

# COMETEO

Innovative Design for Enhanced Protection and Precision Measurement in Extreme Conditions



- Minimal impact from reflected solar radiation
- Minimal residual solar radiation influence
- Proven reliability in windy conditions
- High data quality assurance
- Robust design for accurate measurements
- Arctic performance excellence
- Strong reference performance





## Available types of COMETEO

The Multi-Plate Radiation Shield is expertly designed to provide robust protection for weather monitoring systems, ensuring the highest accuracy in climate measurements. Its advanced design significantly reduces the amount of solar radiation that reaches the sensor while also minimizing the radiation absorbed by the shield itself. This dual function is essential for maintaining the integrity of the data collected, as it prevents external factors from distorting the sensor's readings.

Additionally, the shield maximizes ambient airflow around the sensor, which is crucial for capturing precise environmental data. The outer surface, made from UV-resistant and highly reflective ASA plastic, is built to withstand long-term exposure to sunlight and harsh weather conditions, ensuring the shield's durability. The inner surfaces are crafted from matte black plastic to effectively reduce internal reflections that could compromise the sensor's accuracy.

With a substantial diameter of 210mm and composed of 14 plates, the shield offers comprehensive protection for the sensor. This design not only extends the sensor's lifespan but also ensures that it consistently delivers accurate and reliable climate data.

The COMETEO shield is available in three variants, each tailored to meet different measurement needs. The first variant allows for the entire measuring device to be housed within the shield, with an internal space shaped like a cylinder, offering a diameter of 110 mm and a height of 210 mm, providing ample room for various sensors. The second variant features a pass-through for an external probe with a diameter of up to 18 mm, allowing for flexible probe placement outside the main enclosure. The third version also includes pass-throughs with a diameter of 18 mm, but in this case, there are four separate pass-throughs, enabling the connection of multiple probes simultaneously, offering versatile measurement capabilities and maximum adaptability for various applications.

COMETEO is made of ASA plastic which is resistant to mechanical damage and UV radiation. ASA plastic is very stable over time.

Measuring device entirely protected inside the shield.

### Full-Enclosure Sensor Shield Cometeo F8000

Complete protection for the entire measuring device inside the shield.

New dual-color plate design with black undersides to absorb radiation and white topsides to reflect it, offering high reflectivity, low thermal conductivity, and maximum weather resistance.

A mirror to eliminate the reflection of rays from water surface, snow or desert sand.

### Sensor Shield with Single Probe Port Cometeo F8001

Protective shield with a port for one probe, ensuring accurate measurement.

### Sensor Shield with Four Probe Ports Cometeo F8004

Protective shield with four ports for probes, designed for comprehensive measurements.

Passively ventilated requires no power.

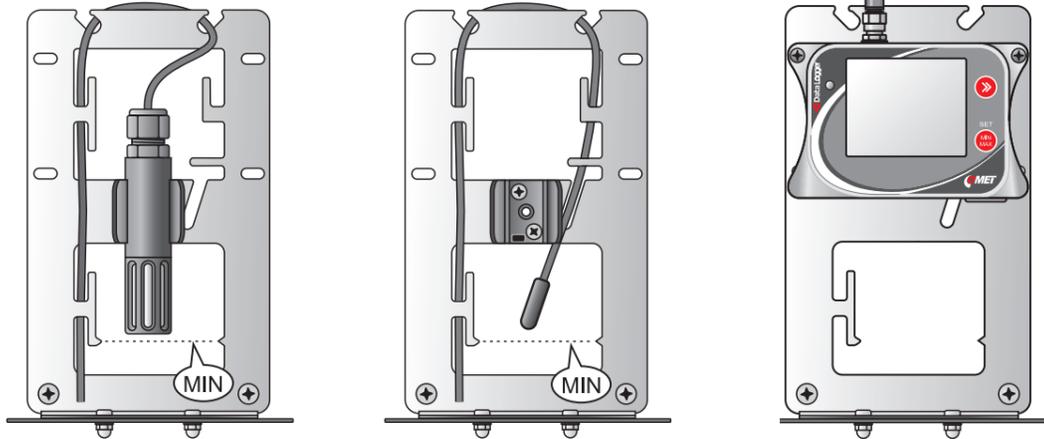
One or four cable glands for installation of external probes.





# Available Types of COMETEO with COMET Compatible Measuring Devices

Holder for sensors, probes, and other measurement equipment designed for placement inside the cylindrical space of the COMETEO. This space has a diameter of 210 mm or 110 mm and offers various attachment options to the universal mount



GSM/LTE Dataloggers



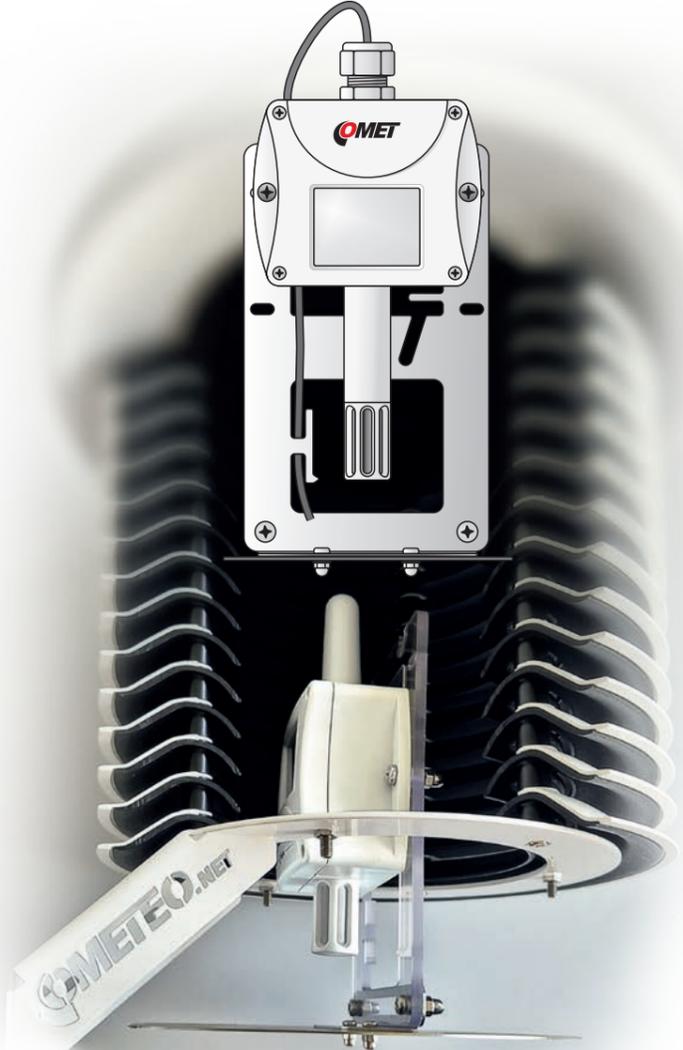
LoRa Senesors



Sigfox Senesors



Analog Senesors



1.

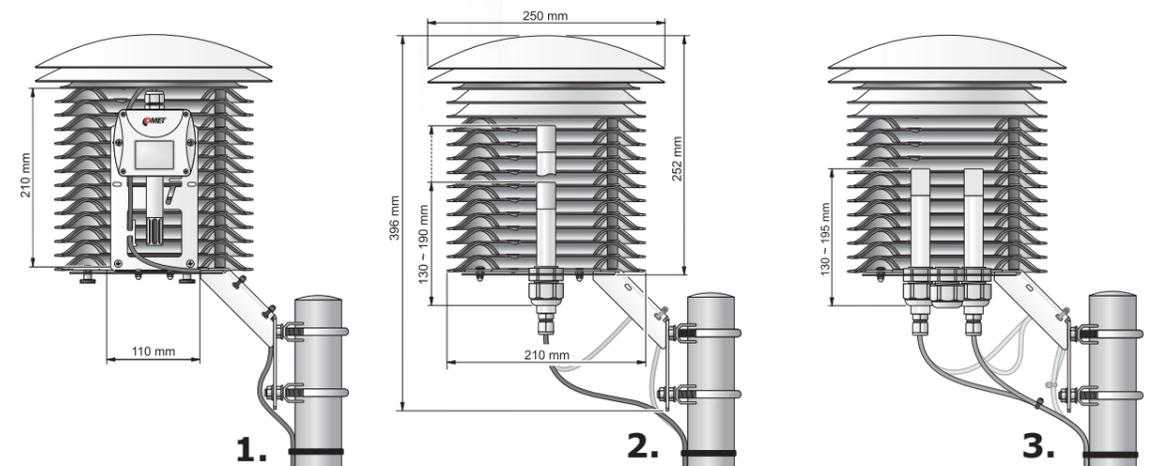
The Cometeo F8000 features lamellas with a large diameter of 210 mm, providing full protection for measuring devices located within its cylindrical space, which has a diameter of 110 mm.

2.

The F8001 is a universal, naturally ventilated weather shield designed to protect measuring probes with diameters ranging from 13 to 18 mm from weather effects. If needed, a weather shield with mounting bushings can be provided for probes of different sizes.

3.

F8004 - version with four bushings  
**Version 2 and 3 can be used with most devices and probes, e.g. Vaisala, Rotronic.**





# Performance of COMETEO Radiation Shields in the Arctic

A Comparative Project Supported by the World Meteorological Organization (WMO)

The testing of radiation shields for temperature sensors in extreme Arctic conditions aimed to evaluate their performance and determine how different models affect the accuracy of temperature measurements. The study examined the impacts of solar radiation, wind speed, and snow cover. The objectives were to compare shields used by national meteorological services, update knowledge on their performance characteristics, and assess the relative influence of external factors on measurements. The results contribute to a better understanding of the factors affecting measurement uncertainties and enhance data comparability in extreme conditions.

**Arctic Performance Excellence:** COMETEO radiation shields were rigorously tested in Ny-Ålesund, Svalbard, highlighting their reliability in extreme Arctic conditions as part of a WMO-supported intercomparison project.

**Robust Design for Accurate Measurements:** Particularly in naturally ventilated versions, COMETEO shields excelled under low solar irradiance and high winds, proving ideal for precision in challenging climates.

**Minimal Impact from Reflected Solar Radiation:** The shields effectively minimized the impact of reflected solar radiation from snow-covered ground, ensuring accurate temperature readings.

**High Data Quality Assurance:** A 94.5% pass rate in quality control tests underscores the shields' contribution to reliable and robust data collection, crucial for meteorological research.

**Minimal Residual Solar Radiation Influence:** COMETEO shields showed negligible internal solar radiation, even with high emissivity thermometers, maintaining accurate readings in direct sunlight.

**Proven Reliability in Windy Conditions:** The shields consistently delivered accurate measurements with minimal lag-time across various wind conditions, essential for real-time climate monitoring.

**Strong Reference Performance:** The COMETEO shield at pole 1 was chosen as the reference for the study, setting the benchmark for other shields in the comparison.



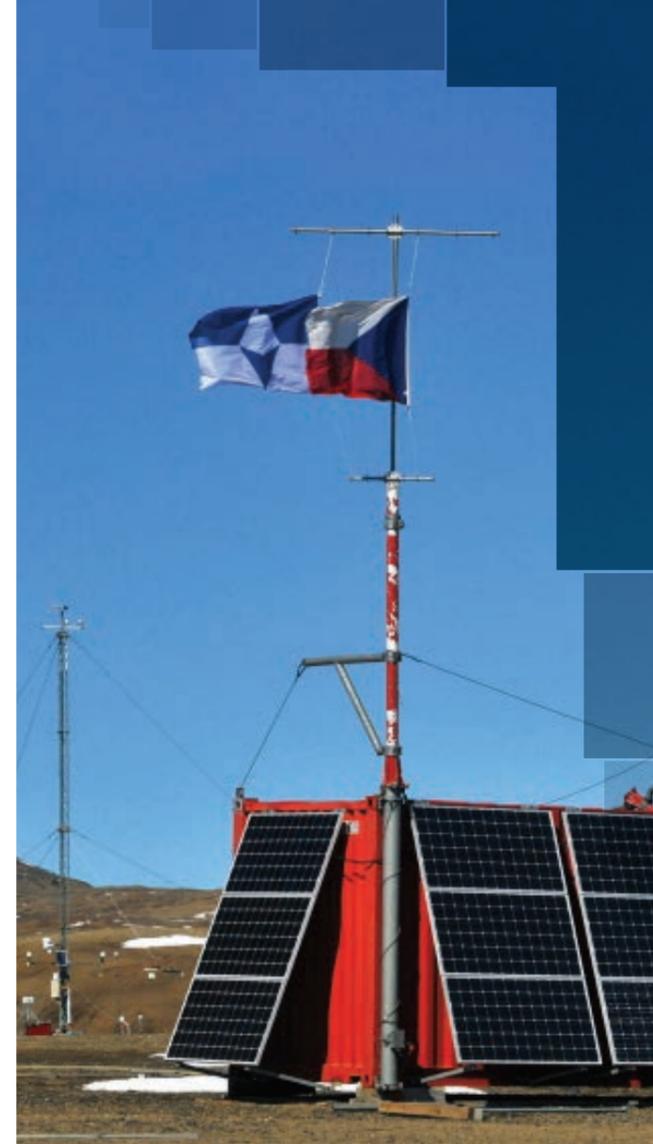
# COMETEO Successfully Tested in Antarctica

Tested and Certified by Masaryk University and Czech Antarctic Research Programme

COMET System has established cooperation with Masaryk University in Brno and is involved in its research at the Czech polar station Johann Gregor Mendel, located on James Ross Island.

The U3121 datalogger and a temperature and humidity probe are used for measurements in Antarctic conditions where temperatures drop well below freezing. The entire set is housed in a COMETEO F8000 which protects the datalogger and sensors in extreme conditions.

The datalogger U0141 is used as an additional measuring instrument with the usual temperature probes, but also with probes for cryo environments. With these sensors it is possible to measure both air temperature and temperature just above the surface.



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