

# Use of Capacitive Voltage Detectors

## Background

Capacitive Voltage Detectors are used in ESB Networks for checking loss of voltage from 10kV to 400kV. Recently there have been a number of incidents reported where these detectors have given incorrect indications. ESB Networks use voltage detectors from various manufacturers. All are manufactured according to the same standard, have similar threshold voltage ranges and are equally affected by field interference which can influence the voltage detector.



There are two scenarios that can happen in practice:

- In-Phase Interference –detector indicates the absence of voltage even when the conductor being tested is still live.
- Out-of-Phase Interference –detector indicates that the conductor is live when it is disconnected. This can occur when the conductor is disconnected or when it is disconnected and earthed.

The situations where capacitive voltage detectors **may NOT** operate reliably include:

- **No direct contact with the metallic conductor** – The metal contact electrode of the detector must make direct contact with the metal conductor in order for a test to be effective.
- **Reaching between same-phase conductors** - This can cause in-phase interference as the device cannot detect a voltage drop across it.
- **Use close to plant, jumpers and droppers** - Do not position the detector parallel to the conductor being tested or parallel to any droppers connected to the conductor being tested.
- **Interference from adjacent live sources** - This causes the detector to indicate that the conductor is live when it is disconnected e.g. where a live HV line is passing over a disconnected MV line
- **Heavy rain causing a continuous water film on the shell of the detector** - Capacitive voltage detectors may fail to detect the presence of voltage on live network during heavy rainfall. As rainwater accumulates on the shell of the detector it creates a continuous conductive film which may affect its operating threshold.  
*ESB Networks now stock Individually packed Silicone Cleaning Wipes in boxes of 50 wipes for this purpose. The Stores Code is 8818236.*
- **Use of paper or metallic stickers on the shell of the detector** - As with rain water, paper and metallic labels can conduct at the voltages in question. This will shield the sensors.
- **Heavy surface scratching on the shell of the detector** - This can impact shedding of rain water as well as affecting the rated insulation properties of the shell.
- **Detectors with Auto Shut-Off and Stand-By modes** – Some voltage detectors have auto shut-off while others are in constant standby mode. Refer to manufacturer’s instructions for self-test and operating instructions.

A comprehensive Guidance Document on Capacitive Voltage Detectors is currently being prepared. Once this document is approved it will be communicated to all staff using Capacitive Voltage Detectors.

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<p>Reaching between same phase conductors</p>		
<p>Use close to plant and droppers</p>		
<p>Use around jumpers</p>		

## What should I do?

### Managers & Supervisors:

Ensure all staff who use these Voltage Detectors receive a copy of this special briefing note.

### All Staff Using MV & HV Voltage Detectors:

Always comply with ESB Networks' policy for checking the operation of voltage detectors by carrying out a self-test before and after each use using the self-test function on the detector and testing off a live source daily where possible but at least weekly.

### For further information please contact:

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