

# Model 282A-1 Digital Stat-Arc™ 3 Electrostatic Fieldmeter Operator's Manual

P/N 0340130  
282A-1/100  
Rev A



## Description

Model 282A-1 Digital Stat-Arc™ 3 is a pocket-size, non-contacting static meter which produces consistently accurate readings, is easy to use, and is backed by a 2-year warranty, the best in the business.

The 282A-1 features:

- Pulsing-beam range finder for always obtaining the correct reading
- Drift-free accuracy even in ionized environments
- HOLD button to capture transient readings
- Recorder output and 40-hour battery life for unattended monitoring
- Exclusive auto-zero circuit
- Available charged-plate adaptor (Model 282CPS)

With the Model 282A-1, accuracy is unquestioned. Holding the instrument so the range finder LED beams form a non-pulsing circle indicating you're at exactly the right distance (1 inch) from the target for readings up to 20 kV. To read higher voltage, use the greater distances given in Specifications.

For location where it's hard to read the display, you can freeze it, and then read it. Simply position the meter at the correct distance from the target, press and release the HOLD button, move the instrument to a more convenient position, then read the display.

Zeroing is push-button simple, and Model 282A-1'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.

## Specifications

**Display:** LCD 3 ½ digit, auto-polarity readout, HOLD and LOW BATT indicators

**Range:** 0 to ± 19.99kV at 1 inch. Voltages of 20kV and higher may be read by increasing the distance to the target:

Kv	Distance	Multiply Reading By
0 - 40	4.0 inches	2
0 - 60	6.5 inches	3
0 - 80	8.5 inches	4

**Accuracy:** ± 5% of reading, + zero offset, + 2 lsd

**Analog Output:**

**Jack Type:** Accepts standard 3/32 inch (2.5mm) monaural phone plug

**Amplitude:** 1V signal denotes 10kV reading at 1 inch for high impedance loads

**Impedance:** 10kΩ Load > 1 meg for < 1% error. Sleeve GND tip 1/10,000

**Response Time:** Typ. 80 – 100 msec 10 – 90%

**Battery Type:** 9V NEDA #1604 or equivalent life: 40 hours normal use, with alkaline battery

**Dimensions:** (L x W x H) 2.4 x 4.2 x 0.9 inches (6.1 x 10.7 x 2.3cm)

**Operating Environment:** 0 – 50° C, 0 85% RH (non-condensing) unaffected by ionizing equipment

## Operation

1. **ON/ZERO Button** The ON/ZERO button performs three functions ON, ZERO, and AUTO SHUTDOWN TIMER reset in the normal operation mode. **To turn unit ON** press and hold the ON/ZERO button for 1 second, then release. The display appears and the range finder LEDs begin to flash alternately. Zeroing the unit adjusts the offsets of the meter to within 2 counts typ. or 7 counts maximum. **To ZERO unit**, with unit ON, point the sensor plate away from any charged object, press and hold the ON/ZERO button until reading stabilizes then release. As an alternative, point it toward, but **do not** touch, a known grounded surface such as the palm of your hand.. While ZERO button is pressed the LEDs will stop blinking, only the right LED will remain lit (as viewed while reading the meter.) During ZERO all annunciators are off, including DP.
2. **Discharge the instrument** Grounding (discharging) your body discharges the instrument through its conductive case. If you are not wearing a grounded wriststrap, discharge your body by touching a grounded metal object such as water pipe, conduit or workbench. As an alternative, place a grounded wriststrap around the instrument itself. The shell of the front panel output jack can be used to provide a “hard” or soft ground connection.
3. **Take a reading.** For voltages less than 20 kV, move the sensor plate of the instrument toward the target surface. When the instrument is exactly the correct distance (1 inch) from the target, the image projected by the range finder LEDs appears as a stationary circle. To read voltages of 20 kV and higher use the distances and multiplying factors given under “Range” in Specifications. If readings seem inconsistent measure using the ground to output jack connection.
4. **To HOLD a reading.** Press and release the HOLD/OFF button for less than 3 seconds. The present reading is displayed along with the word “HOLD.” To conserve battery life the LEDs turn off while the reading is held. To take another measurement press and release the HOLD/OFF button again. This also resets the AUTO SHUTDOWN TIMER.
5. **Turn the instrument OFF.** Press and hold HOLD/OFF button for longer than 3 seconds.
6. **AUTO SHUTDOWN TIMER** During normal operation (**not** during ZERO) a blinking decimal point indicates the AUTO SHUTDOWN TIMER is enabled. If the AUTO SHUTDOWN TIMER is disabled the decimal point will be on continuously. Holding down the ZERO button, while unit is ON, for less than 3 seconds resets the AUTO SHUTDOWN TIMER (if enabled.) The AUTO SHUTDOWN TIMER is enabled or disabled by turning on the unit and keeping the ON/ZERO button pressed then toggling the HOLD/OFF button. Enable/disable of the AUTO SHUTDOWN TIMER is indicated by the decimal point: DP on = timer on, DP off = timer off. AUTO SHUTDOWN TIMER state is maintained during power OFF. AUTO SHUTDOWN TIMER can be continually toggled as long as the ON/ZERO button remains pressed, up to 20 seconds, after which the unit will turn off. A blinking decimal point indicates the AUTO SHUTDOWN TIMER is active. During the last minute before power off ALL annunciators will blink at a fast rate. Pressing any button will reset the timer. Timeout is nominally 15 minutes.
7. **Version Display** With unit OFF, press and hold the HOLD/OFF button then press the ON/ZERO button and release the HOLD/OFF button, the unit will blink the version number. For VERSION 1.02 the right LED will blink the first digit (1). The left LED will blink once indicating the end of the first digit. The right LED will then blink twice indicating the third digit (2). Releasing the ON/ZERO number allows the unit to return to normal operation. If the digit is zero ten blinks will be output.

**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.

## Maintenance

**Replacing the battery** The battery should be replaced annually, whenever you plan an extended period of unattended monitoring, or whenever "BAT" appears in the display for more than an instant. Low BAT is set for  $6.9 \pm 0.6$  volts. Remove the battery before long-term storage. See Specifications for replacement type. If unit fails to operate after replacing the battery, remove battery, press and release the ON/ZERO button then re-connect 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. The stand the instrument on end and allow it to dry for several hours. **DO NOT** clean with any solvent on a regular basis.

**Zero Drift** Apply anti-stat solution to plastic surrounding the sensor plate using lint free applicator. **DO NOT** allow entry into aperture.

## Calibration

Monroe Electronics instruments are 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.

We are happy to recalibrate your instrument for you at a reasonable cost, or provide information and procedures on calibration upon request. We also offer calibration services with traceability to NIST or MIL-STD-45662A.

## Safety Considerations

The Model 282A-1 has undergone testing to qualify for the following markings:

**CE** — Radiated and ESD immunity to severity levels for industrial devices according to EN 50082-1 and radiated emissions with limits for Group 1, Class A product of EN 55011 to the generic standard EN 50081-2 (1992).

## Two-year warranty

Monroe Electronics, Inc. warrants this instrument to be free from defects in material and workmanship for a period of two years after shipment from the factory. This warranty is applicable to the original purchaser only. Liability is limited to service, adjustment or replacement of defective parts (other than fuses or batteries) on any instrument returned to the factory, transportation charges prepaid. It does not apply to any instrument subjected to abuse, abnormal operating conditions, or unauthorized repair or modification. No other warranties, explicit or implied, apply. Under no circumstances shall Monroe Electronics be responsible for damages either direct or consequential. For additional information concerning this product, contact Monroe Electronics, Inc.