

# AC Current Probe Models SR631 and SR632

## User Manual

### DESCRIPTION

The Models SR631/SR632 (Catalog #2113.47 and #2114.79) 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. continuous and are compatible with any AC ammeter, multimeter, or other current measurement instrument with an input impedance lower than  $0.6\Omega$ . To achieve the stated accuracy, use the SR631/SR632 with an ammeter having an accuracy of 0.75% or better.

### WARNING

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

- Read the instruction manual completely and follow all the safety information before attempting to use or service this instrument.
- Use caution on any circuit: Potentially high voltages and currents may be present and may pose a shock hazard.
- Read the Safety Specifications section prior to using the current probe. Never exceed the maximum voltage ratings given.
- Safety is the responsibility of the operator.
- ALWAYS connect the current probe to the display device before clamping the probe onto the sample being tested.
- ALWAYS inspect the instrument, probe, probe cable, and output terminals prior to use. Replace any defective parts immediately.
- NEVER use the current probe on electrical conductors rated above 600V in overvoltage category III (CAT III). Use extreme caution when clamping around bare conductors or bus bars.

### 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.



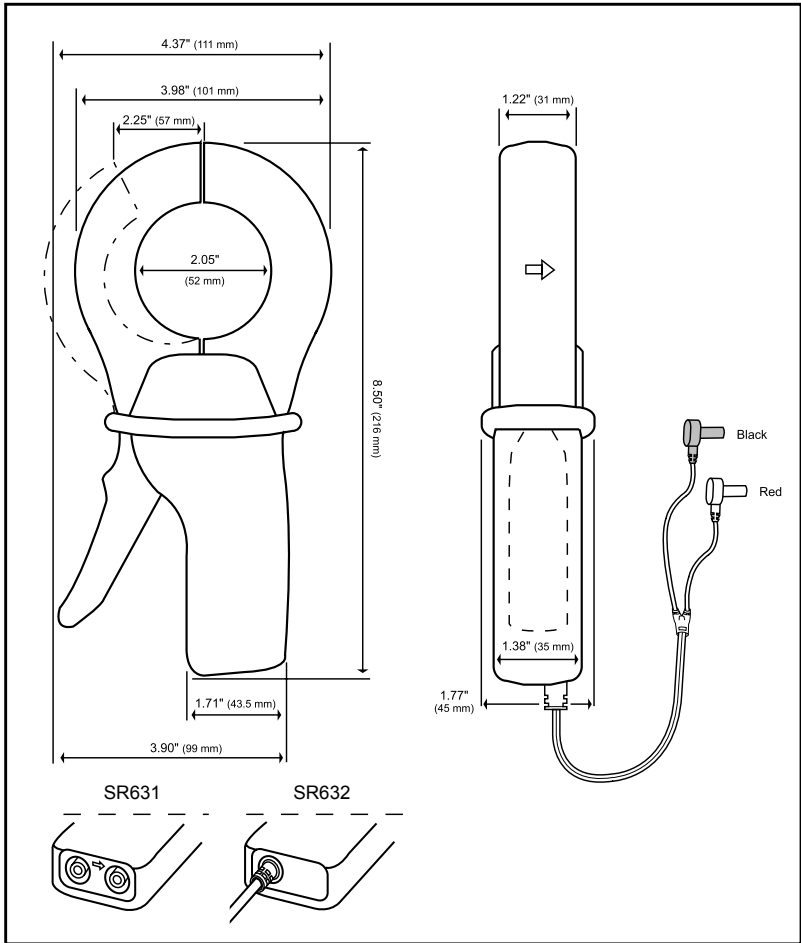
This is a type A current sensor. This symbol signifies that application around and removal from HAZARDOUS LIVE conductors is permitted.

### 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:

0.1 to 1000A AC, continuous cycle @  $\leq$  1kHz

### Transformation Ratio: 1000:5

### Output Signal:

5mA AC/A AC (5A AC at 1000A)

### Accuracy and Phase Shift\*:

Primary current	1 to 20A	20A	50A
Accuracy %	< 6% $\pm$ 0.5A	5%	3%
Phase shift	N/A	5°	3°

Primary current	200A	1000A	1200A
Accuracy %	1.5%	1%	1%
Phase shift	1.5°	1°	1°

\*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 0.2 $\Omega$  @ lead < 40 m $\Omega$ .

**Overload:** 1200 A for 30 mn on, 15 mn off

**Accuracy:** Per IEC 185

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

**Load Impedance:** 0.6Ω max.

**Working Voltage:** 600V Cat. III

**Common Mode Voltage:** 600V Cat. III

**Open Secondary Voltage:**

< 25V by limiting circuit

**Influence of Adjacent Conductor:**

< 1mA/A AC

**Influence of Conductor in Jaw Opening:**

0.2% of reading

**Influence of Frequency:**

From 30 to 48 Hz : < 1% of R

From 65 to 1000 Hz : < 0.5% of R

From 1 kHz 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" (57 mm) max.

**Maximum Conductor Size:**

2.05" (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" (111 x 216 x 45 mm)

**Weight:**

1.21 lbs. (550 g)

**Output:**

SR631: Two standard safety banana jacks (4 mm)

SR632: 5 ft. (1.5 m) lead with safety 4mm 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, 50/60 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 SR631..... Cat #2113.47**

**AC Current Probe SR632..... Cat #2114.79**

*Includes a user manual and a product warranty and registration card*

**Accessories:**

Leads, set of 2, 5 ft. safety (1000 V)... **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 SR631/SR632

- 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. The AC current probe has a ratio of 1000:5. This means that for 1000A AC in a conductor around which the probe is clamped, 5A AC will come out of the probe leads to your DMM or instrument. The output is 5mA AC/A AC. 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 200 to obtain the measured current (e.g, 260mA reading = 260 x 200 = 52,000mA or 52A).
- 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. 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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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:

(800) 343-1391 • (508) 698-2115 • Fax (508) 698-2118

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