Differential pressure switch
Model DPS40

DELTA-switch

Applications

Monitoring and control of filters, compressors and pumps in:
- Marine boilers, pressure vessels, bilge-water collection
- Drinking and cooling-water treatment plants
- Pressure-boosting stations
- Heating technology
- Fire-extinguishing systems

Special features

- Differential pressure switch with one or two adjustable micro switches
- Robust aluminium case with shatterproof window
- Optionally with Ex approval
- High ingress protection, IP65, for outdoor use and processes with high condensation
- Low measuring range from 0 ... 250 mbar

Differential pressure switch with two micro switches, model DPS40

Description

The differential pressure gauges of the DELTA-line product family are primarily used for the monitoring and control of low differential pressures where there are high requirements in terms of one-sided overpressure and static pressure. Typical markets for these products are the shipbuilding industry, process heating technology, the heating, ventilation and air-conditioning industries, the water/wastewater industry, and machine building and plant construction. For these, the main function of the measuring instruments is the monitoring and control of filters, compressors and pumps.

Wherever circuits need to be switched safely dependent on a defined differential pressure, the DELTA-switch finds its use. As the pressure passes above or below a defined set point, the switching operation is triggered. The switch point is accessible from the front and can be set in the range of 10 ... 100 % of the full scale value via an assistant scale.

The robust aluminium case and shatterproof window enable a long service life of the product, even under harsh ambient conditions. This ensures that there is no danger from the instrument and it is resistant to external mechanical impacts. In addition, ingress protection of IP65 protects the unit against ingress from dust and spray water.

As a result of the low measuring range of 0 … 250 mbar, the instrument can also be used for applications with low differential pressures.

The new and functional design completes the appearance of the measuring instrument.

Data sheets showing similar products:
DELTA-comb, differential pressure gauge with micro switches; model DPGS40; see data sheet PV 27.20
DELTA-comb, differential pressure gauge with component testing; model DPGS40TA; see data sheet PV 27.22
DELTA-plus, differential pressure gauge; model DPG40; see data sheet PM 07.20
DELTA-trans, differential pressure gauge with output signal; model DPGT40; see data sheet PV 17.19

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Design and operating principle

Pressures p_1 and p_2 act on the media chambers ⊕ and ⊖, which are separated by an elastic diaphragm (1).

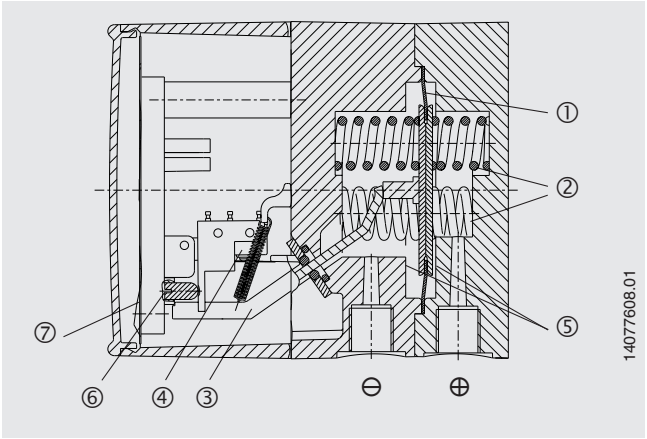
The differential pressure ($\Delta p = p_1 - p_2$) leads to an axial deflection of the diaphragm against the measuring range springs (2).

The deflection, which is proportional to the differential pressure, is transmitted to the leaf springs of the micro switches (4) in the switch enclosure via a pressure-tight and low-friction rocker arm (3).

Overpressure safety is provided by metal bolsters (5) resting against the elastic diaphragm.

The setting of the switch point is made by the adjustment screws accessible from the front (6). The assistant scales (7) simplify the setting of the switch point.

Illustration of the principle



Mounting according to affixed symbol:
⊕ high pressure, ⊖ low pressure

Mounting:
- Rigid measuring line
- Wall mounting with available mounting links

Specifications	
Case diameter	100 mm
Differential pressure measuring ranges	0 ... 0.25 to 0 ... 10 bar
Max. working pressure (stat.)	25 bar
Overpressure safety	Either side max. 25 bar
Permissible temperature	Ambient: -10 ... +70 °C Medium: -10 ... +90 °C Storage: -40 ... +70 °C
Ingress protection	IP65 per IEC/EN 60529
Media chamber (wetted)	Aluminium, EN AC–Al Si9Cu3(Fe), black lacquered (option: Stainless steel 1.4571)
Process connections (wetted)	2 x G 1/4 female, lower mount, in-line, centre distance 26 mm
Pressure elements (wetted)	Differential pressure: Compression springs from stainless steel 1.4310 and separating diaphragm from FPM/FKM (option: NBR)
Transmission parts (wetted)	Stainless steel 1.4301, 1.4305, 1.4310, FPM/FKM (option: NBR)
Sealings (wetted)	FPM/FKM (option: NBR)
Case	Aluminium, EN AC–Al Si9Cu3(Fe), black lacquered
Window	Plastic, with plug screw for switch point adjustment
Weight	approx. 1.4 kg

Options

- Intrinsically safe versions (Ex i)
- 4-way valve manifold from Cu-alloy or stainless steel, (1 x pressure compensating valve, 2 x shut-off valve, 1 x valve for purging and ventilating)
- Sealings (model 910.17, see data sheet AC 09.08)
- Other process connections for female and male threads
- Compression fittings with ferrule or clamp ring for pipe diameters 6, 8 and 10 mm
- Mounting flange (available in 2 versions: Stainless steel or stainless steel, black lacquered)
- Electrical connection via cable terminal box or angular connector

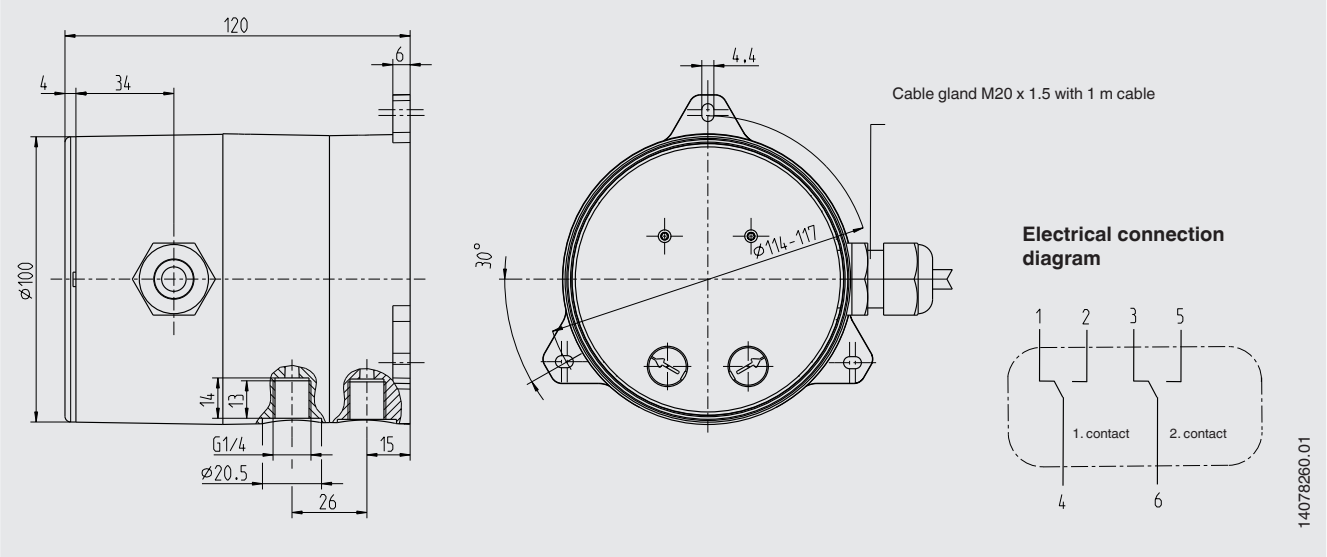
Electrical contact	
Type of contact	Micro switch
Contact function Single change-over contact Double change-over contact	 Contact type 850.3 Contact type 850.3.3
Load data U max., I max., P max.	 AC 250 V, 5 A, 250 VA DC 30 V, 0.4 A, 10 W
Switch point setting	from the outside at assistant scale by means of adjustment screw(s)
Setting range	from 10 % to 100 % of the full scale value
Switch point reproducibility	≤ 1.6 %
Switch hysteresis	max. 5 % of the full scale value (option: max. 2.5 %)
Electrical connection	Cable gland M20 x 1.5 with 1 m free cable

Maximum values for the power supply circuit (only for Ex version)

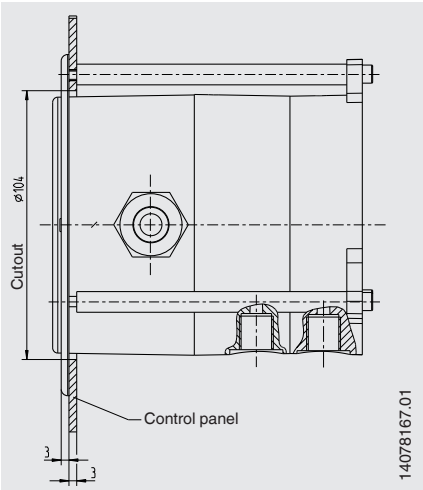
Parameters	Instrument group II	
	Potentially explosive gas atmosphere	Potentially explosive dust atmosphere
Terminal marking	“1” / “4” / “2” for switch A “3” / “6” / “5” for switch B (option)	
Voltage Ui	DC 30 V	
Current Ii	100 mA	
Power Pi	1 W	≤ 750 mW for Ta ≤ +40 °C ≤ 650 mW for Ta ≤ +60 °C
Effective internal capacitance Ci	Negligible	
Effective internal inductance Li	Negligible	

Instruments with two micro switches
If more than one circuit is connected, all conditions for the separation of two intrinsically safe circuits must be observed.

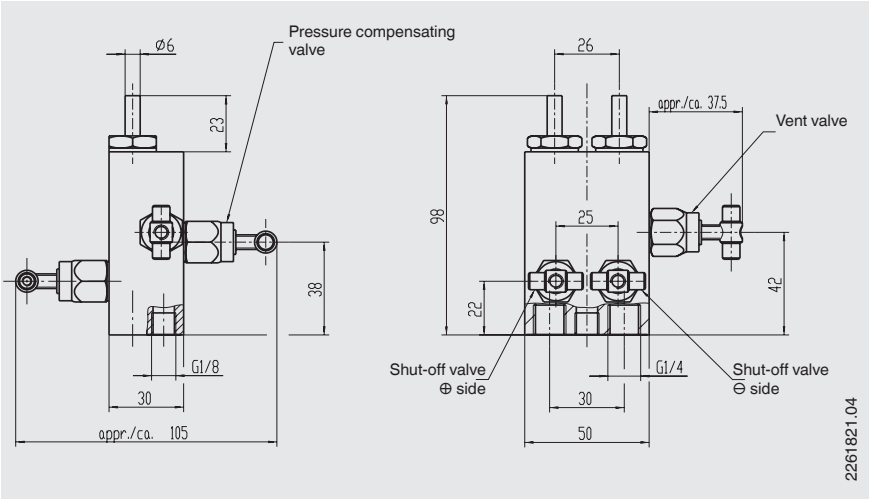
Dimensions in mm



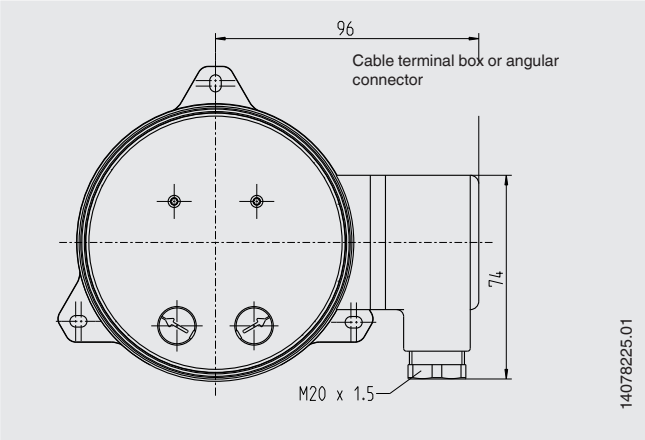
Option
Panel mounting



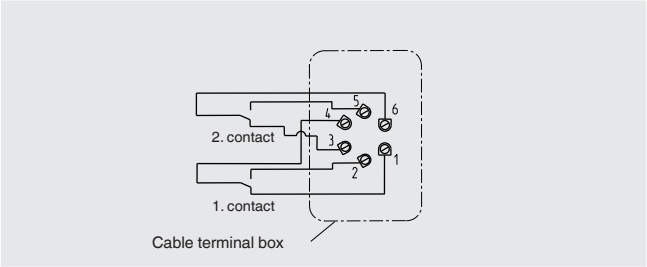
Option
4-way valve manifold



Option
Electrical connection variants



Electrical connection diagram



Approvals

Logo	Description	Country
CE Ex	**EU declaration of conformity** ■ Pressure equipment directive ■ Low voltage directive ■ RoHS directive ■ ATEX directive (option)	European Union
IEC IECEx	**IECEx** (option) Hazardous areas	International
EAC Ex	**EAC** (option) ■ EMC directive ■ Low voltage directive ■ Hazardous areas	Eurasian Economic Community

Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy)
- 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)

Approvals and certificates, see website

Ordering information
Model / Scale range / Process connection / Material of separating diaphragm and sealings / Micro switch / Options

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