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

PRODUCT INSTRUCTIONS

Model XL-2 - Fluid Leak Detector

Model XL-2 Includes:

(A) Instrument

All controls and connections are made with the instrument, using the control panel. The instrument is housed in a rugged outdoor use thermoplastic resin case. It is water tight, has a latching lid, and can be locked. The case also has a storage area to hold accessories. The Panel and Controls are explained in more detail in Section 2 – Control Panel.

(B) Pickup w/ Cable

The Pickup is the sensor microphone which is set on the ground surface to pick up the acoustic signals of the leak. It has three small spike feet to help make good contact with most surfaces. It is designed to be moved to locate the strongest acoustic signal. More on the Pickup is explained later in Section 3 – Operation

(C) Probe spike

The probe spike is an additional part of the Pickup which can be screwed into the bottom of the Pickup sensor to enhance the signals reception. The probe is used when the ground cover is soft dirt, or turf and the probe can be pushed into the ground. It can also be used to make direct contact with the pipe.

(D) 9v Battery (Installed, not shown)

A common 9v battery operates the XL-2 instrument. There is a battery holder on the panel which can slide up and out, making battery changes simple. More on the battery in Section 6 – Servicing.

(E) Headphones

The included headphones are over ear style headphones, designed for comfort and to assist in blocking out environmental noises and distractions. The headphones are specific to the XL-2. More on headphones is explained later in Section 2 - Components.

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(F) Instructions (Not Shown)

These instructions are shipped with each new XL-2 instrument. Instructions can also be downloaded for the Detectron website: www.detectron.com, or by contacting Tinker & Rasor.

(G) Warranty Card/Calibration Statement (Not Shown)

The XL-2 comes with a limited 1-year manufacturer warranty against defects in manufacturing. If you experience problems with the XL-2 instrument, first contact Tinker & Rasor for technical assistance by calling our offices, or e-mailing: info@tinker-rasor.com.

1. UNPACKING

Note the various components included with the instrument and store them in the same location when not in use. When unpacking the instrument, ensure all items have been received. If there is any damage to the shipping carton, you may need to make a claim with the carrier. The included 9v battery is installed in the instrument.
Locate the warranty card and follow directions to register your product online.

2. COMPONENTS

Control Panel

The XL-2 Control Panel is the main interface to control the features and performance of the instrument.

Figure 2 Control Panel

Power

The XL-2 instrument is powered On and Off by a toggle switch, located in the upper Left corner of the Control Panel. When powered On, the LCD display will show and briefly display full bars. When turned Off, the XL-2 is disconnected from the 9v power source and can be stored indefinitely. If the unit is to be stored for a longer period, > 6 months, the 9v battery should be removed from the instrument. See more on the Battery, below.

Battery

The XL-2 is powered by a single 9v battery. The common 9v battery is easy to find and replace, and the instrument does not require any charging. It will always be ready to use when you need it.

The Batt Test button should be used periodically to ensure the battery is in good condition. When using the Batt Test button, ensure that the headphones and Pickup are both plugged into the instrument. When the battery is too low, the LCD will fade out.

Figure 3 Battery Holder

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Filter

The XL-2 has an 11-position filter switch. The filter is used to accentuate the sound of the leak while lessening or removing other environmental sounds. This lets the user focus in on just the sound of the leak. It is suggested to always start with no filter selected by pointing the switch straight down at the six o'clock position. When a leak is heard and sensitivity has been adjusted you can begin selecting filters. More on the use of the Filter is explained later is Section 3 – Operation

Figure 4 Filter Selector Switch

LCD

The main LCD display shows a digital representation of an analog swing meter. The meter displays a series of dark lines from Left to Right. As these lines move to the Right of the display, they are indicating more acoustic signal being received. The display is meant to mimic or be the visual representation of the intensity of the audible signal being received by the headphones. The LCD will flash to indicate a low battery voltage.

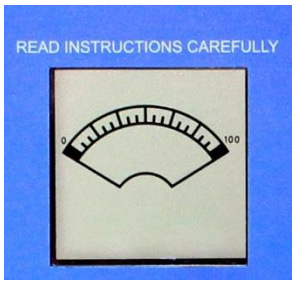

Figure 5 LCD Display

Batt Test

The panel of the XL-2 includes a momentary button to test the battery. When this button is pushed, the LCD display changes to show the battery level, and is no longer displaying signal intensity. When the button is released, the LCD goes back to signal intensity. This button only functions when held down. The performance of the instrument can be affected by low battery voltage.

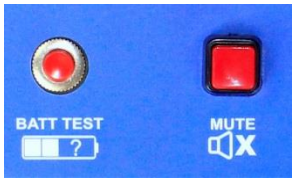

Figure 6 Batt Test & Mute

Mute

The Red Mute button is a latching switch. When depressed and released, the mute feature is on and the audible signal to the headphones is cut off. Pushing and releasing the button again will turn the mute feature off.

Pickup Connector

The Pickup connects to the XL-2 panel at the Pickup connector. The Pickup connector has a cover to keep water and debris out of the instrument when the Pickup is not connected. The cover is rotated to allow the Pickup cable connector to mate with the instrument panel. The Pickup cable has a 3-pin connector. It is pushed into the panel Pickup Connector firmly and should be pushed down until it stops, ensuring a good connection.

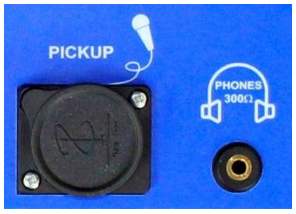

Figure 7 Pickup & Headphones Connection

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Headphone Jack

The headphones connect to the panel at the headphone jack. This connector is a standard 3.5mm headphone jack, and will accept a wide variety of headphones.

The headphones included with the XL-2 are specifically designed for use with the instrument and have an impedance of 300 Ohms (each ear piece), which make them a superior choice for this application. Use of other impedance headphones is not suggested, and will likely result in poorer performance than the using the included headset.
Headphones have a standard fit adjustment for each ear piece and also have a volume control adjustment on one side.

Figure 8 Headphones

Sensitivity – Coarse

The Coarse Sensitivity adjustment switch can be rotated between three options: Low (L), Medium (M) and High (H). More on the use of the Sensitivity controls later in Section 3 – Operation

Figure 9 Sensitivity Controls

Sensitivity – Fine

The Fine Sensitivity adjustment switch is rotated from 0 to 100 to increase the sensitivity of the Pickup signal. More on the use of the Sensitivity controls later in Section 3 – Operation

Storage

The XL-2 control panel is bent to allow for in-case storage of accessories such as the Pickup and Probe.

Pickup

The pickup sensor is made up of the main pickup body, the attached cable and the optional probe. The probe can be screwed into the pickup body. More on the pickup and probe in Section 3 – Operation

Figure 10 Pickup & Probe.

3. OPERATION

Setup in the area where you will begin the leak detection.

- Open the case and make the connection of the Pickup cable to the control panel.
- Screw the Probe spike into the Pickup, if it is to be used.
- Place the Pickup on the ground area where you will begin detecting.
- Connect the headphones to the headphone jack on the panel
- Turn the XL-2 On by moving the toggle switch up to Power On.
- Note the LCD becomes active. Push the Batt Test button to ensure good battery condition.

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- Rotate the Filter switch all the way counter-clockwise so that the knob is pointing down, towards the six o'clock position. No filter selected.
- Rotate the Coarse Sensitivity switch counter-clockwise to position L.
- Rotate the Fine Sensitivity switch counter-clockwise to position 0.
- Put on the headphones. You should immediately note the sounds from the Pickup.
- Press the Mute button to disengage the headphones.

NOTE: As you move the Pickup from one location to the next, it is suggested that you mute, in case the very sensitive Pickup is bumped or banged into something creating a very loud condition in the headphones.

You are ready to begin the leak detection survey.

With the Pickup placed on the surface to be investigated, begin to adjust the "COARSE" and "FINE SENSITIVITY" controls. Starting at the COARSE setting L, adjust the FINE setting knob clockwise. If leak is not heard, or is not loud, move COARSE setting to M, and start FINE setting at 0 again. If necessary, move COARSE to H, and adjust FINE from 0 again. Move the sensitivity controls until the meter indicates somewhere in the upper two-thirds of its scale and note the sounds heard in the headphones. If a leak is heard, the filter switch may be rotated to a position which accentuates the leak and reduces background noise. Filters 1 through 11.

When moving the Pickup or during periods of excessively high background noise, it is possible to mute the detector without disturbing the sensitivity controls by pushing the MUTE button on the control panel.

When listening for sounds on an exposed pipe, screw the pointed probe into the bottom of the Pickup and hold the point firmly against the pipe. Underground leaks can often be detected more easily by pushing the pointed probe into the ground. When listening for leaks on flat surfaces, the probe is removed, and the Pickup is placed on the surface with the three spikes supporting it.

It is possible to familiarize oneself with the sound of a water leak by listening on a water line and slowly turning on a faucet so that a small amount of water is discharging from it. By alternately turning the water "on" and "off" the characteristic high-pitched hissing sound can be heard and distinguished from other sounds on the line.

4. LEAK DETECTION METHODS

The general locality of the water leak may be indicated by a metered loss, damp spots, or surface water. Since water from an underground leak usually travels a considerable distance before appearing at the surface its presence usually only indicates the general area of a leak.

To narrow down the search for the leak, take readings with the leak detector on all exposed portions of the system (fireplugs, meter boxes, valves) in the suspected area. When taking

comparative readings with a leak detector, all readings must be made to the same reference level if accurate results are to be obtained. After the first reading is taken and the sensitivity controls have been initially set, subsequent readings should be taken without re-adjusting the sensitivity settings, so that the deflection of the meter will give a true indication of relative sound intensities.

Another method of taking comparative readings is to adjust the "FINE SENSITIVITY" control until some particular meter reading (say one-half scale) is obtained. Record the position of the sensitivity control required at each location to give the same meter indication. If more sensitivity is required at a subsequent location, the leak sound is weaker, and if less sensitivity is required, the leak sound is greater.

After determining the specific area of the leak from readings taken on exposed portions of the system, the next step is to pinpoint the leak. First, mark the course of the pipeline including all laterals and services using a Detectron Model 505 "Go-Fer" Pipe & Cable Locator. Take readings every few feet along the course of the suspected pipeline by placing the pickup on the surface directly over the pipe and record the sound intensity. Correlation of these readings will indicate the exact location of the leak.

5. OPERATING SUGGESTIONS

1. Protect the pickup and its cable from wind. Wind noise is likely to mask the sound of a leak.

2. Use systematic approach to leak locating. Always know the exact location of the suspected pipeline.

3. Become familiar with the sound produced by a water leak by experimenting with known leaks.

4. Whenever possible, use the same personnel for leak detection work. Experience is a great aid to efficient leak locating.

5. When the leak sound has been located on the main, be sure to check for unknown laterals which may have leaks.

6. SERVICING

To replace battery, slide the battery holder up and out of the control panel. To open the battery holder, insert a finger nail or small standard screwdriver into the slot opening near the bottom of the battery holder. Push the holder up towards the Detectron logo and lift up and away from panel. The battery holder and 9v battery will come completely away from the instrument, with no wires attached. Replace the 9v battery and pay close attention to polarity. The battery holder has a large opening and a small opening. Ensure that the battery contacts match the size of the openings.

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All 9v batteries are not equal in energy and performance. 9v batteries can range from 400 mAh to 1200 mAh and the performance of the XL-2 will match the battery installed in length of battery life. Rechargeable 9v batteries are not recommended for use in the XL-2.

If the detector fails to operate properly, be sure all controls are set to the proper positions. Make sure the mute button is not set. Ensure the headphones and pickup are connected. Check the connections for faults or breaks.

7. SHIPPING INSTRUCTIONS

All instruments being returned for repair should be sent PREPAID to the address below:

Tinker & Rasor
ATTN: Repairs
2828 FM 758
New Braunfels, TX 78130

Include with shipment information the nature of the problem, purchase order, serial number and return delivery address and phone and fax numbers.

A fill and print repair form is available on the Tinker & Rasor website: www.tinker-rasor.com

Look for the link to Repairs under the Contact Us menu.

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Model XL-2 Parts List

QTY	Part Number	Description
01	085-165	Instrument, XL-2, with battery
01	010-007	Battery, 9v
01	122-001	Pickup, with cable and probe
01	118-001	Probe, 7” spike for XL-2
03	073-017	Spike, small, dirt. For XL-2 pickup
01	115-004	Headphones, 300 Ohm impedance, 3.5mm with ¼” adapter