

# AC Current Probe Models SR701 and SR704

## User Manual

The SR701/SR704 (Catalog #2116.29 and #2116.30) 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 1000Arms and are compatible with any AC ammeter, multimeter, or other current measurement instrument with an input impedance lower than  $5\Omega$ . To achieve the stated accuracy, use the SR701/SR704 with an ammeter having an 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 600V 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 I:** For measurements on circuits not directly connected to the AC supply wall outlet such as protected secondaries, signal level, and limited energy circuits.

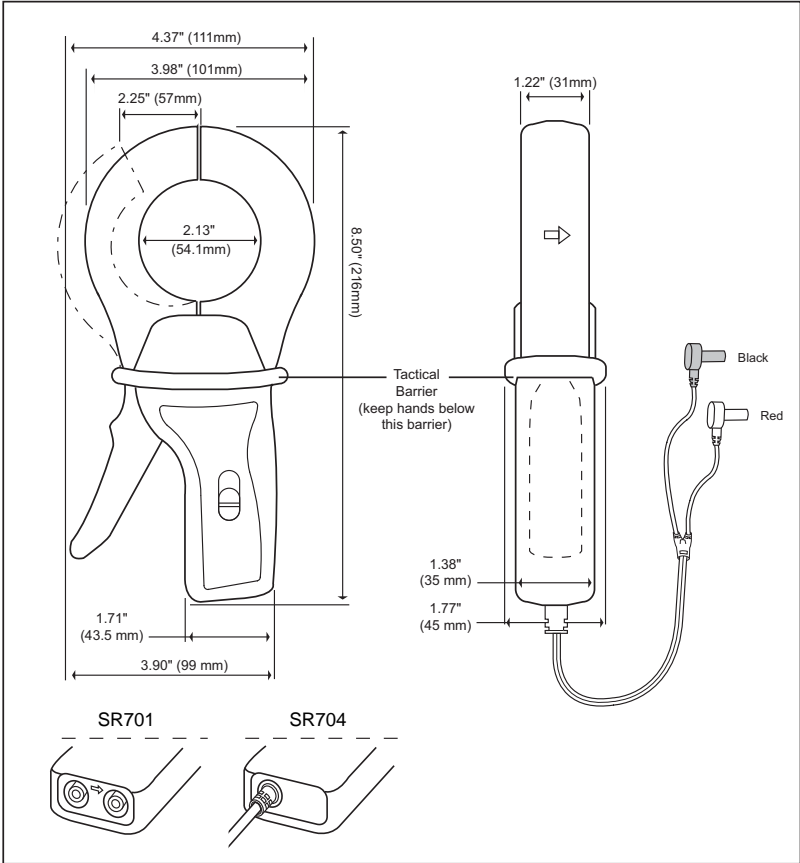
**CAT II:** For measurements performed on circuits directly connected to the electrical distribution system. Examples are measurements on household appliances or portable tools.

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

### 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:**

1mA to 1200A AC

**Transformation Ratio:** 1000:1

**Output Signal:** 1mA AC/A AC (1A AC at 1000A)

**Accuracy and Phase Shift\*:**

*Accuracy:*

- 1mA to 100mA:  $\leq 3\%$  Reading  $\pm 5$ mA
- 0.1 to 1A:  $\leq 2\%$  Reading  $\pm 3$ mA
- 1 to 10A:  $\leq 1\%$  Reading
- 10 to 100A:  $\leq 0.5\%$  Reading
- 100 to 1200A:  $\leq 0.3\%$  Reading

*Phase Shift:*

- 1mA to 100mA: Not Specified
- 0.1 to 1A: Not Specified
- 1 to 10A:  $\leq 2^\circ$
- 10 to 100A:  $\leq 1^\circ$
- 100 to 1200A:  $\leq 0.7^\circ$

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

**Overload:** 1200A for 40mn on, 20mn off

**Accuracy:** Per IEC 185

**Frequency Range:** 30Hz to 5kHz; current derating above 1kHz using the formula:

$$1000 A \frac{x 1}{F \text{ (in kHz)}}$$

**Load Impedance:**  
5Ω max

**Working Voltage:**  
600V CAT III

**Common Mode Voltage:**  
< 25V by limiting circuit

**Open Secondary Voltage:**  
< 1mA/A AC

**Influence of Adjacent Conductor:**  
< 1mA/A AC

**Influence of Conductor in Jaw Opening:**  
0.1% of reading

**Influence of Frequency:**  
From 30 to 48Hz : < 0.5% of R  
From 65 to 1000Hz : < 1% of R  
From 1kHz to 5kHz : < 2% 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:**  
< 0.15% per 10°K

**Influence of Humidity:**  
From 10 to 90% : 0.1%

**Jaw Opening:**  
2.25" (57mm) max

**Maximum Conductor Size:**  
2.05" (52mm)

**Envelope Protection:** IP 40 (IEC 529)

**Drop Test:**  
1m (IEC 68-2-32)

**Mechanical Shock:**  
100g (IEC 68-2-27)

**Vibration:**  
5 to 15Hz, 0.15mm (IEC 68-2-6)  
15 to 25Hz, 1mm  
25 to 55Hz, 0.25mm

## **Polycarbonate Material:**

Handles: ABS Grey and  
Lexan 500R, Red: UL94V0  
Jaws: Lexan 500R, Red : UL94V0

**Dimensions:**  
4.37 x 8.50 x 1.77" (111 x 216 x 45mm)

**Weight:**  
1.21 lbs (550g)

**Output:**  
SR701: Two standard safety banana  
jacks (4mm)

SR704: 5 ft (1.5m) 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:**  
600V Category III, Pollution Degree 2

**Dielectric Strength:**  
5550V, 50/60Hz 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 SR701** ..... Cat #2116.29

**AC Current Probe SR704** ..... Cat #2116.30  
*Includes a user manual and a product warranty and registration card*

**Accessories:**  
Leads, set of 2, 5 ft safety  
(1000V) for Model SR701 ..... Cat #2111.29  
Banana plug adapter  
(to nonrecessed plug) ..... 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 SR701/SR704

- Connect the black lead of the current probe to “common” and the red lead to the AC current input on your DMM or other current measuring instrument. Select the appropriate current range (2A AC range). Clamp the probe around the conductor to be tested with the arrow pointed toward the load. If the reading is less than 200mA, select the lower range until you obtain the best resolution. Read the value display on the DMM and multiply it by the probe ratio (1000/1). (If reading = 0.659A, the current flowing through the probe is  $0.659A \times 1000 = 659A$  AC).
- 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 factory 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. 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).

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Tel: (800) 945-2362 (Ext. 360)  
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Fax: (603) 742-2346 or (603) 749-6309  
repair@aemc.com

(Or contact your authorized distributor)

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

**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 call our technical hotline:

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