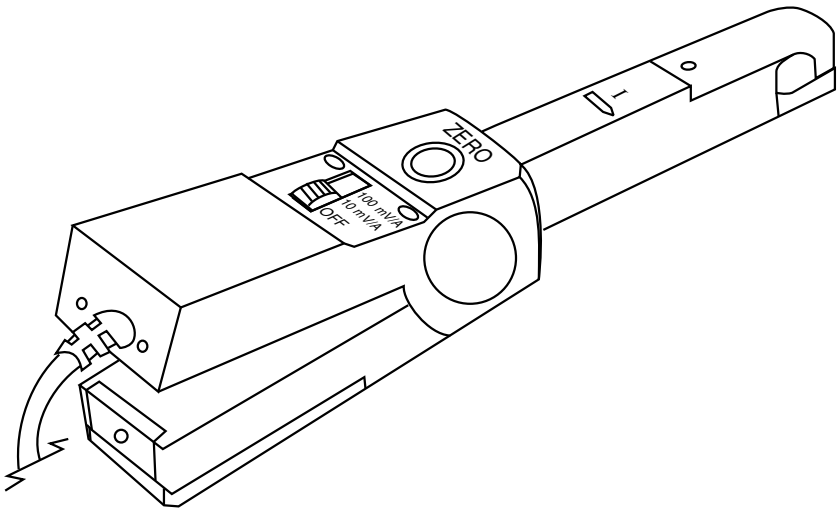
AC/DC Current Oscilloscope Probe Model SL261

USER MANUAL



AEMC® INSTRUMENTS

Statement of Compliance

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments certifies that this instrument has been calibrated using standards and instruments traceable to international standards.

We guarantee that at the time of shipping your instrument has met its published specifications.

An NIST traceable certificate may be requested at the time of purchase, or obtained by returning the instrument to our repair and calibration facility, for a nominal charge.

The recommended calibration interval for this instrument is 12 months and begins on the date of receipt by the customer. For recalibration, please use our calibration services. Refer to our repair and calibration section at **www.aemc.com.**

Serial #: _____

Catalog #: 1201.51

Model #: SL261

Please fill in the appropriate date as indicated:

Date Received: _____

Date Calibration Due: _____

AEMC® INSTRUMENTS

Chauvin Arnoux®, Inc.
d.b.a AEMC® Instruments
www.aemc.com

Limited Warranty

The AC/DC Current Oscilloscope Probe Model SL261 is warranted to the owner for a period of one year 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.

For full and detailed warranty coverage, please read the Warranty Coverage Information, which is attached to the Warranty Registration Card (if enclosed) or is available at www.aemc.com. Please keep the Warranty Coverage Information with your records.

What AEMC® Instruments will do:

If a malfunction occurs within the one-year period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will, at its option, repair or replace the faulty material.

YOU CAN NOW REGISTER ON LINE AT:
www.aemc.com

Warranty Repairs

First, request a Customer Service Authorization Number (CSA#) by phone or by fax from our Service Department (see address below), then return the instrument along with the signed CSA Form. Please write the CSA# on the outside of the shipping container. Return the instrument, postage or shipment pre-paid to:

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA
Tel: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
repair@aemc.com

Caution: To protect yourself against in-transit loss, we recommend you insure your returned material.

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

Table of Contents

⚠ Warning ⚠

These safety warnings are provided to ensure the safety of personnel and proper operation of the instrument.

- Connect the probe to the oscilloscope or voltage measuring instrument before clamping the probe around a conductor.
- Never use the probe on circuits rated higher than 600V or with float voltage greater than 600V.
- Never leave the probe clamped around a conductor while it is not connected to an oscilloscope or voltage measuring instrument.
- Carefully center the conductor inside the probe jaws and ascertain that the probe is perpendicular to the conductor before closing the jaws.
- Avoid, if possible, the proximity of other conductors which may create noise.
- Check the magnetic mating surfaces of the probe jaws; these should be free of dirt, rust, or other foreign matter.
- Do not use a probe that is cracked, damaged, or has defective leads.

International Electrical Symbols

This symbol signifies that the instrument is protected by double or reinforced insulation. Use only 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.

Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.

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, ripple 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.

Packaging

The shipping container includes the SL261 AC/DC Current Oscilloscope Probe with a separate battery (not installed) and this user manual.

Compatibility

- BNC input connector.
- Range capable of displaying 0.2 to 0.5V per division.
- Minimum input impedance of 1MΩ.

Description

The SL261 AC/DC Current Oscilloscope Probe expands oscilloscope applications in industrial, automotive or power environments, and is ideal for analysis and measurement of distorted current waveforms and harmonics. The probe permits accurate display and measurement of currents from 100mA to 100Arms, DC to 100kHz without breaking into the circuit. The probe uses Hall effect technology to measure AC and DC signals. The probe connects directly to an oscilloscope through a 2 meter coaxial cable with an insulated BNC.

Control and Connector Identification

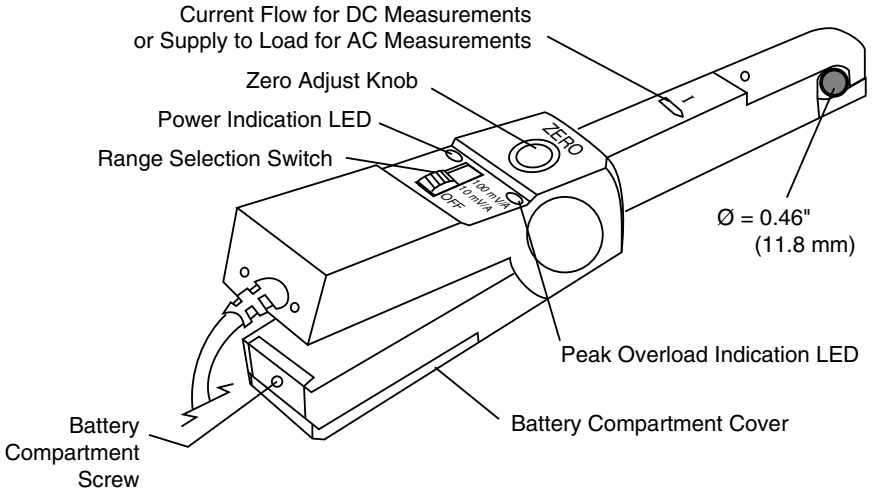


Figure 1

Specifications

ELECTRICAL SPECIFICATIONS

Current Range:
100mV/A: 100mA to 10A peak
10mV/A: 1 to 100A peak

Output Signal: 1000mV peak max

AC Current Accuracy:
After calibration and for one year
(zero probe before making measurement)

Range	Accuracy
100mV/A (50mA to 10A peak)	3% of reading ± 50mA
10mV/A (500mA to 40A peak)	4% of reading ± 50mA
10mV/A (40A to 100A peak)	15% max at 100A

Phase Shift*:
< 1° from dc to 65 Hz on 10mV/A
< 1.5° from dc to 65 Hz on 100mV/A

Frequency Range: DC to 100kHz (-3dB with current derating)

Noise:
Range 10mV/A: 480µV
Range 100mV/A: 3mV

Slew Rate:
Range 10mV/A: 20mV/µs
Range 100mV/A: 0.3V/µs

Load Impedance: > 1MΩ/100pF

Insertion Impedance (50/60 Hz): 100mV/A: 3µs
10mV/A: 0.01Ω

Rise or Fall Time: Range 100mV/A: 3µs
Range 10mV/A: 4µs

** Reference Conditions: 23°C ± 5°C, 20 to 75% RH, DC to 1kHz, probe zeroed, 1 minute warmup, batteries at 9V ± 0.1V, external magnetic field < 40 A/m, no DC component, no external current carrying conductor, 1MΩ/100pF load, conductor centered in jaw.*

Working Voltage: 600Vrms max

Common Mode Voltage: 600Vrms max

Influence of Adjacent Conductor: < 0.2mA/A AC

Influence of Conductor Position in Jaw: 0.5% of reading at kHz

Battery: 9V alkaline (NEDA 1604A, IEC 6LR61)

Low Battery: Green LED when ≥ 6.5V

Overload Indication:
Red LED indicates input greater than the selected range

Typical Consumption: 8.6mA

Battery Life: 55 hours typical

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: 0° to 50°C (32° to 122°F)

Storage Temperature: -30° to 80°C (-22° to 176°F)

Temperature Influence: < 0.2% per °C

Operating Relative Humidity:
10° to 30° C: 85 ± 5% RH (without condensation)
40° to 50° C: 45 ± 5% RH (without condensation)

Altitude: Operating: 0 to 2000m
Non operating: 0 to 12000m

MECHANICAL SPECIFICATIONS

Zero Adjustment: 20 turn potentiometer

Maximum Cable Diameter: 0.46" (11.8 mm)

Case Protection: IP20 per IEC 529

Drop Test:
1.0m on 38mm of oak on concrete; test according to IEC 1010

Mechanical Shock: 100G; test per IEC 68-2-27

Vibration:
Test per IEC 68-2-6, frequency range 10 Hz to 55 Hz,
amplitude 0.15mm

Handle: Lexan® 920A, UL 94 V2

Dimensions: 9.09 x 1.42 x 2.64" (231 x 36 x 67mm)

Weight: 11.6 oz (330 g) with battery

Color: Light gray

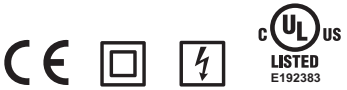
Output Lead: Insulated coaxial cable with insulated BNC connector

Cable Length: 6.5 foot (2m)

SAFETY SPECIFICATIONS

Double insulation or reinforced insulation between primary or secondary and outer case of the handle, per IEC 1010-2-032.

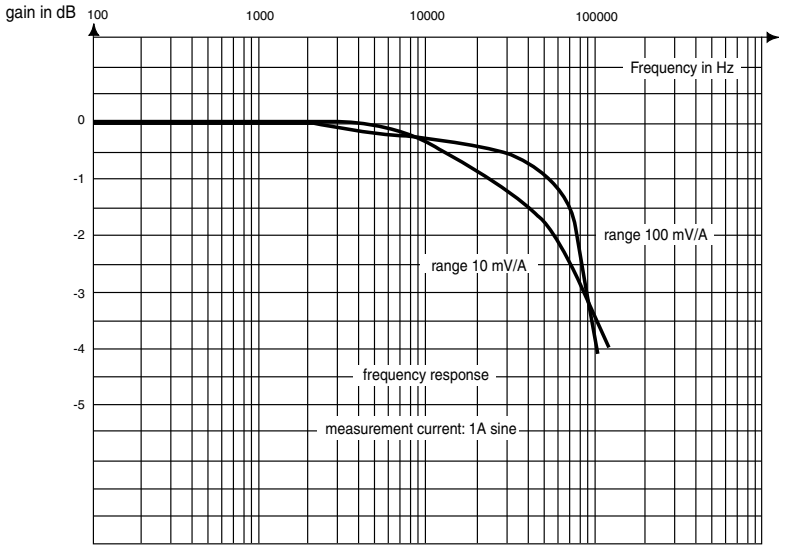
600V, Cat. III, Pollution Degree 2



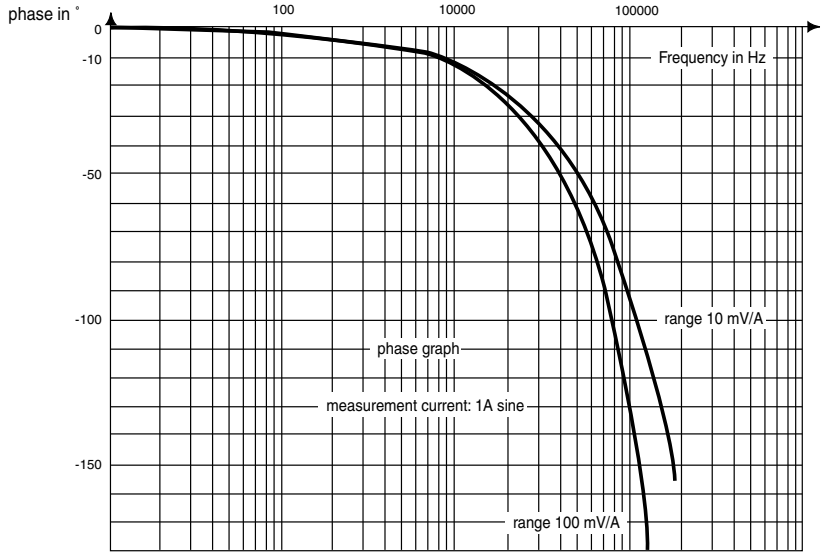
Electromagnetic Compatibility:

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

Typical Response Curves

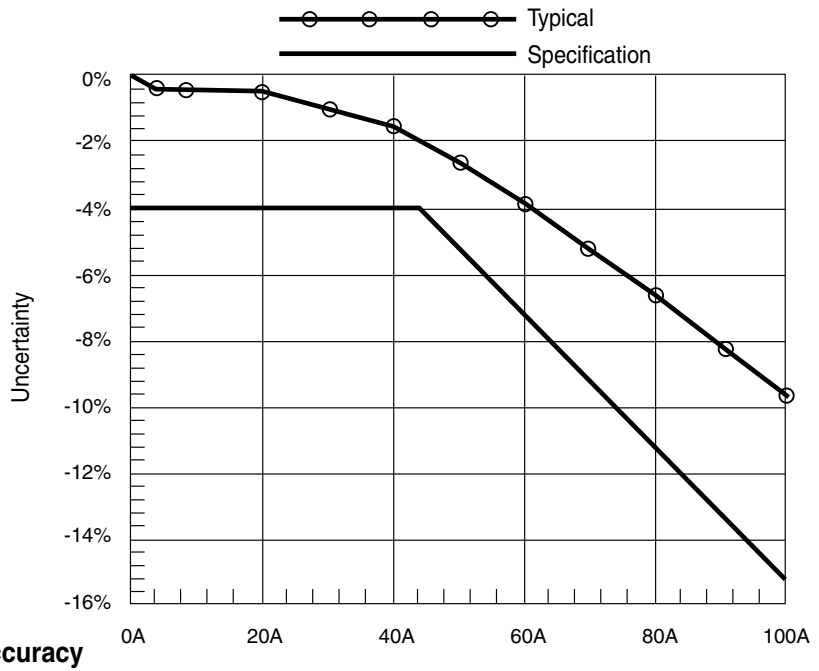


Frequency



Phase Shift

Linearity for a DC Signal Range 10mV/A



Accuracy

Operation

Zero Adjustment

The probe has a zero adjustment that should be adjusted before measurement. Alternatively, you may “zero” with the oscilloscope instead.

Current Measurement

Connect the current probe to the proper input channel on the oscilloscope. Begin with the least sensitive range on the current probe (10mV/A). Select the 0.5V/Division range on your oscilloscope. Clamp the probe on the conductor to be measured and read the current flowing directly on your oscilloscope.

You may also use your oscilloscope to amplify the signal while using the 100mV/A probe range (which offers the best accuracy and least phase shift).

Important: It is possible to change the range on the current probe without removing the probe from the current carrying conductor, but it is important to remember not to exceed the permissible peak ratings of 1000mV peak or 2000mV peak to peak maximum. The peak ratings by range are: 10A peak on the 100mV/A range, 100A peak on the 10mV/A range.

Battery Indication (Green LED)

The probe has a battery condition LED. To ensure proper readings with your current probe, be sure that the green LED is lit during measurement. If not, replace the 9V battery.

Peak Overload (OL) Indication (Red LED)

The SL261 offers an overload indicator. If the red LED illuminates during measurement, this indicates that the peak value exceeds the instrument response level and that the output is distorted. Switch the probe to a higher range if possible.

Maintenance

⚠ Warning

- For maintenance use only specified replacement parts.
- Avoid electrical shock: do not attempt to perform any servicing unless you are qualified to do so.
- Avoid electrical shock and/or damage to the instrument: do not get water or other foreign agents into the electronic module.
- Also see warning on page 3.

Battery Replacement

When the probe is turned on, the green battery indication LED should light up. If not, replace the 9V battery (see figure 1). To replace the battery, disconnect the probe from the circuit and the oscilloscope. Turn the probe “OFF”. Unscrew the battery compartment screw and pull out the battery compartment cover. Replace the battery and put the cover back on. Do not replace the battery while probe is in use.

Repair and Calibration

To ensure that your instrument meets factory specifications, we recommend that it be submitted 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#). 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

Tel: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
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 operation or application of your instrument, please call, mail, fax or e-mail our technical support hotline:

Chauvin Arnoux®, Inc.
d.b.a. AEMC® Instruments
200 Foxborough Boulevard
Foxborough, MA 02035, USA

Phone: (800) 343-1391
(508) 698-2115
Fax: (508) 698-2118
techsupport@aemc.com
www.aemc.com

NOTE: Do not ship Instruments to our Foxborough, MA address.

Chauvin Arnoux®, Inc. d.b.a AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA
www.aemc.com

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