

# AC Current Probe Model MD301

## User Manual

### DESCRIPTION

The MD301 (Catalog #1201.07) is designed for use in industrial environments. The hook-shaped jaws enable the user to "pry" into or "hook" onto cables (will accept 2 x 500kcmil) or even smaller bus bars. The voltage output (1mV DC/A AC) enables instruments without current ranges to measure, display or log currents on a DC voltage range. The Model MD301 is compatible with any DC voltmeter, multimeter, or other voltage measurement instruments with an input impedance greater than 100k $\Omega$ .

### 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.



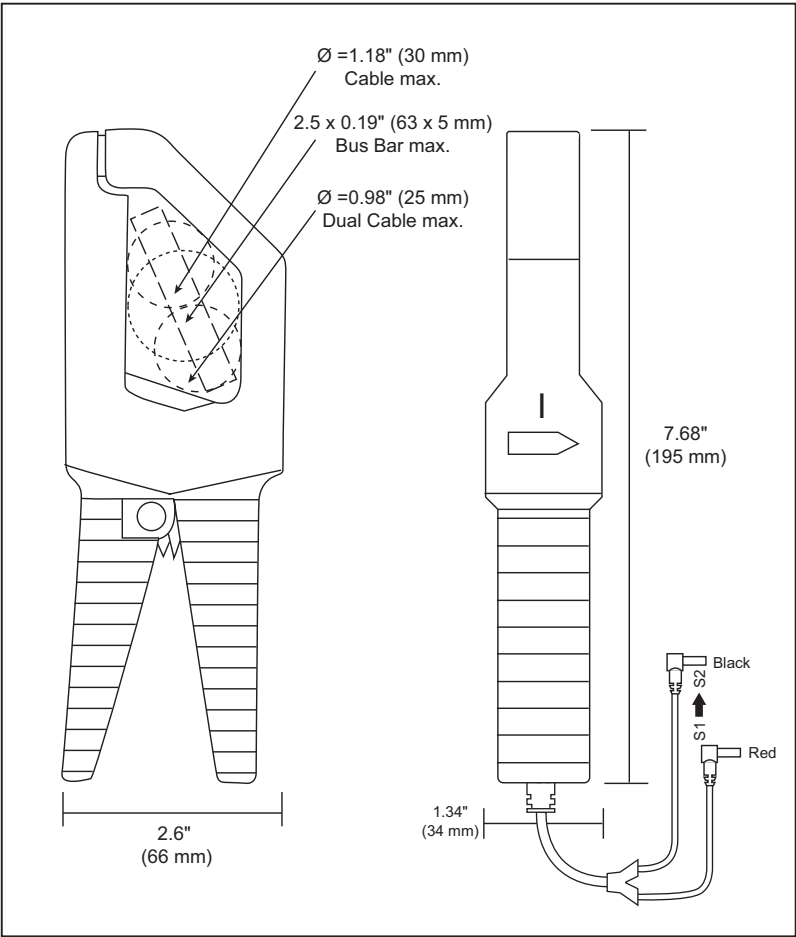
This is a type A current sensor. This symbol signifies that application around and removal from HAZARDOUS LIVE conductors is permitted.

### 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:**

2 to 500A AC

**Transformation Ratio:**

1000:1

**Output Signal:**

1mV DC/A AC

**Overload:** 700A for 10mn

**Accuracy\*:**

Primary current	25A	100A	250A	500A
Accuracy %	5%	2%	1%	1%

(\*Reference conditions: 23°C ± 5°K, 20 to 75% RH, external magnetic field < 40A/m, no DC component, no external current carrying conductor, test sample centered.) 10MΩ load.

**Frequency Range:** 48 to 1000Hz

(error: add 2% to the ref.)

**Load Impedance:**

≥ 100kΩ

**Working Voltage:**

600Vrms

**Common Mode Voltage:**

600Vrms

**Influence of Adjacent Parallel Conductor:**

< 30mA/A at 50Hz

**Influence of Conductor in Jaw Opening:**

< 1%

**Dimensions:**

2.6 x 7.68 x 1.34" (66 x 195 x 34mm)

**Weight:**

14.82 oz (420g)

**Colors:**

Dark gray handles

**Output:**

Double insulated 5 ft (1.5m) lead with safety banana plugs

**MECHANICAL SPECIFICATIONS**

**Operating Temperature:**

-5° to 122°F (-15° to 50°C)

**Storage Temperature:**

-40° to 185°F (-40° to 85°C)

**Influence of Temperature:**

< 0.1% per 10°K

**Altitude:**

Operating: 0 to 2000m

Non-operating: 0 to 12,000m

**Jaw Opening:**

1.3" (33mm)

**Maximum Conductor Size:**

1.18" (30mm)

**Maximum Bus Bar Size:**

2.48 x 0.20" (63 x 5mm)

**Envelope Protection:**

IP 20 (IEC 529)

**Drop Test:**

1.5m (IEC 68-2-32)

**Mechanical Shock:**

100g (IEC 68-2-27)

**Vibration:**

10/55/10Hz, 0.15mm (IEC 68-2-6)

**Polycarbonate Material:**

10% fiberglass charged polycarbonate  
UL 94 V0

**SAFETY SPECIFICATIONS**



**Electrical:**

Double insulation or reinforced insulation between the primary or secondary and the outer case of the handle conforms to EN 61010-2-32.

**Common Mode Voltage:**

600V Category III, Pollution Degree 2

300V Category IV, Pollution Degree 2

**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 50/60Hz IEC 1000-4-8

**ORDERING INFORMATION**

**Current Probe MD301 ..... Cat #1201.07**

**Accessories:**

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 MD301

- Connect the black and red terminals to the Voltage DC range of your DMM or voltage measuring instrument. Select the appropriate voltage range (2V DC 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 = 459.0mV, the current flowing through the probe is  $0.459V \times 1000 = 459A$  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 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, oil 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)  
(603) 749-6434 (Ext. 360)

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:

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

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