Oppermann Regelgeräte

SENSO PP Differential pressure indicator / monitor / transmitter

- Easy to read LCD display
- Differential pressure displayed in Pa or filter contamination level displayed in %
- Limit displayed in Pa
- Measuring range displayed
- Flashing red light when set limit is exceeded
- Programming of limit, measuring range, signal range for analog output
- Power supply: 24 V AC at 50 / 60 Hz or 24 V DC

Technical data

Housing:	high impact ABS
Front panel color:	antique white
Lower housing color:	anthracite
Protection class:	IP 54 with additional sealing (accessories) IP 64
Operating temperature:	-10 °C to +40 °C
Storage temperature:	-20 °C to +60 °C
Relative humidity:	max. 75 % non-condensing
Housing dimensions:	112 x 58 mm [Ø x D]
Front cover dimensions:	
- square:	184 x 139 x 20 mm [L x W x H]
- round:	145 mm Ø
Hose connection:	inner diameter 5 – 6 mm
Working and measuring ranges:	see table
Measuring range:	adjustable via keys
Burst pressure:	15 kPa (PP1000) 75 kPa (PP5000)
Protection class:	II (IEC 60536)
Tolerance:	≤ 1.5 % of measuring range
Power consumption:	24 V AC 35 – 40 mA 24 V DC 30 – 35 mA
Long-term stability:	≤ ± 0.5 % FS/a
Approvals (EMC):	EN61000-6-1, EN61000-6-2 EN61000-6-3, EN61000-6-4
Supply voltage:	24 V AC at 50/60 Hz or 24 V DC, -20 % – +5 %
Output analog:	0(2) – 10 V, 0.1 mA and / or (0)4 – 20 mA, max. load 600 Ω
Digital output:	relay, changer, Closed-circuit principle Contact load 240 V AC 2A 24 V DC 2A
Cable connection:	max. 2 PG M16, strain relief, Screw terminals

Types

	15 – 1000 Pa	50 – 5000 Pa	±150 Pa
Square front cover	PP1000 - 00	PP5000 - 00	PP150 - 00
Round front cover	PP5000 - 01	PP5000 - 01	PP150 - 01
Ranges [Pa]	0 – 250, 0 – 500, 0 – 750, 0 – 1000	0 – 2000, 0 – 3000, 0 – 4000, 0 – 5000	-20..0..+20, -50..0..+50, -100..0..+100, -150..0..+150

Design

The SENSO-PP consists of a round section and a square or round front cover.
The instrument is optimized for installation in ventilation devices and control cabinets. The two pressure test points are sunk into the housing on the back and labeled with + (over-pressure) and - (under pressure). There is a threaded sleeve in the middle. The retaining bracket is attached with the supplied threaded rod and wing nuts. The wing nuts are secured against loosening.
On the back of the housing, 2 cable breakthroughs are foreseen. Two M16 x 1.5 screw joints are included in the assembling set.
The flange sealing of the functional part across from the mounting surface occurs with an integrated O-ring. There is an arrow on the device, pointing to the up side in order to ensure the vertical mounting position when being installed.
Visible at the front, built into the functional part, there is an LCD display, an LED to indicate when limits are exceeded, 3 function keys and the battery compartment.
After installation and configuration of the device, the front cover is snapped onto the functional part. Due to 3 guided notches this is only possible in the correct position. Removing the front cover is done by pulling with both hands or by using a screwdriver.

Principle of operation

The measured differential pressure is guided over the connecting nipples with flexible hoses onto the piezoelectric differential pressure sensor and electronically evaluated and displayed on the LCD indicator. The limit can be programmed using a key situated behind the front cover of the device. In the same way, the measured value is passed on to the analog output, according to the set range. The threshold set, monitors the available measured values and reports an exceeded limit to the relay.

The operating instructions are pasted onto the back side of the front cover.

Activation and operation

Before connecting the supply voltage, connect all other electrical connections. To start up the Senso-PP, set up the 24 V supply voltage. Pay attention to the polarity!
The device is ready immediately: LCD display.
The setting of the parameters occurs via the 3 keys, which appear when the front cover is removed
Below 15 Pa (type PP1000) or 50 Pa (type PP5000), the small value suppression LO (= low) becomes active.

Setting display unit (dimension)
A brief push of the lower key (S1) in normal operation switches the unit back and forth between Pa and %. If the unit % is chosen, for example, a filter contamination level in % of the current limit is shown.

Programming the SENSO-PP
While programming, the current values on the display and the analog output are frozen. Prolonged pressing on the lower key (S1) will you get into the programming mode. The adjustable parameter is displayed by flashing. By further brief pushing of S1, the order of the menu items change:
Limit - Range - Out (mA)
The values corresponding the flashing area can be modified using a key at the upper left (S2) and the upper right (S3):
Short push → single steps,
Long press → increases rate of change
The upper limit is to be entered in Pa.
When exceeding the limit the relay LED flashes and the (digital output) falls off (ditto on failure of the supply voltage).

The measurement range shows the value in Pa, whereby the analog output has 20 mA or 10 V.
For example: set range 250 Pa
at 0 Pa, the AO is 0 (4) mA or 0(2) V
at 250 Pa, the AO is 20 mA or 10 V
The analog output is programmed to 0 – 20 (mA) correlating to 0 – 10 V or 4 – 20 (mA) correlating to 2 – 10 V.

Save (OK)
If the key is not pressed for more than 5 seconds, the set values are saved automatically and the indicator as well as the analog output will again be released.

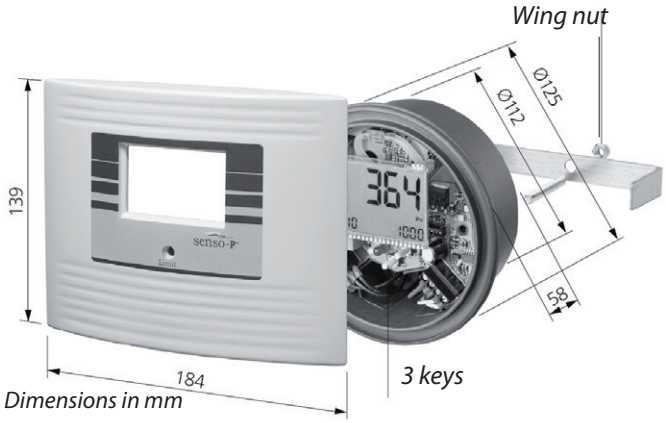
0-point adjustment
Disconnect supply voltage. Then release pressure from the measuring inputs (remove both hoses).
Push (S1) key and keep pressed.
Apply supply voltage (→ display flashes).
Release S1 key (→ pressure indicated: 0 Pa).
Press S1 button briefly and let go again
(→ value will be stored).
Further calibration possibilities available on request.

Delivery
The standard version contains the functional part, the front cover and installation instructions.
Accessories:
SENSO-ZP assembly kit, O-ring for IP 64 SENSO-D,
Clima-set SENSO-CS, mounting rack for SENSO-H
with a height of 30 or 50 mm.

Installation

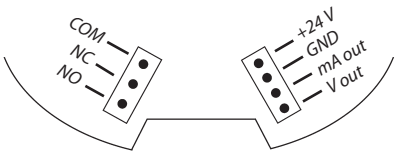
In the sandwich plate or the cabinet door a 115 mm Ø hole is milled and the functional part is pushed through the opening from the front. The mounting direction is labeled with an arrow pointing upward on the back of the device. The threaded rod is screwed into the threaded sleeve with a screwdriver; the mounting bracket is slipped over and secured with a wing nut. When assembling the pressure transfer hoses, care must be taken to comply with the direction of the pressure (+/-). Finally, the front panel can be snapped into place.

SENSO-PP set

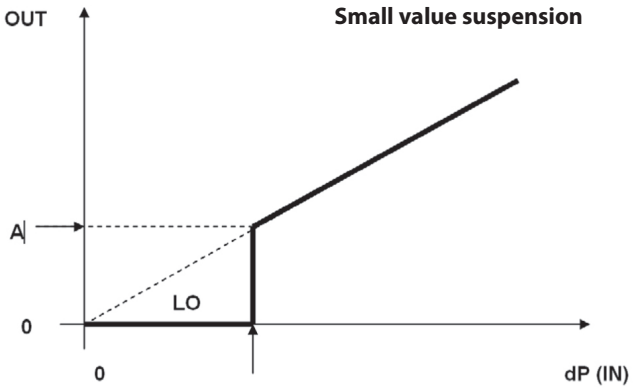


Dimensions:
Round front cover: 145 mm

Electrical connection



If the relay drops off (or limit is exceeded, or voltage drops), COM and NC are connected to each other.



Typ	LO	RA in Pa	OUT 0-20	OUT 4-20
PP1000	≤15 Pa	250 500 750 1000	$A(V)=\frac{15Pa}{RA[Pa]} \cdot 10\,V$ $A(mA)=\frac{15Pa}{RA[Pa]} \cdot 20\,mA$	$A(V)=\frac{15Pa}{RA[Pa]} \cdot 8\,V+2\,V$ $A(mA)=\frac{15Pa}{RA[Pa]} \cdot 16mA+4mA$
PP5000	≤50 Pa	2000 3000 4000 5000	$A(V)=\frac{50Pa}{RA[Pa]} \cdot 10V$ $A(mA)=\frac{50Pa}{RA[Pa]} \cdot 20mA$	$A(V)=\frac{50Pa}{RA[Pa]} \cdot 8V+2V$ $A(mA)=\frac{50Pa}{RA[Pa]} \cdot 16mA+4mA$

LO: Low (low value rejection) *RA: Range (measuring range)*

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