SEBA MultiMET-Sensor

Measurement of meteorological parameters such as wind speed and direction, relative humidity, temperature, solar radiation, barometric and pressure

Product description

Depending on the version, the instruments of the series SEBA MultiMET-Sensor consists of a 2-axes ultrasonic static anemometer for the measurement of:

- **Wind speed and direction, U-V Cartesian components of wind speed,**
- **Relative Humidity and temperature (optional),**
- **Diffuse solar radiation (optional),**
- **Barometric pressure (optional).**

In a single instrument the available measurement options combine the standard parameters used in meteorology, making the instrument a compact and light weight meteorological station.

The MultiMET-Sensor features as standard a SDI-12 serial interface and optional RS 232, RS 485, RS 422 serial interfaces with NMEA, MODBUS-RTU communication protocols. All versions have optionally two analog outputs for wind speed and direction, which are factory configurable. The heater option prevents the accumulation of snow, as well as ice formation, allowing precise measurements in all environmental conditions. The heating requires a 230 VAC power supply. The low power consumption of the sensor allows installation in remote sites, where a photovoltaic panel and backup battery (without sensor heating) can supply power.

Measuring principle of wind speed and direction

Wind speed and direction are determined by measuring the transit time of ultrasonic pulses between the transducer that generates the pulse to the receiving transducer.
The instrument uses two pairs of transducers oriented along two orthogonal axes. Detecting the wind speed along two axes allows the determination of the wind intensity and the wind direction. The sensor uses transit time measurements in both directions of the ultrasonic pulse between two transducers of the same pair. The travel times in two opposing directions are defined as tA (forward direction time) and tR (reverse direction time). If wind speed is zero, tA and tR values are equal. In the presence of wind, tA or tR differ and the comparison between the two time values allows the determination of wind direction and the intensity of wind. By measuring the travel time in both directions the system allows for a compensation of air temperature, air humidity and barometric pressure that influence the transmission speed of ultrasound in the air, and delivers corrected high accuracy measurements.

Technical data

Wind speed:	
Sensor type:	Ultrasound
Measuring range:	0…60 m/s
Resolution:	0.01 m/s
Accuracy:	± 0.2 m/s or ± 2 %, for values (0…35 m/s), ± 3 % (> 35 m/s)
Wind direction:	
Sensor type:	Ultrasound
Measuring range:	0…359,9°
Resolution:	0.1°
Accuracy:	± 2° RMSE from 1.0 m/s
Air temperature:	
Sensor type:	Pt100
Measuring range:	-40…+60 °C
Resolution:	0.1 °C
Accuracy:	± 0.15 °C ± 0.1 % of measurement
Relative humidity:	
Sensor type:	Capacitive
Measuring range:	0…100 % RH
Resolution:	0.1 %
Accuracy (at T = 15…35° C):	± 1.5 % RH (0…90 % RH), ± 2 % RH (remaining range)
Accuracy (at T = -40…+60° C):	± (1.5 + 1.5 % of measurement)% RH
Barometric Pressure:	
Sensor type:	Piezoresistive
Measuring range:	600…1100 hPa
Resolution:	0.1 hPa
Accuracy:	± 0.5 hPa at 20 °C
Solar radiation:	
Sensor type:	Thermopile
Measuring range:	0...2000 W/m^2
Resolution:	1 W/m^2
Accuracy:	2nd Class Pyranometer
General features:	
Power Supply:	10…30 VDC
Power consumption:	26 mA at 12 VDC without heater, 6 W with heater
Serial outputs:	RS 232, RS 485 (¼ Unit Load), RS 422 and SDI-12
Communication protocols:	NMEA, MODBUS-RTU, SDI-12, proprietary RS 232 and RS 485
Analog outputs:	2 analog outputs, for wind speed and direction. Output at choice among 4…20 mA (standard), 0…1 V, 0…5 V and 0…10 V **(option 0…10 V needs 15…30 VDC power supply)**
Electrical connection:	19-pole M23 male connector
Operating temperature:	-40…+60 °C
Protection degree:	IP 64
Dimensions:	H = 179 mm, Ø = 150 mm (Version 1 and 2) H = 200 mm, Ø = 150 mm (Version 3 and 4) H = 336 mm, Ø = 150 mm (Version 5 and 6) H = 357 mm, Ø = 150 mm (Version 7 and 8)
Weight:	About 1 kg (complete version # 8)
Case:	Plastic material: LURAN®S (ASA). Metal parts: AISI 316

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