

AC Current Probe Model JM861

User Manual

DESCRIPTION

The JM861 (Catalog #2110.90) is designed for use in industrial environments. The “squared” jaws permit multiple conductor or bus bar positioning. The Model JM861 accurately measures AC current waveforms and has proportional mV output for direct readings on oscilloscopes. Three-position slide switch on the handle selects ranges. The JM861 offers an insulated 6.5 ft. coaxial cable with insulated BNC connector rated 600V rms. The Model JM861 is compatible with any AC Voltmeter, multimeter, or other voltage measuring instrument with an input impedance greater than $1M\Omega$, 47 pF. To achieve the stated accuracy, use the JM861 with a voltmeter 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: 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.



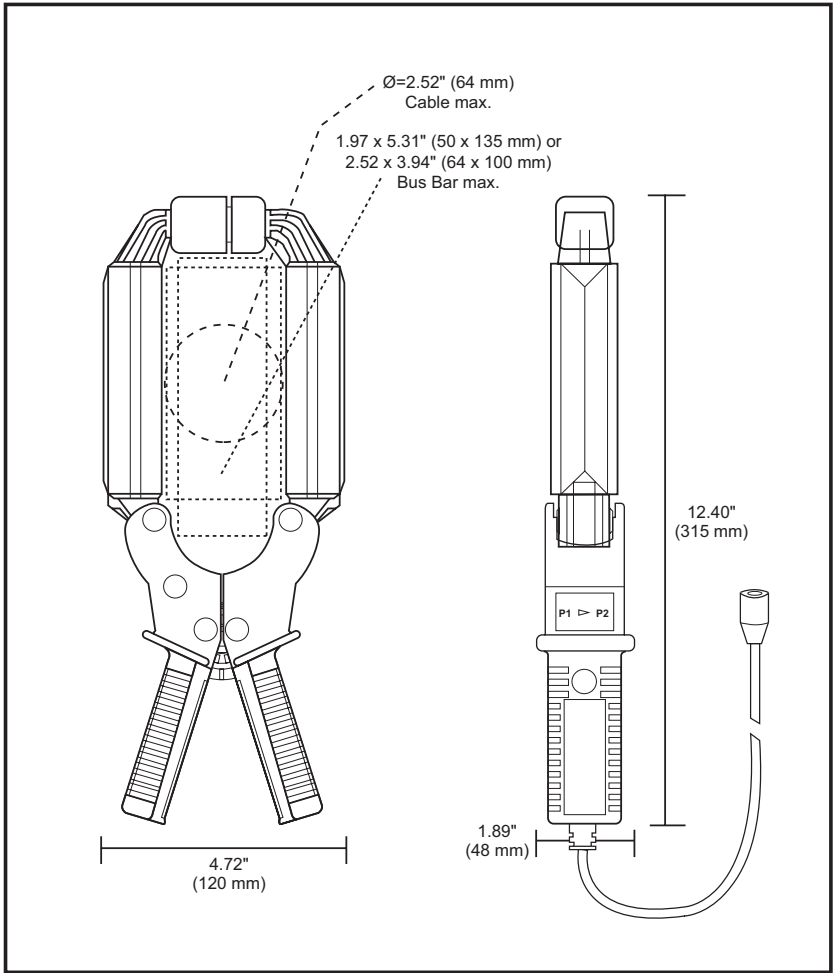
This is a type A current sensor. This symbol signifies that application around and removal from HAZARDOUS LIVE conductors is permitted.

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, riddle 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:

1 to 30A AC continuous cycle; 90A peak to peak
 1 to 300A AC continuous cycle; 900A peak to peak
 1 to 2400A AC continuous cycle; 9000A peak to peak
 1 to 2400A AC continuous cycle for the full temperature range
 (3000A if temperature is < 35°C or 95°F)

Output Signal:

10 mV AC/A AC (0.3V at 30A)
 1 mV AC/A AC (0.3V at 300A)
 0.1 mV AC/A AC (0.3V at 3000A)

Accuracy and Phase Shift*:

30A RANGE

Primary current	1.5A	6A	30A
Accuracy %	2% ± 1 mV		
Phase shift	20°	10°	5°

300A RANGE

Primary current	15A	60A	300A
Accuracy %	2% ± 0.5 mV		
Phase shift	3°	1.5°	1°

3000A RANGE

Primary current	150A	600A	3000A
Accuracy %	2% ± 0.2 mV		
Phase shift	3°	1.5°	1°

(*Reference conditions: 23°C±3°K, 20 to 85% RH, 48 to 65 Hz, external magnetic field < 40 A/m, no DC component, no external current carrying conductor, test sample centered.)
Load impedance ≥ 1MΩ, 47 pF.

Accuracy: Per IEC 185

Ampere Second Product: 90 A.S

Frequency Range: 10 to 50 kHz; current derating above 5 kHz for continuous use

Load Impedance: 1 MΩ, 47 pF

Working Voltage: 600V AC

Common Mode Voltage: 600V AC

Influence of Adjacent Conductor:
0.005A/A AC

Influence of Conductor in Jaw Opening:
1% ± 0.1A of reading

Influence of Frequency from 10Hz to 10kHz:
1 dB on all ranges

Influence of DC Voltage: 0.05% per A DC

MECHANICAL SPECIFICATIONS

Operating Temp.: 14° to 122°F (-10° to 50°C)

Storage Temp.: -40° to 176°F (-40° to 80°C)

Influence of Temperature: < 0.1% per 10°K

Jaw Opening: 3.54" (90 mm)

Maximum Conductor Size:

Cable: 2.52" Ø max. (64mm)

Bus bar: 1.97 x 5.31" (50 x 135 mm)

2.52 x 3.94" (64 x 100 mm)

Envelope Protection: IP 20 (IEC 529)

Drop Test: 500 mm (IEC 68-2-32)

Mechanical Shock: 100 g (IEC 68-2-27)

Vibration:

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

Polycarbonate Material:

Handles: 10% fiberglass charged polycarbonate UL 94 V0

Jaws: ABS UL 94 V2

Dimensions:

4.72 x 12.40 x 1.89" (120 x 315 x 48 mm)

Weight: 2.65 lbs. (1200 g)

Colors: Dark gray handles with red jaws

Output:

Insulated 6.5 ft. (2 m) coaxial cable with insulated BNC connector rated 600V rms

SAFETY SPECIFICATIONS



Electrical:

Double insulation or reinforced insulation between primary or secondary and outer case of handle upon IEC 1010-2-32

Common Mode Voltage:

600V Category III, Pollution: 2

ORDERING INFORMATION

Current Probe JM861 Cat #2110.90

Includes a user manual and a product warranty and registration card

Accessories:

Banana/BNC Connector XF-SS

(4 mm banana plug) **Cat #2111.32**

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 JM861

- Connect the black and red terminals to the Volt AC range of your DMM or voltage measuring instrument. Select the appropriate voltage range. If the current magnitude is unknown, select the highest range (3000A AC / 3V AC) on the switch probe located inside the handle. Clamp the probe around the conductor to be tested. If the reading is less than 300 mV or 30 mV, select the lower range until you obtain the best resolution. Read the value display on the DMM (in mV) and divide it by the range selected. (If reading = 2.59 V on the 10 mV AC/A AC range, the current flowing through the probe is $2590 \text{ mV} \div 10 = 259 \text{ A AC}$).
- For best accuracy: carefully center the conductor inside the probe jaw, 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 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. 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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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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