Differential Pressure Switch
– prototype tested –

FISCHER
MESS- UND REGELTECHNIK

Type 21 D – DS 21

Application

This differential pressure switch is used for the flow-monitoring in thermal oil installations acc. to DIN 32 727 and in hot water installations acc. to VdTÜV – code of practice flow 100 –.

The flow-monitoring installations consist of a differential pressure element, for example a measuring orifice, of the differential pressure measuring and switching device and of the relevant shut-off valves. For all of the above applications, the relevant rules and codes for the construction have to be followed.
All instruments of the series 21 D meet the requirements of these regulations.

The certification of this instrument was based on the prototype test and the grant or the prototype test-stamp:

– For flow-monitoring acc. to DIN 32 727 DIN Reg. No.: 1 B 01292
– Acc. to VdTÜV – "Code of practice flow 100" TÜV SW/SB. 92 – 20.

Main Features

- high repeatability of the switching points
- long service life
- high overpressure protection
- prototype tested

Construction and Operation

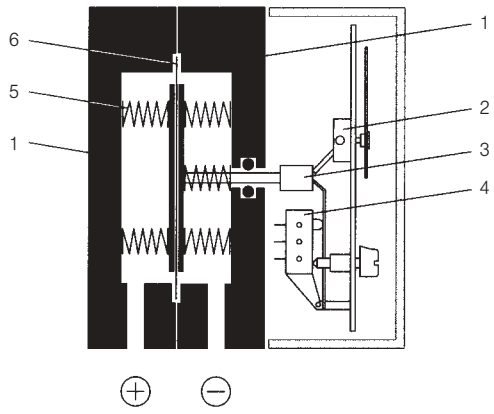
This measuring and switching instrument is based on a rugged and uncomplicated diaphragm movement. In a state of equilibrium, the forces of the springs on both sides of the diaphragm are balanced.

The pressure or differential pressure to be measured creates an unbalanced force at the diaphragm. This force moves the diaphragm system against the force of the springs for the measuring range until a new equilibrium is reached. When subjected to excessive pressure, the diaphragm rests on metal supporting plates.

A centre-mounted tappet transfers the motion of the diaphragm system to the indicator movement and to the initiating elements of the microswitches.

Functional Diagram

1. Pressure chamber
2. Movement
3. Tappet
4. Initiating elements for microswitches
5. Measuring springs
6. Measuring diaphragm



105 D/2/0701 E

Technical Data

Measuring ranges	0…250 mbar to 0…6 bar (acc. to ordering code)
Nominal pressure	25 bar
Max. static operating pressure	(acc. to measuring range)
Max. pressure load	one-sided overpressure protected up to nominal pressure on ⊕- and ⊖-side of diaphragm, partial vacuum protected
Permissible ambient temperature	– 10…+ 70 °C
Permissible medium temperature	85 °C
Protection class	IP 54 acc. to DIN 40 050
Mounting position	as desired
Measuring accuracy	+/– 2.5 % of full scale range
Zero-adjustment	located in the dial

Switching Elements

Contact output	1 or 2 microswitches, 1-channel change-over contacts
Adjustment of switching points	external adjustment by standard value scales smallest adjustable value: approx. 5 % of full scale range
Switching hysteresis	approx. 2.5 % of full scale
Load data / contacts	U ~ max. = 250 V AC, I max. = 5 A, P max. = 250 VA U = max. = 30 V DC, I max. = 0.4 A, P max. = 10 W

Connection

Electrical connection	numbered cable, prewired cable terminal box, 7-channel plug
Pressure connection	thread BSP ¼ female, cutting ring connection 6, 8, 10 and 12 mm tube of brass, zinced steel or chrome nickel steel connection shank BSP ¼ male, DIN 16 288

Measuring System — diaphragm measuring system, diaphragms of fabric back stayed elastomer

Material

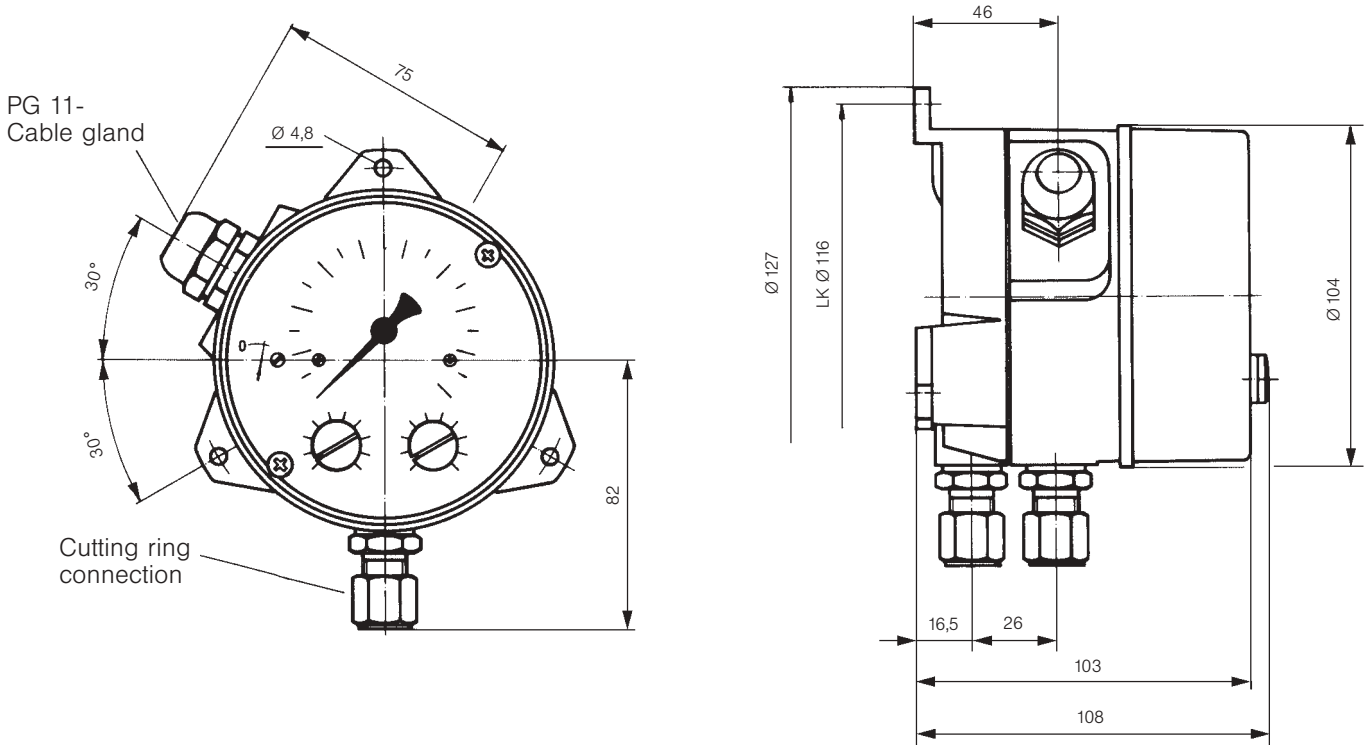
Pressure chamber	aluminium Gk Al Si 12 (Cu), varnished black aluminium Gk Al Si 12 (Cu) HART COAT chrome nickelm steel 1.4305
Measuring diaphragm	diaphragm and gaskets of NBR or VITON
Medium-contacted internal parts	noncorrosive steel 1.4310, 1.4305
Dial cover	macrolon
Weight	pressure chamber AL = 1.2 kg, pressure chamber 1.4305 = 3.5 kg

Approval — for flow-monitoring acc. to DIN 32 727, DIN Reg. No.: 1 B 01297
acc. to VdTÜV – Code of practice flow 100 –, TÜV SW / SB. 92 – 20

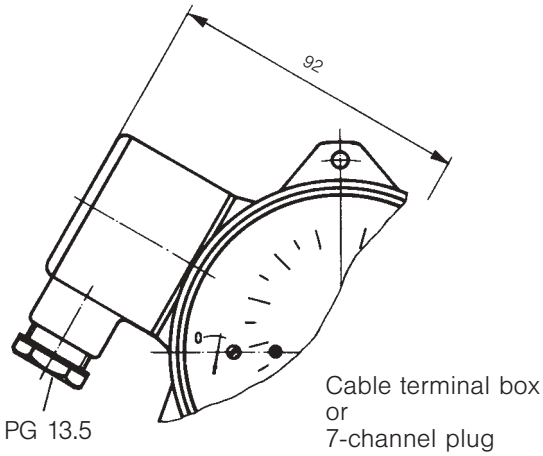
Mounting — pressure connections ≙ ⊕, ⊖-symbols
pipe connection – by screwed-in cutting ring connection

wall mounting – 3 fastening elements

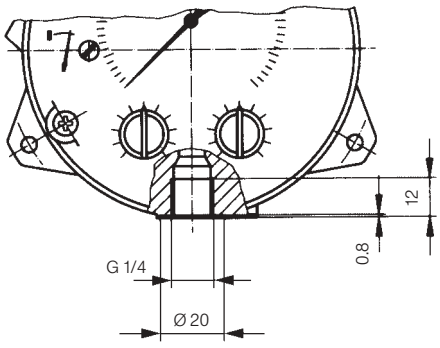
Dimensioned Drawings



21 D Wall mounting (standard version)

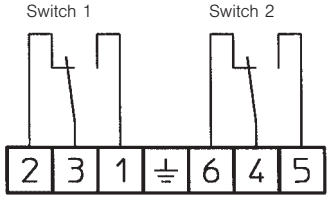


Variants of electrical connection



Connections BSP 1/4" female

Variants of process connection



Connection

Ordering Code

Differential Pressure Switch

Type 21 D ☐ ☐ ☐ ☐ ☐ ☐ ☐ ≙ **Type no. DS 21** ☐☐ ☐ ☐ ☐☐ ☐ ☐

Measuring Ranges stat. pressure

		Type no.
0 – 250 mbar	6 bar	▷ 82
0 – 400 mbar	6 bar .... ▷ 156	▷ 83
0 – 0,6 mbar	10 bar .... ▷ 015	▷ 01
0 – 1,0 mbar	16 bar .... ▷ 025	▷ 02
0 – 1,6 mbar	16 bar .... ▷ 035	▷ 03
0 – 2,5 mbar	16 bar .... ▷ 045	▷ 04
0 – 4,0 mbar	16 bar .... ▷ 055	▷ 05
0 – 6,0 mbar	16 bar .... ▷ 065	▷ 06

Switches

		Type no.
1 adjustable microswitch	▷ K1	▷ A
2 adjustable microswitches	▷ K2	▷ B

Pressure Chamber

		Type no.
Aluminium	▷ A	▷ A

Measuring Diaphragm/Gaskets

		Type no.
VITON	▷ V	▷ V

Pressure Connection

		Type no.
Thread BSP 1/4" female	▷ R	▷ 01
Cutting ring connection for 6 mm tube of steel	▷ 6S	▷ 20
Cutting ring connection for 8 mm tube of steel	▷ 8S	▷ 21
Cutting ring connection for 10 mm tube of steel		▷ 22
Cutting ring connection for 12 mm tube of steel		▷ 23
Cutting ring connection for 6 mm tube of st. st. 1.4571	▷ 6V	▷ 24
Cutting ring connection for 8 mm tube of st. st. 1.4571	▷ 8V	▷ 25
Cutting ring connection for 10 mm tube of st. st. 1.4571		▷ 26
Cutting ring connection for 12 mm tube of st. st. 1.4571		▷ 27

Electrical Connection

		Type no.
Numbered cable, 1 m long, prewired	▷ 1	▷ 1
Numbered cable, 2.5 m long, prewired	▷ 2	▷ 2
Numbered cable, 5 m long, prewired	▷ 5	▷ 5
Cable terminal box	▷ K	▷ K
GL-zugelassene Ausführung	▷ Z	

Accessories

Panel mounting device 132 mm diam.	▷ DZ11

Fischer · Meß- und Regeltechnik GmbH · Bielefelder Str. 37a · D-32107 Bad Salzuflen · Tel. (0 52 22) 9 74-0 · Fax (0 52 22) 71 70
eMail: info@klaus-fischer.de · Internet: www.fischer.ag