



**PRODUCT INSTRUCTIONS  
MODEL AC-15  
AC WARNING SYSTEM**

**PORTABLE – AC Warning System to Alert in the event of 15v AC detected on a pipeline**

Dimensions: 5-3/4" High, 12-1/4" Wide, 10" Long Weight: 5.0 pounds

**FEATURES**

LED Warning Lights  
High Pitch Warning Siren  
(2) Internal 9v Batteries  
Green Power ON LED Indicator  
Isolated Toggle Switch  
Locking Cable Connection

**Packing List**

Instrument in case  
Model 6-A Reference Electrode (CuCuSO4)  
Cable, 6' Length, with (2) Clamps  
AC (Wall plug) Tester (~18v)  
Batteries, (2) 9V  
Instructions, Warranty Card



**BATTERIES ARE INCLUDED - (2) 9 volt**

**Warranty: 90 Days**

**NOT FOR USE IN AN EXPLOSIVE ATMOSPHERE**

Tel: (909) 890-0700 Fax: (909) 890-0736  
P. O. BOX 1667 SAN BERNARDINO, CA 92402-1667  
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## PRODUCT INSTRUCTIONS MODEL AC-15 AC WARNING SYSTEM

### GENERAL

The AC-15 AC Warning System is designed to detect induced AC on pipelines in excess of 15 volts. The AC-15 is designed to be used in the field at locations where personnel will or might come into contact with pipelines where induced AC is suspected or may be indicated.

It is suggested that a person responsible for watching the instrument be in close proximity to the open case, and in a position to clearly see and hear the alerts.

Using a copper-copper / sulfate reference electrode and a direct connection to the pipe, such as through a test station, the AC-15 will activate Audible and Visual (LEDs) alerts when 15 (~14.8v) or more volts are measured through the circuit. The circuit consists of the instrument, cables, reference electrode in contact with soil and the bare steel of the pipe.

### PRECAUTIONS

**The AC-15 should only be used in non-hazardous (unclassified) locations. It has not undergone testing for use in hazardous (classified) locations.**

### TESTING

The Model AC-15 can be tested occasionally or prior to each use to ensure batteries, LEDs and Sirens are operational.

To perform the test:

Connect the Cables into the side of the AC-15 case. This is a locking connection. Be sure to press the cable firmly into the connector and apply a slight pulling force to check connector is locked into the case.

The supplied AC transformer has an output cable that has been terminated with two Spade connectors. Using the Clamps on each end of the AC-15 cables, clamp one cable to each spade connector. **Polarity is not an issue**, so there is no need to determine which cable clamp goes to which AC plug spade connector. Ensure that the AC spade connectors and clamps are separated and will not come in contact with each other or any other conductors and conductive materials.

When clamps have been secured to the AC wall transformer, plug the transformer into an 110v AC outlet.

Move the toggle switch on the AC-15 panel towards the lid of the case. The Green Power LED will light.

If the AC-15 unit is in proper working condition, the Blue LEDs and Sirens will activate immediately. Move the toggle switch to the OFF position and unplug the AC transformer from the wall (AC Source). Disconnect the clamps. The instrument is working properly. See picture below.

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### TESTING continued.



If the AC-15 unit does not indicate AC, there is a problem. The instrument is not functioning properly and is in need of repair. Do not use the instrument if this test fails.  
See Troubleshooting Section, below.

### CONNECTION

The Patent Pending AC-15 AC Warning System is comprised of the instrument and batteries, cables with clamps and a copper-copper/sulfate reference electrode (half cell).

Prior to operation, the reference electrode must be prepared for use.

1. Remove either end of the electrode and fill with water. (Distilled water recommended) Half-Cell Electrodes are shipped dry. However, they do contain the initial charge of high purity copper sulfate crystals. MSDS available upon request.
2. Replace the end piece, making sure both ends are firmly screwed down on the o-rings for proper sealing. Do not over tighten.
3. Shake electrode to obtain proper solution saturation.
4. Remove the vinyl cover from the ceramic tip.

*Note: All Tinker & Rasor Half Cell ceramic tips are pretreated with Copper Sulfate solution for rapid wetting on initial preparation for first time usage.*

For more information on copper-copper/sulfate reference electrodes, refer to Copper Sulfate Half Cell instructions, available on the website: [www.tinker-rasor.com](http://www.tinker-rasor.com) or via e-mail at [Info@tinker-rasor.com](mailto:Info@tinker-rasor.com), or by calling +1-909-890-0700 or faxing +1-909-890-0736.

The AC-15 uses a safety catch to lock the instrument lid Open. Using one hand to hold the bottom of the case down, use another hand to push the lid back, away from the case. With enough force, the locking rod will drop into place and the lid is locked Open. Repeat the process and lift the rod out to close the case lid.

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### CONNECTION continued.

Connect Cables to cable connector on the Right side of the instrument case (facing the user). Connect the Cables into the side of the AC-15 case. This is a locking connection. Be sure to press the cable firmly into the connector and apply a slight pulling force to check connector is locked into the case.

Connect one of the cable leads from the instrument to the reference electrode. There is no need to determine polarity with the AC-15 connections. Make a good and solid connection between the clamp and the threaded copper rod at one end of the half cell.

Connect the other cable lead to the pipe. There is no need to determine polarity with the AC-15 connections. This connection will be determined by what is available in the field, whether it is a CP Test Station connection point, or welded tab on the pipe, or something else. The important factor is that this connection point is in contact with the bare steel of the pipe.

Place the prepared for use reference electrode into contact with the soil by pushing the ceramic tip into the soil. It is recommended that water (any potable) be used between the ceramic tip and the soil to ensure good low resistance contact.

Once all connection steps have been completed, move the toggle switch on the AC-15 panel towards the lid of the case. The Green Power LED will light. If less than 15 volts AC are detected, the Green LED on the panel is the only indicator that the instrument is on and working. If the Audible and Visual alerts are activated, the instrument has detected 15 or more volts of AC in the circuit, and appropriate cautions should be taken.

### BATTERIES

The AC-15 is designed to use two (2) 9 volt batteries in parallel. This means that the instrument will operate on only one 9v battery, but a second battery is provided as a backup. The batteries are stored in a slide out battery holder, on the side of the instrument panel, inside the case. The holder is located on the vertical portion of the panel, below the toggle switch. Using a finger nail or small screwdriver, push in the slot at the bottom of the battery holder, pull upwards and out, to slide the battery holders out. Replace batteries as needed, or prior to each use. The two 9v batteries should operate the instrument for more than 50 hours of continuous use.



**NOTE: the Audible and Visual alerts rapidly decrease battery levels.**

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### CHARGING

The AC-15 has been designed to use standard alkaline batteries. It is not recommended that rechargeable Li-Ion or NiMH batteries be used with this instrument.

### STORAGE

The AC-15 has a storage area inside the case to hold the cables, reference electrode and AC Wall Transformer. The case has a handle and can be locked from the outside using a small padlock.

When not in use, the instrument should be turned Off and all accessories stored inside the case with the lid closed.

The AC-15 uses a safety catch to lock the instrument lid Open. Using one hand to hold the bottom of the case down, use another hand to push the lid back, away from the case. With enough force, the locking rod will drop into place and the lid is locked Open. Repeat the process and lift the rod out to close the case lid.

To remove the Cables, locate the silver colored release button on the outside of the cable connector. Depress this button while pulling the cable connector away from the case.

### TROUBLESHOOTING

The AC-15 is a measurement device and so low resistance connections are very important to the performance of this instrument.

*If the AC-15 fails to activate using the AC Wall Transformer...*

1. Check the Green LED on the panel that indicated Power On. Move the toggle switch to ensure this LED is lit each time the switch is move up, toward the lid of the case.
  - a. If the Green LED does not come on, replace the batteries. If battery replacement does not resolve the issue, the switch or some other component has failed and the instrument is nonfunctioning.
  - b. Do not use the instrument. Send to Tinker & Rasor for repair.
2. Check the cable connection to the case. Make sure this connection is locked and firmly in place.
3. Check the connections at each clamp/spade connector. The copper clamp and aluminum spade surfaces should be clean and reasonably bright metal.
4. Move the AC Wall Transformer to another outlet or use another device to ensure the outlet is providing voltage.
5. Make sure the AC source (wall outlet or other) is providing between 105v and 125v AC.

If none of these steps results in a satisfactory resolution, the instrument is not functioning properly and is in need of repair. Do not use the instrument if this test fails.

*Weak LED light or weak or warbling Audible Alert...*

Replace the batteries.

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### CALIBRATION AND REPAIR

Tinker & Rasor suggests an annual calibration check on the Model AC-15 instrument. While the AC wall transformer does test the Audible and Visual alert indicators, it does not determine the precise voltage at which the AC-15 will activate. This test should be performed by Tinker & Rasor trained personnel only.

It is strongly suggested that all repairs be performed by Tinker & Rasor. **All warranty work must be performed by Tinker & Rasor.** Many of the AC-15 components may not be readily available to outside repair agencies. **Repairs are turned around in 24 hours.**

**Ship To:**  
Tinker & Rasor  
ATTN: Repairs  
791 S. Waterman Ave  
San Bernardino, CA 92408

### WARRANTY

Ninety-day warranty on Parts and Labor.

### TECHNICAL SUPPORT

Should you require assistance with the AC-15 or any Tinker & Rasor product, please call (909) 890-0700 Monday through Friday 7:30 am to 4:00 PM Pacific time.

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