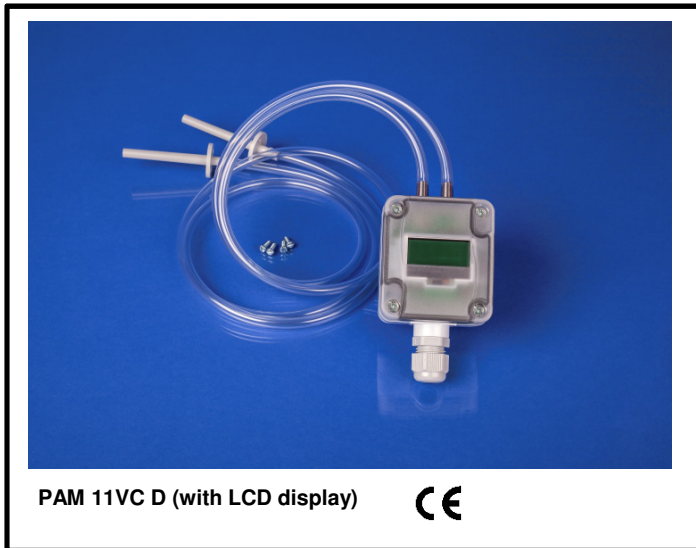


PAM 11VC (without LCD display)



PAM 11VC D (with LCD display)



## Features

- 4 to 8 pressure ranges in same unit, pressure range selectable via DIP-switches on pcb.

### Pressure ranges for PAM 10VC and PAM 10VC D

0 to 50 Pa / -50 to +50 Pa  
0 to 100 Pa / -100 to +100 Pa

### Pressure ranges for PAM 11VC and PAM 11VC D

0 to 100 Pa / -100 to +100 Pa  
0 to 300 Pa / -300 to +300 Pa  
0 to 500 Pa / -500 to +500 Pa  
0 to 1000 Pa / -1000 to +1000 Pa

### Pressure ranges for PAM 15VC and PAM 15VC D

0 to 1000 Pa / -1000 to +1000 Pa  
0 to 2000 Pa / -2000 to +2000 Pa  
0 to 3000 Pa / -3000 to +3000 Pa  
0 to 5000 Pa / -5000 to +5000 Pa

- Output 0-10 Vdc or 4-20 mA (3-wire)
- Accuracy  
PAM 10VC and PAM 10VC D (100 Pa) +/-3 Pa at 25 °C  
PAM 11VC and PAM 11VC D (1000 Pa) +/-10 Pa at 25 °C  
PAM 15VC and PAM 15VC D (5000 Pa) +/-35 Pa at 25 °C
- Power supply 24 Vac/dc
- IP67 protection
- With or without LCD display
- Push button for manual zero point calibration and an adjustable offset.
- Including duct fixing kit (2 plastic tubes with integrated mounting plate, 2 meters PVC hose and 4 screws)

## Ordering

Type no.	Description
PAM 10VC	0 to 50 Pa / -50 to +50 Pa 0 to 100 Pa / -100 to +100 Pa
PAM 10VC D	same as PAM 10VC and with LCD display
PAM 11VC	0 to 100 Pa / -100 to +100 Pa 0 to 300 Pa / -300 to +300 Pa 0 to 500 Pa / -500 to +500 Pa 0 to 1000 Pa / -1000 to +1000 Pa
PAM 11VC D	same as PAM 11VC and with LCD display
PAM 15VC	0 to 1000 Pa / -1000 to +1000 Pa 0 to 2000 Pa / -2000 to +2000 Pa 0 to 3000 Pa / -3000 to +3000 Pa 0 to 5000 Pa / -5000 to +5000 Pa
PAM 15VC D	same as PAM 15VC and with LCD display

## Description

The air pressure transmitter PAM 1-series is used for measuring differential pressure, volume flow in air, above-atmospheric or below-atmospheric.

Applications for air pressure transmitter PAM 1-series are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters.

Media measured with air pressure transmitter PAM 1-series are air (non-precipitating), or other gaseous non-aggressive, non-combustible media.

PAM 1-series air pressure transmitter is equipped with 8 DIP switchable measuring pressure ranges and 2 DIP switchable output signals 0-10 Vdc or 4-20 mA.

The air pressure transmitter PAM 1-series can be supplied with or without LCD display.

The piezo-resistive measuring element for air pressure transmitter PAM 1-series is temperature-compensated and guarantees a high degree of reliability and accuracy.

The PAM 1-series air pressure transmitter has a pushbutton for manual zero point calibration and an adjustable offset.

The air pressure transmitter PAM 1-series is supplied including duct fixing kit (2 plastic tubes with integrated mounting plate, 2 meters PVC hose and 4 screws).

The PAM 1-series air pressure transmitter has high ingress protection IP67.

### Technical data

**Power supply**

24 Vac/dc ( $\pm 10\%$ )

**Power consumption**

< 1 W at 24 Vdc; < 2 VA at 24 Vac

**Current consumption**

< 45 mA

**Working resistance**

Ra (Ohm) = 25 to 450 Ohm for 4-20 mA types

**Load resistance**

RL > 25 kOhm for 0-10 Vdc types

**Output**

0-10 Vdc or 4-20 mA (selectable via DIP switches)

**Connection type**

3-wire connection

**Measuring function**

Differential pressure, volume flow (square root output signal)

**Measuring ranges**

multi-range switching with 8 DIP switchable measuring ranges

**Media temperature**

-20 to +50 °C (temperature-compensated 0 to +50 °C)

**Pressure connection**

4/ 6 x 11 mm (hoses  $\varnothing = 4/ 6$  mm),

**Accuracy**

PAM 10VC and PAM 10VC D (100 Pa)  $\pm 3$  Pa at 25 °C  
 PAM 11VC and PAM 11VC D (1000 Pa)  $\pm 10$  Pa at 25 °C  
 PAM 15VC and PAM 15VC D (5000 Pa)  $\pm 35$  Pa at 25 °C  
 compared to the calibrated reference device

**Zero point offset**

$\pm 10\%$  of final value

**Above- / below-pressure**

$\pm 50$  kPa

**Medium**

clean air and non-aggressive, non-combustible gases

**Signal filtering**

switchable 1 s/ 10 s (via DIP switches)

**Electrical connection**

0.14 - 1.5 mm<sup>2</sup> via terminal screws

**Housing**

plastic, UV-stabilized,  
 material polyamide, 30 % glass-globe reinforced,  
 with quick-locking screws (slotted/ Phillips head - combination),  
 color traffic white (similar to RAL 9016)

**Housing dimensions**

72 x 64 x 37.8 mm without display

72 x 64 x 43.3 mm with display

### Cont. Technical data

**Cable gland**

M 16 x 1.5, including strain relief, exchangeable,  
 max. inner diameter 10.4 mm

**Long-term stability**

$\pm 1\%$ / year

**Hysteresis**

0.3 % of final value

**Media contacting parts**

Brass, Ni, Duroplast, Si, epoxy,  
 RTV, BSG, UV silicone gel

**Temperature drift values**

$\pm 0.1\%$  of final value/ °C

**Linearity**

<  $\pm 1\%$  of final value

**Air humidity**

< 95 % r. H., non-precipitating air

**Protection class**

III (according to EN 60 730)

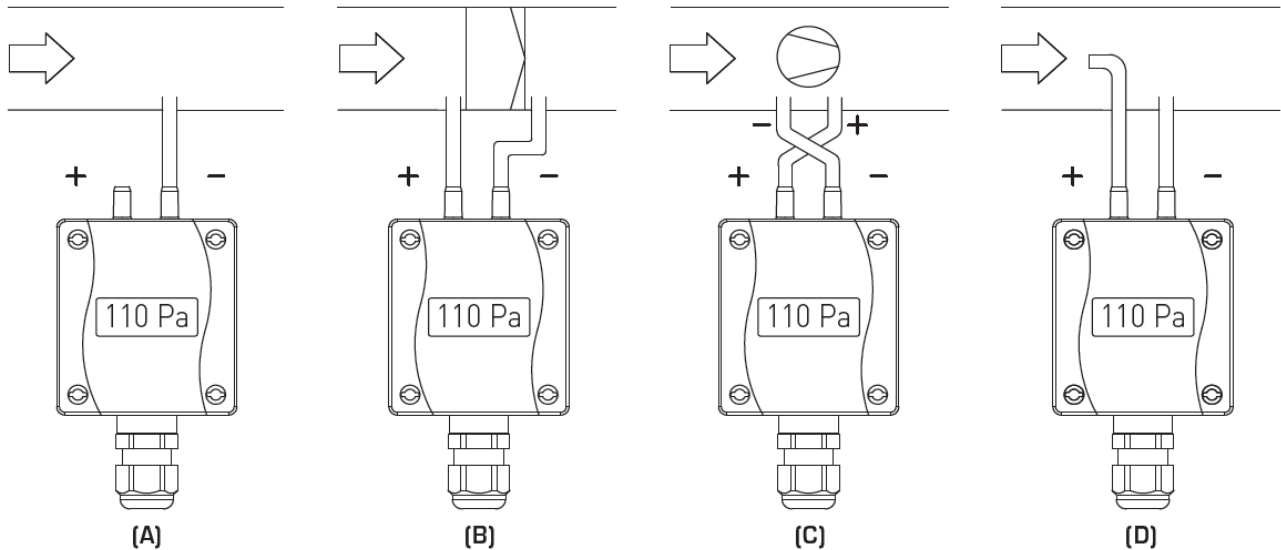
**Protection type**

IP 67 (according to EN 60 529)

**Standards**

CE conformity,  
 electromagnetic compatibility according to EN 61326,  
 according to EMC Directive 2014/ 30/ EU

**Mounting Diagram**



**Types of monitoring**

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

- (A) Below-atmospheric pressure**  
P1 (+) is not connected, but open to the atmosphere  
P2 (-) connected to inside of duct
- (B) Filter**  
P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter
- (C) Ventilator**  
P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator
- (D) Volume flow**  
P1 (+) dynamic pressure, connected in flow direction  
P2 (-) static pressure, connected free of dynamic pressure components

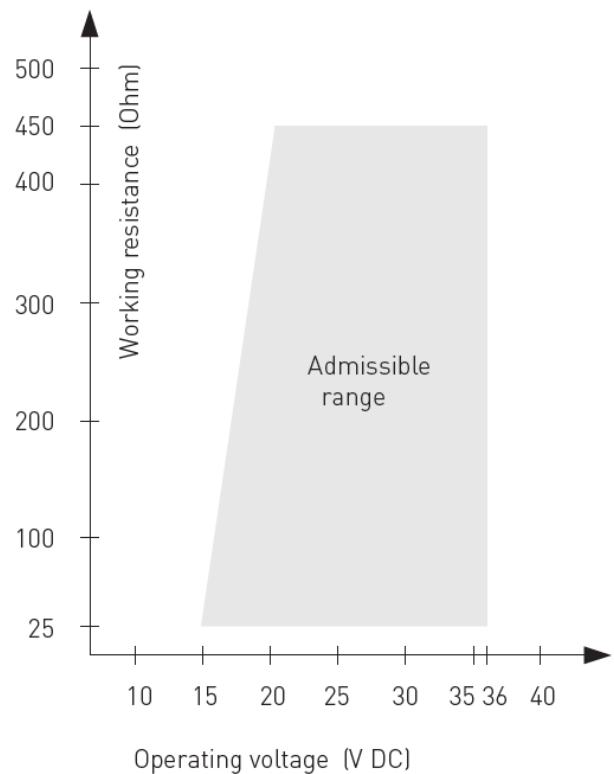
$$V = k \cdot \sqrt{\Delta p}$$

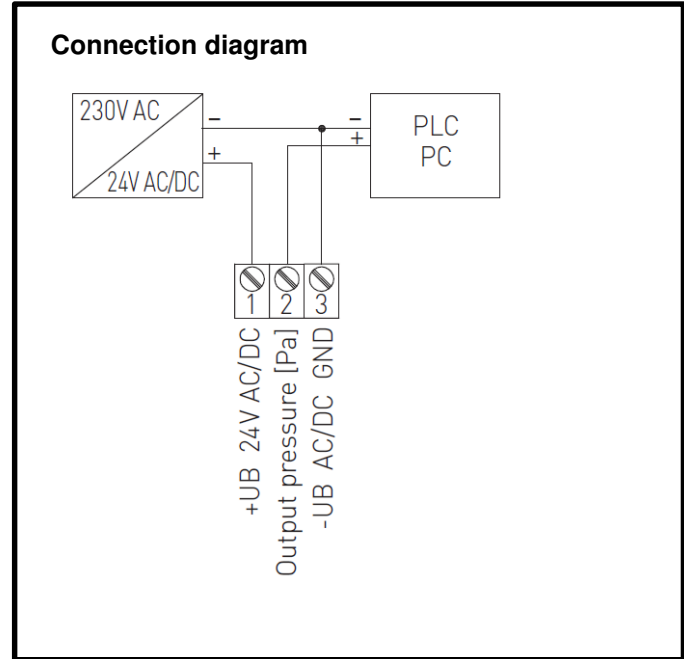
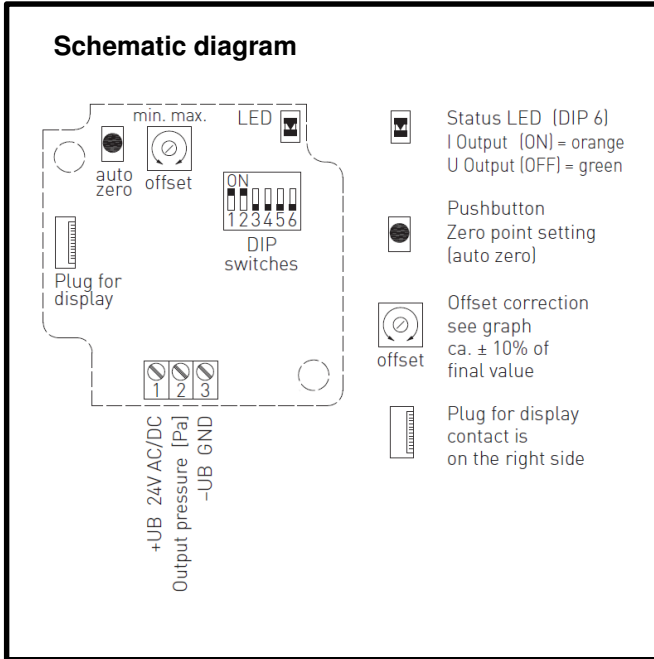
V = Volume flow

k = K factor

$\Delta p$  = Differential pressure [Pa]

**Load resistance diagram 4-20 mA**





### Conversion table for pressure values

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O

### DIP switches for pressure range setting, output attenuation and zero compensation

Pressure range (selectable) – max. measuring range (default) is depending to the type of device					DIP 1	DIP 2	Output characteristic line (Mode selectable)	DIP 4	
0...50 Pa	0...100 Pa	0...1000 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF	Linear (default) (for pressure detection)	OFF
-	0...300 Pa	0...2000 Pa	-	-300...+300 Pa	-2000...+2000 Pa	ON	OFF	Square root extracting (to determine the volume flow)	ON
-	0...500 Pa	0...3000 Pa	-	-500...+500 Pa	-3000...+3000 Pa	OFF	ON		
0...100 Pa	0...1000 Pa	0...5000 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON		

Measuring range mode (Mode selectable)	DIP 3	Measurement signal filtering (Time interval selectable)	DIP 5	Output (selectable)	DIP 6
Unidirectional (0...+MR) (default)	OFF	10 s (default)	OFF	Voltage 0-10V (default)	OFF
Bidirectional (-MR...+MR)	ON	1 s	ON	Current 4...20 mA	ON

## Configuration and zero point calibration

The following configurations can be preset via DIP switches.

The DIP switch sliding blocks can be moved without using tools. DIP switch 6 is not assigned.

### Pressure ranges

In each case four different pressure ranges depending on the type of device can be preset via DIP switches **DIP 1** and **DIP 2**.

### Measuring range mode

The measuring range is configured via DIP switch **DIP 3**, either into the unidirectional range or into the bidirectional range.

Therefore altogether eight pressure measuring ranges are configurable.

### Characteristic line – analog output

The output characteristic line can be defined via DIP switch **DIP 4**. Here is distinguished between a linear and a square root extracting output characteristic line. When square root extracting output characteristic line is selected, the measuring range setting at DIP switches **DIP 1** and **DIP 2** is without function.

In that case the maximum pressure range is used for computation.

### Measurement signal filtering

In order to stabilize the pressure measurement signal and the output voltage, the measurement signal is filtered.

The time interval for such averaging can be preset via DIP switch **DIP 5** to 1 or 10 seconds.

By a longer filtering interval, the settling time of the sensor is automatically extended.

Offset adjustment is done at a potentiometer on the circuit board within an adjustment range of  $\pm 10\%$  of the device's pressure range.

Ex-factory this potentiometer is in center position and is lacquer sealed.

All settings and adjustments that are made before must be done in this configuration.

Offset adjustment is carried out using a tool called "screwdriver 2.5" (blade width in mm).

### Automatic offset setting

1. Before setting the zero point, the device must be in operation for at least 60 minutes.
2. Connect pressure inputs P(+) and P(-) by means of a hose (pressure difference between both inputs = 0 Pa).
3. For zero point setting press button uninterruptedly for 5 seconds.

A LED signalises prompting the calibration by short flashing, and after a short countdown the measured (current) offset value is added to the measurand and zero voltage safe stored.

Correct calibration is confirmed by steady light of the LED for 3 seconds respectively indicated in the display (optional) by switching from "AUTO 0" to "PROG 0".

Note: By releasing the button during the countdown (counter > 0), zero point setting is immediately terminated!



### Manual offset adjustment

At the potentiometer OFFSET  $\Delta P$  can be balanced.

The adjustment range is ca.  $\pm 10\%$  of the pressure range.

Here another reference point different from zero point can be used.

### Readout in the display

In the 1st line of the display, the **ACTUAL** pressure up to the measuring range limit is displayed.

Switching between the units Pa and hPa (100 Pa = 1 hPa) happens automatically.

Pa - Pascal

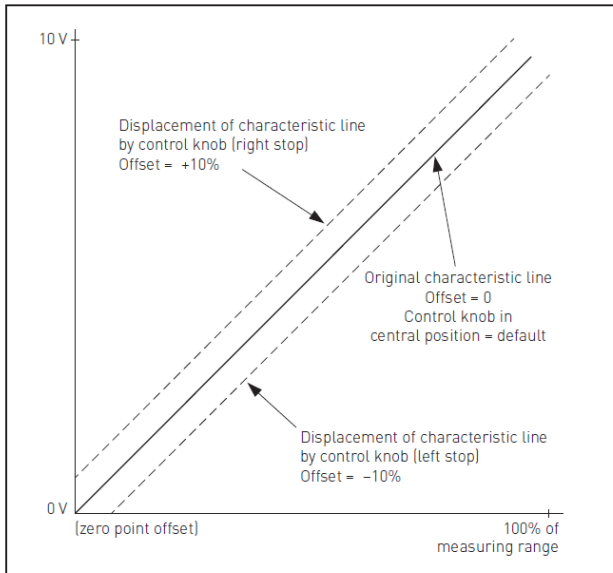
hPa - Hektopascal



**0-10 Vdc types (Range: 0...+ xx Pa)**

After successful zero point calibration, the output voltage is 0 V at 0 Pa pressure difference (with the offset knob in central position)!

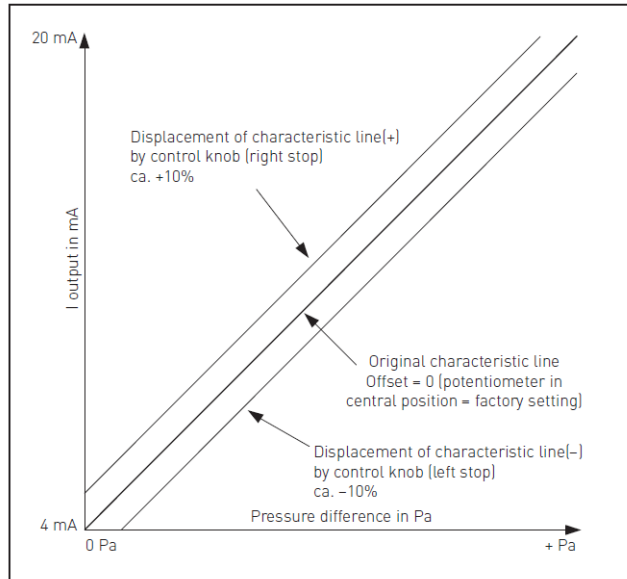
Output voltage 0-10 Vdc for pressure difference from 0 Pa to final value



**4-20 mA types (Range: 0...+ xx Pa)**

After successful zero point calibration, the output current is 4 mA at 0 Pa pressure difference (with the offset knob in central position)!

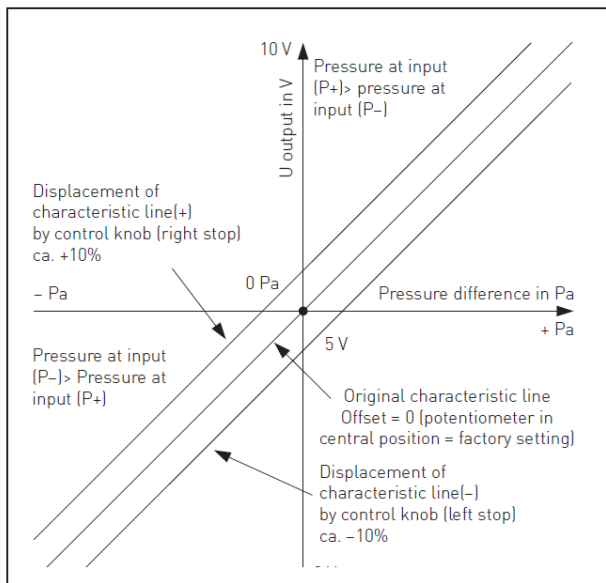
Output current 4-20 mA for pressure difference from 0 Pa to final value



**0-10 Vdc types (Range: - xx ... + xx Pa)**

After successful zero point calibration, the output voltage is 5 V at 0 Pa pressure difference (with the offset knob in central position)!

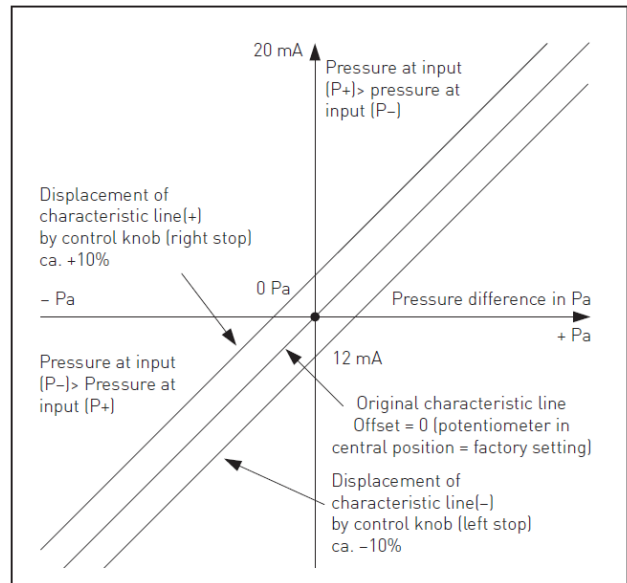
Output voltage 0-10 Vdc for pressure difference - ΔP to +ΔP



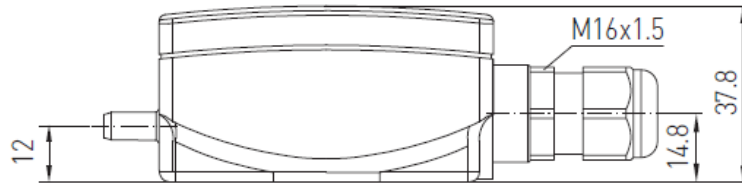
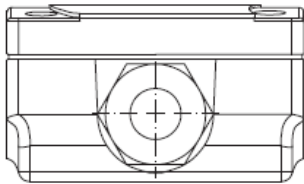
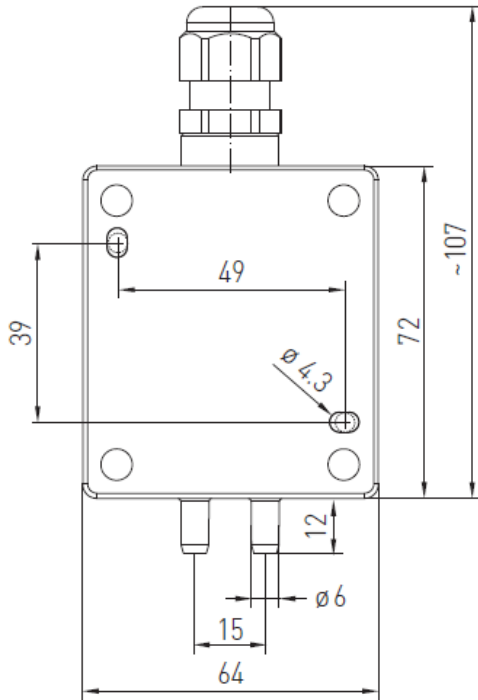
**4-20 mA types (Range: - xx ... + xx Pa)**

After successful zero point calibration, the output current is 12 mA at 0 Pa pressure difference (with the offset knob in central position)!

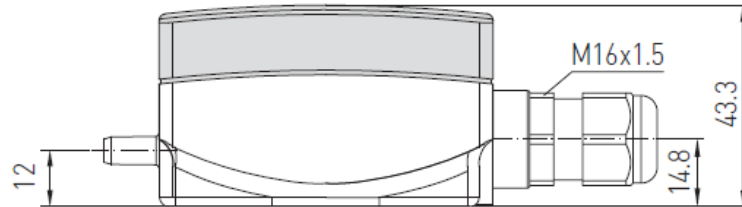
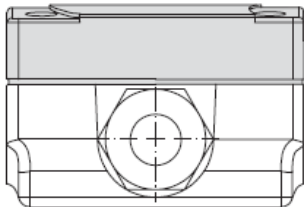
Output current 4-20 mA for pressure difference - ΔP to +ΔP



**Dimensions**



Without display



With display

We reserve the right to make changes in our products without any notice which may effect the accuracy of the information contained in this leaflet.