AC Current Probe
Model MN251T
User Manual

DESCRIPTION

The **MN251T** (Cat. #2132.59) 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 120 Arms which makes it the perfect tool for measurement with DMMs, recorders, and power and harmonic readers. The Model **MN251T** is compatible with any AC voltmeter, multimeter, or other voltage measurement instrument that is capable of displaying 1 mV of output per amp of measured current, a voltmeter accuracy of 0.75 % or better and an input impedance of ≥ 1 MΩ.

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.
- 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 600 V 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

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

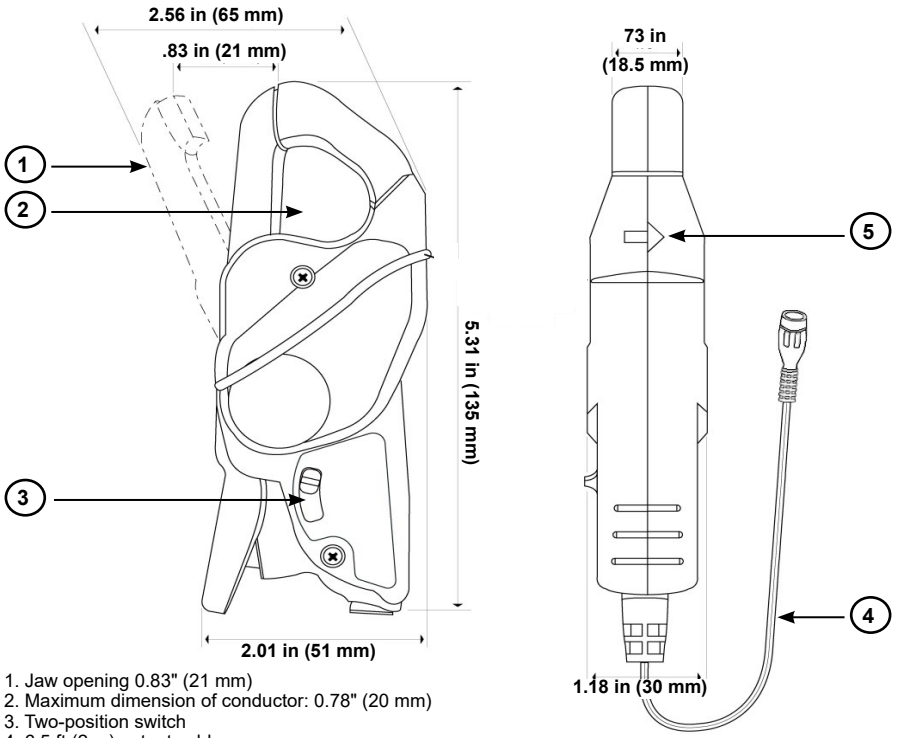
CAT III: Corresponds to measurements performed in the building installation at the distribution level.
Example: hardwired equipment in fixed installation and circuit breakers.

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.

AC CURRENT PROBE - MN251T



1. Jaw opening 0.83" (21 mm)
2. Maximum dimension of conductor: 0.78" (20 mm)
3. Two-position switch
4. 6.5 ft (2 m) output cable
5. Arrow indicates direction of current flow. Current flows in a positive direction when it travels from supply to load.

ELECTRICAL SPECIFICATIONS

Nominal Range: 200 A

Measurement Range: (0.5 to 240) A

Transformation Ratio: Voltage Output

Output Signal: 1 mV/A

Accuracy and Phase Shift*:

Accuracy:
(0.5 to 10) A: 3.0 % Reading ± 0.5 mV
(10 to 40) A: 2.5 % Reading ± 0.5 mV
(40 to 100) A: 2.0 % Reading ± 0.5 mV
(100 to 240) A: 1.0 % Reading ± 0.5 mV

Phase Shift:
(0.5 to 10) A: Not Specified
(10 to 40) A: ≤ 5°
(40 to 100) A: ≤ 3°
(100 to 240) A: ≤ 2.5°

*Reference conditions: (64 to 82) °F (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 MΩ

Frequency Range: 40 Hz 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 A_{RMS} with an error (due to CF) of 3 %

Working Voltage: 600 V_{RMS}

Common Mode Voltage: 600 V_{RMS}

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

Influence of DC on AC signal:
DC Current <20 A, <5 %

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

Influence of Frequency:
40 Hz to 1 kHz: 3 % of mV output
1 kHz to 10 kHz: 12 % of mV output

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/ºK, or 0.15 % of mV output per 10 ºK

Influence of Humidity (10 to 90) % RH:
≤ 0.2 % of mV 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:
(50 to 95) °F (10 to 35) °C 85 % RH (without roll-off above 95 °F (35 °C)

Maximum Cable Diameter:
One Ø 0.78 in (20 mm),
bus bar (0.78 x 0.2) in (20 x 5) mm

Case Protection:
IP 40 (IEC 529)

Drop Test: Test per IEC 68-2-32: 1.0 m drop on 38 mm 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) in (139 x 51 x 30) mm

Weight:
180 g (6.5 oz)

Polycarbonate Material:
Jaws: Polycarbonate with 10 % fiberglass charge, Red UL 94 V0
Case: Polycarbonate 920 A Gray

Opening Operations - Life: > 50,000

Output:
10 ft (3 m) insulated lead with BNC connector.

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:
600 V CAT III, Pollution Degree 2

Dielectric Strength:
5550 V, 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 MN379T .....**Cat #2153.02**

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 MN379T

- Connect the BNC connector to your voltage-measuring instrument. The AC current probe has an output of 1 mV/A. This means that for 200A AC in a conductor around which the probe is clamped, 200 mV 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 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 1000 to obtain the measured current (e.g, 150 mV reading = 150 x 1000 = 150,000 mA or 150 A).
- 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.

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360) • (603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 • E-mail: repair@aemc.com

(Or contact your authorized distributor)

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, e-mail or fax our technical support team:

Contact: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
Phone: (800) 945-2362 (Ext. 351) or (603) 749-6434 (Ext. 351)
Fax: (603) 742-2346 • E-mail: techsupport@aemc.com

LIMITED WARRANTY

The current probe is warrantied 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.