

User Manual  
ENGLISH



# Non-Contact High Voltage Detector Model 275HVD



HIGH VOLTAGE DETECTOR

Measure Up  
WITH AEMC INSTRUMENTS



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# Statement of Compliance

Chauvin Arnoux<sup>®</sup>, Inc. d.b.a. AEMC<sup>®</sup> 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 the instrument's published specifications.

**An NIST traceable certificate may be requested at the time of purchase, or obtained by returning the instrument to our repair and calibration facility, for a nominal charge.**

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.

**Serial #:**

**Catalog #:** 2131.12

**Model #:** 275HVD

Please fill in the appropriate date as indicated:

Date Received:

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

\_\_\_\_\_






Chauvin Arnoux<sup>®</sup>, Inc.  
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# 1. INTRODUCTION

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Thank you for purchasing an AEMC® Instruments **Non-Contact High Voltage Detector Model 275HVD**.

For the best results from your instrument and for your safety, you must read the enclosed operating instructions carefully and comply with the precautions for use. Only qualified and trained operators should use this product.

 **WARNING! - READ BEFORE USE!** 

## 1.1 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 240 VAC 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 240 V selection.

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### 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 Testing the 275HVD Before Operating § 1.1).**

## 1.2 PRECAUTIONS FOR USE

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 is not taken or 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.

## 1.3 INTERNATIONAL ELECTRICAL SYMBOLS

	<b>CAUTION - Risk of Danger!</b> Indicates a <b>WARNING</b> . Whenever this symbol is present, the operator must refer to the user manual before operation.
	Indicates a risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.
	Indicates Important information to acknowledge
	This product complies with the Low Voltage & Electromagnetic Compatibility European directives.

## 1.4 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.

## 1.5 ORDERING INFORMATION

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

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

### 1.5.1 Accessories

Replacement - Battery housing with o-ring and spring for Model 275HVD..... **Cat. #5100.03**

Replacement - Metal Universal Spline Adapter for Model 275HVD..... **Cat. #5100.08**

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## 2. PRODUCT FEATURES

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**WARNING: Never assume conductors have been tested, as de-energized will stay de-energized.**

**Always install proper grounding devices before working. Failure to do so may result in serious injury or death.**

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### 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.



**WARNING: 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.**

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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 1.5 V **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 adapters.

### 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



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**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.

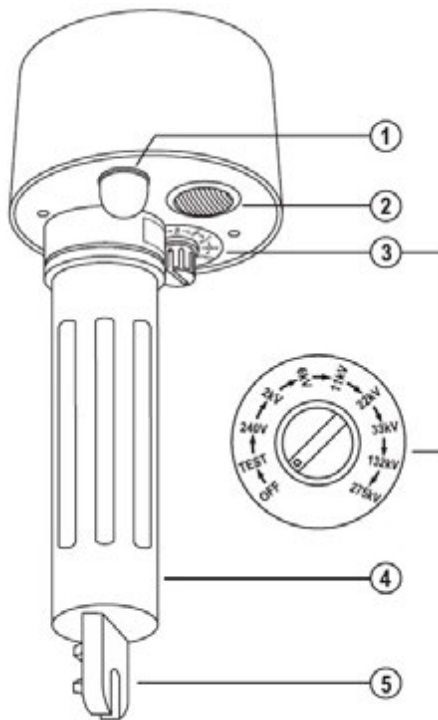


The 275HVD may not detect, as expected, an electrical field on shielded cables (buried cables are often shielded) or shielded samples and the 275HVD has lower sensitivity on cables with concentric neutrals.

**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).**

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## 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
  - 240 V - 2 kV - 6 kV - 11 kV - 22 kV - 33 kV - 132 kV - 275 kV
4. Battery Holder
5. Shotgun adapter end fitting for Hot Stick connection

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## 3. SPECIFICATIONS

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### 3.1 ELECTRICAL

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

**Detection Frequency:** (40 to 70) Hz

**Power Supply:** (3) 1.5 V C cell batteries

**Power Consumption:** 40 mA

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

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

**Electrical Safety:** Compliant with EN 61326-1, EN 61000-4-2, EN 61000-4-3, EN 55011

### 3.2 MECHANICAL

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

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

**Case Protection:** IP65 per IEC 526

**Weight:** 1.30 lbs (0.59 kg) 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 in/10 cm, and detected the selected voltage setting at (8 to 12) in (20 to 30) cm.

The following data provides indicative distances at which the 275HVD will detect a given voltage.



**NOTE:** 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
240 V	4 in – 10 cm	75 V – 90 V
2 kV	4 in – 10 cm	1.3 kV
6 kV	4 in – 10 cm	3.6 kV
11 kV	4 in – 10 cm	7.5 kV
22 kV	4 in – 10 cm	11 kV
33 kV	4 in – 10 cm	19.5 kV
132 kV	4 in – 10 cm	Not Rated
275 kV	4 in – 10 cm	Not Rated

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

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



**NOTE:** 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
240 VAC	500 VAC	12 in - 32 cm
240 VAC	1 kVAC	18 in - 48 cm
240 VAC	2 kVAC	29 in - 75 cm
240 VAC	6 kVAC	48 in - 124 cm
240 VAC	11 kVAC	57 in - 146 cm
240 VAC	22 kVAC	89 in - 226 cm

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

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

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

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

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## 4. OPERATION

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### 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 Warnings on pages 8 and 9**

- 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 275 kV/133 kV/11 kV 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: WARNING! - READ BEFORE USE! on page 5**

Switch the sensitivity to **TEST**. The warning buzzer should emit a 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 240 VAC 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 was 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 240 V selection

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## 4.4 HIGH VOLTAGE TESTING



**See Warnings on pages 8 and 9**

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.

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

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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.

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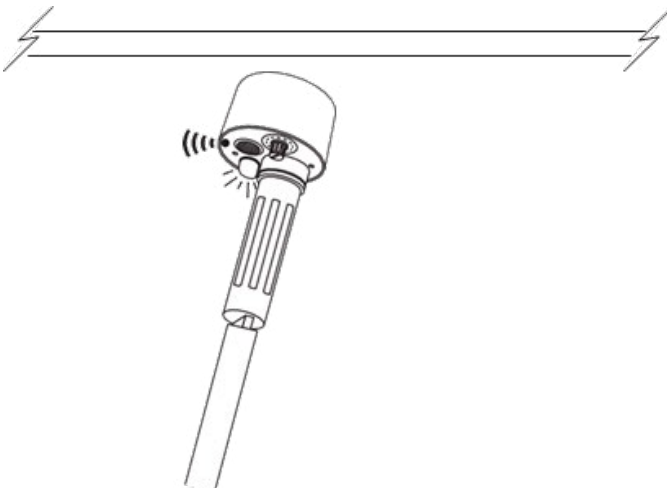


**WARNING: The tester must only be used with an appropriate insulated rod or Hot Stick when measuring High Voltage.**

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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 Warnings on pages 8 and 9

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.



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

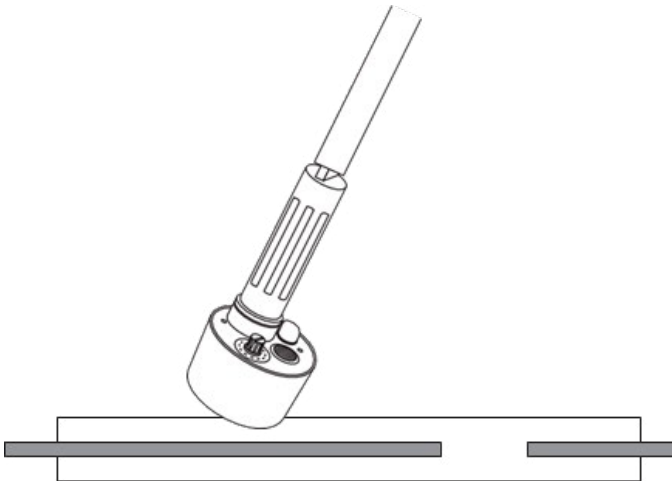
Radiated field strength increases with voltage and decreases quickly with distance and/or ground shielding. The radiated field from a cable where conductors supplying three-phase power are close together, tends to cancel out (See § 4.2). Detecting distance of a 250 VAC single live wire is about 4 in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

## 4.6 FAULTS (OPEN) IN CABLES



See Warnings on pages 8 and 9

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) 1.5 V **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.

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## 5. MAINTENANCE

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### 5.1 REPAIR AND CALIBRATION

To ensure that your instrument meets factory specifications, we recommend that the instrument be sent back to our factory Service Center at one-year intervals for recalibration or as required by other standards or internal procedures.

**(Or contact your authorized distributor.)**

Contact us for the costs for repair, standard calibration, and calibration traceable to N.I.S.T.



**NOTE:** You must obtain a CSA# before returning any instrument.

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### 5.2 TECHNICAL ASSISTANCE

If you are experiencing any technical problems or require any assistance with the proper operation or application of your instrument, please call, e-mail or fax our technical support team.



## 5.3 LIMITED WARRANTY

The instrument is warranted to the owner for a period of three years from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was purchased. This warranty is void if the unit has been tampered with, abused, or if the defect is related to service not performed by AEMC® Instruments.

**Full warranty coverage and product registration is available on our website.**

**Please print the online Warranty Coverage Information for your records.**

**What AEMC® Instruments will do:**

If a malfunction occurs within the warranty period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will repair or replace the faulty material at our discretion.

### 5.3.1 Warranty Repairs

**Caution: To protect yourself against in-transit loss, we recommend that you insure your returned material.**



**NOTE:** You must obtain a CSA# before returning any instrument.

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