

# ACL 350 Digital Static Locator

## OPERATION MANUAL



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

**Calibration is recommended every twelve months.**

## INTRODUCTION

The ACL 350 Digital Static Locator is a non-contact meter that indicates electrostatic field voltage and polarity on charged surfaces. This easy-to-use instrument comes equipped with a “Power On/Hold” button, a “Zero” button and a unique retractable one-inch spacer. The meter automatically shuts off after approximately 90 seconds. The unit's grounding path is through its conductive case, so there is often no need to wear a grounded wrist strap during normal operations. The easy-to-read 3-1/2 digit LCD automatically updates three times per second. Measurements are dependent upon the distance between the meter and the object being measured.



The accuracy of the ACL 350 is dependent upon three factors:

1. The instrument must be properly grounded and zeroed.
2. The distance from the front edge of the case to the target or surface under examination must be accurate and stable.
3. The target must be large relative to the measurement distance. The target should be at least 5" x 5" for true accuracy at 1".

## OPERATION

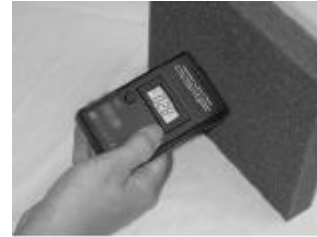
### STANDARD OPERATION

1. While holding the ACL 350 in one hand, discharge your body by touching a grounded conductive object.
  - a. The operator may wear a grounded wrist strap or place a grounded wrist strap cuff around the instrument case beneath the display and operating buttons.
  - b. The case of the instrument is conductive and is the reference for measurement.
2. Press the POWER ON/HOLD button and release
3. Face the static locator away from charged objects and press and release the ZERO button twice. Note that the display indicates 00.0 volts. Due to the tolerance and sensitivity of the sensor, the value may drift by 0.1 or 0.2. The sensor can pick up “noise” from fluorescent lights, electronics, and air movement.
4. Point the sensor plate toward the target and move to a point one inch from the surface to be measured. Thus, there should be a one-inch space between the front sensing end of the case and the target.



- a. Note the meter reading.
- b. To hold the reading, press and hold the PWR ON/HOLD button.
- c. A source with a negative polarity will show a minus (-) sign in the display. A positive source will display no sign.

**NOTE:** As you approach the target, if the indicated field strength begins to exceed 20kV at a distance greater than 1", **STOP!** This implies that the target voltage may be high enough to create an arc. Proceed with caution.



5. Repeat the procedure outlined above for additional measurements.
6. The instrument will automatically shut off after approximately 90 seconds from the time the PWR ON/HOLD button was last activated.

#### BASIC OPERATION WHILE USING THE ONE-INCH RETRACTABLE SPACER

The retractable spacer is provided to conveniently define the measurement space between the front sensing end of the instrument case and the measurement target. The spacer is made of a low charge-generating, somewhat insulative material. It is designed to avoid discharging the measurement target surface if touched by the spacer, and minimize influence of the electrostatic field measurement.

1. While holding the ACL 350 in one hand, discharge your body by touching a grounded conductive object.
  - a. The operator may wear a grounded wrist strap or place a grounded wrist strap cuff around the instrument case beneath the display and operating buttons.
  - b. The case of the instrument is conductive and is the reference for measurement.
2. Press the POWER ON/HOLD button and release.
3. Face the static locator away from charged objects and press and release the ZERO button twice. Note that the display indicates 00.0 volts.
4. Rotate the one-inch spacer 180° from its storage configuration, such that it extends beyond the front sensing end of the case and is on a parallel plane with the case.
5. If the display indicates a measurement other than 00.0, repeat the ZERO procedure above. This will compensate for any small charge on the spacer.
6. Point the sensor plate toward the target and move to a point one inch from the surface to be measured such that the spacer is virtually in contact with the target material. At this point, there is a one-inch space between the front sensing end of the case and the target.



- a. Note the meter reading.
- b. To hold the reading, press and hold the PWR ON/HOLD button.
- c. A source with a negative polarity will show a minus (-) sign in the display. A positive source will display no sign.

**NOTE:** As you approach the target, if the indicated field strength begins to exceed 20kV at a distance greater than 1", **STOP!** This implies that the target voltage may be high enough to create an arc. Proceed with caution.



7. Repeat the procedure outlined above for additional measurements.
8. The instrument will automatically shut off after approximately 90 seconds from the time the PWR ON/HOLD button was last activated.
9. To retract the spacer, rotate it 180° until it rests parallel to the case with its point toward the battery compartment.

#### OPERATION WHILE USING THE ONE-INCH SPACER AS A DISTANCE REFERENCE

In some cases, you may wish to use the spacer to estimate the one-inch distance from a measurement target surface, but make the measurement without the presence of the spacer to minimize its influence on measurement accuracy.

1. While holding the ACL 350 in one hand, discharge your body by touching a grounded conductive object.
  - a. The operator may wear a grounded wrist strap or place a grounded wrist strap cuff around the instrument case beneath the display and operating buttons.
  - b. The case of the instrument is conductive and is the reference for measurement.
2. Press the POWER ON/HOLD button and release
3. Face the static locator away from charged objects and press and release the ZERO button twice. Note that the display indicates 00.0 volts.
4. Rotate the one-inch spacer 180° from its storage configuration such that it extends beyond the front sensing end of the case, and is on a parallel plane with the case.



If the display changes when the spacer is deployed, do not re-ZERO the instrument.

5. Point the sensor plate toward the target and move to a point one inch from the surface to be measured such that the spacer is virtually in contact with the target material.

Carefully retract the spacer without moving the instrument away or towards the measurement target surface.

At this point, there is approximately one inch space between the front sensing end of the case and the target.

- a. Note the meter reading.
- b. To hold the reading, press and hold the PWR ON/HOLD button.
- c. A source with a negative polarity will show a minus (-) sign in the display. A positive source will display no sign.



**NOTE:** As you approach the target, if the indicated field strength begins to exceed 20kV at a distance greater than 1", **STOP!** This implies that the target voltage may be high enough to create an arc. Proceed with caution.

6. Repeat the procedure outlined above for additional measurements.
7. The instrument will automatically shut off after approximately 90 seconds from the time the PWR ON/HOLD button was last activated

## BATTERY REPLACEMENT

Power is supplied by a standard 9-volt "transistor" battery. Replace the battery when the "BAT" indicator appears on the LCD for more than an instant or at least once a year. (NOTE: Dead battery voltage is approximately 7.2 volts.)

1. Unit should be off when replacing battery.
2. Remove the cover from the back of the meter.
3. Remove the battery from its compartment and disconnect it from the power terminals.
4. Connect a new battery to the power terminals and place it inside of the battery compartment.
5. Replace the battery cover by mounting it carefully into the groove, then slide it closed until it clicks shut.



**Do not over force the cover on.** If the cover does not shut easily, remove the battery and reinsert for a better fit. Make sure wires do not hamper the closing of the battery cover.

6. The meter is now ready for use.

## CLEANING

If excessive drift is noted, the surface of the sensing electrode may require cleaning:

1. Wipe the electrode surface with a soft, low-lint cloth dampened with alcohol.
2. Allow to dry thoroughly before use.
3. Remove dust or dirt from case or display using a soft, low-lint cloth.



## PRECAUTIONS

The following safety precautions must be observed to ensure maximum personal safety during the operation of this meter.

1. DO NOT use the meter if the meter looks damaged, or if you suspect that the meter is not operating properly.
2. DO NOT touch the front sensing head while operating this meter.
3. Measuring voltage which exceeds the limits of this meter may damage the meter and expose the operator to a shock hazard. Always recognize the meter voltage limits as stated.

## SPECIFICATIONS

Readout:	3-1/2 digit LCD, automatically displaying measured voltage
Polarity:	Automatic, positive implied, negative polarity indication
Zero:	Semi-automatic "Push to Zero" feature
Response:	Display updates three times per second
Low Battery Indication:	"BAT" is displayed when voltage is too low for proper function
Hold Indication:	The "HOLD" indication appears on the LCD when in hold mode
Spacer:	Retractable 1" spacer
Measurement Ranges: (See chart on p. 8)	@1 inch: 0-20,000 volts in 100 volt increments @1/10 inch: 0-2,000 volts in 10 volt increments
Extended Ranges: (See chart on p. 8)	@ 4 inches: $\pm 40,000$ volts (multiply reading x 2) @ 6.5 inches: $\pm 60,000$ volts (multiply reading x 3) @ 8.5 inches: $\pm 80,000$ volts (multiply reading x 4)
Overall Accuracy:	Better than $\pm 10\%$
Grounding Path:	Through conductive case
Battery SavR™ Timeout:	After 90 seconds meter automatically shut off
Power:	One (1) standard 9-volt battery, PROCELL, Eveready #1222 (NEDA 1604, JIS 006P, IEC 6F22)
Battery Life:	200 hours typical
Dimensions:	4.2" x 2.4" x 0.9"
Weight:	5 oz. (142 g)

### DISTANCE CHART

Distance	Reading	Multiply	Volts
1/10"	0.1		10v
	1.0		100v
	10.0		1,000v
	20.0		2,000v
1"	0.1		100v
	1.0		1,000v
	10.0		10,000v
	20.0		20,000v
4"	0.1	2 x 100v	200v
	1.0	2 x 1,000v	2,000v
	10.0	2 x 10,000v	20,000v
	20.0	2 x 20,000v	40,000v
6.5"	0.1	3 x 100v	300v
	1.0	3 x 1,000v	3,000v
	10.0	3 x 10,000v	30,000v
	20.0	3 x 20,000v	60,000v
8.5"	0.1	4 x 100v	400v
	1.0	4 x 1,000v	4,000v
	10.0	4 x 10,000v	40,000v
	20.0	4 x 20,000v	80,000v



# ACL 350

## CALIBRATION INSTRUCTIONS

### EQUIPMENT REQUIRED

1. ETS 810 High Voltage(0-10 kV) Power Supply
2. Simco EA-2 Charge Plate Monitor (6"x6" plate) or Prostat CPM-760 6" Plate
3. Floating Power Supply – Tenma 0-30 volt DC Maximum
4. Laboratory Test Fixture with Instrumented Clamp Holder
5. Personnel Grounds – Tested

### TEST PROCEDURE:

1. Attach the ETS 810 Power Supply to the EA-2 6-inch plate using the high voltage-lead provided.
2. Place the ACL 350 instrument into the test fixture clamp
  - A. The instrument sensor should be exactly 1 inch away from the 6-inch plate
  - B. The ACL 350 should be 6 inches above the calibration table
3. Adjust the floating power supply to approximately 9.2V DC
4. Turn on the ACL 350 by pressing the power button

NOTE: The ACL 350 has a built in time out function, approximately 60 seconds. After the power switch is pushed, the unit will turn itself off in 60 seconds. Before each test reading, push the power switch to reset the time out function. Before each test, reading the ACL 350 must be re-zeroed to ground. Ground the CPM target plate and push the ground button twice to obtain a zero display.

5. Ramp up the ETS 810 Power Supply Voltage to positive (+) 1KV. This voltage is being applied to the 6-inch plate through the high-voltage cable.
6. Observe that the instrument measurement being displayed is plus or minus 5% of the applied voltage (+1KV +/-5%).
7. If so, document the measurement in the correct spot on the calibration sheet.
8. If not, unit is out of calibration and needs to be returned for sensor replacement.
9. Turn ETS Power supply off.
10. Push the power button to reset the 60 second time out function on the ACL 350 and re-zero as noted before.
11. Ramp up the ETS Power Supply Voltage to negative (-) 1KV. This voltage is being applied to the 6-inch plate.
12. Observe that the instrument measurement being displayed is plus or minus 5% of the applied voltage (-1KV +/-5%).
13. If so, document the measurement in the correct spot on the calibration sheet.
14. If not, unit is out of calibration and needs to be returned for sensor replacement.
15. Turn ETS Power Supply off.
16. Push the power button to reset the 60 second time out function on the ACL 350 and re-zero as noted before.
17. Repeat steps No. 5 through No. 10 at +/-5KV.

- 18. Repeat steps No. 5 through No. 10 at +/-10KV.
- 19. LOW BATTERY TEST:
  - A. After all tests are finished and documented unit should be tested for low battery display on the LCD
  - B. Lower the voltage on the Tenma Floating Power supply to less than 7.2 volts.
  - C. The low battery display should come on to less than 7.2 volts.
  - D. Adjust the Tenma Floating Power Supply to greater than 7.2 volts.
  - E. The low battery display should go off when the voltage reaches greater than 7.2 volts.
- 20. After all procedures are successfully completed and documented, place a calibrated sticker on the instrument.

**NOTE:** NO INTERNAL ADJUSTMENTS CAN BE MADE TO THESE UNITS. AT ANY POINT IN THE UNIT FAILS A PROCEDURE, THE UNIT MUST BE RETURNED FOR SENSOR OR BOARD REPLACEMENT.

ACL 350 Final Calibration and Adjustment Measurements				
Item No.	Reference	Target	Actual	Actual
	Voltage	± 10%	(+)	(-)
1				
2				
3				
4				