

Differential Pressure Transmitter / Switch OMNI-DP1



- Ideally suited to wet/wet applications
- Can also be used at high differential pressures
- High chemical resistance thanks to top-quality materials
- Rotatable head for adjustment
- Units can be programmed at will
- Limit values and hysteresis adjustable
- Units can be selected
- 0/4..20 mA output with adjustable range and zero point
- Clear, easily legible, illuminated LCD display
- Bright signal-LED

Characteristics

The OMNI-DP1 differential pressure transmitter / switch is intended for the measurement of differential pressures in liquids and gases. It consists of a differential pressure cell as a sensor, and an integrated transformer.

The differential pressure measuring cell has two separate ceramic pressure sensors with a measuring bridge applied by thick film technology. The bridge signal of each sensor is temperature-compensated. The integrated microcontroller measures the signals from the two sensors, and calculates the pressure difference. This is shown in the display and output as an analog signal (0/4..20 mA or 0/2..10 V). In addition, if set limit values are fallen short of or exceeded, this can be signalled by means of two switching outputs and a red LED.

The ceramic sensors are available in various pressure ranges. This limits the maximum pressure to be applied to each connection. The differential pressure which is intended to correspond to the maximum value of the output signal can be freely set within this range on the device, but should not be less than 10 % of the metering range of the single cells, so that sufficient resolution and accuracy are ensured.

The medium comes into contact exclusively with top-quality materials such as Al_2O_3 -ceramics, stainless steel, fluorocarbon O-rings.

By turning the programming ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180 °, and replaced, or completely removed, thus acting as a key.



Technical data

Sensor	ceramic cell with measuring bridge using thick film technology																	
Process connection	2 x female thread G 1/8																	
Metering ranges of the single cells	(pressure relative to environment of the single cell) in bar <table><tr><td>Range</td><td>Burst pressure</td></tr><tr><td>0.. 1</td><td>4</td></tr><tr><td>0.. 2</td><td>6</td></tr><tr><td>0.. 5</td><td>15</td></tr><tr><td>0.. 10</td><td>40</td></tr><tr><td>0.. 20</td><td>60</td></tr><tr><td>0.. 50</td><td>150</td></tr><tr><td>0..100</td><td>280</td></tr></table>		Range	Burst pressure	0.. 1	4	0.. 2	6	0.. 5	15	0.. 10	40	0.. 20	60	0.. 50	150	0..100	280
Range	Burst pressure																	
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0.. 5	15																	
0.. 10	40																	
0.. 20	60																	
0.. 50	150																	
0..100	280																	
Differential pressure meas. range	when ordering please state: minimum: 10 % of the nominal pressure maximum: Nominal pressure																	
Measurement accuracy	±1 % of full scale value, plus 0.05 %/K at < 0 °C and > 60 °C																	
Repeatability	±0.5 % of full scale value																	
Pressure	corresponds to metering range																	
Dynamics	measuring cycle 31.25 ms																	
Media temperature	-20..+70 °C (with gooseneck max. 85 °C)																	
Ambient temperature	-20..+70 °C																	
Storage temperature	-20..+80 °C																	
Media	fluids and gases																	
Material medium-contact	1.4571, FKM, ceramic Al ₂ O ₃																	
Materials electronic housing	Housing	stainless steel 1.4305																
	Glass	mineral glass, hardened																
	Magnet	samarium-Cobalt																
	Ring	POM																
Supply voltage	18..30 V DC																	
Power consumption	< 1 W																	
Analog output	0/4..20 mA (0/2..10 V available on request)																	
Switching points S1 and S2	transistor output "push-pull" (resistant to short circuits and polarity reversal) I _{out} = 100 mA max. per output																	
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum																	
Display	backlit graphical LCD-Display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display																	

Product Information

Electrical connection	for round plug connector M12x1, 5-pole
Reversal polarity protected	yes
Ingress protection	IP 67
Weight	approx. 0.7 kg
Conformity	CE

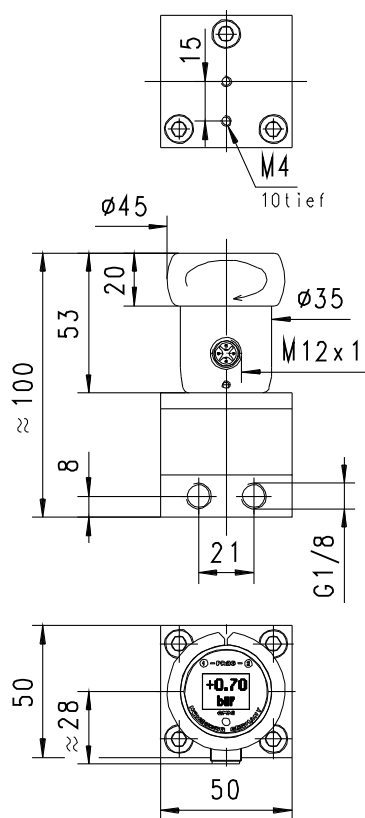
Wiring

Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

It is recommended to use shielded wiring.

The push-pull outputs can be set as a PNP or an NPN output, as desired.

Dimensions



Gooseneck option

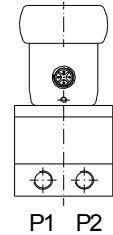


A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation and reading direction of the sensor. This option simultaneously provides thermal decoupling between the two units.

Handling and operation

The pipework is connected to P1 and P2. When sealing off, ensure that it is carried out cleanly.

P1 > P2 displays positive pressure differences;
P1 < P2 displays negative values.



When cleaning the pressure cells from the media side, the bolts of the part with the media connections can be loosened (the electronics remain closed in this case). Cleaning should be carried out very carefully, using a cotton tips.

Programming

The annular gap of the programming ring can be turned to positions 1 and 2. The following actions are possible:



**Set to 1 = continue (STEP)
Set to 2 = modify (EDIT)**

Neutral position between 1 and 2

The ring can be removed to act as a key, or turned through 180° and replaced to create a programming protector.

Operation is by dialog with the display messages, which makes its use very simple.

Starting from the normal display (currently measured value with unit), if 1 (STEP) is repeatedly selected, then the display shows the following information in this order:

Display of the parameters, using position 1

- Switching value S1 (switching point 1 in the selected unit)
- Switching characteristic of S1
- (MIN = monitoring of minimum value, hysteresis greater than switching value,
- MAX = monitoring of maximum value, hysteresis less than switching value)
- Hysteresis 1 (hysteresis value of S1 in the set unit)
- Switching value S2
- Switching characteristic of S2
- Hysteresis 2
- Code:
After entering the code 111, further parameters can be defined:
- Filter (settling time of the display and output)
- Units: e.g. l/min or m³/h
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (flow rate corresponding to 0/4 mA)
- 20 mA (flow rate corresponding to 20 mA)

Edit, using position 2

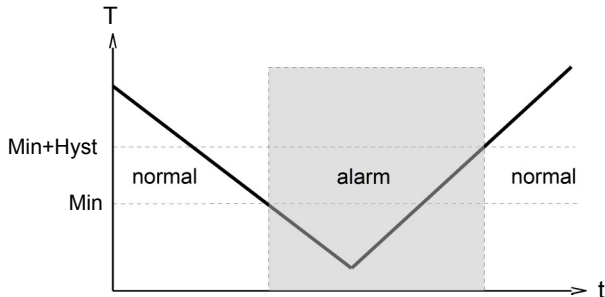
If the currently visible parameter is to be modified:

- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the next position is reached.
- Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
- If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

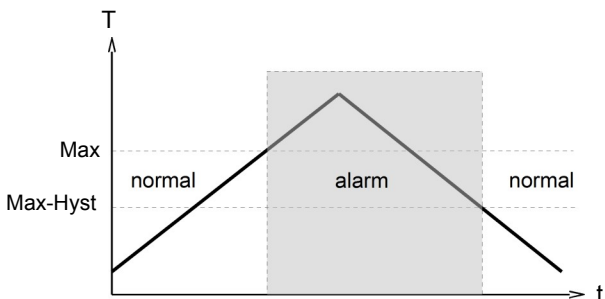
Product Information

The limit switches S1 and S2 can be used to monitor minima or maxima.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



The change to the alarm state is indicated by the integrated red LED and a cleartext in the display.

The switching outputs are at the level of the supply voltage in the normal state, and in the alarm state they are at 0 V, and so a wire break would also be displayed as an alarm state at the signal receiver. Over-load of the switching output is detected, indicated on the display ("Check S 1 / S 2"), and the switching output is switched off.

Simulation mode

To simplify commissioning, the sensor supports a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested during commissioning. This is mode is accessed by means of code 311.

Overload display

Overload of the switching output is detected, indicated on the display, and the switching output is set to high impedance.

Default setting

After setting the configuration parameters, they can be reset to factory values at any time, by means of code 989.

Starting from the normal display (currently measured value with unit), if 1 (STEP) is pressed repeatedly, then the display shows the following information:

Display of the parameters with position 1

- Switching values S1 and S2: Switching values in the selected unit.
- Hysteresis direction of S1 and S2:
Max = Hysteresis less than S1 or S2
Min = Hysteresis greater than S1 or S2
- Hystereses Hyst 1 and Hyst 2:
- Hysteresis values of the switching values in the set unit
- After entering code 111, further parameters can be defined (this should take place only if necessary)
- Filter: Selectable filter constant in seconds (affects display and output)
- Unit: e.g. bar or psi ...
- Output: 0..20 mA or 4..20 mA
- 0/4 mA: Displayed value for 0/4 mA
- 20 mA: Displayed value for 20 mA

Edit, using position 2

- If the **visible** parameter is to be modified:
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified. By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached. In this way, every digit can be modified. If there is no action within 5 seconds, the device returns to the normal display range without accepting the modification.

Saving the changes using position 1

After leaving the last value, turn once to position 1; this accepts the modification.

Ordering code

OMNI-DP1 1. 2. 3. 4. 5. 6. 7.

○ = Option

1. Range of the single cell		
001	0..	1 bar
002	0..	2 bar
005	0..	5 bar
010	0..	10 bar
020	0..	20 bar
050	0..	50 bar
100	0..	100 bar
2. Pressure type		
R		relative pressure
3. Differential pressure range		
0001		example 0055 = 5.5 bar (min. 10 %, max. 100 % of the range of the single cells)
...		
1000		
4. Connection material		
K		stainless steel
5. Mechanical connection		
004		female thread G 1/8
6. Electrical connection		
S		for round plug connector M12x1, 5-pole
7. Optional		
H	☐	model with gooseneck

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1