

AC Current Probe Model MN213

User Manual




DESCRIPTION

The **AEMC® Instruments Model MN213** (Cat. #2115.75) is a small, compact AC current probe. 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 a perfect tool for measurement with DMMs, recorders, power and harmonic meters. The **Model MN213** is compatible with any AC ammeter, multimeter, or other current measurement instrument with an input impedance lower than 1 MΩ. To achieve the stated accuracy, use the MN213 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: 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 600 V in overvoltage CAT III. Use extreme caution when clamping around bare conductors or bus bars.

SYMBOLS AND DEFINITIONS

	Signifies that the instrument is protected by double or reinforced insulation
	CAUTION - Risk of Danger! Indicates a WARNING . Whenever this symbol is present, the operator must refer to the user manual before operation
	Application or withdrawal authorized on conductors carrying dangerous voltages. Type A current sensor as per IEC 61010-2-032

DEFINITION OF MEASUREMENT CATEGORIES (CAT)

CAT IV: Corresponds to measurements performed at the primary electrical supply (< 1000 V).
Example: primary overcurrent protection devices, ripple control units, and meters.

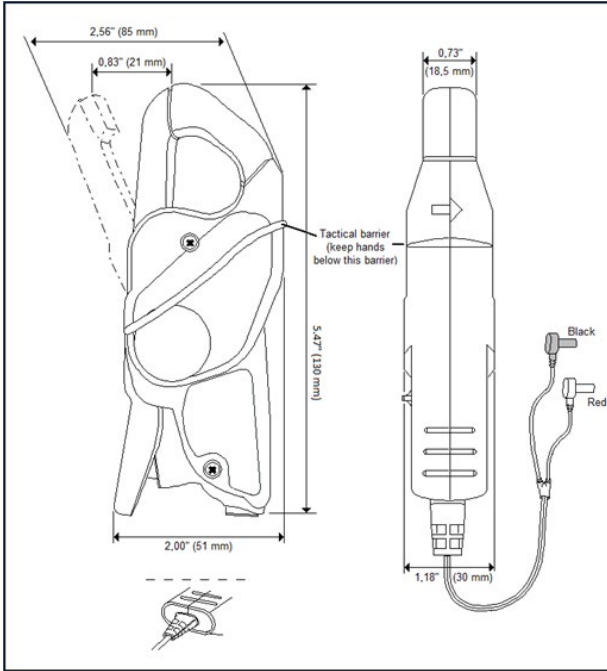
CAT III: Corresponds to measurements performed in the building installation at the distribution level.
Example: hardwired equipment in fixed installation and circuit breakers.

CAT II: Corresponds to measurements performed on circuits directly connected to the electrical distribution system.
Example: measurements on household appliances and 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.

CURRENT PROBE - MN213 DRAWING



ELECTRICAL SPECIFICATIONS

Nominal Range: 200 A

Measurement Range: (0.5 to 240) A_{AC}

Transformation Ratio: 1000:1

Output Signal: 1mV/A on 1 Ω

Accuracy and Phase Shift*:

Accuracy:

(0.5 to 10) A: 3.0 % Reading \pm 0.5 A

(10 to 40) A: 2.5 % Reading \pm 0.5 A

(40 to 100) A: 2.0 % Reading \pm 0.5 A

(100 to 240) A: 1.0 % Reading \pm 0.5 A

Phase Shift:

(0.5 to 10) A: Not Specified

(10 to 40) A: \leq 5°

(40 to 100) A: \leq 3°

(100 to 240) A: \leq 2.5°

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

Overload:

240 A for 10 min ON, 30 min OFF

Frequency Range: (40 to 10) kHz

Frequency Range: (40 to 10) kHz

Limit Operating Conditions:

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

Crest Factor:

3 @ 200 Arms with an error (due to CF) of 4 %

Open Secondary Voltage:

Limiting Circuit with Diodes

Working Voltage: 600 Vrms

Common Mode Voltage: 600 Vrms

Influence of Adjacent Conductor:
< 15 mA/A at 50 Hz

Influence of DC (< 20 A) on AC signal: < 5 %

Influence of Conductor Position in Jaw:
0.5 % of mA output @ 50/60 Hz

Influence of Load:
< 3 % of mA output from 40 Hz to 1 kHz
< 12 % of mA output from 1 kHz to 10 kHz

Influence of Temperature:
≤ 150 ppm/°K, or 0.15 % of mA output per 10 °K

Influence of Humidity (10 - 90% RH):
≤ 0.2 % of mA output per 10 °K @ (18 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 in (20 mm), bus bar 20 x 5 mm

Case Protection: IEC 60529

Drop Test:
Test per IEC 60068-2-32
1.0 m drop on 38 mm of Oak on concrete

(to non-recessed plug)..... **Cat. #1017.45**

OPERATION

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

Making Measurements with the AC Current Probe Model MN213

- 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 (400 mAAC range). Clamp the probe around the conductor to be tested with the arrow pointed toward the load. If the reading is less than 400 mA, 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 = 0.159 A, the current flowing through the probe is 0.159 A x 1000 = 159 Aac)
- 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.

Mechanical Shock: Test per IEC 60068-2-27

Vibration: Test per IEC 60068-2-6

Dimensions:
(5.47 x 2.00 x 1.18) in (139 x 51 x 30) mm

Weight: 180 g (6.5 oz)

Material: Jaws and case: Polycarbonate UL94

Opening Operations - Life: > 50,000

Output:
Double/reinforced insulated 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 61010-2-32

Common Mode Voltage:
600 V CAT III, Pollution Degree 2

Electromagnetic Compatibility:
Emission and immunity in an industrial environment according to EN 61326-1

ORDERING INFORMATION

AC Current Probe MN213 **Cat. #2115.75**
(Discontinued - replaced by Cat. #2129.17
MN01 or Cat. #2153.04 LM102)

Accessories:
Banana plug adapter

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

To ensure that your instrument meets factory specifications, we recommend that it be sent back to our factory Service Center at one-year intervals for recalibration or as required by other standards or internal procedures.

For instrument repair and calibration:

You must contact our Service Center for a Customer Service Authorization Number (CSA#). Send an email to repair@aemc.com requesting a CSA#, you will be provided a CSA Form and other required paperwork along with the next steps to complete the request. Then return the instrument along with the signed CSA Form. 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).

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

(Or contact your authorized distributor.)

Contact us for the costs for repair, standard calibration, and calibration traceable to N.I.S.T.



NOTE: You must obtain a CSA# before returning any instrument.

TECHNICAL ASSISTANCE

If you are experiencing any technical problems or require any assistance with the proper operation or application of your instrument, please call our technical hotline:

(800) 343-1391 (Ext. 351) • techsupport@aemc.com

LIMITED WARRANTY

The instrument 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

Please print the online Warranty Coverage Information for your records.