AC Current Probe
Model JM861

User Manual

DESCRIPTION

The **Model JM861** (Cat. #2110.90) is designed for use in industrial environments. The **squared** jaws permit multiple conductor or bus bar positioning. The JM861 accurately measures AC current waveforms and has proportional mV output for direct readings on oscilloscopes. The three-position slide switch on the handle selects ranges. The JM861 offers an insulated 6.5 ft. coaxial cable with insulated BNC connector rated 600 V_{RMS} and is compatible with any AC voltmeter, multimeter, or other voltage measuring instrument with an input impedance greater than 1 MΩ, 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 600 V in overvoltage CAT III. Use extreme caution when clamping around bare conductors or bus bars.

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.

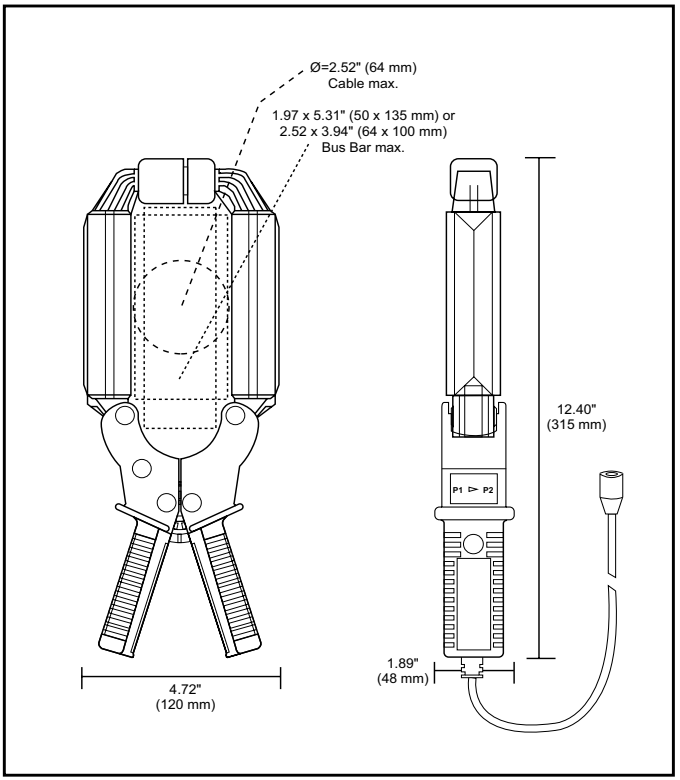
DEFINITION OF MEASUREMENT CATEGORIES (CAT)

CAT IV:	For measurements performed at the primary electrical supply (< 1000 V), such as primary overcurrent protection devices, ripple control units, or meters.
CAT III:	For measurements performed in the building installation at the distribution level, such as hardwired equipment in fixed installation or circuit breakers.
CAT II:	For measurements performed on circuits directly connected to the electrical distribution system, such as 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 providing a detailed description of any damage.

AC CURRENT PROBE - JM861 DRAWING



ELECTRICAL SPECIFICATIONS

Current Range:

(1 to 30) A_{AC} continuous cycle;
90 A peak to peak

(1 to 300) A_{AC} continuous cycle;
900 A peak to peak

(1 to 2400) A_{AC} continuous cycle;
9000 A peak to peak

(1 to 2400) A_{AC} continuous cycle for the full temperature range

(3000 A if temperature is < 35 °C or 95 °F)

Output Signal:

10 mV AC/A_{AC} (0.3 V at 30 A)

1 mV AC/A_{AC} (0.3 V at 300 A)

0.1 mV AC/A_{AC} (0.3 V at 3000 A)

Accuracy and Phase Shift*:

30 A RANGE

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

300 A RANGE

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

3000 A RANGE

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

*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: 1 MΩ, 47 pF

Accuracy: Per IEC 185

Amphere Second Product: 90 A·s

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

Working Voltage: 600 V_{AC}

Influence of Adjacent Conductor:
0.005 A/A_{AC}

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

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

Influence of DC Voltage: 0.05 % per A_{DC}

MECHANICAL SPECIFICATIONS

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

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

Influence of Temperature: < 0.1 % per 10 °K

Jaw Opening: 3.54 in (90 mm)

Maximum Conductor Size:
Cable: 2.52 in Ø max. (64 mm)
Bus bar: (1.97 x 5.31) in (50 x 135) mm
(2.52 x 3.94) in (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) in
(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 600 V_{RMS}

SAFETY SPECIFICATIONS

CE  

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

Common Mode Voltage: 600 V_{AC}, CAT III, Pollution 2

ORDERING INFORMATION

Current Probe JM861.....Cat. #2110.90

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 (3000 A_{AC} / 3 V_{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 mV ÷ 10 = 259 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 service on the device 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.

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)

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, e-mail or fax our technical support team:

Contact: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
Phone: (800) 343-1391 (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.