

ACL 450B Ionized Environment Electrostatic Locator

OPERATION MANUAL



Meter is warranted for one year from the date of purchase on parts and labor.

Calibration is recommended every twelve months.

DESCRIPTION

The ACL 450B Ionized Environment Electrostatic Locator is a pocket-sized, non-contacting static meter which produces consistently accurate readings and is easy to use. The ACL 450B features:

- Drift-free accuracy even in ionized environments
- Range: $\pm 20\text{kV}$ @ 1 inch (25mm)
- Pulsing-beam range finder for always obtaining the correct 1-inch distance
- HOLD button to capture transient readings
- 0.375" (9.5mm) LCD Display

With the ACL 450B, accuracy is unquestioned. When the range finder LED beams form a non-pulsing circle, the meter is indicating that you have positioned the unit at the correct distance (1 inch) from the target for readings up to 20kV. To read higher voltage, use the greater distances given in *Specifications* section.



For locations where it is hard to read the meter's display, you can freeze the displayed number and then read it. Simply position the meter at the correct distance from the target and depress the pushbutton into the MEASUREMENT position. Depress again to the HOLD position to capture the measurement.

The ACL 450B's chopper-stabilized circuitry is immune to ionization so accuracy is assured in all environments. For long-term monitoring, the front panel output jack provides easy interfacing with a recorder, oscilloscope, or automated data acquisition system.

OPERATION

1. Power ON:

Slide the power switch to the ON position and verify activity on the display. The kV/Inch light will illuminate red when the meter is on, and the pushbutton is in the HOLD position.

With power ON, check the display. Battery low is indicated by all four decimal points illuminated. If low battery is indicated, replace the battery before use.



2. Ground Meter

Grounding (discharging) your body also discharges the instrument through its dissipative case. If you are not wearing a grounded wrist strap, discharge your body by touching a grounded metal object such as a water pipe, conduit, or workbench. The meter can also be grounded by attaching a ground cable to the snap on the back of the case and connecting the other end of the cable to a known ground.

3. Zero adjust the instrument

Once grounded, with unit ON, point the sensor plate away from any charged object and press the pushbutton so that it clicks into the lower MEASUREMENT position. Do not touch sensor, but point it toward a known grounded surface at 1 inch until the concentric ring forms. Alternatively point the sensor into free hand (this will shield the sensor from external fields). If the display does not read 0.00, adjust the ZERO knob until the display reads 0.00. Once set, the zero should not have to be reset unless the control has moved.



3. Set distance

For voltages between 19.99kV to +19.99kV, move the sensor plate of the instrument toward the target surface. When the instrument is the correct distance (1 inch) from the target, the projected range finder appears as a stationary concentric ring. To read voltages of 20 kV, use the distances and multiplying factors given under *Range* in *Specifications*.



4. MEASURE and HOLD

Once the meter is zeroed, point the sensor 1 inch from the object being measured. Depress the **MEASURE/HOLD** pushbutton so it releases to the upper **HOLD** position. This will freeze the reading and allows the operator to move the meter where it may be more easily read or saved for later reference.

In the **HOLD** position, the red LED will light. The analog output signal is also held. The concentric rings will no longer be projected. When the pushbutton is returned to the **MEASURE** position, concentric rings will be projected.

5. Turn the instrument OFF

Slide power button to the OFF position.

7. Display

If the numeral **1** appears on the left side of the 450B display, the meter's range of 20 kV per inch has been exceeded. When this occurs, move the meter farther away from the object and multiply the reading by the distance away from the object being measured. For example, if the meter is 2 inches (51mm) from a surface with a 30kV charge, the display will indicate 15kV.

The measurement accuracy is dependent on a stable ground reference and the measuring distance plus the aspect ratio that relates the size of the object to be measured to the measurement distance. This aspect ratio should be at least 4:1 for best accuracy, i.e., the surface should be at least a 4-inch (102mm) square when measuring at a 1-inch (25mm) distance.

CAUTION:

If you bring the instrument (or any grounded object) too close to a charged surface, an electrical arc may occur. To avoid this and take readings safely, check the voltage/distance ranges given in *Specifications*. Always bring the instrument toward a target surface from a distance of several inches. As the distance closes, watch the display to be sure that the proper distance is maintained for each voltage range.

SPECIFICATIONS

Display	LCD. 3½-digit numeric display, 0.375" digit height Displays measure voltage in kV when measurement distance is 1 inch
Range	-19.99 kV to +19.99 kV at a distance of 1 inch (25mm). Higher voltages may be measured at distances greater than 1 inch
Accuracy	±5%
Controls	ON/OFF slide switch MEASURE/HOLD pushbutton (latching push-ON/push-OFF) ZERO adjustment knob
Analog Output	2.5mm sub-miniature jack Scaling is 100mV per kV Full scale is -2V to +2V
Power	9V DC alkaline battery. Battery life in excess of 30 hours. Reversal protected
Size	2.4" W x 4.2" L x 1.3" D (61x107x33mm)
Weight	5 oz. (14.2g) with battery
Environmental	Operates at 0 – 50°C and 0 – 85% RH (non-condensing) Accuracy unaffected by air ionization

ACL 450B DISTANCE CHART

Distance	Reading	Multiply	Volts	kV	Test Field	Accuracy
1"	1.00		1000 v	1 kV	4"	5%
	10.0		10,000 v	10 kV		
	19.99		20,000 v	19 kV		
4"	1.00	2 x 1000	2000 v	2 kV	16"	10%
	10.0	2 x 10,000	20,000 v	20 kV		
	19	2 x 20,000	40,000 v	40 kV		

MAINTENANCE

Replacing the battery

When replacing battery, turn the power switch to the OFF position. Remove the battery before long-term storage. See Specifications for replacement type. If unit fails to operate after replacing the battery, turn power switch to OFF position, remove battery, press and release the MEASURE /HOLD button, then reconnect the battery.

Cleaning

To obtain accurate, drift-free readings, the sensor plate and especially the area **around the aperture** must be kept absolutely clean at all times. Be sure to always keep the instrument in its protective case when not actually taking measurements. **Never touch the aperture with anything – not even cotton swabs.** To remove dust or other particulate matter use low-pressure instrument-grade air. To remove severe contamination spray or flush with the smallest practical amounts of clean technical-grade isopropyl alcohol. Then stand the instrument on end and allow it to dry for several hours. **DO NOT** clean with any solvent on a regular basis.

CALIBRATION

The ACL 450B Ionized Environment Electrostatic Locator is factory-calibrated prior to shipment. Recalibration should be performed annually, or more frequently if specified by contract or company policy. Your instrument should also be recalibrated any time it has been repaired or tampered with. ACL will recalibrate your instrument at a reasonable cost or provide information and procedures on calibration upon request. We also offer calibration services with traceability to NIST (level 1) and with before and after data (level 2).

WARRANTY

ACL, Inc. warrants to the owners, each instrument and sub-assembly manufactured by them to be free from defects in material and workmanship for a period of one year after shipment from factory. This warranty is applicable to the original purchaser only. Liability under this warranty is limited to service, adjustment or replacement of defective parts (other than fuses or batteries) on any instrument or sub-assembly returned to the factory for this purpose, transportation charges prepaid. This warranty does not apply to instruments or sub-assemblies subjected to abuse, abnormal operating conditions, or unauthorized repair or modification. Since ACL, Inc. has no control over conditions of use; no warranty is made, or implied as to the suitability of our product for the customer's intended use.

RETURN POLICY TO FACTORY

Materials returned to ACL must have a Return Material Authorization number. To obtain a RMA number, contact our meter department at Customers have 30 days to determine that the product ordered fills their need and performs as described in ACL literature. Units returned for approved repair or credit must be in the original packaging including all parts and paperwork plus be in very good physical condition. If not, the customer is billed the cost to refurbish the unit and for missing accessories and merchandise. No products may be returned for exchange or credit after 12 months of the shipment date. ACL, Inc. reserves the right to repair or replace units under warranty.