

AC Current Probe Models MN352 and MN353

User Manual

DESCRIPTION

The **Models MN352 and MN353** (Catalog #2116.26 and #2116.27) are the latest in compact AC current probes. Designed to meet the most stringent demands in industry and electrical contracting, they also meet the latest safety and performance standards. This probe has a measurement range up to 240 Arms which make them perfect tools for measurements with DMMs, recorders, power and harmonic meters. The Models MN352 and MN353 are compatible with any AC voltmeter, multimeter, or other voltage measurement instrument that is capable of displaying 10 mV of output per amp of measured current, an accuracy of 0.75 % or better and an input impedance of $\geq 1 \text{ M}\Omega$.

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 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)

CAT IV corresponds to measurements performed at the primary electrical supply ($< 1000 \text{ V}$).
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.

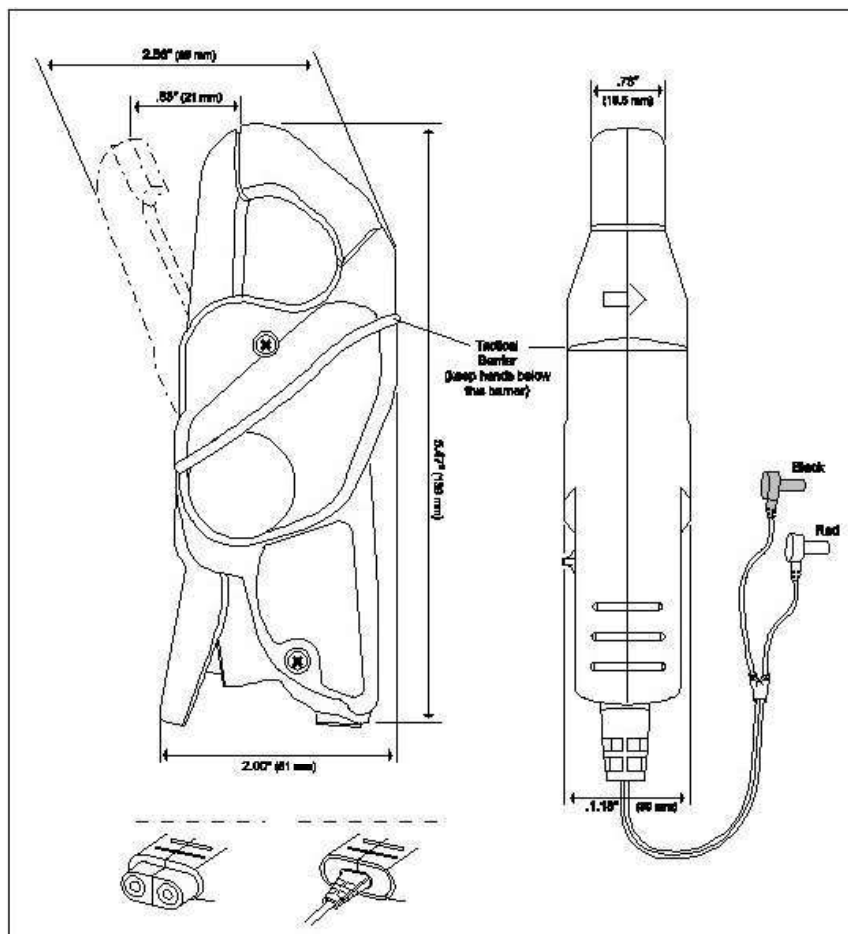
CAT II corresponds to measurements performed on circuits directly connected to the electrical distribution system.

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.





ELECTRICAL SPECIFICATIONS

Nominal Range: 150 A

Measurement Range: 0.1 to 200 A

Transformation Ratio: Voltage output

Output Signal: 10 mV/A

Accuracy and Phase Shift*:

Accuracy:

0.1 to 1 A: $\leq 3\%$ Reading $\pm 200 \mu V$
 1 to 20 A: $\leq 2\%$ Reading $\pm 200 \mu V$
 20 to 80 A: $\leq 1\%$ Reading
 80 to 150 A: $\leq 3\%$ Reading
 150 to 200 A: $\leq 7\%$ Reading

Phase Shift:

0.1 to 1 A: Not Specified
 1 to 20 A: $\leq 3^\circ$
 20 to 80 A: $\leq 2^\circ$
 80 to 150 A: $\leq 3^\circ$
 150 to 200 A: $\leq 4^\circ$

(*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 M Ω .

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 @ 150 A peak max with an error
(due to CF) of 3 %

Overload:

240 A for 10 min ON, 30 min OFF

Working Voltage:

600 Vrms

Common Mode Voltage:

600 Vrms

Influence of Adjacent Conductor:

< 15 mA/A at 50 Hz

Influence of DC on AC signal:

DC Current < 10 A, < 10 %

Influence of Conductor Position in Jaw:

0.5 % of mV output @ 50/60 Hz

Influence of Frequency:

40 Hz to 1 kHz: 5 % of mV output
1 kHz to 10 kHz: 15 % 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:

≤ 200 ppm/°K, or 0.2 % of mV output per 10 °K

Influence of Humidity (10 - 90% RH):

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

MECHANICAL SPECIFICATIONS**Operating Temperature:**

(-10 to 55) °C

Storage Temperature:

(-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

Cabl 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 V)

Case: Polycarbonate 920 A Gray

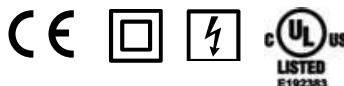
Opening Operations - Life:

> 50,000

Output:

MN352: Two standard safety banana jacks (4 mm)

MN353: 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 1010-2-32.

Common Mode Voltage:

600 V Category 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 MN352 **Cat #2116.26**

AC Current Probe MN353 **Cat #2116.27**

Accessories:

Leads, set of 2, 5 ft safety
(1000 V) for Model MN352 **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 MN352/MN353.

- 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 10 mV/A. This means that for 200 AAC in a conductor around which the probe is clamped, 2 VAC 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 100 to obtain the measured current (e.g. 160 mV reading = $160 \times 100 = 16,000 \text{ mA}$ or 16 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 allow water or other foreign agents to come into contact with 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, and 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.



NOTE: You 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 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.

Please print the online Warranty Coverage Information for your records.

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