

# Introducing VeriSafe™ Absence of Voltage Tester

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in Sales**



**5000+  
Employees**



**17  
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**2000+  
Patents**



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Connectivity  
Providers**



**91%  
Fortune 100  
Companies  
are Customers**



# **Safety is Paramount at the Industrial Workplace**

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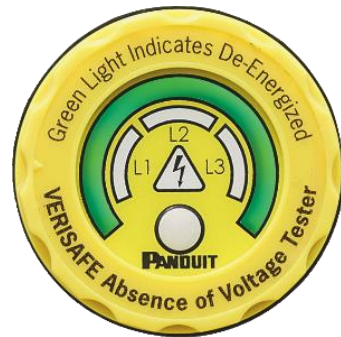


# AVT - Absence of Voltage Tester

- > A new product Category
- > UL1436 was modified to account for the AVT



# AVT - Absence of Voltage Tester



- 1 Verifying the Absence of Voltage
- 2 VeriSafe™ **Absence of Voltage Tester (AVT)** Features & Benefits What is an AVT?
- 3 VeriSafe™ **AVT** Product details - Why trust an AVT?
- 4 Summary

# U.S. data about Electrical Accidents

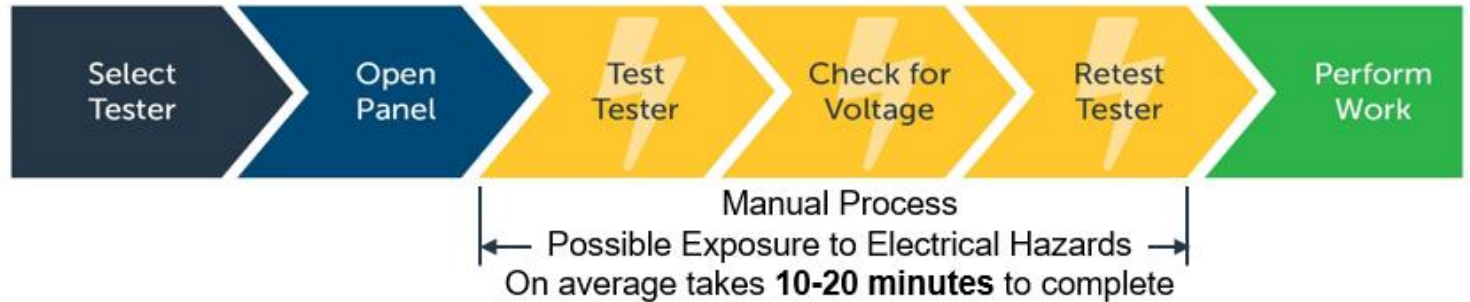
- > 5190 workers were killed on the job in 2016 in the USA
- > 154 (3%) of these deaths were attributed to electrocution
- > More than 30,000 non-fatal shock accidents occur each year
- > Electrocution is the third leading cause of workplace death
- > Estimated 5 to 10 arc explosions occur in electrical equipment every day in the US
- > Average cost per incident estimated at over \$1,000,000
- > The average cost of medical treatment for survivors of arc flash is \$1.5 million



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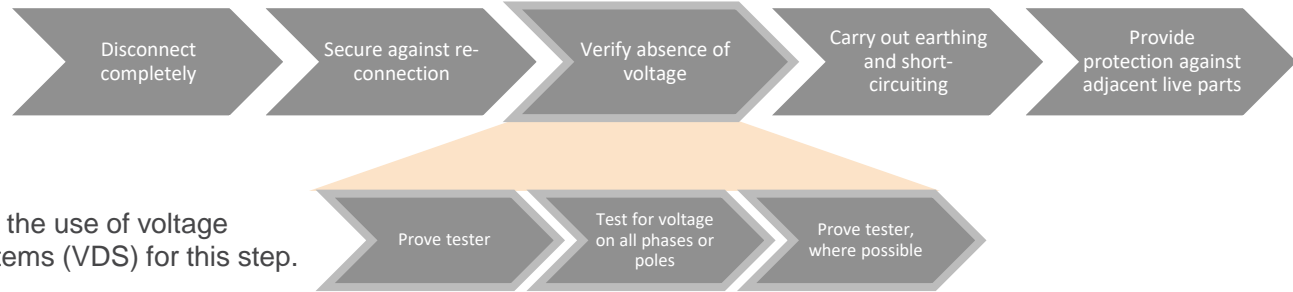


# Testing with a Portable Tester





# Tools for Verifying the Absence of Voltage



## Hand-held portable tester for applications less than 1000V

- > Often include visual and sound indicators
- > Include an auto test function (internal control + activate LED & Buzzer)
- > Used to verify the absence of voltage phase-to-phase and phase-to-ground
- > Used to check for both AC and DC voltage
- > Digital multimeters (DMM) are not allowed



# Portable Testers Have Limitations

- > Error Setting Function Selection Switch
- > Inadequately Rated Tester
- > Error Reading Digital Display “OL” or over-range was misinterpreted to mean “zero”
- > Use of Improper Portable Tester

## Using a Voltmeter for verification has limitations...

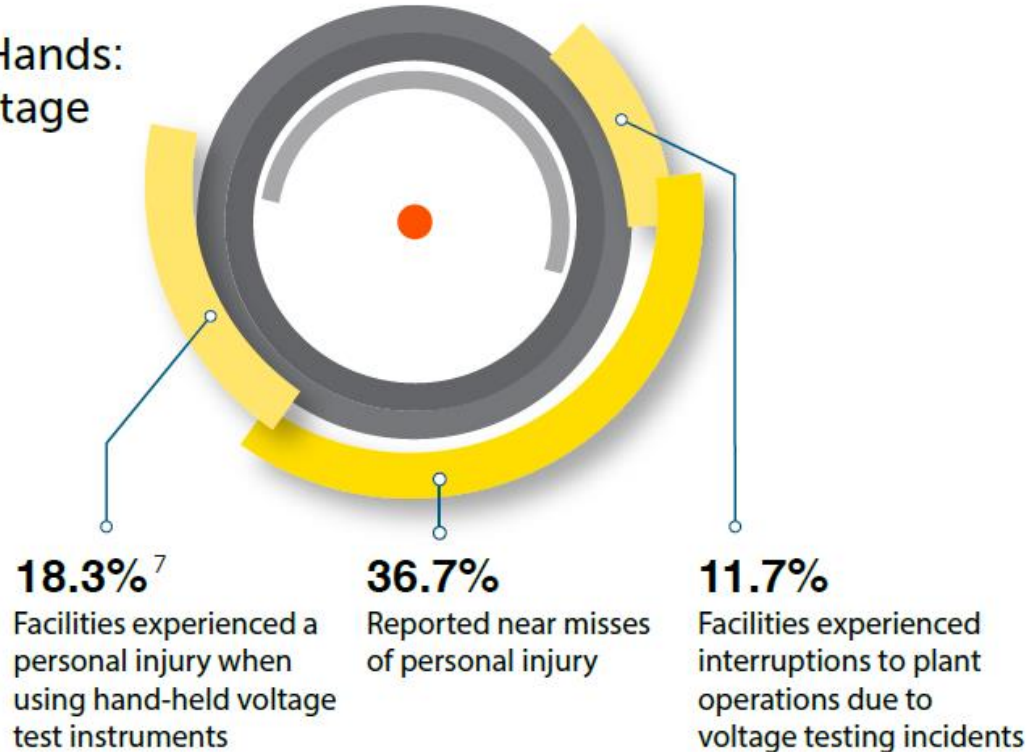
- > Hardware failures
- > Human error
- > Process failures
- > Misinterpretation
- > Exposure to hazards



Figure 1. Absence of voltage test using a hand-held voltage test instrument.

# We Need a Better Way!

Safety Is In Your Hands:  
The Risks of Voltage  
Testing



# Why We Need a Better Way

## Training alone is not enough!

In a study of electrical burn patients, researchers found that none of the patients followed all appropriate safety measures<sup>3</sup>

1. C. M. Wellman, "OSHA arc-flash injury data analysis," in Proc. 2012 IEEE IAS Electrical Safety Workshop, Daytona Beach, FL, 2012, pp. 1–5.
2. R. M. Bugaris, "Improving Electrical Safety in the Workplace: Applying Prevention Through Design to Voltage Testing," in IEEE Industry Applications Magazine, vol. 23, no. 3, pp. 12–23, May–June 2017.
3. J. Noble, M. Gomez, and J. S. Fish, "Quality of life and return to work following electrical burns," Burns, vol. 32, no. 2, pp. 159–164, 2006.



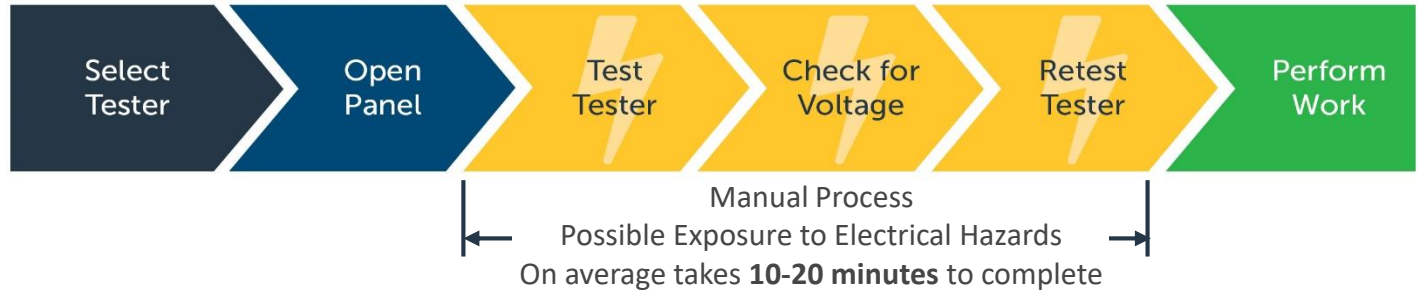


# What is an Absence of Voltage Tester (AVT)?

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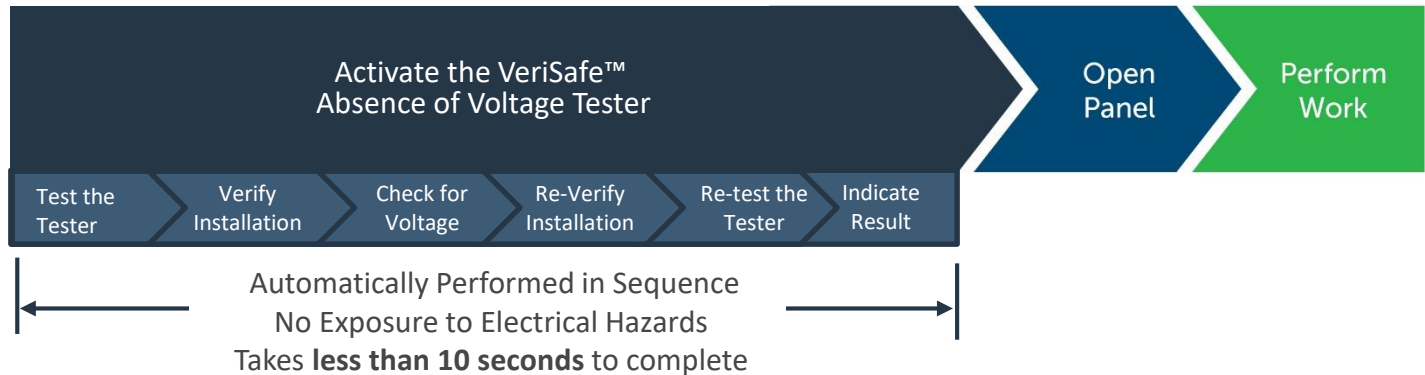
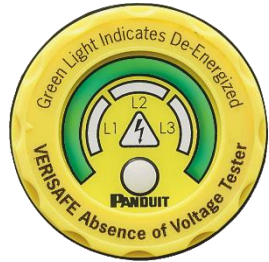
# Comparison of Test Methods

## Portable Testers



vs.

## Absence of Voltage Testers



# VeriSafe™ Absence of Voltage Tester

The safe way to verify the absence of voltage

Designed for equipment up to 300KA, 600V



Isolation Module & Sensor Leads  
(with dry contacts for optional output)

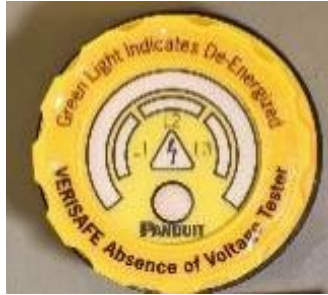
Indicator Module  
(external to enclosure)

AVT System Cable



# VeriSafe™ Absence of Voltage Tester

The safe way to verify the absence of voltage

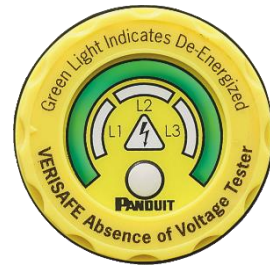


VeriSafe™ Absence of Voltage Testers use active visual indicators that convey the status of voltage inside electrical equipment before it is accessed, reducing exposure to electrical hazards and protecting workers.

VeriSafe™ is a - **GO, No GO** - Solution



# What is an Absence of Voltage Tester?



A **permanently-mounted tester** used to verify a circuit is **de-energized** prior to opening an electrical enclosure

- Verifies the absence of phase-to-phase and phase-to-ground
- Checks for both AC and DC voltage
- Built-in test circuit verifies operation on a known voltage source before and after absence of voltage test
- Contains provisions to ensure tester is properly installed and in direct contact with the circuit at time of testing
- Automated test sequence helps reduce operator errors
- Utilizes active indications
- All safety functions rated to SIL 3
- Listed to UL 1436

## Key takeaway:

AVTs are a NEW product category added to UL 1436 in Sept. 2016

# Key Features & Benefits

## > Improved Safety

- Determine voltage status BEFORE equipment is accessed
- Prevents direct exposure to electrical hazards

## > Increased Productivity

- 10 seconds
- Easy to use with the push of a button
- No additional tools
- Provides visual alert

## > Reliable Results

- Fail-safe design with active indications
- Safety functions meet SIL 3 per IEC 61508-1

## > Automated Test

- Reduce operator errors

## > Flexible Applications

- Designed for testing three-phase circuits up to 600V
- Install online or load side of electrical disconnect
- Detects presence of AC and DC voltage

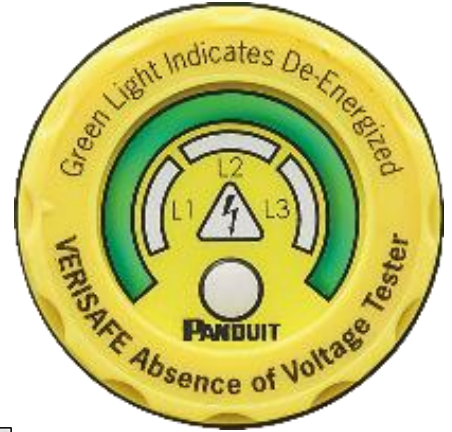


# **Why *Trust* an AVT?**

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# Active Indication for Absence of Voltage

- > An active indicator is required to visually convey the absence of voltage
- > Indicator must be green
- > All test conditions must be satisfied for the green indicator to illuminate
  - Test-the-tester
  - Installation verified
  - Voltage level



UL 1436

STANDARD FOR SAFETY

Outlet Circuit Testers and Similar  
Indicating Devices



# Establishing the Threshold

- > AVTs define a de-energized condition as less than 3.0 V ( AC & DC)



# SIL Rating for Safety Functions

- > Functional safety is measured by **Safety Integrity Levels (SIL)**
  - SIL 3 is required for AVT safety functions, IEC 61508
  - SIL 3 means probability of failure is better than 1,000+ years of continuous use

**IEC 61508 outlines functional safety requirements**



# You Can Trust VeriSafe AVT

- > Fail-safe design
- > Absence of voltage confirmed with active indicators
- > Keeps hazardous voltage off the door
- > Indicators comprised of multiple long-life LEDs
- > Safety functions meet SIL3 (IEC 61508)
- > Redundancy
- > Indicator LEDs
- > Dual and independent detection circuitry
- > Two leads for each phase and ground connection point
- > Automatically self calibrates



# You Can Trust VeriSafe AVT

- > Easy to use, no additional tools required
- > Actively indicates presence and absence of voltage
- > Detects AC and DC voltage
- > Built in overcurrent/surge protection keeps voltage off the door
- > Troubleshooting codes provide intelligence
- > Output contacts (optional use)
- > Long-life industrial battery
- > Numerous standards and third-party certifications
- > Listed to UL 1436, UL 61010, & UL 508
- > Meets requirements of NPFA 70E-2018 120.5 (7) Exception 1





# קצת על אלכסנדר שניידר...



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- > Air-Conditioning
- > UPS
- > Rack PDUs, Transfer Switches
- > Racks & Cabinets
- > Connectivity
- > Cable Pathways
- > Busways
- > DCIM
- > KVM
- > Professional Services



# Alexander Schneider IT

Solutions for resilient, energy efficient Critical Sites



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Talk



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