

# DBL-A Differential pressure transmitter, 0-10 VDC

## General description

The differential pressure transmitters series are used for measuring differential pressure, positive pressure and vacuum.

## Applications

Monitoring gaseous, non-aggressive media. Possible areas of application are:

- air-conditioning and clean rooms
- building automation
- environmental protection
- fan and blower control
- valve and flap control
- filter and blower monitoring
- fluid and level monitoring
- control of air flows

## Measuring method

Piezoresistive pressure transducer

## Principle of operation

The pressure transducer converts the mechanical measured variable of pressure into an electrical measuring signal. The piezoresistive pressure transducer integrated in the differential pressure transmitter 984 is designed so that the pressure to be measured is applied to a thin membrane made of monosilicon. The membrane is deflected by this. The semiconductor resistors on the membrane detect this mechanical deflection and generate an electrical output signal. The arrangement of the resistors simultaneously compensates for the temperature response. The signal of the pressure transducer is converted into the output signal by high-gain operation amplifiers.

The electrical output signal changes within the specified error limits proportionally to the applied pressure.



Linearity range	Overload capacity	Bursting pressure
0 ... 100 Pa 1)	25 kPa	50 kPa
0 ... 250 Pa 1)	25 kPa	50 kPa
0 ... 500 Pa 1)	25 kPa	50 kPa
0 ... 1 kPa 2)	25 kPa	50 kPa
0 ... 2.5 kPa	30 kPa	75 kPa
0 ... 5 kPa	75 kPa	100 kPa
0 ... 10 kPa	100 kPa	200 kPa
0 ... 25 kPa	100 kPa	200 kPa
0 ... 50 kPa	100 kPa	200 kPa
0 ... 100 kPa	300 kPa	500 kPa
0 ... 250 kPa	1.2 MPa	2 MPa

Pressure medium	Air and non-aggressive gases
Linearity and hysteresis error	$\leq \pm 1\%$ of FS
Temperature error 0 .. 50 °C	$\leq \pm 1\%$ of FS 1) $\leq \pm 5\%$ v. FS 2) $\leq \pm 2.5\%$ v. FS
Storage temperature	-10 .. 70 °C
Long-term stability, typ.	$\leq \pm 0.5\%$ of FS / year
Repetition accuracy	$\leq \pm 0.2\%$ of FS
Position dependence	$\leq \pm 0.02\%$ of FS / g
Humidity	0 ... 95 % rel, non-condensing
Response time	10 ms
Supply voltage	18 ... 24 ... 30 VAC 16 ... 24 ... 32 VDC
Supply Current , max.	30 mA for AC 20 mA for DC
Output signal	0 ... 10 V, short-circuit-proof to ground
Offset adjustment	$\leq \pm 50$ mV
Span adjustment	$\leq \pm 50$ mV
Output current, max.	10 mA
Switching output	Open-collector, npn, SPST 100 mA maximal, $\leq 35$ VDC, adjustable
Hysteresis	5 ... 10 % v. FS
Response time	> 100 ms
Process connection	6 mm hose pipe
Electrical connection	Screw terminal block for wire up to 1.5 mm <sup>2</sup>
Mounting	Screw mounting with serrated screws
Special features	optional with LED-Display
Housing material	Housing with process connection P2 made of ABS, light gray; mounting part with process connection P1 made of POM, white
Housing dimensions	approx. $\varnothing$ 85 x 58 mm
Weight	approx. 130 g
Protection category to DIN 40050	IP 00 without protection cab IP 54 with protection cab
Standards / Conformance	IEC 770, EN50081-2, EN50082-2

## Installation position

The position error is eliminated by the self-compensating piezo measuring cell. The installation position is arbitrary.

## Start-up

The differential pressure transmitter 984 can be operated with 24 V direct or alternating voltage.

Firstly the pressure is applied to the required port with a hose (interior diameter 6 mm). The pressure at P1 must basically be higher than at P2 to obtain a correct 0 ... 10 V signal.

The output signal is then connected to the *Out 0...10 V* terminals. Pay attention to the correct polarity. Select the load so that 10 mA output current is not exceeded.

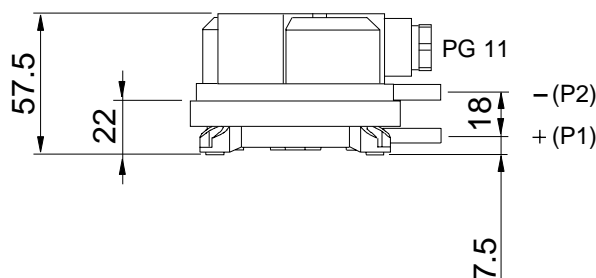
In the final step the supply voltage is connected to the terminals labeled with *In 24 VAC/VDC*.

## Switching output

The differential pressure transmitter 984 contains apart from the analog voltage output an additional switching output.

The analog output signal is compared internally by a comparator with a reference voltage which can be set by a potentiometer between 0 ... 100 % of the full scale range. The potentiometer is accessible using a screwdriver through a hole on the top of the housing. A permanently set hysteresis of 5 ... 10 % as well as a response time  $\geq 100$  ms prevent the output responding in the case of short pressure changes. The switched through state of the switching output is indicated by a LED.

The switching output is designed as an open-collector transistor output in NPN technology. The permissible current is 100 mA, whereby the voltage may not exceed 35 VDC. The output is protected against short-circuit by a self-resettable fuse.



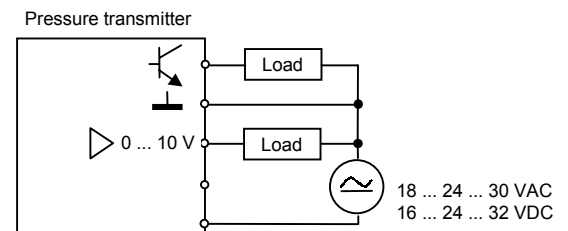
## Setting the switching threshold

To set the switching threshold, the differential pressure transmitter is connected according to the procedure specified under *Start-up*. In addition, the required reference pressure at which the switching output should respond is applied to the pressure connection(s).

If the switching output should switch on with rising pressure, firstly turn the potentiometer to the right until the LED goes out. Now turn the potentiometer to the left until the LED lights up. The switching threshold is then set.

Switching through the switching output on rising pressure is permanently configured (normally-open contact). Reprogramming the function – switching on with falling pressure – is not provided for.

## Connection



## Connection assignment

