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Sensomatik

senso-v

Flow rate displays
with alarm signal

Features

- easy-to-read main display thanks to large numerals and residual-light reflecting display technology
- Display of volume flow up to 99'999 in the following units: m^3/h, l/s, ft^3/min
- Displays the alarm value up to max. flow rate
- Red LED flashes when value falls below alarm value
- Programmable alarm value, K-factor and air density ρ
- Power: 2 x 1.5 V "Mignon AA" batteries

Technical data

Housing:	High impact ABS
Colour front panel:	beige
Colour housing body:	anthracite
Protection:	IP 54
	IP 64 with supplementary seal
Operating temperature:	-10 to +40 °C
Storage temperature:	-20 to +60 °C
Relative humidity:	max. 75 %, non-condensing
Dimensions body:	112 x 58 [Ø x T]
Dimension front panel:	184 x 139 x 20 mm [L x W x H]
Flexible tube connection:	5 to 6 mm internal diameter
Working pressure range:	0-5000 Pa
Display range:	0-99'999 m^3/h, l/s, ft^3/min
Burst pressure:	75 kPa
Protection class:	II (IEC 60536)
Tolerance:	± 1.5 % of the measuring range
Long-term stability:	≤ ± 0,5 % V. EW/a
Approbations:	EMV: EN50081-1, EN50082-2
Battery:	2 x Mignon AA 1.5V
Battery service life:	3 - 4 years at ambient temperature 0 to 40 °C and Battery capacity of 2800 mAh

Function

The differential pressure measured is fed using flexible tubing via the connection nipples to the Piezo-measuring device, electronically interpreted, converted into volume flow according to the selected K-factor and density ρ and shown on the LCD display.

The basis for the conversion calculations is the following formula:

$$\dot{V}_h = K \sqrt{\frac{2 \times \Delta p}{\rho}}$$

$\dot{V}_h =$ Flow rate $[m^3/h]$
K = K-factor $[m^2s/h]$
$\Delta p =$ Differential pressure [Pa]
$\rho =$ Air density $[kg/m^3]$

Specification

The **SENSO-V** consists of a round measurement instrument and a front panel.

The measurement instrument is optimised for mounting in air-handling units and switchboards. The two connections for pressure measurement are located at the back of the instrument in recesses to prevent mechanical damage. They are labelled with + (overpressure) and - (underpressure).

A threaded bushing is provided in the centre of the housing. The fixing clamp is attached using the threaded bolt and the wing-nut supplied. The wing-nut is secured against loosening. An O-ring integrated in the flange of the measurement instrument seals it against the panel in which it is mounted. In order to ensure correct mounting, an arrow can be found on the back of the device that must point upwards.

In the front part of the instrument an LCD display which reflects residual light can be found, together with the electronics motherboard, the red LED, the function button as well as a battery compartment in which batteries can be plugged-in using a special cable.

After the unit has been mounted and any programming done, the front panel can then be clipped onto it. Three guide-grooves ensure that this is only possible when correctly oriented. The front panel can be removed by pulling it with both hands and/or using a screwdriver.

Activation and operation

The SENSO-V can be activated by plugging the battery pack's connecting cable onto the motherboard. This should remain connected even when changing batteries. It is protected against reverse polarity. With sufficient battery capacity, the device is immediately ready for operation (displays on the LCD are active). The setting of the units displayed and the programming is carried out using the three buttons that are accessible when the front panel is removed.

Setting the units displayed (Dimension)

By pressing the button during normal operation for a short time, the units displayed change between m^3/h, l/s and ft^3/min.

Programming the SENSO-V

By pressing the lower button for a long time, the unit goes into programming mode (menu). By pressing this button repeatedly, the menu items change as follows:

Limit - K-factor - Air density ρ

When the appropriate menu item flashes, the top left (-) and top right (+) buttons can be used to adjust the programmed values:
Short press → single step
Long press → increasing rate of change

The following values should be selected: low-alarm value in Pa, the K-factor (defined by the manufacturer of the measurement unit) and the air density, which is multiplied by the factor 100 (default value $112 = 1.12$ kg/m^3).

Save (OK)

If the button is not pressed within 5 sec., the value currently shown is automatically stored and programming mode is left.

Battery capacity display

Full: bar over the whole length of the battery icon
Empty: no bar visible
Change battery: after maximum 2 months if bar is in the right-hand segment.
Changing batteries: Pull the battery-holder out of its mounting without unplugging it and change both batteries.
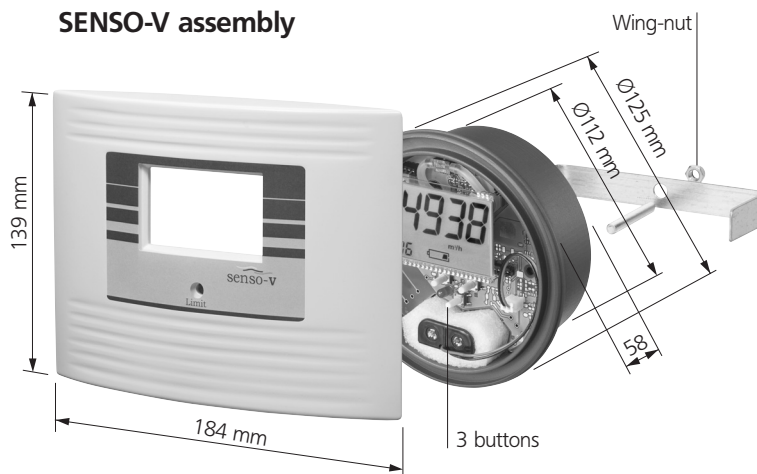
Zero-point correction

If no differential pressure is applied and the power supply is removed for a short time, the device calibrates itself automatically.
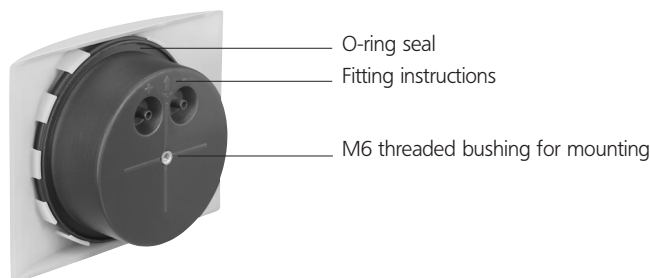
Display of differential pressure for testing purposes

By pressing both of the top buttons at the same time, the differential pressure measured is displayed in Pa as long as the buttons are pressed.

SENSO-V assembly

Wing-nut
Ø125 mm
Ø112 mm
139 mm
184 mm
58
3 buttons

SENSO-V reverse side

O-ring seal
Fitting instructions
M6 threaded bushing for mounting

Scope of delivery

The standard version comprises the measurement instrument, a front panel, a threaded bolt, a mounting bracket, a wing-nut and fitting instructions. The operating instructions can be found inside the front panel.

Fitting

A 115 mm Ø hole is drilled in the sandwich plate or the control cabinet door and the measurement instrument is slid into the aperture from the front side. The correct alignment of the instrument is indicated by an upwards-pointing arrow on the rear of instrument. Using a screwdriver, the threaded bolt is firmly screwed into the threaded bushing; the mounting bracket is placed over it and secured with the wing-nut. When connecting the pressure tubing, great care should be taken that the correct polarity is adhered to (+ overpressure, - underpressure). The front panel can then be snapped on.

Overview of the SENSO range of products

Model	Display range	Units	Alarm value	Voltage	Analogue output	Relay contact
SENSO-P	0÷1000 Pa, 0÷100 %	Pa, %	exceeds	2 pcs. Mignon AA	-	-
SENSO-P+	0÷250 Pa 0÷500 Pa 0÷750 Pa 0÷1000 Pa -50÷ +50 Pa* 0÷100 %	Pa, %	exceeds	24 V, 50÷60 Hz 24 V DC	4÷20 mA 0÷20 mA 0÷10 V, 0,1 mA	EPU 8 A at 240 V
SENSO-V	100÷99'999	m³/h, l/s, ft³/min	falls below	2 pcs. Mignon AA	-	-
SENSO-V+	100÷99'999	m³/h, l/s, ft³/min	falls below	24 V, 50÷60 Hz 24 V DC	4÷20 mA, 0÷20 mA 0÷10 V, 0,1 mA	EPU 8 A at 240 V

* special version

Technical details subject to change