

DS11 || Differential Pressure Switch

A combination of indicating and switching instrument for pressure, differential pressure and partial vacuum.

Pressure chamber and measuring diaphragm are available in different materials to meet various requirements.

Construction and Operation

This differential pressure instrument is based on a rugged and uncomplicated diaphragm movement, suitable for overpressure, partial vacuum and differential pressure measurements. The system's operating principle is identical for all applications of this type.

In a state of balance, forces of springs on both sides of diaphragm are equalised. The pressure or differential pressure to be measured creates an unbalanced force of springs for measuring range until a new balance is reached. When subjected to excessive pressure, the diaphragm rests on metal supporting plates.

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



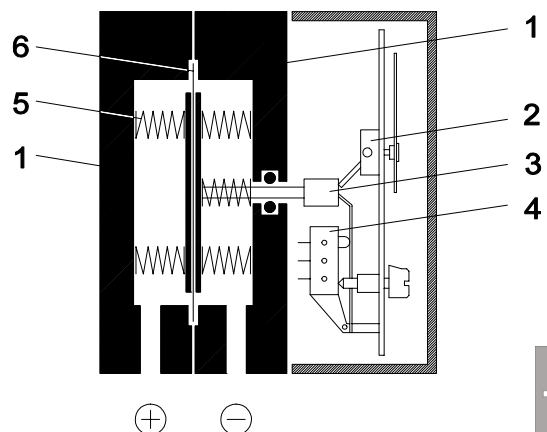
Main Features

- High repeatability of switching points
- Long service life
- Multiple applications
- High overpressure protection

Typical Applications

- Measurement of differential pressure between forward and return flow in heating systems
- Observation of filters and pumps

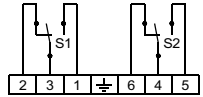
Schematic Diagram



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



Specifications

General		
Measuring range	0... 400 mbar up to 0... 25 bar (see ordering code)	
Nominal pressure	25 bar	
Max. static 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. ambient temperature	-10... +70°C (but max. 55°C in case of SEV)	
Perm. medium temperature	70°C	
Protection class	IP 54 acc. to DIN EN 60529	
Mounting position	Vertical	
Measuring accuracy	± 2.5% FS	
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% FS	
Switching hysteresis	Approx. 2.5% FS	
Load data / contacts	$U_{\sim \max.} = 250 \text{ V AC}, \quad I_{\max.} = 5 \text{ A}, \quad P_{\max.} = 250 \text{ VA}$ $U_{= \max.} = 30 \text{ V DC}, \quad I_{\max.} = 0.4 \text{ A}, \quad P_{\max.} = 10 \text{ W}$	
		Instrument pressureless and dead 
Electrical Connection	Numbered cable, prewired terminal box, 7-channel plug	
Pressure Connection	Thread G1/4 female, cutting ring connection for 6, 8, 10, 12 mm Ø tube of brass, zinc steel or chrome nickel steel Connection shank G1/4 male DIN EN 837	
Measuring System		
Measuring ranges ≤ 16 bar	Diaphragm measuring system, diaphragm of fabric back stayed elastomer	
Measuring range 0-25 bar	Diaphragm measuring system, diaphragm of DURATHERM®	
Materials		
Pressure chamber	Aluminium GkAlSi10(Mg), varnished black Aluminium GkAlSi10(Mg) HART-COAT® Chrome nickel steel 1.4305	
Measuring diaphragm	Diaphragm measuring system and gaskets of NBR or Viton® Diaphragm of DURATHERM® NiCrCo-alloy	
Materials: medium	Stainless steel 1.4310, 1.4305	
Materials: housing	Macrolon	
Weight	Pressure chamber of Aluminium = 1.2 kg, pressure chamber of 1.4305 = 3.5 kg	
Approval	Approval acc. to SEV guidelines for low voltage products Type approval acc. to German Lloyd, test mark (GL)	
Mounting	Wallmounting - 3 fastening elements Panel mounting - panel mounting kit DZ11 ø132 mm Pipe mounting, pressure connections ≅ (+), (-) symbols - by screwed-in cutting ring or clamping ring connection - by screwed-in connection shank acc. to DIN EN 837 for nipple fitting acc. to DIN 16288	

Accessories

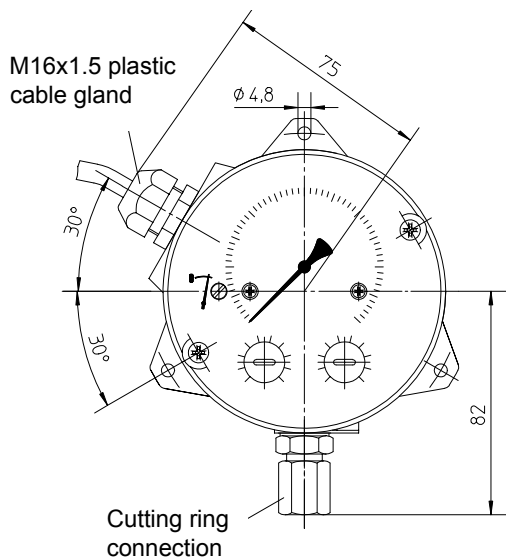
DZ11 Panel mounting kit ø132 mm consisting of front ring, spacer and fastening screws.

DZ13/14 Three- and four-spindle shut-off and equalizing valves DZ13/14 are especially suited for mounting differential pressure instruments. For example they are used for:

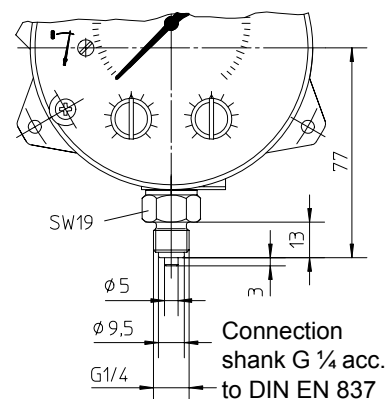
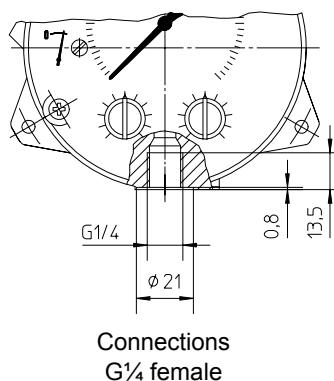
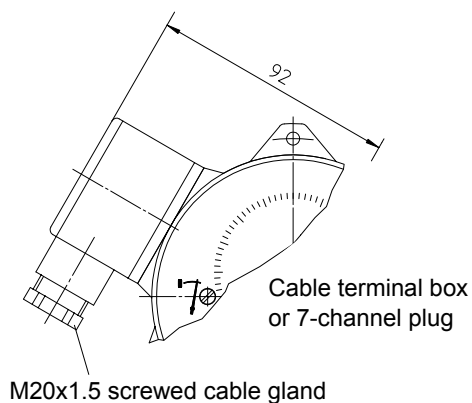
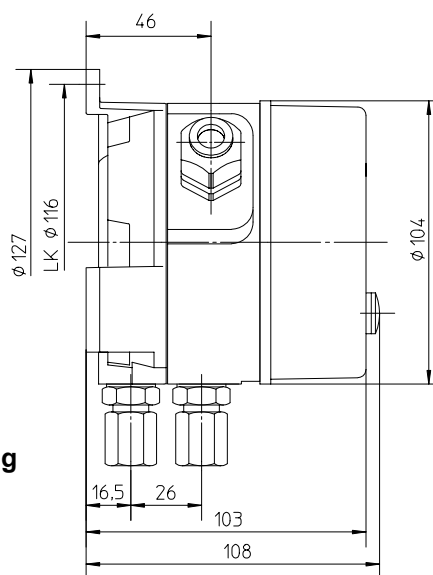
- Depressurizing or shutting down of plant.
- Cutting differential pressure instruments off a plant to enable controlling or repairing.
- Shut-off valves may be used for operational checks on site.

DZ14 - additional to DZ13 - is provided with a venting valve to ventilate the connected pipe system. Nominal pressure of these shut-off and equalizing valves is PN40. Case is available in aluminium, brass or stainless steel 1.4301. Several process connections acc. to Ordering Code are available.

Dimensions (all units in mm unless stated otherwise)

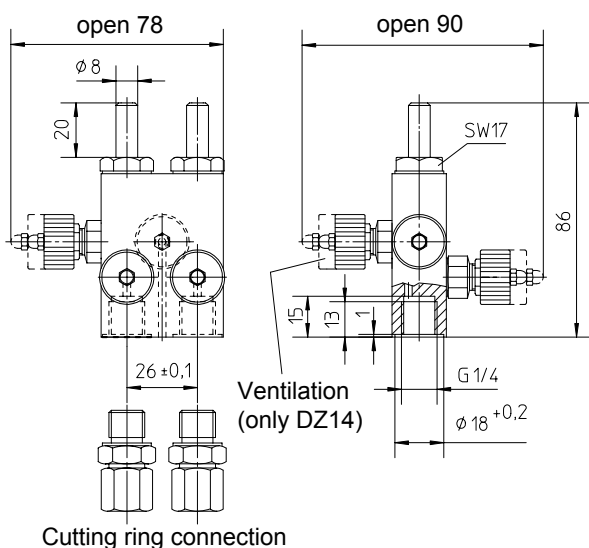


DS11 Wall mounting (standard version)

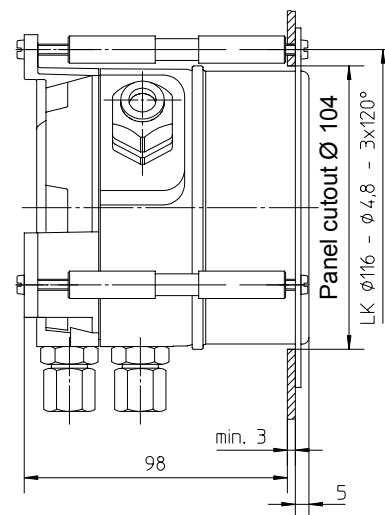
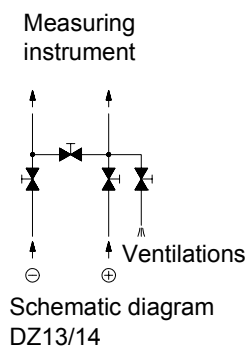


Variants of electrical connection

Variants of process connection



DZ13/14 Four-spindle shut off and equalizing valves



Panel mounting

Ordering Code

Differential Pressure Switch

DS11

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Measuring Range Max. Static Operating 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	25 bar	>	0	3
0 ... 2.5 bar	25 bar	>	0	4
0 ... 4 bar	25 bar	>	0	5
0 ... 6 bar	25 bar	>	0	6
0 ... 10 bar	25 bar	>	0	7
0 ... 16 bar	25 bar	>	0	8
0 ... 25 bar	25 bar	>	0	9
-0.6 ... 0 bar	10 bar	>	3	0
-1 ... 0 bar	16 bar	>	3	1
-1 ... 0.6 bar	25 bar	>	3	2
-1 ... 1.5 bar	25 bar	>	3	3
-1 ... 3 bar	25 bar	>	3	4
-1 ... 5 bar	25 bar	>	3	5

Measuring Diaphragm /Gaskets

NBR	NBR (all ranges up to 16 bar)	>	N
Viton®	Viton® (all ranges up to 16 bar)	>	V
DURATHERM®	NBR (measuring range 0-25 bar only)	>	D
DURATHERM®	Viton® (measuring range 0-25 bar only)	>	E

Pressure Chamber

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

Pressure Connections

Female thread G1/4		>	0	1
Connection shank G1/4 B male of brass		>	0	6
Connection shank G1/4 B male of stainless steel		>	1	1
Cutting ring connection for 6 mm tube of steel		>	2	0
Cutting ring connection for 8 mm tube of steel		>	2	1
Cutting ring connection for 10 mm tube of steel		>	2	2
Cutting ring connection for 6 mm tube of stainless steel 1.4571		>	2	4
Cutting ring connection for 8 mm tube of stainless steel 1.4571		>	2	5
Cutting ring connection for 10 mm tube of stainless steel 1.4571		>	2	6
Cutting ring connection for 6 mm tube of brass		>	2	8
Cutting ring connection for 8 mm tube of brass		>	2	9
Cutting ring connection for 10 mm tube of brass		>	3	0

Switches

1 adjustable microswitch		>	A
2 adjustable microswitches		>	B

Electrical Connection

Numbered cable, 1 m long, prewired		>	1
Numbered cable, 2.5 m long, prewired		>	2
Numbered cable, 5 m long, prewired		>	5
Cable terminal box		>	K
7-channel plug		>	W
German Lloyd approval, 3 m numbered cable H07 RNF		>	Z
SEV-approval, 2 m numbered cable VDE NYSLYO		>	U