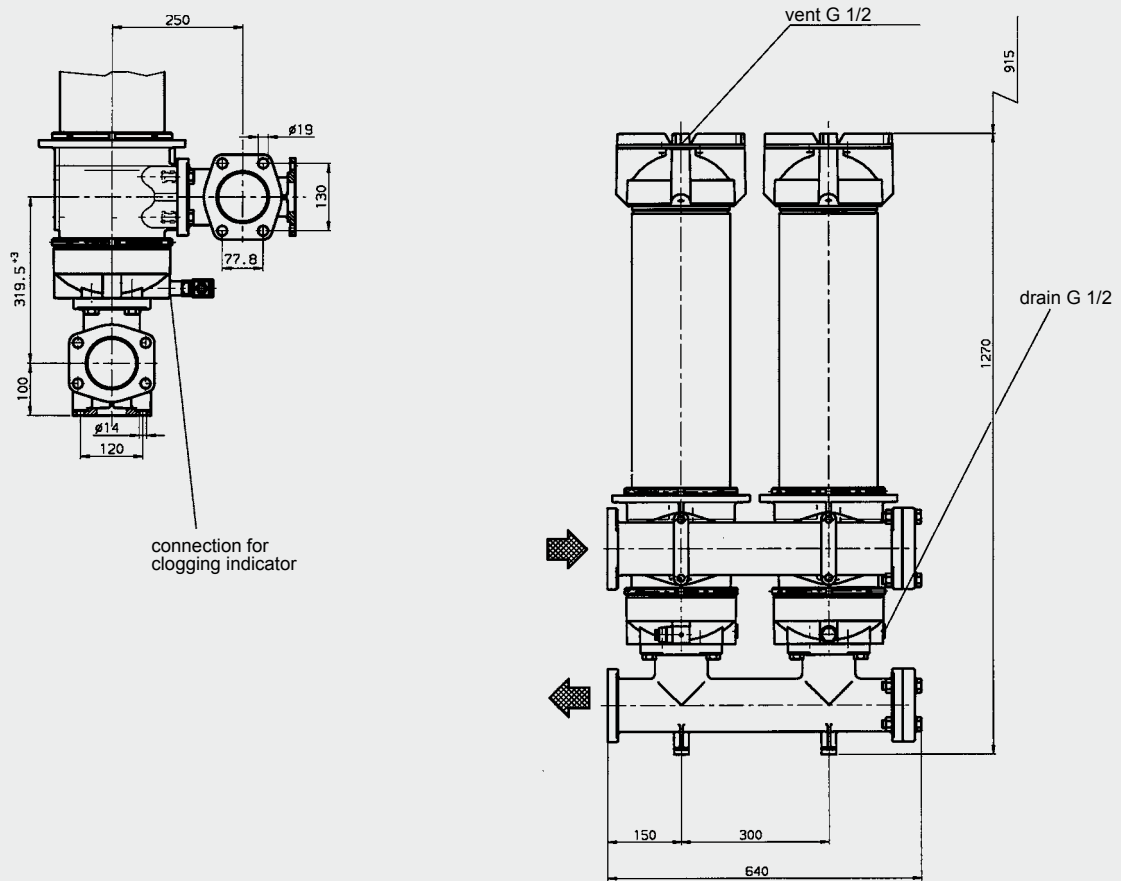
NF 5210 ... 1.X  
On request



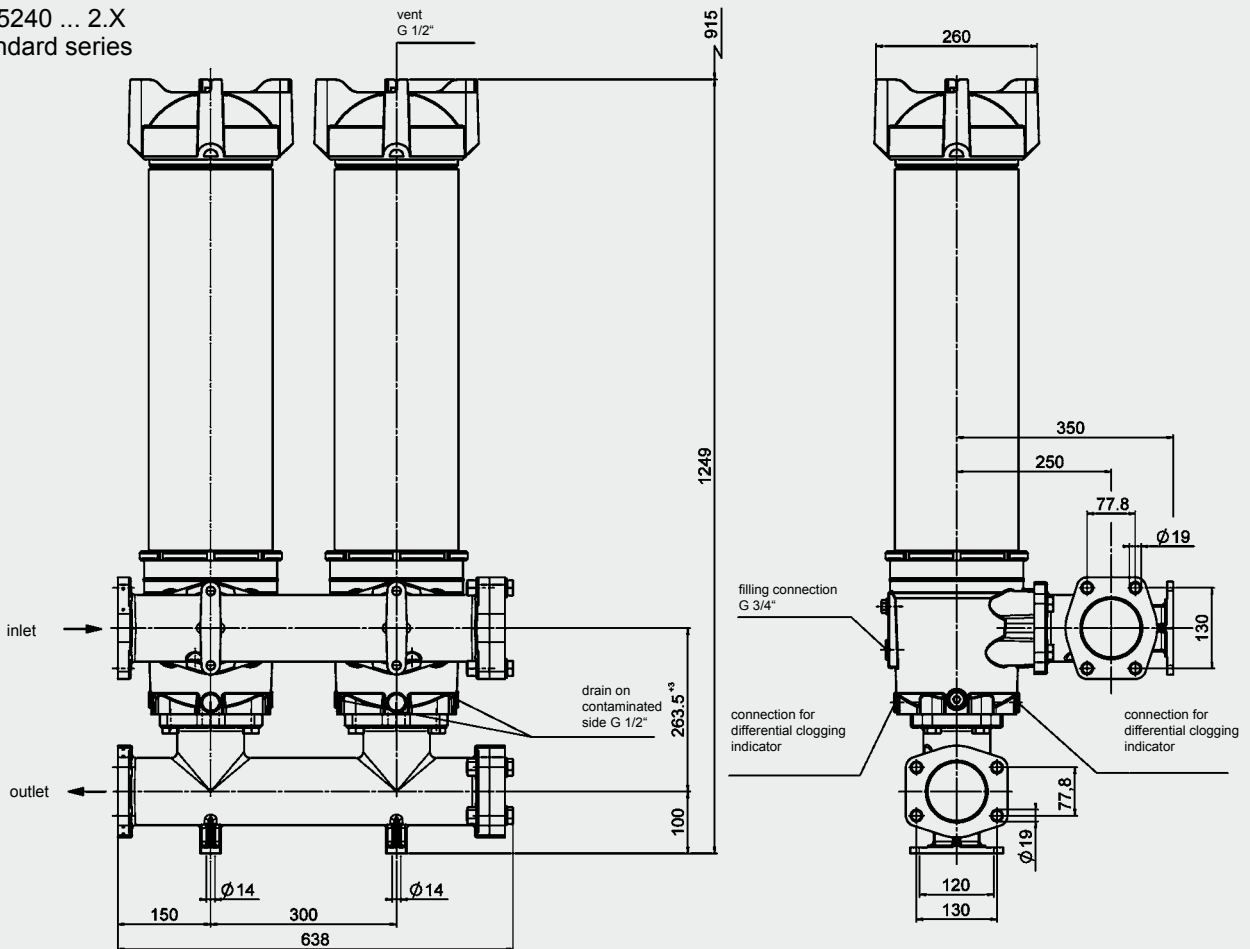
| NF                       | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|--------------------------|-----------------|---------------------------|------------------------------|
| 1310...2.X<br>1340...2.X | 1x1300 R...     | 17                        | 14                           |
| 1310...3.X               | 1x1300 R...     | 17                        | 14                           |
| NF                       | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
| 5210...1.X               | 2x2600 R...     | 68                        | 55                           |

| NF                       | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|--------------------------|-----------------|---------------------------|------------------------------|
| 2610...2.X<br>2640...2.X | 1x2600 R...     | 23                        | 25                           |
| 2610...3.X               | 1x2600 R...     | 23                        | 25                           |

NF 5210 ... 2.X

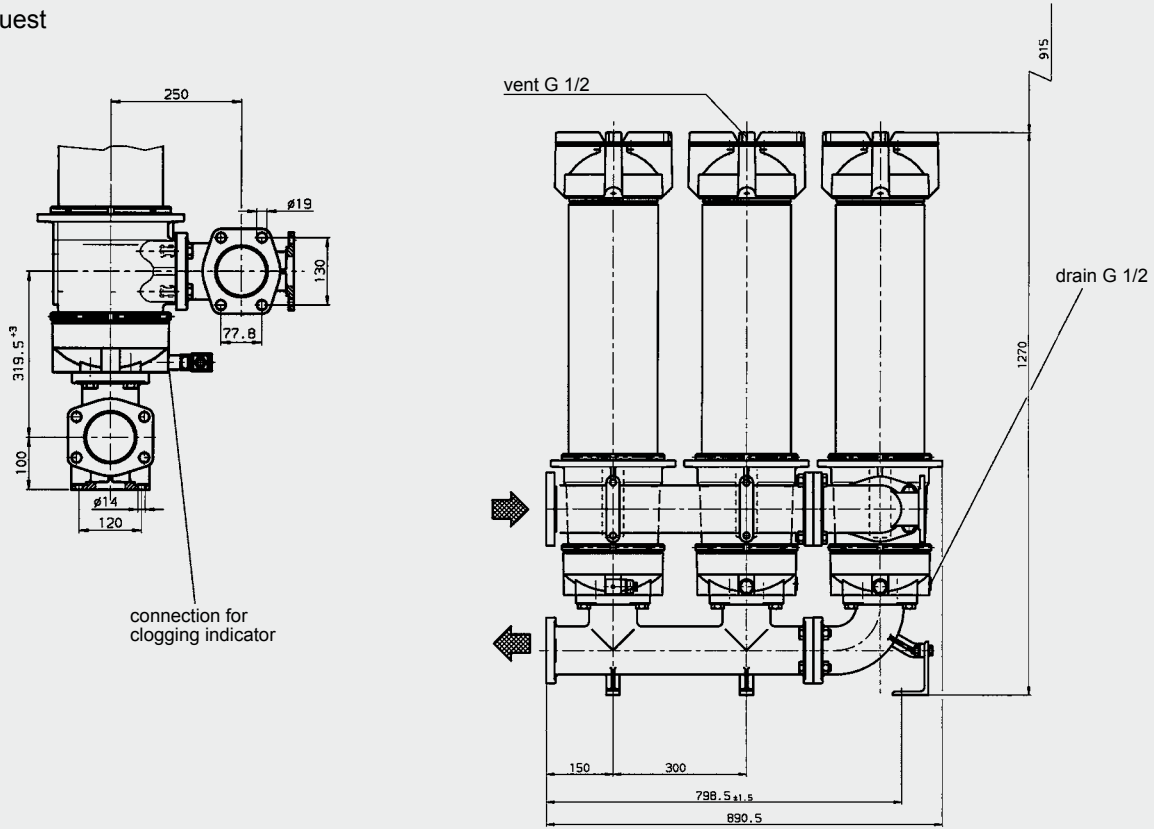


NF 5240 ... 2.X  
Standard series

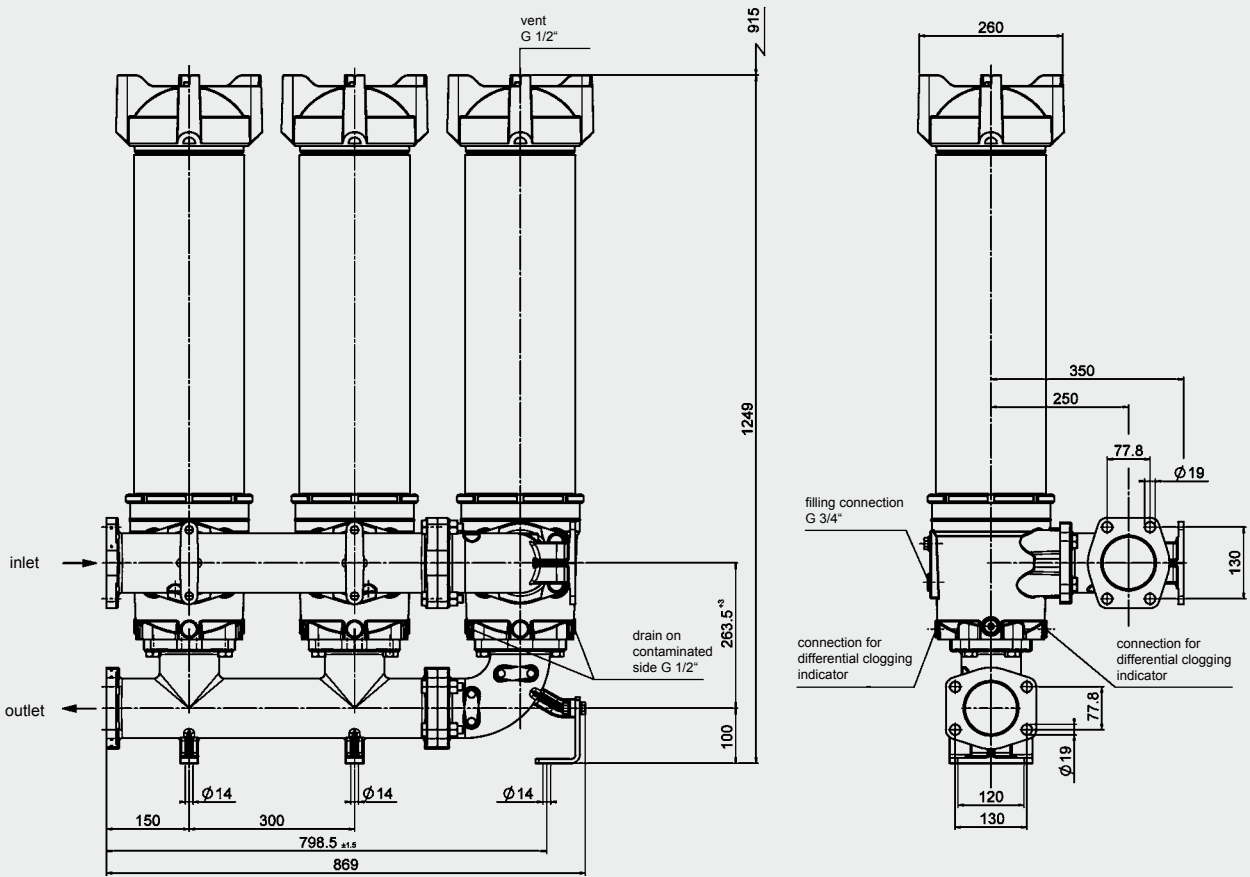


| NF         | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber[l] |
|------------|-----------------|---------------------------|-----------------------------|
| 5210...2.X | 2x2600 R...     | 90                        | 60                          |
| 5240...2.X |                 |                           |                             |

NF 7810  
On request

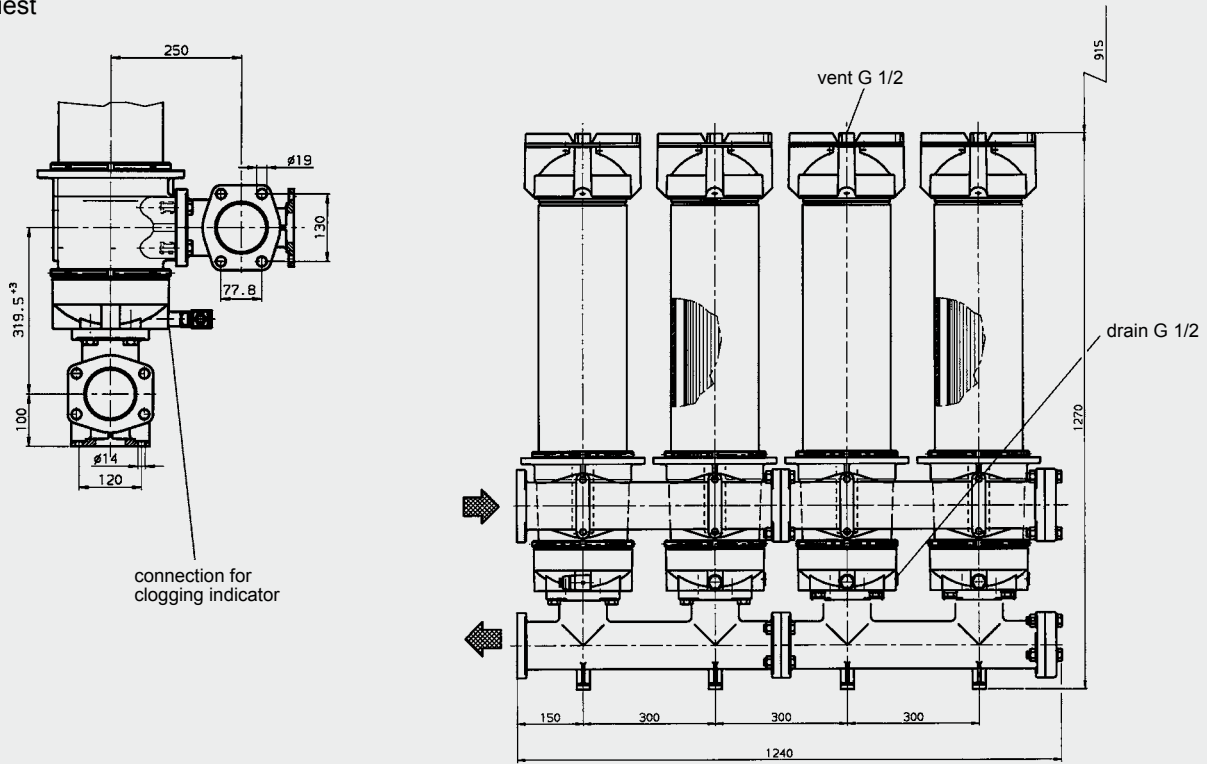


NF 7840  
Standard series

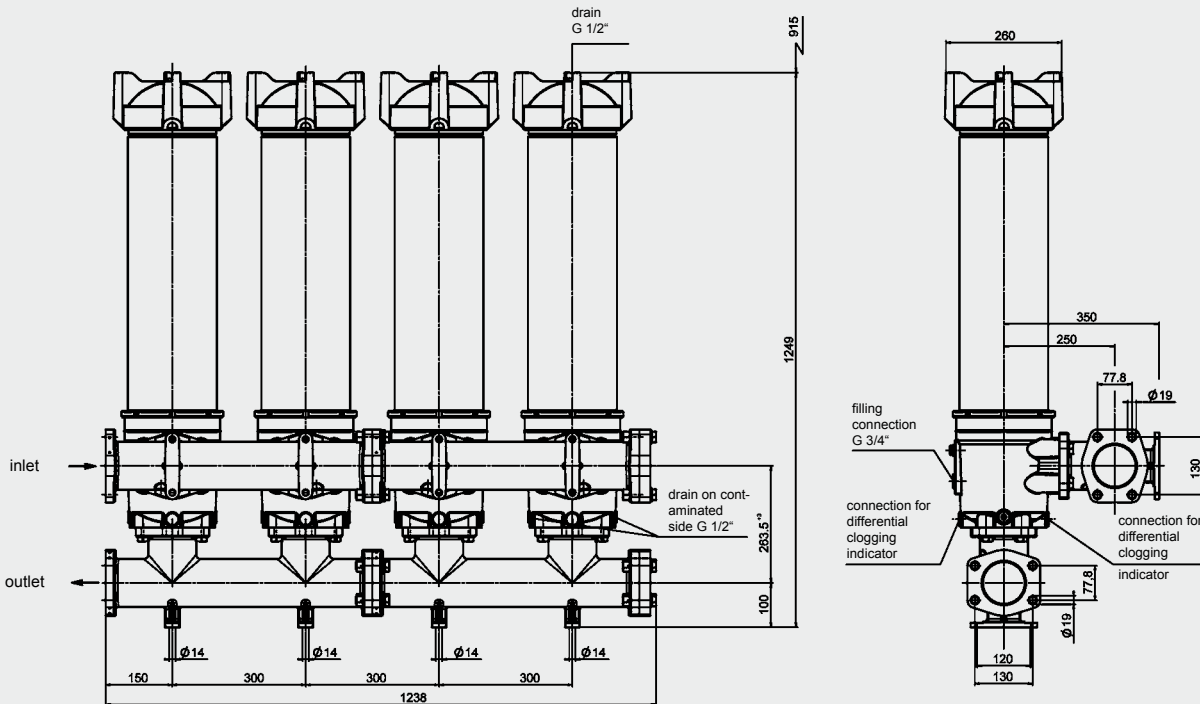


| NF          | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|-------------|-----------------|---------------------------|------------------------------|
| 7810 / 7840 | 3x2600 R...     | 125                       | 88                           |

NF 10410  
On request



NF 10440  
Standard series



| NF            | No. of elements | Weight incl. element [kg] | Vol. of pressure chamber [l] |
|---------------|-----------------|---------------------------|------------------------------|
| 10410 / 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.

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