HM40 Series Handheld Humidity and Temperature Meter

Features

- Humidity measurement range 0 … 100 %RH
- Temperature measurement ranges -40 ... +100 °C (-40 ... +212 °F), depending on probe model. The HM46 model can measure up to +180 °C (+356 °F) for a short period of time.
- Incorporates proven Vaisala HUMICAP® sensor technology
- Calibration reminder function
- Probes can be user calibrated using an on-site reference
- Graphical display indicates when measurement has stabilized
- Hold-button to freeze the screen and save the reading
- Multilingual user interface available in 10 languages (EN, DE, FR, JA, ZH, PT, ES, RU, FI, SV)

The easy-to-use HM40 is a compact and portable humidity meter that provides reliable measurements in a wide range of applications. It is the ideal spot-checking tool for everything from structural moisture measurement and air conditioning systems to humidity measurement in industrial production processes and life science applications. There are four different models available: HM41, HM42, HM45, and HM46.

Benefits

- Compact, portable, and easy to use
- Versatile meter with wide measurement range and multiple calculated parameters
- Ideal for spot-checking in a wide variety of applications

Simple and Easy to Use

HM40 has a large, user-friendly graphical display and easy-to-use push buttons. The user interface is simple and intuitive, and available in 10 languages. Also, many settings can be modified to meet users’ individual needs. In addition to relative humidity and temperature, HM40 provides five calculated humidity parameters, all of which are available in metric and non-metric units. HM40 is powered by 2 AA batteries. An external USB-charger and rechargeable AA sized NiMH batteries are available as an option. Each model also comes with a handy belt clip and case.

Easy Recalibration

Calibrating HM40 is easy. The meter or the probe can be sent to a Vaisala Service Center for recalibration. Alternatively, calibration can be completed on site by users with a humidity reference such as another hand-held meter or Vaisala Humidity Calibrator HMK15. The indicator includes a calibration reminder function that can be activated by the user.
**HM40 Hand-Held Humidity and Temperature Meter Series**

**HM41 Technical Data**

Humidity Measurement Accuracy (Including Non-linearity, Hysteresis, and Repeatability):
- At 0 … +40 °C
  - ±1.5 %RH (0 … 90 %RH)
  - ±2.5 %RH (90 … 100 %RH)
- At -10 … 0 °C and +40 … +60 °C
  - ±3.0 %RH (0 … 90 %RH)
  - ±4.0 %RH (90 … 100 %RH)

Humidity sensor: HUMICAP® 180R
Temperature measurement range: -10 … +60 °C (+14 … +140 °F)
Temperature sensor: Pt1000 RTD Class F0.1 IEC 60751
Measurement probe: Interchangeable HMP113 probe
Probe material: PC/ABS plastic blend (white)
IP rating: IP54
Weight (with alkaline batteries): 230 g (8.1 oz)
Filter material: PC (glass-reinforced)

**HM42 Technical Data**

Humidity Measurement Accuracy (Including Non-linearity, Hysteresis, and Repeatability):
- At 0 … +40 °C
  - ±1.5 %RH (0 … 90 %RH)
  - ±2.5 %RH (90 … 100 %RH)
- At -40 … 0 °C and +40 … +80 °C
  - ±3.0 %RH (0 … 90 %RH)
  - ±4.0 %RH (90 … 100 %RH)
- At +80 … +100 °C
  - ±4.0 %RH

Humidity sensor: HUMICAP® 100R-Mini
Temperature measurement range: -40 … +100 °C (+-40 … +212 °F)
Temperature sensor: Pt1000 RTD Class F0.3 IEC 60751
Measurement probe: HM42PROBE
Probe head material: Stainless steel
IP rating: IP40 (probe), IP54 (indicator)
Weight (with alkaline batteries): 370 g (13.1 oz)
Filter material: Stainless steel and PTFE membrane
Probe cable length: 1500 mm (59 in)

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Not recommended for $T_d > 85 \, ^\circ C$

**Dimensions in mm**

- **HM40**
  - Length: 232.5 mm
  - Width: 155 mm
  - Height: 77.5 mm

- **HM41**
  - Length: 232.5 mm
  - Width: 155 mm
  - Height: 77.5 mm

- **HM42**
  - Length: 235 mm
  - Width: 155 mm
  - Height: 77.5 mm

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**HM45 Technical Data**

Humidity Measurement Accuracy (Including Non-linearity, Hysteresis, and Repeatability):

- At 0 … +40 °C: ±1.5 %RH (0 … 90 %RH)
  ±2.5 %RH (90 … 100 %RH)
  ±3.0 %RH (0 … 90 %RH)
  ±4.0 %RH (90 … 100 %RH)

- At -40 … 0 °C and +40 … +60 °C: ±1.5 %RH (0 … 90 %RH)
  ±2.5 %RH (90 … 100 %RH)
  ±3.0 %RH (0 … 90 %RH)
  ±4.0 %RH (90 … 100 %RH)

Humidity sensor: HUMICAP® 180R

Temperature measurement range: -40 … +60 °C (-40 … +140 °F)

Temperature sensor: Pt1000 RTD Class F0.1 IEC 60751

Measurement probe: Interchangeable HMP113 with HM40HANDLE

Probe material: PC/ABS plastic blend (white)

IP rating: IP54

Weight (with alkaline batteries): 330 g (11.6 oz)

Filter material: PC (glass-reinforced)

Probe cable length: 1200 mm (47 in)

**HM46 Technical Data**

Humidity Measurement Accuracy (Including Non-linearity, Hysteresis, and Repeatability):

- At 0 … +40 °C: ±1.5 %RH (0 … 90 %RH)
  ±2.5 %RH (90 … 100 %RH)
  ±3.0 %RH (0 … 90 %RH)
  ±4.0 %RH (90 … 100 %RH)

- At -40 … 0 °C and +40 … +80 °C: ±1.5 %RH (0 … 90 %RH)
  ±2.5 %RH (90 … 100 %RH)
  ±3.0 %RH (0 … 90 %RH)
  ±4.0 %RH (90 … 100 %RH)

- At +80 … +100 °C: ±4.0 %RH

Humidity sensor: HUMICAP® 180R

Temperature measurement range: -40 … +100 °C (-40 … +212 °F), short-term up to +180 °C (+356 °F)

Temperature sensor: Pt1000 RTD Class F0.1 IEC 60751

Measurement probe: HM46PROBE

Probe head material: Stainless steel, brass filter

IP rating: IP40 (probe), IP54 (indicator)

Weight (with alkaline batteries): 490 g (17.3 oz)

Filter material: Sintered brass

Probe cable length: 1500 mm (59 in)

1) Not recommended for Td > 85 °C

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**Dimensions in mm**
HM40 Series Technical Data

Measurement Performance

Calculated parameters: Dew point, wet bulb temperature, absolute humidity, mixing ratio, enthalpy

Relative Humidity

Measurement range: 0 ... 100 %RH

Accuracy (including non-linearity, hysteresis, and repeatability) for different models at 0 ... +40 °C (+32 ... +104 °F):

- HM42 and HM46: ±1.5 %RH (0 ... 90 %RH)
- HM41 and HM45: ±2.5 %RH (90 ... 100 %RH)

Factory calibration uncertainty at +20 °C (+68 °F):

- HM42 and HM46: ±1.1 %RH (0 ... 90 %RH)
- HM41 and HM45: ±1.8 %RH (90 ... 100 %RH)

Stability: ±2 %RH over 2 years

Humidity Measurement Response Time:

- (90 %) with plastic grid filter (HM41 and HM45): 17 s
- (90 %) with membrane filter and steel grid (HM42): 26 s
- (90 %) with brass sintered filter (HM46): 40 s

Temperature

Accuracy over temperature range:

- At 0 ... +40 °C (+32 ... +104 °F): ±0.2 °C (0.36 °F)
- At -40 ... 0 °C and +40 ... +100 °C (-40 ... +32 °F and +40 ... +212 °F): ±0.4 °C (0.72 °F)

Operating Environment

Operating temperature:

- Indicator
- Probe handle
- Probe head
- Storage temperature
- EMC compliance

Spare Parts and Accessories

Indicator

- Spare HM40 indicator: HM40INDI
- Belt clip (3 pcs): 227710SP
- Battery cover (3 pcs): 225688SP
- NiMH rechargeable batteries (4 pcs): 229247SP
- External battery recharger with USB connection and 4 batteries: 229249SP
- Case for short HM40 probes: DRW242335SP
- Case for long HM40 probes: DRW242335SP

Standard Probe (HM41)

- HMP113 probe for HM40: HMP113 (configuration: V00B2C1A0)
- Plastic locking bushing (3 pcs) for attaching HMP113 probe to HM40 indicator: DRW238590SP
- Plastic grid filter for HMP113 probe: DRW236214SP
- Plastic grid with membrane filter for HMP113 probe: 230727SP

HM42 Probe (HM42)

- Thin 4 mm diameter probe for HM40: HM42PROBE
- Steel grid filter for HM42PROBE: 19867HM
- Membrane tube set (5 pcs) for HM42PROBE: 19858HM
- Rubber sleeve set (10 pcs) for HM42PROBE: 19809HM
- Calibration adapter for HM42PROBE: HM37067

Remote Probe (HM45)

- HMP113 probe for HM40: HMP113 (configuration: V00B2C1A0)
- Plastic locking bushing (3 pcs) for attaching HMP113 probe to HM40 indicator: DRW238590SP
- HM40 handle and cable: HM40HANDLE
- Plastic grid filter for HMP113 probe: DRW236214SP
- Plastic grid with membrane filter for HMP113 probe: 230727SP

HM46 Probe (HM46)

- Stainless steel 12 mm diameter probe for HM40: HM46PROBE
- Sintered filter for HM46PROBE: 0195
- Optional membrane filter for HM46PROBE (up to +80 °C): 10159HM
- Plastic grid filter for HM46PROBE (up to +80 °C): 6221
- Disposable sleeve, 50 pcs set: 1558
- Probe holder: HM36915

Mechanical Specifications

Materials

- Indicator body: PC/ABS blend, acrylic display lens
- Probe handle: PC/ABS blend (gray)
- Probe handle: PC/ABS blend (white), PC/ABS blend (gray, HM45)
- HMP113 probe or probe measurement head: PC/ABS blend (white, HM41/45) or stainless steel (HM42/46)
- IP rating, HM40: IP54

Indicator

- Display: LCD (140 x 160 pixels)
- Power-up time: < 3 s
- Batteries: 2 x AA, 1.5 V
- Operation time (typical): 100 hours (without backlight)
- Menu languages: English, Chinese (simplified), Finnish, French, German, Japanese, Portuguese, Russian, Spanish, Swedish
Vaisala HUMICAP® Structural Humidity Measurement Kit SHM40 offers an easy and reliable solution for humidity measurements in concrete and other structures.

Measuring Humidity under the Surface
Concrete dries unevenly and is usually drier on the surface, consequently it is important to measure beneath the surface conditions. The borehole method provides information about the humidity profile under the surface. In this method, a humidity probe is left in the borehole until the humidity in the hole has reached an equilibrium state and the stabilized values can be read.

SHM40 is All You Need for Borehole Humidity Measurement
The Vaisala HUMICAP® Structural Humidity Measurement Kit SHM40 is an ideal solution for the borehole method. The starter kit is comprised of an HMP40S probe, HM40 indicator and accessories for the borehole method in a weather-proof case, optimized for use in harsh and humid construction sites. Additional accessories for the SHM40 can be used to prepare a moisture measurement hole in fresh concrete. Pre-formed holes eliminate the need for drilling and the risk of damaging heating elements or tubing embedded in the concrete.

Features
- Truly interchangeable measurement probes
- Accurate measurement data in numeric, statistic or graph views
- Conforms to ASTM standard F2170
- IP65 classified measurement probe and case

Standard Contents of SHM40
- HM40 indicator with adapter
- 1 piece HMP40S RH&T probe with a cable
- 12 pcs plastic tubes (19266HM)
- 12 pcs rubber plugs (233976)
- 3 pcs protective covers with lid (19268HM)
- Traceable calibration certificate
- Weather-proof carrying case with a shoulder strap
SHM40 Structural Humidity Measurement Kit

**Easy Measurement with Multiple HMP40S Probes and Quick Connectors**

HMP40S measurement probes are interchangeable. The probes connect easily to the HM40 indicator with a snap-on connector enabling convenient use of multiple probes with one indicator. The measurement data can be displayed in numeric, statistic or graph views.

Snapping a connector to the indicator HM40 to read the measurement results.
Technical Data

HMP40S Probe Measurement Performance

<table>
<thead>
<tr>
<th>Relative Humidity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range</td>
<td>0 ... 100 %RH</td>
</tr>
<tr>
<td>Accuracy (incl. non-linearity, hysteresis, and repeatability)</td>
<td></td>
</tr>
<tr>
<td>Temperature range: 0 °C ... +40 °C</td>
<td>0 ... 90 %RH: ± 1.5 %RH</td>
</tr>
<tr>
<td></td>
<td>90 ... 100 %RH: ± 2.5 %RH</td>
</tr>
<tr>
<td>Temperature range: -40 °C ... +80 °C</td>
<td>0 ... 90 %RH: ± 3.0 %RH</td>
</tr>
<tr>
<td></td>
<td>90 ... 100 %RH: ± 4.0 %RH</td>
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</table>

Factory calibration uncertainty at +20 °C (68 °F)

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<thead>
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<tbody>
<tr>
<td>0 ... 90 %RH: ± 1.1 %RH</td>
<td></td>
</tr>
<tr>
<td>90 ... 100 %RH: ± 1.8 %RH</td>
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</tbody>
</table>

Humidity sensor HUMICAP® 180R

Stability ± 2 %RH over 2 years

Temperature

<table>
<thead>
<tr>
<th>Measurement range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy over temperature range:</td>
<td></td>
</tr>
<tr>
<td>-40 °C ... +80 °C</td>
<td>0 ... +40 °C: ± 0.2 °C</td>
</tr>
<tr>
<td></td>
<td>-40 ... 0 °C, +40 ... +80 °C: ± 0.4 °C</td>
</tr>
</tbody>
</table>

Temperature sensor Pt1000 RTD Class F0.1 IEC 60751

HMP40S Probe Mechanical Specifications

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Probe weight with standard cable</td>
<td>31 g</td>
</tr>
<tr>
<td>Probe housing material</td>
<td>stainless steel</td>
</tr>
<tr>
<td>Probe filter and sensor protection</td>
<td>membrane filter with chrome coated ABS plastic</td>
</tr>
<tr>
<td>Cable material</td>
<td>Wire PVC / jacket PU</td>
</tr>
<tr>
<td>Cable connector</td>
<td>TRRS male 3.5 mm</td>
</tr>
<tr>
<td>Probe housing classification</td>
<td>IP65</td>
</tr>
<tr>
<td>Borehole diameter needed</td>
<td>16 mm</td>
</tr>
<tr>
<td>Measurement depth with standard accessories</td>
<td>min. 30 mm, max. 90 mm</td>
</tr>
</tbody>
</table>

Operating Environment

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Operation temperature range for probe</td>
<td>-40 °C ... +80 °C</td>
</tr>
<tr>
<td>Operation temperature range for indicator</td>
<td>-10 ... +60 °C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-30 ... +70 °C</td>
</tr>
</tbody>
</table>

HM40 Indicator Mechanical Specifications

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Weight</td>
<td>Indicator with adapter 240 g</td>
</tr>
<tr>
<td></td>
<td>SHM40 case with standard content 3.7 kg</td>
</tr>
<tr>
<td>Indicator materials</td>
<td>PC/ABS blend, acrylic display lens</td>
</tr>
<tr>
<td>Indicator adapter materials</td>
<td>Nickel plated brass and plastic overmolding</td>
</tr>
<tr>
<td>Indicator housing classification</td>
<td>IP54</td>
</tr>
<tr>
<td>Mechanical drop endurance</td>
<td>1.0 m without the probe</td>
</tr>
</tbody>
</table>

HM40 Indicator - General

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Power-up time</td>
<td>&lt; 3 s</td>
</tr>
<tr>
<td>Alkaline batteries</td>
<td>2 x AA sized, 1.5V (LR6)</td>
</tr>
<tr>
<td>Operation time (Alkaline batteries)</td>
<td>typical 100 hours (without backlight)</td>
</tr>
<tr>
<td>Calculated variables</td>
<td>Td, Tw, a, x, h</td>
</tr>
<tr>
<td>Menu languages</td>
<td>English, German, French, Finnish, Spanish, Swedish, Chinese (simplified), Russian, Japanese</td>
</tr>
<tr>
<td>Display</td>
<td>LCD (140 x 160 pixels)</td>
</tr>
<tr>
<td>Electromagnetic compatibility (EMC)</td>
<td>European Union directive EN61326-1 for portable equipment</td>
</tr>
</tbody>
</table>

Spare Parts and Accessories

<table>
<thead>
<tr>
<th>HM40 indicator with adapter and cable probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH&amp;T probe with cable</td>
</tr>
<tr>
<td>HM40 indicator with adapter</td>
</tr>
<tr>
<td>Quick connection adapter</td>
</tr>
<tr>
<td>Cable for RH&amp;T probe</td>
</tr>
<tr>
<td>Long cable (2.7 m) for RH&amp;T probe</td>
</tr>
<tr>
<td>Plastic tube set (12 pcs)</td>
</tr>
<tr>
<td>Long (200 mm) plastic tube set (12 pcs)</td>
</tr>
<tr>
<td>Rubber plugs (12 pcs)</td>
</tr>
<tr>
<td>Protective cover with lid (3 pcs)</td>
</tr>
<tr>
<td>Weather-proof carrying case with SHM40 filling</td>
</tr>
<tr>
<td>USB recharger for HM40 indicator batteries</td>
</tr>
<tr>
<td>Plastic grid with membrane filter for HMP40S probe</td>
</tr>
</tbody>
</table>

Accessories for Wet Concrete

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Plastic flange set (12 pcs)</td>
<td>26529HM</td>
</tr>
<tr>
<td>Long rubber plug for wet concrete (12 pcs)</td>
<td>26530HM</td>
</tr>
</tbody>
</table>