
Concrete and Mortar Moisture Tester
Model HI-520



Operating Manual

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About the Model HI-520 Concrete and Mortar Moisture Tester

The HI-520 is a handy high-frequency moisture tester with integrated main unit and sensor section. Moisture content can be displayed directly simply by pressing the unit against the object to be measured.

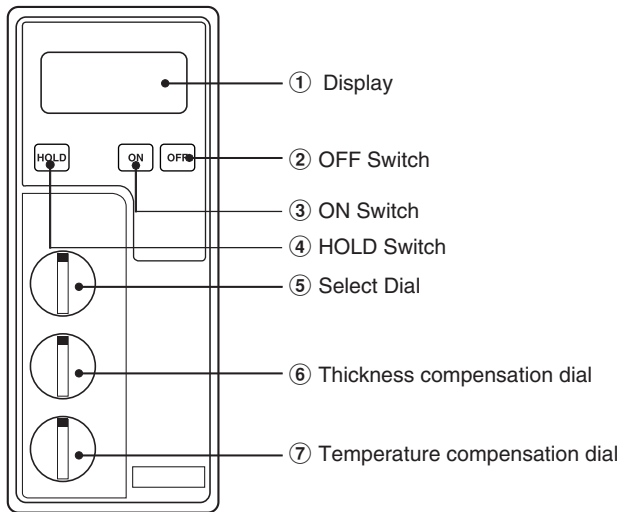
The HI-520 also features alarm and hold functions which make it possible to confirm the results of measurements taken at locations which are not directly visible. In addition, the HI-520 features a temperature compensation function which eliminates the effects of temperature on measurement values, thus providing an all season capability.

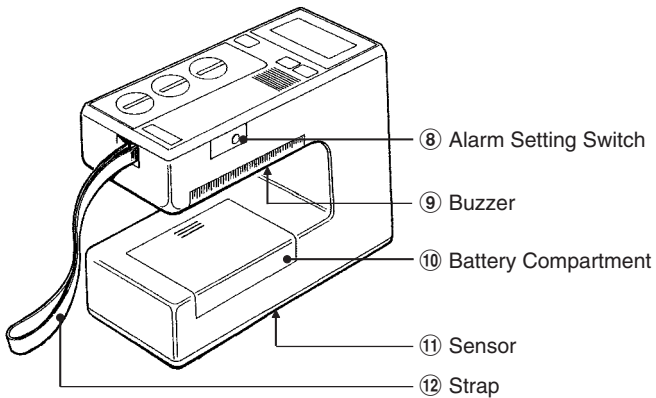
The HI-520 is a valuable moisture content management tool useful in a variety of applications in concrete manufacturing , water proofing and coating work in the construction and building industries.

1. Specifications

Measurement Principle:	High frequency capacitance (20MHz)
	Application: Concrete, Mortar, ALC
Measurement Range:	LWC(0~23%) GYP(0~50%)
	Mortar (0 ~15%) Concrete(0~12%)
	ALC (0 ~ 100%)
Compensation Functions:	Thickness 10 ~ 40mm
	Temperature: (1) Automatic (0 ~ 40°C),
	(2) Manual (0 ~ 70°C)
Display:	Digital LCD display
Alarm Functions:	Buzzer alarm when moisture content values exceed set values
Power Supply:	One 9V alkaline battery (006P)
Dimensions:	110 (H) x 56 (w) x 130 (d) mm
Weight:	Approx. 540g
Accessories:	9V alkaline battery x 1
	Screwdriver x 1
	Soft case x 1

2. Part Names





3. Measurement Principles

The HI-520 is a high frequency capacitance moisture tester which detects changes in electrical conductivity (high frequency capacitance) due to moisture content in concrete and mortar to determine the moisture content.

Taking 1 as the reference conductivity of air, the conductivity of each type of material is 10 or less. The conductivity of water is 80, a much larger value than concrete or mortar. Therefore when the concrete or mortar contains water, the conductivity is found to be higher than with the dry material. This makes it possible to determine the moisture content by determining the relationship between moisture content and conductivity beforehand. In actuality, the HI-520 measures changes high-frequency capacitance rather than conductivity to determine moisture content. The values obtained in this way are displayed as the measured moisture content.

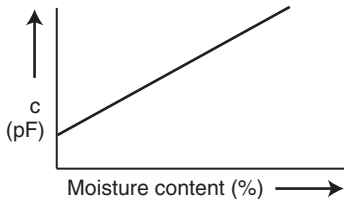
This relationship is described by the following formula:

$$c = e \cdot K \text{ (farad)}$$

e : Conductivity of the material containing moisture

K : Constant determined by shape of the sensor
(electrode)

c : Capacitance

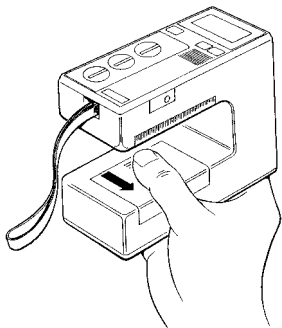


4. Using the HI-520

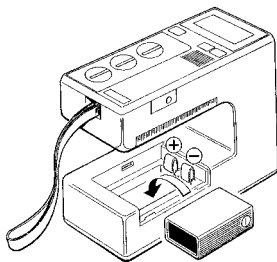
(1) Preparations

1. Power supply

The HI-520 utilizes a 9V alkaline battery as its power supply.



Use thumb to pull the battery compartment cover in the direction of the arrow.



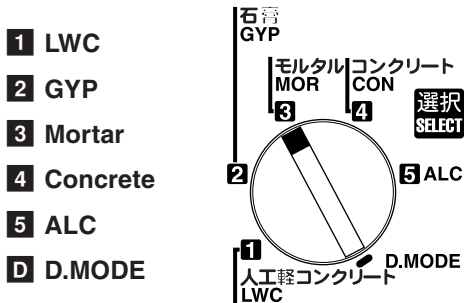
Insert a new battery into the compartment, taking care to orient the positive and negative terminals correctly.

2. Adjusting the dials

First, adjust the dials as necessary before beginning measurements.

① Select Dial

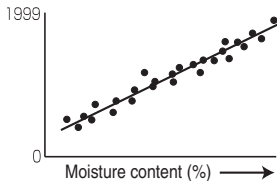
Set the select dial to the type of material to be measured.



D. MODE


The HI-520 uses predetermined information about the relationship between mortar, concrete and ALC moisture content and **high-frequency capacitance stored** in the built-in microcomputer memory to directly display values for these materials on its digital display. Although the HI-520 does not have calibration information for other materials in its microcomputer memory and therefore it cannot directly display moisture content values for other materials, it does have D. MODE (0 ~ 1999 calibration) corresponding to moisture content.

These D. MODE calibrations indicate high-frequency capacitance and higher values signify greater moisture content. Therefore the relationship between material moisture content and D.MODE calibrations are as indicated in the diagram on the right.





② Alarm Setting

You can set an upper moisture content limit. A buzzer sounds when moisture content values above the set limit are measured.

(a) Press the  switch and turn the thickness compensation dial to the ALARM position.

(b) The display appears as indicated below:

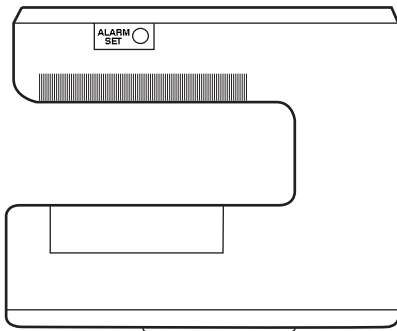
 The alarm is not set

 The alarm limit is set to 15%

(Note) The alarm can only be set to the following values:

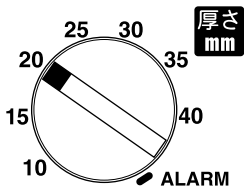
2,3,4,5,6,7,8,9,10,15,20,25,30,34,40%

- (c) There is an ALARM SET trimmer on the right side of the unit.
Use the supplied screwdriver to turn the trimmer desired setting (displayed on the LCD).



③ Thickness compensation dial

Set the thickness compensation dial to the thickness of the material to be measured. Set the dial to the 40mm position if the thickness exceeds 40mm. Please note that you will not be able to make measurements if the dial is turned all the way to the ALARM position.



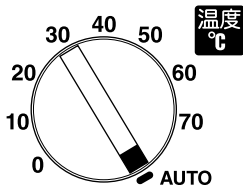
* Even when the material is more than 40 thickness, take care that the dial is not turned over 40mm.

④ Temperature compensation dial

The HI-520 features a temperature compensation function which makes manual compensation unnecessary. Set the temperature compensation dial to the AUTO position.

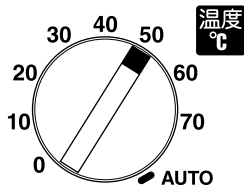
* Use the temperature compensation dial to manually set the temperature compensation value if the temperature difference between the material being measured and the unit is 10°C or above or if the temperature of the sample is 40°C or greater.

Automatic temperature compensation



(Example)

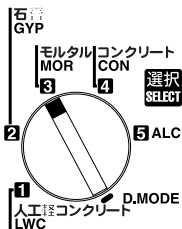
Material temperature is 50°C



(2) Measurement


1. Point the moisture sensor in the air and press the switch.
The buzzer will beep and **888** will be displayed for approximately 2 seconds. Next : **[9 . 1 ~ 5]** (the value selected with the select dial) is displayed. (**[0]** is displayed if set to the D. MODE.)

(Example) Mortar





[9 . 3]

- If the displayed numbers or symbols blink this indicates that the batteries are low. Replace the batteries with new ones (9V 006P)
- If **[0 0 0]** comes out, press switch and again, keeping the sensor in the air.

2. The moisture content is displayed on the digital display when the sensor is pressed against the material to be measured.
3. Press the  switch to turn off the power when done making measurements.

5. Part Functions

(1) The HOLD Switch

The HI-520 displays the moisture content of the material being measured when the unit is placed against the surface. The display disappears when the sensor is moved away. To keep the displayed value, press the  switch. Press the  switch a second time to release the displayed value.

(2) Auto Power Off Function

The unit's power switches off automatically if it is left for 10 minutes without making measurements.

(3) Warning Signal Display

The maximum measurable moisture content value depends upon the type of material being measured.

FFF

Indicates that the material's moisture content exceeds the maximum measurable limit.

6. Notes regarding use and handling of the HI-520

(1) Notes regarding use

- A. When making measurements, hold the unit so that the sensor is in even contact with the surface to be measured. It is best if the surface being measured is flat.

- B. When measuring objects of more than 40mm in thickness, set the thickness compensation dial to 40mm.

- C. The surface area of the object being measured must be greater than the surface area of the sensor (130 x 55mm).

MEMO



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