



## HD2301.0 HYGRO-THERMOMETER

The **HD2301.0** is a portable instrument with a large LCD display. It measures relative humidity and temperature using a Pt100 sensor or thermocouple humidity/temperature combined probe. Temperature only is measured by immersion, penetration or contact probes. The sensor can be a Pt100 or Pt1000.

When the humidity/temperature combined probe is connected, the instrument calculates and displays the absolute humidity, the dew point, the partial vapour pressure. The probes are fitted with an automatic detection module, with the factory calibration data already stored inside. The Max, Min and Avg function calculate the maximum, minimum or average values. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off that can also be excluded. **The instruments have IP67 protection degree.**

### INSTRUMENT TECHNICAL CHARACTERISTICS

#### Instrument

|   |   |
|---|---|
| Dimensions<br>(Length x Width x Height) | 140x88x38mm                                       |
| Weight                                  | 160g (complete with batteries)                    |
| Materials                               | ABS   |
| Display                                 | 2x4½ digits plus symbols<br>Visible area: 52x42mm |

#### Operating conditions

|                           |                                |
|---------------------------|--------------------------------|
| Operating temperature     | -5...50°C                      |
| Storage temperature       | -25...65°C                     |
| Working relative humidity | 0...90%RH without condensation |

**Protection degree** **IP67**

#### Power

|                                    |   |
|------------------------------------|---|
| Batteries                          | 3 1.5V type AA batteries                  |
| Autonomy                           | 200 hours with 1800mAh alkaline batteries |
| Power absorbed with instrument off | < 20µA                                    |

**Measuring unit** °C - °F - %RH - g/m³ - Td - hPa

#### Connections

Input module for the probes 8-pole male DIN45326 connector

#### Measurement of relative humidity by Instrument

|                    |             |
|--------------------|-------------|
| Measurement range  | 0...100%RH  |
| Resolution         | 0.1%RH      |
| Accuracy           | ±0.1%RH     |
| Drift after 1 year | 0.1%RH/year |

#### Measurement of temperature by Instrument

|                          |               |
|--------------------------|---------------|
| Pt100 measurement range  | -200...+650°C |
| Pt1000 measurement range | -200...+650°C |
| Resolution               | 0.1°C         |
| Accuracy                 | ±0.1°C        |
| Drift after 1 year       | 0.1°C/year    |

#### Relative humidity and temperature probes using SICRAM module

| Model     | Temperature sensor | Working range |                | Accuracy   |        |
|-----------|--------------------|---------------|----------------|--|--------|
|           |                    | %RH           | Temperature    | %RH  | Temp   |
| HP472ACR  | Pt100              | 0...100%RH    | -20°C...+80°C  | ±1,5%RH (10...90%RH)<br>±2,5%RH (in the remaining range) | ±0.3°C |
| HP572ACR  | Thermocouple K     | 0...100%RH    | -20°C...+80°C  |  | ±0.5°C |
| HP473ACR  | Pt100              | 0...100%RH    | -20°C...+80°C  | -40°C...150°C (180°C)                                    | ±0.3°C |
| HP474ACR  | Pt100              | 0...100%RH    | -40°C...+150°C |  | ±0.3°C |
| HP475ACR  | Pt100              | 0...100%RH    | -40°C...+150°C | ±(1,5+0,02 times the displayed value)                    | ±0.3°C |
| HP475AC1R | Pt100              | 0...100%RH    | -40°C...+150°C |  | ±0.3°C |
| HP477DCR  | Pt100              | 0...100%RH    | -40°C...+150°C | ±0.3°C   | ±0.3°C |
| HP478ACR  | Pt100              | 0...100%RH    | -40°C...+150°C |  | ±0.3°C |

#### Common characteristics

##### Relative humidity

|  |  |
|--|--|
| Sensor   | Capacitive   |
| Typical capacity @30%RH                              | 300pF±40pF   |
| Sensor operating temperature<br>(depending on model) | -20°C...+80°C<br>-40°C...+150°C                      |
| Measuring range                                      | 0÷100%RH   |
| Uncertainty  | ±1,5%RH (10...90%RH) ±2,5%RH in the remaining range) |
| Resolution   | 0.1%RH   |
| Temperature drift @ 20°C                             | 0.02%RH/°C   |
| Response time %RH at constant temperature            | 10sec (10÷80%RH; air speed=2m/s)                     |

##### Temperature with sensor Pt100

|                          |           |
|--------------------------|-----------|
| Resolution               | 0.1°C     |
| Temperature drift @ 20°C | 0.003%/°C |

##### Temperature with thermocouple K - HP572ACR

|                          |          |
|--------------------------|----------|
| Resolution               | 0.1°C    |
| Temperature drift @ 20°C | 0.02%/°C |

### TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT

#### Temperature probes Pt100 sensor with SICRAM module

| Model            | Type                     | App. range      | Accuracy  |
|------------------|--------------------------|-----------------|---|
| TP472I           | Immersion                | -196°C...+500°C | ±0.25°C (-196°C...+350°C)<br>±0.4°C (+350°C...+500°C) |
| TP472I.0         | Immersion                | -50°C...+400°C  | ±0.25°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP473P           | Penetration              | -50°C...+400°C  | ±0.25°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP473P.0         | Penetration              | -50°C...+400°C  | ±0.25°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP474C           | Contact                  | -50°C...+400°C  | ±0.3°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)   |
| TP474C.0         | Contact                  | -50°C...+400°C  | ±0.3°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)   |
| TP475A.0         | Air                      | -50°C...+250°C  | ±0.3°C (-50°C...+250°C)                               |
| TP472I.5         | Immersion                | -50°C...+400°C  | ±0.3°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)   |
| TP472I.10        | Immersion                | -50°C...+400°C  | ±0.30°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP49A            | Immersion                | -70°C...+400°C  | ±0.25°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP49AC           | Contact                  | -70°C...+400°C  | ±0.25°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP49AP           | Penetration              | -70°C...+400°C  | ±0.25°C (-50°C...+350°C)<br>±0.4°C (+350°C...+400°C)  |
| TP875            | Globethermometer Ø 150mm | -30°C...+120°C  | ±0.25°C   |
| TP876            | Globethermometer Ø 50mm  | -30°C...+120°C  | ±0.25°C   |
| TP87             | Immersion                | -50°C...+200°C  | ±0.25°C   |
| TP878<br>TP878.1 | For solar panel          | +5°C...+80°C    | ±0.25°C   |
| TP879            | For compost              | -20°C...+120°C  | ±0.25°C   |

#### Common characteristics

Temperature drift @ 20°C 0.003%/°C

#### 4 wire Pt100 and 2 wire Pt1000 Probes

| Model     | Type           | Application range | Accuracy |
|-----------|----------------|-------------------|----------|
| TP47.100  | Pt100 4 wires  | -50...+400°C      | Class A  |
| TP47.1000 | Pt1000 2 wires | -50...+400°C      | Class A  |

#### Common characteristics

|                          |           |
|--------------------------|-----------|
| Temperature drift @ 20°C |           |
| Pt100                    | 0.003%/°C |
| Pt1000                   | 0.005%/°C |

#### ORDER CODES

**HD2301.0:** The kit is composed of the instrument HD2301.0, 3 1.5V alkaline batteries, operating manual, case. **Probes and cable must be ordered separately.**

#### Relative humidity and temperature probes complete with SICRAM module

- HP472ACR:** %RH and temperature combined probe, dimensions Ø 26x170 mm. 2 m connecting cable.
- HP572ACR:** %RH and temperature combined probe, **K thermocouple sensor.** Dimensions Ø 26x170 mm. 2 m connecting cable.
- HP473ACR:** %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x110 mm. 2m connecting cable.
- HP474ACR:** %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x210 mm. 2m connecting cable.
- HP475ACR:** %RH and temperature combined probe. 2 m connecting cable. Handle Ø 26x110 mm. Stainless-steel tube Ø 12x560 mm. Terminal tip Ø 13.5x75 mm.
- HP475AC1R:** %RH and temperature combined probe. 2 m connection cable. Handle Ø 26x110 mm. Stainless steel stern Ø 14x480 mm.
- HP477DCR:** %RH and temperature combined sword probe. 2 m connecting cable. Handle Ø 26x110 mm. Probe tube 18x4 mm, length 520 mm.
- HP478ACR:** %RH and temperature combined probe. Dimensions Ø 14x130 mm. 5m connection cable.

#### Temperature PROBES complete with SICRAM module

- TP472I:** Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 300 mm. Cable length 2 metres.
- TP472I.0:** Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.
- TP473P:** Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
- TP473P.0:** Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
- TP474C:** Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.
- TP474C.0:** Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.
- TP475A.0:** Air probe, Pt100 sensor. Stem Ø 4mm, length 230mm. Cable length 2 metres.
- TP472I.5:** Immersion probe, Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable length 2 metres.
- TP472I.10:** Immersion probe, Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable length 2 metres.
- TP875:** Globe thermometer Ø 150mm with handle, cable length 2 metres.

**TP876:** Globe thermometer Ø 50mm with handle. Cable 2 metres.

**TP87:** Immersion probe, Pt100sensor. Stem Ø 3mm, length 70mm. Cable 2 metres.

**TP878:** Contact probe for solar panels. Cable 2 metres

**TP878.1:** Contact probe for solar panels. Cable 5 metres.

#### Temperature probes without SICRAM module

- TP47.100:** 4 wire direct Pt100 sensor immersion probe, Probe's stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 metres.
- TP47.1000:** Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 metres.
- TP47:** Only connector for probe connection: direct 4 wires Pt100 and 2 wires Pt1000.

#### Accessories

- HD11:** Saturated solution at 11.3%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
- HD33:** Saturated solution at 33.0%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
- HD75:** Saturated solution at 75.4%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.

#### Protection for humidity probes Ø 26 M24x1,5

- P1:** Stainless steel grid protection for probes Ø 26 mm.
- P2:** 20µ sintered polyethylene PE protection for probes Ø 26 mm.
- P3:** 20µ sintered bronze protection for probes Ø 26 mm.
- P4:** 20µ sintered PE complete cap for probes Ø 26 mm.

#### Protection for humidity probes Ø 14 M12x1

- P5:** Stainless steel grid protection for probes Ø 14 mm.
- P6:** 20µm sintered complete protection made of stainless steel for probes Ø 14 mm.
- P7:** 10µm sintered complete protection made of PTFE for probes Ø 14 mm.
- P8:** Stainless steel grid and Pocan protection for probes Ø 14 mm.



Humidity



HD11 / HD33 / HD75

