NORGREN HERION

OBSOLETE DOCUMENT
Technical Reference Only

Differential Pressure Switches Series 7DD

Sensor system: Stainless steel bellows
For neutral gaseous and liquid fluids
Differential pressure range 0.2 ... 16 bar
Working pressure range -1 ... 25 bar

- **Microswitch with gold plated contacts**
- **For precise control and monitoring of differential pressure. Vibrations should be avoided.**
- **Excellent sealing properties (leakage rate $< 10^{-6}$ mbar · l · s^{-1})**
- **Works within a wide temperature range**

Technical data

Differential pressure switch for air, gas, water, steam,oil, refrigerants.

Max. viscosity:
1000 mm^2/s

Repeatability:
± 1% of full scale value

Switching element:
Microswitch with gold plated contacts

Degree of protection:
IP 65

Ambient temperature:
- 10 to + 80 °C

Fluid temperature:
- 20 to + 100 °C

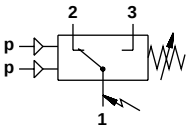
Temperature at switching element:
+ 80 °C max.

Mounting position:
Optional

Vibrations:
4 g max. (sinusoidal)[1)]

Ordering example

Differenz pressure switch,
operating pressure 0 - 16 bar,
Differenz pressure 1 bar fixed hysteresis,
fluid connection G 1/4 female,
Type: **0819200**



Switching function:
Micro switch SPDT
Terminals 1 – 3: Contacts close on rising pressure,
Terminals 1 – 2: Contacts open on rising pressure.

Other versions available on request

– In protection class (Ex)d 3n G5
– Weatherproof design

General information – Switching pressure difference fixed

Type	Differential pressure range [2] $p_{vu\ min}$ ... $p_{vo\ max}$ (VDI 3283) (bar)	Switching pressure difference Lower range (bar)	Switching pressure difference Upper range (bar)	Working pressure range [3] (bar)	Max. allowable pressure [4] (bar)	Switching cycles per minute	Pressure sensor materials Housing	Pressure sensor materials Bellows	Pressure sensor materials Other materials	Connection Internal thread	Total weight (kg)	Dimensional drawing No.
0819100	0.2 ... 1	0.12	0.15	–1 ... 16	20	10	Brass 2.0401	St. st. 1.4401	Soft solder	G 1/4	1.20	01
0819200	0.2 ... 1.6	0.12	0.17	–1 ... 16	20	10				G 1/4	1.20	01
0819300	0.25 ... 2.5	0.15	0.2	–1 ... 16	20	10				G 1/4	1.20	01
0819400	0.3 ... 4	0.2	0.25	–1 ... 16	20	10				G 1/4	1.20	01
0819500	0.5 ... 6	0.6	0.7	–1 ... 25	30	10				G 1/4	1.20	01
0819600	0.5 ... 10	0.7	0.8	–1 ... 25	30	10				G 1/4	1.20	01
0819700	0.5 ... 16	0.8	0.9	–1 ... 25	30	10				G 1/4	1.20	01

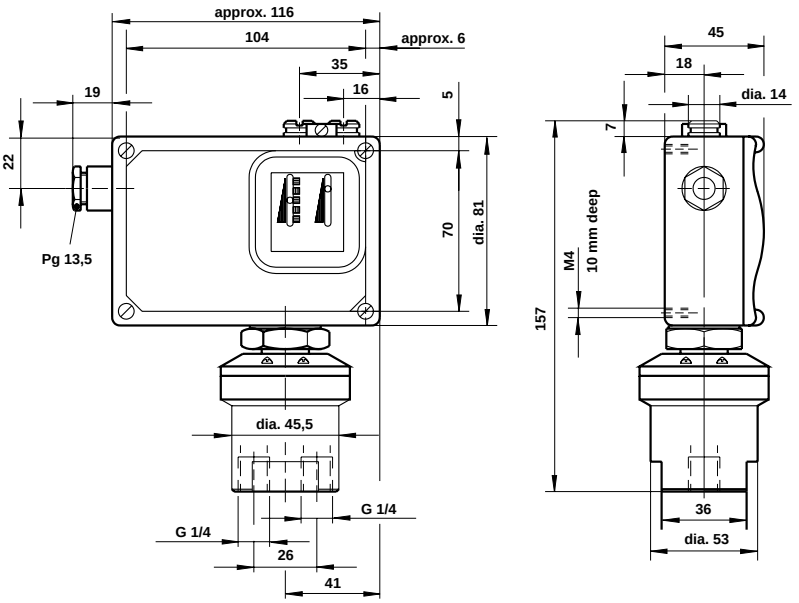
1) Tested in accordance with DIN 89011, 5.2., within the frequency range 25...100 Hz; within the frequency range 2...25 Hz tested with amplitude 1.6 mm.
2) The differential pressure is the pressure difference between both pressure sensing elements under operating conditions.
3) The working pressure range indicates the required minimum pressure as well as the load on the pressure sensor under operating conditions.
4) Even short pressure peaks must not exceed this value during actual operation (max. value = max. testing pressure).

General information – Switching pressure difference adjustable

Type	Differential pressure range [2] $p_{vu\ min}$ ... $p_{vo\ max}$ (VDI 3283) (bar)	Switching pressure difference min. [4] (bar)	Switching pressure difference max. (bar)	Working pressure range [3] (bar)	Max. allowable pressure [4] (bar)	Switching cycles per minute	Pressure sensor materials Housing	Pressure sensor materials Seal	Pressure sensor materials Other materials	Connection Internal thread	Total weight (kg)	Dimensional drawing No.
0809100	0.2 ... 1	0.35...0.4	1	–1 ... 16	20	10	Brass 2.0401	St. st. 1.4401	Soft solder	G 1/4	1.25	01
0809200	0.2 ... 1.6	0.35...0.4	1.5	–1 ... 16	20	10				G 1/4	1.25	01
0809300	0.25 ... 2.5	0.4 ... 0.45	2.5	–1 ... 16	20	10				G 1/4	1.25	01
0809400	0.3 ... 4	0.45...0.5	4	–1 ... 16	20	10				G 1/4	1.25	01
0809500	0.5 ... 6	1.6 ... 1.7	4	–1 ... 25	30	10	Brass 2.0401	St. st. 1.4401	Soft solder	G 1/4	1.25	01
0809600	0.5 ... 10	1.7 ... 1.8	8	–1 ... 25	30	10				G 1/4	1.25	01
0809700	0.5 ... 16	1.8 ... 2	12	–1 ... 25	30	10				G 1/4	1.25	01

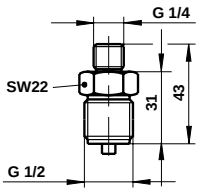
1) The differential pressure is the pressure difference between both pressure sensing elements under operating conditions.
2) The working pressure range indicates the required minimum pressure as well as the load on the pressure sensor under operation conditions.
3) Even short pressure peaks must not exceed this value during actual operation (max. value = max. testing pressure).
4) Maximum values; min. = beginning, max. = end of switching pressure range.

Dimensional drawing
01

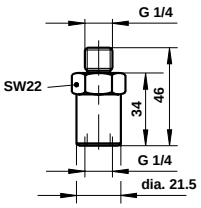


Zubehör

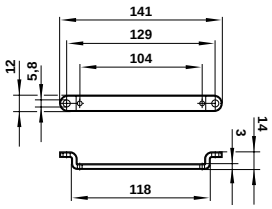
Reducer
G 1/4 to G 1/2, external thread
Type: **0574767**



Surge damper
G 1/4
Type: **0574773**



7 D-mounting support
(2 brackets and
4 screws)
Type **0574772**



Switch selection and mountinginstructions

The switching points should normally be in about the middle of the adjustable range.
Observe switching pressure range, do not subject switch to max. allowable pressure during normal operation.
Do not exceed electrical ratings.
Electrical connection by a Pg 13.5 cable gland, in accordance with local regulations. For outdoor installation, sufficient protection has to be provided for. Critical conditions are: Aggressiveness of air, high or low temperatures, drastic changes in temperature, solar radiation, penetration of water. For liquid fluids with pressure peaks and/or pulsating pressure, install surge damper upstream to eliminate scattering of switching points and excessive wear, possible failure of differential setting. For steam, install condenser coil or water trap upstream.When connecting, observe symbols on sensor (+) = higher-, (–) = lower system pressure.

Setting of the switching points

Use differential pressure spindle to set the upper or lower switching point on designs with fixed switching pressure difference.The opposite one is determined by the **fixed** switching pressure difference.

Example:

Required switching point:	with rising differential pressure:	2	bar
	minus fixed switching pressure difference:	0,25	bar
	results (with differential pressure falling) in the switching point:	1,75	bar
Adjustment with differential spindle		1,75	bar
or			
Required switching point:	with falling differential pressure:	2	bar
	plus fixed switching pressure difference:	0,25	bar
	results (with differential pressure rising) in the switching point of	2,25	bar
	Adjustment with differential spindle	2	bar

On designs with **adjustable** switching pressure difference, use the range spindle to set the lower switching point, then use differential spindle to set the upper switching point by adding the desired switching pressure difference.Turning the range spindle anticlockwise shifts both switching points upwards. Turning the differential spindle anticlockwise shifts only the upper switching point upwards, i. e. the switching pressure difference (distance between the upper and lower switching points) increases.

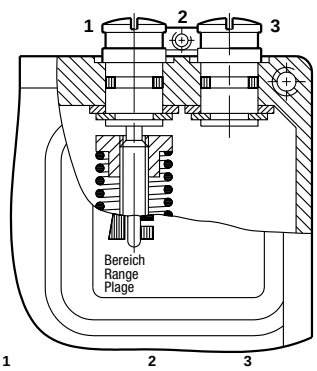
Example:

Required switching points:	with differential pressure rising:	3	bar
	with differential pressure falling:	2	bar
	i. e. switching pressure difference	1	bar
Setting:			
	Range spindle	2	bar
	Differential spindle	1	bar
Switching possibilites:	a) at the (+) pressure system operating pressure constant	9	bar
	at the (–)-pressure system switching points	7 bar und 6 bar	
	b) At the (–)-pressure system operating pressure constant	6	bar
	At the (+)-pressure system switching points at operating pressure	8 bar and 9 bar	

c) With variable operating pressures both at the (+)-, and the (–) pressure system, the switching points will be obtai ned as soon as the differential pressure reaches the value of the switching pressure difference.

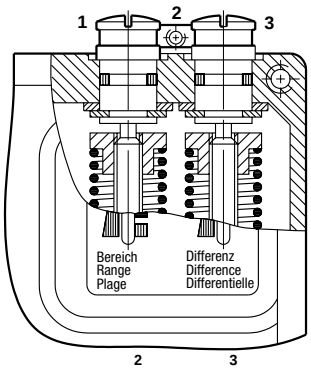
To set precise switching points a pressure gauge is required. (The pressure switch is a switching and regulating device and not a measuring instrument - even if it has a scale to assist in the setting). The setting can be changed at aby time, even during operation. Differential pressure and differential spindle are provided with a releasable detend; if desired, switch can also be leadsealed.

With **fixed** switching pressure difference



1	2	3
Bereichsspindel Range spindle Broche de la plage	Arretierung Detend Blocage	Blindzapfen Blanking plug Faux bouchon

With **adjustable** switching pressure difference



1	2	3
Bereichsspindel Range spindle Broche de la plage	Arretierung Detend Blocage	Differenzspindel Differential spindle Broche de la fourchette

Making and/or breaking capacity / Change-over switch with gold-plated contacts

Type of current	Type of load	Voltage Us (V)			
		24	60	110	230
		Make and break current I (A)			
AC	Resistive load	15	15	15	15
AC	Inductive load, cos φ ≈ 0.7	4	2.5	1.5	0.9
AC	Inductive load, spark quenching with RC-link	6	4	2.5	1.5
DC	Resistive load	2	0.9	0.45	0.2
DC	Inductive load, L/R ≈ 10 ms	1	0.3	0.09	0.02
DC	Inductive load, spark quenching with diode	1.5	0.7	0.35	0.15

Reference number of switchings: 60/min.
Reference temperature + 30 °C
(with a reference temperature of + 70 °C, Imax corresponds to 50% of the tabulated values only).

Contact-life appr. 1 x 10^6 switching cycles at max. current (at 50% of max. current, contact life is appr. 3 times as long).

Mechanical life appr. 5 x 10^6 switching cycles.

For non-aggressive atmosphere, which in particular does not contain any sulphur, the following limits are valid:

Microswitch with standard silver contacts:
V_{min} appr. 8 ... 12 V, I_{min} appr. 10 mA,
Maximum values acc. to table above.

Microswitch with gold-plated contacts:
V_{min} and I_{min}: No lower limit Sensible upper limit:
V_{max} appr. 48 V, I_{max} appr. 20 mA; (for higher values silver spring contacts are completely sufficient).

Creepage and air paths correspond to insulation group B according to VDE Reg. 0110 (except contact clearence of microswitch).

Spark quenching (direct current):

1. Diode in parallel to inductive load Make sure polarity is correct when making connections.

   Dimensioning of quenching diode (rectifier):
   Rated voltage of diode $V_D \geq 1.4 \times V_{Term.}$
   Rated current of diode $I_{Rated} \geq I_{load}$
   Choose quick switching diode (recovery trr ≤ 200 ns).

2. RC-link in parallel to load (or in parallel to switching contact). Suited for direct and alternating current.

Ratings: R in [Ω] ≈ 0.2 · R_{Load} in [Ω]
C in [µF] ≈ I_{Load} in [A]