

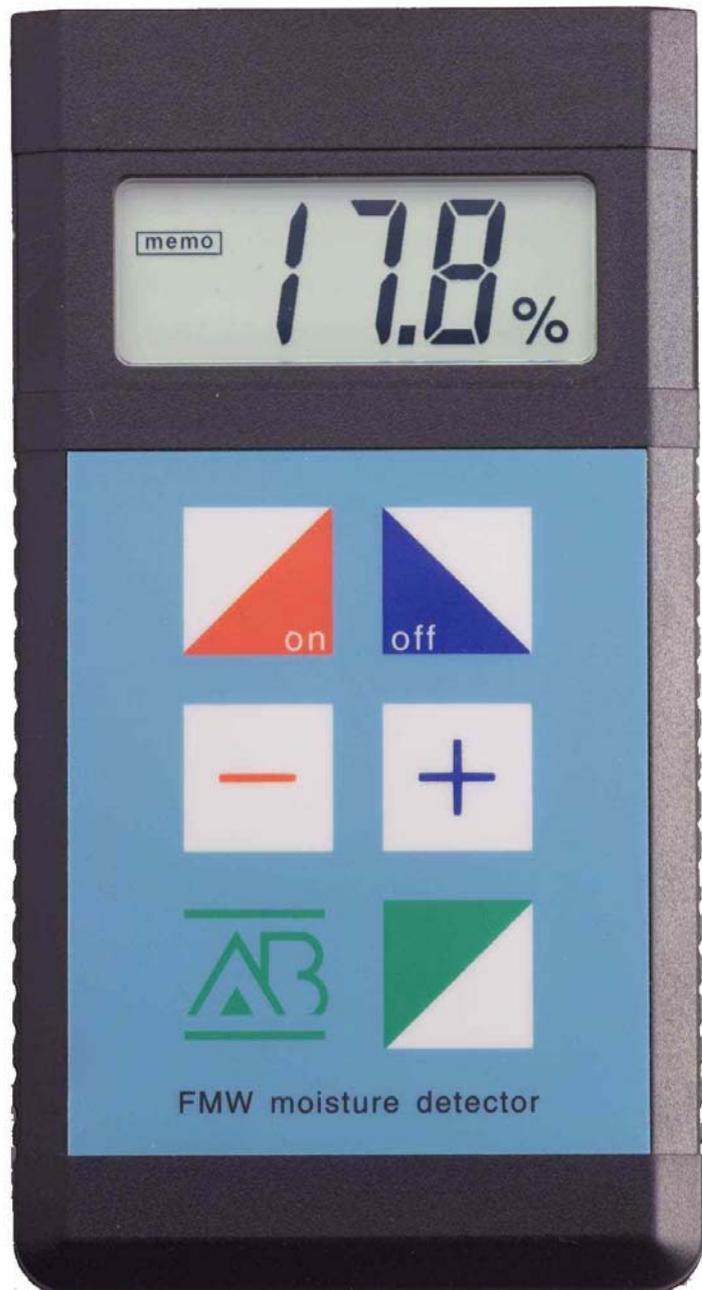


Brookhuis Micro-Electronics BV

FMW Moisture Meter

Operating instructions
Version 3.12

MOISTURE METERS
FEUCHTEMESSGERÄTE
HUMIDIMÈTRES
MEDIDORES DE HUMEDAD
MEDIDORES DE HUMIDADE
ALAT MENGUKUR KADAR AIR
PENGUKUR KADAR AIR
FUKTKVOTSMÄTARE
KOSTEUSMITTARIT
VOCHTMETERS



Foreword

Congratulations on your purchase of the FMW microprocessor-controlled moisture meter. This meter is a Dutch quality product that will allow you to measure the moisture content of various materials without damaging them.

These operating instructions contain a number of important directions on how to use and handle the FMW moisture meter. Please keep them in a safe place for future reference.

Enschede, the Netherlands, 9 August 2004

Notification

The information in these operating instructions may be altered without prior notification.

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1 Introduction

These operating instructions explain how to operate and use the FMW moisture meter. The FMW allows you to measure the moisture content of wood easily and rapidly and without damaging the wood. The FMW can also be used to indicate moisture levels in various construction materials. The measurements can be stored in the memory.

Various symbols are used in these instructions:



This symbol indicates safety measures to be taken or instructions to be followed that make this meter easier to use.



This symbol indicates an operation to be performed.

2 Intended use

- ⚠ The meter should be placed in the measuring area several minutes before starting a measuring session so that it can take on the ambient temperature (acclimatise).
- ⚠ The meter may only be used for measuring the moisture content of non-movable materials.
- ⚠ The purpose of the meter is to determine the moisture content of solid materials.
- ⚠ The thickness of the material to be measured must be at least 10 mm for both the FMW-T and the FMW-B.

3 Examples of use

The FMW can be used in various applications. The table below shows some of these applications.

	FMW-B	FMW-T
Measuring moisture in wood	 A hand holds the FMW-B moisture detector against a vertical wooden surface. The LCD screen displays '12.0%'.	 A hand holds the FMW-T moisture detector against a horizontal wooden surface. The LCD screen displays '11.6%'.
Measuring moisture in construction materials	 A hand holds the FMW-B moisture detector against a grey concrete surface. The LCD screen displays '12.6%'.	 A hand holds the FMW-T moisture detector against a grey concrete surface. The LCD screen displays '6.5%'.

4 Overview of the FMW moisture meter set

This Chapter describes the various components of the FMW as well as optionally available components.

4.1 Picture of the FMW moisture meter

The components of the FMW are shown in Figure 4-1 below.

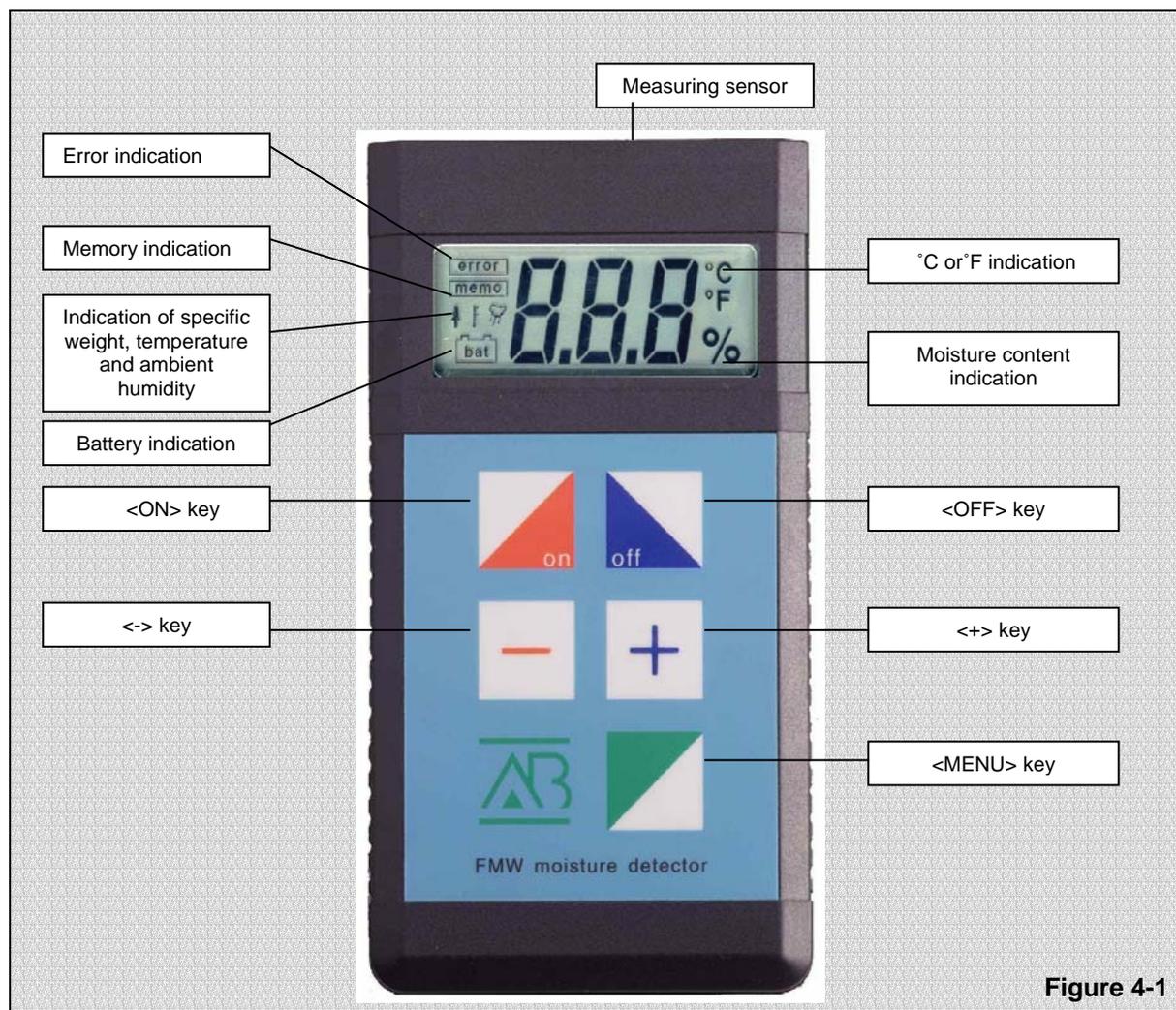


Figure 4-1

4.2 The FMW moisture meter set components

The FMW set consists of a FMW with a 9 Volt battery, an instrument case, a booklet about moisture measurement, and operating instructions.

4.3 Optionally available components

Reference block With the help of the reference block, you can easily find out whether the FMW carries out measurements in accordance with the factory setting. (See Chapter 6.2).

Thermo-hygrometer The thermo-hygrometer measures relative air humidity and temperature in order to establish the equilibrium moisture content or the dew point, for example.

5 Starting up and settings

This Chapter describes the operations required to start up the FMW.

5.1 Installing the battery

The battery compartment is at the back of the FMW, as shown in Figure 5-1.



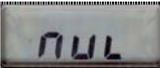
Figure 5-1

- ☞ Open the battery compartment by gently pressing down the groove in the lid and then lifting it up.
- ☞ Connect the 9 Volt battery supplied with the FMW to the attachment clip and then close the compartment by replacing the lid. The FMW is now ready to be set up.

- ⚠ When removing the battery, hold the attachment clip – **not the wires**.
- ⚠ Use Alkaline batteries only.

5.2 Setting up the FMW

Before measuring can start, the FMW has to be adjusted to the correct thickness and specific weight of the material to be measured. It may also have to be set so that the maximum measured value can be displayed.

<ul style="list-style-type: none"> ☞ Position the battery as described in Chapter 5.1. ☞ Press the <ON> key to switch on the FMW. 	
<i>The display will now show</i>	
<ul style="list-style-type: none"> ☞ Hold up the meter and press the <MENU> key. The meter will then set itself to zero. 	
<ul style="list-style-type: none"> ⚠ Do not touch the sensor surface during zeroing. 	
<i>The display will now show</i>	
<ul style="list-style-type: none"> ☞ Press the <MENU> key. 	
<i>The display will now show (example)</i>	
<ul style="list-style-type: none"> ☞ Press either the <+> or the <-> key to enter the thickness of the material. 	
<ul style="list-style-type: none"> ⚠ Material thickness can be adjusted in steps of 1 mm. ⚠ Adjust the FMW-T if the thickness of the material is below 20 mm. Adjust the FMW-B if the thickness of the material is below 30 mm. ⚠ The maximum thickness adjustment applies in all other cases. 	
<ul style="list-style-type: none"> ☞ Press the <MENU> key. 	
<i>The display will now show (example)</i>	
<ul style="list-style-type: none"> ⚠ A reading of 0.50 in the display indicates a specific weight of 500 kg/m³. The last value entered is shown in the display. 	
<ul style="list-style-type: none"> ☞ Look up the setting for specific weight in the booklet "Brookhuis moisture meters for wood, construction materials and paper". ☞ Press the <+> and <-> keys to set the correct specific weight. ☞ Press the <MENU> key. 	
<i>The display will now show (example)</i>	

⚠ The setting PH0 means that the meter will display the currently measured value. If the meter is set to PH1, it will display the highest value measured.

⚠ Whether this function is available depends on the FMW type. If it is not available, it will be left out of the menu.

☞ Press the <+> or <-> key to set the meter to PH0 or PH1.

☞ Press the <MENU> key.

The display will now show



⚠ The meter is now ready to start measuring.

5.3 Measuring with the FMW

☞ Make the FMW ready for use as described in Chapter 5.2.

☞ Position the sensor surface of the meter on the material.



The display will now show (example)

17.3%

- ⚠ In the case of the PH1 setting, press the <MENU> key to proceed to the next measurement.
- ⚠ The FMW will switch off automatically after 10 minutes to save the battery.
- ⚠ Press the meter gently against the material. Not pressing at all or pressing too hard can result in different moisture content readings.
- ⚠ Do not put your hand behind the material.
- ⚠ Do not put the material on a metal surface.
- ⚠ The FMW will give a higher than true reading of the moisture content if measuring is done on a gnarl. Measuring on cracks in the wood leads to lower moisture percentage readings. Measurements should be taken elsewhere.
- ⚠ Normally, the FMW will give a slightly lower reading if the surface of the material is coarse.
- ⚠ When measuring materials with fluctuating specific weights, always keep to the average specific weight.

6 Functions

This Chapter describes the various special functions of the FMW.

6.1 The FMW memory

Depending on the version, the FMW can store up to 50 readings in its memory. These readings can be stored and recalled as follows:

<p>☞ Make the FMW ready for use as described in Chapter 5.2</p>	
<p>☞ Position the sensor surface of meter on the material.</p>	
	<p><i>The display will now show</i> </p>
<p>☞ Press the <+> key to store the reading in the memory.</p>	
	<p><i>The display will now show</i> </p>
<p>⚠ The meter has now stored the reading in the memory. The 'memory indication' in the display shows this reading.</p>	
<p>☞ Press the <MENU> key to do the next measurement.</p>	

The stored readings can be recalled as follows:

<p>☞ Press the <-> key to recall the last reading stored.</p>	
	<p><i>The display will now show (example)</i> </p>
<p>☞ Continue pressing the <-> key to recall previously stored readings.</p>	
<p>☞ Press the <MENU> key to do the next measurement.</p>	

The memory can be emptied as follows:

☞ Press the <+> and <-> keys simultaneously and keep them pressed down until the display reads the following:	
	<i>The display will now show</i> 
☞ Release the keys.	
	<i>The display will now show</i> 
⚠ The meter is now ready to start measuring.	

6.2 Calibration check

A benchmark block (optional) is needed to check the calibration of the FMW.

☞ Make the FMW ready for use as described in Chapter 5.2.	
☞ Set the thickness to 20 for the FMW-T and 30 for the FMW-B.	
☞ Set the specific weight to 0.50.	
☞ Press the <MENU> key until the measuring display appears.	
☞ Place the sensor surface of the meter on the benchmark block.	
⚠ Place the top of the FMW-T and back of the FMW-B in the centre of the benchmark block.	
⚠ Do not place the benchmark block on a metal surface.	
⚠ The meter is correctly calibrated if the reading given on the meter display is the same as the reading on the benchmark block.	

6.3 Battery check

⚠ The 'battery indication' will appear if the battery is almost empty. If you see this, replace the battery immediately.



6.4 Accessing the serial number

☞ Keep the <-> key pressed down when switching on the FMW.

The display will show alternately (example)



6.5 Accessing the version number

☞ Keep the <+> key pressed down when switching on the FMW.

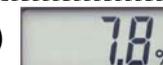
The display will now show (example)



6.6 Pin code

☞ Press the <ON> key to turn on the meter.

The display will now flash (example)



☞ Keep the <MENU> key pressed until the following appears in the display:

The display will now flash



☞ Keep the <MENU> key pressed and press the <-> simultaneously.

The display will now show



⚠ The setting Pn0 means the pin code setting is switched off. Pn1 means the pin code setting is switched on.

⚠ If the <-> is not pressed the meter will go back to the measuring screen.

☞ Press the <-> or <+> key to switch the pin code setting on or off.

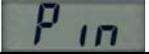
☞ Press the <MENU> key to go to the measuring screen.

The display will now flash (for example)



 The settings can not be changed when the pin code setting is switched on.

The display will now show



7 Specifications

- Capacitive moisture measuring
- Measuring range 2-30% (for wood)
- Measuring range 0-60% (for construction materials)
- Measuring accuracy 0.5% (on reference material)
- Resolution 0,1%
- Average measuring depth 25 mm (1 inch)
- Memory function for 50 measuring values (depending on FMW type)
- Memory function for highest moisture content (depending on FMW type)
- Material temperature range 0-50°C (32-122°F)
- Instrument temperature range 0-50°C (32-122°F)
- Automatic switchoff after approx. 10 minutes
- Battery: 6LR61 (Alkaline)
- Battery check
- Calibration check by means of benchmark block (optional)
- Dimensions 160 x 85 x 30 mm
- Weight 260 grams (including battery)

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Declaration of conformity

We,

Brookhuis Micro-Electronics BV
Institutenweg 15
7521 PH Enschede
The Netherlands

declare under our sole responsibility that the product

Brookhuis FMW moisture meter

to which this declaration relates is in conformity with the following standards:

EN 50081-1 : 1993

EN 50082-1 : 1995

The product thereby complies with the requirements of the:

EMC Directive 89/336/EEC

Enschede, the Netherlands 09 August 2004

Brookhuis Micro-Electronics BV



M.J.P. Schuijl



Brookhuis Micro-Electronics BV