State of California
Department of Food and Agriculture
Division of Measurement Standards

Certificate Number: 5424(b)-09

California Type Evaluation Program
Certificate of Approval
for Weighing and Measuring Devices

For:
Electronic Watt-Hour Meter
Models: UMS XYYY
Voltage Rating: 120/208/240 VAC
Class: 200 (200 Amps Max.)
TA: 30 Amps
Registration: 0.1 kWh (100 Wh)

Submitted by:
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Standard Features and Options

Model Designation:

UMS	X	YYY
UMS = United Metering System	1 = 1 Element or CT	120 = 120 VAC
	2 = 2 Elements or CT's	240 = 240 VAC
	3 = 3 Elements or CT's	208 = 208 VAC

Indicators: Electromechanical (12 VDC) analog indicator. The least significant digit is highlighted. Registration is 0.1 kWh (100 Wh). Colored wheel indicates the decimal place **(See Figure 1)**.

Current Transformers (CT's): UMS Model 415 (closed loop style), Rating 415:1 A, Accuracy Class 0.3. The CT side (marked with "H") faces toward the line side when testing. **(See Figure 2)**.

Figure 1
Typical electromechanical 12 VDC analog indicators

Figure 2
Current Transformer (CT) showing side marked "H"

This device was evaluated under the California Type Evaluation Program (CTEP) and was found to comply with the applicable technical requirements of California Code of Regulations for "Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Effective Date: October 15, 2009

Edmund E. Williams, Director

United Metering Services Inc.
Electronic Watt-Hour Meter
Model: UMS XYYY

Application: For use as a watt-hour metering system in legally sub-metered electric service applications.

Identification: There are two generations of meters. The serial number is on a tamper evident label on the front of the older white plastic version of meter **(See Figure 3)**. The serial number is on a tamper evident label on the back of the newer clear plastic version **(See Figure 4)**. The rest of the meter marking requirements are permanently molded into the face of the meter. The CT marking requirements are a combination of tamper evident labels and molding into the front and back of the CT.

Figure 3 Older meter white plastic version with Serial No. preceding the number label on the front of the meter

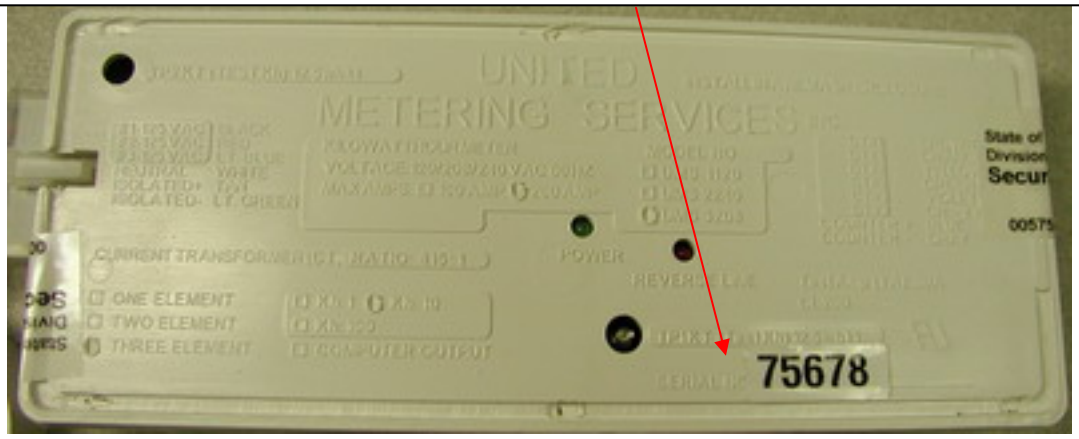
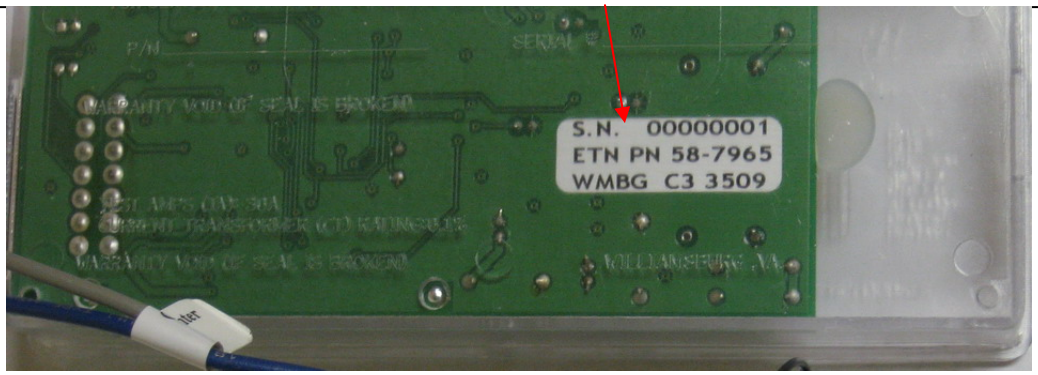


Figure 4 Newer meter clear plastic version with S.N. label on the inside of the case on the back of the meter



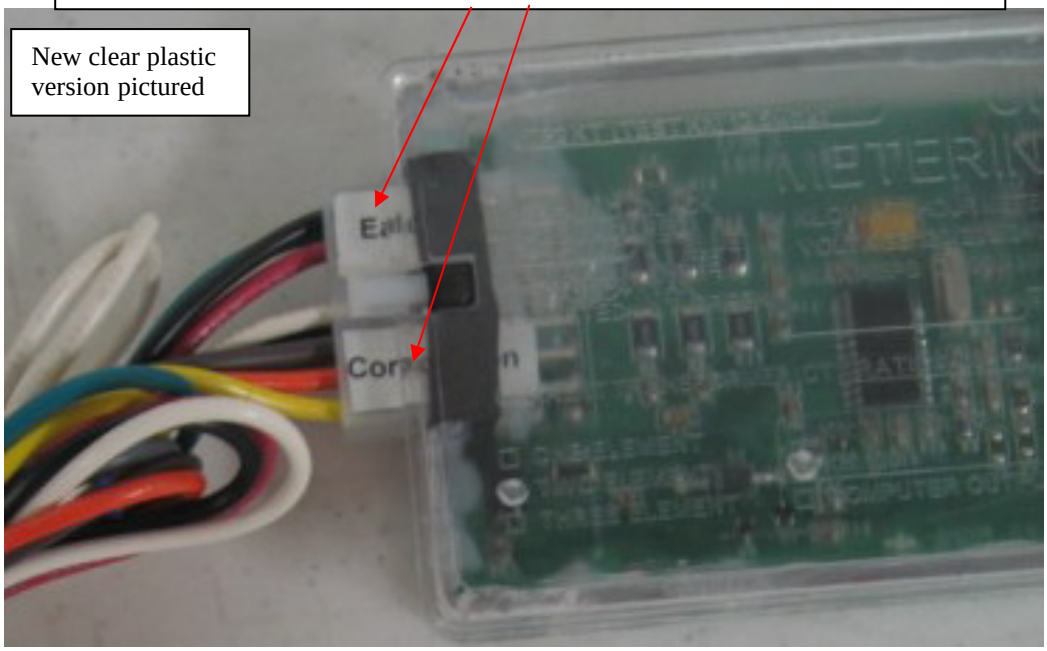
CT Labels

United Metering Services Inc.
Electronic Watt-Hour Meter
Model: UMS XYYY

Sealing: Factory adhesive tamper evident seals shall be placed on the electrical plug connection across the parting line by the manufacturer on the old and new version of meters. **(See Figure 5 and 6)**

There are no adjustable metrological components under the cover. However, an adhesive tamper evident seal may be placed on the parting line between the hermetically sealed lid and meter case.

Figure 5 Required factory tamper evident seal across the electrical connections plug



Operation: **Normal operation:** The **"POWER"** LED is illuminated whenever line voltage is present. The **"Reverse Line"** LED illuminates when a CT line is connected backwards **(See Figure 6)**. One increment of the 12 VDC analog indicator provides the visual registration of 0.1 kWh (100 Wh) for tenant display.

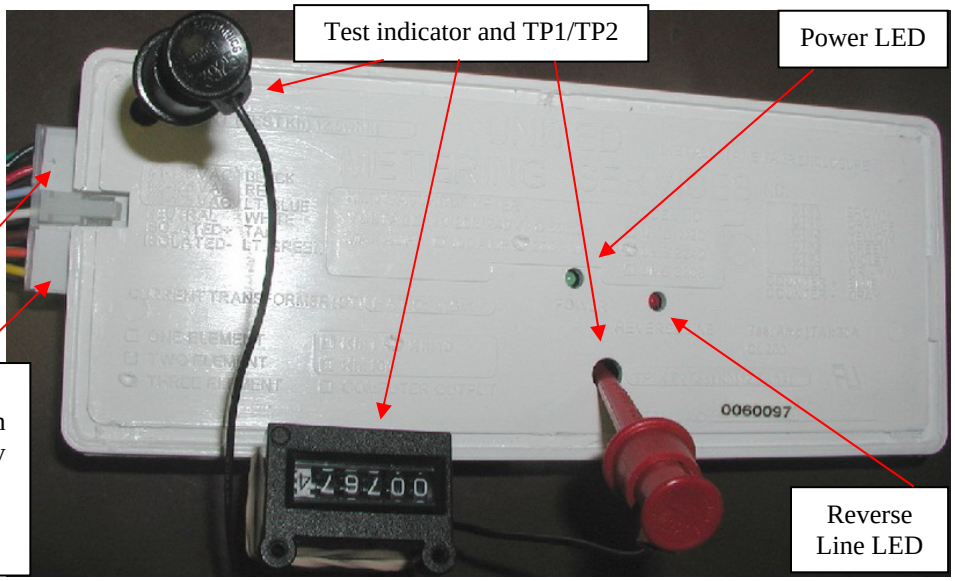


Figure 6
Old white plastic version showing required factory tamper evident seal across the electrical connections plug.

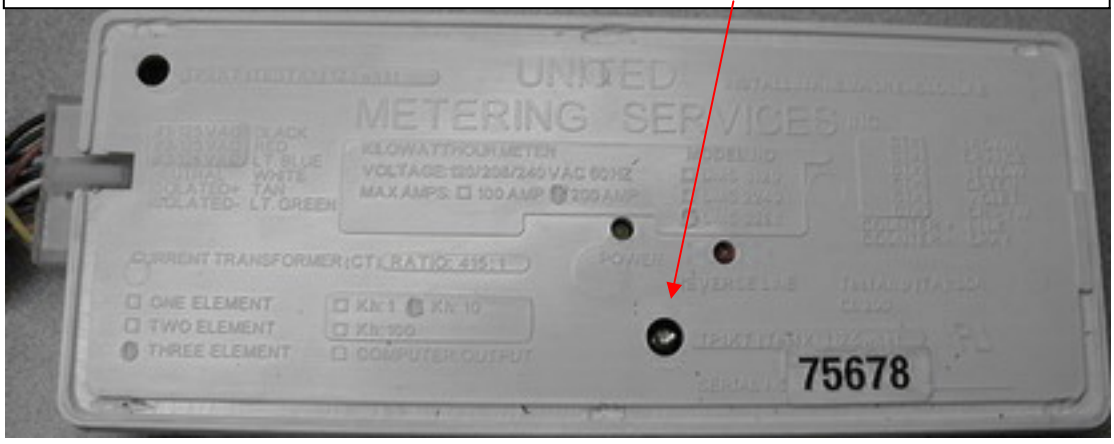
United Metering Services Inc.
Electronic Watt-Hour Meter
Model: UMS XYYY

Operation (continued): **Testing:** The old meter version can be tested using a 12 VDC analog **"test indicator" (See Figure 6)**. The **"test indicator"** connections are made at test points TP1 and TP2 for a **"test K_h"** registration of 12.5 Wh per increment **(See Figure 6)**.

On newer meter versions, the meter utilizes a blinking LED replacing the **"test indicator"** for the **"test K_h"** registration of 12.5 Wh. This LED is located at TP1 and flashes for a quick instant when 12.5 Wh has expired. **(See Figure 7)**.

CT line 1 (black wire) corresponds with CT1 (brown and orange wire); line 2 (red wire) corresponds with CT2 (green and yellow wire); line 3 (light blue) corresponds with CT3 (violet and green/yellow stripe) and the white wire is neutral. The wiring code is also labeled on the meter.

Figure 7 New meter version with an instantaneous quick flashing LED instead of the test indicator



Test Conditions: This certificate supersedes Certificate of Approval Number 5424(a)-06 and is issued to clarify the sealing provision, add a new clear case version of the previously approved meter and to update the marking requirements due to the new regulation.

Certificate of Approval Number 5424(a)-06: This certificate is issued to add a newer version of the previously approved meter model that utilizes an instantaneous quick flashing LED instead of the "test indicator" for the test K_h registration of 12.5 Wh for ease of testing. A meter was tested at the Division of Measurement Standards lab and the emphasis was on the new improved testing method (instantaneous quick flashing LED). Previous test conditions are listed below for reference.

Certificate of Approval Number 5424-05: Samples of each model meter, current transformer, and three different indicators were submitted for evaluation. Three meters were initially tested at the Division of Measurement Standards (DMS) lab. The meters were then sealed and installed at a field location. After a permanence period of approximately 20 days the meters were returned to DMS lab for retesting. The meters were subjected to a combined total of 118 tests from 3 amps to 110 amps at both unity and 0.5 power factors.

Results of the evaluation indicate the devices comply with applicable requirements.

Type Evaluation Criteria Used: Title 4, California Code of Regulations, 2009 Edition

Tested By: John Roach (CA) 2005 and 2006, Matt Stevens (CA) 2009