LABORATORY: CNR-ISPC

NAME OF THE INSTRUMENT

IoT Indoor Environmental Monitoring system

GENERAL DESCRIPTION

Indoor microclimate monitoring system consisting of units for data acquisition and transmission (GSM or Wi-Fi), transducers of air temperature (Pt100 resistance thermometer), relative humidity (thin film capacitor with dielectric in polymeric material) and air speed and direction (ultrasound).
The data collected through this monitoring system can be used to inform simulation models for the evaluation of the energy and environmental performance of buildings as well as for the model calibration and validation. The analysis with this system also allows to characterize the microclimatic conditions inside the building and their adequacy in relation to the conservation needs of the materials that make up the cultural collections and/or the building. The system allows 12 simultaneous measurements with remote data reading and control.

TECHNICAL DETAILS

1. **N.1 Acquisition and data transmission unit on GSM network, model Grillo BEE, with four channels for external sensors (for measurements inside the cabinets and near the finds)**
   Other characteristics:
   - Wi-Fi network data transmission module
   - Programmable data acquisition, processing and storage interval between 10 s and 12 hours
   - Programmable data transmission interval between 10 m and 24 hours
   - Power supply: stylus batteries with an autonomy of 6 months
   - Dimensions: 10 x 6 x 4cm
   - Complete with calibration certificate for comparison with SIT reference

2. **N.12 Transducer of temperature and relative humidity of the air EE071,** with the following characteristics:

   Air temperature (in accordance with EN 15758:2010)

   - sensor: Pt1000 resistance thermometer
   - measuring range: from -40°C to + 80°C.
   - accuracy: ±0.2°C at 20°C

   Relative humidity (in accordance with EN 16242:2012)

   - sensor: thin film capacitor with dielectric in polymeric material
   - measuring range: 0..100% RH.
   - accuracy: ±2 % RH (0...90 % RH)
   - temperature dependence: < (0.025 + 0.0003 x RH) [% RH/°C]

3. **N. 11 Ultrasonic air speed and direction transducer METER ATMOS22**, with the following characteristics:
   - Speed measurement range: 0.00-30.00 m/s
   - Resolution: 0.01 m/s
   - Accuracy: the greater of 0.3 m/s or 3% of measurement
   - Direction measurement range: 0-359°
   - Resolution: 1°
   - Accuracy: ±5°

EE071, METER ATMOS22, Grillo BEE (MOUNTED SYSTEM)

EE071, METER ATMOS22, Grillo BEE (IEM SENSORS)

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