User manual

LEADER Volt

FR Lire ce manuel avec attention, avant la première utilisation

EN Read this manual carefully, before the first use

ES Leer este manual con atención, antes de la primera utilización

LEADER Volt - AC Voltage detector

1. Warnings

Read this manual before using the AC Leader Volt.
Always use extreme caution when approaching areas where live voltages may be present.
Failure to follow directions in this manual or to observe safe operating procedures can cause severe injury or death.
- Always start using the HIGH SENSITIVITY SETTING.
- Observe the function of LED and beeper during the 3 second self-test.
- Treat all wires as voltage carrying. You will not be warned of DC voltages or live wires which are fully shielded.

Nearby exposed AC voltages may not be indicated in the FRONT FOCUSED MODE because of greatly reduced sensitivity.

2. Description

The AC Leader Volt consists of a high sensitivity AC amplifier for the frequency range below 100 Hz. The special logarithmic amplifier is capable of receiving AC signals over a very wide amplitude range. Such signals, emanating from an unshielded, voltage-carrying surface, are made audible and visible as a warning.
The warning signals (beeps and LED flashes) will increase as the signal amplitude increases. This makes it possible to locate the source of the signal quickly.
Turning the plastic ring at the front—referred to subsequently as the MODE switch—turns the unit on and off and provides 3 sensitivity settings. Each of the four settings click into position. A small magnet in the ring actuates magnetic reed switches inside the plastic pipe.
The HIGH SENSITIVITY SETTING allows the detection of AC from the greatest distance.
In the LOW SENSITIVITY SETTING, the overall sensitivity is reduced. This aids in detecting the source of the signal.
Finally, the FRONT FOCUSED MODE allows pinpointing a source. In this mode a small sensor in the front is shielded from signals coming from the sides. This makes the unit directional and the influence of e.g. high voltage wires overhead is greatly reduced. The unit features a complete self-test circuit: Immediately after turn-on a built-in low frequency oscillator will operate for about 3 seconds simulating power line signals. This provides a separate test signal to the input. Rapid beeping indicates proper operation of the set.
A low voltage watchdog circuit monitors the built-in batteries. It will make the unit beep continuously and prevent its use in case of weak batteries. The set does not require warm-up and is operational about 10 seconds after turn-on. In normal use with intermittent operation, a set of alkaline batteries will typically provide one year of service. If left on continuously, the batteries will run down in about 300 hours. In order to assure operation and to prevent battery leakage, the batteries should be changed annually.
The electronic circuitry and the batteries are carried on a printed circuit board housed in a sturdy, fully insulating plastic pipe. The set is splash water-proof. It has been designed to be intrinsically safe for operation in potentially explosive atmospheres. After unscrewing the lanyard screw, the batteries can be removed and changed.

3. Basic Operation

Hold the AC Leader Volt by the grip at the lanyard end. The red striped area in the front indicates the sensing section.
Turn unit on: Rotate the ring of the mode switch in the direction of the arrow to the HIGH SENSITIVITY SETTING.
Allow the unit to self-test as follows - After turning switch to HIGH SENSITIVITY wait for completion of the self-test cycle (at least 3 seconds).
- LISTEN for beeping and look for flashing light.
- DO NOT USE unit if there is no beeping, or no flashing light, or it puts out a steady tone or if the unit chirps and/or goes through self-test when tapped.

After the self-test has stopped, move the AC Leader Volt around slowly.

Continue to use the HIGH SENSITIVITY SETTING until the general location and direction of unshielded AC voltage is determined.
As the AC Leader Volt is brought closer to exposed area AC, the unit will start to beep and the LED to flash.
Beeping and LED flashing will become more rapidly as the sensing section is brought closer to the source.
The unit may beep occasionally even when no AC is around. This is normal and frequently occurs while the stick is in motion and/or touching leaves. It can be caused by electrostatic charges or other fields. Hold unit still while checking.
The higher you hold the unit (or the higher the wires are above ground) the earlier a source can be detected.
Once AC has been clearly detected and the AC Leader Volt beeps rapidly, select as needed the LOW SENSITIVITY or the FRONT FOCUSED MODE to pinpoint the sources.

WARNING: In the FRONT FOCUSED MODE the unit will pick up signals mainly from the front tip end. Do not use this mode when starting a search. The sensitivity is greatly reduced and the set will no longer pick up signals from certain distances and directions.
Extreme caution must be exercised to prevent inadvertent contact with live wires which may not be detectable in these modes, especially if multiple live wires may be present.
Do not contact conductors with unit. Do not place unit in liquid.

4. Sensitivity/Range

Aside from the mode switch a number of factors will influence the distance between the first signal indication generated by the AC Leader Volt and a dangerous AC voltage source. The detection range/ sensitivity will be different depending on a number of factors:
1. The AC Voltage signal amplitude which is present will affect the distance at which the first warning will occur. The higher the voltage, the earlier the warning.
2. The physical size of the conductor, length, height of voltage carrying material will affect the distance at which the first warning will occur. A car contacting AC will be detected much earlier than a short piece of wire.
3. The height of the LEADER Volt above ground as well as the height of the signal source will affect the distance between AC source and point of first warning indicated on the Leader Volt. The higher the LEADER Volt is held above the ground, the further it will “see,” the wider its horizon will be. The range of a LEADER Volt lying on the ground is very limited.
The same holds true for wires strung in the air compared to wires lying on the ground. Wires high above the ground will be noticed from a much greater distance than wires on the ground.
4. Shielding: If AC conductors are fully enclosed in grounded metal shielding, they are safe and will generate no indication on the Leader Volt, unless they radiate strong magnetic AC fields e.g. transformers or ballasts for fluorescent lights. Metal doors or plates may prevent AC fields from emanating. However if the metal parts are in electrical contact or very close to an AC power source the LEADER Volt will indicate the presence of AC potential.
Some shielding is also provided through wet leaves, brush and trees. They will reduce the range. However, if a tree or a water puddle is on AC potential, the LEADER Volt will give proper warning from a safe distance.

5. Dangers

The user should **exercise extreme caution** at all times when approaching areas where live voltage may be present, while trying to detect live voltage (with or without the use of the AC Leader Volt) and in taking action after detection of the live voltage. Failure to exercise extreme caution or to use the AC Leader Volt in strict accordance with the directions in this manual can result in **severe injury or death.**
One of the greatest dangers to rescuers comes from sudden reapplication of AC voltage after the high tension wires were disconnected through safety/fusing circuits. These **automatic retries** are computer programmed and will try to reconnect AC voltage after a short. There are no firm rules at what interval and frequency these automatic retries will occur. They usually cease after 3 or 4 retries in the first minutes after a short.
The rescuers must make sure that in case wires have been found, the power company has actually disconnected that section of their circuit.
Downed wires should always be treated as if they were voltage-carrying. Only the power companies have qualified personnel to ground out circuits and to assure their safe handling. The AC Leader Volt does not warn of hazards from DC (Subways, car batteries).

The AC Leader Volt also does not warn of shielded AC voltages. Extreme caution should be exercised to avoid inadvertent contact with live voltage which may be shielded from detection by the AC Leader Volt but which may nevertheless be subject to contact because the shielding can be moved or reached around. Extreme caution also should be exercised when using the AC Leader Volt in areas where multiple live voltages may be present. In such situations, care must be taken, especially when using the LOW SENSITIVITY or FRONT FOCUSED MODE, to avoid inadvertent contact with one source while pinpointing another source.

High Voltages
The electronic circuits of the AC Leader Volt are protected against electrical overload. All conducting parts are encased in insulating material in order to protect the user in case of accidental contact with a live wire. The PVC housing has a wall thickness in excess of 3mm.
Considering that 100% polyvinyl-chloride provides a dielectric strength of 400 Volts per mil at 25 degree Celsius the wall thickness of 0.125" would theoretically be able to withstand voltages up to 50,000 Volts. However, avoid contacting wires which may carry high voltages. The surface of the AC Leader Volt may be wet or contaminated. For safety reasons keep the unit clean and dry. Keep a safety distance of at least 9 feet (2.7 meters) from all unguarded live parts suspected of voltages in excess of 601 Volts.

6. Typical Use

Note: Always select the **HIGH SENSITIVITY** SETTING to start.

A. Site Assessment: Hold the AC Leader Volt on the lanyard end and move it sideways and up and down, moving slowly forward. Observe the LED and listen to any beep. If a signal is noted, hold still. If it persists, try to find the direction from where the signal comes.
The signal will increase, meaning the AC Leader Volt will beep more and more frequently as the AC Leader Volt is brought closer to the AC voltage source. Reduce the sensitivity or switch to **FRONT FOCUSED** mode when needed to better pinpoint in on the source.

B. Vehicular Accidents: When a vehicle has struck a pole, transformer, building, traffic light or other unknown structure, the AC Leader Volt should always be used to verify that the vehicle, guywires, fences or other sections around it are not voltage-carrying. If there is any suspicion of AC voltage being present, make sure the power company has taken steps to assure power disconnect in the area. Be especially aware of the dangers of automatic retries. Use the AC Leader Volt to determine if wire fences, guywires are truly without power and danger.

C. Swimming Pools: A frequent cause for electrocution is defective swimming pool lights or electric appliances which have fallen into a swimming pool. Even if there is no visible indication that this may have happened, use the AC Leader Volt to verify that no dangerous AC potential exists prior to removing a victim from a pool.
WARNING: Do not contact water in and around the pool with your body or with the unit when checking to determine that no AC potential exists.

D. Night Searches: Searches conducted during the night, especially when severe wind or ice storms may have damaged trees and subsequently power lines, the AC LEADER Volt can be used successfully. Search or rescue operations can verify that no dangerous AC signals exist in the path of the rescuers or on the site to be searched. Cases have been reported where highway wire fences carried dangerous AC voltages caused by downed wires from several miles away, creating extreme hazard to responders.

E. Building Collapses: Collapsed buildings in the aftermath of explosions, earthquakes or storms may still be connected to power lines through underground or secondary circuits. The site should be checked out for the presence of AC voltages prior to any rescue operations especially in confined space.

F. Fires: In case of fires, disconnection of the AC can be verified. Dangerous high tension wires can be identified with the AC Leader Volt.

G. Clean-up Operations: Significant danger from AC voltages exists for rescue workers or helpers doing clean-up operations from so-called backfeeding of power lines from auxiliary generators used as emergency power supplies.

7. Standard Operating Procedures

It is important that the AC Leader Volt is incorporated into the available tool arsenal with proper standard operating procedures. Good, safe operating procedures should be established. The training should point out the dangers of intermittent contacts and automatic retries and avoid giving the rescuer the incorrect impression of absolute safety. The AC Leader Volt is a highly sensitive warning device, but is not a measuring tool and certainly not a replacement for good, safe operating procedures.
Use the AC Leader Volt to
- Find voltages you did not expect
- Confirm proper power disconnect
- Monitor power shut down

8. Battery Change

Batteries 4
Type . . . . . standard AA Alkaline, NEDA 15A
. . . . . Duracell MN 1500 or equivalent
Life . . . . . typical usage: 1 year
. . . . . continuous use: 300 hours

To change batteries:
Select a clean, dry area.
Place the AC Leader Volt flat on the table.
Unscrew the knurled lanyard screw. The gray end cap, which contains the beeper, is spring loaded and may push out as the screw is removed.
Note the polarity and location of the batteries. See Fig. 1.
Lift up the front of the AC Leader Volt and let the batteries slide out.
Always wipe clean the terminal of new or used batteries.
Hold the AC Leader Volt horizontally and slide in the fresh batteries. Do not drop the batteries. Their positive terminals are soft.
Replace the end-cap carefully. Note the position of the insert for the lanyard screw. It needs to line up with the hole in the housing.
Hold the stick vertically and push the end-cap fully in. Tighten the lanyard screw.
Check operation. If self-test does not work or continuous tone is heard, recheck direction of the batteries installed.

Low Battery Indication:
Your AC Leader Volt is equipped with a low battery watchdog circuit. If the battery voltage drops below approximately 4.8 V, the AC Leader Volt will emit a constant tone until the batteries are fully exhausted. This prevents the use of the AC Leader Volt when batteries are old or installed incorrectly.

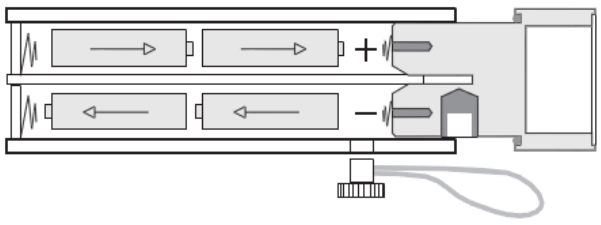

Figure 1

9. In Case of Difficulties

	Problem	Cause	Remedy
1	Keeps on beeping	AC near-by	Move AC Leader Volt away from AC sources
2	Unit “chirps” or goes through self-test when tapped	Batteries make poor contact	1. Clean battery terminals 2. If needed change batteries 3. Return for service if persisting
3	Steady tone	Low batteries One battery reversed	1. Change batteries 2. Check polarities
4	Slow self-test low sensitivity	Water inside housing	Remove end-cap and batteries Store in warm (38°C - 100°F) dry area for 48 hours
5	LED light OFF and no tone	1. Run-down batteries 2. Batteries installed incorrectly 3. Unit defective	1. Change batteries 2. Reinstall batteries, observe polarity 3. Return to service center
6	LED light on but no tone (or vice versa)	Circuit failure Bad contact or defective beeper	Return to service center
7	Unit turns on in “OFF” position	Strong magnet near mode switch	Normal, move AC Leader Volt

10. Service

A. If you want to have the unit rechecked or the AC Leader Volt does not behave normally, contact your nearest service center

B. When contacting for service, make sure you have the serial number of the unit and the approximate date sold available. A brief description of the problem, the return address and a person’s name and phone number should accompany a returned unit.

11. Specifications

Sensitivity, externally switchable: . . . . . 3 settings

The detection range or sensitivity is defined as the distance between the AC Leader Volt and the wire conductor with the AC Leader Volt positioned for maximum indication. Signal “detection” shall be defined as a beeping rate of at least one indication every 2 seconds.

Typical Detection Distance in meters/(feet):

Voltage	Freq.	Setup	High Sensitivity	Low Sensitivity	Focused Setting
120 VAC	60 Hz	Single conductor (6’’ = 15cm above ground)	7.5m	1.5m	180mm
100 VAC	50 Hz	same	3.3m	0.6m	50 mm
220 VAC	50 Hz	same	7.5m	1.5m	180 mm

120 VAC	60 Hz	conductor laying on wet soil	0.9m	150mm	25mm
100 VAC	50 Hz	same	0.4m	60mm	10mm
220 VAC	50 Hz	same	0.9m	150mm	25mm
7.2 kV	60Hz	Overhead distribution line (single insulator)	65m	21m	6m
7.2 kV	50Hz	same	50m	15m	4m
46kV	60Hz	Overhead transmission line (several insulators)	150m	60m	20m
46kV	50Hz	same	120m	50m	15m

Signal Indication: audible (beep) and visual (LED).
beep rate will increase (or decrease) with proximity to conductor.
Frequency Range: AC voltages 20 Hz to 100 Hz
Self-Test built-in, 3-second self-test after turn-on.
Insulation PVC plastic housing.
Note: Direct contact with high tension wires should be avoided.

Safety designed intrinsically safe
Batteries 4AA alkaline batteries, NEDA 15A
Duracell MN1500 or equivalent
Battery Life: continuous use: 300 hours
typical use: 1 year
Battery Check built-in low voltage warning
Battery Change: requires removal of lanyard
Water Resistance: splash water-proof

Temperature Range:
Operating: −30 to 50 °C (−22 to □122 °F)
Storage & transport −40 to 70 °C (−40 to □158 °F)
Size: 45 mm (13⁄4″) diameter □□521 mm (201⁄2″) long
Weight, including batteries: 570 grams (1 lb. 4 oz.)

12. Ordering information

AC Leader Volt Ref D11.03.000
Includes padded pouch and 4AA alkaline batteries (installed)

13. Replaceable Parts

Padded Pouch 9005-0200.00
Lanyard 0820-0000.11
Manual 9005-0000.51
Batteries (4x AA Alkaline) purchase locally

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CERTIFIED ISO 9001 AB CERTIFICATION

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PLEASE RECYCLE

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ZN15.221.EN.1