

## MAINTENANCE

To assure continued safety of this Probe, inspect this Probe before use for cracks or missing portions of the insulating cover, or for loose or weakened components. Pay particular attention to the insulation surrounding the clamp jaws and clamp lever. Any Probe that fails this inspection should be made inoperative by taping the clamp shut.

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents. Do not allow rust or corrosion to form on the magnetic pole pieces.

## SERVICE AND REPLACEABLE PARTS



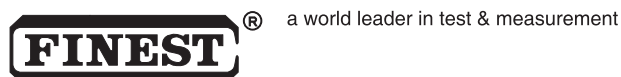
### WARNING!

**TO AVOID ELECTRIC SHOCK, REPAIRS OR SERVICING SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL. WHEN SERVICING THIS PROBE, USE ONLY THE REPLACEABLE PARTS SPECIFIED.**

This Probe should be calibrated annually. Regarding the service/calibration information on this Probe, contact the nearest distributor of this Probe.

## BATTERY REPLACEMENT

When the "LOW BAT" LED of this Probe is turned on, replace the battery installed within the Probe.



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# ***FINEST CA113***

## ***dc/ac Clamp - on High Current Probe***

## ***Instruction Sheet***

## INTRODUCTION

The Probe is a clamp-on dc/ac current adapter that is designed and tested according to EN 61010-1 : 2002 and EN 61010-2-032 : 2002 (Overvoltage Category IV), Safety Requirements for Hand-held Current Clamps for Electrical Measurement and Test, the EMC Directive (EN 61326-1 : 2006 and EN 61326-2-2 : 2006), and other safety standards (see "Safety Specifications").

Today's sophisticated electrical systems in modern electric vehicles (EV or HEV or FCV, etc.) have the Integrated Starter Generator system or the Integrated Starter Alternator system that may need this Probe to measure starting currents or alternator currents up to 1500 A peak.

\* EV = Electric Vehicle, HEV = Hybrid Electric Vehicle,  
FCV = Fuel Cell Vehicle

The Probe is compatible with any instrument capable of 4000 count millivolt measurements providing an output of 1 mV per Amp dc/ac (400 A range) and 0.1 mV per Amp dc/ac (1500 A range).



### WARNING!

**READ "SAFETY CONSIDERATIONS" BEFORE USING THE PROBE.**

## SAFETY CONSIDERATIONS

Before using this Meter, read the following safety information carefully. If the Meter is not used as described in this manual, the safety features of the Meter might be severely impaired.

Observe the International Electrical Symbols listed below.



WARNING! Risk of electric shock.



CAUTION!




Equipment is protected throughout by DOUBLE INSULATION or REINFORCED INSULATION.

Read the following safety information carefully before attempting to operate or service the current probe.

- Never use the Probe on circuits with voltages higher than 600 V rms.
- Keep your fingers behind the barrier (hand guard)
- Be extremely cautious when clamping around uninsulated conductors or bus bars. Accidental contact with the conductor could result in electric shock.
- Check surface of the Probe jaws; these should be free of dust, rust, dirt, and other foreign matter.

- Never use a Probe whose insulating protection has been impaired. Such probes should be made inoperative by taping the clamp shut in order to prevent operation.

## SAFETY SPECIFICATIONS

 Rated for 600 V dc/ac circuits of Overvoltage Category IV per EN 61010-1 : 2002 and EN 61010-2-032 : 2002.

Designed to Protection Class II, double or reinforced insulation requirements of UL 61010-1, 2nd Edition(2005.07), CAN/CSA-C22.2 No. 61010-1, 2nd Edition(2004.07) and EN 61010-2-032 : 2002, 2nd Edition.

## ELECTRICAL SPECIFICATIONS

**Current Ranges:** 0.1 A to 400 A ac/dc and  
1 A to 1500 A ac/dc  
**Output Signals:** 1 mV per A ac/dc in the 400 A range, 0.1 mV per A ac/dc in the 1500 A range

**Accuracy (dc to 400 Hz):**  
**dc range :**  $\pm (1.5\% \text{ of rdg} + 5)$   
**ac range :**  $\pm (2.5\% \text{ of rdg} + 5)$

**Working Voltage:** 600 V ac/dc rms

**Common Mode Voltage:** 42 V dc or 30 V ac

## GENERAL SPECIFICATIONS

**Storage Temperature:** -20°C to 60°C (-4°F to 140°F)  
**Operating Temperature:** 0°C to 45°C (32°F to 113°F)  
**Altitude:** 0 to 2000 meters (0 to 6560 ft.)  
**Relative Humidity:** 0 % to 80 %  
(0°C to 35°C; 32°F to 95°F)  
0 % to 70 %  
(35°C to 45°C; 95°F to 113°F)

**Battery Type:** 9V, NEDA 1604 or IEC 6LR61

**Battery Life:** 200 hrs. typical (alkaline)

**Maximum Conductor Size:** One 51 mm (2.00 in.)  
(1000 MCM THHN)  
or two 25 mm (0.98 in.)  
(500 MCM THHN)

**Maximum Jaw Opening:** 52 mm (2.04 in.)

**Output Cable:** 1.6 meters (63 in.)

**Dimensions:** 205 x 97 x 44 mm  
(8.07 x 3.82 x 1.73 in.)

**Weight:** 410 g (14.5 oz.)

## INSTRUMENT COMPATIBILITY

The Probe is compatible with any 4000 count millivolt measuring device that has the following features:

- Range and resolution capable of displaying 1 mV of output per A of measured current (400 A range) and 0.1 mV of output per A of measured current (1500 A) range.
- Accepts a standard safety-shrouded plugs or a banana plug.
- Input impedance of greater than or equal to 10 M $\Omega$ .

## OPERATING INSTRUCTIONS

### Measuring ac Current

1. Connect the Probe to the input terminals on the DMM.
2. Turn on the DMM and put the DMM in the ac millivolts measurement range.
3. Toggle dc/ac switch to select ac and turn on the Probe to set the Probe on the 400 A or 1500 A measurement range.
4. Clamp the Probe around the conductor.
5. Read the display.

### Measuring dc Current

When measuring dc amps, the display of the DMM reads a non-zero dc volts (positive or negative) value when the Probe clamps around no conductor due to the presence of the Earth's magnetism. This value is variable according to the location measuring dc amps. Thus, this non-zero dc volts should be zeroed by using the dc A Zero Adjustment thumbwheel on the Probe before clamping around a dc current-carrying conductor.

When measuring a dc current-carrying conductor, the dc volts value of the DMM has a positive or negative polarity according to the direction of dc current flow. The value is positive when the current flows through the conductor in the forward-moving direction of a right-hand threaded screw.

And it is negative when the current flows through the conductor in the backward-moving direction of a right-hand threaded screw.

Use the arrow direction mark on the insulated guard of the lower jaw opening to identify the direction of dc current flow.

1. Connect the Probe to the input terminals on the DMM.
2. Turn on the DMM and put the DMM in the dc millivolts measurement range.
3. Toggle dc/ac switch to select dc and turn on the Probe to set the Probe on the 400 A range. Let the DMM display zero value by using the dc A Zero Adjustment thumbwheel.
4. Select an appropriate measurement range between 400 A and 1500 A.
5. Clamp the Probe around the conductor. (If necessary, use the arrow direction mark to identify the direction of dc current flow.)
6. Read the display.

### Guidelines for Positioning the Probe Jaws

- Center the conductor inside the Probe jaws.
- Make sure the Probe is perpendicular to the conductor.
- Avoid measurements, if possible, close to other current carrying conductors.