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# Manual

## Absolute Moisture Meter PCE-WT1N



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## Contents

|          |                                             |          |
|----------|---------------------------------------------|----------|
| <b>1</b> | <b>Introduction .....</b>                   | <b>3</b> |
| 1.1      | Delivery content .....                      | 3        |
| <b>2</b> | <b>Safety notes .....</b>                   | <b>3</b> |
| <b>3</b> | <b>Specification .....</b>                  | <b>3</b> |
| <b>4</b> | <b>System description .....</b>             | <b>4</b> |
| 4.1      | Theoretical determination of humidity ..... | 4        |
| 4.2      | Preparations before measurements .....      | 4        |
| 4.3      | Make a measurement .....                    | 5        |
| 4.4      | General information .....                   | 7        |
| <b>5</b> | <b>Disposal .....</b>                       | <b>8</b> |
| <b>6</b> | <b>Contact .....</b>                        | <b>8</b> |
| 6.1      | PCE Instruments UK .....                    | 8        |
| 6.2      | PCE Americas .....                          | 8        |

## 1 Introduction

Thank you for purchasing a sawdust humidity detector from PCE Instruments.

The humidity detector for sawdust is designed for professional application in the pre-delivery inspection of sawmills or the receipt inspection in pellet plants, manufacturers of heat- briquettes and other process sections (for instance: in the manufacturing of wooden briquettes). The sawdust humidity detector PCE-WT1N can be used to detect the absolute humidity of sawdust and similar biomass, such as chipped wood, hay and straw, immediately after receiving the goods. The operation is quick and easy. The sawdust humidity detector has to be filled with the measuring sample, which is then compressed inside the device and after selecting the sample substance in the menu, the results can be read out at the sawdust humidity detector. The sawdust humidity detector works with the electrical resistance method. Thus the sawdust humidity detector is able to determine the humidity very quickly within a short time. Another advantage of the humidity detector is its practical handling, the small dimensions as well as a solid structure. The sawdust humidity detector is calibrated by the manufacturer.

### 1.1 Delivery content

- Sawdust humidity detector PCE-WT1N
- 9 V battery
- Carrying case
- Instruction manual

## 2 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. There is no warranty of damages or injuries caused by non-observance of the manual.

- The device may only be used in the approved temperature range.
- The case should only be opened by qualified personnel of PCE Instruments.
- You should not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth / use only pH-neutral cleaner.
- Remove the batteries if the device is not used for a longer period of time to avoid damage on the instrument.
- Replace the batteries if the device indicates a low battery level.

This user's handbook is published by PCE Instruments without any guarantee.

We expressly point to our general guarantee terms which can be found in our general terms of business. If you have any questions please contact PCE Instruments.

## 3 Specification

|                                                         |                                |
|---------------------------------------------------------|--------------------------------|
| Measurement range<br>sawdust, wood chips*<br>straw, hay | 8 ... 30 %<br>8 ... 25 %       |
| Resolution                                              | 0.1 %                          |
| Accuracy                                                | ±10 % of the measurement value |
| Volume of the measuring chamber                         | 120 cm <sup>3</sup>            |
| Sample size of chipped wood                             | *max. 20 x 15 x 15 mm          |
| Compressive force during measurement                    | Approx. 0.2 MPa                |
| Temperature compensation                                | Digitally adjustable           |
| Display                                                 | 3 digits LCD display           |
| Power supply                                            | 1 x 12 V battery type A 23     |
| Ambient temperature range                               | 0 ... +50 °C                   |
| Dimensions                                              | 300 x 220 x 65 mm              |
| Weight                                                  | 990 g                          |

## 4 System description

### 4.1 Theoretical determination of humidity

The humidity is calculated as follows:

$$M_c = \frac{w_w - w_d}{w_w} * 100 [\%]$$

Description:

$w_w$  = Weight of the sample before the drying process

$w_d$  = Weight of the sample after the drying process

### 4.2 Preparations before measurements

1. Open the head of the measurement chamber.



2. Pull back the compacting device completely in order to ensure that the measurement chamber can take the maximum volume.
3. Fill the measurement chamber with the sample, according to the specifications of the sawdust humidity detector. Fill the measurement chamber with at least 2 cm of sample material. An exact amount of the sample is not prescribed and has no influence on the measurement result.



4. Close the head of the measurement chamber again and make sure that it is not too tight.
5. Compress the sample within the sawdust humidity detector by using the compacting device.



After operating the compacting device a couple of times, an indicator will show up to give information on the compression pressure. The appropriate compression is reached when a red ring around the indicator is shown. The red ring should only point out of the head of the measuring chamber by a maximum of 0.5 to 1 millimetre.



Red ring

**Please be advised that the device may be damaged if the compression pressure is too high!**

#### 4.3 Make a measurement

1. Press and hold the ON/OFF button of the device to start it.
2. Press the MATERIAL button and adjust your desired sample material.

| Material            | Adjustment |
|---------------------|------------|
| Sawdust, wood chips | 1          |
| Straw, hay          | 2          |

3. Press the Temperature button to set the temperature the sample material has. Each time you press the button, the temperature is increased in steps of 2 °C. By pressing and holding the button, the speed of the increase will be higher. A difference between the set temperature and the actual temperature of  $\pm 4$  °C will not affect the measurement result.

4. Wait until the measurement result has stabilized. When the sample is very dry, the measurement may take up to 10 seconds. Moist samples will give a result within one or two seconds.



5. Pull back the press to its completely again and open the head.



6. Use the compacting device again to push out the sample.



7. After doing so, pull back the compacting device and close the head again.

Please note that there may samples which are very dry. If that should be the case, the result may fall below the measurement range. The display will show "LO" in that case. If the sample is too moist the instrument will display "HI".

#### **4.4 General information**

- Freshly produced material like pellets is usually very dry. It is then recommended to pre-dry the sample for some days before making measurements.
- The samples should be taken out of the middle of the storage container to ensure certain repeatability.
- The size of the sample has effects on the measurement results. The smaller the sample size, the more precise the measurement result (pellets can be crushed with a hammer).
- You can also increase the accuracy of the measurements by calculating the mean value of all measurements.
- If the display shows the BAT-Symbol, you should immediately insert new batteries to ensure correct measurement values. It is recommended to replace the batteries every six months.
- If no measurements have been made for a longer period of time, you need to check the measurement chamber. Inside the chamber, there may be remains of old samples.
- The device should only be stored in cool, dry and chemically neutral atmosphere.

## 5 Disposal

For the disposal of batteries, 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.

If you have any questions, please contact PCE Instruments.



## 6 Contact

If you have any questions about our range of products or measuring instruments please contact PCE Instruments.

### 6.1 PCE Instruments UK

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