



# **TINKER & RASOR**

CORROSION MITIGATION INSTRUMENTATION

P. O. BOX 6890 SAN BERNARDINO, CA 92412

TEL: (909) 890-0700

FAX: (909) 890-0736

## **PRODUCT INSTRUCTIONS**

### **MODEL APS HIGH VOLTAGE HOLIDAY DETECTOR (STICK UNIT)**

#### **1. HOLIDAY DETECTOR FUNCTION**

The Tinker & Rasor Model APS Holiday Detector is an all-purpose electrical inspection instrument which maintains a given inspection voltage in spite of the electrical load on the circuit. It is recommended for use on any pipe diameter as well as on flat surfaces when such surfaces are coated with a highly electrical resistance material, and when the surface beneath the coating is electrically conductive. The detector works equally well on damp or dry surfaces, and is especially desirable where humid conditions prevail.

#### **2. INSTRUCTIONS FOR UNPACKING & INSPECTION**

1) Open the shipping carton and make note of the various accessories.

Includes:

- (1) Instrument
- (2) Battery
- (1) Battery Case
- (1) Battery Charger (110v or 220v)
- (1) Screwdriver
- (1) Ground Cable (20')
- (1) Wand Handle (18")
- (1) Compax Connector (for use with Full Circle Spring Electrodes)
- (1) Paddle, silicone-rubber, 4"
- (1) Carrying case
- (1) Electrode of Choice\*

NOTE: Additional accessories may ship in separate packaging.

2) INSPECTION should be made upon receipt. If damage has occurred during shipment, file a claim with the carrier immediately.

3) If it is necessary to contact your supplier or the manufacturer concerning damaged or missing items, be sure to include the serial number, purchase order number, and invoice number of the instrument in question.

\* Instrument ships with electrode of choice. Electrode may be Full Circle Spring Electrode (up to 16" pipe diameter), Half Circle Spring Electrode (up to 8" pipe diameter) or Silicone Rubber Electrode (up to 8" pipe diameter). Wire Brush Electrodes, larger size electrodes and additional electrodes available at additional cost.

#### **3. CHECK-OUT INSTRUCTIONS**

- Remove all accessories from the shipping carton.

Web: [www.tinker-rasor.com](http://www.tinker-rasor.com)

E-mail: [Info@tinker-rasor.com](mailto:Info@tinker-rasor.com)



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- Connect high voltage wand handle to front of instrument and ground cable to detector handle (insert and twist clockwise). Never connect or disconnect the cable or wand when the instrument is turned on.
- Attach electrode to the high voltage wand handle assembly and apply to the structure to be inspected. The electrode should always make intimate contact with the surface under inspection.
- The Model APS Holiday Detector is now ready to turn on.
- Turn the instrument ON by holding the safety switch handle firmly against the instrument handle. (Instrument handle has rubber grip), then pressing the "ON" button.

NOTE: The instrument will turn OFF when the safety handle is released.

- Use push buttons to select the HIGH or LOW range. Remove the dust cover with the supplied screwdriver, and adjust the voltage setting, using the digital display for reference. The instrument must be ON for this operation.
- The instrument will "remember" the last HIGH or LOW and voltage setting selected, after being turned OFF and then ON again.
- If holiday detection testing is to be done in a high noise environment, the instrument audible alarm may be set to the LOUDER volume using the appropriate push button found near the speaker on top of the unit. Similarly, to lower the volume, push the LOUD button.
- The instrument is now ready to use.

#### **4. OPERATING METHODS**

A good ground return system for both the pipe and the detector will always provide the best and most reliable inspection. The pipe to be inspected must be grounded from the bare pipe to earth at some point along the pipe. If individual joints of the pipe are to be inspected that are not electrically connected, each joint must be grounded.

The speed of the electrode's travel along the pipe should never be excessive, since faulty inspection may result.

Occasional checks of the detector operation should be made, particularly if no holidays are being found. This can be accomplished by testing for the spark and signal at the edge of the coating where bare pipe exists or by touching the probe end to the bare pipe and noting the length of the spark and the visual and audible signal

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effectiveness. If the visual and audible signal do not both occur when the spark discharges from the electrode into a known holiday, the ground return (i.e. the path between the metallic pipe and earth and the earth to the ground trail of the detector) is of high resistance. In this case, a better ground is required and a direct connection between the metal pipe and the ground wire may be necessary. This type of grounding is extremely uncommon unless the soil is very dry (if using a grounding rod) or the detectors output is low.

Correct voltage output for a given thickness of coating has long been a matter of controversy. However, recent formulas have been suggested which may be used as a guide for correct peak voltages on various coating thickness. The calculation is as follows:

$$V = K \sqrt{T}$$

WHERE  $V$  = Peak voltage in volts.

$T$  = Thickness of fusion bonded epoxy (FBE) coating in  
mils

(not including outer wrappers).

$K$  = Constant of 1,250 for coatings over 30 mils and 525 for  
fusion bonded epoxy coatings under 30 mils.

*NOTE: Formula taken from NACE International Standard RP0274, RP0490. These standards and other available for free download to members at: [www.nace.org](http://www.nace.org)*

These formulas, when applied to a coating of 3/32" thickness and with a constant of 1,250, would indicate an applied voltage of 12,500 volts peak or a coating of 16 mil thickness with a constant of 525 would indicate an applied voltage of 2,100 volts. A common practice used in setting inspection voltages in the field is to adjust the output voltage by visual observation. It is the general consensus that spark discharge at least twice the thickness of the coating will give adequate inspection voltage and compensate for any irregularity in coating thickness and grounding conditions. If this practice is desired for determining inspection voltage, it should be done while the electrode is in the normal operating position and under actual grounding conditions.

The formulas and suggestions for setting voltage are supplied as a guide, and are not necessarily recommended by the manufacturer of this detector.

***Consult the coating manufacturer for recommended voltage applications.***

### 5. CHARGING THE BATTERY

The Model APS comes with two (2) batteries. The battery should be charged after each use. The Model APS will indicate when the battery voltage is low, by a flashing or flickering of the Green Power LED, instead of providing a steady glow.

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The battery charger included with the Model APS Holiday Detector operates on a 110v AC power source. 220v AC power source battery chargers are available at additional charge. Check the packing list or invoice of your order to verify which battery charger was included with your Model APS.

The battery charger has a special plug that is designed to fit into the connector on the side of the battery, so that polarity of the connection is not an issue.

The battery charger has a RED LED on its side. This LED will glow RED while charging the battery. The RED LED will begin BLINKING when the battery is fully charged.

### **6. INSTRUMENT SERVICING INSTRUCTIONS**

- A. Cleaning:** Keep the instrument clean and dry. Clean the instrument case with a soft, damp cloth, then wipe dry. Do not use solvents such as lacquer thinner, methyl ethyl ketone, etc.

#### **KEEP ALL ELECTRICAL CONTACTS CLEAN**

**B. Voltage Output Checks**

a. In case of LOW output voltage:

- i. Check the LED indicator for the HIGH or LOW Range selector, to ensure the instrument is in the correct Range.
- ii. Check the display for voltage output. Voltage displayed is in kilovolts. (22,000volts = 22.0 on display)
- iii. Check green ON LED. If flashing, this indicated low battery voltage.

b. In case of NO output voltage:

- i. Check green ON LED. If flashing, this indicated low battery voltage.
- ii. Check for poor connection on battery terminals.
- iii. Check ground cable and wand handle connections.

### **7. FACTORY REPAIRS**

Holiday Detectors returned to the factory for repairs should be sent **TRANSPORTATION PREPAID**. In most cases the detector can be repaired and returned the same day it is received at the factory.

**WHEN ORDERING PARTS FOR YOUR DETECTOR OR REQUESTING FURTHER INFORMATION  
ALWAYS GIVE THE DETECTOR'S SERIAL NUMBER.**

**Mailing Address**

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San Bernardino, CA 92412  
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**Shipping Address**

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