

UR2500

Moisture Meter

High Frequency Capacitive Technology

For non destructive measurement on Mass Products



Operator Manual

Cod. UR2500_5A730_UK_M1

English Language

Rev. Man 1.1 – Rev. Prod. 1.0

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1 – General Features

UR2500 Art. 5A730 is a portable moisture meter, with Capacitive technology at high frequency, planned to be able to make measurements in Mass, as they say at contact, even if the Mass measurement provides that itself should be done not superficially to the product, but on the contrary making an average on the thickness of the measured product.

The instrument is very compact, the circuit is made by an electronic with microprocessor of last generation which assures high reliability and an excellent performance of the product.

To make the measurement, the instrument is provided by three large thin layers of steel, set on the top of the strong plastic housing.

It is provided by a large LCD Display and a strong keyboard with five large and handy membrane keys, and a side key to make the measurement.

Battery power supply : 4 Size AAA Batteries – Suggested battery type

Note: to reduce the battery consumption the instrument is provided by a timer automatic turning off function.

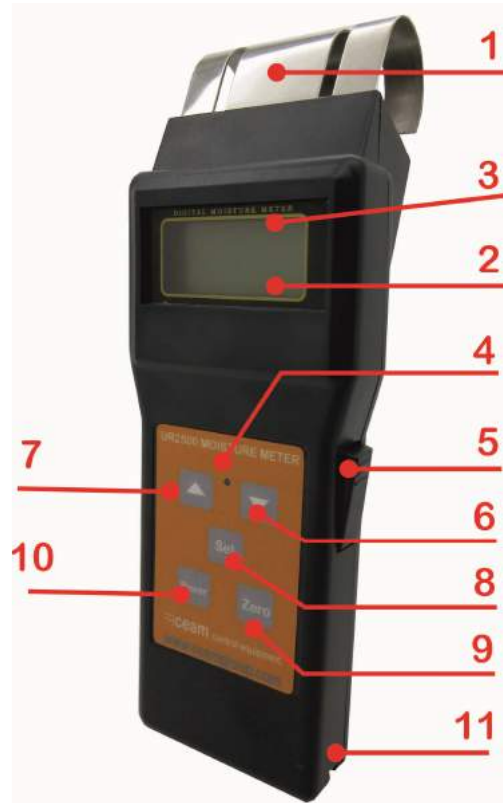
2 – Technical Characteristics of the product

2.1 Product General Data:

| | |
|------------------------------|---|
| Technology | Microprocessor Circuit |
| Measure Range | 0..80,0 % |
| Resolution | 0,1% |
| Precision | $\pm (1\%n+1)$ Up to 30% - $\pm (2\%n+1)$ Over 30% |
| Response Time | About 1 Second |
| Display | 3 Digit – Dimension 10 mm |
| Visualization | 0...99,0 % |
| Special Functions | Material Constant Set up |
| | |
| Power Supply | 4 Size AAA batteries |
| Operative Conditions | 0..50 °C (32..122 °F) – 20...80 UR% not condensing |
| Instrument Dimensions | 218 x 76 x 53 mm |
| Weight | 260 gr |
| Included Optional | Semi-rigid Holder and User Manual |
| Not included Optional | Rechargeable Batteries & Battery charger |

3 – Using Instructions

3.1 Instrument Keys



Picture 1

Keys:

- 1 – Sensible needs to be in touch with the product or the surface to be measured
- 2 – Indicating symbol of the measure you are making
- 3 – Display
- 4 – Trimmer of Fine Calibration
- 5 – Button to make the measurement
- 6 – Key “Low” to correct the values
- 7 – Key “Up” to correct the values
- 8 – Key “Set” to correct setting up values
- 9 – Set “Zero” Key
- 10 – Key “Power” to turn on and off the instrument
- 11 – Batteries Place

4 – Procedure to measurement

Before proceeding with the measurement it is necessary to make some preambles to explain better the functioning principle of the instrument, and providing some warning.

In first place we remind you that the instrument is a Capacitive meter which operates in High Frequency, and it is able to measure the water concentration which is present inside the material (the so called Mass) thanks to the capacity variation that the water produces, of course, the characteristics so called “Dielectrics” of the material to be measured can affect the measure itself.

For this reason the UR2500 cannot be considered an absolute instrument, that is, that the value we read on the display, it is never the real percentage of water contained in the product**, but being the measure , with the same product and the same operative conditions, very repeatable, the UR2500-7812 comes to be very useful to manage a productive process or to make an effective quality control.

**NOTE: to be underlined that the UR2500 has been originally thought for wood application, in fact in this manual you can find a table of the “K” (correction factors) to be set up for each kind of wood, and thanks to this table, it is possible to obtain measurements very close to the true, but to obtain a better knowledge of the real correspondence between the measured and the effective value, we always suggest to make experimental tests with material samples that then can also be preserved inside airtight containers as plastic bags, which can warranty the conservation of the original value of the initial humidity, also after several months, in fact a main characteristic of the UR2500 is that it is not influenced by the surface measurement, but it always makes an average measurement in a thickness which can fluctuate by few millimeters up to even dozens of centimeters, in function of the characteristics and of the density of the product, then, the airtight bag into which the samples are preserved, does not influences at all the measurement.

To make a practical demonstration of this characteristic, it is enough making a simple experiment, on a wood table, also laminated in plastic material, in a point where below there are not metallic structures, which would not allow the measurement, after having turn on the instrument, pressing the key “Power” (Fig.1 – Rif. 10) , after put the reeds of the UR2500 making them well touch the surface, then pressing and keeping pressed the side key to make the measurement (Fig.1 – Rif.5) the instrument will display a value, then always keeping pressed the measurement key, put your hand touching the below side of the table, in the exact correspondence of the measurement point, and you will see that the displayed value will be influenced by the presence of your hand which is for sure more humid then the table.

This proves irrefutably that the instrument is able to make measurement in thickness, and is barely influenced by eventual surfaces which could deceive the operator, as for example in the sector of the manufactures in clay and terracotta tiles, where typically this instrument finds one of its application, a process of wrong and too fast drying could produce a very dry surface, deceiving the operator, but hiding below a hart of the material still completely humid, and this detail, once inserted the product inside the furnace, could make explode the handmade because of the pressure of the steam which does not find through the surface the way to be expelled, but, at best even if the handmade does not explode, it will be anyhow defective, then using the UR2500 the operator would realize immediately that there is something wrong apart from the surface of the product.

Measurement Procedures:

4.1 Turning on the instrument

To turn on the instrument press for at least 3 seconds the key “Power” (Fig. 1 – Rif. 10), the instrument will indicate its turning on by the show of the value “0” on the display.

4.2 Visualization Value”0”

Now the instrument should visualize the value “0” on the display

4.2.1 Access to the Function of the Correction Constant (See table – Paragraph 7)

Press the key “SET” for at least 3 seconds (Pict. 1 – Ref. 7) to enter in the function which allows to insert the correction value which can be set up with a value included between “0” and “10,0” , the instrument will visualize the value “0,0” or the value previously memorized, flashing to indicate that we entered into the function.

4.2.2 Set-up of the Material Constant

Set-up the value using the arrow keys “ increase & Lower” (Pict. 1 – Ref. 6 – 7) , if any other key is pressed, after few seconds, the display stops flashing and gets out automatically by the function “SET” to get back being operative.

4.2.3 Memorization of the Set-up Constant

Once set-up the desired correction value, to memorize it and exit the function "SET", press again the key "SET" (Pict. 1 – Ref. 8) and the instrument will display again "0" and will be ready to make other measurement, using now the new correction set-up value.

Of course in any moment it is possible to verify the correction value set-up, simply pressing the Key "SET" (Pict. 1 – Ref. 8) pressing it again to exit it quickly, or waiting few seconds to exit it automatically.

4.2.4 Verification of the Calibration Zero

Once set –up the correction coefficient of the desired material, (look Table Paragraph 7) it is possible to proceed in executing the calibration Zero as follows:

For security, turn off and on again always the instrument before executing the calibration of the zero, once the instrument visualizes the value "0" on the display, press the Key "SET" (Pict.1 – Ref. 8).

Direct the instrument to air, keeping attention that the sensitive reeds do not touch anything but air.

Press and release the measurement key (Pict.1 – Ref.5) on the display should be still visualize the value "0", if this happens it means that the instrument does not need the re-calibration, while if it visualizes a different value it means that the calibration to zero is really necessary.

At this point press the measurement key (Pict.1 – Ref. 5) and for few seconds also the key "ZERO" (Pict. 1 – Ref.11) and the display shows again the visualization to "0" making flash again the display.

The calibration is finished, to verify that there are no other problems on the circuit, turn off and on again the instrument, direct it to air and press the measurement key (Pict.1 – Ref.5) the instrument must visualize "0" if it visualizes a different value, the instrument could have had a damage to the electronic circuit, then stop using it and send it as soon as possible to the technical service of CEAM Control Equipment.

Attention:

1 – it is not necessary to make the calibration of Zero every time you make the measurement, it is enough making it time by time, or if there is the suspicion that there is some problem.

2 – the instrument is provided by a regulation Trimmer (Pict. 1 – Ref. 4) which acts on the SPAN of the range, this trimmer must not be moved by the user, as modifying this calibration without having the proper equipment and without the deep knowledge of the instrument you could damage it in an irreparable way, besides a modification of this set-up void immediately the warranty on the product.

4.3 – Making the measurement:

To proceed to the effective execution of the measurement, after having followed the previous steps, lean on the surface to be measured the three reeds of the instrument making them stick to the surface as you can see in the picture below, with a little strength, eventually if the surface is dirty, clean it before leaning the reeds.

Press then the side measurement key for at least 4 seconds (Pict. 1 – Ref.5), the key can also be kept pressed for a longer time so to make well adjust the measurement.

Once released the measurement key, on the display it remains memorized the last obtained value, (Data HOLD Function)



5 – Consideration for the measurement

The instrument is very simple to be used, but a good practice and a good experience, keeping in mind few but important rules, will easier the measurement with large satisfaction.

The rules are the following:

5.1 – Ruggedness of the Materials:

Higher will be the ruggedness and irregularity of the surface, and higher should be the pressure of the reeds to make them stick better, at least as more as possible.

On the contrary, better will be the quality of the surface, and minor will be the necessity to press the reeds to make them stick correctly.

5.2 – Thickness of the Materials:

Especially in case of wood, but this indication is also for other materials, the ideal thickness to execute the measurement is about 50 mm, in case the thickness of the product was less, if possible stack other layers of material up to get over such thickness, of course you must consider that the stacked material will contribute to the measurement, as the instrument will make an average in the obtained thickness.

Otherwise in case the product is not of the enough thickness, and it is not possible to stack others without distort the measurement, the alternative solution are the following:

Stack the material to be measured on a block of dry insulating material, or with negligible humidity, for instance the Polystyrene

In the case the product has got a thickness between 10..20 mm and cannot be neither stacked nor laid on anything, increase the used correction value of + 0,6

While in case the thickness of the product is between 21..30 mm and also in this case it cannot be neither stacked nor laid, increase the used correction value of + 0,3

5.3 – Presence of Metals and/or Conductors inside the Materials to be Measured:

Within 50 mm. of thickness, the measurement is strongly altered by metal products and or conductive products, as thin metal plates, nets, structures etc, which are inside the measure range field, including the eventual presence of your hand to hold the product to be measured.

5.4 – Cleaning of the Surface to be Measured:

Before making the measurement, clean well the surface to be measured.

5.5 – Wood and Material kept in Water Bath and/or Salty Liquids :

In case of wood and various material which remained dipped for a long time in salty water, or liquid conductive products, the measure will be higher because of the Salt which remained inside the product also when it will be dry.

5.6 – Correct Positioning of the Measurement Reeds:

The three sensitive reeds must lay everyone on the product to be measured, a covering of a partial surface, generates an error in the measurement visualizing not correct values.

5.7 – Not Homogeneous Measurements:

During the measurements on a wide surface, in particular in wood, it will be possible to obtain different values in different measurement points, this is because of a not homogeneous distribution of the humidity, which is absolutely normal, especially in products which do not have a density and an homogeneous structure, as for instance the wood and the natural fibres, in general the industrial products and the rebuild woods if the productive process is well followed, should always turn out more homogeneous.

6 – Battery Replacement

The instrument indicate the low battery by the visualization on the display with the icon of the Battery.

Warning:

In this condition the measurements are not reliable, then we suggest to change them as soon as possible.

For the substitution of the batteries, remove the plug of the room on the low side of the instrument body (Fig. 1 – Rif. 11) substitute the battery keeping attention to the polarity, and then put again the plug.

Warning:

The instrument need 4 Size AAA Batt or equivalent. Use only alkaline batteries or the CEAM suggested ones.

7.1 – Empiric Procedure to fine the coefficients of new materials:

Even if on the above table you can find only some materials, this does not mean that the instrument is able to be used with success also with many other products, in fact it is true exactly the opposite.

In fact we are sure that many users, use regularly with success the UR2500 with a large range of materials, and all this is possible both because in process often it is not necessary to know the exact and referring meaning of a measure, but it is enough having a relative parameter to be used as a reference, in fact if it is true as before explained, that the reading of this instrument could not correspond to an exact value of the water percentage contained, it is also true then that at the increasing or at the decreasing of the read value, at parity of the material, thickness and operative conditions, the real value of the water it is actually less or more, and this fact often is enough to justify the using of the instrument.

But if you want a measurement more precise and answering to the effective containing of the water, it is possible to proceed with a method as simply as efficacious, to verify if it is possible finding the right correction coefficient to be applied at the measurement of the above mentioned material, and at the end visualizing a reliable value.

The system is simple, and it is based on the quantification of the real water containing of a sample, for difference of weight Humid/Dry:

To proceed, keep two samples of the material, which is of dimension and thickness enough and compatible with how before mentioned, on which make then the measurements with the UR2500

Lay both samples on a Polystyrene block with a thickness of at least 200 mm, which would be dry or with an irrelevant humidity (to verify this detail it is enough measuring it with the UR2500, the measurement should be "0")

Mark the two samples with A & B

Close the two samples into two plastic bags, then seal them without metal of course, and leave them inside the two bags to stand for at least one day at environmental temperature and in a place repaired by the sunlight.

After this stabilization of the samples, proceed to make the measurement of humidity on both the samples, if they are not homogeneous at the first measurement, make several measurement on both sides and in several positions, but if the received results are very discordant, these samples cannot be used for this kind of test, and if it is not possible to obtain better samples, you can proceed anyway, but the obtained result will be less precise and reliable.

Then jot down on a paper sheet the measured value on the sample A and on the sample B

At this point weight with a precision scale the two bags containing the samples, jotting down the respective weights

Now put away one of the two samples, then take the other one taking it out of the bag, keeping attention not to loose any piece from the bag, which we will need to determinate later the precise dry weight, then put the sample inside an oven with a temperature enough to dry the product, and which is compatible with the material under test, let it dry for few hours, and if necessary even one day.

Once it is dry, the product must be put again inside the bag, or at least it must be re joint to it, and then must be weight again.

The new weight represent the dried weight, then subtracting it from the humid weight previously taken, for difference you find the water quantity, and knowing the total original weight of the sample, with a simple mathematical operation, it will be easily definable the percentage of water which was in origin contained inside the product.

Keeping the second sealed sample which was previously taken away, make a new measurement on it, without modifying the coefficient set on the UR25090, so to verify that the sample did not alter during the drying period of the second sample, if the value corresponds to what previously jotted down, begin making on it a series of measurements modifying at little steps the coefficient unless you find the value which more it allows to the measurement to be closer to the found value by the drying of the product.

Note: Of course the procedure above described is a "Simply" version of the real procedure that the CEAM Laboratory can make for you (and Fee-Paying) if you want to verify the eventual coefficient of your material, for more details please contact the customer service.

8 – Warranty

Attention!!

The present handbook is merely indicative, and it is subject to changes in any moment, without giving any notice.

The not respecting strictly the indication found on this handbook, the opening and tampering the product, the incorrect use, the wrong wiring, the using of spare parts or optional not original CEAM Control Equipment, the removing of the labels, of the identification marks put by CEAM Control Equipment, and the hidden export to Extra CE counties, they make immediately lose the responsibility over the product and the warranty right!

WARRANTY TERMS: the product is under warranty for a period of 12 Months (Art. 1490 C.C. and following) starting by the delivery note date, also in case it is in vision, and then transformed in selling, the complete text of the warranty conditions offered by CEAM Control Equipment in conformity to the actual laws, are published, and are at disposal of any people which demand for them, the document is registered both in paper form and in electronic form, to the CEAM Control Equipment, headquarter, and to see it, it is sufficient to make a written request, specifying the title of the applicant.

The warranty cover:

The products and the components which bad functioning is referable for sure to production defects, the eventual defect met gives only the right to repair it, and not to substitute the product, besides the eventual production defect, does not give any right to resolute the contract, or to suspend the payment if not expressly agreed in written by CEAM.

The warranty does not cover:

Defects generated by incorrect or improper use of the product
 Defects generated by using spare parts or consumables products not original CEAM
 Defects generated by environmental and/or atmospheric problems and/or natural calamity
 Products and/or services tampered or modified even partially
 Products and/or services to which have been taken off, or tampered, even partially, labels and lot codes original CEAM

In any case, the warranty does not cover:

Batteries, magnetic devices, perishable products and/or consumable products
 The components of Third parts, to which it must answer directly, the assistance service of the same, with the modalities provided from them.
 The technical time used to verify and/or to repair the products
 The travelling allowance, and the technical intervention on the place, if effected.
 The packaging and shipping cost of the products there and back.
 All the additional costs supported by CEAM to fulfil the warranty.

Clause of responsibility exclusion

CEAM does not assume any responsibility, regarding eventual damages, direct or in direct, caused to people or things, or damages for non production and/or incorrect production and/or eventual damage, in some way referable to the product and/or to this handbook service.

CEAM does not assume any responsibility regarding eventual damages caused to people or things because of the eventual not conformity to the product and/or service of the present handbook, which is merely indicative, and that can be changed by CEAM in any moment without giving any notice.



9 – Codes to order Optional & Spare Parts

Base Instrument:

UR2500 – Base Instrument - Art. 5A730

The instrument is provided complete of:

Semi-rigid Travelling Case Included & Operative Manual

Excluded by the Supply: Batteries

Optionals:

Rechargeable Batteries NiMh – Size AAA – Art. 0A609 (4 Unity Needed)

Batter Charger for NiMh Compatible Batteries - Size AAA – Art. 0943

We can also provide sealed special measurement samples with a wide last of time

Company With Quality System Certified

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Rivenditore di zona:

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