FISCHER MESS- UND REGELTECHNIK

Data sheet

DS11 | Differential pressure switch

DIN EN 61508 SIL 2

Combined display and switching device for over-pressure, under-pressure and differential pressure

Pressure chamber and measuring diaphragms are available in various materials. This allows the devices to be adapted to the various requirements.

Design and mode of operation

The basis for this measurement and switch unit is a sturdy non-sensitive diaphragm measuring unit that is suitable for measuring differential pressure, and over and under-pressure. The units use the same measuring principle for all three measuring applications.

In the rest position, the spring forces on both sides of the diaphragm are balanced out. The pressure that is to be measured or the differential pressure creates a one-sided force on the measuring diaphragm that moves the diaphragm system against the measuring range springs until the spring forces are equalized. In case of overload, the diaphragm supports against the metallic support surfaces.

A centrally positioned tappet transfers the movement of the diaphragm system on the motion train and operating elements of the micro-switches.

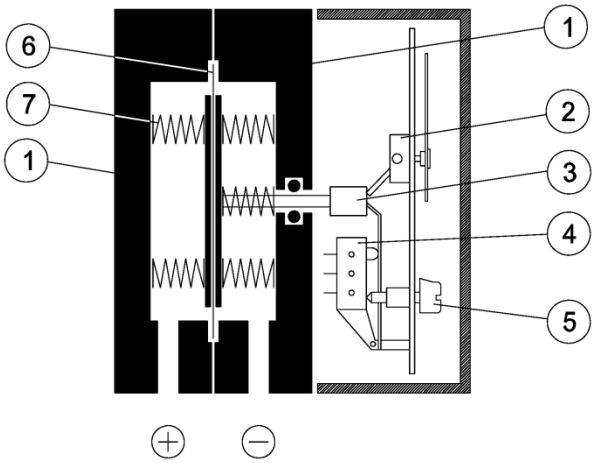
Important features

- high repetition accuracy of the switch points
- long life span
- versatile
- high overload protection

Typical applications

- Differential pressure measurements between the supply and return in heating systems.
- Monitoring of filters and pumps

Functional Schematic



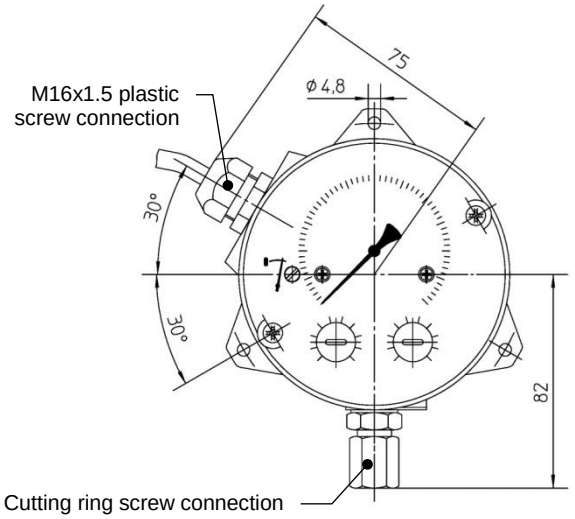
Item	Description
1	Pressure chamber
2	Motion train
3	Tappet
4	Micro-switch
5	Switch point setting
6	Measuring diaphragm
7	Measuring springs

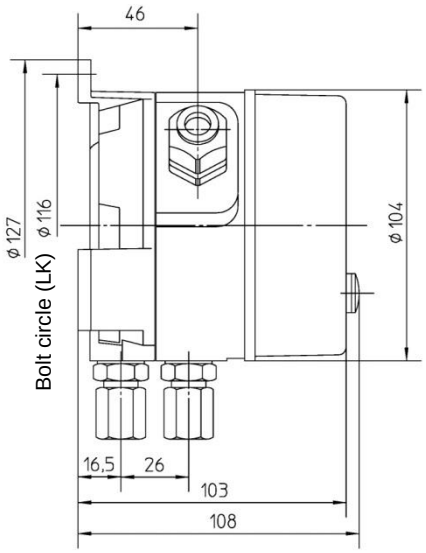
09005784 DB_EN_DS11 Rev.C 11/19

Technical data

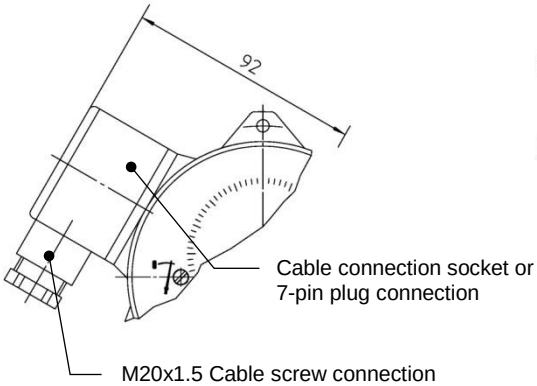
	General points
Admissible ambient temperature	-10 … +70 °C
Admissible media temperature	-10 … +70 °C
Admissible storage temperature	-15 … +75 °C
Enclosure protection class	IP55 acc. to DIN EN 60529
Weight	1.2 kg (Pressure chamber in aluminium) 3.5 kg (Pressure chamber in stainless steel 1.4305)
	Measuring system
Measuring range ≤ 16 bar	Pressure spring measuring diaphragm system made of fabric-reinforced elastomers
Measuring range 0 … 25 bar	Plate spring measuring system, plate spring made of DURATHERM©
Measuring range	0 … 400 mbar to 0 … 25 bar (see order code)
Rated pressure of the measuring system	25 bar
Max. static operating pressure	depending on measuring range (see order code)
Max. pressure load	on-sided over-pressure-proof up to the rated pressure of the measuring system resistance to under-pressure on the (+) and (-) side
Measurement accuracy	± 2.5% of the upper range value
Zero-point adjustment	Arranged in the front panel of the scale
	Switch contacts
Contact output	1 or 2 micro-switches with 1-pin changeover contact.
Switch point setting	can be set to reference scales from outside Smallest settable value approx. 5% of the end value of the measuring range.
Switch hysteresis	approx. 2.5% of the upper range value
Load data/contact	AC DC
U_{max}	250V 30V
I_{max}	5A 0.4A
P_{max}	250 VA 10 W
	Ports
Process connection	Inner thread G 1/4 Connecting shank G¼ DIN EN 837 Cutting ring connections for 6, 8, 10 mm (brass, steel galvanized or stainless steel)
electr. connection	Fixed wire numbered cables Cable connection socket 7-pole plug connection
	Materials
Pressure chamber	Aluminium GkAlSi10(Mg), painted black Aluminium GkAlSi10(Mg) with HART-COAT©-surface protection Chromium nickel steel 1.4305
Measuring diaphragm	Measuring diaphragm and seals made of NBR or Viton© Plate spring made of DURATHERM© NiCrCo alloy
Inner parts in contact with mediums	Stainless steel 1.4310, 1.4305
Hood	Makrolon
	Mounting
Installation position	vertical Wall mounting - three mounting feet Control panel assembly - control panel installation set DZ11 Ø132mm Pipe connection, pressure connections acc. to attached symbols - via screwed-in cutting or clamp screw connections - via screwed-in connection shanks acc. to DIN EN 837 for nipple connections acc. to DIN 16284
	Approvals
	type testing according to the regulations of Det Norske Veritas and the Germanischen Lloyd, test symbol DNV-GL EAC Declaration of conformity EN 61508 2001 Functional safety of safety-related electrical/electronic/ programmable electronic systems requirements for SIL2

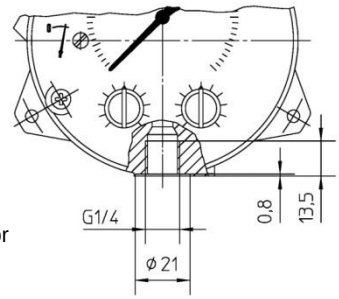
Dimensional drawings (all dimensions in mm unless otherwise specified)



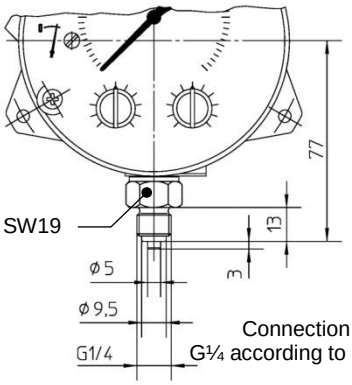


DS11 Wall mounting (Standard model)



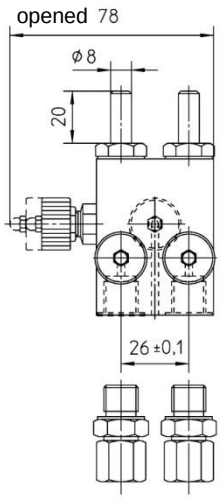


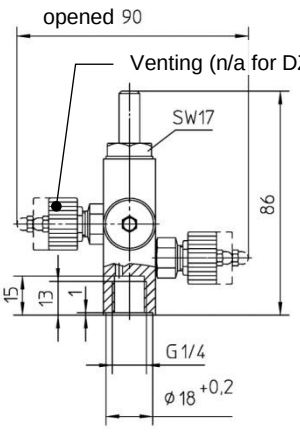
Connection
G¼ inner thread



Connection spigot
G¼ according to DIN EN 837

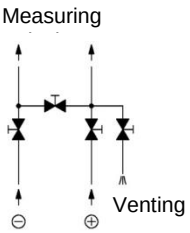
EL-connection variants



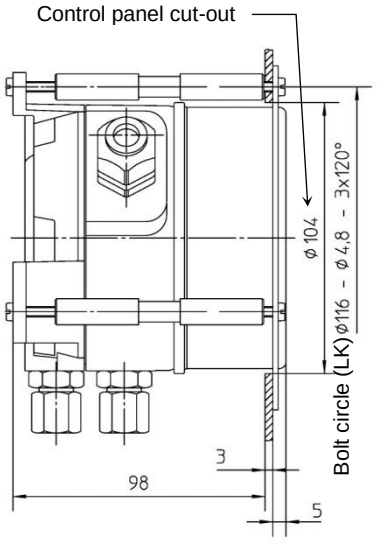


Cutting ring screw connection

Process connection variants



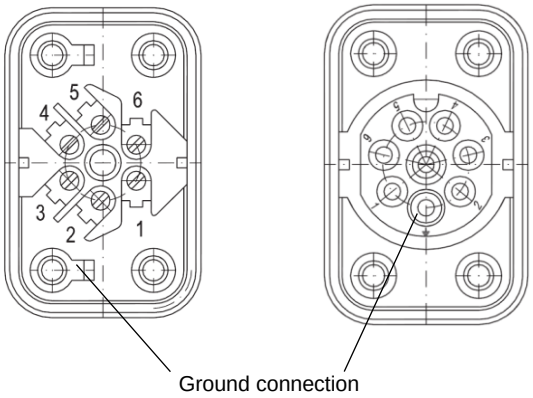
Function diagram
DZ 13/14



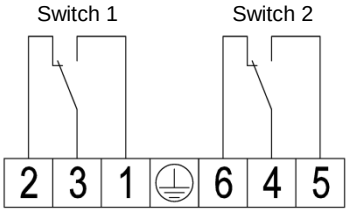
DZ 13/14 Four spindle compensation and shut-off valve

Mounting the control panel

Cable socket and plug connection



Cable socket Plug connection



Numbered cables

For models with numbered cables, the cable numbers correspond with the presented terminal numbers.

Order Codes

Differential pressure measuring and switching device

Type DS11 [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] **0 0**

Measuring range				Max. stat. 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**
0	…	30	psi	.25	bar	>	**H**	**5**

Measuring diaphragm	/ Seal		
NBR	NBR	>	**N**
Viton®	Viton®	>	**V**
DURATHERM®	NBR (Mb 0-25 bar)	>	**D**
DURATHERM®	Viton® (Mb 0-25 bar)	>	**E**

Pressure chamber

Aluminium	>	**A**
Aluminium HART COAT®	>	**D**
Chromium nickel steel 1.4305	>	**W**

Discharge port

Inner thread G 1/4	>	**0**	**1**
Inner thread 1/4 - 18 NPT	>	**0**	**4**
Connection shanks with external thread G 1/4 B, brass	>	**0**	**6**
Connection shanks with external thread G 1/4 B, Chrome-Nickel-Steel	>	**1**	**1**
Connection shanks with external thread 1/4 - 18 NPT EXT Chrome-Nickel-Steel	>	**1**	**4**
Cutting ring screw connection made of steel for 6 mm pipe	>	**2**	**0**
Cutting ring screw connection made of steel for 8 mm pipe	>	**2**	**1**
Cutting ring screw connection made of steel for 10 mm pipe	>	**2**	**2**
Cutting ring screw connection made of 1.4571 for 6 mm pipe	>	**2**	**4**
Cutting ring screw connection made of 1.4571 for 8 mm pipe	>	**2**	**5**
Cutting ring screw connection made of 1.4571 for 10 mm pipe	>	**2**	**6**
Cutting ring screw connection in brass for 6 mm pipe	>	**2**	**8**
Cutting ring screw connection in brass for 8 mm pipe	>	**2**	**9**
Cutting ring screw connection in brass for 10 mm pipe	>	**3**	**0**

Switching Elements

1 adjustable micro-switch	>	**A**
2 adjustable micro-switches	>	**B**

Electrical connection

1 metre numbered cable, permanently wired	>	**1**
2.5 metre numbered cable, permanently wired	>	**2**
5 metre numbered cable, permanently wired	>	**5**
Cable connection socket	>	**K**
Plug connection (7-pin)	>	**W**
DNV-GL-approved version with 3 m connection cable	>	**Z**
SEV-approved version, 2 m connection cable VDE NYSLYO	>...	**U**

Casing protection class

IP545	>	**0**
IP65 (only with cable socket)	>	**P**

Assembly options

Panel mounting set	>	**T**
Wall mounting	>	**W**

Accessories

DZ11 Control panel installation set Ø 132, comprising a front ring, distance columns and attachment screws.

DZ13/14 The shutoff and compensation valves DZ13/14 in three and four spindle versions are highly suitable when mounting differential pressure devices. The following can be used for example:

- is a system is to be depressurized or taken out of operation
- for repairs or tests to disconnect differential pressure devices within the affected systems from the mains supply

The shutoff devices can therefore also be used for function tests on site. In contrast to DZ13, the DZ14 also has a venting valve to vent the conected pipe system. The shutoff and venting valves are designed for the rated pressure level PN40. The housing can be selected in aluminium, brass or chrome-nickel-steel 1.4301. There are various pressure connections (see order code) available for process-side screw connections.