

# METEOROLOGICAL SENSORS

In conjunction with controlling of the performance of photovoltaic and solarthermal system the measurement of meteorological signal as global irradiance, wind velocity and direction as well as ambient temperature is essential. We offer all necessary sensors at interesting prices produced by well known manufacturers.



## General Informations

### Global Irradiance

The best way for measuring the horizontal global irradiance is a thermo-electric pyranometer with a glass-dome. No silicon sensor meets the standards of the World Meteorological Organization (WMO). For precise measurement of the irradiance we therefore use and offer pyranometers produced by Kipp & Zonen, Delft, the Netherlands, or EKO, Japan.

### Wind Velocity and Wind Direction

Our wind sensors have different output signals to meet the requirements of the connected data acquisition system. The case of the sensor consists of eloxadized aluminium and the cupstar and wind vane are made of plastic. Both sensors have an electronically regulated heating system to prevent the ball-bearings and the external rotation parts from freezing.

### Clima Sensor US

The Clima Sensor US (ultrasonic) measures the most important meteorological parameters. According to expansion stage the device offers the following measuring data:

- Wind velocity and direction, averaged according WMO recommendations (ultrasonic)
- Air temperature
- Relative humidity
- Barometrical air pressure
- Precipitation (Doppler radar)
- Brightness (four directions)

Data export uses analogue norm signals, digital signals in ASCII format or binary using Modbus RTU protocol. A software for direct use of the sensor with a PC running MS Windows including data logging is available as accessory.

By installing on top of a mast the integration into a meteorological measuring station is very easy.



**INGENIEURBÜRO**  
**Mencke & Tegtmeier**  
Meßgeräte für die Solartechnik

**INGENIEURBÜRO**  
Mencke & Tegtmeier GmbH

Schwarzer Weg 43A  
D-31789 Hameln  
Tel.: (051 51) 40 36 99 - 0  
Fax: (051 51) 40 36 99 - 19  
email: [info@ib-mut.de](mailto:info@ib-mut.de)  
<http://www.ib-mut.de>

Bankverbindung:  
Stadtsparkasse Hameln  
(BLZ 254 500 01)  
Kto.-Nr. 5 22 33

UID-Nr. DE258133277

Zollnr. DE6018572

Finanzamt Hameln  
22/200/62745

Amtsgericht Hannover  
HRB 202636

## PYRANOMETER

Global Irradiance

### Kipp & Zonen CMP / SMP 3 / 6 / 10 / 11 / 21

- All pyranometers meet the specifications of the WMO and ISO 9060 respectively
- WMO class: Second class (3) / First class (6) / Secondary standard (10, 11, 21)
- Measuring range: 0 to 1400 W/m<sup>2</sup>
- Sensitivity: 5 - 20 µV per W/m<sup>2</sup> (CMP versions)  
4...20 mA or 0...1 V, RS485 Modbus (SMP versions)
- Non-linearity: 2,5 % / 1,5 % / 0,6 % (<1000 W/m<sup>2</sup>)
- Weight: 350 g / 850 g / 850 g

## VWIND

Wind Velocity

### Cupstar Anemometer

- Measuring range: 0,5 to 50 m/s
- Accuracy: ±3 % from rdg.
- Output signal: 10 (11) Imp. per rotation, 0(4) to 20 mA, 0 to 2(5)(10) V
- Heating: 24 V, max. 20 W
- Ambient temperature: -30 to +70 °C
- Weight: 400 g to 750 g



## WRIGHT

Wind Direction

### Wind Vane

- Measuring range: 0 to 360 °
- Accuracy: 5 °
- Output signal: Graycode, 0(4) to 20 mA, 0 to 2(5)(10) V
- Heating: 24 V, max. 20 W
- Ambient temperature: -30 to +70 °C
- Weight: 1100 g



## TMETEO

Ambient Temperature

### Pt100 with Weather and Radiation Shield

- Measuring range: -30 to +70 °C /
- Accuracy: 1/3 DIN EN 60751 (corresponding to ±0,3 K)
- Output signal: Pt100, 4 to 20 mA, 0 to 1(10) V
- Voltage supply: 12 to 30 V<sub>DC</sub>, 24 V<sub>DC</sub> ±10 % for 0 to 10 V version
- Weather and radiation shield of UV resistant plastic with white lamella
- Dimensions Pt100 / shield: ø 20 mm x 138 mm / ø 120 mm x 140 mm
- Supply cable: 5 m long

## CLIMA SENSOR

US

all meteorological values  
in one sensor

### Meteorological Multisensor

- Outputs: max. 8 analogue outputs 0...10 V, 16bit resolution  
Serial RS485/422 port ASCII or Modbus-RTU, full or half duplex
- Measurement parameter output: Current value or floating average
- Galvanic isolation between analogue signals, serial port and power supply
- Other features (s. data sheet): battery buffered real-time clock, GPS, heating
- Power supply: 6...40 V<sub>DC</sub> or 10...28 V<sub>AC</sub> (without heating)  
24 V<sub>AC/DC</sub> ±15%, 25 VA (with heating)
- Housing: LEXAN (Polycarbonat, UV stabilised)
- Mast connection: 48,3 mm external diameter
- Electrical connection: 19-pole plug
- Dimensions housing: ø 150 mm x 220 mm (full expansion)
- Weight: approx. 900 g (full expansion)