



TINKER & RASOR

CORROSION MITIGATION INSTRUMENTATION

P. O. Box 1667 SAN BERNARDINO, CA 92402

TEL: (909) 890-0700

FAX: (909) 890-0736

PRODUCT INSTRUCTIONS

MODEL AP/AC

IN-PLANT USE HOLIDAY DETECTOR

1. HOLIDAY DETECTOR FUNCTION

The Tinker & Rasor Model AP/AC In-Plant 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. The instrument can be delivered for operation on either 110v or 220v AC power.

2. INSTRUCTIONS FOR UNPACKING & INSPECTION

- A. Open the shipping carton and make note of the various accessories.
- B. INSPECTION should be made upon receipt. If damage has occurred during shipment, file a claim with the carrier immediately.
- C. 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.

3. CHECK-OUT INSTRUCTIONS

- Remove all accessories from the shipping carton.
- Make sure that the detector is turned **OFF**.
- Connect high voltage cable and ground cable to detector (insert and twist clockwise). Never connect or disconnect the cables when the instrument is turned on.
- Attach probe handle to voltage cable.
- Attach electrode to the voltage probe assembly and apply to the structure to be inspected. The electrode should always make intimate contact with the surface under inspection.
- Plug AC power cord into 110v power supply (220v on specially configured instruments). See label on outside of case for type.



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- The Model AP/AC Holiday Detector is now ready to operate.
- SELECT the HIGH or LOW position. Adjust the voltage setting, using the digital display for reference.

NOTE: Digital display and actual output may differ as much as 5% due to manufacturer's specifications of display.

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 signal effectiveness. If the signal does not 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 $\sqrt{\text{T}}$
WHERE	V	=	Peak voltage in volts.
	T	=	Thickness of bonded 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.

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



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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. INSTRUMENT SERVICING INSTRUCTIONS

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

KEEP ALL ELECTRICAL CONTACTS CLEAN

B. **Voltage Output Checks**

A. In case of LOW output voltage:

- a. Check position of voltage selector switches.
- b. Check for "parted" conductor in voltage probe and/or ground trail.

B. In case of NO output voltage:

- a. Check power cord and plug.
- b. Check for "parted" conductor in voltage probe and/or ground trail.

6. 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.

Please include the following when shipping repairs: What's wrong with the instrument, Return shipping address, contact person and their phone and fax numbers.

Shipping Address:
Tinker & Rasor
Attn: Repairs
791 S. Waterman Ave.
San Bernardino, CA. 92408
Phone: (909) 890-0700
FAX: (909)-890-0736

104-254

Web: www.tinker-rasor.com

E-mail: Info@tinker-rasor.com



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PRODUCT INSTRUCTIONS CUSTOM INSTRUMENT NOTES

This addendum to the Model AP/AC Operating instructions covers the customized features of the dual Model AP Cabinet, designed to specific specifications from the customer.

This customized instrument cabinet contains two (2) Model AP High Voltage Holiday Detectors, which have been designed to operate independently from one another. Each instrument has been factory set to have a maximum high voltage output of 15kV (15,000 volts).

Although these instruments are meant to be operated independently of one another, there is only one power source for the cabinet, a 110v AC power supply. When the cabinet has been connected to an 110v AC power source, the green LED located in the center of the cabinet will light.

Each instrument, marked as Unit A and Unit B, has its own connections, located on the side of the cabinet. These connections include:

- (1) High Voltage cable connector
- (1) Ground cable connector
- (2) 110v Holiday Indication output connectors (external audio and visual indicators)

A ninth connection point is located near the bottom of the side panel, towards the front of the instrument panel. This connection is for the 110v AC power supply.

Each instrument has its own controls, as described in the main body of these instructions. It is important to point out the each digital display has its own DC battery power supply (9v alkaline) which will need to be maintained for proper voltage indication.

Special Notes

The instrument has been supplied with extra long high voltage cables. (100'/each). It is important that these cables are not coiled upon themselves at any time during operation of the instruments. Also, if the cables are to rest upon a floor during operation, an underground or buried AC power line beneath the instrument high voltage cables can cause coupling resulting in a high voltage spike being sent back into the instrument and causing damage to the holiday detector. It is recommended that the high voltage cables of each instrument be lifted off the floor to avoid this possible issue.