INSTRUCTION MANUAL

MT275

Non-Contact High Voltage Detector

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Caution, risk of electric shock.

Caution, refer to the user manual.

1. Safety Rules

The Non-contact high voltage detector has been designed with safety in mind. However, no design can completely protect against incorrect use.

Electrical circuits are dangerous and lethal through lack of caution or poor safety practice. The following rules should reduce the danger:

- Read the user manual carefully and completely before using the Non-contact high voltage detector. Fully understand the instructions before using this product. Follow the instructions for every test. Take all the necessary precautions. Do not exceed the limits of this Non-contact high voltage detector.
- The Non-contact high voltage detector must never be in physical contact with any conductor higher than 1kV. This is a proximity detector, not a detector which works by contact.
- Always use a fiber glass rod or any authorized stick.
- A high voltage test is carried out with the Non-contact high voltage detector attached to a hot stick.
- Verify the rotary switch setting before measuring. Make sure it is on the correct setting for your application.
- Always check that the Non-contact high voltage detector is working before and after the test.
- Do not touch any exposed wiring, connections, or other "live" parts of an electrical circuit.

This instrument should only be used by a competent, suitably trained person who understands this test procedure fully. Personnel working with high voltage should be trained regularly.

2. General Description

The Non-contact high voltage detector is a new water-proof design tool for checking the presence of AC high voltages and low voltages.

Protection Class : IP65

The Non-contact high voltage detector provides a wider angle (120°) for voltage detection.

The Non-contact high voltage detector consists of an internal pickup sensor plate, a rotary switch as sensitivity selector, a sound annunciator (high pitch, high power buzzer) and a LED indicator (high bright LEDs) for easier viewing by users.

The Non-contact high voltage detector detects AC voltages using the sensor plate. The sensor plate collects part of the radiated electric field (V/M).

The electric field is seen by the internal circuitry and triggers the input of a CMOS integrated circuit. The integrated circuit charges a capacitor via a diode. Once that capacitor reaches a certain level, the buzzer and the LED indicator are turned on.

The trigger level is fixed (CMOS logical level change). The "Test" inserts a voltage on the sensor plate, just like if the sensor would pick up a voltage. The Non-contact high voltage detector allows identification of AC voltages. The enclosure is made out of industrial grade polyurethane. The enclosure can be attached to a hot stick. The small cylinder part of the Non-contact high voltage detector fits into most hot stick adapters.

3. Low Voltage Testing

The Non-contact high voltage detector works by proximity. Physical contact with electrical conductors is not necessary when testing for live lines. Its sensor senses the radiated field which surrounds live conductors. It is recommended not to touch high voltage wires with the Non-contact high voltage detector.

Radiated field strength increases with voltage and decreases quickly with distance or earth shielding. The radiated field from a cable of closely bunched conductors supplied by three phase power, tends to cancel (See **Limitations of the Non-contact high voltage detector** on page 9).
Detecting distance of a 220V AC single live wire is about 10cm.

4. Instrument Layout

1. LED Indicator: High bright low current LED triggered on voltage detection
2. Rotary Selector with the below settings:
   - OFF - Turn the pick-up sensor OFF
   - Test - Check if the entire circuitry is working
   - 240V, 3.3kV, 11kV, 22kV, 33kV, 66kV, 110kV, 220kV, 330kV, 500kV
3. Buzzer: High noise level buzzer triggered on voltage detection
4. Battery Holder
5. Adapter End: The adaptor end connection for hot stick.
6. Flashlight
7. Flashlight Button: Push to lock, to enable the flashlight.

5. Preparation for Use

When unpacked, the Non-contact high voltage detector should be inspected for any visible signs of damage, and the preliminary checks described in the user manual should be performed to ensure that it is operating correctly. If there is any sign of damage, or if the instrument does not operate correctly, return it to your nearest supplier.

This instrument is powered by three "C" type batteries.

6. Checking and Proofing

Switch the sensitivity to "TEST". The buzzer of the Non-contact high voltage detector should beep and the LED indicator should light.

This indicates that the Non-contact high voltage detector is operational.

Verify the working of this unit by selecting 240V AC and place the dome against a low voltage live conductor or rub the dome with a cloth or against an item of clothing as this generates a static DC which triggers the detection of circuit.

The LED indicator and the buzzer should go on as if a live wire is being approached.

Approaching the dome near a Computer screen or a TV screen (not liquid crystal display type) should also trigger the Non-contact high voltage detector while on the 240V selection.

7. Typical Uses

- Identify and check live cables.
- Check and detect live high voltage cables (using extension hot stick).
- Find fault in flexible cables.
- Check earth equipment.
- Trace live wires.
- Check high frequency radiation.
- Detect residual or induced voltages.

8. Broken Wires in Cables

Faults in damaged flexible cables are found by applying low voltage to each conductor. Earthing the remainder (the wires that do not need to be traced. Do not earth the live wire, so that they can be detected by the Non-contact high voltage detector.) and moving the tester along the cable until the change in condition is obtained. (Flexible cables, as used in mining and building industries, are readily repairable when the break in the cable is located).

9. High Voltage Testing

The rotary switch (attenuator) is used to identify and differentiate various HV live cables. **The Non-contact high voltage detector must be used in conjunction with a long and insulating rod or hot stick when measuring high voltage (kV).**

The non-contact high voltage detector should never be in contact with live conductors. Live conductors emit a radiated field that can be detected by the detector's sensor.

- **When working under high voltage systems, please wear the insulation gloves and rubber shoes. Do not touch live conductors with this non-contact high voltage detector.**

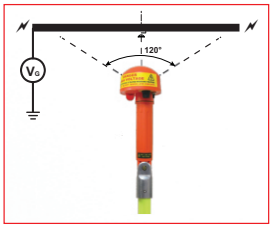
An increase in voltage means an increase in its radiated field strength. The radiated field strength quickly decreases with distance and/or ground shielding. The radiated field from a cable where conductors supplying 3-phase power are close together tend to cancel out. The rotary switch, or attenuator, is used to identify and differentiate various HV live cables.

- **The detector should only be used in conjunction with an insulated rod or hot stick when measuring high voltage.**

Check to see if the non-contact high voltage detector is in good operating condition. Select the appropriate test range. It is advised that you start with a lower test range setting than the actual working voltage.

Then perform the test again with the higher settings. The user may also opt to use a lower setting to check for lower voltages on a conductor.

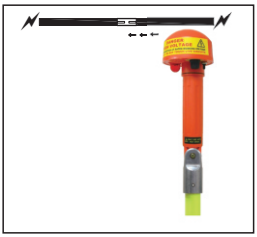
With the hot stick, gradually move the Non-contact high voltage detector towards the live conductor until its warning signal is triggered. Again, do not touch the live conductor with the Non-contact high voltage detector.



▪ The detection angle

10. Faults (Open) Cables

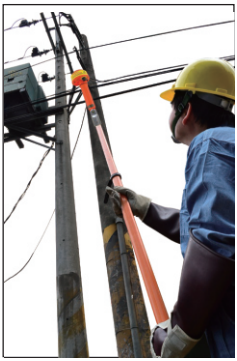
The Non-contact high voltage detector is capable of detecting faults in certain flexible cables. For a cable that is still energized, set the detector's sensitivity so that it triggers. Move the detector along the cable until you notice a change. An audible sound and LED will be on when the sensor is on the supply side of the open and will turn off when on the other side.



▪ For finding a break of cable

11. Limitations on the Non-contact High Voltage Detector
It is recommended that this Non-contact high voltage detector is not used in HV yards of mixed voltages. In the presence of mixed voltages, the tester can become unreliable.

Problems can arise when the tertiary circuit of a 275 / 133 / 11kV transformer is tested. The electric field of the HV and MV bus bars can trigger the detector when it is about 3m above the ground. This is common with most of the electric field voltage detectors. Users should be aware of it. The tester can pick up adjacent circuit to the one being tested and indicates the wrong information to the user.



- Check and detect live high voltage cables(using extension hot stick.)

12. Changing Batteries
The Non-contact high voltage detector uses 3 x 1.5V "C" type batteries. Open the battery holder (turn counter-clockwise) to remove the batteries. Ensure the polarity is correct. Then install the new batteries.

13. Specifications

Operating Temperature	-10°C to 50°C
Operating Humidity	85%RH
Storage Temperature	-20°C to 60°C
Storage Humidity	85%RH
Case Height	255mm
Case Width	96mm
Weight (Battery Included)	531g
Batteries	3 x C Alkaline
Safety Standard	EN 61326-1 CISPR 11 EN 61000-4-2 EN 61000-4-3 EN 61000-4-8
Accessories:	Instruction Manual Carrying Case Batteries

14. Limited Warranty

We warrant the product to be free from defective materials or factory workmanship. We agree to repair or replace this product with no charge for parts and service, if used under normal operation and is a result of manufacturer defects. If we are unable to repair or replace this product, we will make a full refund of the purchase price. Consult the user manual for proper instruction regarding use of this instrument. Our obligation under this warranty is limited to repairing, replacing or making refund of this test equipment which proves to be defective within 12 months from the date of purchase.

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons in any way. In our sole judgement, if the stability or reliability of products are injured, or which have been subject to misuse, abuse, misapplication, negligence or accident, or the serial numbers have been altered, defaced or removed, this warranty will not apply.

All warranties implied by law are hereby limited to a period of 12 months, and the provisions of the warranty are expressed in lieu of any other warranties expressed or implied.

The purchaser agrees to assume all liability for any damages or bodily injury which may result from the use or misuse of the product by the purchaser, or its user, his employees, or others, and the remedies provided by this warranty are expressed in lieu of any other liability we may have included in incidental or consequential damages.

We reserve the right to discontinue models at any time, or change specification, price or design, without notice and without incurring any obligation.

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