CORROSION MITIGATION INSTRUMENTATION
2828 FM 758, NEW BRAUNFELS, TX 78130 TEL: (830) 253-5621

PRODUCT INSTRUCTIONS

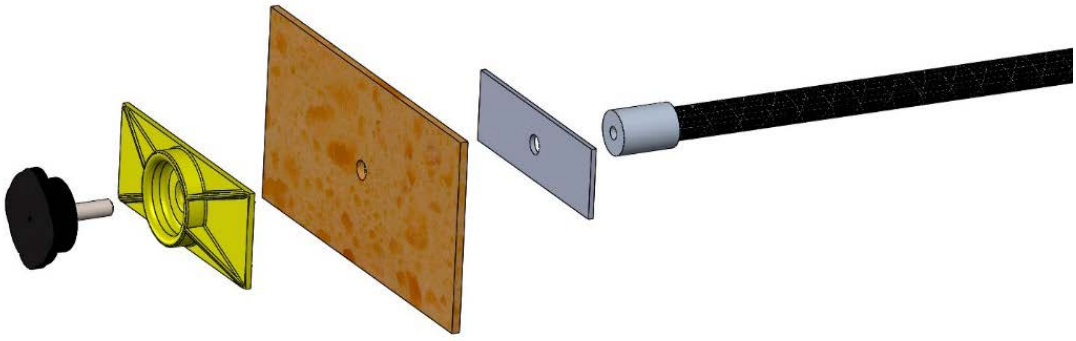
MODEL M/1
WET SPONGE HOLIDAY DETECTOR

Unpacking Checklist

The Model M/1 Holiday Detector Kit includes the following:
(1) M/1 Unit (085-156)
(1) Battery, 9v (010-007)
(1) Cable, Ground (026-101)
(1) Water Wetter Solution, 4oz (049-013)
(1) Wand, 16” w/red cable (177-075)
(1) Wand, 18" extension (177-070)
(1) Sponge Assembly (ships assembled)
(1) Sponge (055-882)
(1) Holder, Yellow (076-050)
(1) Knob, sponge holder (094-030)
(1) Sponge bracket (014-195)
(1) Canvas tote bag
(1) Screwdriver
(1) Instructions
(1) Warranty/Calibration Document

For updates, please visit our website:

http://tinker-rasor.com



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DESCRIPTION

The Model M/1 Holiday Detector is a highly sensitive device designed to locate holidays (pin holes, voids, etc.) in thin film protective coatings of relatively high electrical resistance when such films are applied to the surface of material of low electrical resistance. In these applications, such as painted metal surfaces, the Model M/1 Holiday Detector will locate these points very accurately with an audible and visual signal. This method of inspection of thin film is a non-destructive test and will not injure the protective coating.

OUTPUT VOLTAGES

The M/1 has multiple voltage outputs that can be selected. These outputs have been determined to meet varying international standards regarding the use of the equipment. The Model M/1 Low Voltage (Wet Sponge) Holiday Detector is designed to meet or exceed the requirement of the following standards (Partial List):
NACE RP0188, SP0188, TM0384
ASTM D 5162-A, G6, G62-A
ISO 8289, 14654, 14655, 14656, 15741, 16967, 29601
AUSTRALIA AS 3894-2
JAPAN JIS 6766

EQUIPMENT

The Model M/1 Holiday Detector consists of a portable battery powered electronic instrument, a wand handle, and sponge assembly (open cell sponge ships compressed, will expand with water), and ground wire. The instrument is housed in a sturdy plastic case with provision for attachment of optional (not included) headphones.

The detector is a “non-destructive wet sponge” type holiday detector. The basic electronic design of the Model M/1 Holiday Detector is that of a very sensitive circuit which is energized by one 9v battery. When current of 500 or 700 (+/- 10/%) micro-amperes flows in the circuit, an audible and visual signal is actuated.

The test lead wire used in the ground wire can handle a minimum of 100 milliamps at 100 volts. If replacement or additional wire is needed, make sure it meets these requirements. Up to 100’ length of ground wire does not adversely affect the detectors operation, in most cases. If adding additional ground wire, 14 AWG stranded or equivalent is recommended.

The exploring electrode is open-cell sponge material and is conductive when saturated with a wetting solution. The sponge electrode is attached to the non-conductive wand handle by means
of the bolt with knob, plastic sponge holder and backing plate.
The wetting solution should consist of potable tap water and a wetting agent.

The ratio of one (1) ounce agent to one (1) gallon tap water is recommended. Tinker & Rasor *WATER*-WETTER© is a non-sudsing wetting agent, available in 8 oz. bottles, factory direct or through stocking distributors.

PRODUCT INSTRUCTIONS

PRE-ELECTRICAL TEST PROCEDURES

The protective coatings should be dry and free of all contamination prior to electrical holiday testing. Proper curing and drying time of the protective coating must be established prior to conducting electrical holiday testing.

Note: Solvents retained in the protective coating film can cause erroneous indications (false holidays) during electrical testing.

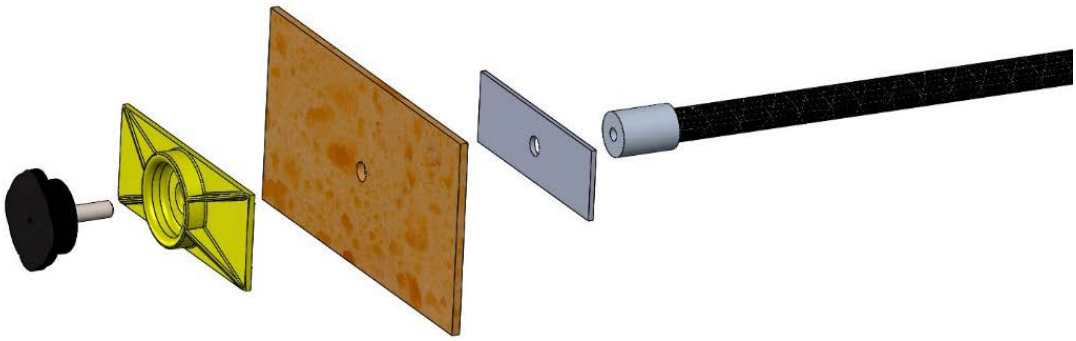
The dry film thickness should not exceed 20 mils when electrical holiday testing is done with the low voltage Model M/1 Holiday Detector. Film thickness should be determined with a non-destructive dry film thickness gauge to make sure limits are not exceeded.

Special Note: Ordinary tap water will generally suffice to dampen the sponge electrode, provided the protective coating thickness does not exceed 10 mils. The factory recommended practice is to use a wetting agent at all times, regardless of coating thickness up to 20 mils. The low voltage holiday detector is not recommended for coatings greater than 20 mils of thickness.

Check battery voltage. This can be done by shorting the wet sponge with the bare end of the ground cable of the holiday detector. If a steady, level audible signal is heard, the battery voltage is OK. If the audible signal starts to attenuate while testing, REPLACE battery. Note: A battery output voltage drop of over 10% also indicates weak battery.

HOLIDAY DETECTOR ASSEMBLY

Assemble the Holiday Detector by first connecting the ground cable to the handle. Insert the ground cable connector into the handle, and then rotate one quarter turn counter clockwise to lock. Connect the wand handle to the front (nose) of the instrument and screw down until firmly seated.
Attach the sponge bracket (aluminum piece), sponge, sponge holder (plastic piece) and the knob with threaded bolt through all and screw down on the wand end. Saturate the sponge in a wetting solution.



CALIBRATION

Factory calibration on Model M/1 Holiday Detectors is for the voltages and resistances of each of the four (4) output settings. All voltages are calibrated to a tolerance of +/- 5%.

PRODUCT INSTRUCTIONS

USING THE M/1

The Model M/1 is turned ON by pressing the Power On/Off button on the instrument panel. When powered On, the M/1 will flash the Blue LEDs through each of the four (4) output voltages. Once the LED's flash through once, the LED will indicate the selected output voltage.
A Low Battery condition exists when all four (4) of the Blue LEDs continue to flash. The 9v battery should be replaced when this indication occurs.

MAIN PANEL AND LED INDICATORS

The main instrument panel includes two (2) buttons and five (5) LED indicators. The RED LED indicates a holiday signal. This LED will light along with the audible tone indicator of a holiday.
The four (4) output voltage settings each have an associated LED. The LED that is illuminated indicates the output voltage of the M/1.

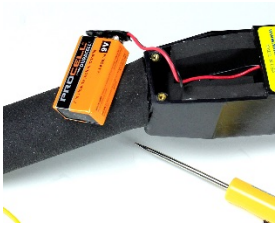
ADJUSTMENT OF THE OUTPUT VOLTAGES

Model M/1 Holiday Detector offers four (4) output voltages and sensitivity settings.
9v @ 90 K-ohms
67.5 volts @ 80 K-ohms
67.5 volts @ 90 K-ohms
90 volts @ 400 K-ohms

When the M/1 is powered On, the Blue LED will indicate the selected voltage output. Pressing the Output Voltage button will change the voltage selection, and a Blue LED will indicate the new output voltage.

Consult with the coating manufacturer, inspector or the standard being referenced for the application to determine which output voltage is suggested.

CHANGING THE BATTERY



The M/1 is powered by a replaceable 9v battery. To access the battery, locate the BATTERY ACCESS label on the main top panel of the instrument. There are two (2) screws near the handle that need to be removed. Once removed, lift and rotate the BATTERY ACCESS door toward the front of the instrument and remove. Replace the BATTERY ACCESS door by hooking the latch under the mail panel and rotating back into place. The latch will snap in and the BATTERY ACCESS door will sit flush when properly aligned.

The 9v battery is located inside the battery access area and is attached to a battery terminal connector. The battery connecter can be removed by firmly grasping the battery with one hand and the connector with the other and pulling apart. Do not use a screwdriver or any prybar made of a conductive material to separate the battery from the connector.

PRODUCT INSTRUCTIONS

When replacing the battery, observe polarity. The 9v battery has two terminals side by side. The smaller terminal is the Positive (+) connection, as indicated on the battery (most batteries). The larger terminal on the battery is Negative (-). When connecting the 9v battery to the battery connector, ensure that the terminals are mating with the corresponding connector. If the battery terminals do not snap into the battery connector terminals, the battery may be backwards.

ELECTRICAL TESTING PROCEDURES

The sponge electrode should contain sufficient amount of wetting solution to assure moisture penetration from the sponge electrode into any defect that may be present in the protective coating. Excess wetting solution should be squeezed out of the sponge electrode.

Attach ground wire directly to the bare structure (substrate) under test. On coated steel structures the ground wire must be directly connected to the bare metal.

On coated concrete structures the ground wire should be connected directly to the reinforcing steel embedded in the concrete. If rebar is not present, a ground connection to the concrete can be made by placing the bare end of the ground wire against the bare concrete surface and anchor it down with a burlap bag filled with damp sand.

The ground wire can be checked quickly for proper connection by contacting the wetted sponge electrode to the bare structure and observing an audible signal, indicating correct electrical continuity of the holiday detector circuit.

The rate of inspection speed of the sponge electrode over the protective coated surface should not exceed sixty (60) linear feet per minute. Using a double stroke of the sponge electrode over each area assures better inspection coverage with less likelihood of any missed areas.

ACCESSORIES

The M/1 uses the same accessories as the Tinker & Rasor Model M/2 Stick Unit. All accessories included with the instrument (page 1 list) are available for purchase, including additional sponges. Sponge electrodes are available in standard size, as included with new instruments, or as custom size widths, or as disks for internal pipeline coatings. Contact T&R for details.

The M/1 can use optional headphones for loud/noisy environments. Headphones are available for purchase from Tinker & Rasor or many standard headphones with 3.5mm jack will work with the M/1.

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TROUBLESHOOTING

ISSUE	ASSUMPTION	SUGGESTION
NO LED	battery not present, or too low of voltage to power instrument	Replace 9v battery
NO ALARM ON VISUAL HOLIDAY IN COATING	Ground connection issue.	Check ground connection to substrate
NO ALARM ON VISUAL HOLIDAY IN COATING	Ground connection has too much resistance in the circuit	Move/change the ground connection point to the structure.
NO ALARM ON TOUCHING BARE GROUND CABLE	Ground cable not connected properly to instrument.	Remove and reconnect ground cable.
NO ALARM ON TOUCHING BARE GROUND CABLE	Wand not properly connected to instrument.	Remove and reconnect wand, ensuring the wand has been screwed down all the way into instrument.
NO ALARM ON TOUCHING BARE GROUND CABLE	Sponge not wet or conductive.	Rewet the sponge or check the sponge connection to the wand.

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.

Visit www.tinker-rasor.com/repair for shipping information and the Repair Form

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