User Manual
ENGLISH

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

AC/DC Current Oscilloscope Probe Model SL261

CURRENT PROBES

Measure Up
WITH AEMC® INSTRUMENTS

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA
Phone: (603) 749-6434 or (800) 343-1391 • Fax: (603) 742-2346

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 the instrument's 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/calibration.

Serial #: _____

Catalog #: **1201.51**

Model #: **SL261**

Please fill in the appropriate date as indicated:

Date Received: _____

Date Calibration Due: _____

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d.b.a AEMC® Instruments
www.aemc.com

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1. INTRODUCTION

Thank you for purchasing an AEMC® Instruments **AC/DC Currrent Oscilloscope Probe Model SL261**.

For the best results from your instrument and for your safety, you must read the enclosed operating instructions carefully and comply with the precautions for use. Only qualified and trained operators should use this product.

1.1 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.
	Indicates a risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.
	Application or withdrawal authorized on conductors carrying dangerous voltages. Type A current sensor as per IEC 61010-2-032.
	This symbol signifies a voltage limiting circuit.
	Indicates Important information to acknowledge
	This product complies with the Low Voltage & Electromagnetic Compatibility European directives.
	In the European Union, this product is subject to a separate collection system for recycling electrical and electronic components in accordance with directive WEEE 2012/19/EU.

1.2 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.

1.3 PRECAUTIONS FOR USE ⚠

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.

1.4 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. Save the damaged packing container to substantiate your claim.

1.5 ORDERING INFORMATION

AC/DC Current Probe Model SL261
(10 A-100 mV/A, 100 A-10 mV/A, BNC)..... Cat. #1201.51
Includes a user manual.

1.5.1 Accessories and Replacement Parts

Adapter - BNC Adapter for use with AC/DC Current Probe
Model SL261 & Meters 8220, 8333, 8335 & 8336 ..... **Cat. #2140.40**

2. PRODUCT FEATURES

2.1 DESCRIPTION

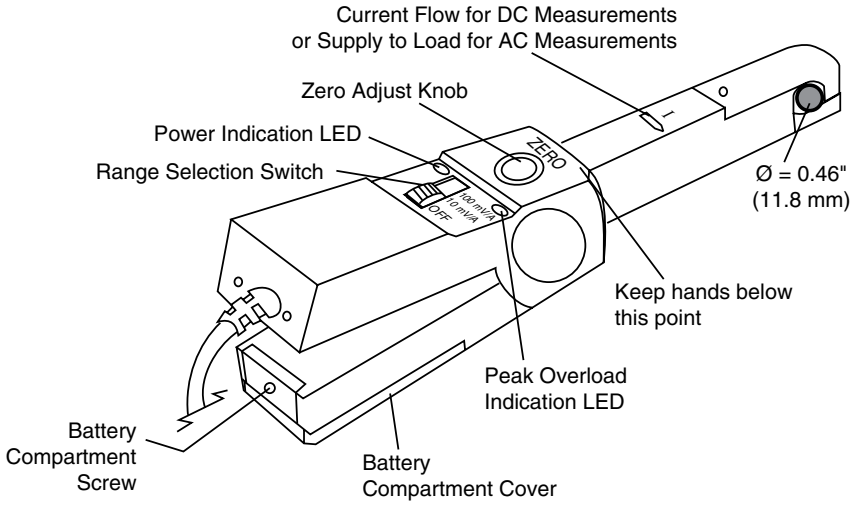
The SL261 AC/DC Current Oscilloscope Probe expands oscilloscope applications in industrial, automotive or power environments, and is ideal for analysis and measurement of distorted current waveforms and harmonics. The probe permits accurate display and measurement of currents from 100 mA to 100 ARMS, DC to 100 kHz 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.

2.2 COMPATIBILITY

The Model SL261 is compatible with any analog or digital oscilloscope or other voltage-measuring instrument which has the following features:

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

2.3 FEATURES



WARNING: Always keep hand on the handle part of the probe..

3. SPECIFICATIONS

3.1 ELECTRICAL SPECIFICATIONS

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

Current Range:

100 mV/A: 100 mA to 10 A peak

10 mV/A: 1 to 100 A peak

Output Signal: 1000 mV peak max

AC Current Accuracy:

After calibration and for one year

(zero probe before making measurement)

Range	Accuracy	Phase Shift
100 mV/A (50 mA to 10 $A_{DC/AC}$ peak)	± 3 % of reading ± 50 mA	< 1.5 ° from DC to 65 Hz
10 mV/A (500 mA to 40 $A_{DC/AC}$ peak)	± 4 % of reading ± 50 mA	< 1 ° from DC to 65 Hz
10 mV/A (40 A to 80 $A_{DC/AC}$ peak)	12 % of reading ± 50 mA	
10 mV/A (80 A to 100 $A_{DC/AC}$ peak)	15 % of reading	

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

Noise:

Range 10 mV/A: 480 µV

Range 100 mV/A: 3 mV

Slew Rate:

Range 10 mV/A: 20 mV/µs

Range 100 mV/A: 0.3 V/µs

Load Impedance: > 1 MΩ/100 pF

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

10 mV/A: 0.01 Ω

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

Working Voltage: 600 V_{RMS} max

Common Mode Voltage: 600 V_{RMS} max

Influence of Adjacent Conductor: < 0.2 mA/A_{AC}

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

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

Low Battery: Green LED when ≥ 6.5 V

Overload Indication:

Red LED indicates input greater than the selected range

Typical Consumption: 8.6 mA

Battery Life: 55 h typical

3.2 MECHANICAL SPECIFICATIONS

Zero Adjustment: 20 turn potentiometer

Maximum Cable Diameter: 0.46 in (11.8 mm)

Case Protection: IP20 per IEC 529

Drop Test:

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

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

Vibration:

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

Handle: Lexan® 920A, UL 94 V2

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

Weight: 11.6 oz (330 g) with battery

Color: Light gray

Output Lead: Insulated coaxial cable with insulated BNC connector

Cable Length: 6.5 ft (2 m)

3.3 ENVIRONMENTAL SPECIFICATIONS

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

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

Operating Relative Humidity:

(10 to 30) °C: 85 ± 5 % RH (without condensation)

(40 to 50) °C: 45 ± 5 % RH (without condensation)

Influence of Temperature: < 0.2 % per °C

Altitude: Non-operating: (0 to 12,000) m

Operating: (0 to 2000) m

3.4 SAFETY SPECIFICATIONS

Electrical: Double insulation or reinforced insulation between the primary or secondary and the outer case of the handle per EN 61010-2-032.

600 V, CAT III, Pollution Degree: 2

Electromagnetic Compatibility:

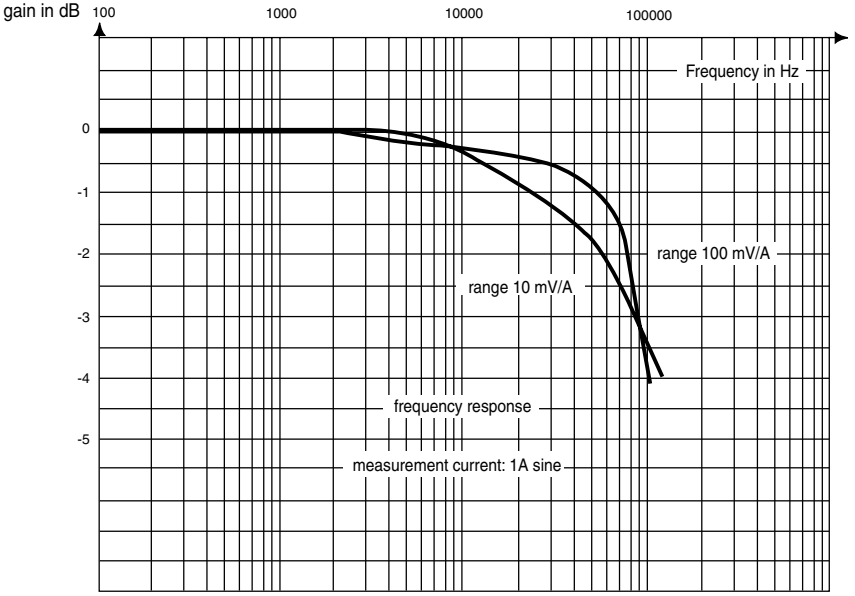
EN 50081-1 Class B

EN 50082-2 Electrostatic discharge IEC 1000-4-2

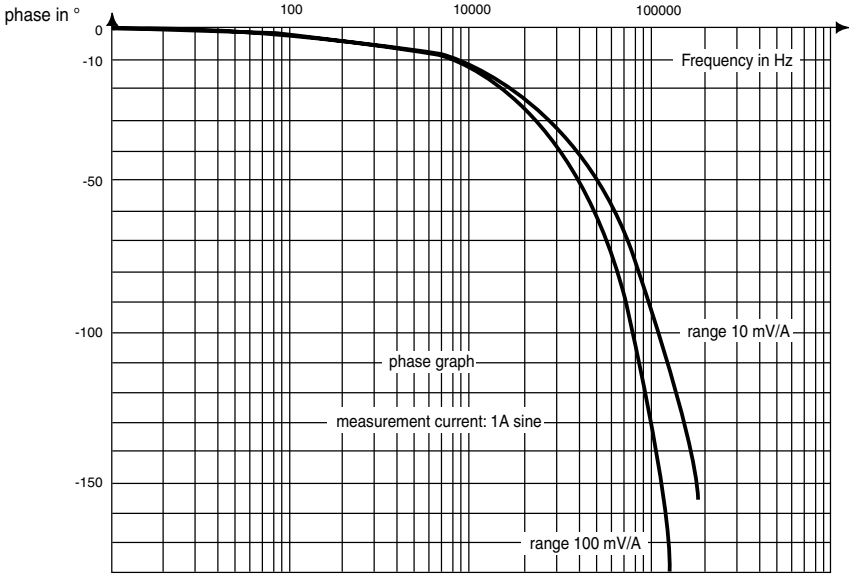
- Radiated Field IEC 1000-4-3
- Fast Transients IEC 1000-4-4
- Magnetic Field at 50/60 Hz IEC 1000-4-8

**Specifications are subject to change without notice*

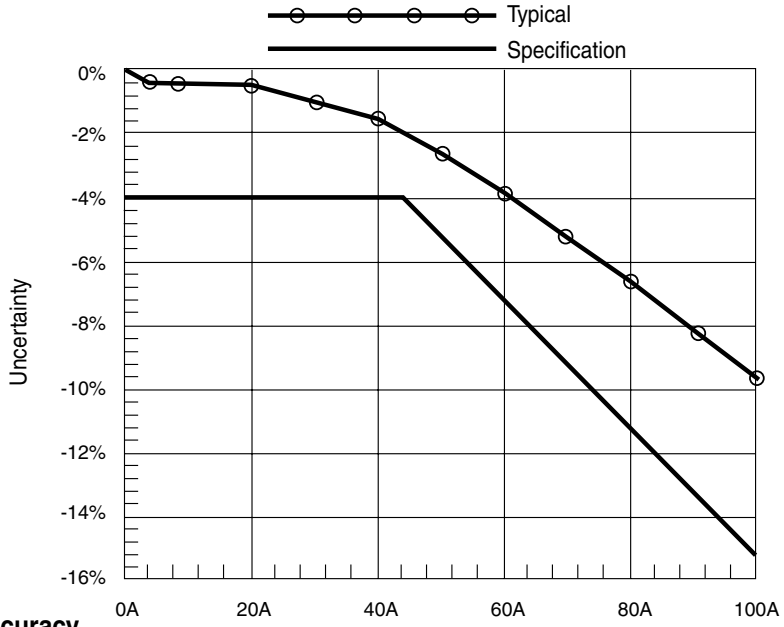
3.5 TYPICAL RESPONSE CURVES



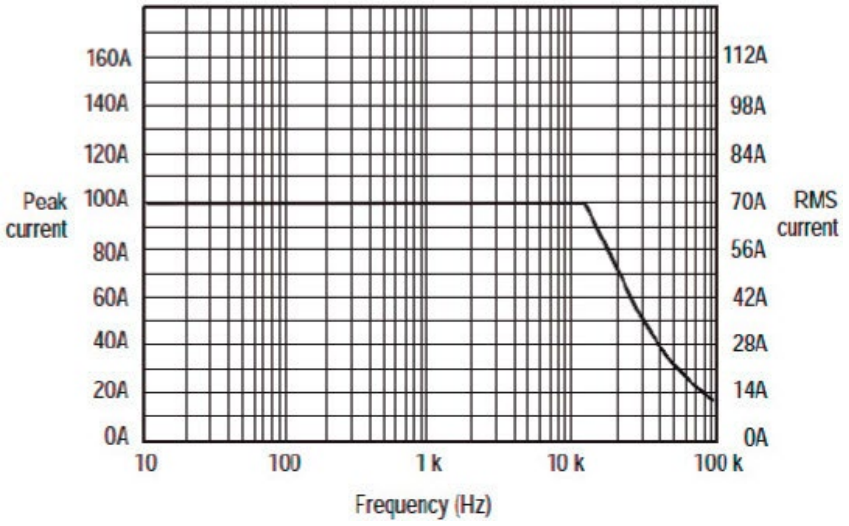
Frequency



Phase Shift


Typical
Specification
Uncertainty
0%
-2%
-4%
-6%
-8%
-10%
-12%
-14%
-16%
0A
20A
40A
60A
80A
100A

Accuracy


Peak current
160A
140A
120A
100A
80A
60A
40A
20A
0A
RMS current
112A
98A
84A
70A
56A
42A
28A
14A
0A
10
100
1 k
10 k
100 k
Frequency (Hz)

4. OPERATION

4.1 ZERO ADJUSTMENT

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

4.2 CURRENT MEASUREMENT

WARNING: Always connect the probe to the instrument before clamping onto the circuit under test.

Connect the Model SL261 to the proper input channel on the oscilloscope.

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

NOTE: Remember to unclamp the probe from the conductor before disconnecting it from your meter or instrument.

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

NOTE: 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 1000 mV peak or 2000 mV peak to peak maximum. The peak ratings by range are: 10 A peak on the 100 mV/A range, 100 A peak on the 10 mV/A range.

4.3 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 9 V battery.

4.4 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.

5. MAINTENANCE

⚠ WARNING

- 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.
- For maintenance use only specified 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 substances into the case.
- Disconnect the unit from all circuits and test cables before opening the case.

5.1 CLEANING

- To clean the probe body, use a soft cloth dampened in a solution of mild detergent and water. To clean the core, open the jaw and clean the exposed core surfaces with a cotton swab dampened with isopropyl alcohol (isopropanol) or ethyl alcohol (fotocol or ethanol). Lubricate the jaws mating surfaces with a light oil.
- Do not use chemicals containing benzine, benzene, toluene, xylene, acetone, or similar solvents.
- Do not immerse the probe in liquids or use abrasive cleaners.

5.2 REPLACING THE BATTERIES

⚠ **WARNING: Risk of electric shock. Disconnect all input(s) from the unit or remove the probe from any conductor before opening the battery cover to change the batteries.**

If the green battery indication LED does not light up when the probe is turned on, the batteries will need to be replaced.

Do not replace the battery while probe is in use.

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.

5.3 REPAIR AND CALIBRATION

To ensure that your instrument meets factory specifications, we recommend that the instrument be sent back 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#). Send an email to repair@aemc.com requesting a CSA#, you will be provided a CSA Form and other required paperwork along with the next steps to complete the request. Then return the instrument along with the signed CSA Form. 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).

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.

5.4 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:

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
Phone: (800) 343-1391 (Ext. 351)
Fax: (603) 742-2346
E-mail: techsupport@aemc.com
www.aemc.com

5.5 LIMITED WARRANTY

The instrument 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.

What AEMC® Instruments will do:

If a malfunction occurs within the warranty 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 repair or replace the faulty material at our discretion.

REGISTER ONLINE AT: www.aemc.com/warranty.html

5.5.1 Warranty Repairs

What you must do to return an Instrument for Warranty Repair:

First, send an email to repair@aemc.com requesting a Customer Service Authorization Number (CSA#) from our Service Department. You will be provided a CSA Form and other required paperwork along with the next steps to complete the request. 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
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346
E-mail: repair@aemc.com

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

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

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12/23

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