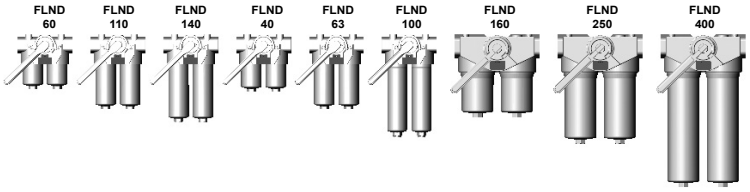
HYDAC INTERNATIONAL

Change-Over Inline Filter FLND to DIN 24550*, up to 400 l/min, up to 63 bar

*Filter and filter elements also available with HYDAC dimensions



1. TECHNICAL SPECIFICATIONS

1.1 FILTER HOUSING

Construction

The filter housings are designed in accordance with international regulations. They consist of a filter head with integral change-over valve and screw-in filter bowls.

Standard equipment:

- without bypass valve
- connection for a clogging indicator
- with drain screw (FLND 160 to 400)

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)				
FLND	3 µm	5 µm	10 µm	20 µm
60	6.5	7.3	7.8	8.0
110	13.8	15.5	16.4	16.9
140	18.1	20.3	21.5	22.2

Betamicron® (BN4HC)				
FLND	3 µm	6 µm	10 µm	25 µm
40	5.2	5.6	6.3	7.0
63	9.2	9.9	11.1	12.8
100	15.4	16.5	18.6	20.6
160	27.5	29.3	33.1	36.7
250	46.0	49.0	55.2	61.3
400	76.2	81.3	91.4	101.5

Betamicron® (BH4HC)				
FLND	3 µm	5 µm	10 µm	20 µm
60	4.6	4.5	5.0	5.7 12.4
110	10.1	9.9	10.9	
140	13.3	13.0	14.3	16.3

Betamicron® (BH4HC)				
FLND	3 µm	6 µm	10 µm	20 µm
40	4.1	4.4	5.2	11.2
63	7.3	7.9	9.2	18.9
100	12.2	13.2	15.5	33.8
160	21.8	23.9	27.8	59.0
250	38.1	41.7	48.6	98.3
400	63.6	69.5	81.0	

Filter elements are available with the following pressure stability

Betamicron® (BN4HC): 20 bar
Betamicron® (BH4HC): 210 bar
Wire mesh(W/HC, W): 20 bar

1.3 FILTER SPECIFICATIONS

Nominal pressure	25 bar (FLND 160 to 400) 63 bar (FLND 40 to 140) at nominal
Fatigue strength	pressure 10_6 load cycles from 0 to nominal pressure
Temperature range	-10 °C to +100 °C
Material of filter head	Aluminium
Material of filter bowl	Aluminium (FLND 100 and 140: steel)
Type of clogging indicator	VM (differential pressure indicator up to 210 bar operating pressure)
Pressure setting of clogging indicator	5 bar (others on request)
Bypass cracking pressure (optional)	3 bar, 7 bar (others on request)

1.4 SEALS

NBR (= Perbunan)

1.5 MOUNTING

As inline filter

1.6 SPECIAL MODELS AND ACCESSORIES

- with bypass valve
- with oil drain plug (FLND 40 to 140 = SO184)
- seals in FPM, EPDM

1.7 SPARE PARTS

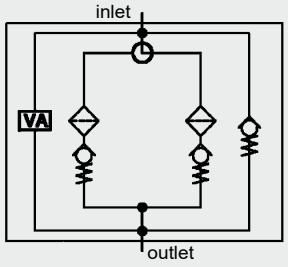
See Original Spare Parts List **1.8 CERTIFICATES AND APPROVALS** On request

1.9 COMPATIBILITY WITH HYDRAULIC FLUIDS ISO 2943

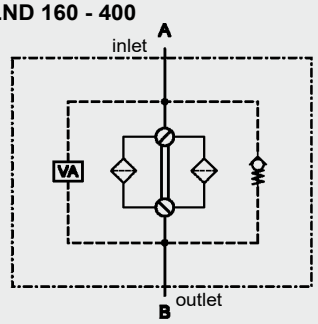
- Hydraulic oils H to HLPD DIN 51524
- Lubrication oils DIN 51517, API, ACEA, DIN 51515, ISO 6743
- Compressor oils DIN 51506 **1.10 IMPORT**
- Biodegradable operating fluids VDMA 24568 HETG, HEES, HEPG
- Non-flam operating fluids HFA, HFB, HFC and HFD
- Operating fluids with high water content (>50% water content) on request

- Filter housing 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 FLND 40 - 140



FLND 160 - 400



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2. MODEL CODE (also order example)

FLND BN/HC 250 D D F 10 D 1 . X /-L24

2.1 COMPLETE FILTER

Filter type
FLND

Filter material of element
BN/HC Betamicron® (BN4HC) W/HC, W Stainless steel wire mesh
BH/HC Betamicron® (BH4HC)

Size of filter or element
FLND: 40, 60, 63, 100, 110, 140, 160, 250, 400

Operating pressure
D = 25 bar (FLND 160 to 400)
F = 63 bar (FLND 40 to 140)

Type of change-over
D single switching valve and check valve (FLND 40 to 140); segment valve (FLND 160 to 400)

Type and size of port ~~to DIN 24550~~
(▯); ports available (X)

Type	Port	Filter size ... not to DIN 24550			... to DIN 24550					
		60	110	140	40	63	100	160	250	400
B	G ½	X	X	X	▯	X	X			
C	G ¾			X	X	▯	X			
D	G 1	X	X	X	X	X	▯			
E	G 1¼							▯	X	X
F	G 1½							X	▯	X
I	DN 25*	X	X	X	X	X	X			
K	DN 38*	X	X							▯

*SAE flange , 3000 PSI

Filtration rating in µm
BN4HC, BH4HC: 3, 5, 10, 20
W/HC, W: 25, 50, 100, 200
BN4HC, BH4HC to DIN 24550: 3, 6, 10, 25
W/HC to DIN 24550: 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
LZ visual-mechanical / 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. B3.5 = 3.5 bar, B7 = 7 bar); no details = without bypass valve
EV air bleed valve
L... light with appropriate voltage (24V, 48V, 110V, 220V) only for clogging indicators Type D
LED 2 light emitting diodes up to 24 Volt
A V LZ indicator with plug to AUDI and VW specification
BO LZ indicator with plug and pin connection to BMW and Opel specification (M12x1)
CN LZ indicator with plug to DIN 43651 with 3 LEDs (CNOMO standard)
DB LZ indicator with plug to DIN 43651 with 3 LEDs (Daimler-Benz standard)
D4C LZ indicator with plug and pin connection to Daimler-Chrysler specification and cold start suppression 30 °C
BO-LED as for BO, but with progressive diode strip
SO184 oil drain screw (FLND 40 to 140)
V FPM seals
W suitable for HFA and HFC emulsions

2.2 REPLACEMENT ELEMENT

250 DN 010 BN4HC /-V

Size
0040, 0060, 0063, 0100, 0110, 0140, 0160, 0250, 0400

Type
D 0060, 0110, 0140
DN to DIN 24550: 0040, 0063, 0100, 0160, 0250, 0400

Filtration rating in µm
BN4HC, BH4HC: 003, 005, 010, 020
W/HC, W: 025, 050, 100, 200
BN4HC, BH4HC to DIN 24550: 003, 006, 010, 025
W/HC to DIN 24550: 025, 050, 100, 200

Filter material
BN4HC, BH4HC, W/HC, W

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

2.3 REPLACEMENT CLOGGING INDICATOR

VM 5 D . X /-L24

Type
VM differential pressure indicator up to 210 bar operating pressure

Pressure setting
5 5 bar standard, 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, W, AV, BO, CN, DB, D4C, BO-LED (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 element Δp and is calculated as follows:

$\Delta p_{total} = \Delta p_{housing} + \Delta p_{element}$

$\Delta p_{housing}$ = (see point 3.1)

$\Delta p = Q \cdot \frac{SK^* \cdot viscosity_{element}}{1000 \quad 30}$ (*see point 3.2)

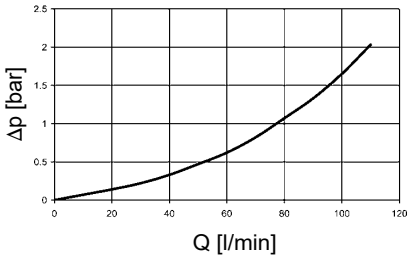
For ease of calculation, our Filter Sizing Program is available on request free of charge.

NEW: Sizing online at www.hydac.com

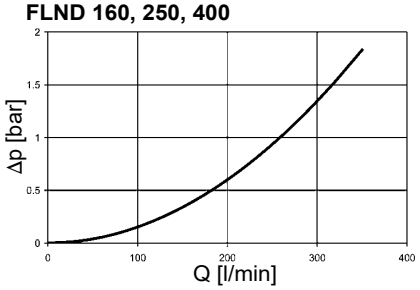
3.1 Δp-Q HOUSING GRAPHS BASED ON ISO 3968

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

FLND 40, 60, 63, 100, 110, 140



FLND 160, 250, 400

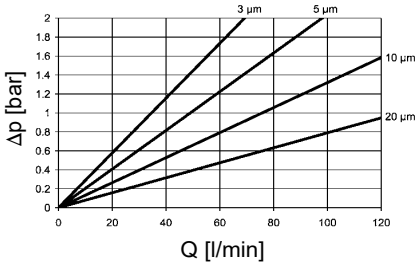


3.2 GRADIENT COEFFICIENTS (SK) FOR FILTER ELEMENTS

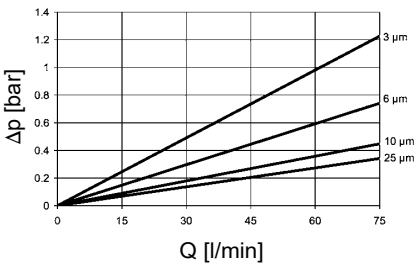
The gradient coefficients in mbar/(l/min) apply to mineral oils with a kinematic viscosity of 30 mm²/s. The pressure drop changes proportionally to the change in viscosity.

FLND	... D ... BH4HC				W/HC - W	... DN ... BH4HC			
	3 µm	5 µm	10 µm	20 µm	–	3 µm	6 µm	10 µm	25 µm
60	58.6	18.1	12.2		0.757	-	-	-	-
110	25.4	14.9	8.9	5.6	0.413	-	-	-	-
140	19.9	11.3	8.1	4.3	0.324	-	-		-
40	-	-	-	-	0.966	40.4	24.8	16.4	10,9
63	-	-	-	-	0.540	29.0	18.2	11.7	7,6
100	-	-	-	-	0.325	19.0	7.7	11.7	5,3
160	-	-	-	-	0.168	8.0	5.1	3.8	2,5
250	-	-	-	-	0.101	5.4	3.4	2.8	1,9
400	-	-	-	-	0.068	3.4	2.1	1.7	1,1

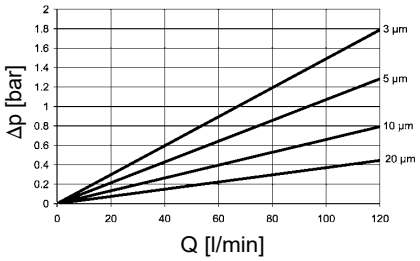
BN4HC: FLND 60



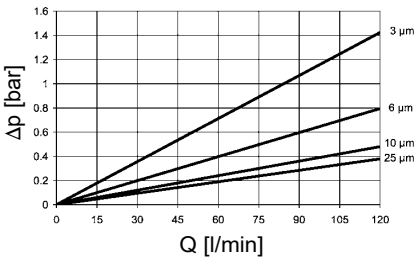
BN4HC: FLND 63



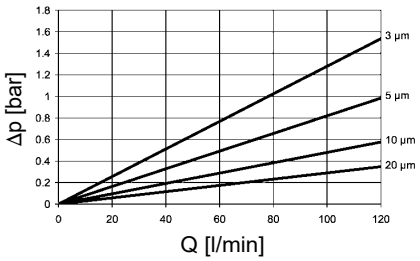
BN4HC: FLND 110



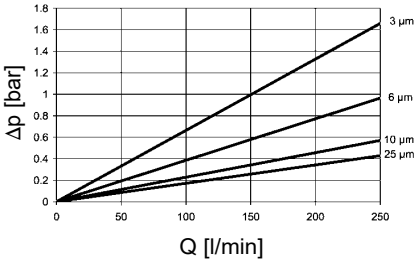
BN4HC: FLND 100



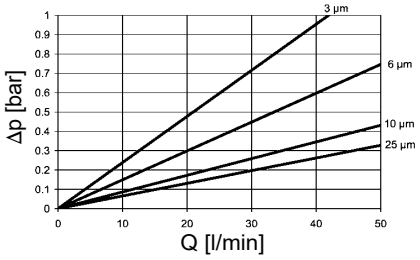
BN4HC: FLND 140



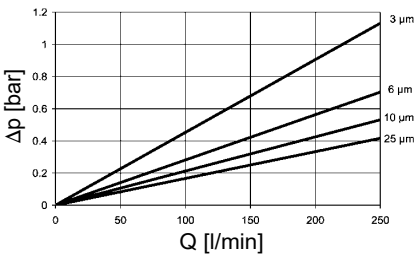
BN4HC: FLND 160



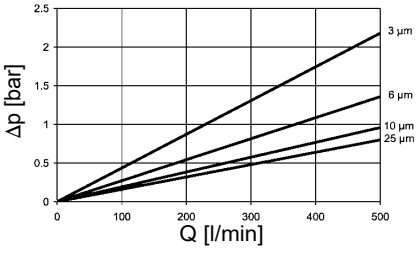
BN4HC: FLND 40



BN4HC: FLND 250



BN4HC: FLND 400



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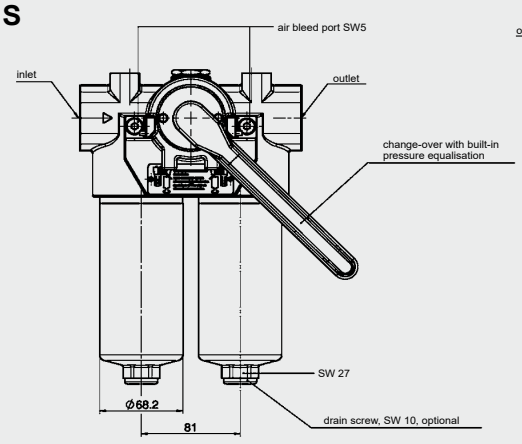
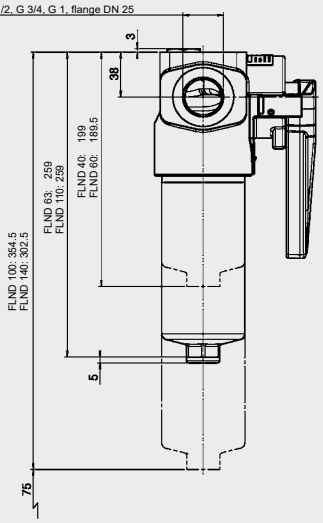
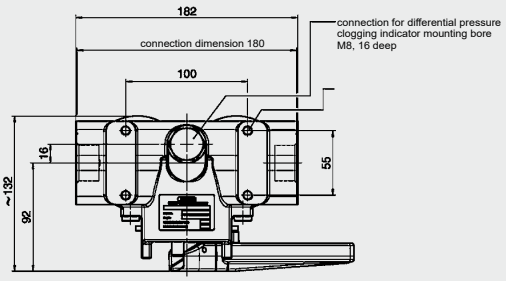
4. DIMENSIONS

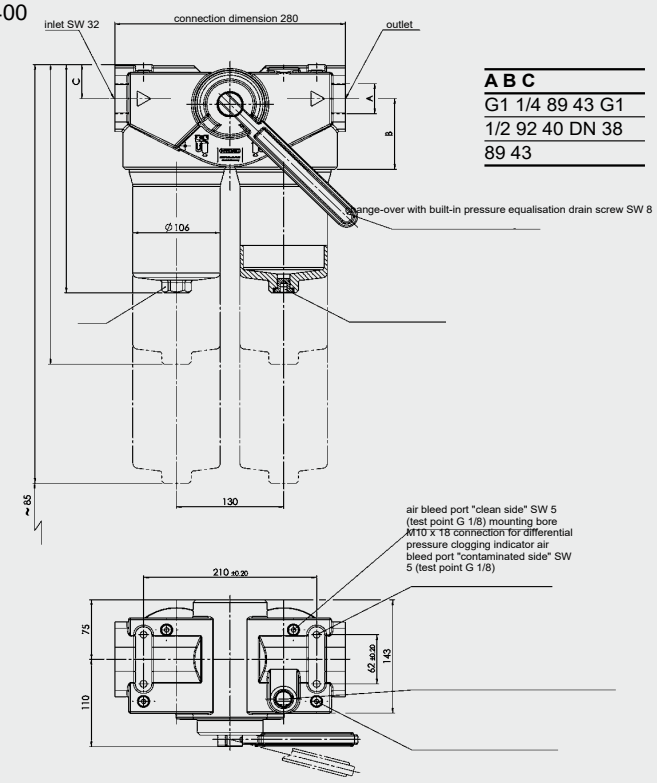
FLND 40 - 140







FLND 160 - 400



A	B	C
G1 1/4	89	43 G1
1/2	92	40 DN 38
	89	43

FLND 400: 527.50FLND 250: 377.50FLND 160: 287.50

FLND	Weight incl. element [kg]	Vol. of pressure chamber [l]
40	6.73	2x 0.26
60	6.83	2x 0.25
63	7.10	2x 0.40
100	11.33	2x 0.50
110	7.32	2x 0.40
140	11.78	2x 0.40
160	10.3	2x 1.40
250	11.6	2x 2.00
400	13.0	2x 3.10

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.