HT305, HT304k Irradiance Sensor User Manual

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HT305, HT304k Irradiance Sensor

Product Information

Technical Specifications

This product is designed for measuring irradiation and is equipped with various safety features for user protection.

Description

The product is designed for use in solar panel installations to measure irradiation levels. It comes with specific accessories for accurate readings.

Product Usage Instructions

Precautions and Safety Measures

Before using the product, carefully read and follow all safety instructions mentioned in the user manual. Failure to do so may result in damage to the instrument or its components.

General Description

The product consists of monofacial modules designed to measure irradiation on the front side of the module (F). Ensure proper handling and care during use.

Preparation for Use

Initial Checks

Prior to usage, perform initial checks to ensure all components are in place and functioning correctly.

During Use

While using the product, follow the recommendations and instructions provided to achieve accurate measurements.

Nomenclature

Accessory Description

The accessory includes features such as screw holes for mounting, a monocrystalline reference cell, and output connectors.

Frequently Asked Questions

- **Q: How should I clean the accessory?**
  - A: Use a soft cloth dampened with mild soap and water to gently clean the accessory surface. Avoid using harsh chemicals or abrasive materials.
- **Q: What should I do if the product malfunctions?**
  - A: Refer to the user manual troubleshooting section or contact customer service for assistance in case of product malfunction.

PRECAUTIONS AND SAFETY MEASURES

Accessories HT305 and HT304k have been designed in compliance with the safety directives relevant to electronic measuring instruments. Further in this manual, model HT305 will be referred to as “accessory” unless otherwise specified. For your own safety and to avoid damaging the accessory, you are recommended to follow the procedures described in this manual and read carefully all instructions preceded by symbol  . Before and after carrying out measurements, carefully observe the following instructions:

CAUTION

- Do not carry out any measurements in case gas, explosive materials or flammables are present, or in dusty environments
- Even though no measurement is being carried out, please avoid any contact with the circuit to be tested, with exposed metal parts, unused measuring terminals, circuits, etc.
- Do not carry out any measurement in case you find anomalies in the accessory such as deformation, breaks, substance leaks, etc.
- Pay the utmost attention when measuring voltages higher than 25V in special environments (building yards, etc.) and higher than 50V in ordinary environments due to the risk of electric shock

In this manual, and on the accessory, the following symbols are used:

- CAUTION: it is necessary to consult the instruction manual to identify the nature of the potential danger and the actions to be taken.

- The symbol on the accessory indicates that the appliance and its accessories must be collected separately and correctly disposed of

PRELIMINARY INSTRUCTIONS

- Do not subject the protection glass of the solar cell to mechanical shock to prevent any damage.
- Avoid rubbing the protection glass with abrasive bodies.
- Do not apply any voltage to the accessory's outputs.
- Do not subject the output connector or the connection cable to strong mechanical shock.
- Carefully clean the glass with a soft humid cloth before carrying out measurements.
- Do not use alcohol, acetone, or solvents to clean the glass.
- Install the accessory in a position free from obstacles which could cast shadows or cause reflections of light onto the sensor different from the ones the PV modules to be tested are exposed to

CAUTION

If the accessory is to be used to measure irradiance in photovoltaic installations:

- Assemble the sensor is a parallel position with respect to the surface of the panels, with a maximum error of + 2°. If the sensor is not perfectly parallel to the surface of the modules, the measured result could be altered.
- Use the relevant fastening bracket provided with the accessory and install it in a position that allows the cell to be hit by the same radiation the PV modules/strings are exposed to (typically central position with respect to the panels' axis). Once the bracket is in position, tighten the fastening screws and finally check that sensor and module are parallel.
- Expose the sensor to the testing conditions (irradiance, temperature, tilt angle) for at least 1 minute before carrying out any measurement, in order to prevent using the sensor before it has reached the operating conditions

GENERAL DESCRIPTION

The accessory you just bought, if used according to the instructions given in this manual, guarantees accurate and reliable measurements thanks to the stability of the used cell and to the possibility of compensating the effects of temperature on the cell itself through the in-built temperature sensors.

FUNCTIONS OF ACCESSORY HT305

Accessory HT305 measures irradiance only when connected to the remote unit SOLAR03 through an in-built monocrystalline cell, and can be used with two different kinds of modules, built according to two different technologies:

- MONOFACIAL modules → measurement of irradiance only on the module's front (F)
- BIFACIAL modules → measurement of irradiance both on the module's front (F) and on the module's back (obtained by reflection from the surrounding environment) by dividing the high back part (BH = BackHigh) and the low back part (BL = BackLow). In this case, it is necessary to use three HT305 cells

CAUTION

Irradiance can only be measured by connecting accessory HT305 to the remote unit SOLAR03, which automatically detects the measuring sensitivity after connection

FUNCTIONS OF ACCESSORY HT304K

Accessory HT304k measures irradiance when connected to remote unit SOLAR-02 and with Master instruments provided with 3-pole HT connectors (PVCHECK, PVCHECKs, I-V400x, I-V500w, SOLAR I-Vx) by means of an in-built monocrystalline cell and can be used on MONOFACIAL modules.

CAUTION

- Accessory HT304k CANNOT be connected to remote unit SOLAR03, since it is provided of a 3-pole connector.
- The backside of model HT304k reports the calibration constants of the accessory (sensitivity) and the temperature coefficients to compensate its effects (alpha) which must be set on the remote unit SOLAR-02 or on the Master instruments provided with 3-pole HT connectors (PVCHECK, PVCHECKs, IV400x, I-V500w, SOLAR I-Vx) to obtain correct irradiance values

PREPARATION FOR USE

INITIAL CHECKS

Before shipping, the accessory has been checked from an electric as well as a mechanical point of view. All possible precautions have been taken so that it is delivered undamaged. However, we suggest checking it rapidly, to detect possible damage which may have occurred during transport. In case anomalies are found, immediately contact the Dealer. We also recommend checking that the packaging contains all components indicated in § 7.3.1. In case of discrepancy, please contact the Dealer. In case the accessory should be returned, please follow the instructions given in § 8..

DURING USE

Please carefully read the following recommendations and instructions

CAUTION

Failure to comply with the caution notes and/or instructions may damage the instrument and/or its components, or be a source of danger for the operator

- Avoid moving or shading the sensor during use.
- When the accessory is connected to the circuit being measured, do not touch any unused terminal

POWER SUPPLY

The accessory is a passive sensor and does not need any external power supply

STORAGE

In order to guarantee precise measurement, and protect the accessory from possible damage, after a long storage time under extreme environmental conditions, wait for the instrument to come back to normal operating conditions (see § 7.2).

NOMENCLATURE

ACCESSORY DESCRIPTION

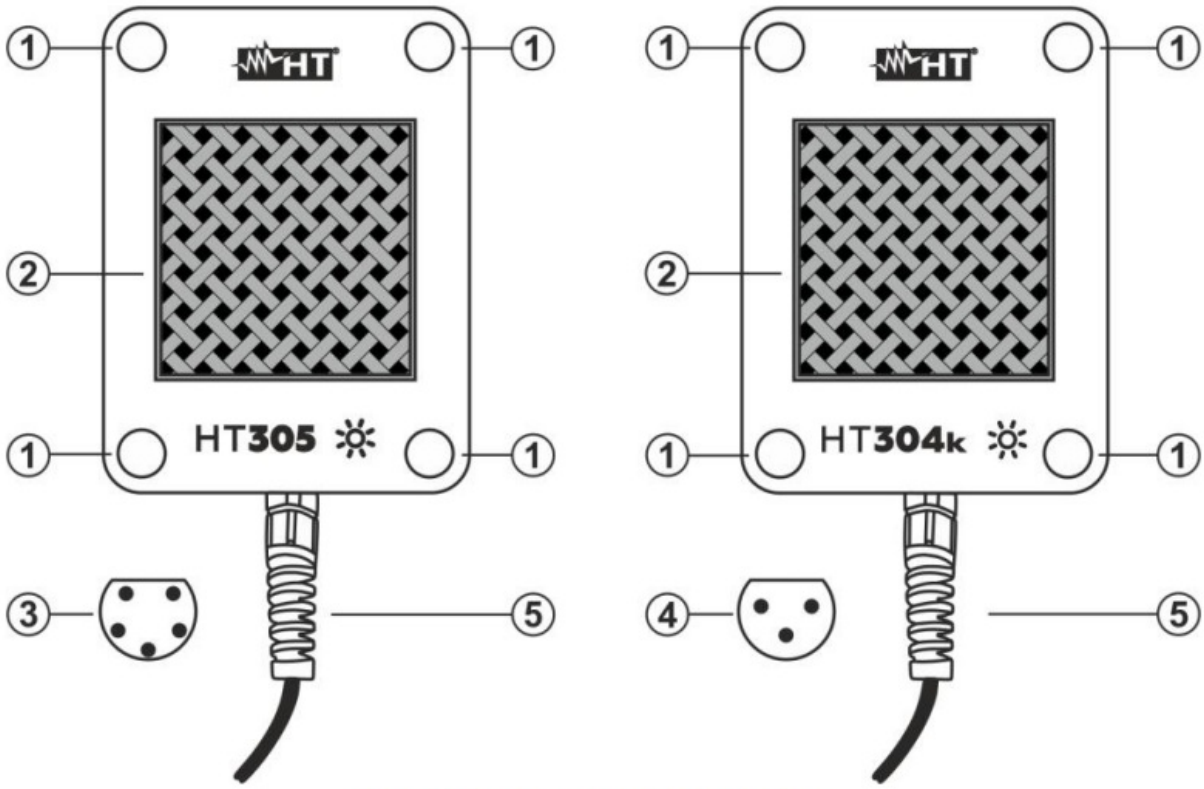

Fig. 1 Accessory description

1. Holes for screws fastening the accessory to the metal bracket
2. A monocrystalline reference cell
3. Output connector with 5 poles (HT305)
4. Output connector with 3 poles (HT304k)
5. Cable for connection to Master instrument or remote units

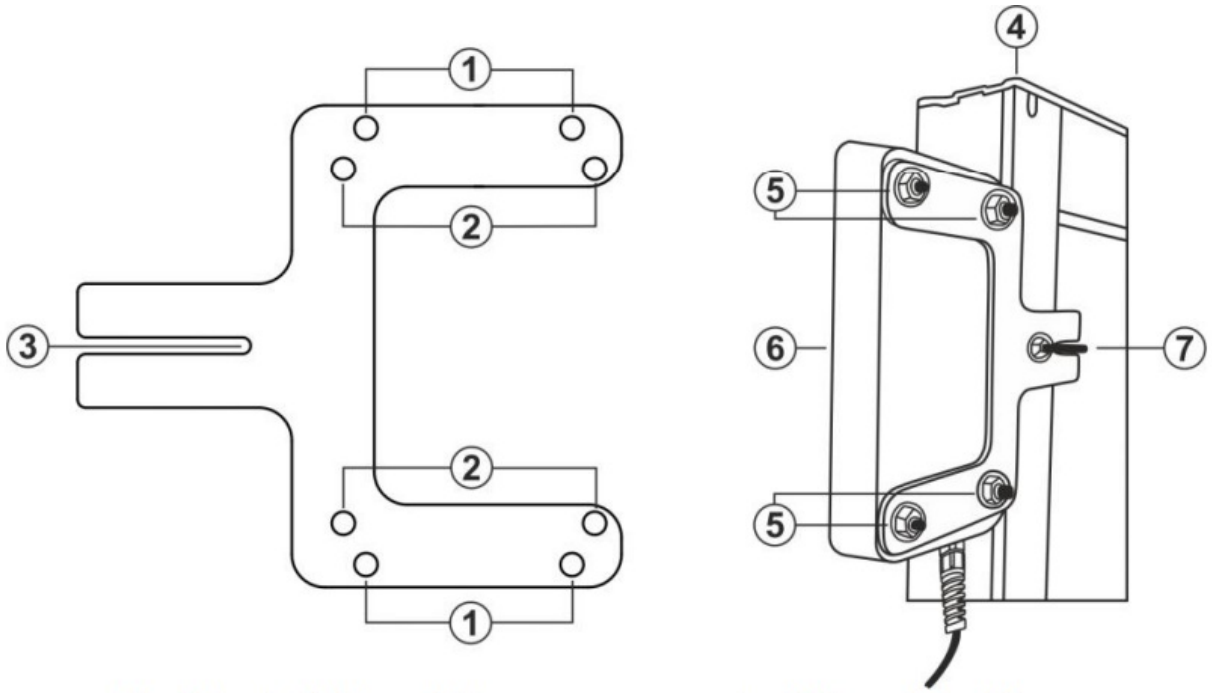

Fig. 2 Installation of the accessory onto PV modules' frame

1. Holes for screws fastening accessory HT304N to metal bracket
2. Holes for screws fastening accessory HT305 and HT304k to metal bracket 6 Accessory assembled to bracket
3. Slot for fastening bracket to PV module's frame 7 Screw for the fastening bracket to PV module's frame
4. PV module frame
5. Screws fastening accessory to bracket

OPERATING INSTRUCTIONS

USE OF THE ACCESSORY

This manual contains the instructions to be followed in case the accessory is to be used for irradiance measurements on photovoltaic installations. The described procedures are generally valid also for other applications.

1. Fasten the provided bracket (see Fig.2 – left side) in a central position with respect to the axis of the PV modules (see Fig.2 – right side). The bracket is provided with a fastening system with screws, compatible with the holes found on the back side of the PV modules' frame (see Fig.2 – part 3).
2. Check that the bracket always rests on the border of the module.
3. Once the bracket has been positioned, insert the accessory onto its support.
4. Connect the connection cable's connector (5 poles for HT305 or 3 poles for HT304k – see Fig.1 – parts 3 and 4) to the remote unit SOLAR03 (HT305) or to the remote unit SOLAR-02 or to Master instruments with 3-pole HT connector (HT304k).
5. Always check that the sensor and the photovoltaic module being tested are parallel (max error + 2°). If the sensor is not perfectly parallel to the module's surface, the measured result could be considerably altered.
6. Tighten the fastening screws.
7. Expose the sensor of the accessory to the testing conditions (irradiance, temperature, tilt angle) for at least 1 minute before carrying out any measurement, to prevent using the sensor before it has reached the operating conditions

MAINTENANCE

CAUTION

While using and storing the accessory, carefully observe the recommendations listed in this manual in order to prevent possible damage or danger during use

CLEANING

Use a soft and humid cloth to clean the accessory. Never use acetone, solvents, alcohol, sponges or abrasive cloths, etc.

TECHNICAL SPECIFICATIONS

TECHNICAL CHARACTERISTICS

Accuracy referred to STC conditions (1000W/m2, 25°C, AM=1.5)

Irradiance measurement	
Measuring range [W/m²]	**Accuracy**
5 ÷ 100	±(3.0% reading + 5W/m²)
101 ÷ 1400	±3.0% reading

Sensitivity: 20µV/W/m² ÷ 28.6 µV/W/m²

GENERAL CHARACTERISTICS

Reference guidelines

- EMC: IEC/EN61326-1
- Technical documentation: IEC/EN61187
- Calibration: IEC/EN60904-2
- Pollution level: 2

Electrical characteristics

- Type of photovoltaic cell: Monocrystalline
- Internal temperature sensor: PT1000
- Visual range: ≥160°
- Output connector: 5-pole HT connector (HT305)
- 3-pole HT connector (HT304k)
- Length of output cable: approx. 2m

Mechanical characteristics

- Dimensions (L x W x H): 111 x 85 x 28mm (4 x 3 x 1in)
- Weight (with connection cable): 240g (8 ounces)

- Mechanical protection: IP65 according to IEC/EN60529

Environmental conditions for use

- Operating temperature: -20°C ÷ 70°C (-4°F ÷ 158°F)
- Operating humidity: <95%RH (10°C÷30°C) no condensation
    - <75%RH (30°C÷40°C) no condensation
    - <55%RH (40°C÷50°C) no condensation
- Max height of use: 2000m (6562ft)

This accessory complies with European Directive EMC 2014/30/EU This accessory satisfies the requirements of European Directive 2011/65/EU (RoHS) and 2012/19/EU (WEEE)

ACCESSORIES

Standard accessories

See the attached packing list

Service

WARRANTY CONDITIONS

This instrument is warranted against any material or manufacturing defect, in compliance with the general sales conditions. During the warranty period, defective parts may be replaced. However, the manufacturer reserves the right to repair or replace the product. Should the instrument be returned to the After-sales Service or to a Dealer, transport will be at the Customer's charge. However, shipment will be agreed in advance. A report will always be enclosed to a shipment, stating the reasons for the product's return. Only use original packaging for shipment; any damage due to the use of nonoriginal packaging material will be charged to the Customer. The manufacturer declines any responsibility for injury to people or damage to property.

The warranty shall not apply in the following cases:

- Repair and/or replacement of accessories and batteries (not covered by warranty).
- Repairs that may become necessary because of an incorrect use of the instrument or due to its use together with non-compatible appliances.
- Repairs that may become necessary because of improper packaging.
- Repairs which may become necessary because of interventions performed by unauthorized personnel.
- Modifications to the instrument performed without the manufacturer's explicit authorization.
- Use not provided for in the instrument's specifications or in the instruction manual.

SERVICE

If the instrument does not operate properly, before contacting the After-sales Service, please check the conditions

of the battery and replace it, if necessary. Should the instrument still operate improperly, check that the product is operated according to the instructions given in this manual. Should the instrument be returned to the After-sales Service or to a Dealer, transport will be at the Customer’s charge. However, shipment will be agreed in advance. A report will always be enclosed to a shipment, stating the reasons for the product’s return. Only use original packaging for shipment; any damage due to the use of non-original packaging material will be charged to the Customer

Documents / Resources

	HT HT305, HT304k Irradiance Sensor [pdf] User Manual HT305, HT305 HT304k Irradiance Sensor, HT305 Irradiance Sensor, HT304k Irradiance Sensor , Irradiance Sensor, Irradiance, Sensor

References

- User Manual