RYCOM®
instruments, inc.

LD - 8000

Acustic Leak Detector User's Manual

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Table of Contents

General Information

Introduction 3
- Part List 3
- Functinal Introduction 3
- Instrument Components 3
- Technical Parameters 3
- Standard Set 4

Components 5
- Operating Panel. 5
- Profile Interfaces 6
- Ground Sensor and Its Connection 6
- Headphone. 7
- Battery Compartment and Charger 8

Operation. 9
- Relevant Concepts 9
- Connection of Headphone and Ground Sensor 9
- Turn On Power 9-10
- Preliminary Locating Operation. 10
- Accurate Locating Operation 11

Service Guarantees 11

Introduction

Congratulations on the purchase of your new LD-8000 Acustic Leak Detector. The LD-8000 is specially designed to listen for leak in buried pressurized lines. Please feel free to contact RYCOM with any questions or concerns.

DISCLAIMER OF LIABILITY

MANUFACTURER SHALL NOT BE LIABLE TO DISTRIBUTOR, RESELLER, OR ANY OTHER PERSON FOR ANY INCIDENTAL, INDIRECT, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, OR INJURY OF ANY TYPE WHATSOEVER, AND CAUSED DIRECTLY OR INDIRECTLY BY PRODUCTS SOLD OR SUPPLIED BY RYCOM INSTRUMENTS.

Part List

Transceiver	1
Ground Sensor	1
Probe	1
Probe Rods	2 stainless steel stick for 1 pair
Headphone	1
Charger	1
Spare batteries	1 (7.2V NI-MH rechargeable battery group)
User's Manual	1
Warrenty Card	1
Portable Instrument Case	1

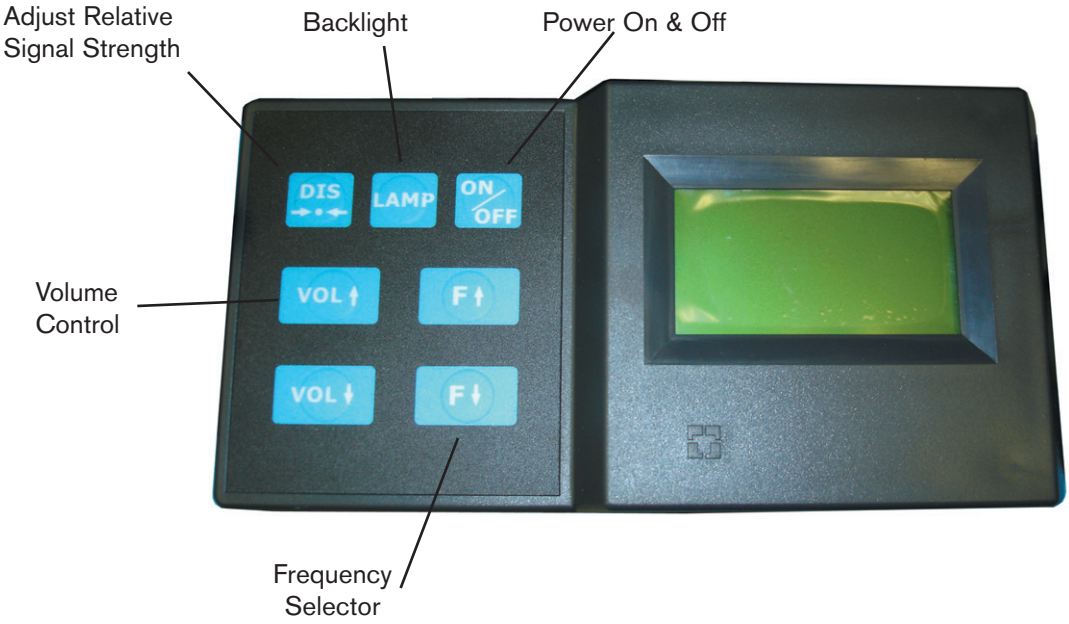
Functional Introduction

LD8000 Water Leak Detector is a state of the art leak detector designed specifically to meet the demanding needs of the professional leak hunters. It is specialized to locate and pinpoint leaks in a water pipe, or pressurized pipe. It utilizes the principle that the liquid flow or gas inside a pipe generates a vibration at leaking spots due to pressure change. The vibration radiates along the pipe to the ground or media (earth, concrete, etc). The detector receives the radiating signals and applies an advanced noise filtering technology using digital wave filter chip to reduce the unwanted noises and interferences (e.g.: foot steps and traffic noises, etc.) in the testing environment to maximize the quality and accuracy of leak detection.

Components

The transceiver housing shell is made of ABS engineering plastic with dimension of 220′110′80mm. The transceiver consists of an operating panel on the left, a LCD display panel on the right, a profile interface that contains 7-pin ground sensor jack, headphone jack, and charger jack on the side, and the battery compartment on the back.

Instrument Controls and Indicators



Operation

The theory of locating and orientating of leak is to compare Strength difference between leakage vibration and ground vibration. The leakage vibration could be indicated via headphone and Strength indicator on the LCD Panel of transceiver. (Informations) Information could be heard of: tone, rhythm and vibrating strength; Human ears have a worse sensitivity in sound strength than tone, especially long time listening would cause hearing fatigue. The strength indicator could precisely indicate changing vibration strength, but it is not sensitive to other information. Combining listening and hearing can effectively increase detecting result.

Relevant Concepts

For the purpose of better detecting result, relevant concepts and information should be aware beside the instrument performance.

Pipeline

Pipeline material, soil condition, Buried depth of pipeline, Pipe direction, Pressure inside the pipeline, Valve position, Water meter position, Branch position and pipeline turning, etc. Iron or steel pipeline is easy to conduct vibration; they are ideal materials for detection. PVC and PE plastic are hard to conduct vibration. Thick soil is easy to conduct vibration; loose soil is hard to conduct vibration. The vibration is weaker as the pipeline buried deeper. Only with correct direction of pipeline and positioning probe right above pipeline, leakage could be detected accurately. Beside the resources from original pipeline blueprint, more often direction of pipeline is detected by using pipeline detector. As the pressure of pipeline is high, the sound of leakage is sharp, vibration is obvious; as the pressure of pipeline is low, the sound of leakage is dull, and vibration is weak. Acquiring valve position and water meter position as measurement point and reference point, acquiring branch position and pipeline turning is convenient to distinguish leakage vibration cased by normal liquid flow; it could avoid confusion of those points to real leak age.

Environmental Noise

All sounds except leakage vibration are considered to be environmental noise. Environmental noise interfered detection towards leakage, excessive environmental noise would cause non-accuracy or failure of detection. To avoid interference of environmental noise, night or morning is preferable working time.

Environmental noise mainly includes: (1) footfall, (2) vehicles engine noise, (3) wind, (4) nearby machinery noise, (5) water meter, (6) water flow vibration in the valve, (7) vibration while liquid flow through turning corner and branching of pipeline, (8) resonance at turning corner and branch corner caused by leakage etc.. While examples (1)(2)(3)(4) have distinct characteristics, and are easy to distinguish, (5)(6)(7)(8) are not easy to distinguish, and requires more professional experience.

Adjustment of frequency channel

There are six frequency channels, A B C D E F; each channel corresponds to different center frequency. The purpose of adjusting frequency channel is to restrain environmental noise and stress leak vibration.

Volume Adjustment

Suitable volume is important. High volume is not easy to distinguish changes and might cause hearing fatigue. Put the volume to critical point would be easier to orientate leak.

Corresponding centre frequency

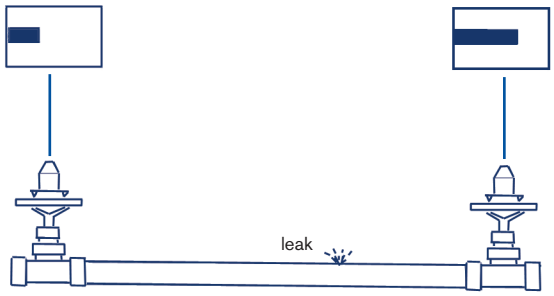
A: 100HZ B: 200HZ C: 300HZ D: 500HZ E: 800HZ F: 1200HZ

Operating Instructions

Preliminary Locating

Preliminary locating is used to find the probable scope of leakage. Choose exposed point of pipe (water meter, valve, etc) is good approach for preliminary locating. The probe could obtain manifest information. Probe should be placed right above pipeline if no exposed point is available. Probe must closely contact to ground.

1. Put volume to low before place probe to suspecting location.
2. Press "mute" and adjust volume properly after placed probe.
3. Press "DIS" if bar graph overflowed.
4. Adjust frequency channel to locate possible leak position.
5. Adjust volume and display properly
6. Wait until display stable, record the leakage strength at this position
7. Do not change volume and display under following detection procedure
8. Change to another suspecting position, repeat step 6

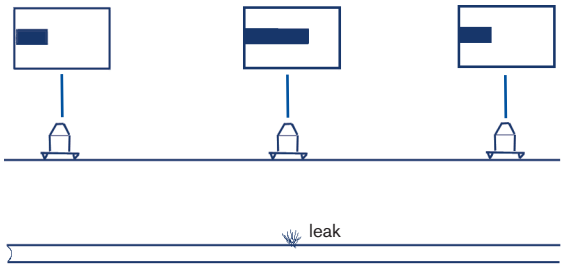


Precise Locating Operation

Precise Locating is a procedure of comparison, measure iteratively and compare difference, find the loudest position at last. Walk along suspicious pipeline, place probe close to ground:

1. Put volume low before place probe to suspecting position
2. Press "mute" and adjust volume properly after placed probe.
3. Press "DIS" if bar graph overflowed.
4. Adjust frequency channel, find the probable position of leakage.
5. Adjust volume and bar graph display properly
6. Wait until display stable, record the leakage strength at this position (Do not change volume and display under following detection procedure)
7. Move forward half meter along pipe, place probe, repeat step 6.
8. While detecting along pipe, if sound change from rise to fall and then fall to rise, find the point with highest sound, suspicious leak is the point with highest sound around this position.
9. Several positions might be suspicious when detecting pipeline, beware branch point and pipeline turning. Beside branch point and pipeline turning, hole in the ground might cause sharp sound.
10. To check leakage under high-level pavement, hollow out on suspicious position, insert in vibration conducting pole, result may be more accurate.

In obvious cases, use Precise Locating operation directly.



Technical Specifications

LD- 8000	
Dynamic Magnifying Range	120dB adjustable
Frequency Analysis Scope	50 ~ 4000 HZ
Display Mode	Singal horizontal bar display
Displaying Monitor	128x 60 single color display
LCD Panel Backlight	Controllable & automatic shut-off
Power Supply	7.2V NI-MH rechareable batteries
Dimensions	515 x 320 x 150 (L′W′D) mm
Weight	5.6 kg Tranceiver w/ batteries 0.9 kg
Working Temperature	-10°C ~ +50°C
Continuous Battery Life	35 hrs (with backlight off) 10 hrs (with backlight on)

FACTORY SERVICE

The RYCOM LD-8000 was designed for dependable operation with recommended yearly adjustment or calibration. If, however, your LD-8000 Series is not working properly, first call the factory to receive an RMA number, then return it to the factory for repair. Send it prepaid to:

RYCOM Instruments, Inc.
9351 East 59th Street
Raytown, Missouri 64133 USA
816.353.2100 or 800.851.7347
Fax: 816.353.5050

We will repair and ship the instrument back within 10 working days, or advise you if the instrument is unrepairable.

Note: There is a minimum charge for repair and handling.

When shipping your LD-8000 **back for service be sure to include your RMA number.**

Packing Instructions

Remove all batteries, and place the unit in the original shipping carton, or equivalent sturdy container. Add packing material around all sides of the unit. Seal the shipping container with strong tape. Mark the shipping container: **FRAGILE ELECTRONIC EQUIPMENT**

Warranty

THIS INSTRUMENT IS UNDER WARRANTY FOR ONE YEAR FROM THE DATE OF DELIVERY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP **(EXCEPT BATTERIES)**. WE WILL REPAIR OR REPLACE PRODUCTS THAT PROVE TO BE DEFECTIVE DURING WARRANTY PERIOD.

THIS WARRANTY IS VOID IF, AFTER HAVING RECEIVED THE INSTRUMENT IN GOOD CONDITION, IT IS SUBJECTED TO ABUSE, UNAUTHORIZED ALTERATIONS OR CASUAL REPAIR.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. THE WARRANTY DESCRIBED IN THE PARAGRAPH SHALL BE IN LIEU OF ANY OTHER WARRANTY, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE ARE NOT LIABLE FOR CONSEQUENTIAL DAMAGES.