FISCHER MESS- UND REGELTECHNIK

DS21 Differential Pressure Switch - structural tested

Models For Assignment in Explosion-hazardous Areas

Applications

These type series instruments are used as flow-operation safety device in heat carrier oil plants acc. to DIN 32 727 and hot water plants acc. to VdTÜV data sheet flow 100.

The flow-operation safety devices consist of a differential pressure device, e.g. an orifice plate, differential pressure switch and adequate shut-off valves. Follow mounting instructions in accordance to application.

Approvals

- EC type approval for application in explosion-hazardous areas
  TÜV 06 ATEX 2964
  Marking for usage in zone 1 and 2
  Ex II 2 G EEx ib c IIC T6
  Zone 22
  Ex II 3 D c T70°C IP65

These instruments may be applied in explosion-hazardous areas zone 1 and zone 2 (hazardous gases), as well as in zone 22 (hazardous dry dust) if they are connected to certified intrinsically safe circuits.

The instruments meet requirements to applicable electrical and non-electrical norms.

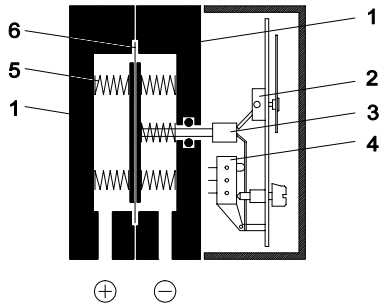
- Type approval acc. to DIN 32727 in conjunction with differential pressure devices as flow-operation safety device for heat transfer plants.
  DIN record No. 1B012/07
- Structural testing acc. to VdTÜV data sheet flow 100 in conjunction with differential pressure devices as flow control and flow limiting device in hot water plants.
  Component marking: TÜV . SW/SB . 07 - 020
- EC type approval acc. to directive 97/23/EC (Pressure Equipment Directive (PED)) as equipment accessory with safety function.
  Certificate No.
  07 202 5435Z 0063/2/2
- Type test according to the German Lloyd directives for marine applications.
  Certifikate No. 93 823-88 HH,
  Quality mark GL

Main Features

- High repeatability of switching function
- Long service life
- High overload safety
- Structural testing

Functional Scheme

1. Pressure chamber
2. Motion work
3. Tappet
4. Microswitch actuating elements
5. Measuring springs
6. Measuring diaphragm



Construction and Operation

The monitoring and switching instrument is based on a rugged and uncomplicated diaphragm movement suitable for overpressure, partial vacuum, and differential pressure measurements. The operating principle of the system is identical in all three applications.

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.

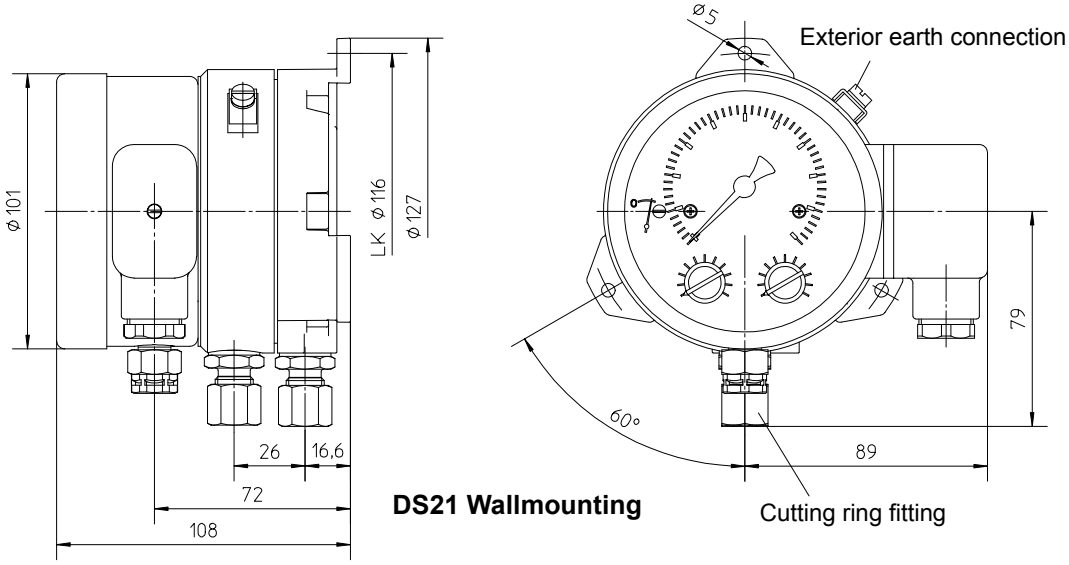
When subjected to excessive pressure, the diaphragm rests on metal supporting plates.
A centre-mounted tapped transfers the motion of the diaphragm system to the motion work and to the actuating elements of the microswitches.

Specifications

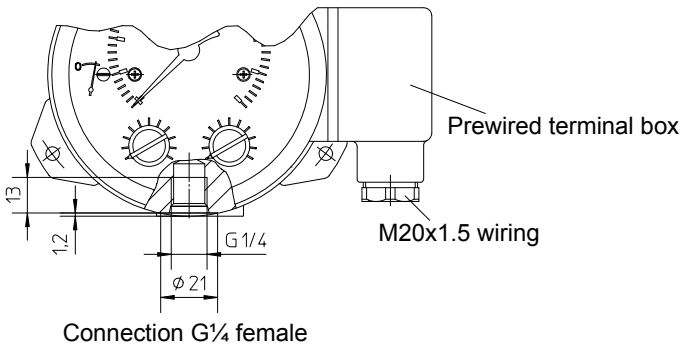
General	
Measuring range	0 ... 250 mbar to 0 ... 6 bar (see ordering code)
Nominal pressure	25 bar
Max. stat. operating pressure	Acc. to measuring range (see ordering code)
Max. pressure load	One-sided overpressure protected up to nominal pressure on (+) - and (-) side of diaphragm, partial vacuum protected
Perm. temperature for application in explosion-hazardous areas	
Perm. ambient temperature	**$-10 \leq T_{amb} \leq 60$°C**
Max. media temperature (in device)	**60°C**
Protection class	IP 65 acc. to DIN EN 60529
Mounting position	Vertical, pressure ports downward
Measuring accuracy	± 2.5% of FS
Zero adjustment	Located in the dial
Switching elements	
Contact output	1 or 2 microswitches, 1-channel change-over contacts
Adjustment of switching points	after opening and demounting of bayonet case and front pane adjustment by standard value scales smallest adjustable value: approx. 5% FS
Switching hysteresis	approx. 2.5% of FS
Load data / contacts (for application in explosion-hazardous areas!)	**U max. = 30 V , I max. = 160 mA, P max. = 800 mW** **The instruments need to be connected to intrinsically safe circuits if applied in explosion-hazardous areas!** **Internal capacity C_i and inductivity L_i are negligible small.**

Connection	
Electrical connection	Prewired terminal box, 7-pin plug
Pressure connection	Female thread G1/4, cutting ring fitting for 6, 8, 10, 12 mm Ø tube of brass, steel or chrome-nickel-steel Male connection shank G1/4 B DIN EN 837
Measuring System	Diaphragm measuring system, diaphragm of reinforced Viton®
Materials	
Pressure chamber	Aluminium GkAlSi10(Mg), varnished black Aluminium GkAlSi10(Mg) with HART-COAT® surface protection Chrome-nickel-steel 1.4305
Measuring diaphragm	Measuring diaphragm and gaskets of Viton®
Materials (medium)	Stainless steel 1.4310, 1.4305
Housing / bayonet case	1.4301
Front pane	Laminated safety glass
Weight	Pressure chamber of Al = 1.2 kg, pressure chamber of 1.4305 = 3.5 kg

Dimensions (all units in mm unless otherwise stated)

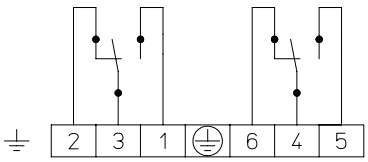


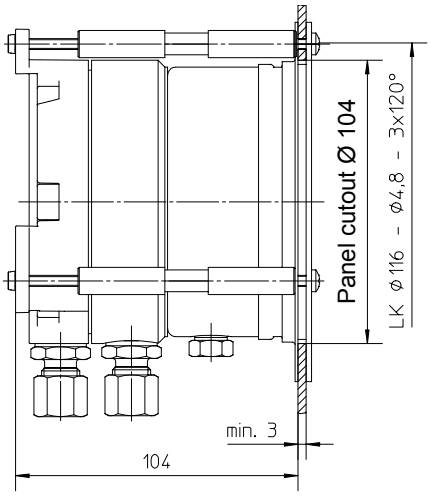
DS21 Wallmounting



Variants of Process Connection

Connection Scheme





Panel Mounting with Panel Mounting Kit DZ21

Ordering Code

Differential Pressure Switch DS21

Models For Assignment in Explosion-hazardous Areas

		0										

Range / **Max. static pressure**

0 . . . 400 mbar	6 bar	8	3
0 . . . 0.6 bar	10 bar	0	1
0 . . . 1 bar	16 bar	0	2
0 . . . 1.6 bar	16 bar	0	3
0 . . . 2.5 bar	16 bar	0	4
0 . . . 4 bar	16 bar	0	5
0 . . . 6 bar	16 bar	0	6

Application

Thermal oil DIN 32727 / Hot water / Flow 100	0

Pressure Chamber

Aluminium	A
Aluminium HART COAT®	D
Chrome-nickel-steel 1.4305	W

Pressure Connection

Female thread G1/4	0	1
Cutting ring fitting of steel for 6 mm tube	2	0
Cutting ring fitting of steel for 8 mm tube	2	1
Cutting ring fitting of steel for 10 mm tube	2	2
Cutting ring fitting of steel for 12 mm tube	2	3
Cutting ring fitting of 1.4571 for 6 mm tube	2	4
Cutting ring fitting of 1.4571 for 8 mm tube	2	5
Cutting ring fitting of 1.4571 for 10 mm tube	2	6
Cutting ring fitting of 1.4571 for 12 mm tube	2	7

Switching Elements

1 adjustable microswitch	A
2 adjustable microswitches	B

Electrical Connection

Prewired terminal box	K
GL approved model, 3 m connection cable H07 RNF	Z

Explosion Protection

Instrument with contact output (inbuilt microswitches)

Zone 1 and 2 - Hazardous gases	CE Ⓔx II 2 G EEx ib c IIC T6	#	#	#	I

Instrument with contact output (inbuilt microswitches)

Zone 22 - Hazardous dry dust	CE Ⓔx II 3 D c T70°C IP65	#	#	#	F

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