

Technical Note

<b>Title:</b>	<b>VeriSafe AVT Detection Lead Separation Fault Analysis</b>
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**Revision History**

<b>Revision Number</b>	<b>ECN</b>	<b>Date</b>	<b>Editor</b>	<b>Summary of Change</b>
0	GAECN05660	5/11/2020	MSAD	Initial Release

**Potential Installation Issue**

The Installations Considerations section of the VeriSafe AVT Instruction Manual describes a low probability scenario that could occur if AVT sensor leads are not installed properly and come in contact with a low impedance path to ground while the test is in progress. This may result in a green absence of voltage indication, while the electrical system is still energized. This scenario would require a series of multiple faults and would only occur if terminations are not properly made and secured.

**Fault Analysis Sequences**

**1. Single-Phase System**

- Fault 1: Energy is present on system that user believes they have de-energized
- Fault 2: Cable tie/clamp securing detection lead fails or is missing
- Fault 3: Detection lead wire separates from power conductor
- Fault 4: Detection lead wire contacts low impedance path to ground

**2. Single-Phase System, Redundant Detection Lead Installation Option**

- Fault 1: Energy is present on system that user believes they have de-energized
- Fault 2: Cable tie/clamp securing detection lead 1 fails or is missing
- Fault 3: Detection lead 1 separates from power conductor
- Fault 4: Detection lead 1 contacts low impedance path to ground
- Fault 5: Cable tie/clamp securing detection lead 2 fails or is missing
- Fault 6: Detection lead 2 separates from power conductor
- Fault 7: Detection lead 2 contacts low impedance path to ground

**3. Three-Phase System**

- Fault 1: Energy is present on system that user believes they have de-energized
- Fault 2: Cable tie/clamp securing phase 1 detection lead fails or is missing
- Fault 3: Phase 1 detection lead separates from power conductor
- Fault 4: Phase 1 detection lead contacts low impedance path to ground
- Fault 5: Cable tie/clamp securing phase 2 detection lead fails or is missing
- Fault 6: Phase 2 detection lead separates from power conductor
- Fault 7: Phase 2 detection lead contacts low impedance path to ground
- Fault 8: Cable tie/clamp securing phase 3 detection lead fails or is missing
- Fault 9: Phase 3 detection lead separates from power conductor
- Fault 10: Phase 3 detection lead contacts low impedance path to ground

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**4. Three-Phase System, Disconnect Failure**

Fault 1: Energy is present on system that user believes they have de-energized

Fault 2: One phase of the power conductors is energized, but the other two are not

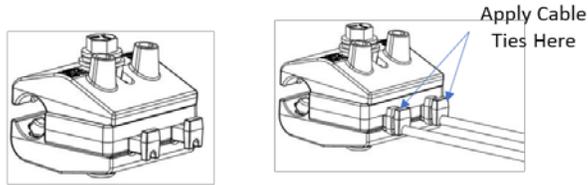
Fault 3: Cable tie/clamp securing detection lead on the energized phase fails or is missing

Fault 4: Detection lead on energized phase separates from power conductor

Fault 5: Detection lead from energized phase contacts low impedance path to ground

**Notes:**

1. The VeriSafe AVT is designed with two sensor leads for each phase conductor. The two leads in each set have different functions: one lead is used to detect voltage (detection lead) and the other lead (termination lead) is used to verify that the detection lead is in contact with a conductor. This fault analysis only applies to the detection leads. A similar scenario with the termination leads will not result in an unsafe condition.
2. Regarding “contacts low impedance path to ground,” this scenario requires good electrical contact between the detection lead and the low impedance path to ground. Contact between the detection lead and a painted surface is not likely to result in the fault condition.
3. Use of the redundant detection lead option is recommended for single-phase systems. Refer the VeriSafe AVT Instruction Manual for schematics.
4. The VeriSafe AVT should be installed with sensor leads secured as described in the Instruction Manual. In addition, if you are using the VeriSafe Insulation Piercing Connectors, there is an integrated cable management feature built-in to mitigate the fault scenario.



Part Numbers: VS-CKP14-6, VS-CKP4-000.