1 YEAR WARRANTY

CE

OMEGA®

User's Guide

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MADE IN CHINA

RH297
Pinless Moisture Psychrometer with IR Thermometer + Bluetooth

OMEGA®

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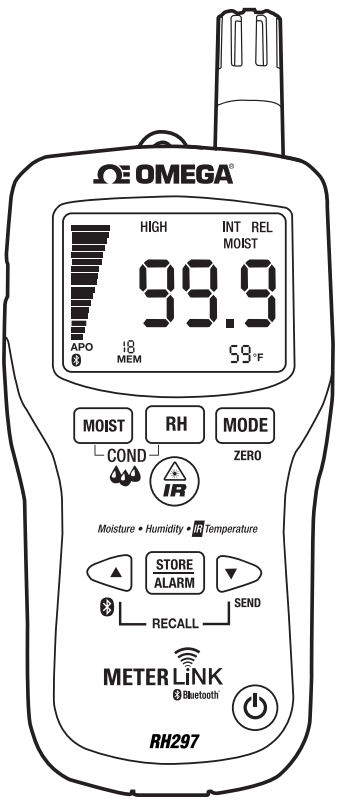
User's Guide

OMEGA®

Pinless Moisture Psychrometer with IR Thermometer + Bluetooth

Model RH297



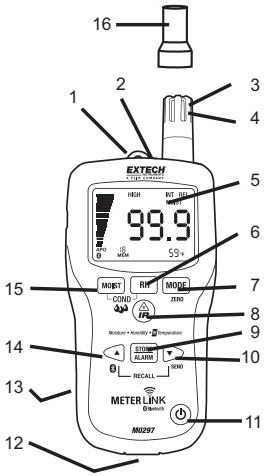
CE

Introduction

Congratulations on your purchase of the Extech MO297 with MeterLink bluetooth capabilities for use with Flir infrared cameras. This Pinless Moisture Meter incorporates a Patented Built-in IR Thermometer and 20 Point Memory. Monitor moisture in wood and other building materials with no surface damage with the Pinless Moisture sensor (Pin-type Moisture Probe included). Measure Humidity and Air Temperature with built-in probe plus non-contact InfraRed Temperature with patented IR design. Advanced functions provide Grains per Pound, Dew Point and Vapor Pressure calculations. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

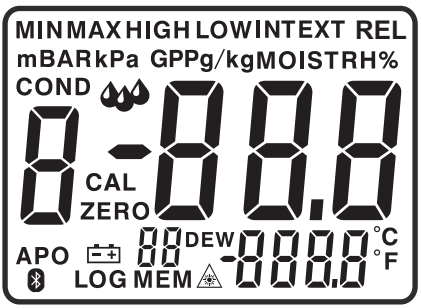
Meter Description

1. IR temperature sensor
2. Laser pointer
3. Humidity sensor
4. Temperature sensor
5. LCD display
6. Relative Humidity button
7. Mode/Zero Button
8. IR thermometer button
9. Alarm set button
10. Alarm adjust down / SEND button
11. ON/OFF power button
12. Remote pin probe input jack (bottom)
13. Battery compartment (rear)
14. Alarm adjust up / Bluetooth button
15. Moisture/Relative button
16. Protective cap



LCD Display

1. **MIN MAX** – Minimum and maximum value
2. **HIGH LOW** – Alarm limits
3. **INT EXT** – Internal/External probe
4. **mBar** – Vapor pressure
5. **kPa** – Vapor pressure
6. **GPP** – Grains per Pound
7. **g/kg** – Grains per kilogram
8. **MOIST** – Moisture mode
9. **RH%** - Relative Humidity mode
10. **COND** – Condensation mode
11. **APO** – Auto power off
12. **DEW** – Dew Point temperature
13. **C/F** – Temperature units
14. - Low battery
15. **MEM** - Memory location indicator
16. - Laser pointer On
17. - Bluetooth On



Safety

- Use extreme caution when the laser pointer beam is on
- Do not point the beam toward anyone's eye or allow the beam to strike the eye from a reflective surface
- Do not use the laser near explosive gases or in other potentially explosive areas

Features

- Quickly indicates the moisture content of materials with Pinless technology without damaging the surface;
- Optional remote Pin-type probe (MO290-P) allows for moisture readings at different penetration levels (3ft/0.9m cable length);
- Easy to read, large dual display with backlit feature;
- Simultaneously displays % moisture of wood or material being tested and Air Temperature, IR Temperature, or Humidity
- Designed with patented IR design to measure non-contact surface temperature; 8:1 distance to spot ratio with 0.95 fixed emissivity
- Built-in Humidity/Temperature probe measures Relative Humidity,
- Air Temperature plus Grains Per Pound (GPP) and Dew Point (DP)
- Ambient and Surface Vapor Pressure
- Automatic calculation of differential Temperature (IR - DP)
- Min/Max and Data Hold
- 20 point internal memory
- Auto power off and low battery indication

Battery Replacement

1. Turn off the meter.
2. Remove one Philips head screw and lift off the rear battery cover.
3. Replace the 9V battery.
4. Secure the rear battery cover.

You, as the end user, are legally bound (**EU Battery ordinance**) to return all used batteries, **disposal in the household garbage is prohibited!** You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

Operation

Powering the meter

1. Remove the RH sensor protective cap before use.
2. Press the power ⏻ button to turn the meter on.
3. If the 🔋 symbol appears or the meter does not turn on, replace the battery.

Humidity (Dew point, GPP, g/kg) Measurements

1. Press the power ⏻ button to turn the meter on.
2. Press the RH button
3. Relative Humidity will be displayed in the primary display and the temperature will be displayed in the secondary display.
4. Press the up or down arrow button to change the temperature units.
5. Press the MODE button to display the DEW point.
6. Press the MODE button to display GPP (°F) or g/kg (°C). Press the ▲or ▼button to toggle between GPP or g/kg.

Pinless Moisture Measurements

1. Press the power ⏻ button to turn the meter on.
2. Press the MOIST button to select Moisture measurement.” MOIST”, and “INT” (internal pinless sensor) will appear in the display.
3. Hold the meter so that the rear sensor is away from any surface or your hand. The reading should be near 0.0. If not, press and hold the ZERO button for more than 2 second and the ZERO icon appears.
4. Place the rear sensor on the surface of the material to be tested and read the relative moisture content.

Pin Type Moisture Measurements

1. Connect the external pin probe to the jack on the bottom of the meter.
2. Press the power ⏻ button to turn the meter on.
3. Press the MOIST button twice to select Moisture measurement.” MOIST”, and “EXT” (external pin probe) will appear in the display.
4. Press the probe pins into the material and read the % moisture content in the display.

Infrared Temperature Measurements

1. Press the power ⏻ button to turn the meter on.
2. Press the IRT button to enable the IR thermometer and the laser pointer. The laser pointer icon will flash while the mode is active.
3. Press the ▲or ▼button to change the temperature units
4. Aim the laser pointer at the surface to be measured and read the surface temperature in the secondary display.
5. Release the IRT button. The last temperature measured and the laser icon will remain on the display for approximately 10 seconds before returning to ambient temperature measurement.

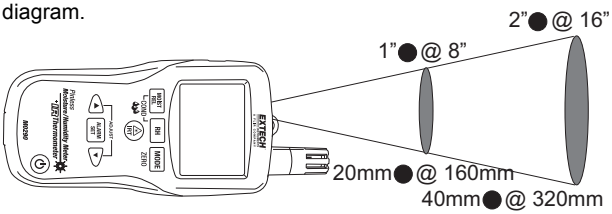
IRT MAX MIN display:

The meter can be set to display only the maximum or minimum temperature measured during an IR scan.

1. With the meter in the IR hold mode, press the MODE button. “MIN” will appear in the display.
2. Press the IRT button to enable the IR thermometer. The meter will display the minimum temperature measured and will update only when a lower temperature is measured.
3. Press the MODE button twice to enable the MAX mode and proceed as stated above for the maximum temperature.
4. The MAX or MIN temperature is not stored when the function is exited. The unit automatically exits MAX/MIN mode after approximately 10 seconds.

IR Field of View

Ensure that the desired target is larger than the spot size. As the distance from an object increases, the spot size of the area measured by the meter becomes larger. The meter’s field of view ratio is 8:1, meaning that if the meter is 8 inches (cm) from the target, the diameter (spot) of the object under test must be at least 1 inch (cm). Refer below to the field of view diagram.



WARNING: Do not directly view or direct the laser pointer at an eye. Low power visible lasers do not normally present a hazard, but may present some potential for hazard if viewed directly for extended periods of time.

Condensation Mode

The Condensation feature alerts the user when the surface temperature as measured by the IR thermometer is close to or has reached the Dew Point temperature.

1. Press the power ⏻ button to turn the meter on.
2. Simultaneously press the MOIST and RH buttons. The “COND” icon will appear.
3. Point the meter at a surface, press the IRT button to measure the surface temperature. The small display will indicate the IR surface temperature and the large display will indicate the difference between the IR temperature and the Dew Point temperature.
4. The meter will then report the potential for condensation on that surface in the following manner
   - If the temperature of the IRT is more than 14°C (25°F) above the Dew Point, the temperature difference shall be displayed, with no other warning.
   - If the temperature of the IRT is 3-14°C (5-25°F) above the Dew Point, the temperature difference shall be displayed, along with a standard Condensation Indicator icon. The meter shall beep once to confirm that the reading is in the risk area.
   - If the temperature of the IRT is less than 3°C (5°F) above the Dew Point, the temperature difference shall be displayed, along with a flashing Condensation Indicator icon. The meter shall beep twice to confirm that the reading is in the high-risk area.
5. Press the RH button to exit the mode.

Vapor Pressure Mode

Ambient Vapor Pressure

1. With the Condensation mode active, press the MODE button to display the Vapor Pressure in mBAR (°F) or kPa (°C). Press the ▲or ▼button to toggle between mBAR or kPa.
2. Press the MODE button to exit the Vapor Pressure mode.

Surface Vapor Pressure

1. Enter the Vapor Pressure mode as described above.
2. Press the IRT button and aim the laser pointer at the surface to be measured to display the Surface Vapor Pressure in mBAR (°F) or kPa (°C).

Alarm High and Low Limit Setting

High and Low alarm points can be set for Humidity and Moisture measurements.

Humidity Alarm Set Procedure:

1. With RH% displayed, simultaneously press the RH and MODE buttons.
2. The “HIGH” icon will appear on the display.
3. Press the ▲or ▼button to set the high limit desired.
4. Press the STORE/ALARM SET button to save the value and proceed to the LOW set value.
5. With the “LOW” icon in the display, Press the ▲or ▼button to set the low limit desired.
6. Press the STORE/ALARM SET button to save the value and to return to the normal mode.
7. If the humidity measurement is lower than the low alarm setting or higher than the high alarm setting, the meter will beep once every second.

Moisture Alarm Set Procedure:

1. With MOIST displayed, simultaneously press the MOIST and MODE buttons.
2. The “HIGH” icon will appear on the display.
3. Press the ▲or ▼button to set the high limit desired.
4. Press the STORE/ALARM SET button to save the value and proceed to the LOW set value.
5. With the “LOW” icon in the display, Press the ▲or ▼button to set the low limit desired.
6. Press the STORE/ALARM SET button to save the value and to return to the normal mode.
7. If the moisture measurement is lower than the LOW alarm setting, the meter will beep once every second
8. If the moisture measurement is higher than the HIGH alarm setting, the meter will beep continuously.

Data Memory Storage

Storing Readings:

1. With the data to be saved in the display, press the **STORE** button for 2 seconds until the unit beeps. The data will be saved to the memory location indicated. The numeric display above the **MEM** icon will then advance to the next location.
2. When the 20 memory locations are full, the unit will overwrite old saved readings starting with memory location 01.

Recalling Stored Readings:

1. Simultaneously press and release the ▲and ▼ buttons to display stored readings. The numeric display above the **MEM** icon will flash and the data stored in that location will be displayed.
2. Press the ▲or ▼button to scroll through the memory locations.
3. To return to normal operating mode, press the **STORE** button.

Clearing Stored Data:

1. To clear stored data, press and hold the ▲and **STORE** buttons simultaneously until **CLR** appears on the display.

Auto Power Off

The meter will enter a sleep mode after 30 minutes of inactivity. The meter will emit a warning beep 15 seconds before shutting down.

To disable the APO feature, press the MODE button when turning the meter ON. The “APO” icon will not appear, indicating it is disabled.

MeterLink™ Bluetooth Communication

This meter includes a Bluetooth module designed to communicate with the FLIR T/B200, T/B300, T/B360, T/B400 or i/b60 cameras. The combination of a moisture meter and an IR camera is used for analysis and documentation of moisture in buildings.

Setup

1. Enable the MO297 bluetooth by pressing and holding the ▲button for two seconds. The bluetooth icon will appear in the display.
2. Pair the meter to the camera by following the “Pairing Bluetooth Devices” section in the thermal camera manual.
3. Once paired, the data from the MO297 will be continuously displayed and updated on the camera display.
4. Readings stored into memory can be recalled and applied to live thermal images.

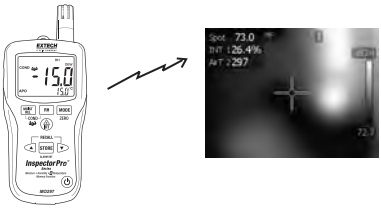
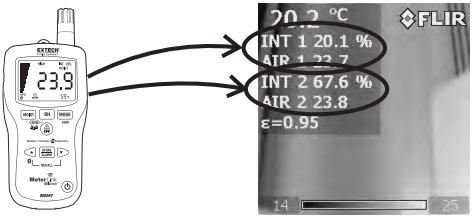


Image Editing

A single or series of readings can be applied to a single image by saving and entering the image edit mode. Data stored in the MO297 memory can also be added to the image.



T/B200, T/B300, T/B360, T/B400 Image Edit

1. Entering the camera Preview mode (single press of the image store button).
2. In Preview mode real time data or recalled memory data is no longer streamed to the image but it is displayed in a preview box.
3. The data in the box can be applied to the image by pressing (3 seconds) the MO297 ▼ / SEND button or the ADD button in the camera's preview box.
4. Data applied to the image in this way will be enumerated.

i/B60 Image Edit

1. Press the trigger to store the image
2. Recall the image using the recall archive button (arrow in a box)
3. The real time data or recalled memory data is no longer streamed to the image but it is displayed in a preview box.
4. The data in the box can be applied to the image by pressing (3 seconds) the MO297 ▼ / SEND button or the camera's trigger
5. Data applied to the image in this way will be enumerated.

Typical Moisture Measurement and Documentation Procedure

1. Using the camera, identify any potential damp areas behind walls and ceilings.
2. Use the Moisture meter to measure the moisture levels at various suspect locations that may have been found.
3. When a spot of particular interest is located, store the moisture reading in the moisture meter's memory and identify the measurement spot with a handprint or other thermal identifying marker.
4. Recall the reading from memory. The moisture meter will now continuously transmit this reading via bluetooth.
5. Use the camera to take a thermal image of the area with the identifying marker. The stored data from the moisture meter will also be saved on the image.

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Specifications

Function	Range	Accuracy
Pinless Moisture	0 to 99.9	Relative only
Ext. Pin Moisture	0 to 99.9	Relative only
Pinless Depth	Up to 0.75” (19mm)	
RH Measurement	0 to 10%	± 3%RH
	11 to 90%	± 2.5%RH
	91 to 100%	3%RH
Air Temperature	-29 to 77°C (-20 to 170°F)	± 2.0°C (3.6°F)
IR Temp	-4 to 31°F	± 9°F
	32°F	± 2°F
	33 to 392°F	Greater of ±3.5% or ±9°F
	-20 to-1°C	± 4.5°C
	0°C	± 1°C
	1 to 200°C	Greater of ±3.5% or ± 4.5°C

Display	3-digit primary display, 4-digit secondary display
Vapor Pressure	0 to 20.0kPA, calculated from temperature and RH measurements
Dew Point	-30 to 100°C (-22 to 199°F)
Mixing Ratio	0-999GPP (0 to 160g/kg)
Sample Rate	2 per second
Backlight	White LED
Memory	20 point memory
Bluetooth range	32 feet (10 meters) approximately
Operating Temperature	4 to 43°C (40 to 110°F)
Storage Temperature	-30 to 60°C (-14 to 140°F)
Operating Humidity	90%, 0-30°C (32-86°F), 75%, 30-40°C (86-104°F), 45%, 104-122°F (40-50°C)
Storage Humidity	90%
Power Supply	9V battery
Battery Life	6-8 weeks (4 hrs/day use), using alkaline batteries
Auto Power Off (APO)	After 30 minutes (nominal) inactivity. The APO function can be disabled by the user.
APO Quiescent Current	50µA maximum
Dimensions	165x70x38mm (6.5x2.8x1.5’)
Weight	210g (7.4oz)

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of theproduct, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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