VeriSafe™ Absence of Voltage Testers in Motor Control Centers (MCCs)

AVTs in MCCS: Where to Install

Absence of Voltage Testers can be used to safely and efficiently verify the absence of voltage, a crucial step in lockout/tagout process and electrical safety procedures. As a general guideline, the AVT should be installed in at the point where you would normally test for voltage. If there are multiple test points, more than one AVT can be installed.

The following sections describe typical locations where an AVT may be installed in a MCC.

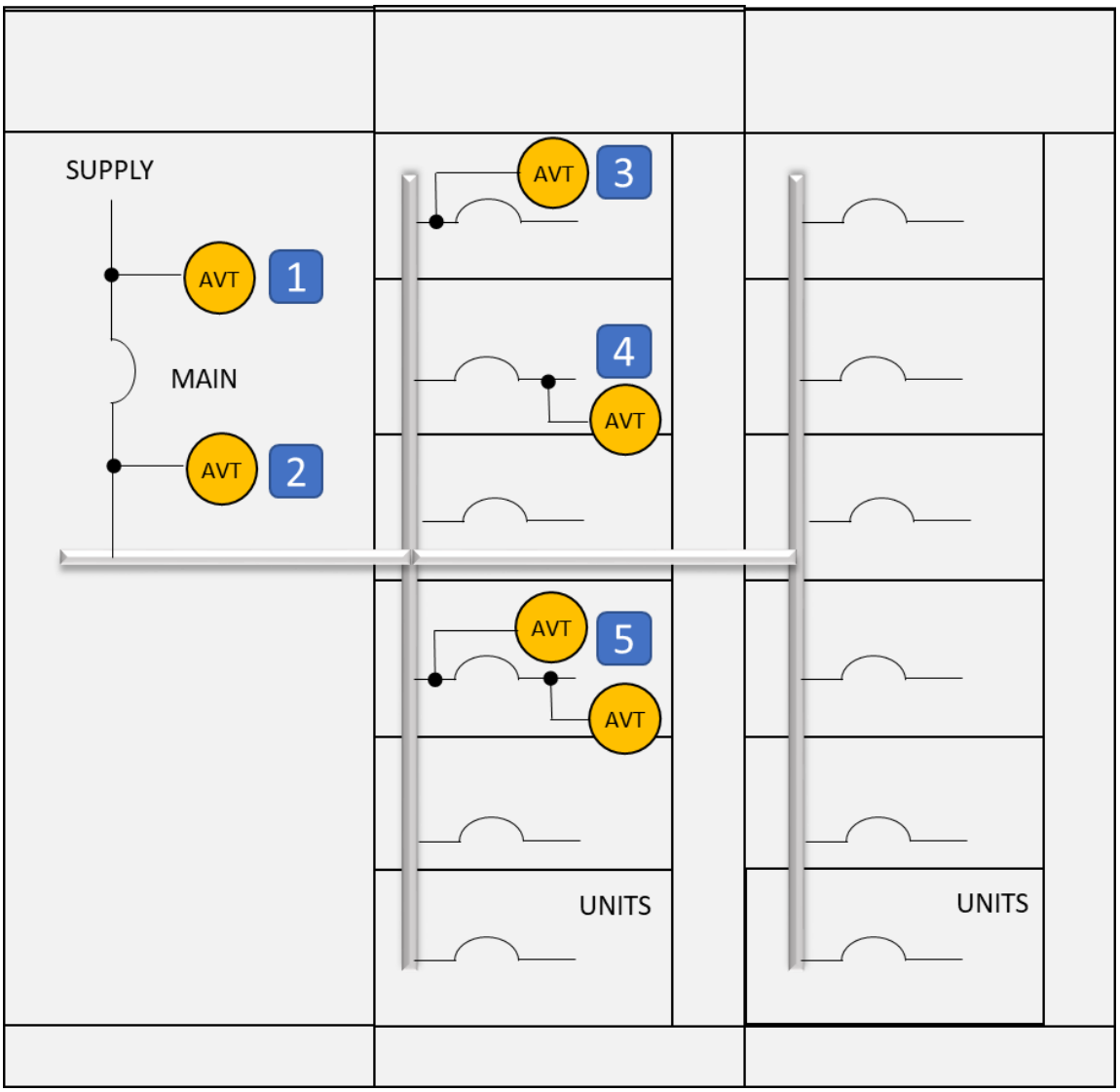


Figure 1: MCC Oneline and Elevation View Hybrid

1 Line Side of Main

Use Cases

- If the upstream protective device is de-energized before performing maintenance in the MCC, the AVT can be used to test the main horizontal bus in the MCC.

Considerations

- MCC Main must be closed to test the bus

*This is a rare application.

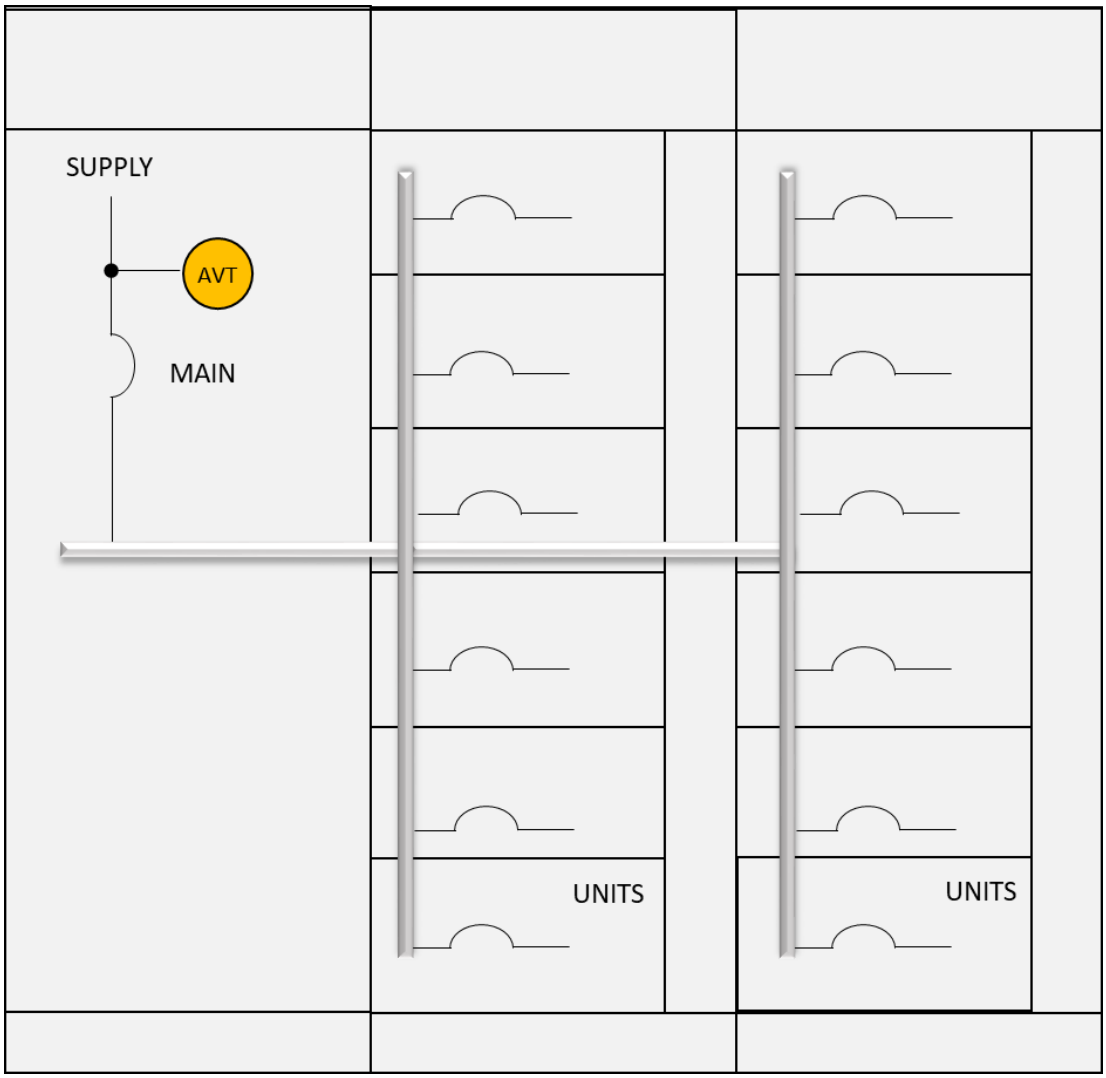


Figure 2: AVT Installed on Line Side of Main

2 Load Side of Main

Use Cases

- Verify that the MCC bus is de-energized
- Also compatible with MCCs that have a Main Lug Only (MLO) incoming compartment with the Main in an upstream enclosure

Considerations

- Voltage may still be present on the line side of the main if the upstream device is not de-energized and locked/tagged out.

Example

- 3” AVT Bucket for Square D Model 6 Motor Control Centers by Schneider Electric

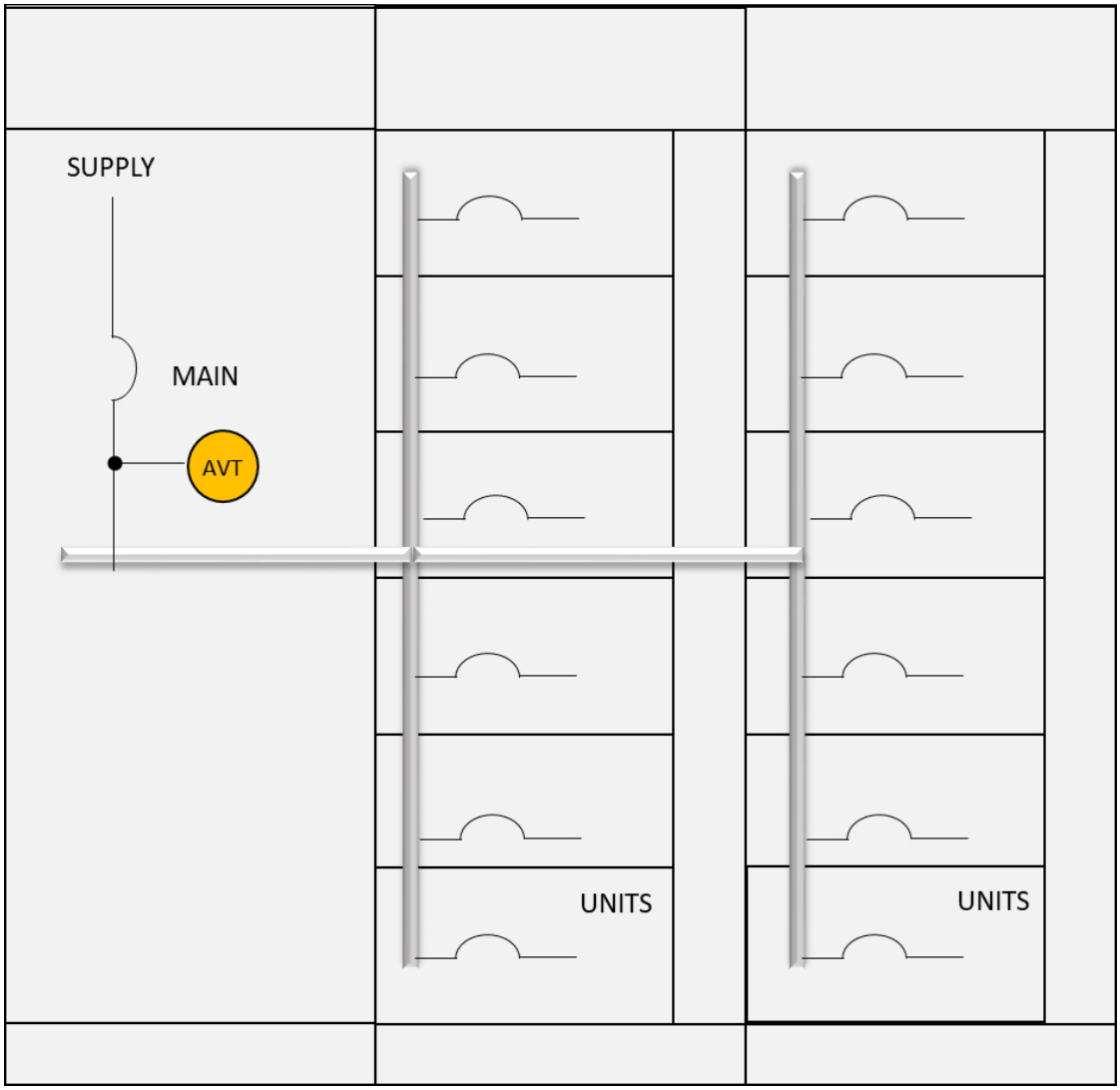


Figure 3: AVT Installed on Load Side of Main

3 MCC Units on Line Side

Use Cases

- Test to ensure breaker is racked out or stabs are fully disengaged when main bus is energized
- Use with plug-in units that have retractable stabs and arc resistant rating to verify absence of voltage before opening unit door

Considerations

- Any voltage on the load side of the disconnect (e.g., DC voltage collapse from the connected motor windings or stored energy from a capacitor) would not be verified if the disconnect in the bucket is in the Open or Tripped position

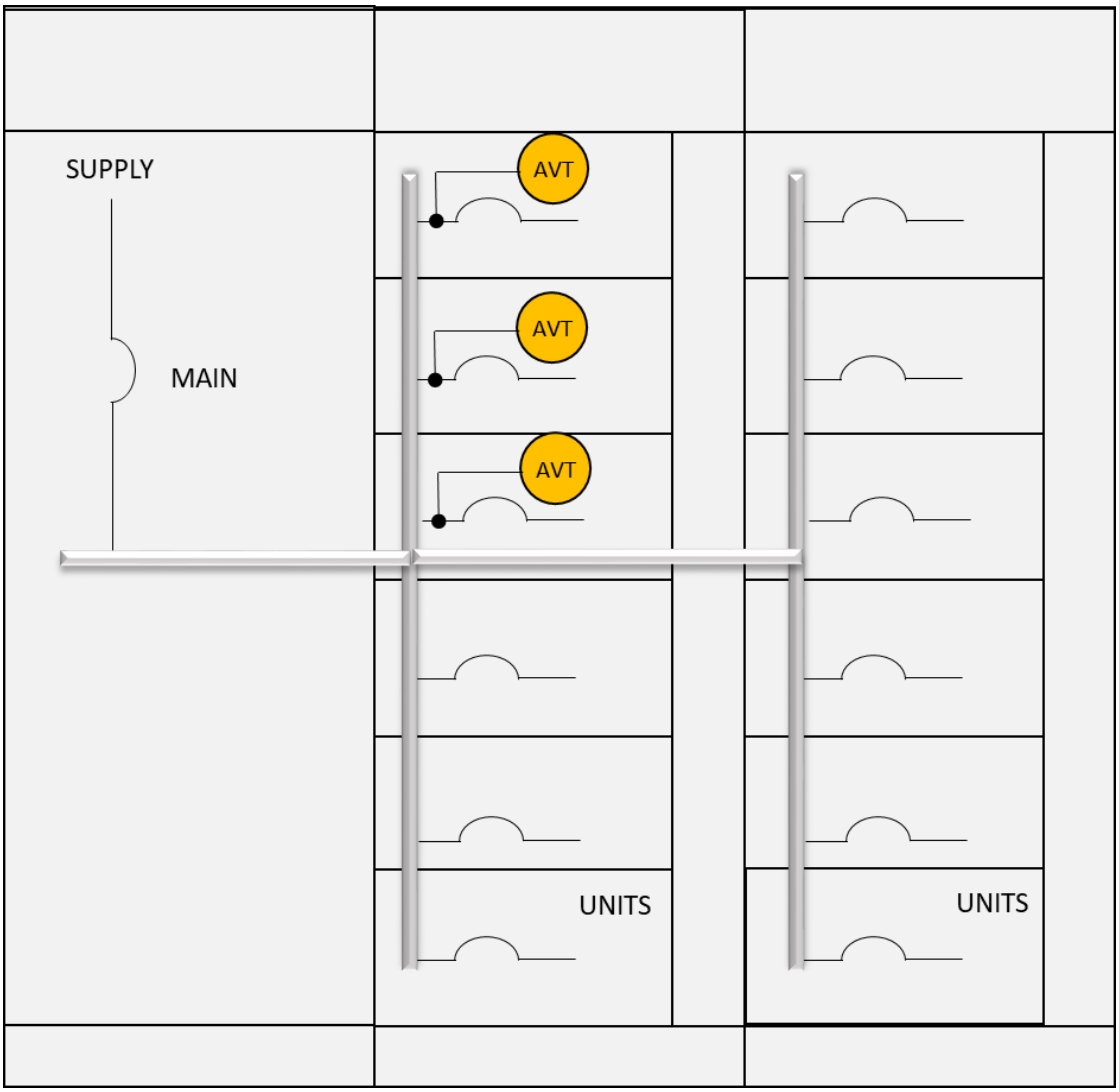


Figure 4: AVT Installed on Line Side of MCC Unit

4 MCC Units on Load Side

Use Cases

- Test for absence of voltage in an individual bucket without powering down the entire MCC
- Verify no DC voltage from motor backfeed*

*As long as there are no open switches or circuit elements (such as a contactor) between the motor and the point in the circuit where the AVT test leads are installed

Considerations

- Voltage may still be present on the line side of the disconnect/unit stabs if the main bus is not de-energized
- If main is not locked out at time of test, best practice is to also verify breaker poles are fully disengaged

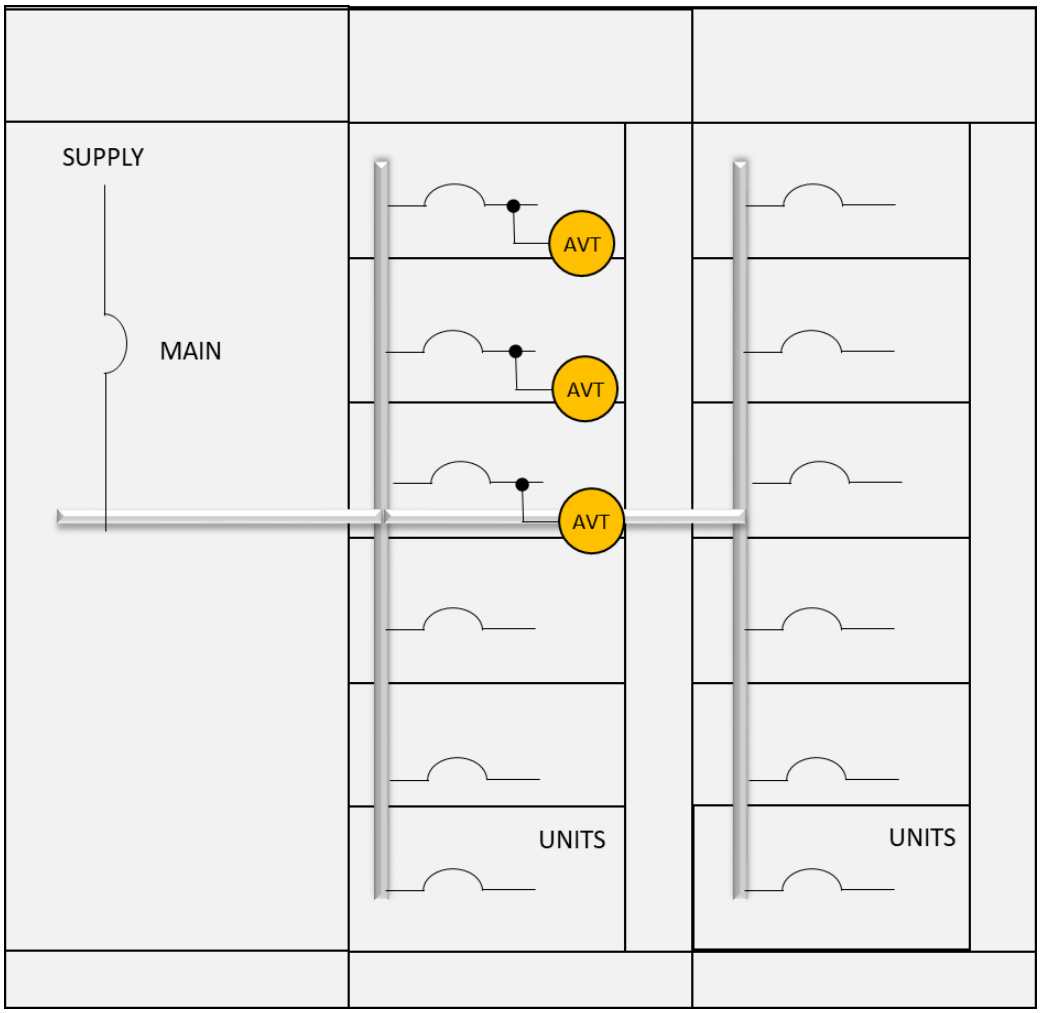


Figure 5: AVT Installed on Load Side of MCC Unit

5 MCC Units on Line and Load Side

Use Cases

- If the procedure requires the main bus to be de-energized and backfeed from the motor is likely

Sample Procedure

1. Open the disconnect in the MCC bucket
2. Use the AVT on the load side to verify that the DC voltage from the motor has dissipated
3. Open the main MCC (or disengage the stabs from the bus) and follow LOTO procedures
4. Use the AVT on the line side to verify the absence of voltage on the stabs.

   Note: an alternative for Step 4 would be to use an AVT installed on the load side of the main (for example, the 3" AVT bucket from Schneider Electric).

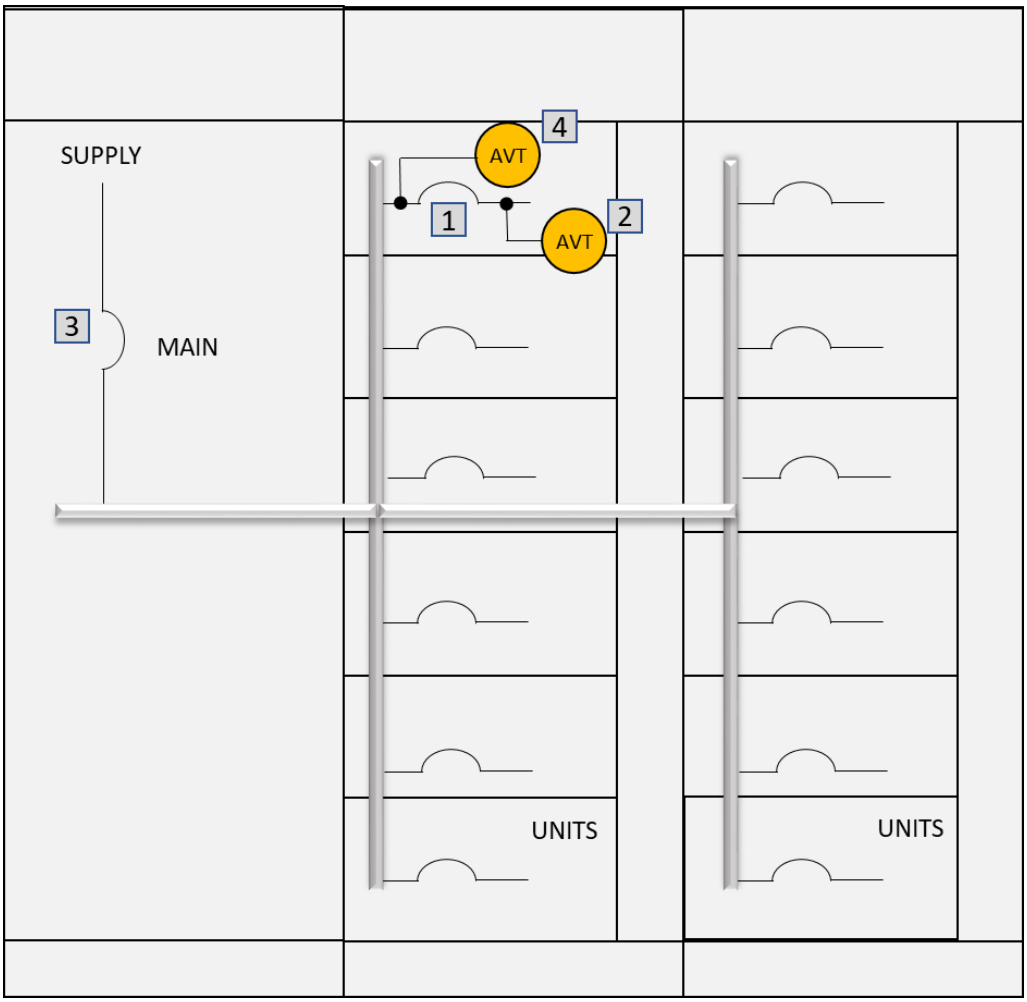
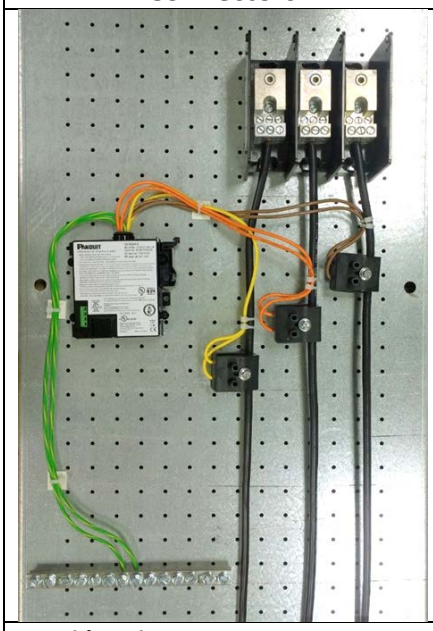
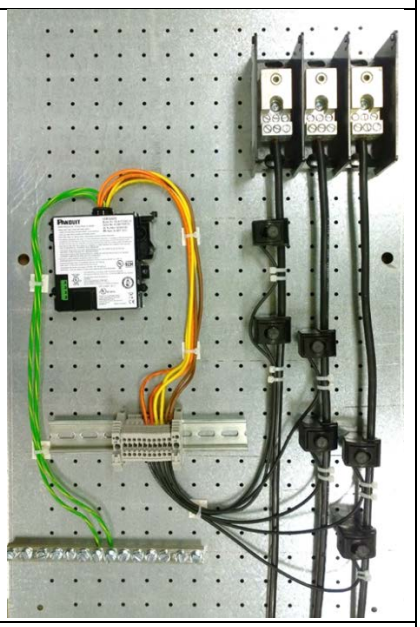


Figure 6: AVTs Installed on Line AND Load Side of MCC Unit

AVTs in MCCS: How to Terminate Sensor Leads

Absence of Voltage Tester sensor leads can be terminates using a variety of methods. The use of ferrules is highly recommended for reliable contact. Sample termination methods are shown below. Further details and other methods can be found on the AVT Connection Options Document on www.panduit.com.

VeriSafe Insulation Piercing Connectors	Power Disconnect Switch with Distribution Lugs	Terminal Blocks
		
Considerations • Single connector is used to terminate two sensor leads, allowing for a smaller, cleaner, quicker solution • **Sensor leads must have ferrules applied** • Insulation piercing connectors do not compromise the integrity of the conductor	**Considerations** • Sensor leads must have ferrules applied • Sensor leads must be secured to the power conductor • Connection may be on line side or load side • Lugs must be rated to accept multiple leads and compatible with the 14 AWG AVT sensor leads • Distribution lugs can be added or changed on some Power Disconnect Switches	**Considerations** • Use of a terminal block provides a means of converting the AVT sensor leads to a wire type that is compatible with additional types of connectors. • Select proper extension wire per UL 1436 and the NEC • **Sensor leads must have ferrules applied** • Sensor lead extensions from terminal black must be secured to the power conductor
SCCR Impact • No Impact	**SCCR Impact** • Changing lug may impact SCCR	**SCCR Impact** • No Impact
Limitations • Total length of the AVT sensor leads must not be longer than 10 ft from AVT Isolation Module to connection point on power conductor.	**Limitations** • Total length of the AVT sensor leads must not be longer than 10 ft from AVT Isolation Module to connection point on power conductor. • AVT sensor leads must not be terminated in the same port	**Limitations** • Total length of the AVT sensor leads must not be longer than 10 ft from AVT Isolation Module to connection point on power conductor.

AVTs in MCCS: Other Tips and Tricks

- Indicator module can be installed in control stations or directly mounted to the door
- Isolation module can be mounted via DIN rail or on any flat surface within the unit. If space is limited in buckets, consider placing in wireways. However, consider using quick connect terminal blocks to make plug-in units easy to remove
- Mark tester location with instruction label included with the Absence of Voltage Tester
- Other technical information can be found on the Panduit AVT Knowledgebase on www.panduit.com.