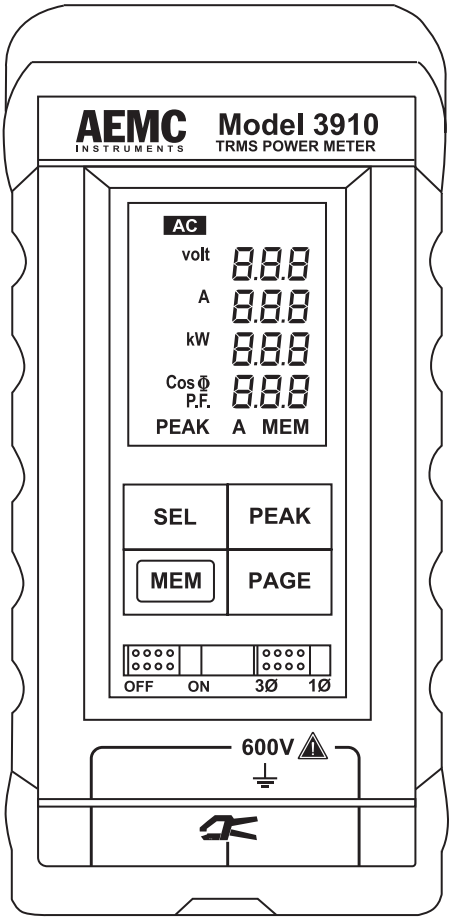
■ TRUE RMS POWER METER

3910



ENGLISH **User Manual**

AEMC® INSTRUMENTS

Owner's Record

The serial number for the Model 3910 is located inside the battery compartment of the instrument. Please record this number and purchase date for your records.

TRMS POWER METER MODEL 3910

CATALOG #: 2111.27

SERIAL #: _____

PURCHASE DATE: _____

DISTRIBUTOR: _____

Table of Contents

INTRODUCTION

⚠ WARNING ⚠

These safety warnings are provided to ensure the safety of personnel and proper operation of the instrument.

- Read this instruction manual completely before attempting to use or service this instrument and follow all the safety information.
- Use caution on any circuit: Potentially high voltages and currents may be present and may pose a shock hazard.
- The instrument must not be operated beyond its specified operating range.
- Safety is the responsibility of the operator.
- Never open the back of the instrument while connected to any circuit or input.
- Always make connections from the instrument to the circuit under test.
- Always inspect the instrument and accessory leads for serviceability prior to use, and replace defective parts immediately.
- Do not use the meter or any test leads, connectors, probes or clips if they look damaged.
- Never use the Model 3910 on electrical conductors rated above 600V.
- On the current probe input, only use the current probe(s) supplied with the instrument.
- Never use the Model 3910 without its rubber holster.

1.1 International Electrical Symbols

This symbol signifies that the instrument is protected by double or reinforced insulation. Use only specified replacement parts when servicing the instrument.

This symbol on the instrument indicates a WARNING and that the operator must refer to the user manual for instructions before operating the instrument. In this manual, the symbol preceding instructions indicates that if the instructions are not followed, bodily injury, installation/sample and product damage may result.

Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.

1.2 Receiving Your Shipment

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage. Save the damaged packing container to substantiate your claim. Do not use an instrument that appears to be damaged.

1.3 Ordering Information

TRMS Power Meter Model 3910..... **Cat. #2111.27**

Includes 3910 power meter, shock-proof safety holster, 500A AC clamp-on current probe, two 5 ft (1.5m) leads, two test probes, two probe grips, batteries (not installed), user manual and hard carrying case.

1.3.1 Accessories and Replacement Parts

Probe Adaptor..... **Cat. #2118.34**

Clamp-on Current Probe Model SR652 (1000A AC)..... **Cat. #2113.46**

Order Accessories and Replacement Parts Directly Online
*Check our Storefront at **www.aemc.com** for availability*

PRODUCT FEATURES

2.1 Description

The True RMS Power Meter Model 3910 is designed for today's electrical environments. Operation is simple. There are no programming requirements or menus, just four push-buttons for direct access. The Model 3910 is auto-ranging and ensures the best range for measurements.

Troubleshooting and measuring power is done simply by connecting two voltage leads and clamping on the current probe. The Model 3910 is easier to operate than most DMMs and may even replace your multimeter for individual voltage or current measurements.

Small and compact in its protective holster, the Model 3910 provides seven essential power measurement values. Four measurements are displayed at a time on its extra large multi-display LCD.

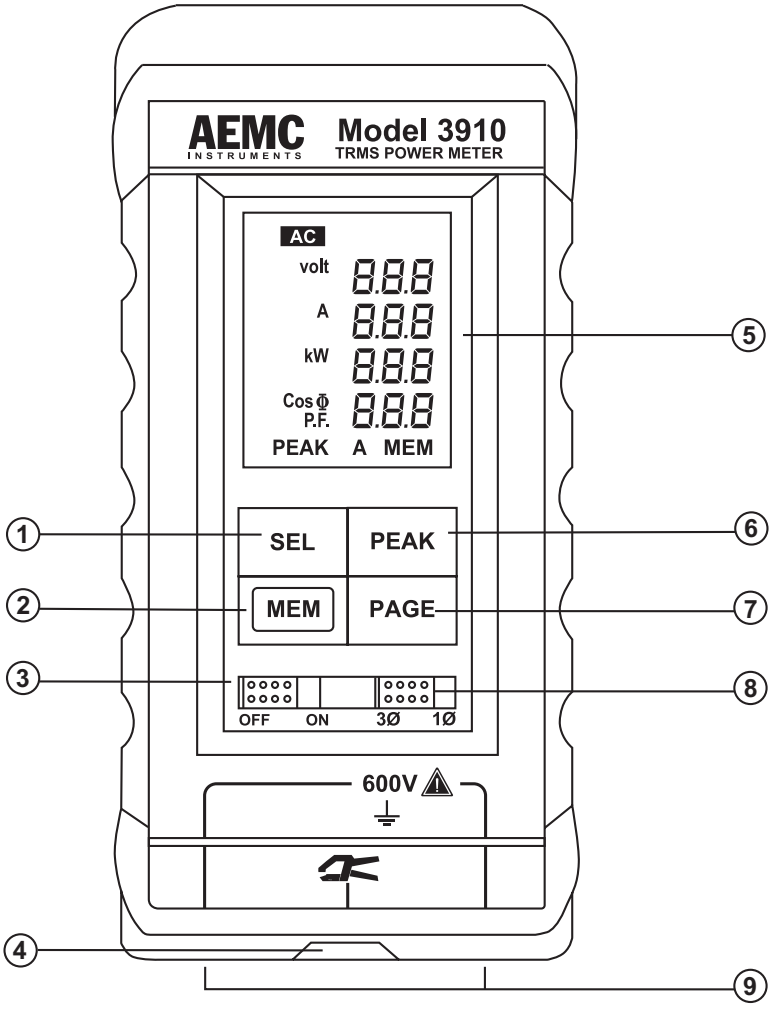
The Model 3910 performs current and voltage measurements in True RMS, and provides immediate readings of power factor (PF), active power (kW), reactive power (kVar), apparent power (kVA) and frequency (Hz). The Model 3910 displays Vrms, Arms, kW and PF on the first screen; pressing and holding the PAGE button gives access to kVar, kVA and Hz on a second screen.

The Peak function allows selection of a specific parameter (A, V or W) for peak measurement, and also displays the associated values at the particular peak (for example, the Model 3910 displays the actual V, kW, PF, kVar, kVA and Hz values when Apeak is selected).

The unique memory function permits not only storing the measurements at any time, but also comparing subsequent readings by displaying the difference between the stored values and the new readings. This is helpful in analyzing and measuring the impact of loads being turned on and off.

A selector switch on the front panel selects power measurements for single-phase or balanced three-phase, three-wire systems.

2.2 Control Features



1. **SEL Button**
   Selects the parameter (A, W, V) whose peak is to be measured.

2. **MEM Button**
   Accesses two functions:
   - Memory
   - Measurements of differences in voltage, current and active power between stored values and subsequent readings.

3. **ON/OFF Switch**
   Turns the instrument ON or OFF. The Model 3910 takes a few seconds to power up when turned “ON”.

4. **Clamp Input**
   FRB socket for connecting the clamp-on current probe. Use only specified current probes, which have a voltage output (1mVAC/AAC).

5. **Display**
   LCD (40x50mm), displays the seven measurements on two pages.

   NOTE: A beep sounds when the PAGE, PEAK, SEL or MEM button is pressed.

6. **PEAK Button**
   Selects “PEAK” measurement mode.

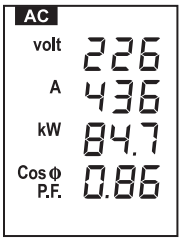
7. **PAGE Button**
   Displays Vrms, Arms, W, PF (or Cos Φ) on page 1 automatically; pressing PAGE gives access to Var, VA and Hz on page 2.

8. **1Ø / 3Ø**
   Selects the type of network to be tested.
   - 1Ø: single-phase
   - 3Ø: balanced three-phase, three-wire

9. **Voltage Inputs**
   Two safety input terminals (4mm) for lead connection. Voltage measurement may be made up to 600VAC/DC.

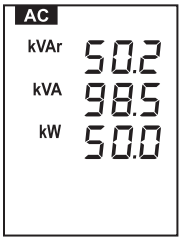
2.3 Display Features

When the Model 3910 is switched ON, page 1 is displayed automatically:



- RMS voltage (V)
- RMS current (A)
- Active power (W)
- Power factor (pF) (or Cos Φ)

Hold down the PAGE button to display page 2:



- Reactive power (Var)
- Apparent power (VA)
- Frequency (Hz)

To return to page 1, release the PAGE button

2.4 Button Functions

2.4.1 PEAK Button

When this button is activated, PEAK values of a measurement can be displayed.

To activate the PEAK mode, press the PEAK button once. The Model 3910 changes initially to peak current measurements and “PEAK A” is displayed.

Press the SEL button to choose the desired parameter (A, W, V). **The SEL button can only be used after the PEAK button has been activated.**

NOTE: The peak measurement is:

- the **maximum** value for the current (A)
- the **maximum** value for the active power (W)
- the ***minimum*** value for the voltage (V)

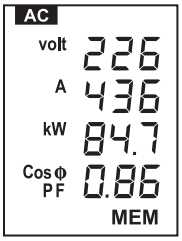
The Model 3910 stores all the measurements present when peak is selected. The first four measurements (V, A, W, PF) are displayed on page 1 and the following three measurements (Var, VA, Hz) on page 2 (press the PAGE button). For example, you can find the voltage, the power, etc., at the moment when current is at a peak.

In PEAK mode, the typical acquisition time is 400ms. Each new peak is taken into account as long as the PEAK button is activated. To exit PEAK mode, press the PEAK button.

2.4.2 Memory Button

This button has two functions:

- **First Function - Memory**

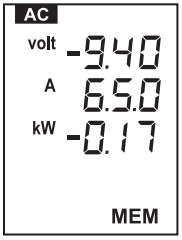


To store page 1 of the display, press the MEM button once. “MEM” will show on the display.

Voltage, current, active power and power factor are stored.

- **Second Function - Differential Measurements**

Once the values are memorized (MEM is displayed), press the PAGE button. Page 2 will display the differences between the values in memory and the values that the instrument continues to measure.



Measurements of differences in voltage, current and active power.

NOTE: The power factor is no longer displayed.

If the difference between measurements is a negative value, a minus “-” sign is displayed.

To exit memory mode, press the MEM button again.

SPECIFICATIONS

Reference Conditions: *Temperature 23°C ± 5K, 45 to 75% RH; battery voltage 6V; conductor centered in the probe jaws; DC magnetic field; earth's field; no external AC magnetic field; no external electrical field; sine wave 45 to 65Hz. In Peak, basic accuracy is based on 1 ms samples and on a signal from 10 to 500Hz.*

3.1 Electrical Specifications

CURRENT (TRMS)

Input Range: 1 to 500ARMS

Typical Accuracy (and Phase Shift) with 500A Current Probe MD313:
25A: 5% of Reading (4°)
100A: 2% of Reading (2°)
500A: 2% of Reading (1.5°)

Typical Accuracy (and Phase Shift) with 1000A Current Probe SD652:
50A: ± 0.9% of Reading (1.5°)
200A: ± 0.5% of Reading (0.5°)
1000A: ± 0.5% of Reading (0.5°)

Resolution:
1 to 9.99A: 10mA
10 to 99.9A: 100mA
100 to 500A: 1A

VOLTAGE (TRMS)

Input Range: 0 to 600VRMS

Accuracy:
1 to 99.9V: 0.5% ± 0.6V
100 to 600V: 0.3% ± 2V

Resolution:
0 to 99.9V: 0.1V, 100 to 600V: 1V

FREQUENCY

Input Range (from voltage input):
30 to 100Hz
101 to 999Hz

Accuracy:
30 to 100Hz: 0.03% of Reading ± 0.1Hz
101 to 999Hz: 0.5% of Reading ± 1Hz

POWER FACTOR

Range: -0.00 (Lag) to +0.00 (Lead)

Accuracy: Sum of the V and A accuracy plus the probe phase shift

ACTIVE POWER

Range: 30W to 300kW (600kW with SR652 probe)

Accuracy: Sum of the V and A accuracy

REACTIVE POWER

Range: 0 to 300kVar (600kVar with SR652 probe)

Accuracy: Sum of V and A accuracy @ Sin Φ = 1 plus the probe phase shift

APPARENT POWER

Range: 0 to 300kVA (600kVA with SR652 probe)

Accuracy: Sum of the V and A accuracy

3.2 Mechanical Specifications

Display: 1.58 x 1.97" (40 x 50mm) multi-display LCD

Power Supply: Four 1.5V AA alkaline batteries

Low Battery Indicator: “BAT” on display

Battery Life: 50 hours approx, continuous use

Dimensions:
3.2 x 6.9 x 1.3" (80 x 175 x 32mm) - without holster
3.5 x 7.7 x 2.1" (90 x 195 x 54mm) - with holster

Weight (with battery):
15 oz (400g) - without holster
17.6 oz (500g) - with holster

Supplied 500A current probe:
Accommodates two 500 MCM or one 750 MCM

3.3 Safety Specifications

Protection Level: EN 61010, Class II

Protection Index: IP40 per IED 529

Max. Voltage Overload: 825Vrms, 1170Vpeak

CE

OPERATION

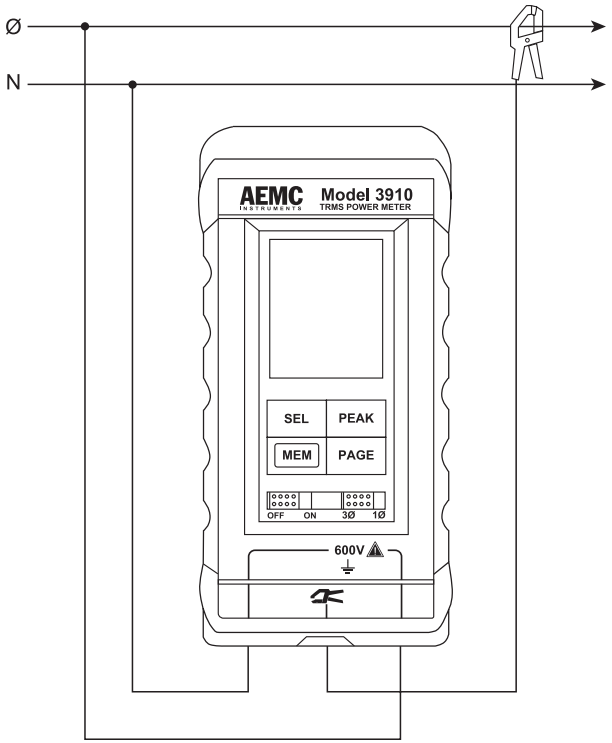
4.1 Single-Phase Networks

⚠ **WARNING:** Maximum voltage rating 600V

- Set the selector switch to the 1Ø position.
- Connect the Model 3910 as shown in the diagram, with phase connected to the right terminal and the probe on phase.

⚠ **NOTE:** Only clamp the current probe around one conductor.

The arrow on the current probe should always point towards the load for correct polarity indication during power measurements.

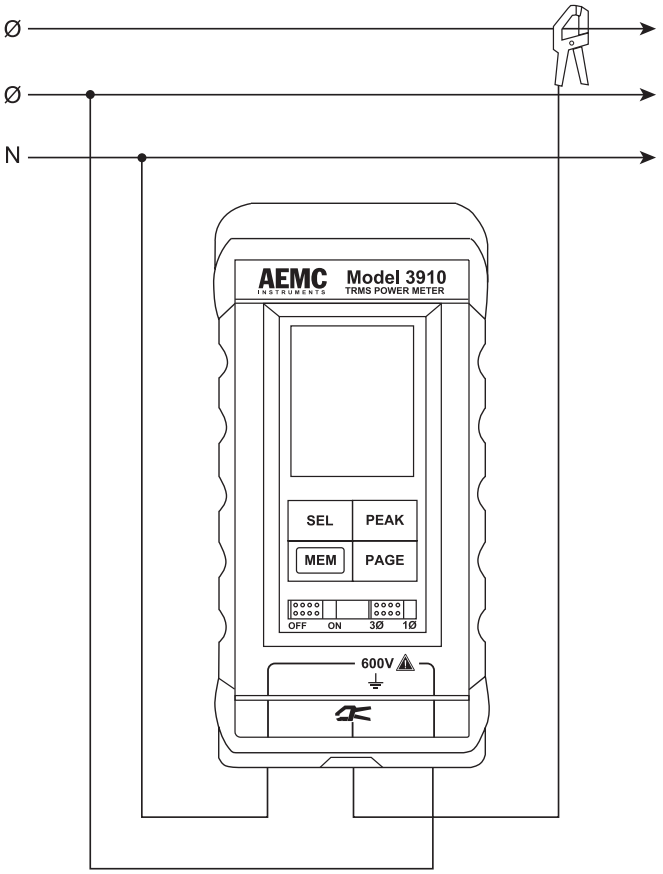


4.2 Balanced Three-Phase Networks

WARNING: Maximum voltage rating 600V

- Set the selector switch to the 3Ø position.
- Connect the Model 3910 as shown in the diagram. Note that the current probe is clamped onto the conductor that is not connected to a voltage input.

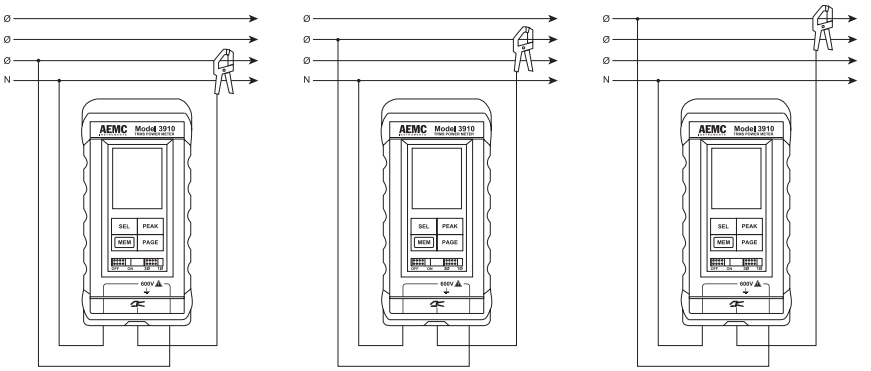
The Model 3910 will automatically display the system power on balanced three-phase, three-wire circuits (two wattmeter method).



4.3 Three-Phase, Four-Wire Networks

WARNING: Maximum voltage rating 600V

- Set the selector switch to the 1Ø position.
- Connect the Model 3910 as shown for single-phase (phase-to-neutral) and measure on each phase.
- Add all three readings for system total.

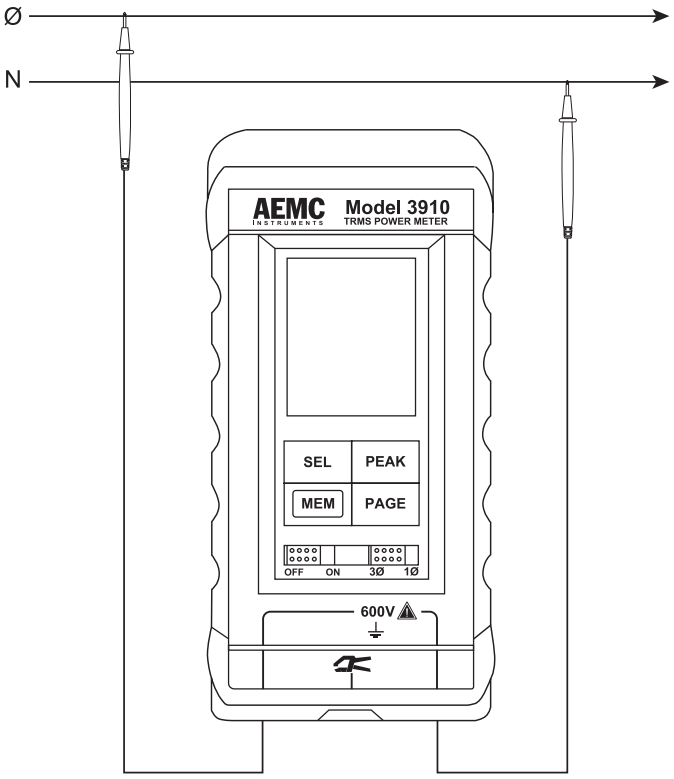


Total W = W_1 + W_2 + W_3

4.4 Using as a Voltmeter

WARNING: Maximum voltage rating 600V

- Plug voltage leads into the safety input terminals.
- The selector switch may be set at either 1Ø or 3Ø position.
- Connect the Model 3910 as shown in the diagram below.

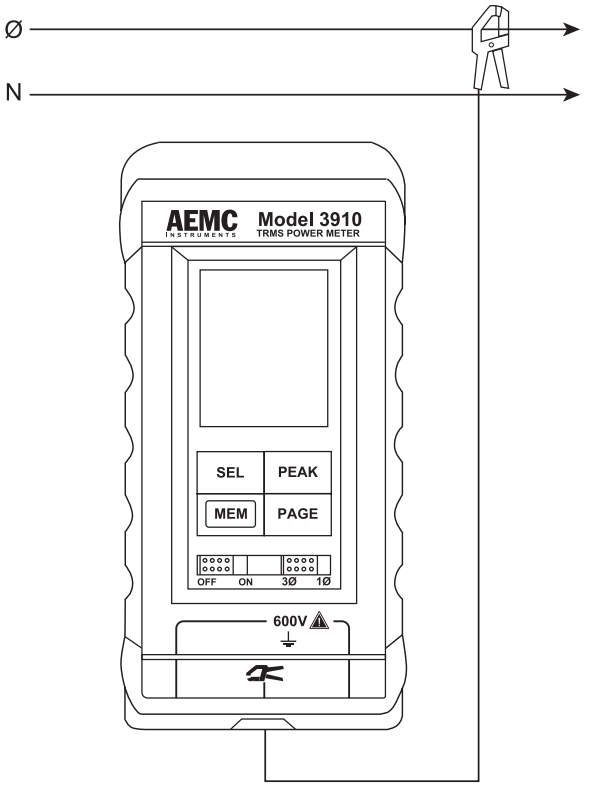


Note: The Model 3910 may also measure DC volts. DC will be displayed on the LCD.

4.5 Using as an Ammeter

WARNING: Maximum voltage rating 600V

- Connect the current probe to the FRB socket.
- The selector switch may be set at either 1Ø or 3Ø position.
- Connect the Model 3910 as shown in the diagram.
- Only use the supplied current probes (MD313 or optional SR652)



4.6 Measurements: Review of Formulas Used

RMS Voltage: $$\text{Vrms} = \sqrt{\frac{1}{n}\sum_{1}^{n} V_n^2}$$

RMS Current: $$\text{Irms} = \sqrt{\frac{1}{n}\sum_{1}^{n} I_n^2}$$

Active Power: $$\text{W} = \frac{1}{n}\sum_{1}^{n} Vn.In$$

Apparent Power: $$\text{VA} = Vrms \times Irms$$

Power Factor: $$\text{PF} = \frac{W}{VA}$$

Reactive Power: $$\text{Var} = \sqrt{VA^2 - W^2}$$

MAINTENANCE

5.1 Warning

Use only factory specified replacement parts. AEMC® will not be held responsible for any accident, incident, or malfunction following a repair done other than by its service center or by an approved repair center.

- Do not allow water or other foreign substances into the instrument.
- Disconnect the unit from all circuits and test cables before opening the case.

5.2 Battery Replacement

The TRMS Power Meter Model 3910 is powered by four 1.5V “AA” alkaline batteries. When the battery indicator shows that the batteries are low (“BAT” appears on the LCD), the batteries should be replaced.

- Unplug the leads and the clamp from the instrument.
- Remove the shock-proof case.
- Lift the fold-away stand and pry off the battery compartment cover with a small screwdriver.
- Insert four new 1.5V “AA” alkaline batteries, being sure to observe the polarity shown in the battery housing.
- Replace the cover of the battery compartment and the shock-proof case before use.

5.3 Cleaning

Disconnect the instrument from any power source. Use a soft cloth slightly moistened with soapy water. Rinse with a damp cloth and quickly dry with a dry cloth or forced dry air. Do not use any abrasives or solvents.

Repair and Calibration

To ensure that your instrument meets factory specifications, we recommend that it be scheduled back to our factory Service Center at one-year intervals for recalibration, or as required by other standards or internal procedures.

For instrument repair and calibration:

You must contact our Service Center for a Customer Service Authorization Number (CSA#). This will ensure that when your instrument arrives, it will be tracked and processed promptly. Please write the CSA# on the outside of the shipping container. If the instrument is returned for calibration, we need to know if you want a standard calibration, or a calibration traceable to N.I.S.T. (Includes calibration certificate plus recorded calibration data).

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
E-mail: repair@aemc.com

(Or contact your authorized distributor)

Costs for repair, standard calibration, and calibration traceable to N.I.S.T. are available.

NOTE: You must obtain a CSA# before returning any instrument.

Technical and Sales Assistance

If you are experiencing any technical problems, or require any assistance with the proper operation or application of your instrument, please call, fax or e-mail our technical support team:

Contact: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
Phone: (800) 945-2362 (Ext. 351)
(603) 749-6434 (Ext. 351)
Fax: (603) 742-2346
E-mail: techsupport@aemc.com

Limited Warranty

The Model 3910 is warranted to the owner for a period of 2 years from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was pur-chased. This warranty is void if the unit has been tampered with, abused or if the defect is related to service not performed by AEMC® Instruments.

For full and detailed warranty coverage, please read the Warranty Coverage Information, which is attached to the Warranty Registration Card (if enclosed) or is available at www.aemc.com. Please keep the Warranty Coverage Information with your records.

What AEMC® Instruments will do:
If a malfunction occurs within the warranty period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will, at its option, repair or replace the faulty material.

REGISTER ONLINE AT:
www.aemc.com

Warranty Repairs

What you must do to return an Instrument for Warranty Repair:

First, request a Customer Service Authorization Number (CSA#) by phone or by fax from our Service Department (see address below), then return the instrument along with the signed CSA Form. Please write the CSA# on the outside of the shipping container. Return the instrument, postage or shipment pre-paid to:

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
E-mail: repair@aemc.com

Caution: To protect yourself against in-transit loss, we recommend you insure your returned material.

NOTE: You must obtain a CSA# before returning any instrument.

02/18

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