

AEMC INSTRUMENTS F01 Clamp Multimeter User Manual

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AEMC INSTRUMENTS F01 Clamp Multimeter

Product Information

- Product Name: Clamp Multimeter
- Model Number: F01
- Manufacturer: AEMC
- Serial Number: [Serial Number]
- Catalog Number: 2129.51
- Website: www.aemc.com

Statement of Compliance

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.

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Introduction

This manual provides instructions for using the Clamp Multimeter Model F01.

Warning: Please adhere to the international electrical symbols and safety precautions mentioned in this manual.

Definition of Measurement Categories

The Clamp Multimeter Model F01 is designed for measurements in the following 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.

Product Usage Instructions

4. Operation

4.1 Voltage Measurement – ()

Follow the instructions provided in the manual to accurately measure voltage using the Clamp Multimeter.

4.2 Audio Continuity Test and Resistance Measurement

Refer to the manual for step-by-step instructions on performing audio continuity tests and measuring resistance with the Clamp Multimeter.

4.5 Current Measurements – ()

Learn how to measure current using the Clamp Multimeter by following the instructions provided in the manual.

5. Maintenance

5.1 Changing the Battery

Refer to the manual for detailed instructions on how to change the battery of the Clamp Multimeter.

5.2 Cleaning

Follow the provided guidelines in the manual to properly clean the Clamp Multimeter.

5.3 Storage

Learn how to store the Clamp Multimeter correctly by referring to the instructions in the manual.

INTRODUCTION

Warning

- Never use on circuits with a voltage higher than 600V and an overvoltage category higher than Cat. III.
- Use in inside environments with Pollution Degree 2; Temperature 0°C to +50°C; 70% RH.
- Only use accessories compliant with safety standards (NF EN 61010-2-031) 600V min and overvoltage Cat. III.
- Never open the clamp before disconnecting all power sources.
- Never connect to the circuit to be measured if the clamp is not properly closed.
- Before any measurement, check the proper positioning of the cables and switch.
- When measuring current, check for proper alignment of the conductor in relation to the markers and proper closing of the jaws.
- Always disconnect the clamp from any power source before changing the battery.
- Do not perform resistance tests, continuity tests or semi-conductor tests on a circuit under power.

International Electrical Symbols

	This symbol signifies that the instrument is protected by double or reinforced insulation.
	This symbol on the instrument indicates a WARNING and that the operator must refer to the user manual for instructions before operating the instrument. In this manual, the symbol preceding instructions indicates that if the instructions are not followed, bodily injury, installation/sample and product damage may result.
	Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.
	This symbol refers to a type A current sensor. This symbol signifies that application around and removal from HAZARDOUS LIVE conductors is permitted.
	In conformity with WEEE 2002/96/EC

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. Save the damaged packing container to substantiate your claim.

Ordering Information

Clamp-on Multimeter Model F01Cat. #2129.51

Includes multimeter, set of red and black leads with probe tips, 9V battery, carrying pouch and this user manual.

Accessories and Replacement Parts

Replacement set of leads, red and black with probe tips Cat. #2118.92

General Canvas Pouch (4.25 x 8.5 x 2")..... Cat. #2119.75

Only use accessories adapted to the voltage and overvoltage category of the circuit to be measured (per NF EN 61010).

PRODUCT FEATURES

Description

The Clamp-on Multimeter, Model F01 emphasizes reliability and simplicity of use to respond to the needs of power professionals.

Features:

- A compact unit, integrating the current sensor for intensity measurements without breaking the test circuit
- Outstanding ergonomic features:
 - automatic selection of AC or DC measurement – V only
 - automatic selection of measurement ranges
 - programmable audio voltage indication (V-Live)
 - “over-range” indication
 - power auto-off
- Compliance with IEC electrical safety standards and CE markings
- Light and rugged construction for field use

Model F01 Control Functions

1. Jaws
2. Command Buttons
3. 4-way Rotary Switch
4. Liquid Crystal Display

Rotary Switch Functions

- OFF Deactivation of the clamp, activation is ensured by selection of other functions
- DC and AC voltage measurement (rms value)
- Continuity and resistance measurement
- AC ampere measurement (rms value)

Hold Button Primary Functions

Short Press: Freezes the display. The display is cleared when the button is pressed again.

Button Held Down: Enables access to secondary functions in conjunction with the rotary switch.

Hold Button Secondary Functions (with rotary switch)

- **Disable Auto-Off Function**

While pressing down the HOLD button, bring the rotary switch from the OFF position to the position.

The unit emits a double beep, then the symbol flashes.

The selected configuration is put into memory when the button is released (the symbol remains lit continuously).

Auto-off is reactivated when switch returns to OFF position.

- **Activate The V-Live Function**

(Beeper ON when voltage >45V peak)

While pressing down the HOLD button, bring the rotary switch from the OFF position to the V position. The unit emits a double beep, then the V and symbol flashes. The selected configuration is put into memory when the button is released (the V symbol becomes fixed and the symbol flashes).

Proceed in the same way to suppress the V-Live function (the symbol disappears when the button is released).

- **Displaying The Internal Software Version**

While pressing down the HOLD button, bring the rotary switch from the OFF position to the A position. The unit beeps, the software version is displayed in the form UX.XX for 2 seconds, then all the segments of the display are shown.

- **Liquid Crystal Display**

The liquid crystal display includes the digital display of the measured values, the related units and symbols.

- **Digital Display**

4 digits, 9999 counts, 3 decimal points, + and – signs (DC measurement)

- + OL : Positive value range exceedance (>3999cts)
- – OL : Negative value range exceedance
- OL : Unsigned value range exceedance
- – – – – : Indeterminate value (middle segments)

- **Symbol Display**

- HOLD Function active
- Constant operation (no power auto-off)
- Flashing: V-Live function selected
- Fixed: Continuity measurement
- AC Measurement in AC mode
- DC Measurement in DC mode
- Flashing: power limited to approximately 1 hour
- Fixed: battery drained, operation and accuracy are no longer guaranteed

• Buzzer

Different sounds are emitted according to the function performed:

- Short and medium sound: valid button
- Short and medium sound every 400 ms: voltage measured is higher than the unit's guaranteed safety voltage
- 5 short and medium recurring sounds: automatic deactivation of the instrument
- Continuous medium sound: continuity value measured below 40Ω
- Modulated medium continuous sound: value measured in volts, higher than 45V peak when the V-Live function is selected

SPECIFICATIONS

Reference Conditions

23°C $\pm 3^\circ\text{K}$; RH of 45 to 75%; battery power at 8.5V $\pm 5\text{V}$; frequency range 45 to 65Hz; position of conductor centered in clamp jaws; conductor diameter .2" (5mm); no electrical field; no external AC magnetic field.

Electrical Specifications

Voltage (V)

Range	40V	400V	600V*
Measuring Range**	0.2V to 39.99V	40.0V to 399.9V	400 to 600V
Accuracy	1% of Reading + 5cts	1% of Reading + 2cts	1% of Reading + 2cts
Resolution	10mV	0.1V	1V
Input Impedance	1MW		
Overload Protection	600VAC/DC		

*In DC, the display indicates +OL above +600V and -OL above -600 V.

In AC, the display indicates OL over 600Vrms.

**In AC if the value of the voltage measured is <0.15V the display indicates 0.00.

Audio Continuity () / Resistance Measurement (Ω)

Range	400W
Measuring Range	0.0 to 399.9W
Accuracy*	1% of Reading + 2cts
Resolution	0.1W
Open Circuit Voltage	£3.2V
Measuring Current	320µA
Overload Protection	500VAC or 750VDC or peak

*with compensation for measurement lead resistance

Current (A)

Display Range	40A	400A	600A*
Measuring Range**	0.20 to 39.99A	40.0 to 399.9A	400 to 600A peak
Accuracy	1.5% of Reading + 10cts	1.5% of Reading + 2cts	
Resolution	10mA	100mA	1A

*The display indicates OL over 400Arms.

**In AC, if the value of the current measured is <0.15A, the display shows 0.00.

- Battery: 9V alkaline battery (type IEC 6LF22, 6LR61 or NEDA 1604)
- Battery Life: 100 hrs approx
- Auto-off: After 10 minutes of no activity

Mechanical Specifications

Temperature:

1. Reference Range
2. Operating Range
3. Storage Range (without battery)

- Operating Temperature: 32 to 122°F (0 to 50°C); 90% RH
- Storage Temperature: -40 to 158°F (-40 to 70°C); 90% RH
- Altitude:
Operation: ≤2000m
Storage: ≤12,000m
- Dimensions: 2.76 x 7.6 x 1.46" (70 x 193 x 37mm)
- Weight: 9.17 oz (260g)
- Clamp Tightening Capacity: ≤1.00" (≤26mm)

Safety Specifications

• Electrical Safety

(as per EN 61010-1 ed. 95 and 61010-2-032, ed. 93)

- Double Insulation
- Category III
- Pollution Degree 2
- Rated Voltage 600V (RMS or DC)

• Electric Shocks (test as per IEC 1000-4-5)

- 6kV in RCD mode on the voltmeter function, aptitude criterion B
- 2kV induced on the current measurement cable, aptitude criterion B

• Electromagnetic Compatibility (as per EN 61326-1 ed. 97 + A1)

- Emission: class B
- Immunity:
- Electrostatic discharges:
 - 4kV on contact, aptitude criterion B
 - 8kV in the air, aptitude criterion B
- Radiated field: 10V/m, aptitude criterion B
- Fast Transients: 1kV, aptitude criterion B
- Conduit interference: 3V, aptitude criterion A

- **Mechanical Resistance**

- Free fall 1m (test as per IEC 68-2-32)
- Impact: 0.5 J (test as per IEC 68-2-27)
- Vibration: 0.75mm (test as per IEC 68-2-6)

- **Auto-extinction (per UL94)**

- Housing V0
- Jaws V0
- Display window V2

Variations in Operating Range

Influence Quantities	Meas. Range Quantities	Quantity Influenced	Influence Typical	Max
Battery Voltage	7.5 to 10V	All	–	0.2% R + 1ct
Temperature	32 to 122°F	V A W	0.05% R/50°F 0.1% R/50°F 0.1% R/50°F	0.2% R/50°F + 2cts 0.2% R/50°F + 2cts 0.2% R/50°F + 2cts
Relative Humidity	10 to 90% RH	V A W	≤1ct 0.2% R ≤1ct	0.1% R + 1ct 0.3% R + 2cts 0.3% R + 2cts
Frequency	40Hz to 1kHz 1kHz to 5kHz 40Hz to 400 Hz 400Hz to 5kHz	V A	see curve see curve	1% R + 1ct 6% R + 1ct 1% R + 1ct 5% R + 1ct
Position of conductor in the jaws (f ≤ 400Hz)	Position on internal perimeter of jaws	A	1% R	1.5% R + 1ct

Adjacent conductor with AC current (50 Hz) running through	Conductor in contact with external perimeter of jaws	A	40 dB	35 dB
Conductor clamped	0 to 400VDC or rms	V	<1ct	1ct
Application of voltage to the clamp	0 to 600VDC or rms	A	<1ct	1ct
Peak factor	1.4 to 3.5 limited to 600A peak 900V peak	A V	1% R 1% R	3% R + 1ct 3% R + 1ct
Rejection of series mode in DC	0 to 600V/50Hz	V	50 dB	40 dB
Rejection of series mode in AC	0 to 600VDC 0 to 400ADC	V A	<1ct <1ct	60 dB 60 dB
Rejection of common mode	0 to 600V/50Hz	V A	<1ct 0.08A/100V	60 dB 0.12A/100V
Influence of external magnetic field	0 to 400A/m (50Hz)	A	85 dB	60 dB
Number of jaw opening movements	50000	A	0.1% R	0.2% R + 1ct

Typical Frequency Response Curves

- – V = f (f)
- – I = f (f)

OPERATION

Voltage Measurement – ()

1. Connect the measurement leads to the instrument's terminals, complying with the polarities indicated: red lead on the "+" terminal and black lead on the "COM" terminal.
2. Set the rotary switch to the " " position.
3. Connect the unit to the voltage source to be measured, making sure that the voltage does not exceed the maximum acceptable limits (see § 3.2.1).
 - Range switching and AC/DC selection are automatic

If the signal measured is >45V peak, the audio indication is activated if the V-Live function is selected (see § 2.6.2).

For voltages ≥600Vdc or rms, a repetitive beep indicates that the measured voltage is higher than the acceptable safety voltage (OL).

Audio Continuity Test – () and Resistance Measurement – (Ω)

1. Connect the measurement leads to the terminals.
2. Set the rotary switch to the “ ” position.
3. Connect the unit to the circuit to be tested. The buzzer is continuously active as soon as contact is established (circuit closed) and if the resistance value measured is less than 40 Ω .

NOTE: Above 400 Ω , the display indicates OL.

Current Measurements – ()

1. Set the rotary switch to position “ ” position.
2. Clamp the conductor carrying the current to be measured, checking for proper closing of the jaws and for foreign matter in the gap.

Range switching and AC/DC selection are automatic.

MAINTENANCE

Use only factory specified replacement parts. AEMC® will not be held responsible for any accident, incident, or malfunction following a repair done other than by its service center or by an approved repair center.

Changing the Battery

Disconnect the instrument from any source of electricity.

1. Set the switch to OFF.
2. Slide a screwdriver into the slot at the top of the battery cover (rear of the clamp) and push the battery cover upwards.
3. Replace the used battery with a 9V battery (type LF22), observing the polarities.
4. Install the battery in its housing, then reattach the battery cover.

Cleaning

Disconnect the instrument from any source of electricity.

- Use a soft cloth lightly dampened with soapy water.
- Rinse with a damp cloth and then dry with a dry cloth.
- Do not splash water directly on the clamp.
- Do not use alcohol, solvents or hydrocarbons.
- Make sure the gap between the jaws is kept clean and free from debris at all times, to help ensure accurate readings.

Storage

If the instrument is not used for a period of more than 60 days, remove the battery and store it separately.

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.

Limited Warranty

The Model F01 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 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

Service Department

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.

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

Documents / Resources

	<p>AEMC INSTRUMENTS F01 Clamp Multimeter [pdf] User Manual F01, F01 Clamp Multimeter, Clamp Multimeter, Multimeter</p>
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References

-  [Get Electrical Testers – Power Analyzers | AEMC Instruments](#)
-  [Search - Manual-Hub.com](#)