Exotek Instruments

MC-380XCA

**Electronic Moisture Meter
for Wood & Building Material
with RH Presentation**

USER MANUAL

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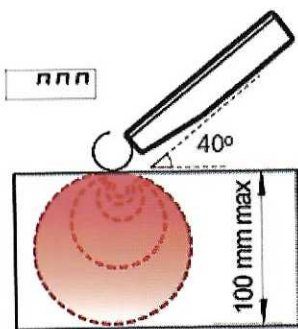
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E

L/S   MENU
F1-F4

MC-380XCA
Moisture Content Meter
Wood-/Building Material

CE

NOR SVE PYC SUO DEU FRA ENG

CE

Figure 1

Figure 2

MC-380XCA ⬚ Exotek
Instruments

INTRODUCTION

With the MC-380XCA moisture-measuring instrument, EXOTEK INSTRUMENTS has introduced a hand-held moisture-measuring unit, incorporating electronic circuitry perfected over years of development and practical applications with the latest technology.

It is easy to determine moisture content in wood and building materials with the contact measurement procedure without destroying the material. Reliability, durability and a high standard of accuracy are assured by modern digital components built to cope with the stress of everyday use.

The setting of wood-groups and building material groups combined with an automatic zero-correction, allow more accurate measurements on all European as well as Tropical timbers, as well as on a great number of building materials. **The Unique switchable dual Scanning Depth of 10 and 100 mm makes it easy to determine Moisture Content even in floors with built in Central Heating.**

SWITCH-ON

By pressing this key once, if the device is off, the unit is switched on.

SWITCH-OFF

By pressing this key once, if the device is on, the unit is switched off. Or:
Automatic off after approx. 30 seconds if the value is stable.

ALARM FUNCTION

The MC-380XCA has the possibility to give an acoustic alarm in case of an user selectable alarm threshold is reached or exceeded. This function is most useful for sorting out timbers.

By pressing this key once, a L-sign is indicated on the display. During this indication, the key has to be pressed again. Now the actual threshold value (L6 – L30 or; L 0.6-L 3.0 or; 60-99% in RH mode) if the Building material group CC2 – b30 is selected) is indicated and the alarm function is activated. In case this key is pressed again, while the limit is indicated, the threshold value is being increased by 1% moisture in the range of 6 – 30% or If the CC2 to b30 is selected the alarm threshold is increased with 0,1%. For RH mode the step increases by 1% when the key is pressed). After 2 sec. the unit is ready to take measurements. To turn off the alarm function, select only a different function.

INSTALLING BATTERY

- Open the battery lid on the backside of the meter.
- Install a 9 volt L6R22.
- Close the lid.

A low voltage is indicated with ⬚ at the upper left side of the display when the battery needs to be replaced. A new battery should be inserted to achieve correct measuring results.

SENSOR SWITCHING

By pressing the L/S key once, a **L**-sign is indicated on the display. Wait until the **S**-sign is shown. During the **S**-sign indication, the key has to be pressed again. Now the previous selected sensor top (⨅ ⨅ ⨅) or bottom (⨆ ⨆ ⨆) is indicated. If during this display, this button is pressed again, the device toggels to the other sensor.

ⴖ ⴖ ⴖ 　　　　 ⴗ ⴗ ⴗ

Upper Sensor Indication　　　Lower Sensor Indication

ENVIRONMENT PROTECTION

According to the regulations for battery dispose, all batteries must be returned to the trade or to battery collecting points. You are not allowed to dispose batteries through the household waste.

ONLY FOR EU COUNTRIES

Do not dispose of electrical tools together with household waste material! In observance of European Directive 2002/96/ EC on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reach the end of their life must be collected separately and returned to an environmentally recycling facility.

BACKLIGHT

To increase battery life, the backlight dims down to OFF automatically after about 5 seconds if no measuring value changes. Immediate reactivation of backlight after key-press or changing of measuring value.

SELECTION OF WOOD GROUPS OR BUILDING MATERIAL GROUPS

After the unit has been switched on, the previous selected sensor (top sensor with ⨅ ⨅ ⨅ or bottom sensor with ⨆ ⨆ ⨆ followed by the wood density 200-1180 kg/m3, or building material CC2-b30 is indicated on the Display. If this key is kept pressed, the group increases by itself automatically while increasing the velocity, as longer it is kept pressed. Or after releasing and pressing the key E repetitively, the wood group will increase by 20kg/m³ or the next Material group is selected. After 2 sec. the unit is ready to take measurements. The indicated wood group is equivalent to the density of the timber.

ENG

MATERIAL CODE

200	Balsa, Sugi
300	Aspen, Cypress, Cedar
400	Fir, Poplar, Pine, Alder, Small Leaved Lime tree
500	Maple, Larch, Douglas Fir
600	Oak, Birch, Beech, Pear, Teak
700	Silver Birch, Hickory, Wengé
800	Stone Oak, Zebra
900	Boxwood, Rosewood
1000	Ebony
CC2-4	Cellular concrete
AC5-7	Asbestos-cellulose-cement
C18-19	Light-weight concrete
E20	Cement mortar
C21-22	Concrete
L23-24	Lime-sandstone
E25	Lime-cement mortar
P26	Plaster
E27-28	Sandstone, Limestone
b29-30	Brick

For a wider selection and more precise of wood materials, please see the Wood Group Table at the end of the manual.

SET.	DENSITY RANGE	MATERIAL
CC2	1200 – 1300 kg/m³	Cellular concrete 200 – 400 kg/m³
CC3	1300 – 1400 kg/m³	Cellular concrete 500 kg/m³
CC4	1400 – 1500 kg/m³	Cellular concrete >500 kg/m³ porosity 75 - 85%
AC5	1500 – 1600 kg/m³	Asbestos-cellulose-cement 1500kg/m³ porosity 40 - 45%

ENG

SET.	DENSITY RANGE	MATERIAL
AC6	1600 – 1700 kg/m³	Asbestos-cellulose-cement 1900kg/m³ porosity 35 - 40%
AC7	1700 – 1800 kg/m³	Asbestos-cellulose-cement 2000kg/m³ porosity 30 - 35%
C18	1800 – 1900 kg/m³	Light-weight concrete open porosity
C19	1900 – 2000 kg/m³	Light-weight concrete building stones
E20	2000 – 2100 kg/m³	Cement mortar 1:4 porosity 20 - 25% Tiles and Stone ware
C21	2100 – 2200 kg/m³	Concrete K 200 - 250
C22	2200 – 2300 kg/m³	Concrete K 300 - 400
L23	2300 – 2400 kg/m³	Lime-Sandstone 1700 - 1800kg/m³
L24	2400 – 2500 kg/m³	Lime-Sandstone >1800kg/m³
E25	2500 – 2600 kg/m³	Lime-Cement mortar
P26	2600 – 2700 kg/m³	Plaster 1200 - 1300kg/m³ Marble, Cement screed
E27	2700 – 2800 kg/m³	Sandstone
E28	2800 – 2900 kg/m³	Limestone
b29	2900 – 3000 kg/m³	Brick 1600 - 1800kg/m³ open porosity 40 - 50%
b30	3000 – 3100 kg/m³	Brick >1800kg/m³ open porosity 10 - 30%

MEASURING WITH SPRING ELECTRODES
(penetration depth up to 100 mm (4"))

After selecting the appropriate material-group the measuring springs must be hold up in the air for automatic 0-correction.

The unit is ready for measuring after about 2 sec.

Hold the spring electrodes without excessive force and in an approx. 40o angel to the material. All of the 3 measuring springs must be in good contact with the material to be measured. **See Page 2 figure 1.**

Measurements may be taken in different spots of the material, or the measuring springs could be slided across the material.

MEASURING WITH INTEGRATED
BOTTOM SENSOR (penetration depth up to 10 mm (½"))

After selecting the appropriate material-group the bottom of the unit must be hold up in the air for automatic 0-correction.

The unit is ready for measuring after about 2 sec.

Place the unit in upright position onto the material to be measured or press the bottom of the unit against the material. **See page 2 Figure 2.**

The surface of the material that is to be measured have to be flat and even. Measurements may be taken in different spots of the material.

SELECTING MEASURING FUNCTIONS

F I: Measurement without hold function.
When the spring electrodes are moved over a surface, the MC-380XCA continuously takes a new measurement. This function is used for fast scanning of an area.

MENU F1-F4

F2: Measurement with hold function, indicated by "HOLD".
The MC-380XCA only takes one measurement when the spring electrodes touch a surface. The value is kept on the display after the MC-380XCA being removed from a surface. This is used for viewing the result where it is difficult to see the display during operation. A new reading is taken when the unit is placed on a surface again.

F3: Measured value is calculated into Relative Humidity,
indicated by „RH:" (only for material codes CC2 - b30).
To be used for building materials only not wood. The MC-380XCA automatically calculates the Moisture content value (% H_2O) into Relative Humidity (% RH). This function is used when relative humidity is a more appropriate term.

F4: MC measurements are stored and the average value is calculated.
Up to 16 measurements can be stored in the memory. The MC-380XCA then calculates the average of values stored in the memory.
- "AVE+" is showed in the left corner of the display when a value is stored.
- The average value is flashing on the display if the green button is pushed.
- To reset the memory turn the unit off.

THIN MATERIALS

For single materials, thinner than 5 mm, the sensitivity of the meter is normally not enough even with the bottom sensor. To obtain a more accurate measuring result we recommend measurements in a pile without air spaces between the single parts and with a minimum thickness of 15 mm for the pile.

BASE

With material thickness < 50 mm the base material is very important To avoid a metal base. The best results are achieved if the material to be measured is held into the air. Polystyrene material with a minimum thickness of 20 (8") cm can also be used when using the Measuring Springs. It is sufficient with 2.5 cm (1") of polystyrene mateial if the internal (bottom) sensor is used.

WET SURFACES

In case of material with a wet surface a PVC-foil can be used between the material and measuring springs. For the Internal (bottom sensor) a PVC foil is not necessary.

APPROXIMATE REFERENCE VALUES MOISTURE CONTENT (% H_2O):

BUILDING MATERIAL	DRY	MOIST	WET
Breezeblock (cellular lightweight concrete)	0 - 4	4 - 5	> 5
Bricks, plaster	0 - 2.5	2.5 - 3.5	> 3.5
Asbestos cement	0 - 5	5 - 7	> 7
Clinker-clay floor tiles, wall tiles	0 - 1.5	1.5 - 2	> 2
Concrete, cement wash floor	0 - 3	3 - 4	> 4
Gypsum	0 - 1	1 - 2	> 2
Marble, sandstone	0 - 1.5	1.5 - 2	> 2

WOOD	DRY	MOIST	WET
Parquet flooring	6 - 8		
Furniture (indoor)	6 - 9		
Door/ window (outdoor)	12 - 15		

(Mold: 18 - 20 %, Rot: >28 %)

When examining wood, make sure that measurements are carried out in accordance with its fibre direction – otherwise the measured values will be too low. The measuring direction is correct when the wood fibre direction is parallel to the indicator (see below).

REFERENCE MEASUREMENT

How to locate moist and leakage:

1. Set the Material code to 200 or CC2
2. Hold the spring electrodes or the bottom sensor to a surface you know is dry
3. The received value corresponds to a "dry material" and could be used as reference value
4. Now it is possible to locate moist and leakage using the reference value
5. By moving the measurement springs over the surface you could quickly locate the leakage and find out about the extent of the moist damage.

TECHNICAL SPECIFICATION

WOOD	230 different species of wood or user defined by density.
BUILDING MATERIALS	Ytong, brick, tile, plaster, asbestos cement board, gypsum fiber boards, tiles, sandstone, limestone, concrete, concrete blocks, clinker and more.
MEASURING PRINCIPLE	Capacitance type, non intrusive.
MEASURING RANGE - CONCRETE	Building material: 0 - 98% Relative air Humidity (RH@E4)
MEASURING RANGE - MOISTURE CONTENT	Wood@ 200 kg/m³ : 0 - 85% H_2O Building material @ (CC2): 0 - 10% H_2O
MEASURING ACCURACY	Approximately ± 1 % MC
MEASURING GROUPS (DENSITY RANGE)	50 Wood Groups . (200-1180 kg/m³) 19 Building Materials Groups (1200-3000 kg/m³)
SCANNING DEPTH SELECTABLE	Internal sensor: 10 mm - 15 mm Measuring Springs: Maximum 100 mm
AUTOMATIC OFF	Yes, after 30 seconds
MEASUREMENT AVERAGING	16 Measurements when selected.
BATTERY WARNING	Yes
WORKING RANGE	0°C/+60°C
DISPLAY	LCD graphical with backlight
RESOLUTION	0,1 %
CASING	ABS Plastic
SENSOR	Stainless Feather Steel Springs (50 mm).
BATTERY	9 V alkaline, L6R22
CARRYING BAG	Artificial Leather
SIZE (L x H x D)	150 x 71 x 25 mm
WEIGHT (INCL. BATTERY)	150 gram
WARRANTY	2 years

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