



# AA-GWR Water Retention Meter

# Model 250

Instruction Manual

# AA-GWR Water Retention Meter

for Accurate Measurement of Water Retention

## Principle of Measurement:

Coating color is poured into a test cell and separated from a blotting paper with a filter. The cell is then pressurized between 0.25 and 2.0 bar for a given time period. The amount of water going into the blotting paper is measured by weight.

- Measures water migration under pressure.
- Separates the influence of the color and of the paper.
- Rapid measurements, two to five minutes per test.
- Very high accuracy and repeatability.
- Built-in timer controls test duration and alerts the operator when the test is complete.
- Easy to operate and clean.
- Can be used to evaluate coating structure.
- Can be used to evaluate the base paper.

## Features:

|                    |   |
|--------------------|---|
| Cell Pressure:     | 0 - 2.0 bar (0 - 30 psi)<br>Digital Pressure Gauge  |
| Input Pressure:    | Minimum 80 psi (5.5 bar)<br>Maximum 120 psi (7 bar) |
| Electrical:        | 110 - 220 Volts                                     |
| Timer:<br>Display, | Digital Timer with LCD<br>0.1 sec to 9990 hours     |
| Weight:            | 16 lbs. net   |
| Dimensions (in.):  | 10 x 10 x 7 (HxWxD)                                 |

# AA-GWR Set Up

## BEFORE YOU BEGIN . . .

Read the instructions before attempting to unpack, assemble, or operate the water retention meter. If you should have any doubts as to what to do, call Kaltec's Service Department and they will assist you.

## Unpacking the Instrument

The following parts are packed with your AA-GWR Water Retention Meter. If any parts are missing or damaged, please notify Kaltec® immediately.

1 - Magnetic Cup & Mat

1 - Leak Test Mat

6' - Input Hose with Filter

1 - AC Power Supply

## Assembling the Instrument

1. Connect the power transformer plug to the water retention meter before plugging into an AC outlet.
2. Before connecting the unit to the air supply, make certain the power is off.
3. The input air pressure tube should be connected to the fitting on the back side of the cabinet. The tube is a ¼" OD and is inserted by pushing in until it stops. Note: To remove, the input air supply must be off, then press in on the collar surrounding the tube while simultaneously pulling out.
4. Connect the other end of the tubing to the house supply having a pressure of 80 to 120 psi — connector not included.

## **Operating environment**

The AA-GWR should be placed on a flat, level, dry surface and separated as far as possible from any sources of electrical noise, such as high-voltage power lines.

## **AA-GWR Supplies**

| <b><u>Item Description</u></b>         | <b><u>Part Number</u></b> |
|--|---------------------------|
| Filters, 5.0 microns<br>(Pack of 100)  | GWR420                    |
| Blotter Paper, 17 Chr<br>(Pack of 100) | GWR430                    |
| Traveling Case<br>(Optional)           | GWR440                    |

## **How to order supplies and accessories:**

You can order water retention meter supplies and accessories in any of the following ways:

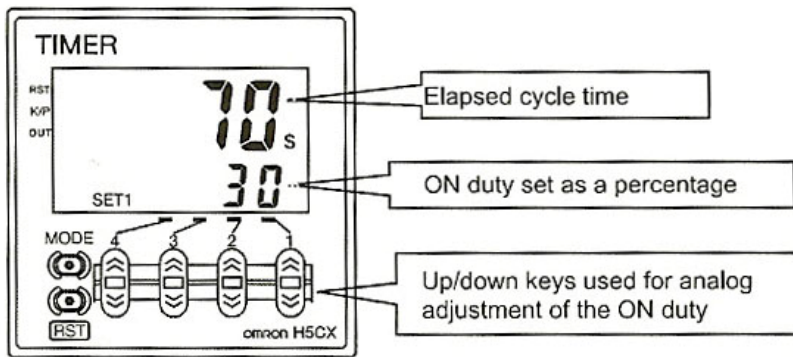
- Call Kaltec directly with your order,
- Fax or mail Kaltec your purchase order, or
- Contact your local authorized agent.

# The AA-GWR, Model 250

## Controls and Indicators

- ON/OFF:** Turns the power on and off to the meter. It can also be used to terminate a test cycle and or reset the timer.
- UP/DOWN:** Raises and lowers the bottom platen, which seals the test, cell. The switch will only illuminate when in the raised position. Upon completion of a test, the UP/DOWN button must be pushed to lower the platen and terminate the sounder.
- START:** Starts the test by applying pressure to the test cell and activating the timer. Upon completion of the test, the START button light will turn off and the sounder will be turned on.
- REGULATOR:** Regulates the air pressure in the test cell.
- CELL PRESSURE:** Displays the amount of pressure applied to the test cell. Units are in bar with resolution of one hundredth of a bar.
- TIMER:** Displays and counts down the time of the test. It also turns the cell pressure off at the end of a test cycle. The timer must be set before the meter will work. For your convenience the time period has been preset for 90 seconds.

## Timer Operation:



The digital timer has been preset for 90 seconds. To adjust time, push the button directly below the digit you wish to change. The timer has been factory programmed to be user settable from 0 – 9999 seconds specifically for the AA-GWR. The Elapsed cycle time display will change from green to red when the start button is pressed to show that the test is underway and the timer is counting down.

The timer contains a lithium battery, and must never be incinerated.

## Cell Pressure:

1. Turn the unit on using the ON/OFF switch.
2. Rotate the cell pressure knob until the desired pressure appears. Pressure in the measuring cell is continuously monitored and automatically controlled by means of pressure sensor and control circuitry. A slight buzzing sound may be heard at the beginning of each test as the system pressurizes.  
**NOTE:** If the buzzing sound continues throughout the test, check for air leakage around the cup's seal.

## Test Procedure:

1. Set the cell pressure and the desired time.
2. Weigh the piece of blotting paper and place it on the magnetic mat. **NOTE:** We recommend a Whatman 17 Chr, chromatography paper cut into 57 mm x 57 mm pieces. The choice of paper is up to the user's discretion. It should have enough weight to provide adequate resolution on the scale being used. ***If you want to investigate the absorptive characteristics of a paper, the paper should be used instead of the blotting paper. A procedure where several papers are placed on top of each other is recommended.***
3. Place a filter on top of the paper. Make certain you know the difference between the paper separator and the polycarbonate filter membrane. The filter is translucent with a caliper of 0.0003" and the separator is blue/gray with a caliper of 0.003".
4. Place the cup (magnets down) on top of the mat. Pour the coating color into the cup. A pipette will aid in this operation. Make certain there is at least 2 mm of depth of coating or a volume of 2 ml minimum and 10 ml maximum. Higher viscosity samples require more coating to cover the filter. Insert the entire assembly on the platen and raise the platen up, via the UP/DOWN switch.
5. Start the test by pressing the START switch.
6. After the test is complete, lower the platen by pressing the UP/DOWN switch, and remove the magnetic cup and mat system.
7. Invert the entire assembly and remove the blotting paper.
8. Weigh the blotting paper and subtract the original weight to get the mass of the water absorbed. (A good starting point is 50 mg of water depending on viscosity pressure, time periods, and base paper.) The weight difference times 1,250 give the penetrated amount of water in  $\text{g/m}^2$ .
9. Wash and dry the cup and mat before the next measurement. Additional magnetic cup and mats are available, should you want to prepare the next test while one is in progress. Wait to pour sample in the cup until just before the test procedure.

## Guaranty and Certificate of Quality

All of Kaltec Scientific's instruments are guaranteed against defects in materials and workmanship for a period of one year providing:

1. The defective unit has been operated within published electrical specifications.
2. The unit has not been damaged by misuse, improper operation, or accident.
3. The unit has not been modified or altered.
4. All costs of transportation of the unit to and from Kaltec Scientific are paid by the original purchaser.

**THE INSTRUMENT MUST BE RETURNED DIRECTLY TO THE FACTORY, NOT TO THE DISTRIBUTOR OR AGENT FROM WHICH THEY WERE PURCHASED.**

Kaltec Scientific limits its obligation under this guaranty solely to the repair or replacement of any unit returned during the period covered by the guaranty. No other obligations or liabilities are implied or expressed. This document also serves as a certificate of quality.

Kaltec Scientific, Inc.





**Kaltec Scientific, Inc.**

**22425 Heslip Drive**

**Novi, Michigan 48375**

**Tel (248) 349-8100 - Fax (248) 349-8909**

**Web [www.kaltecsci.com](http://www.kaltecsci.com)**