brookhuis
APPLIED TECHNOLOGIES

FMC / FME Moisture Meter

Operating Instructions
Version 7.14

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 FMC or FME microprocessor-controlled moisture meter. This meter is a Dutch quality product that will allow you to measure the moisture content of wood and construction materials.

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

Enschede, The Netherlands, 1 April 2015

Notification

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

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Contents

1 Introduction

These operating instructions explain how to operate and use the FMC and FME moisture meters. Since these instructions describe the operation of two types of meter, FMC/E is used to refer to a function in both the FMC and FME meters. If the function only applies to one of the meters, that particular type of meter is indicated.

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 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.

⚠ Avoid using the instrument near highly magnetic, electromagnetic and electrostatic fields.

⚠ The instrument should be cleaned with a dry cloth only.

⚠ Be careful when and after using the measuring instrument since the measuring pins on the electrode are sharp.

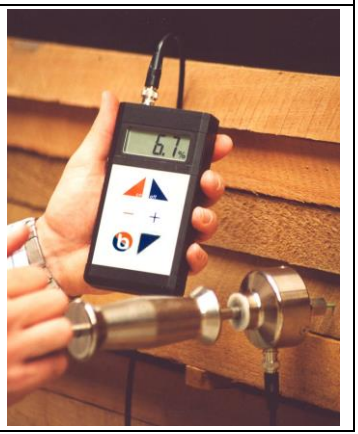
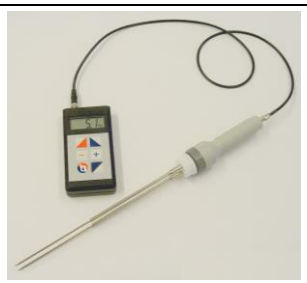
⚠ Use only Brookhuis measuring pins for the electrode.

⚠ Always return the measuring electrode to its case to avoid accidents.

⚠ After use, the measuring instrument should be stored in a dry place.

3 Examples of use

The FMC/E can be used in various applications. The table below shows some of these applications.

	FMC/FME
Measuring moisture in wood	
Measuring moisture in construction materials	
Measuring moisture in wood chippings and dust, coffee beans, etc.	
Measuring moisture in paper, veneer, sawdust, etc.	

4 Overview of the FMC/E moisture meter set

This chapter describes the various components of the FMC/E, as well as optionally available components.

4.1 The FMC/E moisture meter set components

The FMC/E set consists of the following components:

- An FMC or FME moisture meter.
- An ABS instrument case.
- A measuring electrode and cable.
- A spanner (for the hammer probe and hand probe).
- A 9 Volt battery.
- Booklet “moisture measurement” with settings for the material being measured.
- Operating instructions.

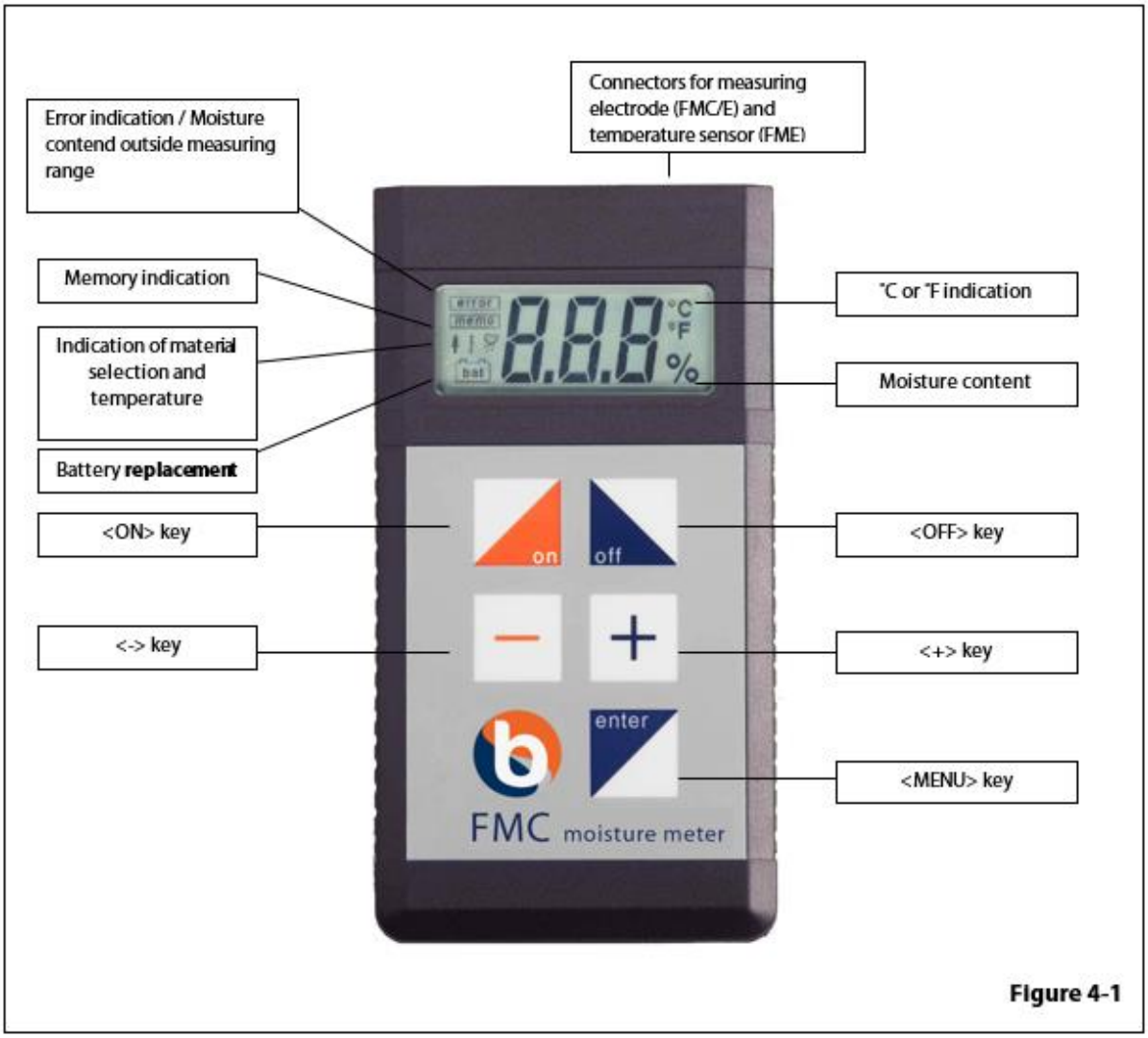


Figure 4-1

4.2 Picture of the FMC/E moisture meter

The components of the FMC/E are shown in **Fout! Verwijzingsbron niet gevonden.** below.

Error indication / Moisture contend outside measruring range

4.3 ailable accessories

Reference resistance	With the help of the reference resistance, it is easy to find out whether the FMC/E moisture meter carries out measurements in accordance with the factory settings (see section 6.3)
Temperature sensor	The FME can be used as a temperature meter with the aid of the temperature sensor. The temperature measured is used for the automatic temperature correction (see section 6.1)
Concrete measuring set	The concrete measuring set enables the user to measure the moisture content of various construction materials to a high level of accuracy. The set is suitable for both the FMC and the FME.
MC selector	The MC selector enables the user to measure the moisture content of wood at various locations in the drying room without having to enter the room.
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.
Special electrodes	Using special electrodes, the FMC/E is able to measure the moisture content of materials such as paper, card cotton, sawdust, coffee beans and veneer.

Ask your Brookhuis Dealer for these accessories!

5 Starting up and settings

This chapter describes the operations required to start up the FMC/E.

5.1 Installing the battery

The battery compartment is at the back of the FMC/E, 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 meter to the attachment clip and then close the compartment by replacing the lid. The FMC/E is now ready to be set up.

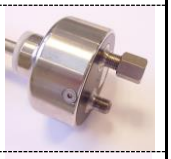
⚠ When removing the battery, hold the attachment clip – **not the wires**.

⚠ Use alkaline batteries only.

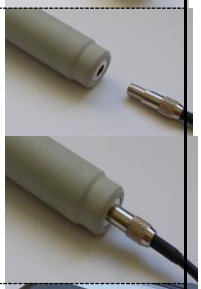
5.2 Setting up the FMC/E

Before measuring can start, the measuring electrode has to be connected and the meter set for the material and temperature in question. Depending on the type of electrode, sections 5.2.1 to 5.2.4 contain instructions for connecting the electrode.

5.2.1 Connecting the Ram electrode / handle electrode

☞ Install the battery as described in section 5.1	
☞ Unscrew the swivel nut from the electrode with the spanner supplied with the meter.	
☞ Insert the measuring pin into the swivel.	
☞ Slide the swivel nut over the measuring pin and screw it tight.	
☞ Repeat the above for the second measuring pin.	
☞ Attach the plug for the measuring cable to the electrode connector. Make sure the groove in the plug slides over the tips of the connector.	
☞ Turn the plug's metal housing clockwise until it locks into the connector.	
☞ Attach the other end of the measuring cable to the FMC/E in the same way.	
☞ Insert the electrode measuring pins into the material being measured by hitting them into the material. Hold the electrode at the top and straight over the wood.	
⚠ The meter is now ready for setting (see section 5.3)	

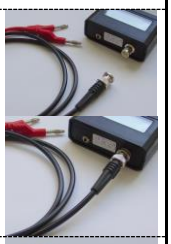
5.2.2 Connecting the universal electrode

☞ Install the battery as described in section 5.1	
☞ Unscrew the plastic nut from the holder.	
☞ Place the electrode in the holder and push it until it locks in position.	
☞ Tighten the plastic nut on the holder.	
☞ Insert the measuring cable connector into the back of the holder.	
☞ Attach the measuring cable plug to the FMC/E connector. Make sure the groove in the plug slides over the tips of the connector. Turn the plug's metal housing clockwise until it locks into the connector.	
☞ Place the electrode measuring pins in or on (depending on the type) the material being measured.	
⚠ The meter is now ready to be set (see section 5.3)	

5.2.3 Connecting the cup electrode

☞ Install the battery as described in section 5.1	
☞ Attach the measuring cable plug to the FMC/E connector. Make sure the groove in the plug slides over the tips of the connector. Turn the plug's metal housing clockwise until it locks into the connector.	
☞ Attach the measuring cable plug to the electrode connector. The plug is locked once it clicks over the connector.	
☞ Turn the wheel of the cup electrode anticlockwise until it comes away from the cup.	
☞ Fill the cup electrode with the material being measured and close it.	
⚠ The meter is now ready for setting (see section 5.3)	

5.2.4 Connecting the concrete measuring set

☞ Install the battery as described in section 5.1	
☞ Attach the measuring cable plug to the FMC/E connector. Make sure the groove in the plug slides over the tips of the connector. Turn the plug's metal housing clockwise until it locks into the connector.	
☞ Screw the contact sockets onto the measuring pins.	
☞ Connect the measuring pins to the red plugs.	

☞ Drill two holes in the material being measured using the concrete drill supplied. The holes should be approximately 25 cm apart.	
☞ Dip the measuring pin with the socket into the graphite powder bottle.	
☞ Insert the measuring pins and contact sockets into the holes. Turn the measuring pins clockwise until they are secured in the material being measured.	
⚠ The meter is now ready for setting (see section 5.3)	
⚠ Once a measurement has been taken, the measuring pins can be removed from the holes by turning them anticlockwise.	

5.3 Setting the FMC/E

☞ Turn on the FMC/E by pressing the <ON> key.	
The display will now show (example)	
⚠ If the electrode is not in the material or not connected, the value in the meter display will flash.	
☞ Press the <MENU> key.	
The display will now show (example)	
⚠ The value displayed is the material setting last used.	
☞ Find the appropriate material setting in the booklet entitled 'Brookhuis moisture meters for wood, construction materials and paper' supplied with the FMC/E.	
☞ Press the <+> or <-> key to select the appropriate material.	
☞ Press the <MENU> key.	
The display will show (example)	
☞ Press the <+> or <-> key to enter the temperature of the material being measured.	
⚠ If the temperature sensor is connected to the FME, the temperature is measured and corrected automatically (see section 6.1 for how to connect the temperature sensor to the FME).	
☞ Press the <MENU> key.	
The display will now show (example)	
⚠ The meter is now ready to start measuring.	

5.4 Precautions and instructions

⚠ The insulated measuring pins should be hit into a depth of 1/3 of the wood thickness.

⚠ The meter measures the resistance between the two measuring pins. Cracks, resin channels, knots, etc. may affect the moisture measurement.

⚠ In certain weather conditions, condensation may occur on the measuring electrode. The FMC/E will then display a higher measurement value. The measurement electrode should be dry and placed in the measuring area for a few minutes to allow it to acclimatise to the ambient temperature.

⚠ If the wood is extremely dry and the relative air humidity is low, static electricity may cause problems. In that case, the meter should be laid on the material being measured and not held.

⚠ In some cases, the measurement value in the meter display may fall. This may occur, for example, if the wood has been impregnated or been in contact with salt-water. The measurement should then be taken in another part of the wood.

6 Functions

This chapter contains an overview of the special functions of the FMC/E.

6.1 Automatic temperature correction

The temperature is automatically corrected while the FME is being set. The temperature sensor must be connected before the meter is readied for use.

☞ Insert the temperature sensor plug into the connection on the FME until it clicks into place.	
⚠ Ready the FME for use as described in section 5.2	

6.2 The FME memory

The FME can store up to 50 measurement values in its memory. The measurement values can be stored, retrieved and deleted as follows:

☞ Ready the FME for use as described in section 5.2	
☞ Insert the electrode into the material being measured (see sections 5.2.1 to 5.2.4).	
The display will now show (example)	
☞ Press the <+> key to store the measurement value in the memory.	
The display will now show	
⚠ The meter has now stored the measurement value in its memory. This is shown in the display by the memory indication 'MEMO'.	
☞ Press the <MENU> key to take another measurement.	

The stored measurement values can be retrieved as follows:

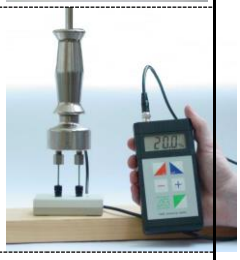
☞ Press the <–> key to retrieve the measurement values stored in the memory.	
The display will now show	
☞ Press the <–> key again to retrieve measurement values stored previously in the memory.	
☞ Press the <MENU> key to take another measurement.	

The memory can be cleared as follows:

☞ Press the <+> and <-> keys simultaneously and keep them pressed until the displays shows the following:	
The display will now show	
☞ Release the keys	
The display will now flash (example)	
⚠ The meter is now ready to start measuring.	

6.3 Calibration check

The calibration of the FMC/E can be checked using the reference resistance (optional, see section 4.3).

☞ Ready the FMC/E for use as described in section 5.2.
☞ Press the <MENU> key.
The display will now show (example) 
☞ Press the <+> or <–> key to zero the FMC/E.
The display will now show 
☞ Press the <MENU> key.
☞ Set the temperature as shown on the back of the reference resistance. 
☞ Insert the measuring pins into the two sockets on the reference resistance. 
⚠ When the value shown by the meter corresponds to the value indicated on the reference resistance, the meter is calibrated correctly.

6.4 Battery check

⚠ When the battery is almost empty, a battery icon will appear in the display. The battery should then be replaced. 

6.5 Accessing the serial number

☞ Keep the <-> key pressed when turning on the FMC/E.
The display will show alternately (example 02-532) 

6.6 Accessing the version number

☞ Keep the <+> key pressed when turning on the FMC/E.
The display will now show (example) 

6.7 Setting ˚C or ˚F and switch-off time

☞ Press the <ON> key to turn on the meter.
☞ Keep the <MENU> key pressed until the following appears in the display:
The display will now show 
☞ Keep the <MENU> key pressed and press the <+> or <–> key to set the temperature to ˚C or ˚F.
☞ Press the <MENU> key.
The display will now show 
☞ Press the <MENU> key.
☞ Press the <+> or <–> key to set the switch-off time in minutes.
☞ Press the <MENU> key.
⚠ The meter is now ready to start measuring.

6.8 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 setting "˚C or ˚F and switch-off time" will appear. (see chapter 6.7)
☞ 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

- Resistance moisture measuring
- Measuring range 5~99% (for wood)
- Measuring range 0~99% (for construction materials)
- Measuring accuracy 0.2% (on reference material) (FMC 0,3%)
- Resolution 0.1%
- Memory function for up to 50 measurement values (FME only)
- Temperature correction -40~90˚C (-40~194˚F)
- Connection for temperature sensor (FME only)
- Instrument temperature range FMC/E 0~50˚C (32~122˚F)
- Adjustable automatic switch-off function
- Battery check function
- Volt alkaline battery (6LR61)
- Calibration check using the reference resistance (optional)
- Dimensions 160x85x30mm
- Weight 260 grams (including battery)

Index

Declaration of conformity

We,

Brookhuis Applied Technologies BV
Institutenweg 15
7521 PH Enschede
The Netherlands

declare under our sole responsibility that the product

Brookhuis FMC / FME moisture meter

complete with:

Brookhuis Measuring probe
Brookhuis Measuring cable
Brookhuis Measuring pins
Brookhuis Temperature probe (optional)

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:

EMC Directive 89/336/EEC

Enschede, 01 April 2015

Brookhuis Applied Technologies BV

M.C.M Elbers