English

User Manual

Hay Moisture Meter PCE-HMM

User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our product search on: www.pce-instruments.com

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Contents

1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, …) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

2 Technical specifications

Measurement range moisture	9 ... 50 %
Measurement range temperature	-10 ... 100 °C / 14 ... 212 °F
Resolution of display	0.1 %
Accuracy	0.8 %
Display	LCD with 15 mm digit height
Keypad	membrane keyboard
Handle	stable wooden handle with ergonomic design
Housing	resistant to splashes and dust
Measuring lance	lance made of stainless steel with 25 cm, 50 cm, 100 cm or 270 cm length
Functions	hold function, counting function, average value calculation
Display light	automatic
Power-off	automatic
Calibration	automatic
Power supply	9 V block battery
Dimensions	772 x 70 x 48 mm / 30.3 x 2.7 x 1.8 in (edition with 50 cm lance)
Package size	800 x 78 x 54 mm / 31.4 x 3 x 2.1 in (edition with 50 cm lance)
Weight incl. battery	650 g / 1.4 lbs (edition with 50 cm lance)

3 Delivery scope

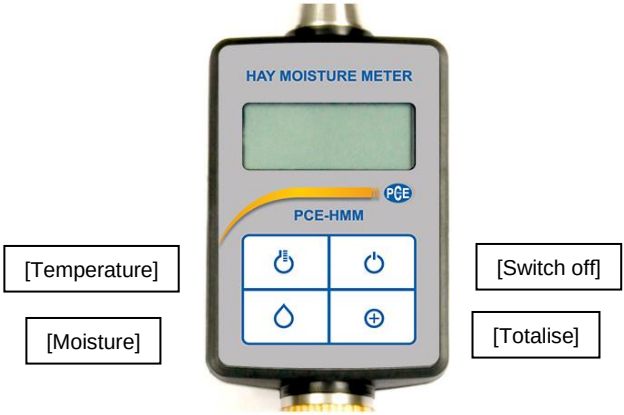
1 x hay moisture meter PCE-HMM
1 x 50 cm measuring lance (or 25/100/200 cm depending on version)
1 x 9 V battery
1 x user manual

4 First use

When delivered, the included battery is not connected. Open the battery compartment, connect the battery and close the battery compartment.

5 Description/instructions

5.1 Keyboard



5.2 Switch on the meter

The meter does not have its own power key. It switches on automatically as soon as you press one of the [Temperature] or [Humidity] keys.

5.3 Make a measurement

As soon as the meter is switched on, either moisture or temperature values are displayed continuously (2 x per second) depending on the set mode. The flashing decimal point indicates that the display is on. Of course, the displayed values are only meaningful if the probe is in the material. To change the mode, briefly press the [Moisture] key or the [Temperature] key.

To make moisture measurements, proceed as follows:

- Penetrate one of the side surfaces of the bale with the probe and read the measured value.
- Due to the active display, you can read the measured value even when slowly inserting the probe. When the probe is pulled out, the values are not meaningful.
- Moisture values are displayed between 9 and 50 per cent.
- At moisture values below 9 %, the meter displays the letter "L".
- At moisture values above 50 %, the moisture flashes alternately with the letter "H".
- Repeat the measurement at different points in the bale with different penetration depths to get a better overview of the conditions in the bale.
- The display backlight switches off automatically after 20 seconds without pressing a key. To reactivate it, press the [Moisture] or [Temperature] key.
- The meter itself switches off automatically after 2 minutes without pressing any key. To switch the meter back on, press the [Moisture] or [Temperature] key.
- If the word "lobat" appears on the display, the battery voltage is too low, below 8 V, and the battery must be replaced.

To make temperature measurements, proceed as follows:

- Penetrate one of the side surfaces of the bale with the probe.
- Wait until the temperature value is stable. This can take several minutes. Only read the value when it no longer changes.
- Note that the probe itself heats up through repeated penetration. Let the probe cool down accordingly.
- Temperature values are displayed between 0 and 100 °C.
- Repeat the measurement at different points in the bale with different penetration depths to get a better overview of the conditions in the bale.

5.4 Freeze displayed values (HOLD function)

If you cannot see the display during moisture measurement, for example when you are measuring a bale on a trailer, you can freeze the currently displayed moisture value for 5 seconds by briefly pressing the [Moisture] key. During this time, the active display is stopped and the held value is displayed together with a non-flashing decimal point. After that, the current measured value is displayed again automatically.

5.5 Averaging

To average several moisture measurements or to count the number of measurements, proceed as follows:

- Make the first measurement.
- As soon as the measured value on the display is stable, briefly press the [Totalise] key. The displayed measured value is saved to the memory. The display shows the number of measurements already in the memory for 5 seconds. After that, the unit switches back to the automatic display of the moisture.
- Repeat the process as frequently as desired with different measurements in one bale or measurements in several bales.

5.6 Recall the average value

To display the average of the saved measurements, proceed as follows:

- Press and hold the [Moisture] key for approx. 3 seconds.
- The display shows the average moisture value from all saved measured values. This value flashes alternately with the letter "A".
- The totalising memory is not deleted.
- To return to the current display, press and release the [Moisture] key.

In order to save the current measured value to the totalising memory and immediately display the quantity and the average, proceed as follows:

- Perform the measurement that is to be saved to the totalising memory. While the measured value appears on the display, press and hold the [Totalise] key for approx. 3 seconds.
- The number of measured values in the totalising memory appears on the display for approx. 2 seconds.
- Then the average moisture value from all saved measured values appears. This value flashes alternately with the letter "A".
- The totalising memory is not deleted.
- To return to the current display, press and release the [Moisture] key.

5.7 Delete the totalising memory

To clear the totalising memory, switch off the meter and turn it back on manually. The totalising memory is not deleted when the meter is switched off automatically.

5.8 Battery voltage display

To display the battery voltage, press and release the [Switch off] key. The display shows the battery voltage in V for approx. 3 seconds. Then the meter automatically returns to the current display mode.

5.9 Switch off the meter

After 2 minutes without pressing any key, the meter switches off automatically. To switch off the meter manually, press and hold the [Switch off] key for approx. 3 seconds. When the meter is switched off manually, the totalising memory is deleted.

6 Factors influencing moisture measurements

6.1 Bale density

Hay and straw bales are pressed with different densities. In practice, the bale density can usually not be determined. Furthermore, the density within a bale can vary a lot, intentionally or unintentionally.
The calibration of the PCE-HMM is designed for an average bale density. Bales with a higher density tend to show a higher moisture value, bales with a lower density tend to show a lower value.

6.2 Matreial

A bale of hay or straw consists of various plant parts that dry unevenly. Also, the material in the bale is not always deposited uniformly. The leaf/stem ratio is not always the same throughout the bale.
Accordingly, the moisture within a bale varies. Bales with higher moisture usually also have higher moisture differences within the bale. With increasing drying, the differences become smaller.
The PCE-HMM measures moisture and temperature only within the range of the material that is directly in contact with the device in the area of the tip.

6.3 Sweating phase

In the first few days after baling, the moisture content may increase slightly from the initial value. In the case of marginal bales, you should continuously carry out control measurements during these days.

6.4 Preservatives

Some preservatives change the electrical properties in the material. During the time that the preservative is absorbed, the moisture may increase by a few percentage points for a few days.

7 Maintenance and cleaning

- Before the season and if visibly dirty, clean the tip of the meter and the probe with fine steel wool and/or alcohol.
- Store the meter in a dry and safe place.
- If you do not use the meter for a long time, it is recommended to disconnect the battery.

8 Troubleshooting

8.1 Battery is flat

As soon as the device shows the word "lobat" on the display, the battery must be replaced. Any readings that are still displayed may be incorrect.

8.2 Incorrect readings

If you have reason to believe that the displayed readings are not correct, please proceed as follows:

- Observe the information in chapter 6 Factors influencing moisture measurements.
- Note the fact that damp spots and/or spots with higher temperature can also occur in dry bales.
- Make sure that the tip and the probe are dry. In the initial state, "L" must appear on the display. If a value is displayed without inserting the probe, the tip is not dry.
- Make sure that the tip and the probe are not contaminated.
- For temperature measurements, note that the probe must remain in the material until the temperature reading no longer changes.

8.3 Damaged meter

Please contact PCE Instruments for help.

9 Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

10 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

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