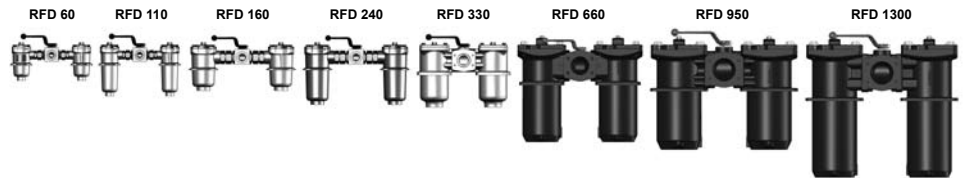




## Change-Over Return Line Filter RFD up to 1300 l/min, up to 25 bar



### 1. TECHNICAL SPECIFICATIONS

#### 1.1 FILTER HOUSING

##### Construction

The filter housings are designed in accordance with international regulations. They consist of one-piece housings with bolt-on cover plates. The two housings are connected by a ball change-over valve with negative overlap and single-lever operation.

Standard equipment:

- with bypass valve
- connection for a clogging indicator (1 clogging indicator per filter side)

#### 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 Betamicon® (BN4HC)

RFD	Elements	3 µm	5 µm	10 µm	20 µm
60	1x0060R	5.7	6.3	7.6	8.6
110	1x0110R	12.0	13.3	16.0	18.1
160	1x0160R	18.6	20.7	24.9	28.1
240	1x0240R	29.3	32.5	39.1	44.2
330	1x0330R	38.4	42.6	51.2	57.9
660	1x0660R	87.1	96.5	116.1	131.3
950	1x0950R	130.0	144.1	173.3	196.1
1300	1x1300R	181.0	200.7	241.4	273.1

Filter elements are available with the following pressure stability values:

Betamicon® (BN4HC):	20 bar
Paper (P/HC):	10 bar
Wire mesh (W/HC):	20 bar
Stainless steel fibre (V):	210 bar
Betamicon®/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 housing and cover plate	RFD 60 to 330: Aluminium RFD 660 to 1300: EN-GJS-400-15
Type of clogging indicator	VR connection thread G ½ (return line indicator up to 25 bar operating pressure)
Pressure setting of clogging indicator	2 bar (others on request)
Bypass cracking pressure	3 bar (others on request)

#### 1.4 SEALS

NBR (= Perbunan)

#### 1.5 MOUNTING

As tank-top mounted filter

#### 1.6 SPECIAL MODELS AND ACCESSORIES

On request

#### 1.7 SPARE PARTS

See Original Spare Parts List

#### 1.8 CERTIFICATES AND APPROVALS

On request

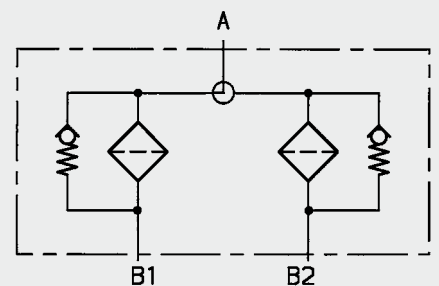
#### 1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

- 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
- 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 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



## 2. MODEL CODE (also order example)

RFD BN/HC 330 D A L 10 D 1 . X /-L24

### 2.1 COMPLETE FILTER

**Filter type** \_\_\_\_\_

RFD

**Filter material of element** \_\_\_\_\_

BN/HC Betamicon® (BN4HC) W/HC Stainless steel wire mesh  
 V Stainless steel fibre AM Aquamicon®  
 P/HC Paper BN/AM Betamicon®/Aquamicon®

**Size of filter or element** \_\_\_\_\_

RFD: 60, 110, 160, 240, 330, 660, 950, 1300

**Operating pressure** \_\_\_\_\_

D = 25 bar

**Type of change-over** \_\_\_\_\_

A ball

**Type and size of port** \_\_\_\_\_

Type	Port	Filter size							
		60	110	160	240	330	660	950	1300
C	G ¾	●	●						
D	G 1			●	●				
G	G 2					●			
L	SAE DN 50 (2")					●			
M	SAE DN 80 (3")						●		
N*	G3						●		
P	SAE DN 100 (4")							●	●

\* This port G3 applies to filter outlet only

**Filtration rating in µm** \_\_\_\_\_

BN/HC, V: 3, 5, 10, 20 P/HC: 10, 20 AM: 40  
 W/HC: 25, 50, 100, 200 BN/AM: 3, 10

**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. E 7.050../..

**Type code** \_\_\_\_\_

1

**Modification number** \_\_\_\_\_

X the latest version is always supplied

**Supplementary details** \_\_\_\_\_

B cracking pressure of bypass (e.g. B6 = 6 bar)  
 KB no bypass valve  
 L... light with appropriate voltage (24V, 48V, 110V, 220V)  
 LED 2 light emitting diodes up to 24 Volt  
 SO136 filter housing RFD 330 in EN-GJS-400-15  
 V FPM seals  
 ] only for clogging indicators type D

### 2.2 REPLACEMENT ELEMENT

0330 R 010 BN/HC /-V

**Size** \_\_\_\_\_

0060, 0110, 0160, 0240, 0330, 0660, 0950, 1300

**Type** \_\_\_\_\_

R

**Filtration rating in µm** \_\_\_\_\_

BN/HC, V: 003, 005, 010, 020 P/HC: 010, 020 AM: 040  
 W/HC: 025, 050, 100, 200 BN4AM: 003, 010

**Filter material** \_\_\_\_\_

BN4HC, V, W/HC, P/HC, BN4AM, AM

**Supplementary details** \_\_\_\_\_

V (for descriptions, see point 2.1)

### 2.3 REPLACEMENT CLOGGING INDICATOR

VR 2 D . X /-L24

**Type** \_\_\_\_\_

VR return line indicator up to 25 bar operating pressure

**Pressure setting** \_\_\_\_\_

2 standard 2 bar, others on request

**Type of clogging indicator** \_\_\_\_\_

D (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)

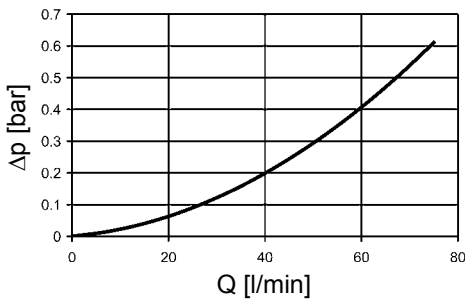
For ease of calculation, our Filter Sizing Program is available on request free of charge.

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

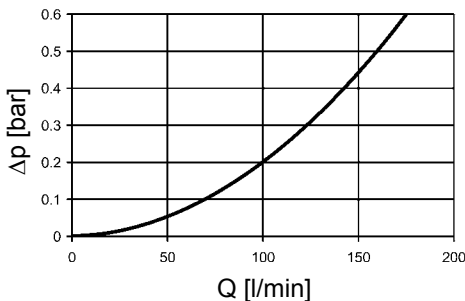
#### 3.1 $\Delta p$ -Q HOUSING GRAPHS BASED ON ISO 3968

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.

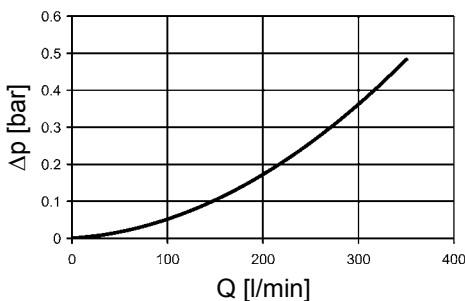
##### RFD 60, 110



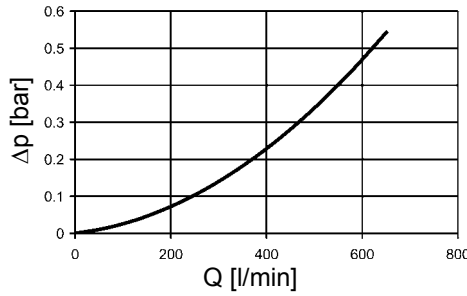
##### RFD 160, 240



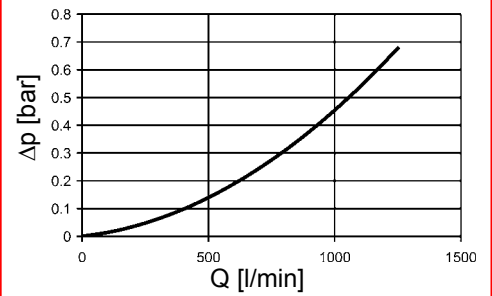
##### RFD 330



##### RFD 660, 950



##### RFD 1300

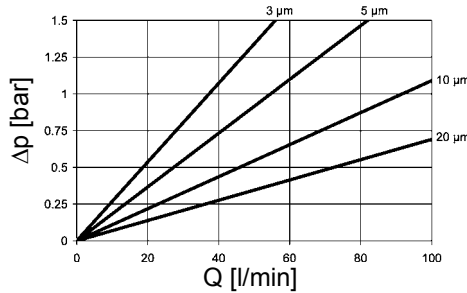


#### 3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

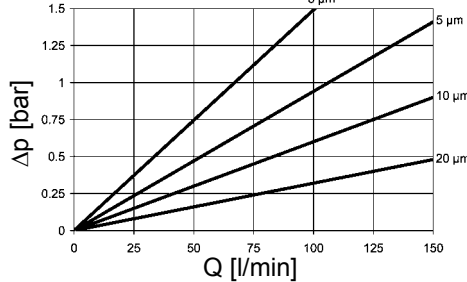
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm<sup>2</sup>/s. The pressure drop changes proportionally to the change in viscosity.

RFD	V				W/HC
	3 μm	5 μm	10 μm	20 μm	
60	15.9	9.3	5.4	3.3	0.900
110	7.6	5.1	3.0	2.0	0.495
160	4.9	3.5	2.4	1.5	0.338
240	3.2	2.6	1.7	1.2	0.225
330	2.1	1.7	1.1	0.8	0.162
660	1.0	0.8	0.6	0.4	0.081
950	0.7	0.6	0.4	0.2	0.054
1300	0.5	0.4	0.3	0.2	0.045

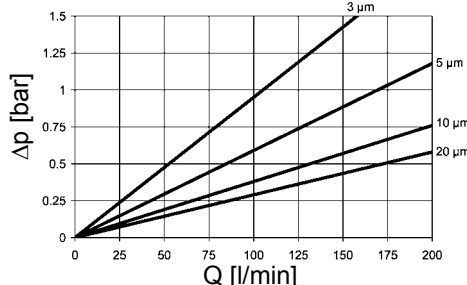
##### BN4HC: RFD 60



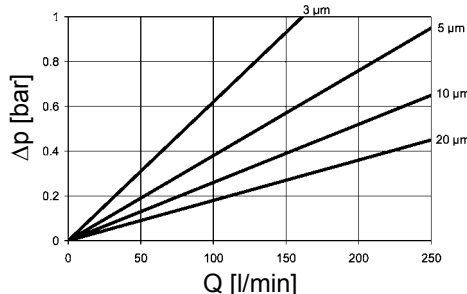
##### BN4HC: RFD 110



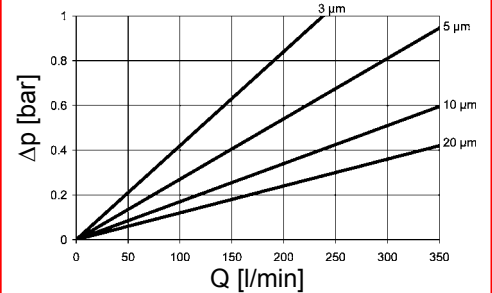
##### BN4HC: RFD 160



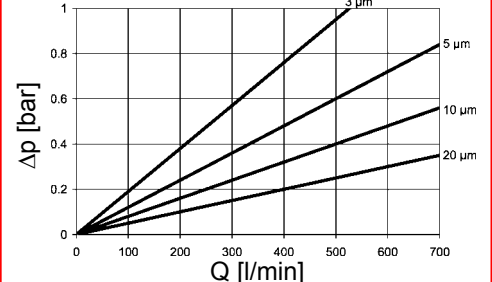
##### BN4HC: RFD 240



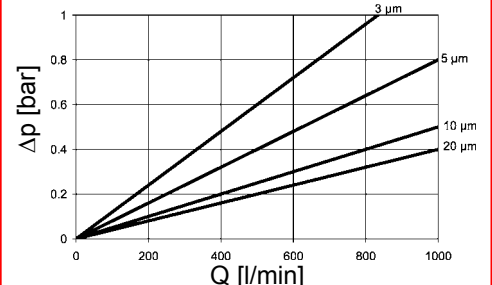
##### BN4HC: RFD 330



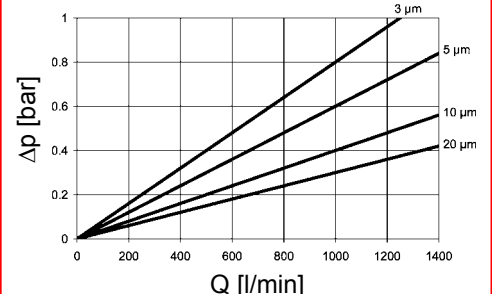
##### BN4HC: RFD 660



##### BN4HC: RFD 950

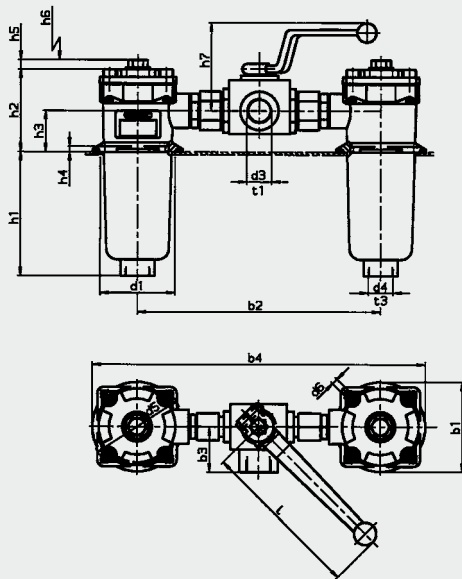


##### BN4HC: RFD 1300

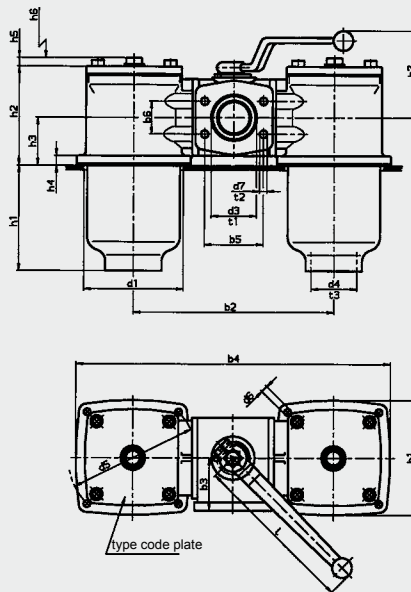


## 4. DIMENSIONS

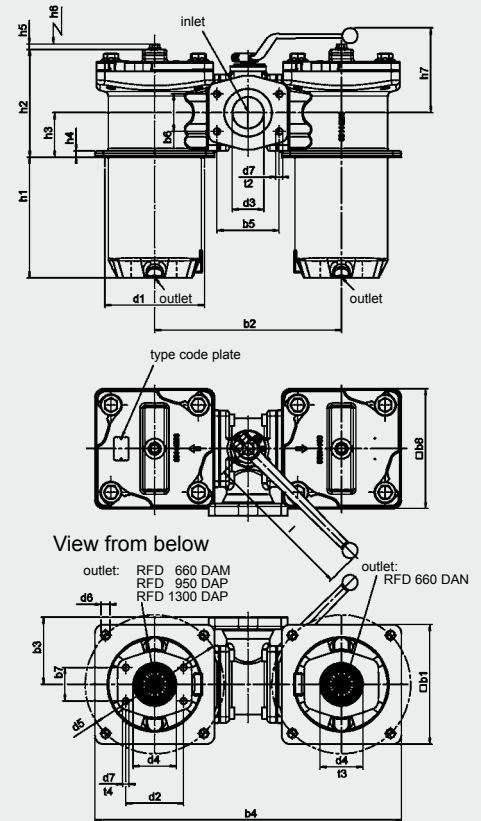
RFD 60-240



RFD 330



RFD 660-1300



RFD	60	110	160	240	330	660	950	1300
b1	96	96	126	126	150	195	250	250
b2 <sub>±1.3</sub>	260.5	260.5	335.5	335.5	254	330	390	410
b3	47.5	47.5	56.5	56.5	69	100	140	140
b4	357	357	461	461	404	540	640	660
b5	-	-	-	-	77.8	106.5	130.2	130.2
b6	-	-	-	-	42.9	61.9	77.8	77.8
b7	-	-	-	-	-	61.9	69.9	77.8
b8	-	-	-	-	-	210	244	244
d1	80	80	106	106	135	180	208	208
d2	-	-	-	-	-	106.4	120.7	130.2
d3	G ¾	G ¾	G 1	G 1	G 2 / SAE DN 50 (2")	SAE DN 80 (3")	SAE DN 100 (4")	SAE DN 100 (4")
d4	G ¾	G ¾	G 1¼	G 1¼	G 2	G 3 or SAE DN 80 (3")	SAE DN 90 (3½ ")	SAE DN 100 (4")
d5	100	100	135	135	170	220	290	290
d6 <sup>1)</sup>	M5	M5	M6	M6	M8	M12	M16	M16
d7 <sup>2)</sup>	-	-	-	-	- / M12	M16	M16	M16
h1	66	133	89	150	139	246	252.5	330.5
h2	88	88	108	108	130	203	225	269
h3	44	44	54	54	63	83	93	121
h4	6	6	6	6	13	13	13	13
h5	11	11	11	11	11	8	8	8
h6	80	145	120	180	180	320	385	485
h7	92	92	95	95	110	114	170	170
l	173	173	173	173	229	229	318	318
t1 <sup>2)</sup>	16	16	24	24	24 / -	-	-	-
t2 <sup>2)</sup>	-	-	-	-	- / 17	20	25	25
t3	17	17	20	20	27	28	-	-
t4	-	-	-	-	-	18	20	20
Weight including element [kg]	3.2	3.7	7.0	7.8	13.4	72.0	105.0	118.0
Volume of pressure chamber [l]	2x 0.30	2x 0.60	2x 1.00	2x 1.40	2x 2.00	2x 6.80	2x 10.30	2x 13.50

<sup>1)</sup> mounting hole for bolt

<sup>2)</sup> refers to the appropriate port (d3)

### 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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