

# AC Current Probe

## Model MN255

### User Manual

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#### DESCRIPTION

The MN255 (Cat. #2115.81) is the latest in compact AC Current probes. Designed to meet the most stringent demands in industry and electrical contracting, it also meets the latest safety and performance standards. The probe has a measurement range up to 240 Arms which makes it the perfect tool for measurement with DMMs, recorders, power and harmonic meters. The Model MN255 is compatible with any AC voltmeter, multimeter, or other voltage measurement instrument that is capable of displaying 10mV of output per amp of measured current, voltmeter accuracy of 0.75% or better and an input impedance of  $\geq 1M\Omega$ .

#### 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

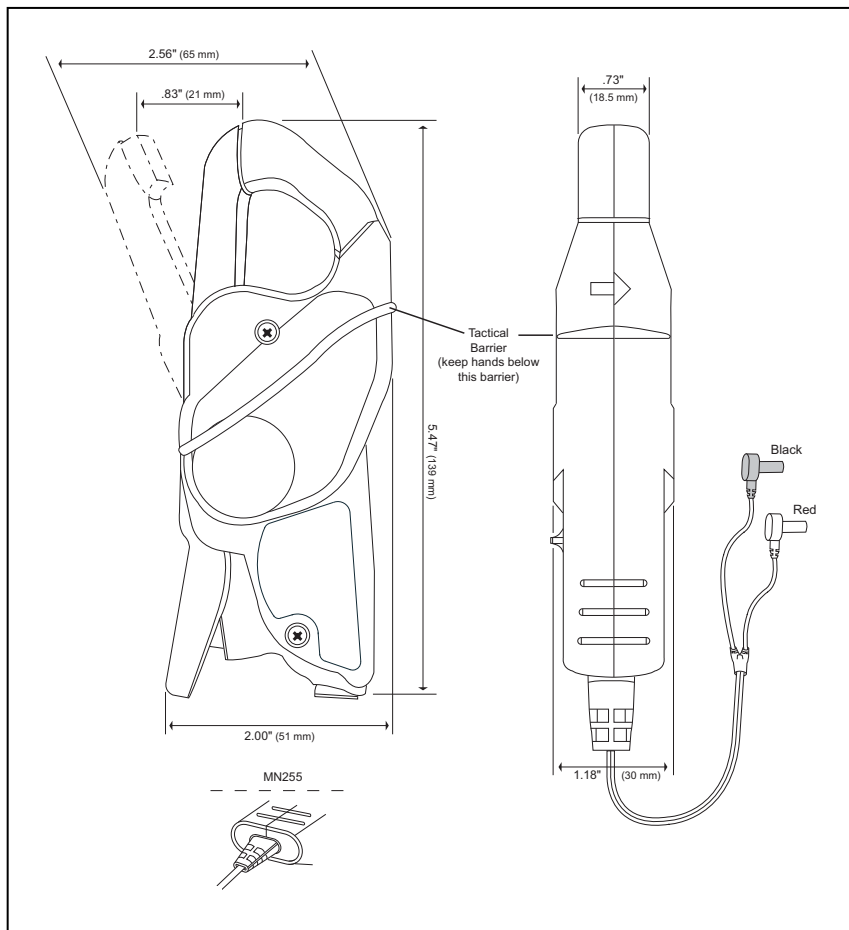
**CAT IV:** For measurements performed at the primary electrical supply (<1000V) such as on primary overcurrent protection devices, ripple control units, or meters.

**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**

**Nominal Range:** 20A, 200A

**Measurement Range:** 20A: 0.1 to 24A  
200A: 0.1 to 240A

**Transformation Ratio:** Voltage output

**Output Signal:** 20A: 100mV/A  
200A: 10mV/A

**Accuracy and Phase Shift\*:**

### ***20A Range***

Accuracy: 1%  $\pm$  50mV

Phase Shift: Not specified

Overload: 24 A for 10 min ON, 30 min OFF

### ***200A Range:***

Accuracy: 0.5 to 10A: 3.0% Reading  $\pm$  5mV  
10 to 40A: 2.5% Reading  $\pm$  5mV  
40 to 100A: 2.0% Reading  $\pm$  5mV  
100 to 240A: 1.0% Reading  $\pm$  5mV

**Phase Shift:** 0.5 to 10A: Not Specified  
10 to 40A:  $\leq 5^\circ$   
40 to 100A:  $\leq 3^\circ$   
100 to 240A:  $\leq 2.5^\circ$

(\*Reference conditions: 18° to 28°C, 20 to 75% RH, external magnetic field <40 A/m, 48 to 65Hz sine wave, distortion factor less than 1%, no DC component, no external current carrying conductor, test sample centered.) Load impedance > 1M $\Omega$ .

**Frequency Range:** 40 to 10kHz

**Limit Operating Conditions:**

200A permanently to 1kHz; derating above  
3kHz: 200A x (1/0.333 F), F in kHz

**Crest Factor:**

3 @ 200Arms with an error (due to CF) of 3%

**Working Voltage:** 600Vrms

**Common Mode Voltage:** 600Vrms

**Influence of Adjacent Conductor:**

< 15mA/A at 50Hz

**Influence of DC on AC signal:**

20A Range: DC Current < 2A, < 0.5%

200A Range: DC Current < 20A, < 5%

**Influence of Conductor Position in Jaw:**

0.5% of mV output @ 50/60Hz

**Influence of Frequency:**

20A Range:

40Hz to 1 kHz: 5% of mV output

1kHz to 10 kHz: 15% of mV output

200A Range:

40Hz to 1kHz: 3% of mV output

1kHz to 10kHz: 12% of mV output

**Influence of Temperature:**

≤ 150 ppm/°K, or 0.15% of mV output per  
10°K

**Influence of Humidity (10 - 90% RH):**

≤ 0.2% of mV output per 10°K @ 18°C to  
28°C

## **MECHANICAL SPECIFICATIONS**

**Operating Temperature:**

14° to 131°F (-10° to +55°C)

**Storage Temperature:**

-40° to 158°F (-40° to +70°C)

**Operating Relative Humidity:**

10° to 35°C 85% RH

(without roll-off above 35°C)

**Maximum Cable Diameter:**

One Ø 0.78" (20mm), bus bar 20 x 5mm

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

**Drop Test:**

Test per IEC 68-2-32:

1.0 m drop on 38mm of Oak on concrete.

**Mechanical Shock:** Test per IEC 68-2-27

**Vibration:** Test per IEC 68-2-6

**Dimensions:**

5.47 x 2.00 x 1.18" (139 x 51 x 30mm)

**Weight:** 180 g (6.5 oz)

**Polycarbonate Material:**

Jaws: Polycarbonate with 10% fiberglass charge,

Red UL 94 V0

Case: Polycarbonate 920A Gray

**Opening Operations - Life:** > 50,000

**Output:**

Double/reinforced insulated 5 ft (1.5m) 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 1010-2-32.

**Common Mode Voltage:**

600V CAT III, Pollution Degree 2

**Dielectric Strength:**

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

**Electromagnetic Compatibility:**

Emission and immunity in an industrial  
environment according to EN61326-1

## **ORDERING INFORMATION**

**AC Current Probe MN255 .....Cat #2115.81**

**Accessories:**

Banana plug adapter

(to non-recessed 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 MN255

- 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 an output of 10mV/A and 100mV/A. This means that with the probe in the 10 mV/A position, for 200A AC in a conductor around which the probe is clamped, 2V AC will come out of the probe leads to your DMM or instrument. Select the range which corresponds to the measured current. If the current magnitude is unknown, start with the probe in the 10mV/A position and if the current is < 20 amps the probe can be switched to the 100 mV/A position for the higher resolution. Clamp the probe around the conductor. With the probe in the 10 mV/A position take the reading on the meter and multiply it by 100 to obtain the measured current (e.g, 160mV reading =  $160 \times 100 = 16,000\text{mA}$  or 16A).
- 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.

(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.

### 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.

Please print the online Warranty Coverage Information for your records.