



## 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, air 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 (Length x Width x Height)	140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
Display	2x4½ digits plus symbols Visible area: 52x42mm

#### Operating conditions

Operating temperature	-5...50°C
Storage temperature	-25...65°C
Working relative humidity	0...90%RH without condensation
<b>Protection degree</b>	<b>IP67</b>

#### 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/m<sup>3</sup> - Td - hPa

#### Connections

Input module for the probes	8-pole male DIN45326 connector
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#### 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)	±0.3°C
HP572ACR	Thermocouple K	0...100%RH	-20°C...+80°C	±2,0%RH (in the remaining range) for T= 15...35°C	±0.5°C
HP473ACR	Pt100	0...100%RH	-20°C...+80°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+1.5% of the displayed value) %RH in the remaining temperature range	±0.3°C
HP475AC1R	Pt100	0...100%RH	-40°C...+180°C		±0.3°C
HP477DCR	Pt100	0...100%RH	-40°C...+150°C		±0.3°C
HP478ACR	Pt100	0...100%RH	-40°C...+150°C		±0.3°C

#### Common characteristics

##### Relative humidity

Sensor	Capacitive
Measuring range	0=100%RH
Temperature drift @ 20°C	Max 0.02%RH/°C
Response time %RH	10sec (10=80%RH; air speed=2m/s) at constant air temperature

##### Temperature with sensor Pt100

Temperature drift @ 20°C	0.003%/°C
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##### Temperature with thermocouple K - HP572ACR

Temperature drift @ 20°C	0.02%/°C
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Same specifications reported above apply for **HP 480** probe (for measuring humidity of the air in pipes), with the following exceptions:

HP480		
Temperature	Measuring range	-40...+60°C
Humidity	Dew point	-40...+60°C DP
Environmental Conditions	Working temperature	-40...+60°C
	Working pressure	16bar max

### 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...+300°C) ±0.5°C (+300°C...+500°C)
TP472I.0 <i>1/3DIN - Thin film</i>	Immersion	-50°C...+300°C	±0.25°C
TP473PI	Penetration	-50°C...+400°C	±0.25°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP473P.0 <i>1/3DIN - Thin film</i>	Penetration	-50°C...+300°C	±0.25°C
TP474C.I	Contact	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP474C.0 <i>1/3DIN - Thin film</i>	Contact	-50°C...+300°C	±0.3°C
TP475A.0 <i>1/3DIN - Thin film</i>	Air	-50°C...+250°C	±0.3°C
TP472I.5	Penetration	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP472I.10	Penetration	-50°C...+400°C	±0.30°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP49A.0 <i>Class A - Thin film</i>	Immersion	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AC.0 <i>Class A - Thin film</i>	Contact	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AP.0 <i>Class A - Thin film</i>	Penetration	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP875.I	Globethermometer Ø150mm	-30°C...+120°C	±0.25°C
TP876.I	Globethermometer Ø 50mm	-30°C...+120°C	±0.25°C
TP87.0 <i>1/3DIN - Thin film</i>	Immersion	-50°C...+200°C	±0.25°C
TP878.0 <i>1/3DIN - Thin film</i> TP878.1.0 <i>1/3DIN - Thin film</i>	For solar panel	+4°C...+85°C	±0.25°C
TP879.0 <i>1/3DIN - Thin film</i>	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
TP47.100.0 1/3DIN - Thin film	Pt100 4 wires	-50...+250°C	1/3DIN
TP47.1000.0 1/3DIN - Thin film	Pt1000 2 wires	-50...+250°C	1/3DIN
TP87.100.0 1/3DIN - Thin film	Pt100 4 wires	-50...+200°C	1/3DIN
TP87.1000.0 1/3DIN - Thin film	Pt1000 2 wires	-50...+200°C	1/3DIN

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 14x120 mm. 2m connecting cable.
- HP474ACR:** %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x215 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 14x75 mm.
- HP475AC1R:** %RH and temperature combined probe. 2 m connection cable. Handle Ø 26x80 mm. Stainless steel stem 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.
- HP480:** Probe for the measurement of air humidity in pipes. 2m connecting cable. 1/4" Italian Standard quick coupling. AISI 304 measuring chamber.

**Temperature probes complete with SICRAM module**

- TP472I:** Wire wound Pt100 sensor, immersion probe. Stem Ø 3 mm, length 300 mm. Cable length 2 m.
- TP472I.0:** Thin film Pt100 sensor, immersion probe. Stem Ø 3 mm, length 230 mm. Cable length 2 m.
- TP473P.I:** Wire wound Pt100 sensor, penetration probe. Stem Ø 4mm, length 150 mm. Cable length 2 m.
- TP473P.O:** Thin film Pt100 sensor, penetration probe. Stem Ø 4mm, length 150 mm. Cable length 2 m.
- TP474C.I:** Wire wound Pt100 sensor, contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 m.
- TP474C.O:** Thin film Pt100 sensor, contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 m.
- TP475A.O:** Thin film Pt100 sensor, air probe. Stem Ø 4mm, length 230mm. Cable length 2 m.
- TP472I.5:** Thin film Pt100 sensor, penetration probe. Stem Ø 6mm, length 500 mm. Cable length 2 m.

- TP472I.10:** Thin film Pt100 sensor, penetration probe. Stem Ø 6mm, length 1000mm. Cable length 2 m.
- TP49A.O:** Thin film Pt100 sensor, immersion probe. Stem Ø 2,7mm, length 150mm. Cable length 2 m. Aluminium handle
- TP49AC.O:** Thin film Pt100 sensor, contact probe. Stem Ø 4mm, length 150mm. Cable length 2 m. Aluminium handle
- TP49AP.O:** Thin film Pt100 sensor, penetration probe. Stem Ø 2,7mm, length 150mm. Cable length 2 m. Aluminium handle
- TP875.I:** Wire wound Pt100 sensor, 150mm diameter globe-thermometer equipped with handle. Cable length 2 m.
- TP876.I:** Wire wound Pt100 sensor, 50mm diameter globe-thermometer equipped with handle. Cable length 2 m.
- TP87.O:** Thin film Pt100 sensor, immersion probe. Stem Ø 3 mm, length 70 mm. Cable length 2 m.
- TP878.O:** Thin film Pt100 sensor, contact probe for solar panels. Cable length 2 m.
- TP878.1.O:** Thin film Pt100 sensor, contact probe for solar panels. Cable length 5 m.
- TP879.O:** Thin film Pt100 sensor , penetration probe for compost. Stem Ø8mm, length 1000mm. Cable length 2m.

**Temperature probes without SICRAM module**

- TP47.100.O:** Thin film Pt100 sensor, immersion probe. Stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.
- TP47.1000.O:** Thin film Pt1000 sensor, immersion probe. Probe's Stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 m.
- TP47:** Module for the connection of Pt100 4-wire and Pt1000 2-wire probes.
- TP87.100.O:** Thin film Pt100 sensor, immersion probe. Stem Ø 3mm, length 70mm. 4-wires connection cable with connector, length 1 m.
- TP87.1000.O:** Thin film Pt1000 sensor, immersion probe. Stem Ø 3mm, length 70mm. 2-wires connection cable with connector, length 1 m.

**Accessories**

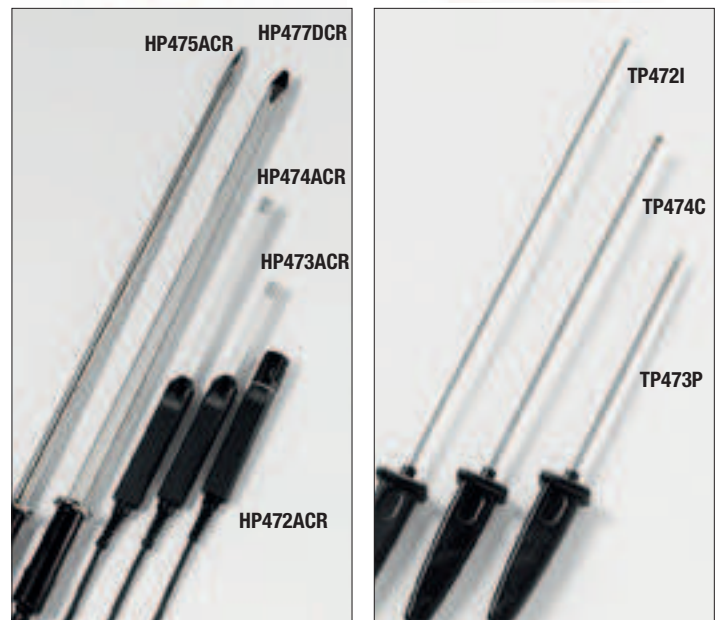
- HD33:** Saturated solution at 33.0%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
- HD75:** Saturated solution at 75.4%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.

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

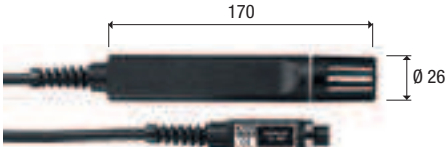
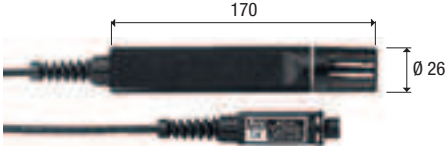
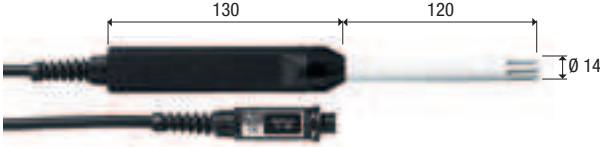
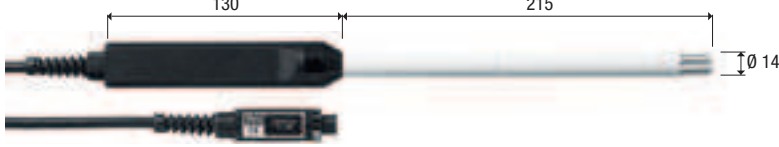

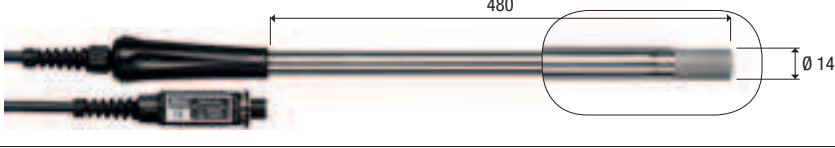

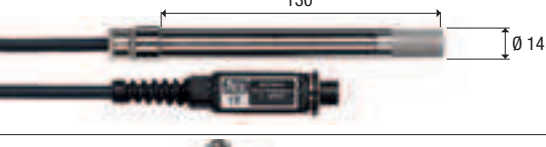
- P1:** Stainless steel 200µm grid protection for probes Ø 26 mm.
- P2:** 20µm sintered polyethylene PE protection for probes Ø 26 mm.
- P3:** 20µm sintered bronze protection for probes Ø 26 mm.
- P4:** 20µm sintered PE complete cap for probes Ø 26 mm.

**Protection for humidity probes Ø 14 M12x1**

- P6:** 10µm sintered complete protection made of AISI 316 stainless steel for probes Ø 14 mm.
- P7:** 20µm sintered complete protection made of PTFE for probes Ø 14 mm.
- P8:** Stainless steel 20µm grid and Pocan protection for probes Ø 14 mm.











## RELATIVE HUMIDITY AND TEMPERATURE PROBES

COD.	Sensors	Range RH - Temp.	USE
HP472ACR	RH Pt100	0...100% RH -20°C...+80°C	
HP572ACR	RH TC.K		
HP473ACR			
HP474ACR		0...100% RH -40°C...+150°C (-40°C...+180°C for HP475AC1R)	
HP475ACR	RH Pt100		
HP475AC1R			
HP477DCR			
HP478ACR			
HP480	RH Pt100		0...100% RH -40°C...+60°C

Humidity

## SATURATED SOLUTIONS AND PROBE PROTECTIONS

COD.			USE
HD75 HD33	Threaded ring nut M24 x 1,5 for probes Ø 26 Threaded ring nut M12 x 1 for probes Ø 14		
P1 P2 P3 P4	Ø 26	M 24x1,5	    <div style="display: flex; justify-content: space-around; width: 100%;"> <span>P1</span> <span>P2</span> <span>P3</span> <span>P4</span> </div>
P6 P7 P8	Ø 14	M 12x1	   <div style="display: flex; justify-content: space-around; width: 100%;"> <span>P6</span> <span>P7</span> <span>P8</span> </div>