

### End User Calibration Procedure:

Methane calibration gas, regulator, tubing and calibration cup is required for calibration.

1. Turn detector ON. Wait five (5) minutes for unit to warm up and stabilize.
2. Remove calibration port plug, located on side of unit. The internal calibration control is located within this port. Be certain area is free of hydrocarbons and drafty air movement.
3. Place Mode Select Switch in the *calibrate* position.
4. Remove Screen Guard.
5. Place calibration cup over sensor guard.
6. Turn gas regulator valve counterclockwise to flood sensor with calibration gas.
7. Adjust internal calibration control so that the meter agrees with calibration gas, i.e. 10,000 ppm=20% lower explosive limit (LEL). Use gas marked 1% CH<sub>4</sub>.
8. Turn calibration gas off and remove calibration cup. Repeat above procedure.
9. The top scale will now indicate percent lower explosive limit for methane as the calibration gas.

**NOTE:** Factory calibration and service is available from Grace Industries, Inc., 305 Bend Hill Road, Fredonia, PA 16124.

### MAINTENANCE PROCEDURE – MODEL 851

The **Model 851** should be used a minimum of 10 hours per month. If the unit is used less than 10 hours per month, simply turn unit on and let both batteries completely discharge. Be certain to use the **Battery Transfer Switch** to discharge battery A, then transfer to battery B. This procedure conditions the batteries and also purges any absorbed gases from the sensor.

**Sensor:** The **Model 851** is equipped with a plug-in sensor that may be removed for replacement by simply pulling it from the sensor socket. Spare sensors are available from the factory.

**Batteries:** The **Model 851** is powered by two Nickel Cadmium batteries. Each battery will provide four hours of operation. Charging time is 16 hours.

### WARRANTY

Grace Industries, Inc. warrants your unit to be free from defects in workmanship and materials for a period of one (1) year from the date of original purchase. Grace Industries will repair or replace at their option the entire unit free of charge. Send all returned merchandise, prepaid and accompanied by proof of purchase that states the date and location of purchase to: Grace Industries, Inc., Repair Division, 305 Bend Hill Road, Fredonia, PA 16124, U.S.A. Customer is responsible for return shipping and handling. The product is warranted providing that defect or damage was not due to accident, misuse or abuse while in possession or control of the consumer and not to repairs or parts replacement that were made or attempted by other than Grace Industries personnel. GRACE INDUSTRIES, INC. SHALL NOT BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL LOSS OR DAMAGE ARISING OUT OF THE FAILURE OF THE DEVICE TO OPERATE.

The sole and exclusive remedy under all guarantees or warranties, expressed or implied, is strictly limited to repair or replacement as herein provided. ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF FITNESS AND MERCHANTABILITY, ARE HEREBY LIMITED IN DURATION TO A PERIOD OF ONE (1) YEAR FROM THE DATE OF PURCHASE. The warranty and liability set forth in the prior paragraphs are in lieu of all other warranties, expressed or implied, in law or in fact, including warranties of merchantability and fitness for a particular purpose. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

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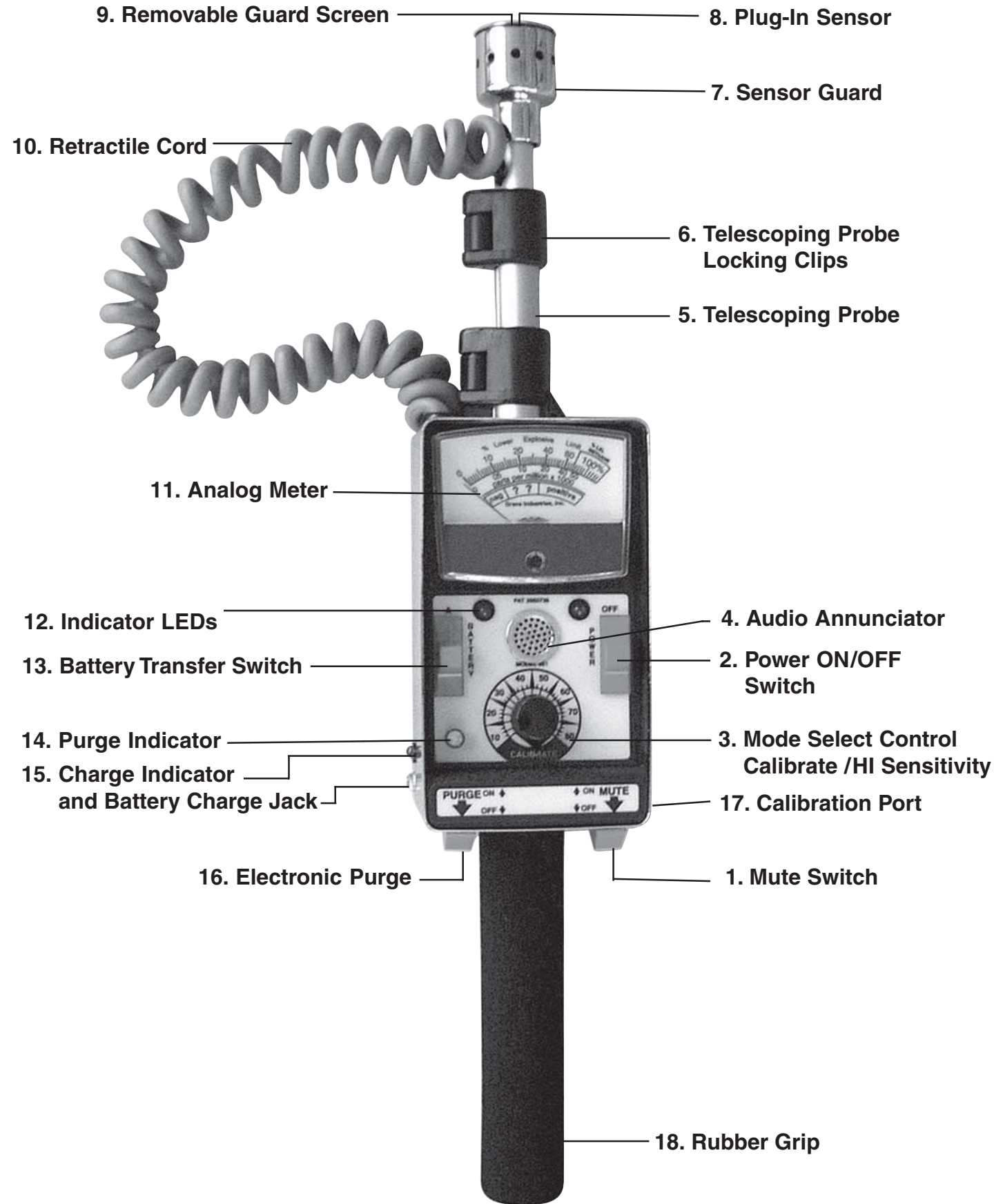
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# MODEL 851 INVESTIGATOR'S AID OPERATION AND MAINTENANCE



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## MODEL 851 INVESTIGATOR'S AID FEATURES



- 1. Mute Switch:** Slide switch upward to turn off beep tones. Permits discrete investigation.
- 2. On/Off Control:** Turns unit ON/OFF.
- 3. Mode Select Control:** Permits choice of either HI Sensitivity mode or Calibrate mode. HI Sensitivity is used to locate trace amounts of hydrocarbons. In the Calibrate mode, meter displays concentration of gas in % LEL by volume. Methane used as the test gas.
- 4. Audio Annunciator:** Provides beep tones.
- 5. Telescoping Probe:** Open clips (See Fig. 6.) to extend probe (18" retracted, 46" extended).
- 6. Telescoping Probe Locking Clips:** Used to lock probe to desired length.
- 7. Sensor Guard:** Provides a protective enclosure for the sensor.
- 8. Plug-In Sensor:** Detects hydrocarbons. May easily be replaced by plugging in a new sensor.
- 9. Removable Guard Screen:** Helps protect sensor. Screen may be removed for slight increase in response time if desired.
- 10. Retractable Cord:** Provides power to sensor and permits probe to be extended.
- 11. Analog Meter:** Indicates the presence of hydrocarbons. When used in Calibrate position, meter indicates percent LEL (lower explosive limit) and PPM (parts per million), methane used as test gas.
- 12. Indicator LEDs:** LEDs flash when a hydrocarbon is present.
- 13. Battery Transfer Switch:** Used to transfer from Battery "A" to Battery "B". Each battery will provide up to 4 hours of use. If a battery should go dead in the field, simply transfer to other battery.  
**NOTE:** Both batteries charge simultaneously.
- 14. Purge Indicator:** Yellow light glows when purging.
- 15. Battery Charge Jack:** Place charger plug into jack to charge. The charge indicator light will glow when the unit is charging.
- 16. Electronic Purge:** Place switch in upward position to purge sensor of any absorbed hydrocarbons. The yellow indicator light will glow when the switch is in this position. Purging elevates the temperature of the sensor and clears it of any absorbed hydrocarbon.
- 17. Calibration Port:** Remove plug to access internal calibration control.
- 18. Rubber Grip:** Sure grip handle to hold the Model 851.

## MODEL 851 INVESTIGATOR'S AID

The **Model 851 hydrocarbon detector** is a precision instrument designed specifically for detecting petroleum volatiles and hydrocarbons. These tools are particularly useful for field survey of landfills for the presence of methane gas and the detection of leaking underground storage tanks. The **Model 851** is an excellent general purpose gas detector and certification tool.

### OPERATION

- A. Energize unit with the Power ON/OFF switch (2).** Allow approximately 3 minutes for sensor to attain stabilization temperature.
- B. Calibrated Operation:** Rotate Mode Select Control (3) fully counterclockwise to the calibrate position until a clicking sound is heard. The Model 851 is now in the Calibrated mode of operation and will indicate the percent lower explosive limit by volume for methane as the test gas.
- C. Search Mode of Operation (High Sensitivity):** Rotate the mode select switch clockwise until meter starts to deflect. The Model 851 is now in its most sensitive mode of operation and has a sensitivity of approximately 50 parts per million (ppm), methane used as the test gas. When the sensor is exposed to a hydrocarbon gas or petroleum volatile, the meter indicator will deflect, followed by a series of beep tones. The more rapid the beep tones occur, the greater the hydrocarbon concentration. The Model 851 may be normalized for areas that contain high levels of hydrocarbons by rotating the Mode Select Control counterclockwise until the beep tones just stop. When the beep tones start again, you are closer to the source. This action may be repeated to converge and locate the source of hydrocarbon concentration.
- D. To detect the presence of hydrocarbon gas or petroleum volatile,** scan area of concern at an angle of 45° while holding sensor approximately 1/2-1" inch from the ground. Scan area of interest very slowly to allow sufficient time for the hydrocarbon to diffuse into the detector. **NOTE:** Volatility of hydrocarbons is dependent on environmental factors such as temperature, wind, humidity, etc. Be patient!
- E. To clear sensor after being exposed to a hydrocarbon,** place the Purge Switch (16) in the upward (purge) position. The yellow indicator light will glow. Leave the switch in this position for 20 to 30 seconds; then return switch to the OFF position. The purge light will go off and the needle will return to the negative region on the meter scale.  
**NOTE:** Be certain the above procedure is done in fresh air.