

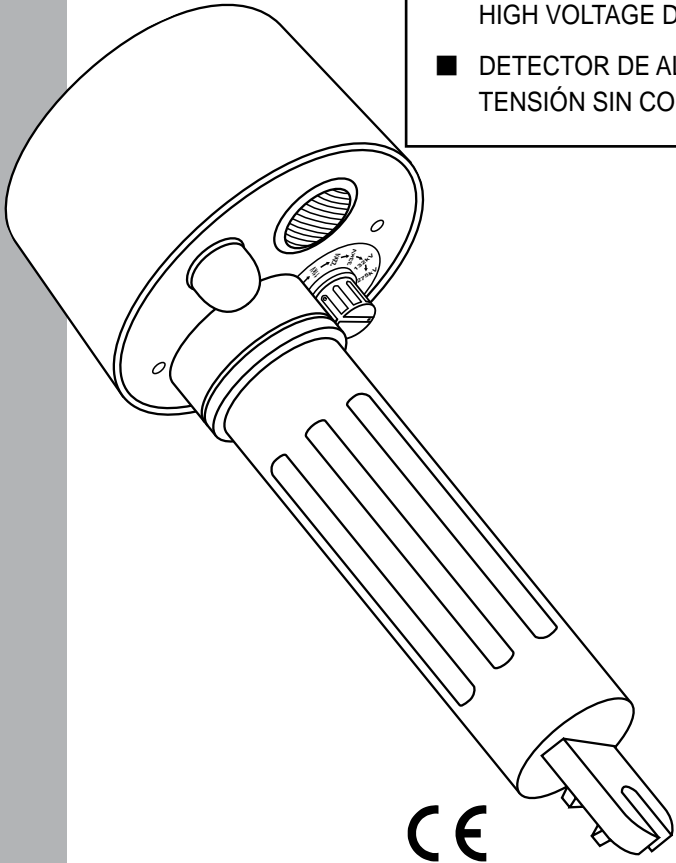


**Advanced Test Equipment Rentals**

**[www.atecorp.com](http://www.atecorp.com) 800-404-ATEC (2832)**

# 275HVD

- NON-CONTACT,  
HIGH VOLTAGE DETECTOR
- DETECTOR DE ALTA  
TENSIÓN SIN CONTACTO



# Statement of Compliance

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Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments certifies that this instrument has been calibrated using standards and instruments traceable to international standards.

We guarantee that at the time of shipping your instrument has met its published specifications.

The recommended calibration interval for this instrument is 12 months and begins on the date of receipt by the customer. For recalibration, please use our calibration services. Refer to our repair and calibration section at [www.aemc.com](http://www.aemc.com).

**Serial #:** \_\_\_\_\_

**Catalog #:** 2131.12

**Model #:** 275HVD

Please fill in the appropriate date as indicated:

Date Received: \_\_\_\_\_

Date Calibration Due: \_\_\_\_\_





WARNING! - READ BEFORE USE!



## Testing the 275HVD Before Operating:

The 275HVD is a battery operated instrument. It must be carefully checked each time before use.

### (1) Test Before Use:

Switch the sensitivity to "TEST". The warning buzzer should emit a continuous audible tone and the warning light LEDs should stay lit up with the 275HVD in all positions. This indicates that the sensor is operational and the battery functional.

**If there is any intermittent buzzer and/or light, do not operate the 275HVD.**

**Further operation is not to take place until authorized and qualified personnel have reviewed the operation and cleared the instrument after proper Test and Functional tests.**

### (2) Detection Test:

After a successful **Test (1)**, perform the following steps to ensure that the 275HVD detects voltage on a known live conductor.

- Select the 240VAC range and place the sensing head near a known live (low voltage) conductor (if not available, rub the sensor with a cloth or against a clothing item to generate a DC static charge which will trigger the sensor circuit detection).
- The warning light and warning beeper should go ON as if a live conductor were being tested.

**NOTE:** Positioning the sensing dome near a computer screen or a TV screen (not liquid crystal display type) should also trigger the tester while on the 240V selection.

### (3) Battery:

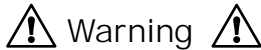
- If any malfunction or instability of the light and/or buzzer occurs, then the user should also check the battery compartment and/or batteries.
- When installing a new set of batteries or before use, tighten the battery compartment completely and properly (insure the O-ring is well seated), select the Test position and move the meter in different positions. **In the Test mode the light and buzzer should remain ON continuously and be steady at all times. Otherwise, do not use the instrument.**
- Failure to properly close the battery compartment and/or the use of weak batteries may result in intermittent operation. **Do not use the 275HVD if intermittent operation occurs (see Test Before Use).**

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# INTRODUCTION



The Model 275HVD Non-Contact High Voltage Detector has been designed with safety in mind. However, no design can completely protect against incorrect use. **The 275HVD should be used by trained and qualified personnel only. The 275HVD can only be used with an insulated rod or “Hot Stick” rated at the appropriate working voltage. The 275HVD Non-Contact High Voltage Detector is never to be put into direct contact with a live conductor.**

**If caution or poor safety practices are not adhered to, electrical circuits can be dangerous and lethal.**

**This instrument should only be used by authorized and properly trained personnel who fully understand the High Voltage testing procedures.**

**Personnel working with high voltages should be trained regularly.**

- Read the user manual carefully and completely before using the tester. Fully understand the instructions before using this product.
- Follow the instructions for every test.
- Take all the necessary safety precautions. Do not exceed the limits of this instrument.
- The 275HVD Non-Contact High Voltage Detector must never be in physical contact with any conductor. This is a proximity detector, not a detector which works by contact.
- Tests must only be carried out with the 275HVD attached to an approved insulated fiberglass rod or Hot Stick.
- Always use an authorized fiberglass (or equivalent) rod or Hot Stick appropriately rated for the voltage with which you are working.
- Always check that the 275HVD Non-Contact High Voltage Detector is working before and after the test.
- Verify the Range Switch setting before measuring. Make sure it is on the correct setting for your application.
- Do not touch any exposed wiring, connections, or other “live” parts of an electrical circuit.

## 1.1 International Electrical Symbols



This symbol on the instrument indicates a WARNING and that the operator must refer to the user manual for instructions before operating the instrument. In this manual, the symbol preceding instructions indicates that if the instructions are not followed, bodily injury, installation/sample and product damage may result.



Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.

## 1.2 Receiving Your Shipment

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage. Save the damaged packing container to substantiate your claim. Do not use an instrument that appears to be damaged.

## 1.3 Ordering Information

### **Non-Contact High Voltage Detector Model 275HVD..... Cat. #2131.12**

*Includes three 1.5V C-cell batteries, shotgun adapter, carrying case, and user manual.*

## **PRODUCT FEATURES**

### **2.1 Description**

The Non-Contact High Voltage Detector Model 275HVD is a high voltage detector by proximity. **It is not designed to enter into contact with conductors.**



**The 275HVD should never touch conductors and must be used with an insulated fiberglass rod or Hot Stick appropriately rated for the voltage being tested.**

The Non-Contact High Voltage Detector Model 275HVD is not a “measuring instrument” per say, rather it is a product designed to warn the user of the presence of voltage in a particular work site.

The 275HVD uses an internal sensor designed to detect the radiated electrical field (V/m) present in energized conductors. The radiated electrical field increases with the line voltage but decreases with distance and/or shielding.

The 275HVD has eight voltage range settings. These correspond to internal field sensitivity settings: the lower the voltage setting; the higher the sensitivity to detect the electrical field; and, the greater the detection distance. It also has an “auto-test” setting to check functionality (see § 4.3).

The 275HVD is battery powered and contains three standard 1.5V “C” cells in the shaft below the sensing head.

When an electrical field is detected, a sound annunciator (high-pitch, high-powered buzzer) and visual indicators (bright LEDs) are triggered ON, warning the user.

The body is made out of industrial grade UL rated polyamide (Type 66 Nylon). The shotgun adapter at the shaft end is designed to fit into most Hot Stick adaptors.



## 2.2 Typical Uses (always use a Hot Stick)

- Identify and check live cables
- Check and detect live high voltage cables
- Find fault in flexible cables
- Check grounding equipment
- Service neon lighting
- Trace live wires
- Check high frequency radiation
- Detect residual or induced voltages



### IMPORTANT WARNING

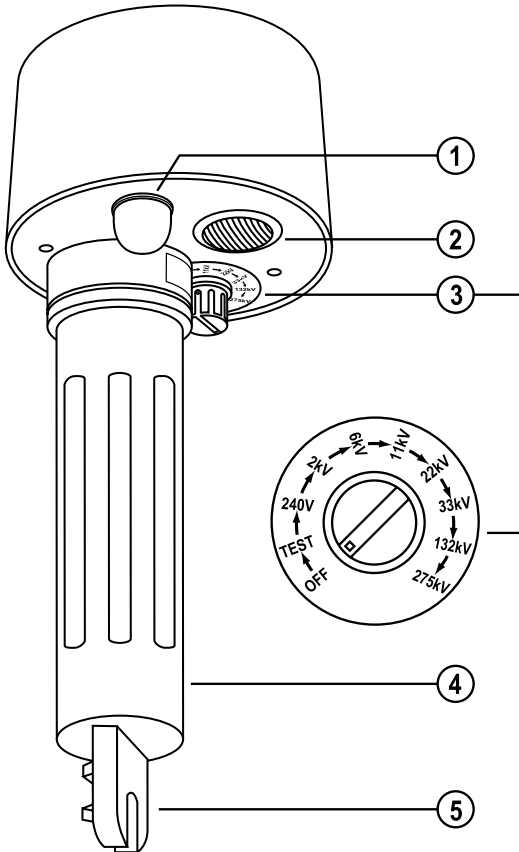


The 275HVD detects radiated electrical fields. To accomplish this, an energized cable or sample must radiate an electrical field. Shielded cables or shielded samples do not radiate, or radiate very small electrical fields. Also, cables with concentric neutrals will have a smaller/lower radiated field than plain insulated cables.

The 275HVD may not detect, as expected, an electrical field on shielded cables (buried cables are often shielded) or shielded samples and the 275HVD has lower sensitivity on cables with concentric neutrals.

**It is not recommended to use the 275HVD on shielded cables or shielded samples. Use extreme care on cables with concentric neutrals (use a low setting).**

## 2.3 275HVD Features



1. Warning Light - Bright, low current Red LEDs triggered on voltage detection
2. Warning Buzzer - High noise level buzzer triggered on voltage detection
3. Rotary Selector with the following settings:
  - OFF - Turn the pick-up sensor off
  - TEST - Verifies that the circuitry is working
  - 240V - 2kV - 6kV - 11kV - 22kV - 33kV - 132kV - 275kV
4. Battery Holder
5. Shotgun adapter end fitting for Hot Stick connection

## **SPECIFICATIONS**

### **3.1 Electrical**

**Ranges:** 240V, 2kV, 6kV, 11kV, 22kV, 33kV, 132kV, 275kV

**Detection Frequency:** 40 to 70Hz

**Power Supply:** Three 1.5V "C" cell batteries

**Power Consumption:** 40mA

**Signal Lamp:** 47 lux @ 20cm

**Sound Volume:** 75 db @ 1m from detector

### **3.2 Mechanical**

**Case Height:** 9" (229mm)

**Case Width:** 3.78" (96mm)

**Weight:** 1.30 lbs (0.59kg) batteries included

**Shock Test:** IEC 68-2-29

**Vibration Test:** EN 61010, clause 8.3

**Drop Test:** EN 61010, clause 8.4

**Impact Test:** EN 61010, clause 8.2

### **3.3 Environmental**

**Operating Temperature:** 5° to 130°F (-15° to 55°C)

**Storage Temperature:** -4° to 150°F (-20° to 65°C)

**Humidity:** 0 to 93% RH @ 104°F (40°C)

**Cold Temperature:** IEC 68-2-1

**Dry Heat:** IEC 68-2-2

**Damp Heat:** IEC 68-2-3



### 3.4 Detection Levels

The 275HVD is used by moving it closer to the live conductor until the buzzer and light warnings are triggered. It is designed to detect at a lower voltage than the range setting.

The following data is considered as typical response for the 275HVD. Variations may occur from unit to unit. As a general rule, in a “clean” environment, the 275HVD will trigger @ 45 to 65% of the voltage range at 4"/10cm, and detected the selected voltage setting at 8 to 12" (20 to 30cm).

The following data provides indicative distances at which the 275HVD will detect a given voltage. Note that these tests were conducted in ideal test conditions (unshielded single conductor, lab environment, sensor head perpendicular to conductor) and are not fully representative of the work site, which may have other voltages present (and which may influence the overall results).

The distances should only be taken as indicative and not as electrical specifications. Care should be taken when in presence of other conductors which may also be detected by the 275HVD (see § 4.2). *Measurements are based upon a 90° angle (sensor head perpendicular to conductor).*

Range Setting	Distance	Voltage Detection
240V	4" – 10cm	75V – 90V
2kV	4" – 10cm	1.3kV
6kV	4" – 10cm	3.6kV
11kV	4" – 10cm	7.5kV
22kV	4" – 10cm	11kV
33kV	4" – 10cm	19.5kV
132kV	4" – 10cm	Not Rated
275kV	4" – 10cm	Not Rated

Range Setting	Voltage	Distance
240V	240V	10.5" - 27cm
2kV	2kV	10.5" - 27cm
6kV	6kV	11.5" - 29cm
11kV	11kV	10.5" - 27cm
22kV	22kV	12.2" - 31cm
33kV	33kV	11.0" - 28cm
132kV	132kV	10.0" - 25cm
275kV	275kV	10.0" - 25cm

The following information provides typical detection distances when using a lower setting than the line voltage.

Note that the distances may vary with each unit and will be affected based on the actual environment. The values displayed were conducted in an ideal lab environment and cannot represent each field environment.

SETTING	VOLTAGE	DISTANCE
240VAC	500VAC	12" - 32cm
240VAC	1kVAC	18" - 48cm
240VAC	2kVAC	29" - 75cm
240VAC	6kVAC	48" - 124cm
240VAC	11kVAC	57" - 146cm
240VAC	22kVAC	89" - 226cm

SETTING	VOLTAGE	DISTANCE
2kVAC	6kVAC	16" - 40cm
2kVAC	11kVAC	20" - 52cm
2kVAC	22kVAC	24" - 60cm
2kVAC	33kVAC	36" - 92cm

SETTING	VOLTAGE	DISTANCE
6kVAC	11kVAC	24" - 61cm
6kVAC	22kVAC	29" - 75cm
6kVAC	33kVAC	41" - 105cm

SETTING	VOLTAGE	DISTANCE
11kVAC	22kVAC	13" - 35cm
11kVAC	33kVAC	16" - 42cm

SETTING	VOLTAGE	DISTANCE
22kVAC	33kVAC	14" - 36cm

# OPERATION

## 4.1 Preparation for Use

The Non-Contact High Voltage Detector should be inspected for any visible signs of damage before using, battery condition and the checks described below should be performed to ensure that it is operating correctly.

When you first receive it, if there is any sign of damage or if the instrument does not operate correctly, return it to the distributor from which it was purchased.

## 4.2 Limitations on the Model 275HVD



See Warning on Page 5

- Testing voltages on cable composed of multiple phases may be a problem. In particular, multiple phase cables twisted together may have their electrical fields canceling each other out (vector sum), and a much lower detectable field signal may result. This may lead to non-detection if the range setting is too high. Try a lower range setting if this situation occurs. **Keep in mind that the actual line voltage may be much higher!**
- Problems can arise when the 3-phase circuit of a 275/133/11kV transformers are tested. The electric field of the HV and MV bus bars can trigger the detector when it is about one meter (approx 3 ft) above the ground. Users must be aware that this is common with most of the electric field voltage detectors. The 275HVD can pick up adjacent circuit electrical fields to the one being tested and may indicate the wrong information to the user.
- Electrical Field sensitivity is reduced when the 275HVD is used close to grounding points.
- The Model 275HVD will work on cables with a concentric neutral.
- The Model 275HVD will **not** work on shielded cables.

### 4.3 Testing the 275HVD Before Operating

 also READ Important warning on page 1)

Switch the sensitivity to “TEST”. The warning buzzer should emit continuous audible tone and the warning light LEDs should light up. This indicates that the sensor is operational and the battery functional.

**Perform the following steps to ensure that the 275HVD detects voltage on a known live conductor.**

- Select the 240VAC range and place the sensing head near a known live (low voltage) conductor (if not available, rub the sensor with a cloth or against a clothing item to generate a DC static charge which will trigger the sensor circuit detection).
- The warning light and warning beeper should go ON as if a live conductor were being tested.

**NOTE:** Positioning the sensing dome near a computer screen or a TV screen (not liquid crystal display type) should also trigger the tester while on the 240V selection.

### 4.4 High Voltage Testing



See Warning on Page 5

The 275HVD Non-Contact High Voltage Detector works by proximity. It is not designed to be in physical contact with live conductors. Its sensor detects the radiated field which surrounds live conductors.



**Do not touch live conductors with the 275HVD Non-Contact High Voltage Detector.**

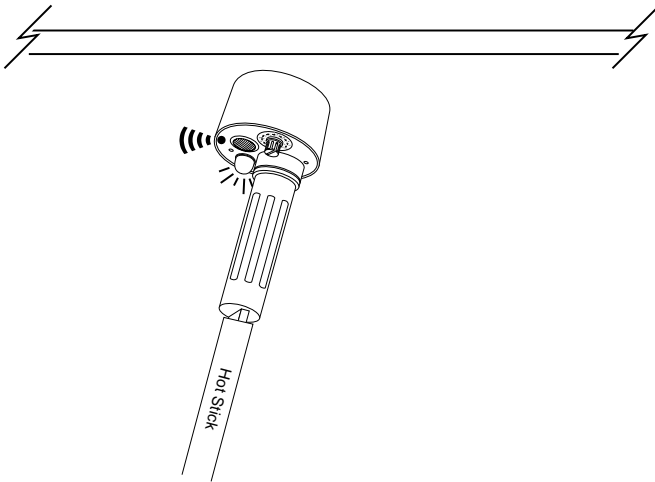
Radiated field strength increases with voltage and decreases quickly with distance and/or ground shielding. The radiated field from a cable where conductors supplying three-phase power are close together, tends to cancel out (See § 4.2). The rotary switch (attenuator) is used to identify and differentiate various HV live cables.



**The tester must only be used with an appropriate insulated rod or Hot Stick when measuring High Voltage.**

After checking the 275HVD and ensuring its good operation, select the test range. It is recommended to start with a lower setting than the actual working voltage, and then to try again with higher settings. The user may also consider using lower settings to check for lower voltages on a conductor.

With the 275HVD at the end of a hot stick, move towards the live conductor until its warnings are triggered.



## 4.5 Low Voltage Testing



See Warning on Page 5

The 275HVD Non-Contact High Voltage Detector works by proximity. The 275HVD is not designed to be in physical contact with live conductors. Its sensor detects the radiated field that surrounds live conductors.



**Do not touch live conductors with the 275HVD Non-Contact High Voltage Detector.**

Radiated field strength increases with voltage and decreases quickly with distance and/or ground shielding. The radiated field from a cable where conductors supplying three-phase power are close together, tends to cancel out (See § 4.2). Detecting distance of a 250VAC single live wire is about 4" (10cm). When grouped with neutral and ground wires, as in a flexible cable, the distance is reduced to 2" (5cm) or less.

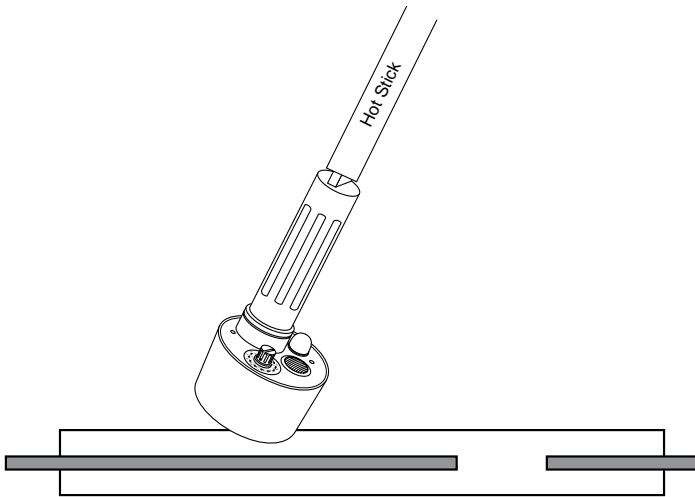


## 4.6 Faults (Open) in Cables



See Warning on Page 5

Faults in certain flexible cables can be detected with the 275HVD. If the cable is still energized, set the 275HVD sensitivity so that it triggers, then move the 275HVD along the cable until a change in condition is obtained. An audible tone and LED should be on when the sensor is on the supply side of the open and will turn off when on the other side.



## 4.7 Changing the Batteries

Batteries should be checked with a multimeter and replaced periodically. The 275HVD Non-Contact High Voltage Detector uses 3 x 1.5V “C” cell batteries.

Open the battery compartment (turn the shaft counter-clockwise) to remove the batteries. Ensure that polarity is respected when installing new batteries.