

# AC Current Probe Models SR651 and SR652

## User Manual

### DESCRIPTION

The Models SR651/SR652 (Cat. #2113.45 and Cat. #2113.46) are designed for use in industrial environments. The ergonomic design allows them to easily attach to cables or small bus bars. The **circular** jaws guarantee a very good accuracy and low phase shift. The probes have a measurement range up to 1000 ARMS continuous and are compatible with any AC voltmeter, multimeter, or other voltage measurement instrument that has the following features: Range and resolution capable of displaying 1mV of output per amp of measured current; voltmeter accuracy of 0.75 % or better.

### WARNING

The safety warnings are provided to ensure the safety of personnel and proper operation of the instrument. Read the instruction completely.

- Use caution on any circuit: potentially high voltages and currents may be present and may pose a shock hazard.
- Do not use the probe if damaged. Always connect the current probe to the measuring device before it is connected around the conductor
- Do not use on non-insulated conductor with a potential to ground greater than 600 V CAT III pollution 2. Use extreme caution when clamping around bare conductors or bus bars.
- Before each use, inspect the probe; look for cracks in housing or output cable insulation.
- Do not use clamp in wet environment or in locations that hazardous gases exist.
- Do not use the probe anywhere beyond the tactile barrier.

### INTERNATIONAL ELECTRICAL SYMBOLS



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



This symbol signifies **CAUTION!** and requests that the user refer to the user manual before using the instrument.



This is a type A current sensor. This symbol signifies that application around and removal from **HAZARDOUS LIVE** conductors is permitted.

### DEFINITION OF MEASUREMENT CATEGORIES

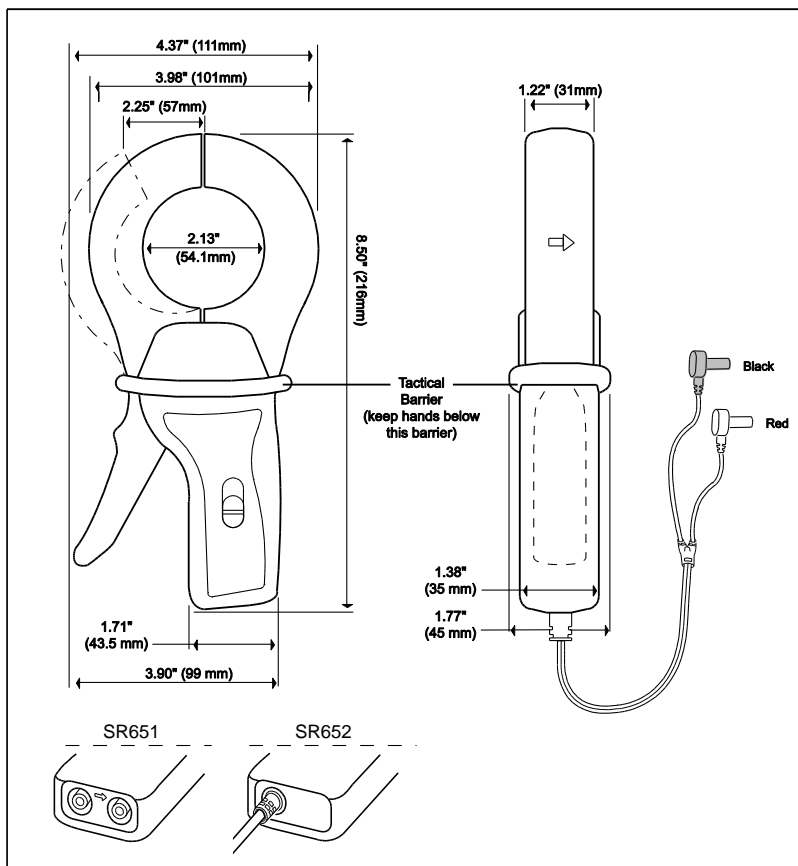
**CAT IV:** For measurements performed at the primary electrical supply (<1000 V) such as on primary overcurrent protection devices, ripple control units, or meters.

**CAT III:** For measurements performed in the building installation at the distribution level such as on hardwired equipment in fixed installation and circuit breakers.

**CAT II:** For measurements performed on circuits directly connected to the electrical distribution system. Examples are measurements on household appliances or portable tools.

### 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.



## ELECTRICAL SPECIFICATIONS

### Current Range:

(0.1 to 1000) AAC, continuous cycle @  $\leq 1$  kHz

### Output Signal:

1 mVAC/AAC (1 VAC at 1000 A)

### Accuracy and Phase Shift\*:

| Primary current | (0.1 to 10) A         | 10 A | 50 A |
|-----------------|-----------------------|------|------|
| Accuracy %      | $\leq 3\% \pm 0.1$ mV | 3%   | 1.5% |
| Phase shift     | N/A                   | 3°   | 1.5° |

| Primary current | 200A  | 1000A | 1200A |
|-----------------|-------|-------|-------|
| Accuracy %      | .75 % | 0.5 % | 0.5 % |
| Phase shift     | 0.75° | 0.5°  | 0.5°  |

(\*Reference conditions: 23 °C  $\pm 3$  °K, (20 to 75) % RH, (48 to 65) Hz, external magnetic field <40 A/m, no DC component, no external current carrying conductor, test sample centered.) Load impedance 1 M $\Omega$ .

**Overload:** 15 minutes ON, 30 minutes OFF

**Accuracy:** Per IEC 185

**Frequency Range:** 30 Hz to 5 kHz; current derating above 1 kHz using the formula:  $1000\text{ A} \times \frac{1}{F \text{ (in kHz)}}$

**Load Impedance:** 100 k $\Omega$  min.

**Working Voltage:** 600 V, CAT III

**Common Mode Voltage:** 600 V, CAT III

**Influence of Adjacent Conductor:**

< 1 mA/A AC

**Influence of Conductor in Jaw Opening:**

0.1 % of reading

**Influence of Frequency:**

From (30 to 48) Hz: < 1 % of R

From (65 to 1000) Hz: < 0.5 % of R

From (1 to 5) kHz: < 1 % of R

**MECHANICAL SPECIFICATIONS**

**Operating Temperature:**

(14 to 122) °F (-10 to 50) °C

**Storage Temperature:**

(-4 to 158) °F (-20 to 70) °C

**Influence of Temperature:**

< 0.1 % per 10 °K

**Influence of Humidity:**

From (10 to 90) %: 0.1 %

**Jaw Opening:**

2.25 in (57 mm) max.

**Maximum Conductor Size:**

2.05 in (52 mm)

**Envelope Protection:**

IP 40 (IEC 529)

**Drop Test:**

1 m (IEC 68-2-32)

**Mechanical Shock:**

100 g (IEC 68-2-27)

**Vibration:**

(5 to 15) Hz, 0.15 mm (IEC 68-2-6)

(15 to 25) Hz, 1 mm

(25 to 55) Hz, 0.25 mm

**Polycarbonate Material:**

Handles: ABS Grey and

Lexan 500R, Red: UL94V0

Jaws: Lexan 500R, Red: UL94V0

**Dimensions:**

(4.37 x 8.50 x 1.77) in (111 x 216 x 45) mm

**Weight:**

1.21 lbs (550 g)

**Output:**

SR651: Two standard safety banana  
jacks (4 mm)

SR652: 5 ft (1.5 m) lead with safety  
4 mm banana plug

**SAFETY SPECIFICATIONS**



**Electrical:**

Double insulation or reinforced insulation between  
the primary or secondary and the outer case of the  
handle conforms to IEC 1010-2-032.

**Common Mode Voltage:**

600 V, Category III, Pollution Degree 2

**Dielectric Strength:**

5550 V, 50/60 Hz between primary, secondary  
and the outer case of the handle

**Electromagnetic Compatibility:**

EN 50081-1 Class B

EN 50082-2 Electrostatic discharge

IEC 1000-4-2

Radiated field IEC 1000-4-3

Fast transients IEC 1000-4-4

Magnetic field at 50/60 Hz IEC 1000-4-8

**ORDERING INFORMATION**

**AC Current Probe SR651 ..... Cat #2113.45**

**AC Current Probe SR652 ..... Cat #2113.46**

*(Model SR652 Discontinued – No longer available  
for purchase)*

**Accessories:**

Leads – set of 2, 5 ft color-coded (red/black)

PVC w/ 4 mm straight/straight

plugs ..... **Cat #5100.07**

Lead – set of 2, 5 ft silicone color-coded

(red/black) w/ 4 mm straight/right banana

plugs (Rated 1000 V, CAT IV, UL) ..... **Cat #5000.94**

Adapter – 4 mm banana plug (to nonrecessed plug),  
non-insulated for safety leads ..... **Cat #1017.45**

## OPERATION

Please make sure that you have already read and fully understand the WARNING section on page 1.

### Making Measurements with the AC Current Probe Model SR651/SR652

- Connect the black lead of the current probe to **Common** and the red lead to the AC voltage input on your DMM or other voltage-measuring instrument. The AC current probe has a ratio of 1000:1. This means that for 1000 AAC in a conductor around which the probe is clamped, 1 VAC will come out of the probe leads to your DMM or instrument. The output is 1 mVAC/AAC. Select the range which corresponds to the measured current. If the current magnitude is unknown, start with the highest range and work down until the appropriate range and resolution are reached. Clamp the probe around the conductor. Take the reading on the meter and multiply it by 1000 to obtain the measured current (e.g. 260 mV reading =  $260 \times 1000 = 260,000$  mA or 260 A).
- For best accuracy, avoid if possible, the proximity of other conductors which may create noise.

### Tips for Making Precise Measurements

- When using a current probe with a meter, it is important to select the range that provides the best resolution. Failure to do this may result in measurement errors.
- Make sure that probe jaw mating surfaces are free of dust and contamination. Contaminants cause air gaps between the jaws, increasing the phase shift between primary and secondary. It is very critical for power measurement.

## MAINTENANCE

### Warning:

- For maintenance use only original replacement parts.
- To avoid electrical shock, do not attempt to perform any servicing unless you are qualified to do so.
- To avoid electrical shock and/or damage to the instrument, do not get water or other foreign agents into the probe.

**Cleaning:** To ensure optimum performance, it is important to keep the probe jaw mating surfaces clean at all times. Failure to do so may result in error in readings. To clean the probe jaws, use very fine sand paper (fine 600) to avoid scratching the jaw then gently clean with a soft oiled cloth.

## 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.

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments  
15 Faraday Drive • Dover, NH 03820 USA  
(800) 945-2362 (Ext. 360) • (603) 749-6434 (Ext. 360) • [repair@aemc.com](mailto:repair@aemc.com)

(Or contact your authorized distributor)

**NOTE: All customers 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 use or application of this instrument, please contact our technical hotline:

(800) 945-2362 (Ext. 351) • (603) 749-6434 (Ext. 351) • [techsupport@aemc.com](mailto:techsupport@aemc.com)

## LIMITED WARRANTY

The current probe is warranted to the owner for a period of two 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 purchased. 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.

Full warranty coverage and product registration is available on our website at: [www.aemc.com/warranty.html](http://www.aemc.com/warranty.html)

**Please print the online Warranty Coverage Information for your records.**