



**PIPELINE
INSPECTION
COMPANY
LTD.**

SPY®



SPY®

Pipeline Inspection Co.

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Portable Holiday Detectors



**OPERATING
INSTRUCTIONS
SPY®, PORTABLE
HOLIDAY DETECTORS
Models 715, 725, 735
& Models 915, 925**

Safety Disclaimer

Only trained and responsible personnel should operate high voltage equipment. Display warning labels prominently prior to and during testing. Portable holiday detectors are designed to operate and maintain an electric current output well below levels which could cause injury. However, you may experience a mild shock if the test electrode or ground is touched while the equipment is activated. Wear rubber or plastic gloves and non-conductive footwear to minimize potential shock. Keep in mind that the shock prevention effectiveness of the rubber or plastic glove and footwear is limited to the condition of their protective surface. Make sure your gloves and footwear are void of tears and holes and are in good condition.

Use of Portable Holiday Detectors is limited to finding defects in insulating materials. Testing should be conducted clear of personnel not involved in the testing procedure. Personnel operating Portable Holiday Detectors should be aware of the safety limitations imposed by their environment at all times. Operator should have an assistant to ensure that unauthorized personnel are kept clear of the testing area.

Danger: Portable Holiday Detectors create an arc or spark. Use of a Portable Holiday Detector in or around combustible or flammable environments can result in an explosion. When operating in any potentially hazardous area, consult with the plant or site safety officer before proceeding with a holiday detection test in any potentially hazardous or suspect area.

EMI Disclaimer

WARNING....This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

NOTE.... Holiday detectors create a spark during their normal course of operation when a defect in the pipe coating is found. This spark will cause radio interference. During the device's passive or search mode, it qualifies as a class A product.

Warranty

Pipeline Inspection Co., Ltd., hereafter referred to as (SPY®) warrants that SPY, Model 7X5/9X5/1X5 Series Holiday Detectors and Jeepmeters shall, under normal use and service, be free from defects in material and workmanship. SPY®'s entire warranty obligation shall be limited to, at SPY®'s option, the repair or replacement free of charge to the buyer of any defective equipment or parts thereof which prove to be defective in material and workmanship under normal use and service.

Claims for defective parts must be made in writing within twelve (12) months after shipment of the equipment from the works of SPY®. Fast wearing and consumable parts including, but not limited to, electrodes and ground cables, are expressly excluded from the warranty. SPY® shall have the option to require return of a claimed defective part to SPY®'s plant in the U.S.A., freight prepaid by buyer for examination to establish buyer's claim.

Except with SPY®'s prior written approval, SPY® shall not be liable (a) for the cost of repairs, alterations or replacements or any expense connected therewith made or incurred by the buyer or its designees, or (b) for defects resulting from alterations or repairs made by others than SPY, or its approved representatives.

SPY® shall not be liable for damages, including but not limited to direct, special, indirect or consequential, resulting from the handling, or use, whether alone or in combination with other products, or any SPY® equipment or third party designed or manufactured equipment, including without limitation, any loss or damage sustained or caused by the operation and use of the equipment which is improperly operated or its successful operation is impaired by natural elements after its delivery to the buyer.

The foregoing warranty is exclusive and in lieu of all other warranties whether written, oral or implied (including without limitation, any warranty of merchantability or fitness for purpose).

EC Declaration of Conformity

Manufacturer of Equipment:

Pipeline Inspection Co. Ltd.
1919 Antoine Houston, Texas 77055 USA
Phone: 713.681.5837
Fax: 713.681.4838
Email: sales@picltd.com

Authorized Representative in the EC Community:

Pipeline Induction Heat LTD
The Pipeline Centre Farrington Road
Rossendale Road Industrial Estate
Burnley, Lancashire BB11 5SW
England, United Kingdom
Attn: Michael Burnley

Description of Equipment:

Holiday Detectors
Models 715,725,735,915,925 and accessories

Holiday detectors are devices that are used to detect the presence of defects in the non-conductive coatings applied to surfaces in order to minimize ion flow from a conductive substrate. This is accomplished by attempting to create an electrical circuit by passing an electrode over the non-conductive coating. A sufficient voltage is generated in the electrode to cause a spark that will jump from the electrode to the substrate if a defect is found. When a defect is found a horn will sound and a light will turn on.

Harmonized Standards tested to:

IEC 801-2: 1991 Electrostatic discharge
IEC 801-3: 1984 Radiated RF Immunity
IEC 801-4: 1988 Electrical Fast Transients
EN 55022: 1995 Radiated Emissions
EN 55022: 1987 Conducted Emissions
72/23/EEC: 1973 Low Voltage Directive
93/68/EEC: 1993 LVD amendment

Specifications: The products mentioned above were submitted as a common family as they utilize common designs, components and methods of construction. Representative tests were performed on each device that would exhibit the "worst case" scenario for approval.

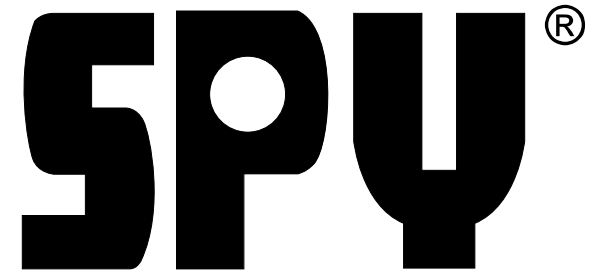


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Warning! This is a HIGH VOLTAGE device capable of producing an electrical shock if not properly grounded and/or operated in accordance with instructions and procedures prescribed in this manual!

Principles of Operation

Metal objects such as pipelines, reinforcing bar (rebar), storage tanks or structural steel are normally covered with a protective coating to prevent corrosion. Holiday detectors are used to inspect these coatings for pin holes, scratches or other coating faults. They work by generating a voltage high enough to jump a gap that is longer than the thickness of the coating.

The laws of physics determine the required voltage level to jump a given distance, or gap. Coating type also affects voltage level requirements.

A holiday detector simply applies a voltage to the outside of the coating. With the pipe connected to ground and with the holiday detector connected to ground, a hole in the coating will cause a spark to jump or "arc" from the electrode to the pipe to complete the circuit. When a complete circuit is formed, a signal is activated on the Holiday Detector.

A brief description of the steps necessary to operate a SPY[®], Model 715, 725, 735, 915, 925 holiday detector is presented here with detailed steps following later in the manual.

Before operating the detector, set the desired output voltage before connecting any components. After setting the desired voltage, slide the battery onto the detector. Then install the electrode wand on the front of detector and insert the ground cable into the rear of detector (inside handle). Ground the pipeline and connect the electrode, spring or brush. Turn the detector on. A running tone and light in the ON/OFF switch indicates the detector is operating. Roll the spring toward the bare metal end of the pipe. When the electrode is sufficiently close, a spark will jump from the electrode to the pipe, the running tone and ON/OFF switch light will go out, and a loud signal horn will sound to designate a holiday. Of course it is not a real holiday but it demonstrates what happens when the electrode encounters a holiday and verifies correct detector operation.

PLEASE NOTE: The diameter of the High Voltage Electrode Wand fitting is slightly larger than the fitting on the ground cable. This allows only the electrode wand to be connected into the hole marked "HIGH VOLTAGE" on the detector.

Insert this high voltage cable fitting into the connector on the front of the detector marked "HIGH VOLTAGE". While pushing the fitting into the detector as far as possible, twist the fitting clockwise to lock it into place.

To remove the cable, push the fitting into the detector and twist counter-clockwise until released.

Ground Cable :

Insert the fitting end of the ground cable into the connector on the front of the detector marked "GROUND". While pushing the fitting inward, twist it clockwise to lock it into place. To remove, press inward and twist it counter-clockwise until released. **Caution!** Do not touch the bare ground cable while the detector is operating.



WARNING! This is a **HIGH VOLTAGE** device capable of producing an electrical shock if not properly grounded and/or operated in accordance with instructions and procedures prescribed in this manual!

Operating Instructions Modified for SPY Models 915 • 925

CAUTION! HIGH VOLTAGE device. Use with caution!

To Install Battery :

To prevent interference with the battery box installation or removal, remove the carrying strap before performing the following steps. Slide the battery lock clip up so the battery box can slide onto the bottom of the detector. Apply pressure until the battery box locks into place. The battery lock clip should now clip downward and lock the battery box to the detector. After the battery box is installed, replace the carrying strap through the strap loops on the side of the detector and around the bottom of the battery box.

To Remove Battery :

Remove the carrying strap. Slide the battery lock clip upwards and slide the battery box off the holiday detector. The battery can then be removed from the battery box for recharging, storage, etc.

Electrode Wand :

The high voltage electrode wand consists of a plastic tube handle with a fitting on one end to connect either a spring electrode or brush electrode, and a cable on the opposite end with a twist type fitting for connecting into the holiday detector.

Differences between 715, 725 & 735

Model 715 thru 735 holiday detectors incorporate new circuitry allowing the detectors to maintain a selected voltage, regardless of different pipe diameters, coating thickness variations and battery wear (unless the battery is totally discharged). Keep in mind that the voltage the coating actually "sees" will decrease slightly depending on ground losses and/or conditions.

The model 715 holiday detector is a low voltage (1-5kv) detector *designed specifically for thin film epoxy coatings*. The output voltage of this detector is normally D.C. (direct current). However, if moisture is encountered on the pipe, the detector output automatically switches to a fast pulse. Fast pulse enables continued operation whereas with older type thin film detectors the operator either had to wait until the moisture evaporated or the pipe had to be dried.

The model 725 holiday detector is a high voltage (1-15kv) detector *designed specifically for thin film, tapes, extruded or coal tar types of coatings*. Since the operating characteristics of this detector are very broad, it is recommended that thin film epoxy coatings be inspected with the model 715 detector.

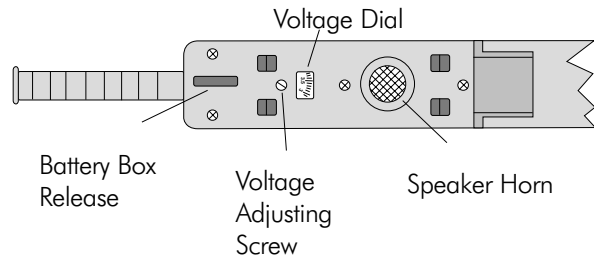
The model 735 holiday detector is an extra high voltage (15-35kv) detector *designed specifically for thicker somatic type coatings*.



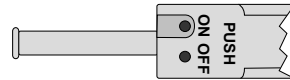
715 • 725 • 735

Detailed Operating Instructions

Steps

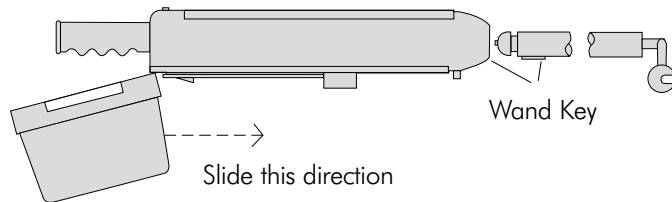


STEP 1: Make sure the "OFF" switch on the right side of unit (looking from the serial numbered side of detector) is pushed down.



STEP 2: With the battery removed, turn the unit so the base plate is facing up. Remove the plastic cap. Rotate the voltage adjusting screw until the desired inspection voltage is indicated on the dial (numbers on dial are x1000). When the dial is set to the desired voltage, replace the plastic cap to protect from dust and moisture.

STEP 3: With the battery contact buttons up, place a fully charged battery into the battery box. Place the battery at rear of the baseplate and slide forward until it locks in place. Make sure that the battery contacts line up. It does not matter which side of the detector the battery buttons are on (right or left). The baseplate is wired to allow the battery to contact the baseplate either way.



Battery Storage:

The battery should be fully charged BEFORE storing. Storage at temperatures below 75°F is recommended. After six months of storage or storage in extremely high temperatures, the battery should be recharged to maintain peak efficiency and maximize its life span.

This Portable Holiday Detector is an accurate, reliable instrument which is only warranted if it is properly handled, maintained and operated as prescribed by Pipeline Inspection Co., Ltd.

Battery Instructions

General : The SPY® battery is a completely sealed, rechargeable 6 volt unit. It can be used in any position and under most conditions.

To Charge The Battery :

Set the battery on a level surface with terminals up and toward the front. Place the battery charger over the battery so that the battery contacts are aligned and touching the contacts on the bottom of charger. Plug the charger into an appropriate AC outlet. *Make sure to change from 120 volt to 240 volt when necessary. Make sure the charger is unplugged when performing this step.* When the charger is placed onto a discharged battery the LED will blink while the battery is charging. The LED changes to steady "on" when the battery is fully charged. A discharged battery requires 8-12 hours to fully charge.

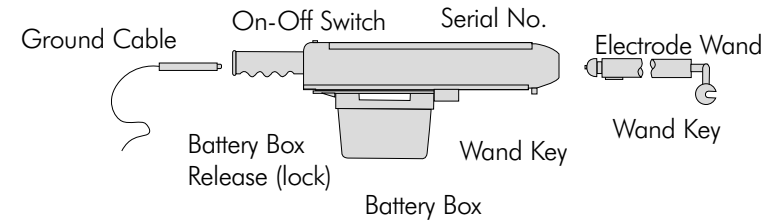
If the LED blinks for a short time then goes steady "on" after a few minutes, or after charging, the battery is fully charged and ready for use.

There is no danger of overcharging the battery. After the battery is fully charged, the charger will maintain a trickle charge to keep the battery at peak charge.

It is recommended that the battery be recharged as soon as possible after use.

WARNING! Do not use any other type of charger. This charger is specially designed for this battery .

STEP 4 : Insert and snap the electrode wand into the front end of the detector. Make sure the wand key & detector slot line up. Wand should snap snugly into detector.



STEP 5 : Connect the ground cable by inserting the fitting on the insulated end of the ground cable into the slot in the detector handle. Maintain forward pressure and then twist the cable clockwise to lock in place. Straighten any kinks out of the cable and keep as much of the cable as possible in contact with the earth. Improve grounding contact by dragging the cable in the pipe ditch where there is more moisture or wet earth. In extremely dry areas, it may be necessary to connect the cable to a ground rod that is driven several feet into the earth or to connect the ground cable directly to the bare metal of the pipe.

STEP 6 : Attach the electrode, brush or spring to the connector of the electrode wand.

CAUTION!

DO NOT TOUCH bare ground wire when the detector is on.
DO NOT CUT the ground cable to a shorter length.

When, AND ONLY WHEN, Steps 1-6 are complete....

STEP 7 : Push the "ON" switch to activate the detector. The "OFF" switch will light up and the "run" tone will sound to indicate that the unit is now on. Begin inspecting for coating holidays. The previously set output voltage is regulated to provide a constant voltage on the coating being inspected. Holidays will be indicated by a beeping sound of the horn as well as a flickering of the "OFF" switch light.

To Stop Operations and Deactivate Unit

CAUTION! DO NOT TOUCH the electrode or ground wire while detector is operating.

Steps

- STEP 1 :** Push the "OFF" switch to deactivate holiday detector. Wait several seconds for the residual charge on the pipe to dissipate before removing or disconnecting the electrode or ground cable.
- STEP 2 :** To remove the electrode wand, press in on the wand and press the release catch on the bottom front of the detector while gently pulling out on the wand.
- STEP 3 :** To remove the ground cable, twist the insulated end counter clockwise until it releases from the handle.
- STEP 4 :** To remove the battery, press and hold the battery box lock while sliding battery box to the rear. **BE SURE THE DETECTOR IS TURNED OFF** before removing the battery or any other components.