

HYDAC

INTERNATIONAL

Change-Over

Inline Filter FLND

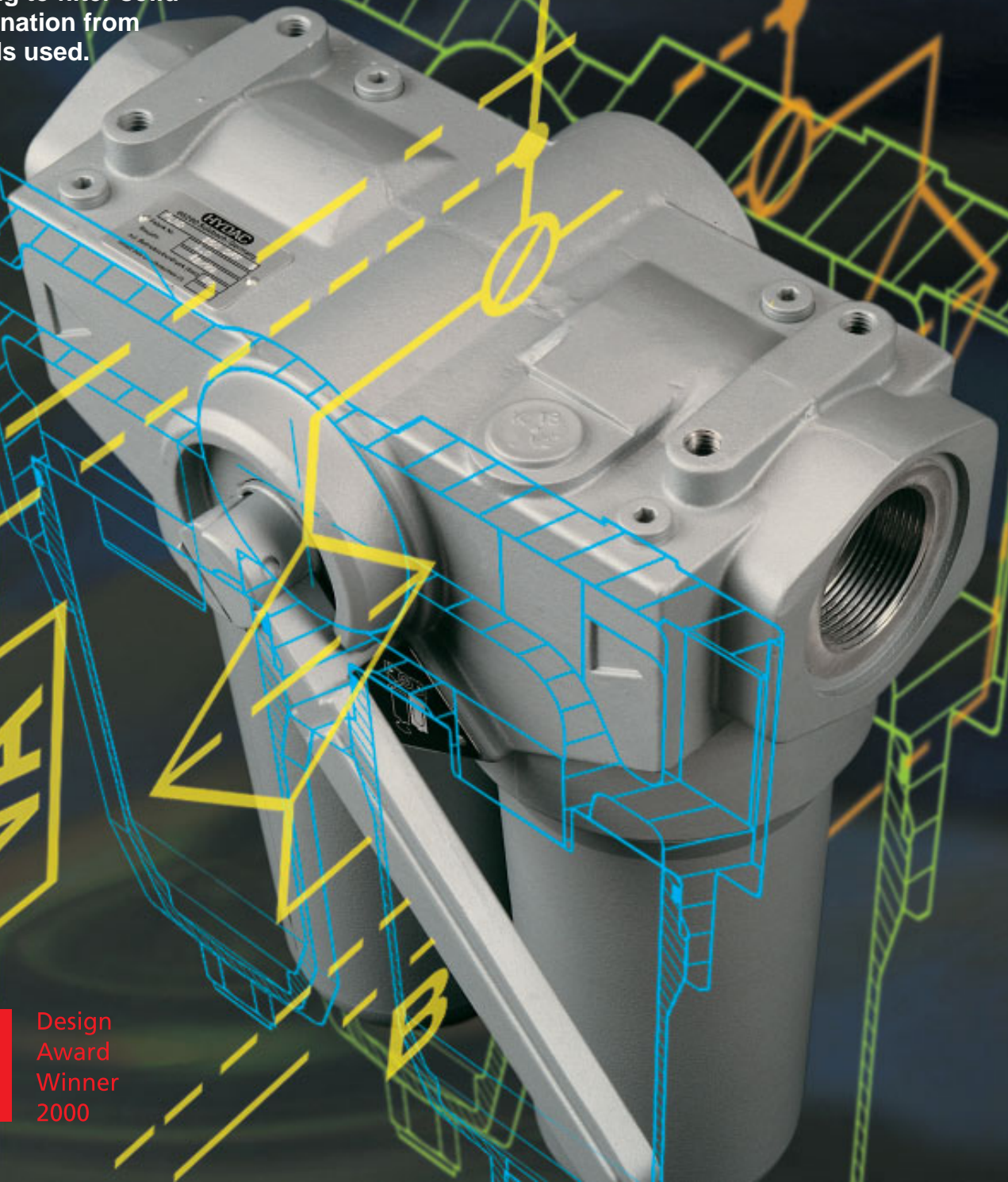
With elements to DIN 24 550

Flow rates up to 400 l/min

Pressure range: 25 bar

Material: Aluminium

FLND change-over inline filters are designed for inline mounting to filter solid contamination from the fluids used.



Design
Award
Winner
2000

1. TECHNICAL SPECIFICATIONS

1.1. FILTER HOUSING

Construction

The FLND filter consists of a filter head with built-in change-over valve and screw-in filter bowls. The standard model is supplied without bypass valve, but with vent and drain screws, and also a connection for differential clogging indicator. The pressure compensation requirement is achieved by raising the change-over lever prior to switching it to the relevant filter side.

1.2. FILTER ELEMENTS

Hydac filter elements are tested according to the following ISO test standards:

- ISO 3724 Verification of flow fatigue characteristics
- ISO 4572 Contamination retention capacity
- ISO 16889 Multi-pass method for evaluating filtration performance
- ISO 3968 Evaluation of pressure drop versus flow characteristics
- ISO 2942 Bubble point test
- ISO 2941 Verification of collapse / burst resistance

Reliable filter operation is only guaranteed with original HYDAC filter elements.

The filter elements are also suitable for use in dynamic applications due to their high pressure stability; max. permiss. Δp across the element:

Betamicon® (BN/HC) : 30 bar
Wire mesh (W/HC) : 30 bar

Fluid compatibility

Suitable for mineral oils, lubrication oils, non-flam fluids, synthetic and rapidly biodegradable oils, cutting oil emulsions. For use with water, please contact our technical sales department.

For further information on filter elements:

Brochure no.: E 7.200../..

1.3. CLOGGING INDICATORS

(example)

VM 5 D . 0 /-V-L24

Type of indicator

VM differential pressure indicator
VD differential pressure indicator

Pressure setting

5 = 5 bar

Indicator type

B = visual
C = electrical
D = visual/electrical

Modification number

0 the latest version is always supplied

Supplementary details

V Viton
L... light with corresponding voltage (24, 48, 110, 220 Volt)
W.. filter suitable for oil-water emulsions (HFA, HFC), NBR seals (VD indicators only)

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

1.4. SEALS

Choice of NBR (Perbunan) or FPM (Viton).

1.5. SPECIAL MODELS AND ACCESSORIES

- with bypass valve

1.6. SPARE PARTS

See Original Spare Parts List and Maintenance Instructions.

2. GENERAL

Mounting

As inline filter

Temperature range

-30 °C to +100 °C

Pressure setting of the differential pressure clogging indicator

$\Delta p_a = 5 \text{ bar} \pm 10\%$

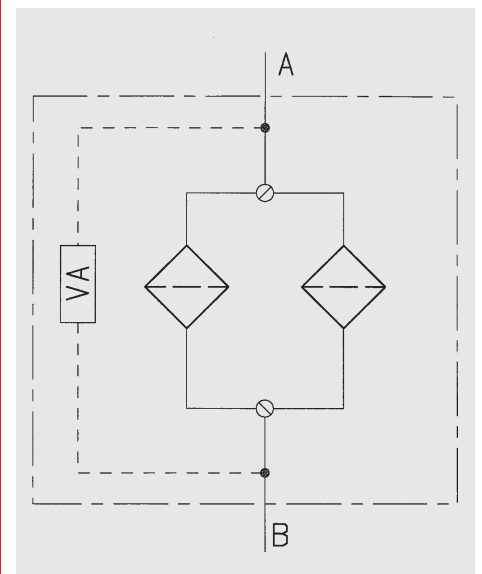
Other pressure settings on request

Cracking pressure of the bypass valve

$\Delta p_o = 7 \text{ bar} \pm 10\%$

Other cracking pressures on request

Hydraulic symbol



3. MODEL CODE (also order example)

3.1. COMPLETE FILTER

FLND BN/HC 250 D D F 10 A 1 . X /-V-B7

Filter type _____
FLND

Filter material of element _____
BN/HC Betamicron®
W/HC Stainless steel wire mesh

Size _____
160, 250, 400

Operating pressure _____
D 25 bar

Type of change-over _____
D segment valve

Type and size of port _____
as per the standard (●), special FLND (X)

Type	Port	Filter size		
		160	250	400
E	G 1 ¼	●	X	X
F	G 1 ½	X	●	X
K	DN 38 *	X	X	●
Z	according to customer specification			

* Flange SAE 1 1/2"; 3000 psi

Filtration rating in µm _____
BN/HC: 3, 6, 10, 25
W/HC: 25, 50, 100, 200 (on request)

Type of clogging indicator _____

Y	without indicator, with plastic blanking plug in indicator port	for other clogging indicators see brochure no. E 7.050../..
A	without indicator, with steel blanking plug in indicator port	
B	with visual clogging indicator	
C	with electrical clogging indicator	
D	with visual and electrical clogging indicator	
LE	visual-mechanical/electrical indicator	
LZ	visual-mechanical/electrical indicator with 75% and 100% switching contact	

Type code _____
1

Modification number _____
X the latest version is always supplied

Supplementary details _____

No details = standard (NBR seals)

V FPM (Viton) seals, filter suitable for rapidly biodegradable oils

L... light with appropriate voltage (24V, 48V, 110V, 220V)

LED 2 light emitting diodes up to 24 volt

DB LZ indicator with plug to DIN 43651 with 3 LEDs

CN LZ indicator with plug to DIN 43651 with 3 LEDs (CNOMO standard)

BO LZ indicator with plug and pin connection to BMW specification (M12x1)

AV LZ indicator with plug to AUDI specification

B7 with bypass valve (cracking pressure 7 bar)

W suitable for oil-water emulsions (HFA, HFC), NBR seals, refers
exclusively to the type of clogging indicator

EV air bleed valve

3.2. REPLACEMENT ELEMENT (also order example)

	0250 DN 010 BN/HC /-V
Size _____ 0160, 0250, 0400	
Type _____ DN	
Filtration rating μm _____ BN/HC: 3, 6, 10, 25 W/HC: 25, 50, 100, 200 (on request)	
Filter material _____ BN/HC W/HC	
Supplementary details _____ V = FPM seals, filter suitable for rapidly biodegradable oils and phosphate esters (HFD-R)	

3.2.1 Element specifications

Filter type	ISOMTD contamination retention capacity in g at $\Delta p = 5$ bar for BN/HC elements			
	3 μm	6 μm	10 μm	25 μm
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

3.2.2 Filter area W/HC

Filter type	Filter area
160	2750 cm ²
250	4400 cm ²
400	6730 cm ²

4. FILTER SPECIFICATIONS

Filter type	Port	Element size	Weight [kg] with element
160	G 1 ¼	0160 DN...	10.3
250	G 1 ½	0250 DN...	11.6
400	ISO 6162 / DN 38 *	0400 DN...	13.0

* Flange SAE 1 1/2"; 3000 psi

5. FILTER CALCULATION / SIZING

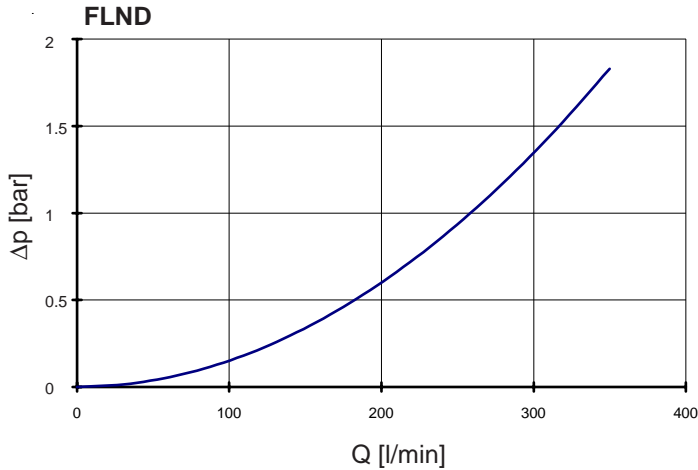
The total pressure drop of a filter at a certain flow rate is the sum of the housing Δp (including change-over valve!) and element Δp .

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

It must be stressed that all of the technical documentation from HYDAC Filbertechnik always states the pressure drop of the complete filter, i.e. including the change-over valve.

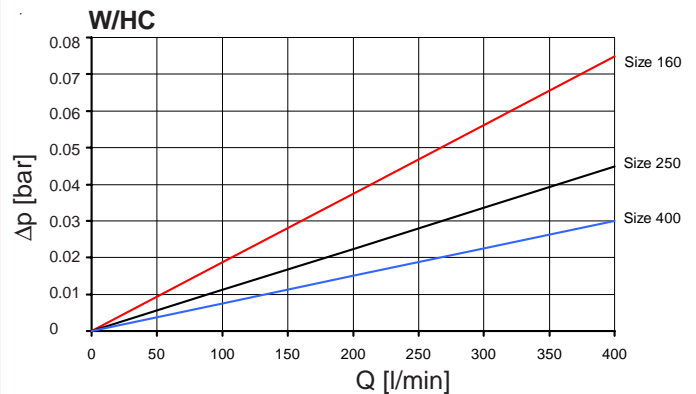
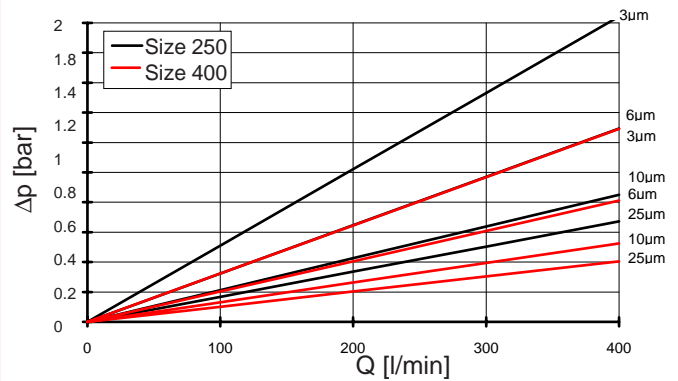
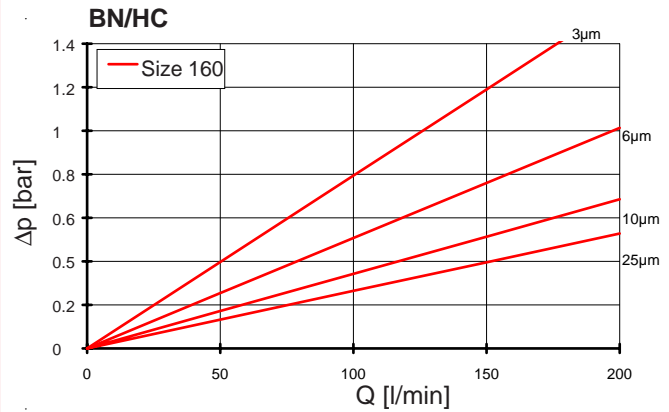
5.1. Δp -Q HOUSING GRAPHS TO ISO 3968

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



5.2. ΔP -Q GRAPHS - FILTER ELEMENTS

The element graphs apply to mineral oil with a kinematic viscosity of $30 \text{ mm}^2/\text{s}$. The pressure drop changes proportionally to the change in viscosity (see Example 5.3.).



5.3. EXAMPLE

General

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

$\Delta p_{\text{housing}}$ = to be determined in accordance with Point 5.1.

$\Delta p_{\text{element}}$ = element pressure drop at flow rate Q and viscosity = $30 \text{ mm}^2/\text{s}$ determined according to Point 5.2.

Example

System parameters:

Q = 150 l/min; FLND 250 with BN/HC element (10 μm);
Viscosity = $46 \text{ mm}^2/\text{s}$
(ISO VG 46 at 40°C);

$$\Rightarrow \begin{aligned} \Delta p_{\text{housing}} &= 0.33 \text{ bar (FLND 250)} \\ \Delta p_{\text{element}} &= 0.3 \text{ bar} \cdot \frac{46 \text{ mm}^2/\text{s}}{30 \text{ mm}^2/\text{s}} = 0.46 \text{ bar} \end{aligned}$$

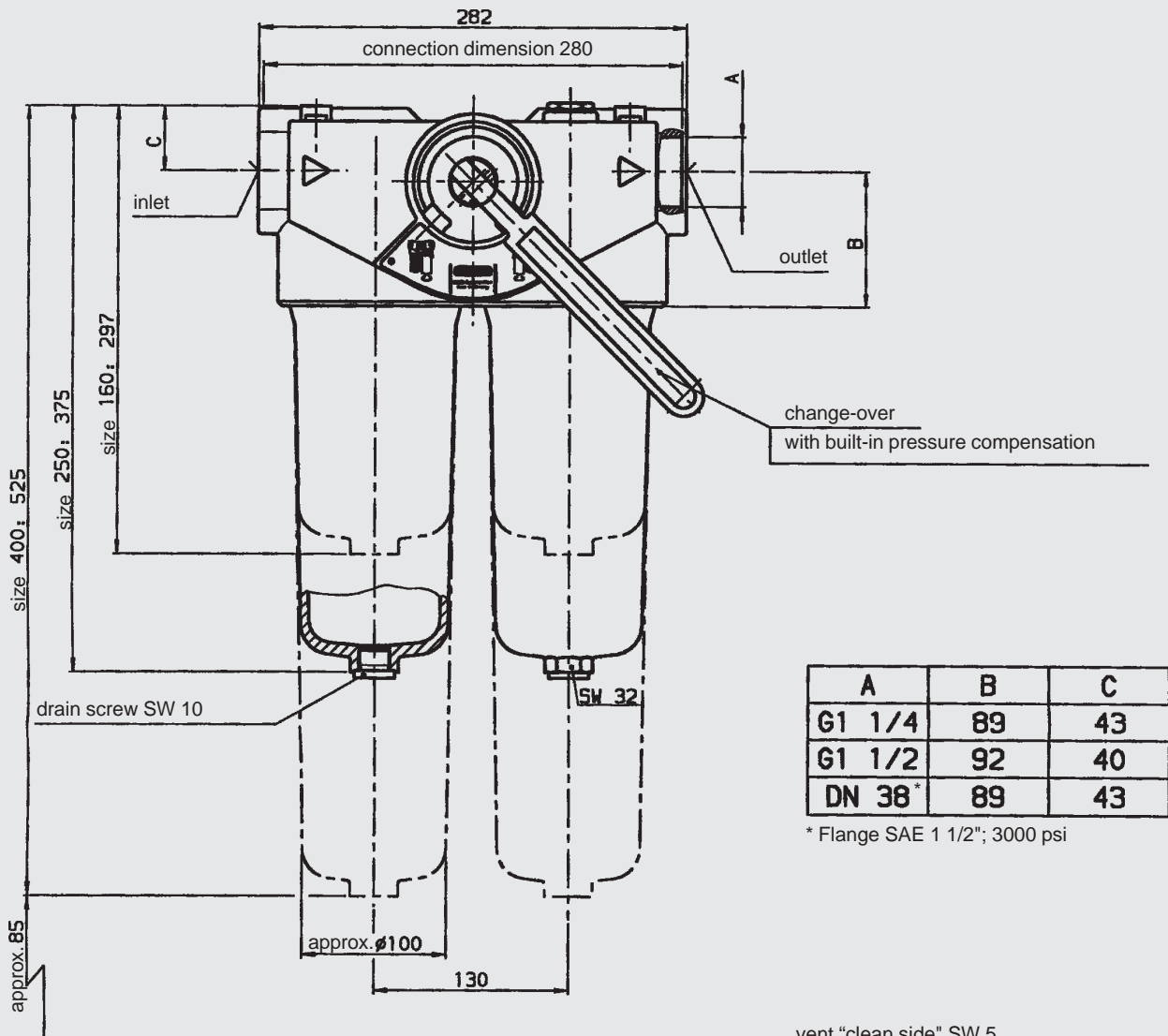
$$\Delta p_{\text{total}} = \Delta p_{\text{housing}} + \Delta p_{\text{element}} = \underline{0.79 \text{ bar}}$$

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

NEW: Sizing online at www.hydac.com

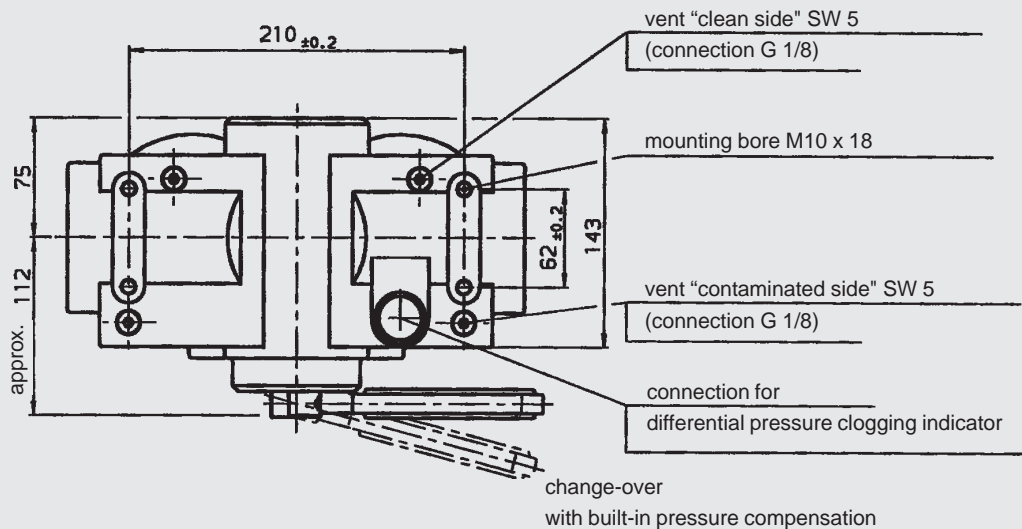
6. DIMENSIONS

6.1. FLND 160, 250, 400



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

* Flange SAE 1 1/2"; 3000 psi



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.

