Allied Edison LLC

ZX3 Ungrounded DC System Fault Detection and Location Equipment Designed for the 21st Century

How do you choose the best Ungrounded DC System Fault Detection and Location Equipment? Simply ask yourself, does my current equipment offer the features and capabilities listed below?

- The ZX3 can find faults that are on the positive rail, the negative rail, on both rails simultaneously, in a field device, battery bank or solar array, regardless of whether they are high resistance, low resistance or in a capacitive environment.
- Provides the operator with all pertinent information related to the system and fault conditions to maximize fault analysis capabilities.
- Provides the operator with various ZX3 operating status messages as well as warning messages when setpoints are approached.
- Designed with AE patented 21st century digital technology and built in the United States.
- It has three (3) location modes built into one machine, which allows the ZX3 to find faults under any conditions.

  a) **A Fast Locate mode** that can find faults in a typical 135 vdc low capacitive (≤ 2 μF) system that are from 0 Ω to >100 kΩ very quickly and accurately.

  b) **A Precise Locate mode** that can find faults in a typical 135 vdc low to high capacitive (≤ 50 μF) system that are from 0 Ω to >100 kΩ quickly and with extreme precision.

  One mode can be used to locate the ground fault while the other can be used to confirm it.

c) **An Intermittent Locate mode**, which can find an intermittent or cycling fault in a 135 vdc system where system capacitance is zero and the fault is ≤ 8 kΩ or where system capacitance is 2 μF and the fault is ≤ 25 kΩ.

The ZX3 is the only machine available that offers a way to locate an Intermittent Ground Fault

- Plus two (2) additional operational modes:

  a) Detect/Analyze mode where voltage on each rail, the fault resistance and system capacitance are calculated and displayed.

  b) Self Test mode, which will perform diagnostic and functional tests each time the equipment is turned on to ensure it is operating properly and display a system ready message for the operator upon successful completion of the self tests.

- The ZX3 supports Data Logging onto a flash drive for remote viewing of the fault for an extended period of time.

- Provides the operator with all pertinent information related to the system and fault conditions, as well as provides the operator with warning and ZX3 status messages.

- Works on ungrounded systems from 24 to 600 volts, including Solar Generation.

- Can be programmed for any major language such as: Espanol, Portugues, Francais, Deutsch, etc...

- Offers a ZX3 Users Group membership to anyone who buys a ZX3, which will allow them to:

  a) Download the latest version of the Technical Manual

  b) Download the latest software version for the Base Unit

  c) Download the latest software version for the Tracer Unit

  d) Download ZX3 related videos such as:

     Field demos

     Training videos

     Remote Software Updates

     Data Logging

- The ZX3 operates within the normal parameters of the users existing DC system.

- The ZX3 **Does Not:**

  - transmit a foreign signal onto the existing DC system.
  - interfere with sensitive electronic equipment.
  - utilize an AC signal generator, or require any AC frequency to be imposed on the existing system.
  - require manual synchronizing of the base and tracer.
  - require phase angle measurements or amplitude comparisons of multiple sensors

The ZX3, combines analog with digital technology, yielding the most innovative, advanced, ground detection and location machine in the world. The ZX3 contains more features than any other unit available and is comparable to having three ground machines built into one machine along with two other modes that work in concert with each other to provide the best location outcome.

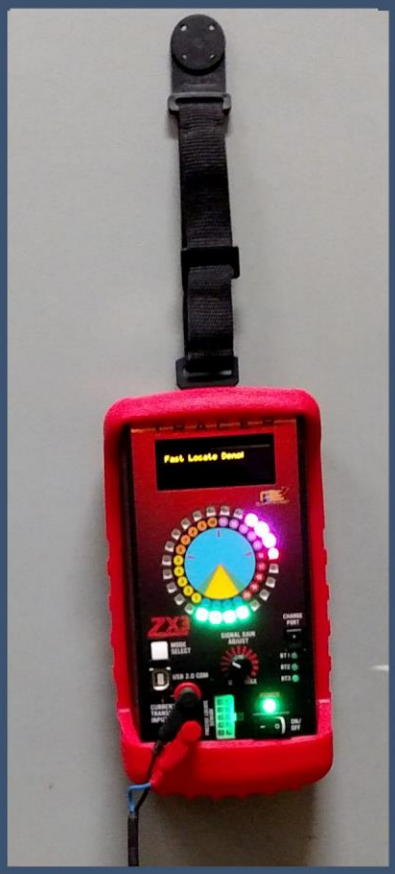
Below is a list of features incorporated in the ZX3:

- The ZX3 is light, portable, hand held for easy and fast operation, much like a multimeter.

- The ZX3 has a protective rubber boot around the Base and Tracer Units, to make them rugged and durable.

- The ZX3 Base and Tracer Units have a magnetic strap so that the system can be hung at eye level.

- The ZX3 Tracer Utilizes a Radar like display



- The Base and Tracer Units also have “fold out” stands that allow them to be placed on a bench top.

- The ZX3 Base Unit derives its power source from the actual switchgear, therefore no charging is required. The input is equipped with overcurrent protection and reverse polarity protection.

- The ZX3 Base Unit works on ungrounded DC voltage systems from 24 volts to 600 Vdc.

- The ZX3 illuminates very brightly in dark areas, making ground location as easy at night as in the day.

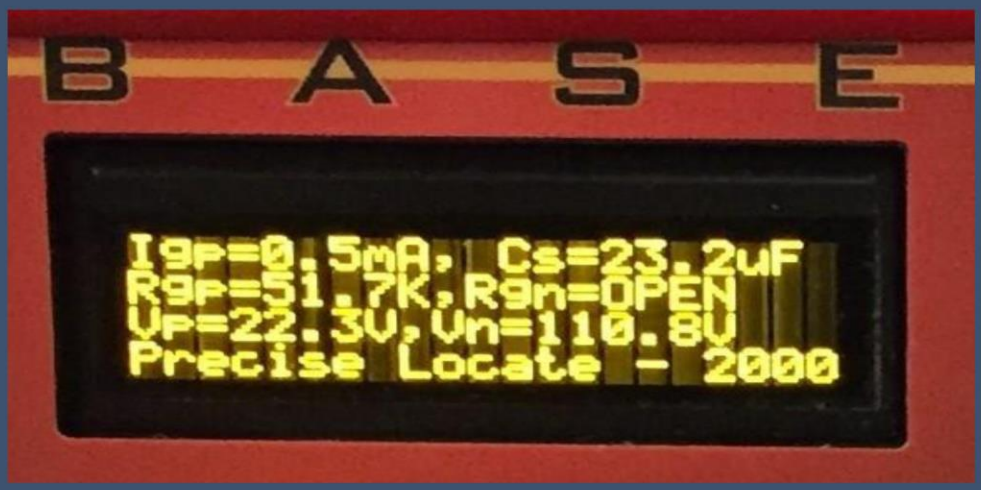
- The ZX3 Base Unit automatically measures line to line voltage (Vll) and calculates positive to ground (Vp) voltage and negative to ground voltage (Vn) to mimic what is normally displayed from the normal system ground detector to provide the operator with measurements that he is used to (see picture below).

- The ZX3 Base Unit will calculate the value of the resistance to ground, whether it is on the positive line (Rgp), negative line (Rgn) or both (see picture below).

- The ZX3 Base Unit will also calculate the value of the Network Resistance (Rnet), useful in a multiple ground analysis.

- The ZX3 Base Unit will calculate the “% grounded”, thereby allowing the operator to immediately know what potential cell could be cleaned if the source of the ground is at the battery bank or also useful in a multiple ground analysis. A message will be displayed **“Battery Suspect”** if the ZX3 believes the ground is in the battery bank. Percent Grounded can be used to identify the suspect cell where the ground fault has occurred.

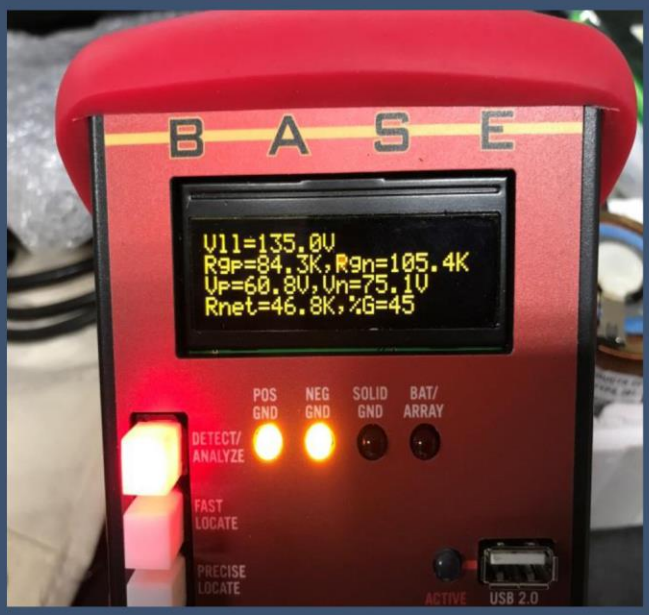
- The ZX3 Base Unit will also measure and calculate the value of system capacitance (Cs) up to 50uF, useful in location effectiveness and providing general information about a particular system. An operator will immediately know from this value which location mode will be the most effective and quickest.



- The ZX3 will also provide a rough measurement of branch circuit capacitance and even allow the user to tell which branch circuits have capacitance when a fault is not in.

- All measurements, calculations, and messages are displayed on the OLED digital display.

- There are LEDs that provide instantaneous information indication if the ground is on the positive line, negative line or both, whether or not the ground meets the criteria for a solid ground or if the ground is located in a battery bank or solar array string.



- There is a warning message that is displayed for 5 seconds when 6 mA of ground current has been exceeded, every 1.0 mA after, the message repeats. The message reads:

a. **Adjusting the current to below 5.0 mA resets the warning level to 6.0 mA. The goal of the operator is to try and stay under 10mA to prevent picking up sensitive relays or devices.**

- A “Signal Gain” control is provided that allows the operator to adjust the amount of ground current above the noise level. This control has a built in safety feature that will not allow the Unit to apply the ground current signal if the control is not first started at zero.

- There is a Self Test mode that when pushed, the unit will test itself and provide indication of “pass” or “fail”. In this mode the connection to ground from the Base Unit is isolated internally.

- The ZX3 Base Unit contains Data Logging capability to assist with troubleshooting intermittent ground conditions and provide historical data. All data in any mode can be recorded on a flash drive to allow remote viewing.

- The ZX3 Tracer Unit runs through a programmed function test that when the unit is first powered on that lets the operator know that all the LEDS are functional. The entire LED ring will light dim and get brighter. This process will advance through three different base colors.

- The ZX3 Tracer ARC display is sectionalized in different colors to provide a sense of magnitude of ground current at the Tracer.

- The ZX3 Tracer offers a display that lets the user know what percentage battery life is left on the internal rechargeable batteries and when to plug in the charger. The version of Tracer software being used. Revisions made by customers will be reflected in the software version.

- The ZX3 Tracer Unit also has a signal gain control to further enhance the magnitude of the CT sensor.

- The ZX3 has remote software download capability to allow the user to download the most current revision of the software for both Base and Tracer.

- Allied Edison has the ability to provide custom programming or custom control functions as required by the user.

- The ZX3 Tracer has circuitry that will allow the sensor to detect ground current through a metal conduit, flexible conduit or other cable raceway without the need to have the actual wiring exposed.

- In summary, the ZX3 is an advanced tool by which a DC ground fault can be analyzed for station risk objectives and located without the need to de-energize live vital circuits critical to the station or system. The ZX3 has been rigorously tested by independent laboratories for emissions, immunity, safety and health compliance and complies with all standards set forth by CE regulations. The ZX3 assists in NERC PRC-002-6 compliance, whereby the Station Battery and DC power System must be inspected for inadvertent grounds every four months and aids to overall Nuclear Safety Risk reduction.

- For pricing, additional information, or to schedule an onsite demonstration contact:

  Allied Edison LLC at 800-307-0315, 307-773-7962, alliededison@gmail.com or go to the website at www.alliededison.com to watch our demonstration and information videos.

Please foward to other departments, utilities, industries.