VeriSafe™ Knowledge Base

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Questions and Answers

General Product Information

GP01 Will voltage be present on the door when VeriSafe is installed?

Hazardous voltage is isolated from the VeriSafe Indicator Module and door. Hazardous three-phase voltage will not be present on the AVT System Cable or Indicator Module. There is non-hazardous (less than 5 V), just enough to power the LEDs on the indicator. Top of the Document

GP02 Does the VeriSafe AVT have internal short circuit protection?

VeriSafe is protected by recognized components that provide limited impedance between the power circuit and the tester. The protection circuit is built with redundancy and can tolerate component failures and fault conditions. Top of the Document

GP03 How should the VeriSafe AVT be disposed of at end of life?

VeriSafe is an electronic product with PCBs in both the indicator and isolation module. The indicator module contains a lithium battery. When decommissioning, remove the battery. Do not discard the battery in the trash; bring to a battery disposal drop off location. The indicator and isolation modules can be brought to an electronics recycling location. All components are RoHS compliant. Top of the Document

GP04 Does the VeriSafe AVT device have digital integrated circuitry?

Yes, a microprocessor is included in the product. Microprocessor firmware is loaded in the factory and is not upgradable by the user. Top of the Document

GP05 What is the absence of voltage threshold?

The absence of voltage threshold for VeriSafe is 3V for both the AC and DC detection. If any voltage is detected above this threshold the green light will not illuminate. Three volts is consistent with the threshold established in the listing requirements for Absence of Voltage Testers described in UL 1436. De-energized industrial systems are rarely measured at 0V. Often, there is a small residual voltage due to RF interference or noise on the ground plane present in de-energized systems. To ensure that the Absence of Voltage Tester maintains personnel safety and operates reliable, an absence of voltage threshold must be selected. The threshold must be low enough to avoid any injuries to personnel and high enough to avoid nuisance indications when small amounts of unharmful voltage are detected in the environment where the Absence of Voltage Tester is installed. Top of the Document

GP06 Does the AVT detect ground faults?

VeriSafe is an absence of voltage tester, not a ground fault monitor. It will detect if voltage greater than 3.0 V is present between any phase and ground when the Test Button is pushed. Top of the Document

GP07 Does VeriSafe detect "stray" or inductive voltage in the 0-50V range?

The AVT device will detect ANY voltage over the 3 volts threshold. To ensure optimal reliability, any residual voltage shall be less than 1.3V when installing VeriSafe AVTs. Top of the Document

GP08 Is the device protected from static electricity?

The device is protected from static electricity. Top of the Document

GP09 Is the VeriSafe Absence of Voltage Tester protected from power surges?

The VeriSafe AVT circuit design includes features that will conduct a typical surge to ground to prevent damage to the device. In the case of a surge event that is extreme in voltage level or duration, there are resistors that will fail to an open state. Top of the Document

GP10 What is the expected product life of the VeriSafe AVT?

VeriSafe Absence of Voltage Tester is designed to last 20 years. For useful life related to functional safety calculations, contact Tech Support. Top of the Document

GP11 Can VeriSafe be used in an outdoor environment application?

The VeriSafe AVT was designed for indoor applications. However, the Indicator Module is made from materials that are UV Resistant and UL approved for outdoor use. The AVT is rated for use in Type 4, 4X, IP66, and IP67 enclosures, meaning it will provide protection against rain, snow, windblown dust, splashing, hose directed water and temporary submersion. The product must be stored and operated within the temperature range specified in the Instruction Manual (Operating Temp.: 0C to 60C, Storage Temp.: -45C to 85C), which may present a challenge when using the product in outdoor environments. It is up to user to determine the suitability for use in their application. Top of the Document

GP12 What is the voltage detection range of the VeriSafe AVT?

The voltage detection range of the VeriSafe AVT is up to nominal 600V AC (50/60Hz) and 600V DC. The voltage range has a rated tolerance +10%. The rated tolerance is intended for temporary excursions over the 600V limit. Top of the Document

GP13 Does the VeriSafe AVT have preventative maintenance (PM)?

Once installed and commissioned, the VeriSafe AVT has very little maintenance. Guidelines can be found in the instruction manual under the maintenance section. Basic cleaning and visual inspection of the cable and O-ring is recommended. The battery is the only component that would require replacement. Top of the Document

Installation/System Requirements

IS01 Is overcurrent protection required for the VeriSafe Absence of Voltage Tester?

Installation of overcurrent protection is not required for safe operation of the VeriSafe AVT. UL 1436 requires AVTs to be constructed so that internal component failures will not expose the AVT to available short circuit currents from the main power supply during normal operation and under single-fault conditions. The VeriSafe AVT Isolation Module uses high impedance to limit voltage and current flow through the device to safe levels. In addition, the VeriSafe AVT has been tested to withstand transient overvoltage up to 6 kV. In the US, the sensor leads of the AVT can be treated as a feeder circuit per NEC

article 240.21(B)(1)(b) Exception (NFPA 70:2017). This rule allows a tap of no more than 10 feet on a feeder circuit without the need for overcurrent protection.

Other local wiring codes and regulations may require use of overcurrent protection. Always follow applicable codes and standards when installing the device. The VeriSafe AVT can be installed safely with overcurrent protection. When installing overcurrent protection with the VeriSafe AVT, it is important to install one overcurrent protection device for each of the six sensor leads. Overcurrent protection should not be installed with the two green ground leads. Do not install multiple lead wires on one overcurrent protection device in a configuration that would leave lead wire pairs electrically connected in the event that the overcurrent protection is in the open state. Top of the Document

IS02 Will installation of VeriSafe Absence of Voltage Tester affect the short circuit current rating (SCCR) of my equipment?

The VeriSafe Absence of Voltage Tester is suitable for use on circuits capable of delivering up to 300,000 rms symmetrical amperes at 600V or less. AVTs listed to UL 1436 are required to operate as a galvanically isolated secondary circuit that is isolated from the circuit conductors by use of a transformer, optical isolator, or limiting impedance, or other similar means. This is intended to reduce the risks of both electric shock and thermal hazard. These galvanic isolation circuits allow very limited current flow, if any, through the AVT. Top of the Document

IS03 Is the VeriSafe AVT a power circuit?

The VeriSafe AVT is not part of the current carrying power circuit. It is a measuring device to determine the absence of voltage in the power circuit. VeriSafe AVT detects the voltage of the three-phase power circuit, but the current from the power circuit does not flow through VeriSafe. The VeriSafe AVT is similar to a voltmeter, testing the circuit voltage without actually being in the power circuit current path. In the event of a short circuit fault, the short circuit current does not flow through the VeriSafe and no short circuit current rating (SCCR) is required.

IS04 Can the VeriSafe Absence of Voltage Tester be installed on a single-phase system?

The tester is designed primarily for three-phase systems, but can also be installed on single-phase systems. Refer to schematics in the Instruction Manual. Top of the Document

IS05 Can the VeriSafe Absence of Voltage Tester be installed on a DC system?

The tester is primarily designed for three-phase AC systems, but it can be installed on a DC power system. When installed in a DC system, the AVT is not polarity specific. If installed on a DC system, there are no differences in the absence of voltage test function. However, the voltage presence indicators are designed to illuminate when AC voltage is detected. The presence of DC voltage will not be indicated. Refer to Installation Schematics in the Instruction Manual for further details. Top of the Document

IS06 Will the VeriSafe AVT detect improper installation?

The AVT will detect lack of continuity between the two leads for each phase, and between the two grounding leads. Installation must be performed per the installation instructions by a qualified electrician who must verify proper installation and operation of VeriSafe as described in the Instruction Manual. Top of the Document

IS07 Can the AVT be installed to monitor the output of a Variable Frequency Drive (VFD)?

The AVT is not intended to be used for monitoring the output voltage from a variable frequency drive, and we do not recommend it for this application. Top of the Document

IS08 Can VeriSafe be retrofit into existing equipment? Will this void the UL listing?

VeriSafe is suitable for greenfield and brownfield applications. In some cases, if you are not modifying the structure (for example, if a 30mm knockout already exists in the door) you may not void UL on the enclosure. As with any modification of listed equipment, it is up to the AHJ to determine if the new installation is suitable for the application. Top of the Document

IS09 Should the VeriSafe AVT device be installed on the Line side or Load side of the equipment disconnect?

The VeriSafe AVT device is designed to work in both scenarios. Users may design their panels so that the line side of the disconnect is inaccessible (behind a barrier or in a separate compartment). In this case, if the safety procedures allow work in the panel with the line side energized, the AVT could likely be installed on the load side of the disconnect. Other users may mandate that all energy sources in an enclosure be disconnected. In these cases, procedures would likely require equipment to be de-energized and locked out at the upstream device or in a separate compartment. For this scenario, it makes most sense to install the AVT on the line or supply side of the disconnect. It is up to the user to decide which way is better for their applications. Top of the Document

IS10 Is it acceptable to use a single VeriSafe AVT device on a main panel to provide absence of voltage protection for downstream panels?

The AVT should be installed at the point where work will be performed. VeriSafe can only test for absence of voltage at the point in the circuit it is installed. Each panel where electrical work is to be performed should have an AVT installed. Top of the Document

IS11 Does VeriSafe operate differently on solidly grounded and high resistance grounded systems?

VeriSafe is designed to work in both solidly grounded and HRG systems. There are no differences in operation between these systems. Top of the Document

IS12 How does the VeriSafe AVT satisfy the NEC tap rule?

The sensor leads of the AVT can be treated as a feeder circuit per NEC article 240.21 (B) (1) (b) exception. This rule allows a tap of no more than 10 feet on a feeder circuit without the need for overcurrent protection. Top of the Document

IS13 What is the withstand and impedance rating of the AVT?

VeriSafe has a short circuit current rating of 300,000A at 600V. VeriSafe is designed with 1 Megaohm impedance. Top of the Document

IS14 Can the VeriSafe AVT be used on 4-pole systems?

The AVT is a tester with terminations for 3-poles with protective ground. For systems with 4-pole or 4-wire plus ground, there is not an additional termination point on the tester for the neutral

wire. However, the AVT will still detect voltage between phase and each phase and ground. Top of the Document

IS15 Can VeriSafe be installed in systems utilizing parallel runs?

Yes. Some applications may use multiple cables per phase. In these cases, it is recommended to install each sensor lead on a separate cable for redundancy. Top of the Document

IS16 Can VeriSafe be installed in ungrounded systems?

Yes. The VeriSafe provides three red LEDs for voltage presence indication and an absence of voltage test to verify that voltage is not present. The red indicator LEDs indicate the presence of voltage between each phase to ground. For an ungrounded power system, in the event one phase becomes grounded, the red LED for that phase will not be lit. Top of the Document

The absence voltage test checks for voltage between phases as well as between each phase to the earth ground. Any voltage above the threshold (3 volts) is detected between the following: L1 to L2, L1 to L3, L2 to L3, L1 to PE GND, L2 to PE GND, L3 to PE GND. For an ungrounded power system, in the event one phase becomes grounded, the absence of voltage test would still detect the voltage potential between the grounded phase and the other phases. Top of the Document

Operation

OP01 Does the VeriSafe Absence of Voltage Tester verify it is operating satisfactorily before and after verifying the absence of voltage?

The VeriSafe AVT includes a supervisory test circuit to verify that the tester is functioning properly. The supervisory test circuit is activated before and after the absence of voltage measurements are taken. Like the process used to validate the functionality of a handheld tester, verifying that the tester is functioning as expected before and after the test ensures that the tester was not damaged during the absence of voltage detection event leading to a false indication.

To verify functionality of the AVT, the test circuit will present a known voltage to the input stage where the line voltage is detected via one of the sensing lead wires. The circuit then inspects the output of the detection circuits to verify that the tester can detect an unsafe condition, hence “testing-the-tester”.

This procedure is repeated before and after verifying the absence of voltage between every phase-to-phase and phase-to-ground combination. Additionally, the detection circuitry is dual channel so the test voltage is verified by two independent circuits before and after each test. Top of the Document

OP02 Why does the yellow Caution Indicator flash at the end of a failed test procedure?

If the absence of voltage cannot be confirmed the Caution Indicator will flash 1-7 times after turning solid yellow to indicate that the test did not pass. The number of flashes can be used to determine why the absence of voltage test failed.

Number of Flashes	Description
1	Battery voltage not sufficient to run test; replace battery and try again
2	Voltage detected

4	Proper installation of sensor leads could not be verified

If the indicator flashes 3, 5, 6, or 7 times, contact Panduit Tech Support for additional troubleshooting. Top of the Document

OP03 Is PPE required to initiate an absence of voltage test with the VeriSafe Absence of Voltage Tester?

The VeriSafe Absence of Voltage Tester allows qualified personnel to test for absence of voltage by pressing a test button located outside of the enclosure where the tester is installed. Typically, devices that are operated from the outside of electrical equipment are not considered to present electrical hazards provided the equipment is properly installed and maintained, operation of the device does not change the state of the enclosed equipment, and the equipment has no evidence of impending failure.

However, when determining the proper PPE for a given task, factors beyond the control of and unknown to Panduit such as installation, maintenance of the equipment, personnel competency, other nearby equipment, processes, or activities must be considered. Therefore, Panduit cannot make recommendations as to what PPE is required and company policies and procedures should always be followed. Top of the Document

OP04 Is PPE required to open an enclosure if the VeriSafe Absence of Voltage Tester confirms the absence of voltage (green light)?

PPE for a given task is determined after performing a risk assessment and hazard analysis. The risk assessment will take into account factors beyond the control of and unknown to Panduit such as installation, maintenance of the equipment, other nearby equipment, processes, or activities that can impact the need for PPE. Therefore, Panduit cannot make recommendations as to what PPE is required. The user must follow standard safety policies and procedures established by the employer to determine PPE requirements. In addition, the VeriSafe Absence of Voltage Tester will only test for voltage at the point it is installed. The user must take necessary measures and follow established policy to ensure safe working condition in all affected areas. Top of the Document

OP05 How does the VeriSafe Absence of Voltage Tester verify that sensor leads are in contact with phase conductors and ground?

The AVT device features two sensor leads for each phase conductor and ground connection point. The second lead on each phase (or ground connection) provides the ability for the AVT to verify that it is in contact with the circuit conductors (each phase and ground) when the absence of voltage test takes place. The presence of the second lead wire is detected by the internal sensing circuitry. This validates the correct connection of the primary sensing lead. Top of the Document

OP06 Will VeriSafe indicate the difference between residual voltage and nominal voltage?

VeriSafe is designed to indicate the absence of voltage if any voltage great than 3 V AC or DC is detected between individual phases and between each phase to ground. There is no distinction based on the magnitude of the voltage, whether it be residual or other nominal. Top of the Document

OP07 How would an operator know if nominal voltage is detected?

If the nominal voltage is detected, the Voltage Presence indicator(s) will be illuminated. These red LED's are for reference only. Lack of illuminated of the red LED's does not guarantee the absence of voltage. Top of the Document

OP08 Are users protected from hazardous voltage when using the AVT?

VeriSafe is designed with several layers of protection with regards to electrical isolation. The isolation module uses limited impedance techniques to limit current from the power conductors to 0.5mA or less. Additionally, galvanic isolation techniques are used between the isolation and indicator modules. Further, the isolation module interface is designed with an insulated plastic housing and potted faceplate to keep voltage away from the user interface. Top of the Document

OP09 Does the VeriSafe AVT device search for stored energy in VFDs, capacitors, or UPS devices?

When the test is initiated, it will not pass if voltage over 3.0V AC RMS (50/60 HZ) or 3.0V DC is detected on the line monitored by the AVT device. Top of the Document

OP10 How do you know that the test circuit is working?

If any part of the test circuit fails, the green absence of voltage indicator will not illuminate. The test circuit is part of the safety function and must meet SIL 3 functional safety requirements. Functional safety ensures that dangerous failures are detected and controlled in a safe manner. In addition, there are multiple provisions in the UL 1436 listing requirements as well as the requirements to address the reliability of the test circuit. Top of the Document

OP11 Does VFD or MCC noise affect the device?

VeriSafe is designed to work in an industrial environment, in proximity to VFDs and MCCs, among other equipment. It is designed to meet IEC/EN 61326-1:2013 (EMC Immunity for measurement, control and laboratory use – EMC requirements, Part 1: General Requirements) and IEC/EN 61326-3-1:2008 (EMC Immunity requirements for safety related systems and for equipment intended to perform safety-related functions (Functional safety) – general industrial applications). Top of the Document

OP12 Can VeriSafe be used to ensure that energy stored in the capacitors in a variable frequency drive (VFD) has dissipated?

The VeriSafe AVT is designed for operation in 50/60Hz systems up to 600V. Although it has been certified to withstand expected EMI and transients that may occur in an industrial environment, there is a potential for the device to overheat and to be damaged if exposed to high levels of emissions.

Care must be taken when installing the VeriSafe into a VFD system or any other system that includes components capable of modifying the frequency or producing electromagnetic energy beyond the levels defined by the IEC 61326-3-1:2008 standard. The VeriSafe should always be installed per the installation guide, connected directly to the incoming phase power and not after any type of equipment or device whose purpose is to provide filtering for a VFD.

If there are any EMC filters installed in the system external to the VFD the VeriSafe should be connected to the line before the filtering. The VeriSafe should not be installed between the filter and the drive, it should also not be connected between the drive and the motor being driven. Top of the Document

OP13 What is the "known voltage source" used to verify that the VeriSafe Absence of Voltage Tester is operating satisfactorily?

In the VeriSafe AVT, the known voltage is not the battery, however it is generated by the battery. The value of the generated voltage exceeds the absence of voltage threshold (3V), ensuring that the tester can detect an unsafe condition. Top of the Document

OP14 What happens if VeriSafe is exposed to temperatures beyond its max rating of 60 C? Will VeriSafe stop working? How will it react?

The VeriSafe will continue to operate as the temperature increases beyond the maximum operating temperature of 60 °C, however the unit should not be operated in an environment that exceeds the max rating. Top of the Document

Standards & Ratings

SR01 Does the VeriSafe AVT meet the requirements for permanently mounted absence of voltage testers described in NFPA 70E?

Yes. The VeriSafe Absence of Voltage Tester satisfies the requirements for permanently mounted test devices described in NPFA 70E-2018 120.5 (7) Exception 1 when it is installed in accordance with the ratings and instructions in the VeriSafe AVT Installation Manual. Top of the Document

SR02 What are the EMC ratings and test levels for VeriSafe?

VeriSafe is certified to meet the requirements of:

IEC 61326-1, IEC 61326-3-1, EN61326-3-1, EN 61326-1, EN61000-6-2, CISPR11, EN55011, AS/NZS CISPR 11, CFR47 Part 15 Subpart B, ICES-001, EN 61000-3-2, EN 61000-3-3

This product is considered Class B Group 1 per CISPR 11 and industrial environment per IEC/EN61326-1

The VeriSafe is compliant with all requirements for:

Conducted Emissions
Conducted Immunity
Electrical Fast Transients
ESD
Flicker
Harmonics
Power Frequency Magnetic Fields
Radiated Emissions
Surge
Voltage Dips and Interruptions Top of the Document

SR03 What is the operating temperature range of the VeriSafe AVT device?

The Operating Temperature range is 0°C to +60°C (32°F to 140°F). Top of the Document

SR04 Do the door mounted Indicator module and DIN mounted Isolation module have different operating temperature ranges?

The Indicator module and Isolation module are considered together as a system for the temperature ratings. Top of the Document

SR05 What is the withstand rating of the AVT?

VeriSafe has a short circuit current rating of 300,000A at 600V. Top of the Document

SR06 What is the impedance rating of the AVT?

VeriSafe is designed with 1 Megaohm impedance. Top of the Document

SR07 Does VeriSafe meet the requirements for OSHA 1910.147 LOTO?

Yes, VeriSafe is considered a test instrument and the absence of voltage indicator (green light) could be considered sufficient to verify that ELECTRICAL energy has been isolated/dissipated. However, that alone does not guarantee that other energy sources are de-energized. Top of the Document

SR08 What is the Performance Level (PL) rating of VeriSafe?

No, VeriSafe does not have a PL rating per ISO 13849. However, it does meet the requirements of SIL 3 per IEC 61508. Top of the Document

SR09 Does VeriSafe have an officially published SCCR?

Yes, the SCCR is 300,000 RMS Symmetrical Amperes, 600 V Maximum. Top of the Document

SR10 Should the VeriSafe AVT be de-rated at higher altitudes?

The VeriSafe AVT is certified for use by UL at altitudes up to 5000 m (16,404 feet) above sea level. At higher altitudes, the transient surge withstand voltage rating may be slightly reduced from the rated value of 6KV. However, the insulating capacity of the AVT should not be affected. Top of the Document

Functional Safety

FS01 What is Functional Safety?

Functional safety is a methodology described in IEC 61508 to ensure that electrical, electronic, or programmable electronic systems (E/E/PE) are designed in such a way to prevent dangerous failures and to control them if they arise. Functional safety certification requires quantitative and qualitative analysis by an ANSI accredited certification body that includes rigorous testing of the product and audits of the manufacturer's processes. Functional safety is measured by Safety Integrity Levels or SILs. The SIL demonstrates the safety and reliability of the parts of the product that impact the safety functions, particularly with regards to hardware and firmware. SIL levels in IEC 61508 are designated as SIL 1, 2, 3, or 4 with 4 having the most stringent requirements. VeriSafe is designed for SIL 3 environments. Top of the Document

FS02 What does SIL 3 mean?

A safety integrity level, or SIL, is a way to measure functional safety. SIL 3 means that the average frequency of a dangerous failure of the safety function is ≥ 10-8 to < 10- 7 (high demand or continuous

mode of operation). This is equivalent to one hazardous failure in 10,000,000 hours or 1,000+ years of continual operation. Keep in mind that the VeriSafe Absence of Voltage Tester safety function is only operating for about 10 seconds and only when the button is pushed, so this is an extremely high level of reliability.

UL 1436 requires SIL 3 for safety functions of absence of voltage testers. Although a higher SIL ensures a higher level of safety, and a lower level of probability that a system will fail-dangerous, SIL 4 systems are often too complex to implement and typically only apply if there is a risk of multiple casualties. Additionally, if a process requires a SIL 4 system due to its high risk, the process design and/or implementation should be re-examined/re-evaluated instead of relying on an instrument or a set of instruments for safety.

Note: A similar approach to functional safety is the Performance Level (PL) rating system described in ISO 13849. VeriSafe will only have a SIL rating (IEC 61508), not PL (ISO 13849). Top of the Document

FS03 Does the AVT maintain its SIL-3 rating over time?

Yes, the AVT maintains its SIL-3 capability over its rated life. An installed AVT does not have to be re-tested for the SIL-3 maintain capability. The AVT does a self-check each time it is operated by a user pushing the button should there be a failure. Top of the Document

FS04 Does VeriSafe have a Performance Level (PL) certification?

No, VeriSafe does not have a PL rating per ISO 13849. However, it does meet the requirements of SIL 3 per IEC 61508. Top of the Document

FS05 How can I access the IEC 61508 functional safety certificate?

Panduit's Functional Safety documentation is public on Exida's website, and the certificate and assessment report can be accessed using the following link: http://www.exida.com/SAEL-Safety/panduit-verisafe-avt-absence-of-voltage-tester

Indicator – Battery

IB01 How long will the battery last?

The battery is designed to last for a minimum of 5 years under normal operating conditions. However, temperature extremes and number of uses can impact battery life. If you push the test button and the yellow Caution Indicator does not start flashing, you should replace the battery. Top of the Document

IB02 Where can a replacement battery for the indicator module be obtained?

The replacement battery can be obtained from an electrical or electronic products reseller. Refer to the AVT Instruction Manual for a list of acceptable batteries. Standard AA batteries cannot be used in the Indicator Module. Top of the Document

IB03 Do I have to de-energize my equipment to replace the battery?

The battery compartment is designed to be finger safe and completely isolated for electrical hazards. The battery can be replaced in the Indicator Module without the need to de-energize and open the equipment. Top of the Document

IB04 If the threshold is 3.0V, why do I have to verify that my de-energized line voltage is below 1.5V before installing?

This is necessary because of the tolerance range for the threshold value. Accounting for that tolerance, if voltage is greater than 1.3V when a circuit is de-energized, there is a possibility that the green Absence of Voltage indicator will not illuminate. Top of the Document

IB05 How many grams of Lithium does the VeriSafe AVT Indicator battery contain?

Approximately 0.7 grams. Top of the Document

Indicator Module

NM01 What is the purpose of the Indicator Module?

The Indicator Module is designed to be mounted to an enclosure wall with part of it penetrating to the outside for user interaction. Minimizing the electronics in this module helps keep the form factor relatively small, which enables the user to install in a standard 30mm knockout and in relatively shallow electrical enclosures. Top of the Document

NM02 Is the Indicator Module serviceable?

The battery is designed to be user replaceable. In addition, the o-rings can be replaced. Top of the Document

NM03 What will happen if an indicator fails?

The system has been designed to be fail-safe which is why the absence of voltage confirmation is provided with an active indicator. Long-life LEDs were selected for the indicators. The green light only remains on for a few seconds after the test, so it is unlikely that it would fail. The green indication consists of multiple LEDs, if one would burn out the others would still operate. If for some reason all of the green LEDs would burn out before the life of the product, the indicator module could be replaced, or you would proceed to verify the absence of voltage with a handheld tester. Top of the Document

NM04 Why does the Yellow Indicator flash when I install a battery?

The battery tray includes a connector that is disconnected when the tray is withdrawn from the housing. When the battery tray is pushed back into the housing, the re-connection initiates a self-test. Top of the Document

NM05 What is the maximum panel thickness that the VeriSafe indicator module can be installed in?

The maximum panel thickness is 0.25” (6.3mm). there is no minimum panel thickness.

Isolation Module

IM01 What are the purpose of the output contacts on the Isolation Module?

The VeriSafe outputs are two channel, single-pole, normally open solid state relay contacts for optional use. They are normally open and close only when the green light is illuminated. By wiring to these contacts, you can use VeriSafe as an input to a control system as well as log when the absence of voltage has been verified. Top of the Document

IM02 What is the rating of the Isolation Module output contacts?

The output contacts have the following specifications:

- Two channel, single-pole, normally open solid state relay
- Relay closure upon absence of voltage verification
- 5000 V_{rms} Input/output Isolation
- Contacts rated for 30V AC/DC
- Load Current 80 mA AC rms / mA DC
- On-Resistance 30 Ω (max)
- Compatible with up to 16 AWG (1 mm^2)
- SIL3 compliant
- Duty Cycle: 10 seconds per test cycle

Load Current Peak: t=10ms, ±350mA
Off-State leakage current: 1 µA
Switching Speeds: @IF=5mA and VL=10V, Turn-On 2ms, Turn-off 1mS Top of the Document

IM03 Is the Isolation Module serviceable?

No. The Isolation module is a factory sealed unit and contain no serviceable parts. Top of the Document

IM04 Is the Isolation Module conformal coated?

Yes, the isolation module circuit boards are conformal coated. Top of the Document

IM05 At what voltage do the phase indicator lights turn off?

For voltages greater than 30VAC, the red indicator LEDs will be visible However, the red indicators may be visible but dim between 18VAC and 30VAC. Top of the Document

IM06 What is the heat dissipation for the vertical and horizontal mounting of the isolation module?

2.14 Wats is the power (heat) dissipation at 600 Volt Y-installation, and 0.72 Wats in a 600V Volt Delta-installation (typical US power distribution system). Top of the Document

Sensor Leads

SL01 Why are there two sensor leads per phase/ground?

VeriSafe is provided with a total of (8) 14 AWG sensor leads (two sensor leads for each phase conductor and ground connection point). The second lead on each phase provides the ability for the AVT to verify that it is in contact with the circuit conductors (each phase and ground) when the absence of voltage test takes place. It is also part of the mechanism that is used to “test-the-tester” to validate that the AVT is functioning. Top of the Document

SL02 Why is it necessary to physically separate the two sensor leads during installation?

Sensor leads for each phase and ground must not be in direct contact with each other in order for the AVT to function properly. If the sensor leads are shorted, it is possible to defeat the installation test. Top of the Document

SL03 Can the AVT Sensor Leads be extended?

The 10ft maximum lead length is necessary to comply with the AVT listing requirements in UL 1436 as well as the NEC tap rule [NEC 240.21 (B) (1) (b) Exception] to avoid using overcurrent protection. Do not extend the sensor leads with a splice. Use approved connection methods and follow local codes and standards when terminating the sensor leads. Top of the Document

SL04 Can the AVT Sensor Leads be shortened?

VeriSafe is provided with 10ft 14 AWG sensor leads, and can be shortened to the installer's desired length. When installing an AVT, care should be taken to ensure that sensor leads used to connect the AVT to the line or bus and to ground shall not be any longer than necessary and shall be routed to avoid sharp edges, pinch points or mechanical damage. Top of the Document

SL05 Is there a minimum or maximum distance required between installed sensor leads?

Sensor leads for each phase and ground must not be in direct contact with each other in order for the AVT to function properly (see figure 1 in the Instruction Manual). There is no maximum distance limitation between the two lead connections on each phase, however there should not be any circuit elements installed between them. Top of the Document

SL06 Can one set of sensor leads be terminated on the line side of phase conductors and the other set of sensor leads be terminated on the load side?

No. There should be no circuit elements installed between the sensor leads. Connecting the sensor leads in this manner would result in the AVT device not being able to verify the absence of voltage. Top of the Document

SL07 How should the VeriSafe Sensor leads be connected to a busbar?

When terminating VeriSafe sensor leads directly to a busbar, tap the bus bar and use a ring terminal on the sensor leads. Ensure that sensor leads are as short as possible and properly dressed and routed around the bus. Each sensor lead must be terminated with separate hardware. Top of the Document

SL08 What methods can I use to terminate the sensor leads connected to power conductors in my equipment?

The Installation Manual provides installation recommendations. Connections can be made with any approved connector/method that is suitable for the application provided that the AVT sensor leads are not extended or mechanically connected to each other. **The use of ferrules is highly recommended on most termination methods**. Top of the Document

SL09 Are ferrules required when installing sensor leads?

The sensor leads on the VeriSafe AVT utilize a 14AWG finely stranded Class K wire. The use of ferrules is highly recommended to ensure reliable connection. The use of soldering is restricted. Refer to the VeriSafe user manual for further detail on installation considerations. Top of the Document

AVT System Cable

AS01 What is the purpose of the AVT System Cable?

The AVT System Cable connects the Isolation and Indicator Modules. This cable requires eight conductors to carry the battery voltage (used for test-the-tester), power and signals for the red, yellow and green LED's and pushbutton signal to initiate the test. The design uses an RJ45 jack and Ethernet style cable to make this connection. Top of the Document

AS02 Is the AVT System Cable used for Ethernet connections?

The AVT system cable is not being used as an Ethernet cable. It does not carry communication signals. The cable is not tested or approved for use as an Ethernet cable and is marked as such. Top of the Document

AS03 Can the AVT System Cable be shortened?

The AVT System Cable should not be altered due to the risk of improper termination or installation. Altering, or replacing the system cable with anything but a Panduit approved replacement cable, would void the warranty of the product and potentially put the user at risk. Top of the Document

AS04 Can I use any CAT5 patch cable to connect the Isolation module to the Indicator Module?

While the device may work correctly with other CAT5 patch cables, the AVT System Cable provided with your device has been verified to have the appropriate cable characteristics and latching mechanisms to function properly and reliably with the AVT system. Top of the Document

Access Control Kit

AC01 What types of equipment can the VeriSafe™ Access Control Kit be installed in?

The VeriSafe Access Control Kit is designed to be installed in single door equipment or panels that allow for side mounting. The mechanical override is NEMA/UL/CSA Rating of 4 and 12. Top of the Document

AC02 How is the electronic latch powered?

The VeriSafe Access Control kit can either be powered by a 12-24 Vdc power source or an approved battery source. The electronic latch requires an operating current of 500mA at 12Vdc to disengage the latch. Panduit offers the VS-ACK-BATTERY as an accessory for the VeriSafe Access Control Kit. Top of the Document

AC03 How much force can the electronic latch sustain?

The electronic latch is rated to sustain a force of 800N (180lbf). Top of the Document

AC04 What is the lifespan of the VS-ACK-BATTERY?

The VS-ACK-BATTERY has an expected life of 10 years at 1 latch cycle per week under normal operating conditions. Top of the Document

AC05 Is the VS-ACK-BATTERY replaceable?

The VS-ACK-BATTERY has screw terminals to enable easy and efficient user replacement. Once the battery dies, the user would need to access the panel, remove the old battery casing, and replace with another VS-ACK-BATTERY. Top of the Document

AC06 How do I access my panel if I lose power, or my electronic latch malfunctions?

The VeriSafe Access Control Kit has an integrated mechanical override that allows access into the panel without having to trigger the electronic latch. Under these conditions, the panel or equipment must be accessed by an qualified electrical worker. Top of the Document

AC07 Can the wire harness included with the VeriSafe Access Control Kit be extended?

Yes. There is no limitation on the length of the wire harness. The included wire harness kit is 11.8in. If extension of the wire harness is required, be sure to follow local and national electrical codes. Top of the Document

AC08 Do I need a different mechanical override key for each VeriSafe™ access control kit?

No. The VeriSafe Access Control Kit overrides are keyed-alike. Top of the Document