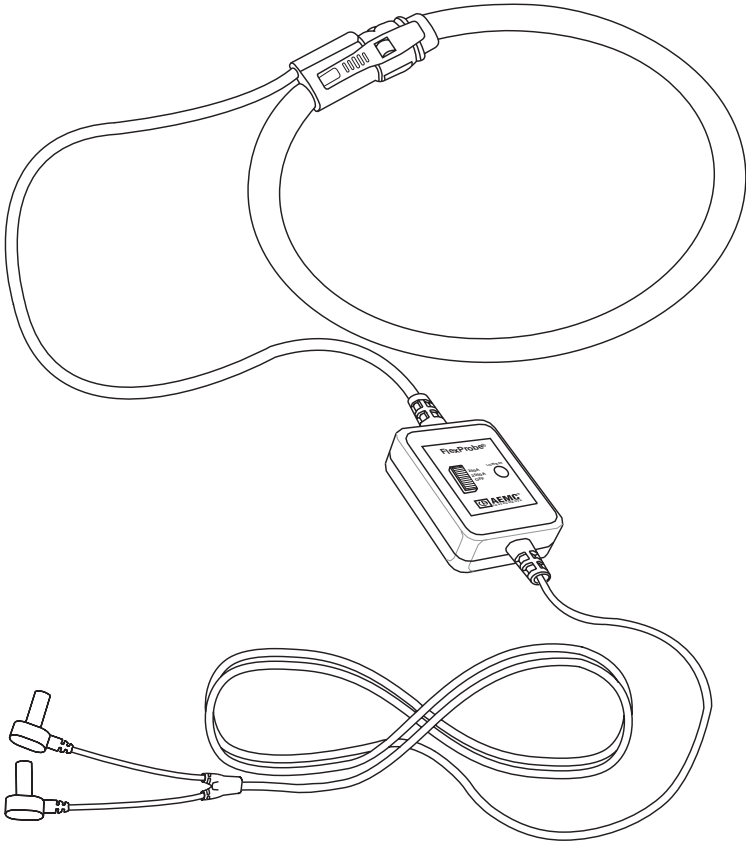


FlexProbe[®]

Flexible AC Current Probe

USER MANUAL



Limited Warranty

The Flexprobe[®] is warranted to the owner for a period of 2 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.

For full and detailed warranty coverage, please read the Warranty Coverage Card, which is attached to the Warranty Registration Card. Please keep the Warranty Coverage Card with your records.

What AEMC[®] Instruments Will Do:

If a malfunction occurs within the warranty period, you may return the instrument to us for repair or replacement free of charge, provided we have your REGISTRATION CARD on file. AEMC[®] Instruments will, at its option, repair or replace the faulty material.

If a registration card is not on file, we will require a dated proof of purchase, as well as your REGISTRATION CARD accompanied by the defective material.

REGISTER ONLINE AT:

www.aemc.com

Warranty Repairs

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

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.

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 **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.
- Wear protective clothing and gloves as required.
- 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. The FlexProbe® must be used only by qualified personnel using applicable safety precautions.
- ALWAYS de-energize the circuit before wrapping the FlexProbe® around bare conductors, bus bars, or near live parts. Do not wrap on live conductors.
- ALWAYS connect the electronic module to the display device before wrapping the FlexProbe® around the sample being tested.
- ALWAYS inspect the module, sensor, sensor cable, and output terminals prior to use. Replace any defective parts immediately. Use only factory parts.
- NEVER use the FlexProbe® on electrical conductors rated above 1000V in overvoltage category III.

International Electrical Symbols



This symbol signifies that the probes are 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.

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

Your FlexProbe® consists of the following items:

- Flexible probe with in-line electronic module
- User manual
- Two 3V lithium batteries (CR2032)
- Product Warranty Registration Card with attached Warranty Card

Description

The FlexProbe® is a flexible AC current transformer composed of a flexible sensor and an electronic module. The flexible sensor permits measurements on conductors where standard clamp-on probes could not be used. In particular, it can be installed in tight spaces, around breaker panels, around cable bundles, around wide or large bus bars, or even wrapped around irregular shapes. The Shape Memory™ feature enables the user to “pre-shape” the sensor, somewhat, before inserting it between or around conductors. This feature facilitates closing, enhances user safety, and alleviates the drooping effect typically associated with flexible sensors.

The FlexProbe® is lightweight. It does not use magnetic cores like standard transformers. The transformation principle is based on an air core. It presents virtually no load to the system under test, has a low phase shift and excellent frequency response, and cannot be damaged by overloads. The sensor assembly is waterproof and insulated for 1000V, Cat. III.

The FlexProbe® has a mV output proportional to the current measured for direct readings on DMMS, data loggers and oscilloscopes. TRMS measurements are taken when connected to a TRMS meter. The FlexProbe® is insensitive to DC currents and only the AC component of the measured signal is measured.

FlexProbe®

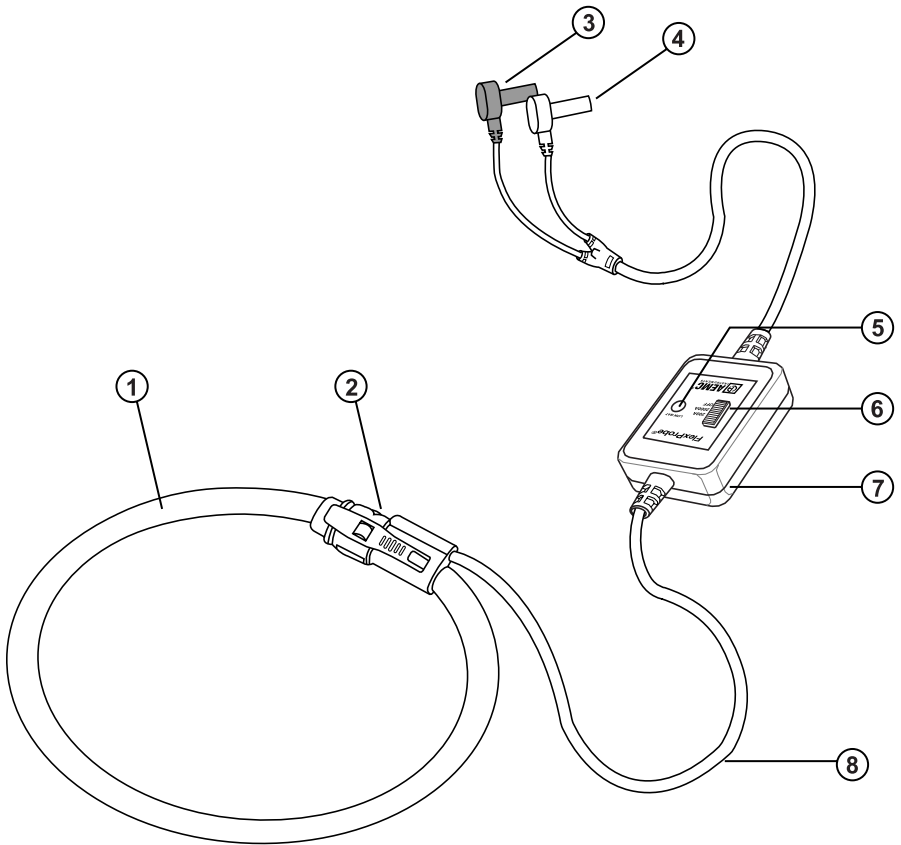


Figure 1

- | | |
|-------------------------------------|--------------------------------|
| 1. Flexible Sensor (Ø 0.5", 12.5mm) | 5. Low Bat Indicator (red LED) |
| 2. FlexProbe® Connector/Latch | 6. Range Selection Switch |
| 3. Common: Black Banana Plug (-) | 7. Electronic Module |
| 4. Positive: Red Banana Plug (+) | 8. Lead (6.5 ft, 2m) |

Features

- Two ranges to measure from: 200Arms and 2000Arms
- TRMS measurements when connected to a TRMS instrument
- No core saturation or damage if overloaded
- 1000V, IEC 1010, Cat III (sensor); 600V, IEC 1010, CAT III (module)
- Waterproof sensor
- (2x) 3V lithium battery for typical 720 hr. continuous operation
- Shape Memory™ for pre-shaping of sensor before use (no drooping)
- Insensitive to DC, measures only AC component on DC + AC signals
- Excellent linearity
- Lightweight

Ordering Information

FlexProbe® Model 24-2000 **Cat. #2115.56**

Includes a flexible probe with in-line electronic module, user manual, two 3V lithium batteries (CR2032), and a product warranty and registration card.

Accessories

Banana (Female) / BNC (Male) Adapter **Cat. #2118.46**

For connection of FlexProbe® to BNC terminals on scopes and other displaying instruments.

Specifications

ELECTRICAL

Accuracy: 10mV/A: 5 - 180A; \pm (1% of Reading + 500mA)
180 - 200A; \pm (2% of Reading)
1mV/A: 10 - 1800A; \pm (1% of Reading + 500mA)
1800 - 2000A; \pm (2% of Reading)

Frequency Range: 30 - 5,000Hz with current derating

Signal Output: 2Vrms max (with fully charged batteries)

Working Voltage: 1000V, IEC 1010, Cat. III

Common Mode Voltage: 600V

Frequency Influence: See Accuracy vs. Frequency curves on page 11

Frequency Limitation:

See current derating curves (note no limitation on 200A Range) pg. 12

Influence of Adjacent Conductor: 0.2% typical, 2% max

Influence of Conductor Position in Sensor: 0.5% typical, 4% max

Influence of Shape of Sensor: Oblong shape: 0.2% typical, 1% max

Common Mode Rejection: 100 dB typical, 80 dB min

Residual Current at 0: \pm 200mA

ENVIRONMENTAL SPECIFICATIONS

Case Protection:

Sensor: IP65 per IEC 529

Electronic module: IP40 per IEC 529

Operating Temperature Range: 10°C to +55°C (14°F to 131°F)

Storage Temperature Range: -40°C to +70°C (-40°F to 158°F)

Influence of Temperature:

Sensor: -10°C to 90°C: 0.15% per 10°C typical, 0.5% per 10°C max

Module: -10°C to 55°C: 0.15% per 10°C typical, 0.5% per 10°C max

Influence of Relative Humidity:

10 to 90% RH: 0.2% typical, 0.5% max

Operating Relative Humidity:

10 - 30°C 85 \pm 5% RH (without condensation)

40 - 50°C 45 \pm 5% RH (without condensation)

MECHANICAL SPECIFICATIONS

Module Output:

Two 4mm safety banana jacks

Battery: Two 3V lithium batteries (CR2032)

Battery Life: From 3.2V to 2.8V, 720 hrs typical (continuous use)

Low Battery: Red LED blinks when battery voltage is low

Dimensions (sensor): 24" nominal ($\pm 1"$)

Dimensions (Electronic Module): 1.95 x 2.7 x 0.8" (50 x 69 x 20mm)

Connection Cable Length: Module to Sensor: 6.5 ft
Module to Banana: 5 ft

Colors: Red sensor with dark gray connector, black module and connection cable (sensor to module)

Drop Test: Per IEC 68-2-32

Weatherproofing: Module: IP40 (EN 60529) - NEMA 2
Sensor: IP 65 (EN60529) - NEMA 4X

MATERIAL SPECIFICATIONS

Module: UL 94V0, Color black, ABS plastic

Sensor Latch: Material: Lexan 500R, UL94V0

Cable Assembly to Sensor: UL 94V0, 1000V rating

SAFETY SPECIFICATIONS

Electrical:

Double insulation or reinforced insulation between primary or secondary and outer case per IEC 1010-2-32

- 1000V, Category III, Pollution Degree 2
- 600V Common Mode
- 7.50kV, 50/60Hz, dielectric between sensor and the output

*Reference Conditions: 25°C \pm 5°K, 20 to 75% RH, 1 minute warm-up, battery at 3V \pm 0.2V, conductor center, external DC magnetic field < 40 A/m, no external AC magnetic field, no external electrical field, 10 to 100 Hz, sine wave. See accuracy curves for low currents.

Instrument Compatibility

The FlexProbe® is compatible with any multimeter, AC voltmeter, or other voltage measuring instrument with an input impedance greater than $1M\Omega$. To achieve the best overall accuracy, use the FlexProbe® with an AC voltmeter having an accuracy of 0.75% or better.

Operation

Please make sure that you have already read and fully understand the WARNING section on page 2.

Making Measurements with the FlexProbe®:

- Connect the electronic module to the AC Volt range of your DMM or measuring instrument. Select the appropriate module output voltage range. If the current magnitude is unknown, select the lowest mV/A output setting.
- Wrap the flexible core around the conductor to be tested. If possible, select the higher mV/A output range to obtain the best resolution. Do not exceed specified current range for the output.
- Read the displayed value on the DMM and divide it by the range selected (e.g. if reading = 1.5V with the 10mV/A output range, the current flowing through the probe is $1500\text{mV} \div 10 = 150\text{A}$).
- True RMS measurements are obtained when the FlexProbe® is connected to a True RMS meter. Note that the DC component is not measured.

Tips for Making Precise Measurements:

- When using the FlexProbe® with a meter, it is important to select the range that provides the best resolution. Failure to do this may result in measurement errors.
- For best results, select the highest FlexProbe® output signal possible and the most sensitive meter range for this output.
- When a measurement approaching 200A is desired, select the 1mV/A range to avoid an overload condition.
- Make sure the DMM or measuring instrument can accurately measure mV AC. Certain inexpensive DMM have poor resolution and accuracy when measuring low mV AC.

- For best accuracy, carefully center the conductor inside the flexible core, and avoid if possible, the proximity of other conductors which may create noise and interference, particularly near the latch. (Fig. 2).
- The overall measurement accuracy is the sum of the FlexProbe® accuracy and the displaying instrument accuracy.

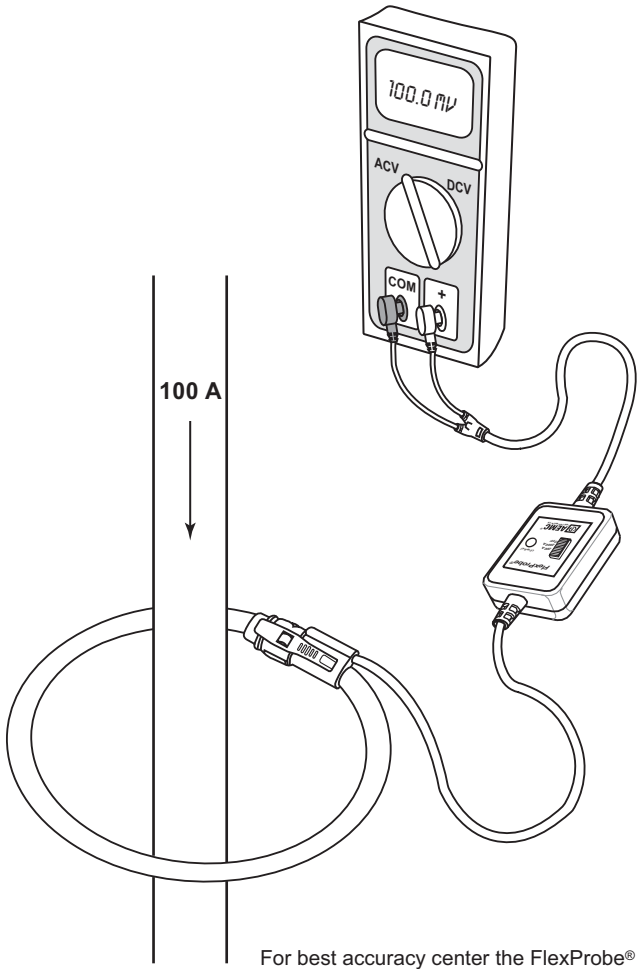
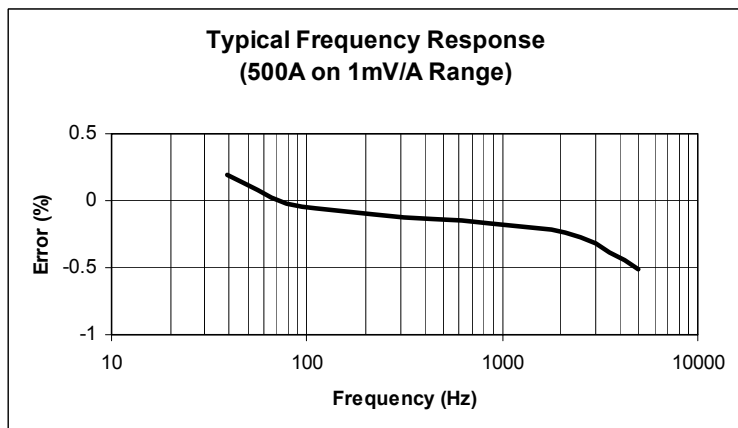
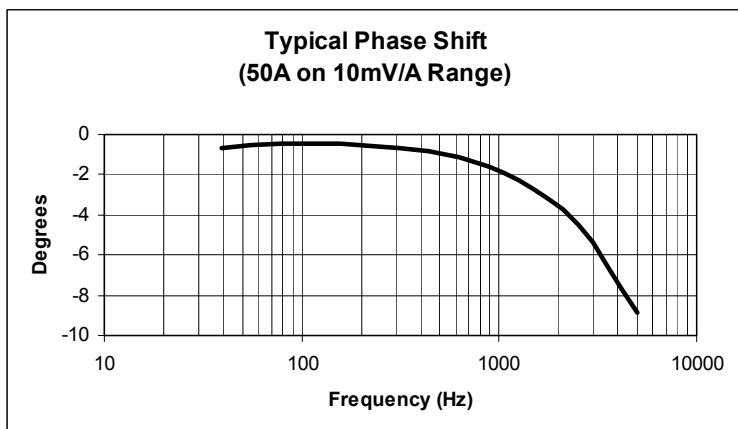
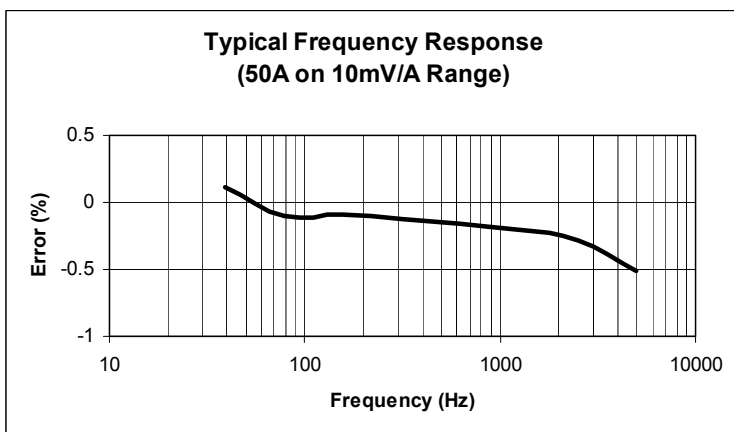
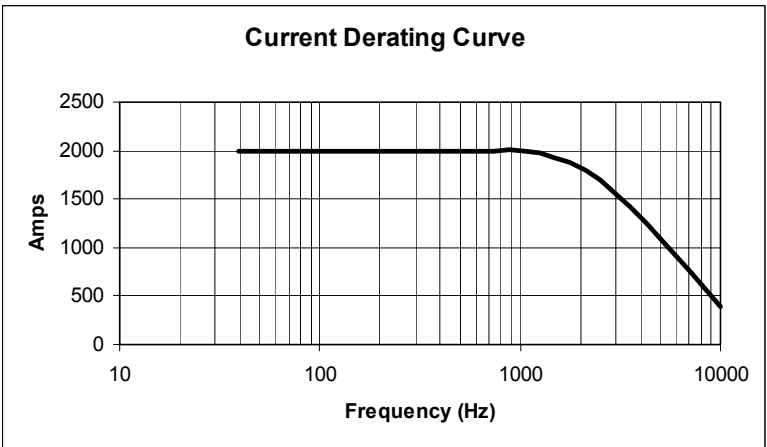
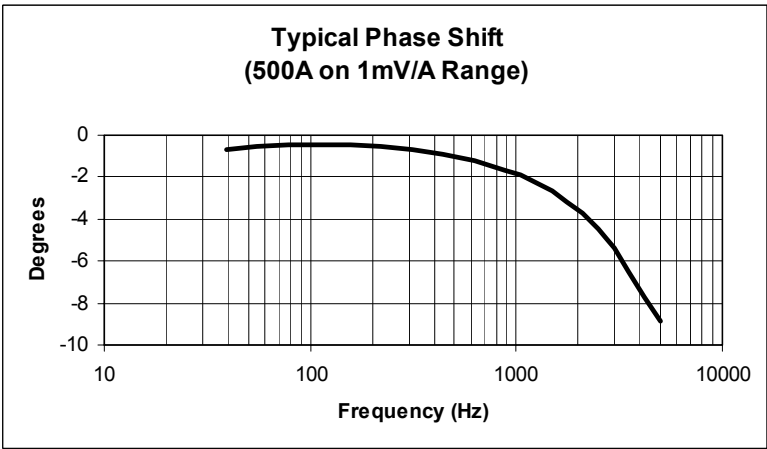


Figure 2

Typical Response Curves:

Typical Response Curves (cont.):



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.
- Do not perform any service while the Flexprobe® is on any circuit.
- 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 2.

Cleaning

- It is important to keep the probe sensor latch mating surfaces clean and prevent foreign bodies from hampering the closing. The sensor may be gently cleaned with a soft cloth, soap and water. Dry immediately after cleaning. Avoid water penetration into the electronic module.
- Make sure the sensor, electronic module, and all leads are dry before any further use.

Battery Replacement

- If the low bat. indicator (red LED) blinks, replace the battery.
- If no signal can be measured and the low bat. indicator is not visible, check the batteries for extremely low levels.
- Remove the FlexProbe® from any circuit before replacing the battery.
- To replace the battery, open rear case, replace battery and reassemble. The red LED should not blink when the module is turned on.

Positive of battery
must be facing up.

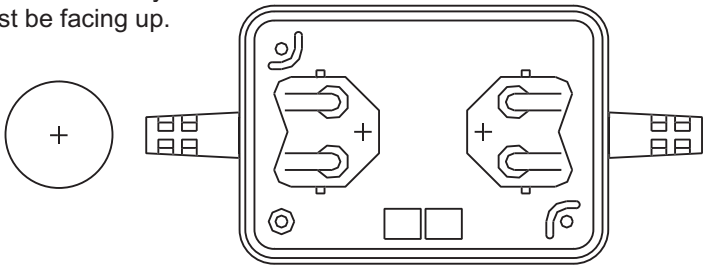


Figure 3

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

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