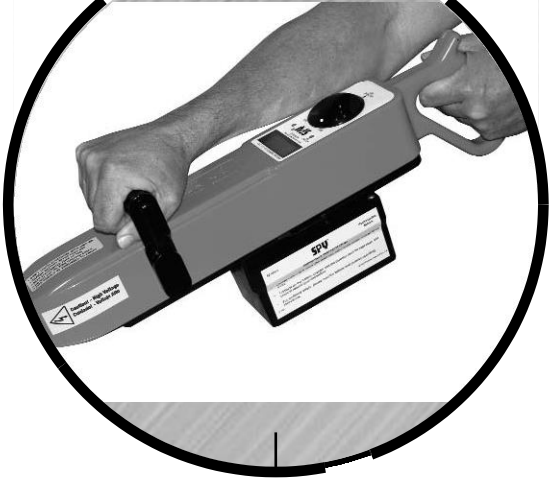

PIPELINE INSPECTION COMPANY LTD.

Portable Holiday Detectors

OPERATING INSTRUCTIONS SPY®, PORTABLE HOLIDAY DETECTORS Models 780, 785, & 790

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.

SPY®

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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 780, 785 or 790 holiday detector is presented here with detailed steps following later in the manual.

To operate the detector, make sure the control switch is in the OFF position (fully ccw), then install the battery. The battery is keyed so it can only be installed in one way. 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 control knob to the middle position (set voltage). This activates the internal Jeepmeter. A pulsing tone and light warn that this is the "set voltage" mode. Set the voltage to the required value. Turn the unit on (fully cw). A running tone and light 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 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.

Differences between 780, 785, & 790

Model 780, 785, and 790 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 780 holiday detector is a low voltage (1-5kv) detector *designed specifically for thin film epoxy coating.s*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 785 holiday detector is a high voltage (1-15kv) detector *designed to cover a wide range of coatings from thin films to tapes to extruded or coal tar types of coatings.* Since the operating characteris- tics of this detector are very broad it is recommended that thin film epoxy coatings be inspected with the model 780 detector.

The model 790 holiday detector is a high voltage (5-35kv) detector *designed specifically for tapes, extruded or coal tar types of coatings,* and *thicker somatic type coatings.*

780 • 785 • 790

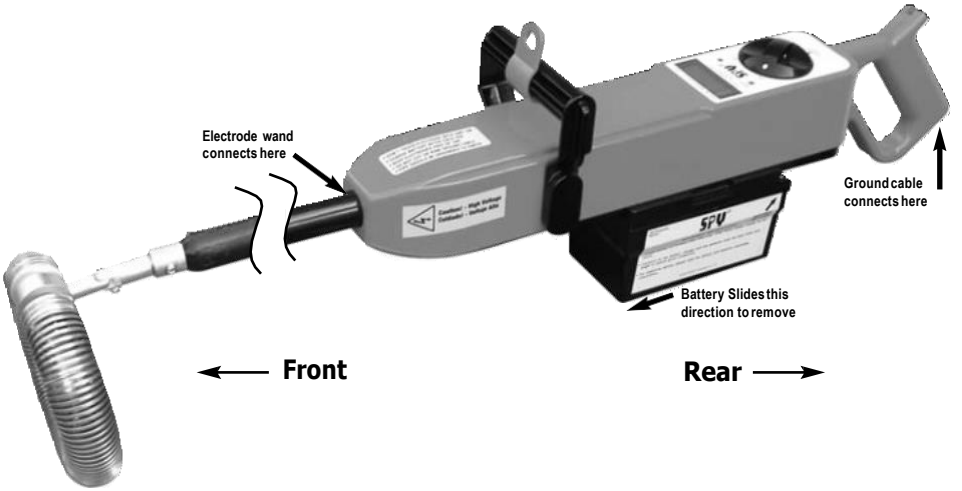
Operating Instructions

Connecting Accessories

The electrode wand plugs into the "front" of the detector. Push the wand in until it locks in place. It can be released by pressing the release (located near the "front" of the unit on the bottom) upwards until the wand pops out.

The ground cable in plugged into the rear handle. It uses a quarter turn fastener, so insert the cable as far as possible, then rotate it at least a quarter turn until it locks in place.

The battery installs from the front. Note the battery will only install one way - it is keyed to prevent insertion in an incorrect fashion. One end of the battery is flat and the other has a step. The flat end goes towards the rear of the unit. Push the battery on until it snaps in place (the spring will be almost completely compressed when properly installed). To remove the battery, press the release on the bottom left side of the unit (the release is orange to stand out against the black base of the detector).



Controls

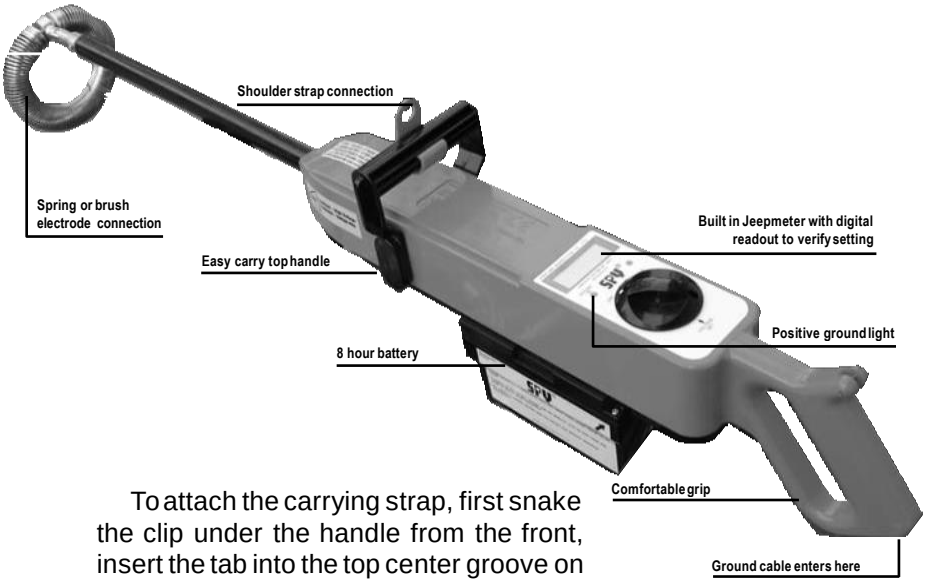
The control knob has three positions: OFF, VOLTAGE SET, and ON.

In the OFF position all power is off, including the high voltage output. Turning the knob clockwise 30 degrees to the VOLTAGE SET position turns on the high voltage output, blinks the red LED, pulses the run tone, and turns on the display. The voltage displayed is in kilovolts (thousands of volts.) A screwdriver can be placed through the hole in the rear of the knob nearest the operator to change the voltage setting. Turning the screwdriver clockwise will increase the voltage. In the ON position the voltage adjustment is not accessible. In this position the unit is in the normal running mode with the red LED on steady, the run tone steady, and the display off.

CAUTION!

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

Carrying Strap



To attach the carrying strap, first snake the clip under the handle from the front, insert the tab into the top center groove on the front handle, and then snap the clip around the front handle. The strap is clipped between the front handle clip and the pin in the rear handle at the top.

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

Battery Instructions

General : The SPY® battery is a completely sealed, rechargeable 12 volt unit. It can be used in any position and under most conditions.

To Charge The Battery :

Slide the charger onto the battery as far as possible. The charger will have an amber LED on while charging. This LED will be green when charged. A discharged battery requires 4-8 hours to fully charge.

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.

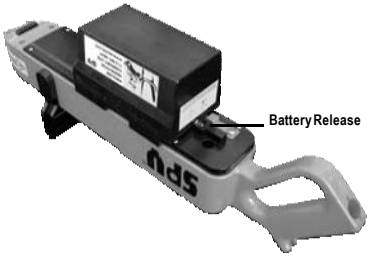
It is recommended that the battery be recharged as soon as possible after use.

Do not disconnect the charge power cord while the battery is attached.

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 REMOVAL:
Press the release (orange part) on the base plate (black part) and push the battery away from the rear handle.

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

EC Declaration of Conformity

Manufacturer of Equipment:
Pipeline Inspection Co. Ltd.

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 780, 785, 790 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 off.

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.

Warranty

Pipeline Inspection Co., Ltd., hereafter referred to as (SPY®) warrants that SPY®, Model 780/785/790 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 designers, 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).

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