



## SURGE PROTECTIVE DEVICES (SPD) AND FILTERING — PRODUCT GUIDE

SOLA<sup>HD</sup>

  
**EMERSON**<sup>™</sup>

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

# INTRODUCTION

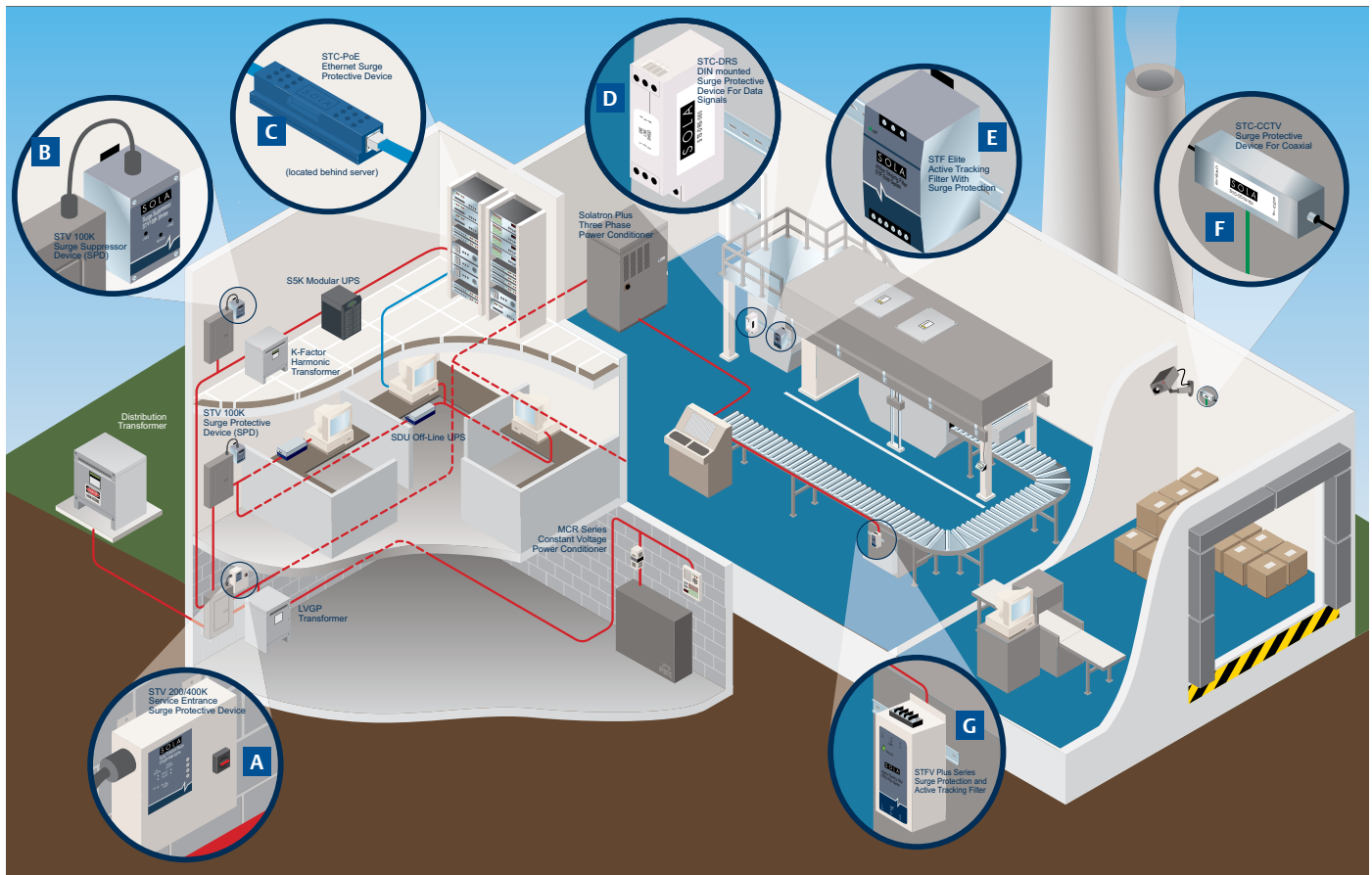
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SolaHD understands that your operations depend on clean, continuous power. That is why, since 1915, SolaHD has focused exclusively on being the premier brand for industrial power quality by eliminating the power interruptions, transients and noise that can stop production and corrupt data. Our full breadth of products convert, clean and maintain electric current from the factory entrance to equipment throughout your facility. Combined with service and support, our total power quality offering can save you time, money and space to ensure optimal production efficiencies.

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# HOW DO YOU PROTECT YOUR POWER?

Employing an entire facility protection strategy will safeguard the electrical system against most transients. Multi-stage protection involves clamping the initial high energy surge, filtering any remaining noise or transients to the protected sensitive equipment and finally, protecting the data/signal lines entering or leaving the control panel or the factory floor. This coordination of devices provides the lowest possible let through voltage to the equipment.



- A STV 200/400K**  
Surge protective devices capable of handling the high-impulse, potentially damaging transients commonly found at the service entrance, distribution panels, and placement in the most severe exposure locations.
- B STV 100K**  
Surge protective devices designed to protect sensitive equipment and microprocessor-based systems from transients on distribution and sub-distribution panels, or any medium exposure locations.
- C STC-POE**  
Surge protective devices designed to work on Power-over-Ethernet Category 5 PoE transmission lines as well as Category 6 applications.
- D STC-DRS**  
DIN Rail mountable, single pair, low voltage data, surge protective devices. The hybrid design of these data/signal line protective devices allows them to respond quickly.

- E STF E**  
DIN Rail mountable high-frequency noise filter/surge protection that offers the original Active Tracking Filter technology with UL approved transient protection to guard against commonly occurring, but very damaging transients, plus provides excellent noise reduction.
- F TC-CCTV**  
Surge protective devices tailored to protect CCTV, data, audio and cable applications.
- G STFV**  
High-frequency noise filter/surge protection that offers the original Active Tracking technology with transient protection to guard against commonly high voltage transients, plus provides excellent noise reduction.

# SURGE PROTECTION, FILTERING, DATA/SIGNAL LINE PROTECTION

## SURGE PROTECTION: FIRST LINE OF DEFENSE IN LIMITING HIGH-IMPULSE TRANSIENTS

High-energy transients either externally or internally generated pose an immediate threat to the reliability and performance of your sensitive electronic equipment. SolaHD recommends placing high-energy Surge Protective Devices (SPDs) on key panels throughout your facility. Within your facility, motors, inductive loads and various equipment load switching can cause damage or costly downtime.

Our surge protective devices focus on limiting high-voltage spikes to a level that is acceptable to most electronic equipment. Plus, they are a great first line of defense, using components that are placed in parallel with the line and serve as clamping mechanisms for high-energy impulses. Protection at this level is referred to in the industry as Sine Wave Tracking or electronic grade. Surge Protective Devices are typically installed at service entrances and on larger distribution panels.

## ACTIVE TRACKING FILTERING WITH SURGE PROTECTION: PROVIDES CLEAN AC POWER BY ELIMINATING LOW-VOLTAGE NOISE

Low-energy transients and high-frequency noise are the primary causes for system disruption and long-term degradation of microprocessor-based equipment within your facility. For more than 30 years, our Active Tracking Filters have proven to be the most effective solution in critical equipment protection within harsh industrial environments. Active Tracking Filters are built upon a unique multi-stage hybrid design. This design creates a foundation for a family of products that attenuate impulses that would normally go untouched by standard, parallel clamping devices.

Changing technology and dependence on total automation processes within modern facilities create a critical need for clean AC power at the equipment level. Active Tracking Filters are a perfect solution for your microprocessor-based products, including industrial PLCs, OEM applications and motion control systems.

## DATA/SIGNAL LINE SURGE PROTECTION: DESIGNED TO PROTECT SENSITIVE INSTRUMENTATION

The rapid development of automated controls, telecommunications and fire/alarm/security systems make it imperative to have properly coordinated low-voltage surge protection. Modern networked industrial facilities require error-free transmission of information for maximum productivity and integrity of data, but these areas are often overlooked when it comes to power protection.

The need to protect all susceptible low-voltage cable routes entering a facility and at key points within the building is as critical as protecting the equipment from high-energy impulses. The importance of protecting at this level grows as your facility's reliance on sensitive instrumentation, networked automation, and uncorrupted data transmission increases. Our Data/Signal Line products utilize high-speed, high-energy components that come in a variety of voltage levels and unique packaging configurations.



### Service Entrance/ Sub Panels

STV 200/400K

- Typical applications of 800 amperes and above
- Surge current capacity – 200,000 to 400,000 Amps

### Branch Distribution

STV 100K

- Typical applications up to 1,200 amperes
- Surge current capacity – 100,000 Amps per phase

### Point of Use Locations

STV 25K

- Typical applications of 20 amperes and below
- Surge current capacity – 25,000 Amps per phase



### STFE Elite Series

- DIN mount
- Critical loads up to 20 amperes of continuous current



### STF & STFV Series

- Hard-wired connection
- Critical loads up to 30 amperes of continuous current



### STC Series

- Three stage hybrid protection
- <1 nanosecond response times
- Variety of voltage and packaging configurations

# SURGE PROTECTIVE DEVICE/FILTER APPLICATION SELECTION TABLE

| Applications                                  | Surge Protection |          |         | Active Tracking Filtering With Surge Protection |      | Data/Signal |
|---|------------------|----------|---------|---|------|-------------|
|   | STV 200/400K     | STV 100K | STV 25K | STFE  | STFV | STC         |
| Facility Service Entrance                     | ●                |          |         |   |      |             |
| Distribution Panels                           | ●                | ●        |         |   |      |             |
| Sub-Distribution Panels                       |                  | ●        |         |   |      |             |
| Branch Panelboards (Commercial)               |                  | ●        |         |   |      |             |
| Branch Panelboards (Residential)              |                  | ●        |         |   |      |             |
| Motor Control Centers                         |                  | ●        | ●       |   |      |             |
| Programmable Logic Controllers                |                  |          | ●       | ●   | ●    |             |
| Control Panels (AC Power)                     |                  |          | ●       | ●   | ●    |             |
| Various OEM Equipment                         |                  |          |         | ●   | ●    |             |
| Transmitters                                  |                  |          |         |   |      | ●           |
| PoE (Power-over-Ethernet)                     |                  |          |         |   |      | ●           |
| Industrial Communications                     |                  |          |         |   |      | ●           |
| Programmable Logic Controllers (I/O Circuits) |                  |          |         |   |      | ●           |
| Control Panels (Low Voltage)                  |                  |          |         |   |      | ●           |
| Water/Wastewater Instrumentation              |                  |          |         |   |      | ●           |

# UL 1449 AND IEEE

Underwriters Laboratories, UL 1449, is the Safety Standard for Surge Protective Devices. It is used to evaluate these types of products.

UL categorizes surge protective devices (SPD) into categories based on its intended application.

SPD Locations by UL 1449 Types:

- TYPE 1 - Connect anywhere in the customer's facility – we strongly urge this to be specified for all critical installations.
- TYPE 2 - Connect downstream on load side of main breaker. Be aware that some competitors may have “conditions of acceptability” that can limit how the device is installed.
- TYPE 3 - Typically cord connected, plug in devices.
- TYPE 4 - Components

Nominal Discharge Current (I Nominal Rating):

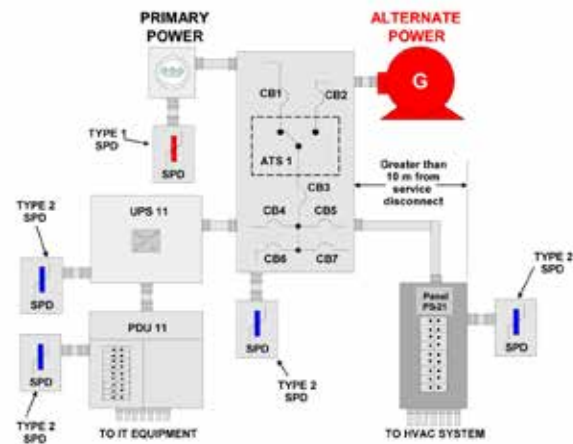
This is the peak value of surge current which goes through the SPD (15 surges).

- TYPE 1 - UL tests to 10kA or 20kA. Not to be confused with maximum kA rating of the device. We recommend 20kA I Nominal rating be specified. While this is the highest UL rating, it is a low level surge which should be required by any device in even moderate exposure installations.
- TYPE 2 - UL tests to 3kA, 5kA, 10kA or 20kA I Nominal ratings. Again, 20kA is recommended for all specified SPD located at service entrances.

Voltage Protection Rating (VPR):

These ratings replace the Suppressed Voltage Ratings (SVR) of the prior standard. UL uses a surge six times the current level of the SVR testing, so ALL measured VPR ratings are higher than the previous SVR rating.

All facilities that employ mission-critical electronic equipment should have a properly sized surge protective device (SPD) installed at the main electrical service entrance and throughout their facility at the distribution and branch levels. The surge protection connected to the incoming power line provides the first line of defense against transient surges which are typically caused by nearby utility grid switching, lightning or other power disturbances. However, disturbances can be internally generated as well as externally generated so employing SPDs at key panels throughout your facility will also provide suitable downstream protection from external surges and local protection from internal high-energy transients caused by motors, inductive loads, and various equipment load switching that can also cause damage or costly downtime.



SPD Locations by UL 1449 Types

IEEE Standard 1100-2005, The Emerald Book: IEEE Recommended Practice for Powering and Grounding Electronic Equipment recommends a tiered SPD protection from your Service Entrance down to branch panel level.

7.2.4 Surge suppressors: “...Effective surge protection for an entire building power distribution system requires the coordinated use of large-capacity current-diverting devices at the service entrance followed by lower capacity voltage-clamping devices applied strategically throughout the power system.”

# STV 200/400K SERIES

SolaHD STV 200/400K Series offers continuous protection from damaging voltage transients and electrical noise commonly found at the service entrance or distribution panel. The modular design of the STV 200/400K allows for installation flexibility and the robust design allows for installation in the most severe exposure locations. They are capable of handling the high-impulse, potentially damaging transients commonly found at the service entrance or distribution panels.

The STV 200/400K utilizes circuitry to monitor the status of all protection modes, including neutral to ground. Should protection be unavailable in any mode, the Green LED will be extinguished, and the Red LED will be illuminated. In addition, high isolation form C dry contacts provide remote monitoring of protection system failure, under voltage, phase and power loss. The STV 200/400K protection integrity monitoring indicates failure for both shorted or opened protection components.

These devices are built to meet your unique requirements, and are available in hardwire, three phase configuration. They are designed for years of trouble free operation and require little or no operator intervention after installation.

## APPLICATIONS

The STV 200/400K Series can be a facility-wide product family and may be installed from service entrances to distribution panels to branch panels.

- Industrial Plants
- Commercial Buildings
- Institutional Facilities
- Any facility that has an environment with electronics based equipment

## FEATURES

- Modular design allows for flexibility
- Surge current capacity of 200 to 400 kA per phase
- UL 1449 4th Edition, Type 1, 20kA I-nominal approved device
- Industry's highest surge current repeatability
- All modes transient protection (L-N, L-G, and N-G)
- Form C dry contacts and audible alarm status indications
- Internal/external monitoring, including neutral to ground
- EMI/RFI Filtering
- Five year limited warranty
- Custom options (contact technical support)
  - NEMA 12 enclosure, NEMA 3R, 4, and 4X
  - Optional rotary disconnect, transient counter and remote monitor panel



# STV 200/400K SERIES

## SELECTION TABLE

| Catalog Number | Input Voltage |                                  |
|----------------|---------------|----------------------------------|
| STV 200K-10Y   | 208 Y/120 V   | Three-Phase Wye, 4-Wire + Ground |
| STV 200K-27Y   | 480 Y/277 V   | Three-Phase Wye, 4-Wire + Ground |
| STV 200K-48D   | 480 V         | Three-Phase D, 3-Wire + Ground   |
| STV 400K-10Y   | 120/208 V     | Three-Phase Wye, 4-Wire + Ground |
| STV 400K-27Y   | 480 Y/277 V   | Three-Phase Wye, 4-Wire + Ground |
| STV 400K-48D   | 480 V         | Three-Phase D, 3-Wire + Ground   |

## SPECIFICATIONS

| Catalog Number  | STV200K-10Y  | STV200K-27Y         | STV200K-48D       | STV400K-10Y         | STV400K-27Y         | STV400K-48D       |
|---|--|---------------------|-------------------|---------------------|---------------------|-------------------|
| Input Voltage   | 208 Y/120 V  | 480 Y/277 V         | 480 V             | 208 Y/120 V         | 480 Y/277 V         | 480 V             |
|   | 3Ph Wye,<br>4 W + G  | 3Ph Wye,<br>4 W + G | 3Ph D,<br>3 W + G | 3Ph Wye,<br>4 W + G | 3Ph Wye,<br>4 W + G | 3Ph D,<br>3 W + G |
| Maximum Continuous Operating Voltage (MCOV)                           | 125% of the nominal level for 120 V; 115% for all other voltages           |                     |                   |                     |                     |                   |
| Line Frequency  | 47–63 Hz   |                     |                   |                     |                     |                   |
| Response Time   | < 0.5 ns   |                     |                   |                     |                     |                   |
| Enclosure   | Metal, UL Listed /NEMA type 12 (3R, 4, 4X also available)                  |                     |                   |                     |                     |                   |
| Mounting Type   | Wall Mounted (mounting hardware ¼ in.)                                     |                     |                   |                     |                     |                   |
| Connection  | Internally connected   |                     |                   |                     |                     |                   |
| Status Indication   | Red and green LED status indicators, audible alarm, summary alarm contacts |                     |                   |                     |                     |                   |
| Operating Temperature   | -40°C to +50°C (-40°F to +122°F)   |                     |                   |                     |                     |                   |
| Operating Humidity  | 0% to 95% non-condensing   |                     |                   |                     |                     |                   |
| Noise Attenuation   | 50 dB maximum  |                     |                   |                     |                     |                   |
| Modes of Protection   | All Modes: L–N, L–L, L–G, N–G ①  |                     |                   |                     |                     |                   |
| SCCR Rating   | 200 kAIC   |                     |                   |                     |                     |                   |
| Nominal Discharge Current Rating (In)                                 | 20 kA  |                     |                   |                     |                     |                   |
| Warranty  | 5 year limited warranty  |                     |                   |                     |                     |                   |
| <b>UL 1449, 4th Edition, Type 1 Voltage Protection Ratings (VPRs)</b> |  |                     |                   |                     |                     |                   |
| Line to Neutral   | 800 V  | 1200 V              | N/A               | 700 V               | 1200 V              | N/A               |
| Line to Line  | 1200 V   | 2000 V              | 2000 V            | 1200 V              | 1800 V              | 2000 V            |
| Line to Ground  | 900 V  | 1200 V              | 1800 V            | 800 V               | 1200 V              | 1800 V            |
| Neutral to Ground   | 700 V  | 1000 V              | N/A               | 700 V               | 1000 V              | N/A               |
| <b>Peak Surge Current Capability</b>                                  |  |                     |                   |                     |                     |                   |
| Per Phase   | 200 kA   | 200 kA              | 200 kA            | 400 kA              | 400 kA              | 400 kA            |
| Line to Neutral   | 100 kA   | 100 kA              | N/A               | 200 kA              | 200 kA              | N/A               |
| Line to Line  | 100 kA   | 100 kA              | 100 kA            | 200 kA              | 200 kA              | 200 kA            |
| Line to Ground  | 100 kA   | 100 kA              | 100 kA            | 200 kA              | 200 kA              | 200 kA            |
| Neutral to Ground   | 100 kA   | 100 kA              | N/A               | 200 kA              | 200 kA              | N/A               |

① Delta Model does not offer N–G mode of protection

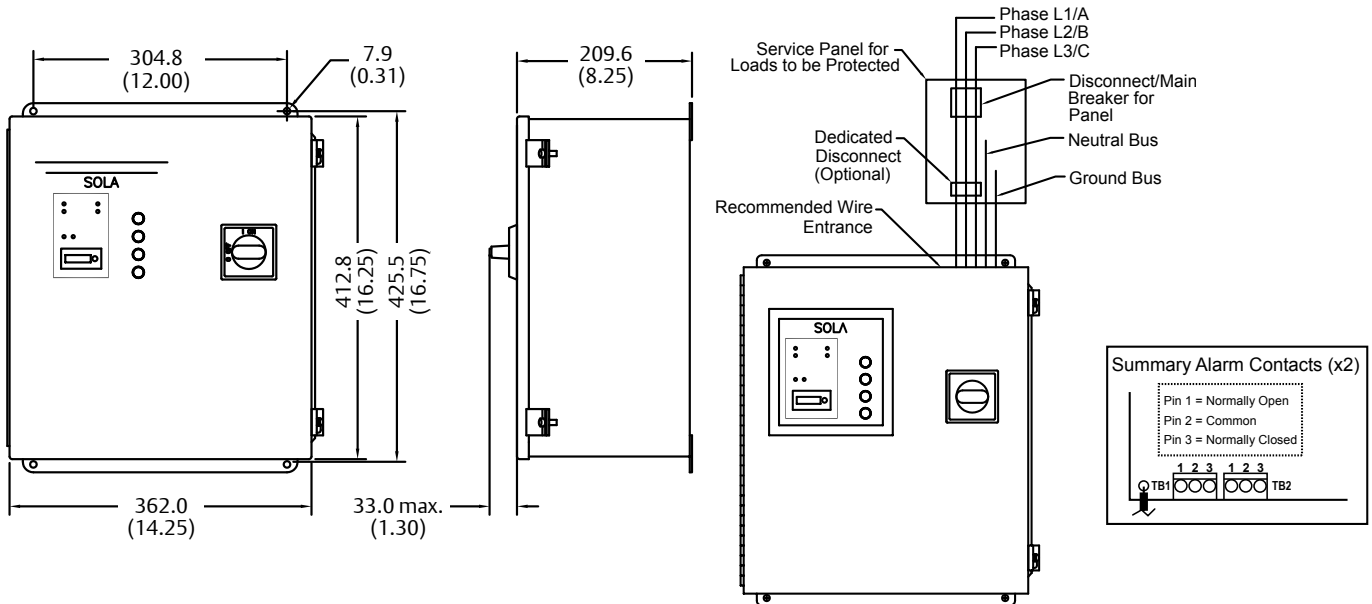


# STV 200/400K SERIES

## DIMENSIONAL SPECIFICATIONS

| Catalog Number | DIMENSIONS<br>D x W x H MM (IN.)                   | Suggested Breaker Size | Suggested Wire Size (AWG) | WEIGHT<br>LBS (KG) | STV 200/400K Series     |                      | Units With Rotary Disconnect |                         |                      |
|----------------|--|------------------------|---------------------------|--------------------|-------------------------|----------------------|------------------------------|-------------------------|----------------------|
|                |  |                        |                           |                    | Allowable Breaker Range | Allowable WIRE Range | WEIGHT<br>LBS (KG)           | Allowable Breaker Range | Allowable WIRE Range |
| STV200K        | 209.55 x 361.95 x 412.75<br>(8.25 x 14.25 x 16.25) | 40 A                   | #8                        | 35 (15.88)         | 15–100 A                | #14–2                | 38 (17.23)                   | 15–175 A                | #14–2/0              |
| STV400K        | 209.55 x 361.95 x 412.75<br>(8.25 x 14.25 x 16.25) | 100 A                  | #2                        | 42 (19.05)         | 15–100 A                | #14–2                | 45 (20.41)                   | 15–175 A                | #14–2/0              |

## DIMENSIONS IN MILLIMETERS (INCHES)



# STV 100K SERIES

SolaHD's STV 100K hardwired surge protective devices are designed for installation at the service entrance, branch panel or a dedicated sensitive electronic load. These units feature all mode protection, LED and audible alarm status indication, sinewave tracking and form C dry contacts. The STV 100K series also contains the highest levels of safety built into the product including thermal fusing and a fault current fusing level of 65 kAIC.

## APPLICATIONS

- Distribution Panels (<1200 A)
- Branch, Lighting and Control Panels
- Factory Automation Installations
- Dedicated Industrial Equipment

## FEATURES

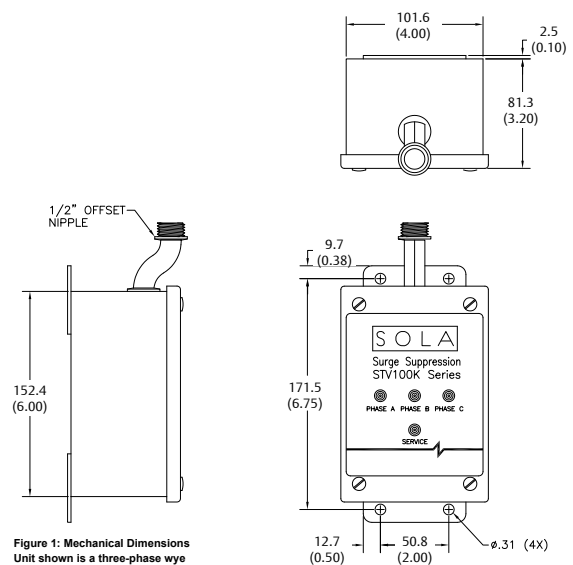
- 100,000 Amp peak current rating provides all mode protection against severe transients
- UL 1449 4th edition, Type 2, 3kA I-nominal approved device
- Low clamping levels for more effective protection
- 100 kAIC fault current fusing level provides safety and NEC conformance
- LED status and audible alarms
- Compact, rugged metal



## SELECTION TABLE

| Catalog Number | Input Voltage | Input Voltage                    |
|----------------|---------------|----------------------------------|
| STV 100K-10S   | 120/240 V     | Single Phase, 3-Wire + Ground    |
| STV 100K-10Y   | 208 Y/120 V   | Three Phase, Wye 4-Wire + Ground |
| STV 100K-10N   | 120 V         | Single Phase, 2-Wire + Ground    |
| STV 100K-24L   | 240 V         | Single Phase, 2-Wire + Ground    |
| STV 100K-23Y   | 230 Y/400 V   | Three Phase, Wye 4-Wire + Ground |
| STV 100K-27Y   | 480 Y/277 V   | Three Phase, Wye 4-Wire + Ground |
| STV 100K-24D   | 240 V         | Three Phase, D 3-Wire + Ground   |
| STV 100K-48D   | 480 V         | Three Phase, D 3-Wire + Ground   |
| STV 100K-10D4  | 240/120 CT    | Three Phase, D 4-Wire + Ground   |
| STV 100K-24D4  | 480/240 CT    | Three Phase, D 4-Wire + Ground   |

## DIMENSIONS IN MILLIMETERS (INCHES)



# STV 100K SERIES

## SPECIFICATIONS

| Catalog Number   | STV 100K-10S  | STV 100K-10N   | STV 100K-24L | STV 100K-10Y       | STV 100K-23Y | STV 100K-27Y | STV 100K-24D     | STV 100K-48D | STV 100K-10D4             | STV 100K-24D4 |
|--|---|----------------|--------------|--------------------|--------------|--------------|------------------|--------------|---------------------------|---------------|
| Nominal Input Vac  | 120/240 V   | 120 V          | 240 V        | 208 Y/120 V        | 400 Y/230 V  | 480 Y/277 V  | 240 V            | 480 V        | 240 D/120 V               | 480 D/240 V   |
| System Configuration   | 1PH<br>3 W + G  | 1PH<br>2 W + G |              | 3PH Wye<br>4 W + G |              |              | 3PH D<br>3 W + G |              | 3PH D High Leg<br>4 W + G |               |
| Maximum Continuous Operating Voltage (MCOV)                                | 125% of the nominal level for 120 V; 115% for all other voltages    |                |              |                    |              |              |                  |              |                           |               |
| Line Frequency   | 47-63 Hz  |                |              |                    |              |              |                  |              |                           |               |
| Response Time  | < 0.5 nanoseconds   |                |              |                    |              |              |                  |              |                           |               |
| SCCR Rating  | 100 kAIC  |                |              |                    |              |              |                  |              |                           |               |
| Fusing   | Thermal and Fault Current   |                |              |                    |              |              |                  |              |                           |               |
| Nominal Discharge Current Rating   | 3 kA  |                |              |                    |              |              |                  |              |                           |               |
| Modes of Protection  | All Mode: L - N, L - L, L - G, N - G                                |                |              |                    |              |              |                  |              |                           |               |
| Operating Temperature  | -40°C to +60°C (-40°F to +140°F)                                    |                |              |                    |              |              |                  |              |                           |               |
| Operating Humidity   | 0% to 95% Non-condensing  |                |              |                    |              |              |                  |              |                           |               |
| Noise Attenuation  | 40 dB maximum   |                |              |                    |              |              |                  |              |                           |               |
| Dimensions W x D x H mm (in)   | 152.4 x 101.6 x 81.3 (6.00 x 4.00 x 3.20)                           |                |              |                    |              |              |                  |              |                           |               |
| Net Weight (kg) lbs  | 3.63 (8.0) maximum  |                |              |                    |              |              |                  |              |                           |               |
| Enclosure  | Metal, UL Listed/NEMA Type 12 Enclosure                             |                |              |                    |              |              |                  |              |                           |               |
| Connection/Mounting Type   | Parallel/Flange   |                |              |                    |              |              |                  |              |                           |               |
| Status Indication  | Red and green LED status indicators, audible alarm, Form C contacts |                |              |                    |              |              |                  |              |                           |               |
| Warranty   | 10 year limited warranty  |                |              |                    |              |              |                  |              |                           |               |
| <b>UL 1449 4th Edition, Type 2 Voltage Protection Ratings (VPRs) Vpeak</b> |   |                |              |                    |              |              |                  |              |                           |               |
| Line to Neutral  | 600 V   | 600 V          | N/A          | 600 V              | 1200 V       | 1200 V       | N/A              | N/A          | 600 V                     | 1200 V        |
| Line to Line   | 1000 V  | N/A            | 1000 V       | 1000 V             | 2000 V       | 2000 V       | 2000 V           | 2000 V       | 1000 V                    | 2000 V        |
| Line to Ground   | 700 V   | 700 V          | 1200 V       | 700 V              | 1200 V       | 1200 V       | 1200 V           | 2000 V       | 700 V                     | 1200 V        |
| Neutral to Ground  | 700 V   | 700 V          | N/A          | 700 V              | 1200 V       | 1200 V       | N/A              | N/A          | 700 V                     | 1200 V        |
| High Leg to Neutral  | N/A   | N/A            | N/A          | N/A                | N/A          | N/A          | N/A              | N/A          | 1200 V                    | 2000 V        |
| High Leg to Line   | N/A   | N/A            | N/A          | N/A                | N/A          | N/A          | N/A              | N/A          | 1500 V                    | 2500 V        |
| High Leg to Ground   | N/A   | N/A            | N/A          | N/A                | N/A          | N/A          | N/A              | N/A          | 1200 V                    | 2000 V        |
| <b>Peak Surge Current Capability</b>                                       |   |                |              |                    |              |              |                  |              |                           |               |
| Per Phase  | 100 kA  | 100 kA         | 100 kA       | 100 kA             | 100 kA       | 100 kA       | 100 kA           | 100 kA       | 100 kA                    | 100 kA        |
| Line to Neutral  | 50 kA   | 50 kA          | N/A          | 50 kA              | 50 kA        | 50 kA        | N/A              | N/A          | 50 kA                     | 50 kA         |
| Line to Line   | 50 kA   | N/A            | 50 kA        | 50 kA              | 50 kA        | 50 kA        | 50 kA            | 50 kA        | 50 kA                     | 50 kA         |
| Line to Ground   | 50 kA   | 50 kA          | 50 kA        | 50 kA              | 50 kA        | 50 kA        | 50 kA            | 50 kA        | 50 kA                     | 50 kA         |
| Neutral to Ground  | 50 kA   | 50 kA          | N/A          | 50 kA              | 50 kA        | 50 kA        | N/A              | N/A          | 50 kA                     | 50 kA         |

# STV 25K DIN RAIL SERIES

This series provides point-of-use protection, at the dedicated equipment level, against damaging transients. Ideal for installation in electronic control cabinets found in harsh industrial environments such as the factory floor or at remote locations. These devices provide 25,000 Amps of surge protection per phase, sine wave tracking, LED status indication and form C dry contacts. This DIN Rail series also provides protection on all electrical paths and comes with a standard ten year product warranty. The STV 25K DIN Rail series surge protective devices are UL recognized to Standard 1449, 4th Edition.

## APPLICATIONS (20 AMP MAX)

- Control Cabinets for Industrial Automation
- Point-of-Use Industrial/Service Equipment
- Remote Commercial or Industrial Equipment
- Instrumentation and Large Test Equipment
- Commercial and Building Automation Systems

## FEATURES

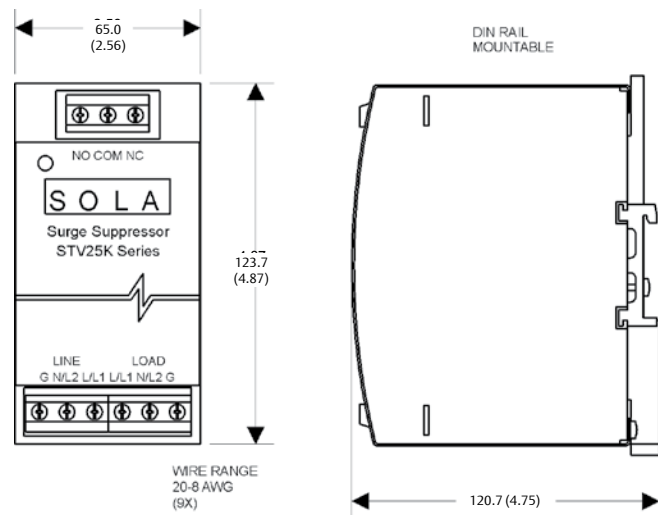
- Compact and narrow design maximizes panel space.
- Low clamping levels for more effective protection.
- Easy access terminal screws for quick mounting and installation.
- 25,000 Amps of surge protection.
- Sine wave tracking and all-mode protection provide consistent and reliable protection on all electrical paths.
- Thermal fusing prevents MOV overheating caused by excessive current levels.



## SELECTION TABLE

| Catalog Number | Input Voltage |                        |
|----------------|---------------|------------------------|
| STV 25K-10S    | 120 V         | Single Phase (L - N)   |
| STV 25K-24S    | 240 V         | Single Phase (L1 - L2) |

## DIMENSIONS IN MILLIMETERS (INCHES)



# STV 25K DIN RAIL SERIES

## SPECIFICATIONS

| Description  | STV 25K-10S   | STV 25K-24S                      |
|--|---|----------------------------------|
| Input Voltage  | 120 Vac, Single Phase 0-135 Vrms  | 240 Vac, Single Phase 0-260 Vrms |
| Maximum Continuous Operating Voltage (MCOV)                                | 150 Vrms  | 300 Vrms                         |
| Line Frequency   | 47-63 Hz  |                                  |
| Connection/Mounting Type   | DIN Rail Mount with screw terminals for #12 AWG.                        |                                  |
| Input Current Rating   | 20 Amps   |                                  |
| Phase Configuration  | 2 wire + GND  |                                  |
| Short Circuit Current Rating (SCCR)  | 5kA   |                                  |
| Weight - kg (lbs)  | 1.36 (3.0)  |                                  |
| Dimensions H x W x D - mm (in)   | 123.7 x 65.0 x 120.7 ( 4.87 x 2.56 x 4.75)<br>includes mounting bracket |                                  |
| Modes of Protection  | All Mode: L - N, L - L, L - G, N-G                                      |                                  |
| Status Indication  | Green LED, Form C Contacts  |                                  |
| Packaging  | Metal DIN Rail Mount Enclosure, IP20                                    |                                  |
| Response Time  | < 0.5 nanoseconds   |                                  |
| Operating Temperature  | -40°C to +60°C (-40°F to +140°F)  |                                  |
| Operating Humidity   | 0% to 95% Non-condensing  |                                  |
| <b>Noise Attenuation</b>   |   |                                  |
| Normal Mode  | 50 dB minimum   |                                  |
| Common Mode  | 40 dB minimum   |                                  |
| <b>UL 1449, 4th Edition, Type 4 Voltage Protection Ratings (VPR) Vpeak</b> |   |                                  |
| L - N  | 500   | —                                |
| L - L  | —   | 900                              |
| L - G  | 500   | 900                              |
| N - G  | 500   | —                                |
| <b>Peak Surge Current Capability (8 x 20 μS)</b>                           |   |                                  |
| Line to Neutral  | 12.5 kA   |                                  |
| Line to Ground   | 12.5 kA   |                                  |
| Neutral to Ground  | 12.5 kA   |                                  |
| Warranty   | 10 year limited warranty  |                                  |

## STF SERIES

Low voltage/high frequency noise is caused by everyday events such as turning on machinery, motors, or equipment. Although noise is less dramatic than high voltage transients, the long term effects of these frequent disturbances can be as damaging. Filtering systems such as SolaHD Active Tracking® Filters provide clean AC power by eliminating lower voltage noise.

The SolaHD STF Series offers the original active tracking technology to guard against commonly occurring but very damaging, lower energy transients. Offering excellent noise reduction, the filter continuously tracks the input AC power line and responds instantly upon detecting extraneous high frequency noise.

The STF Series eliminates low voltage/high frequency noise via a low-pass or L-C filter. These filters are used for low energy, high frequency noise reduction and consist of a series of inductors, capacitors and resistors. STFs are load dependent which means that the series inductors located on each phase and neutral conductors are sized to handle the maximum current draw on the line. These inductors together with the capacitors and resistors form a circuit capable of absorbing a large bandwidth of noise.

These devices are designed to meet UL 1283, and CSA C22.2 No. 8 for Electromagnetic Interference Filters. STFs attenuate or reduce the amplitude of noise to a minimum of 40 dB that occurs in a frequency range of 50 KHz to 50 MHz. They also provide the industry's best IEEE Category A protection, typically reducing normal mode transients to +/- 5 volts.

Built to meet your unique requirements, these filters are available in a multitude of voltage configurations. They are hardwired and designed for years of trouble free operation requiring little or no operator intervention after installation.

Active Tracking® Filters are one part of a total power quality solution. They can be used alone or in conjunction with other SolaHD products to solve more complex power quality problems.

### APPLICATIONS

- Branch and Control Panels
- Factory Automation Installations
- Point of Use Industrial Service Equipment
- Dedicated Industrial and Machine Tools Equipment
- Telecommunications Equipment



### FEATURES

- Non degrading, series filter technology for total durability
- High frequency noise filter, RLC low-pass filter
- Three phase applications up to 200 Amp
- Attenuates noise to 40 dB in frequency range of 50 kHz to 50 MHz
- Operating temperature from -40°C to +45°C (-40°F to 113°F)
- Hardwired connection
- MTBF greater than 100,000 hours, Mil Std. 217F
- Ten year limited warranty

# STF SERIES

| Catalog Number                                | Amps | Min. Wire Size (AWG Suggested) | Fuse/Circuit Breaker Ampacity |         | Case Dim. mm (in) - A x B x C                | Mounting Flange Dim. mm (in) - D x E x F    | Weight kg (lbs) | Design Style |
|---|------|--------------------------------|-------------------------------|---------|--|---|-----------------|--------------|
|   |      |                                | Suggest                       | Max     |  |   |                 |              |
| <b>Three-Phase Models (120/208 Vac WYE) ①</b> |      |                                |                               |         |  |   |                 |              |
| STF0150-10Y                                   | 15   | 14                             | 15 A                          | 18.75 A | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 19.90 (35.0)    | 4            |
| STF0300-10Y                                   | 30   | 10                             | 30 A                          | 37.5 A  | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 19.90 (35.0)    | 4            |
| STF0500-10Y                                   | 50   | 4                              | 50 A                          | 62.5 A  | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 20.41 (45.0)    | 2            |
| STF1000-10Y                                   | 100  | 2                              | 100 A                         | 125 A   | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 29.48 (65.0)    | 2            |
| STF2000-10Y                                   | 200  | 3/0                            | 200 A                         | 250 A   | 609.6 x 508 x 228.6 (24.00 x 20.00 x 9.00)   | 641.4 x 355.6 x 673.1 (25.25 x 14.0 x 26.5) | 52.16 (115.0)   | 2            |
| <b>Three-Phase Models (240 V D) ①</b>         |      |                                |                               |         |  |   |                 |              |
| STF0150-24D                                   | 15   | 14                             | 15 A                          | 18.75 A | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 19.90 (35.0)    | 4            |
| STF0300-24D                                   | 30   | 10                             | 30 A                          | 37.5 A  | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 19.90 (35.0)    | 4            |
| STF0500-24D                                   | 50   | 4                              | 50 A                          | 62.5 A  | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 20.41 (45.0)    | 2            |
| STF1000-24D                                   | 100  | 2                              | 100 A                         | 125 A   | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 29.48 (65.0)    | 2            |
| STF2000-24D                                   | 200  | 3/0                            | 200 A                         | 250 A   | 609.6 x 508 x 228.6 (24.00 x 20.00 x 9.00)   | 641.4 x 355.6 x 673.1 (25.25 x 14.0 x 26.5) | 52.16 (115.0)   | 2            |
| <b>Three-Phase Models (277/480 V wye) ①</b>   |      |                                |                               |         |  |   |                 |              |
| STF0150-27Y                                   | 15   | 14                             | 15 A                          | 18.75 A | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 19.90 (35.0)    | 4            |
| STF0300-27Y                                   | 30   | 10                             | 30 A                          | 37.5 A  | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 19.90 (35.0)    | 4            |
| STF0500-27Y                                   | 50   | 4                              | 50 A                          | 62.5 A  | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 20.41 (45.0)    | 2            |
| STF1000-27Y                                   | 100  | 2                              | 100 A                         | 125 A   | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 29.48 (65.0)    | 2            |
| STF2000-27Y                                   | 200  | 3/0                            | 200 A                         | 250 A   | 609.6 x 508 x 228.6 (24.00 x 20.00 x 9.00)   | 641.4 x 355.6 x 673.1 (25.25 x 14.0 x 26.5) | 52.16 (115.0)   | 2            |
| <b>Three-Phase Models (480 V D) ①</b>         |      |                                |                               |         |  |   |                 |              |
| STF0150-48D                                   | 15   | 14                             | 15 A                          | 18.75 A | 254.0 x 203.2 x 152.4 (10.0 x 8.0 x 6.0)     | 273.1 x 152.4 x 292.1 (10.75 x 6.0 x 11.5)  | 19.90 (35.0)    | 4            |
| STF0300-48D                                   | 30   | 10                             | 30 A                          | 37.5 A  | 254.0 x 203.2 x 152.4 (10.0 x 8.0 x 6.0)     | 273.1 x 152.4 x 292.1 (10.75 x 6.0 x 11.5)  | 19.90 (35.0)    | 4            |
| STF0500-48D                                   | 50   | 4                              | 50 A                          | 62.5 A  | 355.6 x 304.8 x 152.4 (14.00 x 12.00 x 6.00) | 374.7 x 254.0 x 393.7 (14.75 x 10.0 x 15.5) | 20.41 (45.0)    | 4            |
| STF1000-48D                                   | 100  | 2                              | 100 A                         | 125 A   | 508 x 406.4 x 228.6 (20.00 x 16.00 x 9.00)   | 539.8 x 254.0 x 571.5 (21.25 x 10.0 x 22.5) | 29.48 (65.0)    | 2            |
| STF2000-48D                                   | 200  | 3/0                            | 200 A                         | 250 A   | 609.6 x 508 x 228.6 (24.00 x 20.00 x 9.00)   | 641.4 x 355.6 x 673.1 (25.25 x 14.0 x 26.5) | 52.16 (115.0)   | 2            |

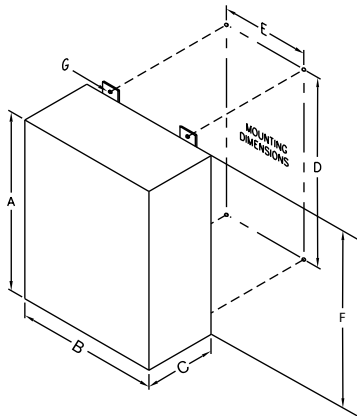
① Units are standard in NEMA 12 hinged enclosures

# STF SERIES

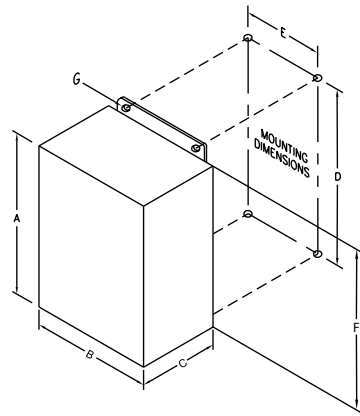
## SPECIFICATIONS

| Description                         | 120/208 Vac Models  | 277/480 Vac Models | 480 Vac Models |
|-------------------------------------|---|--------------------|----------------|
| Input Voltage                       | 0-150/240 Vrms  | 0-320/520 Vrms     | 0-520 Vrms     |
| Line Frequency                      | 50/60 Hz  |                    |                |
| Transient Attenuation Response Time | Instantaneous   |                    |                |
| Mean Time Between Failure (MTBF)    | > 100,000 Hours (Mil Std. 217F)   |                    |                |
| Packaging                           | Single phase < 30 Amps housed in black, high impact plastic case, vacuum impregnated magnetics, epoxy encapsulated.<br>Single phase > 30 Amps, 480 Vac, and three phase units housed in NEMA 12 enclosures.   |                    |                |
| Operating Temperature               | -40°C to +45°C (-40°F to +113°F); Derate Linearly to 60% at +70°C (+ 158°F)   |                    |                |
| Load Surge Current Rating           | 10 milliseconds: 5 x Nominal  |                    |                |
|                                     | 1 second : 3 x Nominal  |                    |                |
|                                     | 5 seconds: 2 x Nominal  |                    |                |
| Transient Reduction                 | Minimum of 40dB from 50 kHz through 50 MHz. Attenuation is greater than 50 dB to the surge withstand capability Ringwave test IEEE C62.41, Category A (IEEE Category A Ringwave 6 kV, 200A, 100 kHz) and B (IEEE Category B Ringwave 6 kV, 500 A, 100 kHz). |                    |                |
| Warranty                            | 10 year limited warranty  |                    |                |

## DIMENSIONS IN MILLIMETERS (INCHES)



Design Style 2



Design Style 4



# STFV PLUS SERIES

The SolaHD STFV Plus Series combines Active Tracking® filtration for low energy noise and surge protection for high energy transients. It continuously tracks the input AC power line responding instantly into action upon detecting extraneous high frequency noise and high voltage transients caused by everyday events such as turning on machinery, motors or equipment.

These devices are designed to meet UL 1283 for Electromagnetic Interference Filters. STFV Plus attenuates or reduces the amplitude of high frequency noise to a maximum of 90 dB that occurs in a range of 100 kHz to 50 MHz. STFV Plus provides the industry's best IEEE C62.41 Category A and B Ringwave protection.

They are built to meet your unique requirements, and are available in hardwired, single phase configuration. They are designed for years of trouble free operation and require little or no operator intervention after installation.

Active Tracking® Filters Plus is one part of a total power quality solution. They can be used alone or in conjunction with other SolaHD products to solve more complex power quality problems.

## APPLICATIONS

- Branch and Control Panels
- Factory Automation Installations
- Point of Use Industrial Service Equipment
- Programmable Logic Controllers
- Dedicated Industrial and Machine Tools
- Telecommunications and IT Equipment

## FEATURES

- Non degrading, series filter/TVSS technology for total durability
- UL surge current capacity – 25,000 Amps
- High impact plastic case, epoxy encapsulated enclosure
- Transient protection in all modes (L-N, L-G, and N-G)
- Single phase applications up to 30 Amps
- Operating temperature from -40°C to +60°C (-40°F to +140°F)
- Hardwired connection
- LED power indication
- Ten year limited warranty

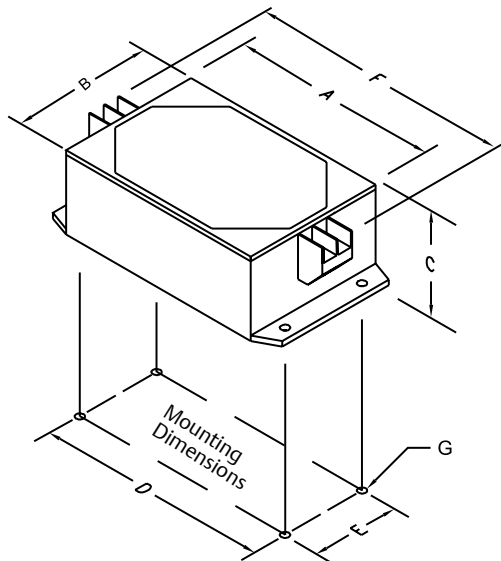


# STFV PLUS SERIES

## SELECTION TABLE

| Catalog Number                | Amps | Case Dim.<br>mm (in) - A x B x C             | Mounting Flange Dim.<br>mm (in) - D x E x F x G           | Number Min.<br>Wire Size<br>(AWG Suggested) | Screw<br>Size | Fuse/Circuit Breaker<br>Ampacity |       | Weight<br>lbs (kg) |
|-------------------------------|------|--|---|---|---------------|----------------------------------|-------|--------------------|
|                               |      |  |   |   |               | Suggest                          | Max   |                    |
| Single-Phase Models (120 Vac) |      |  |   |   |               |                                  |       |                    |
| STFV02-10N                    | 2.5  | 101.6 x 73.2 x 46.0<br>(4.00 x 2.88 x 1.81)  | 111.3 x 53.8 x 134.9 x 4.8<br>(4.38 x 2.12 x 5.31 x 0.19) | 26  | #6            | 2.5                              | 3.125 | .45 (1.0)          |
| STFV050-10N                   | 5.0  | 101.6 x 73.2 x 46.0<br>(4.00 x 2.88 x 1.81)  | 111.3 x 53.8 x 134.9 x 4.8<br>(4.38 x 2.12 x 5.31 x 0.19) | 22  | #6            | 5                                | 6.25  | .59 (1.3)          |
| STFV075-10N                   | 7.5  | 120.7 x 120.7 x 59.7<br>(4.75 x 4.75 x 2.35) | 133.4 x 88.9 x 158.8 x 4.8<br>(5.25 x 3.50 x 6.25 x 0.19) | 18  | #6            | 7.5                              | 6.25  | .91 (2.0)          |
| STFV150-10N                   | 15.0 | 158.8 x 120.7 x 59.7<br>(6.25 x 4.75 x 2.35) | 171.5 x 88.9 x 196.9 x 4.8<br>(6.75 x 3.50 x 7.75 x 0.19) | 14  | #8            | 15                               | 18.75 | 1.59 (3.5)         |
| STFV300-10N                   | 30.0 | 196.9 x 120.7 x 59.7<br>(7.75 x 4.75 x 2.35) | 209.6 x 88.9 x 228.6 x 4.8<br>(8.25 x 3.50 x 9.00 x 0.19) | 10  | #8            | 30                               | 37.5  | 2.72 (6.0)         |
| Single-Phase Models (240 Vac) |      |  |   |   |               |                                  |       |                    |
| STFV025-24L                   | 2.5  | 101.6 x 73.2 x 46.0<br>(4.00 x 2.88 x 1.81)  | 111.3 x 53.8 x 134.9 x 4.8<br>(4.38 x 2.12 x 5.31 x 0.19) | 26  | #6            | 2.5                              | 3.125 | .59 (1.3)          |
| STFV050-24L                   | 5.0  | 120.7 x 120.7 x 59.7<br>(4.75 x 4.75 x 2.35) | 133.4 x 88.9 x 158.8 x 4.8<br>(5.25 x 3.50 x 6.25 x 0.19) | 22  | #6            | 5                                | 6.25  | .91 (2.0)          |
| STFV075-24L                   | 7.5  | 158.8 x 120.7 x 59.7<br>(6.25 x 4.75 x 2.35) | 171.5 x 88.9 x 196.9 x 4.8<br>(6.75 x 3.50 x 7.75 x 0.19) | 18  | #6            | 7.5                              | 9.375 | 1.59 (3.5)         |
| STFV150-24L                   | 15.0 | 196.9 x 120.7 x 59.7<br>(7.75 x 4.75 x 2.35) | 209.6 x 88.9 x 228.6 x 4.8<br>(8.25 x 3.50 x 9.00 x 0.19) | 14  | #8            | 15                               | 18.75 | 2.63 (5.8)         |
| STFV300-24L                   | 30.0 | 196.9 x 120.7 x 59.7<br>(7.75 x 4.75 x 2.35) | 209.6 x 88.9 x 228.6 x 4.8<br>(8.25 x 3.50 x 9.00 x 0.19) | 10  | #8            | 30                               | 37.5  | 2.72 (6.0)         |

## DIMENSIONAL DRAWINGS



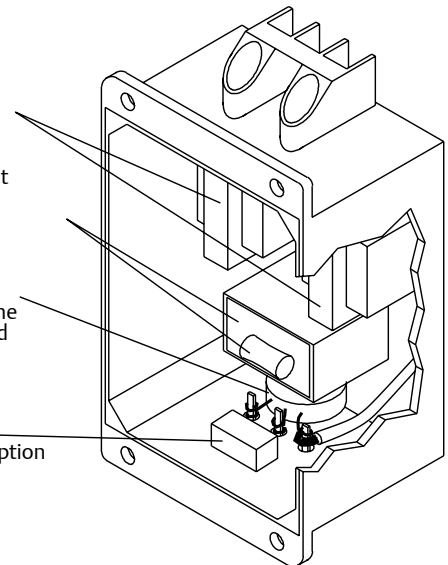
## SYSTEM DESIGN

Series Blocking Inductors  
smoothing inductors

Shunt Absorbing Component  
sine wave tracking circuitry

MOV Transient Protection  
high-energy transient  
protection line to neutral, line  
to ground, neutral to ground

Pulse Capacitor  
high-frequency noise absorption



# STFV PLUS SERIES

## SPECIFICATIONS

| Description                               | Value   |                 |
|---|---|-----------------|
| Input Voltage                             | 120 Vac Models  | 0-150 Vrms      |
|   | 240 Vac Models  | 0-275 Vrms      |
| Line Frequency                            | 50/60 Hz  |                 |
| Configuration                             | Single Phase (2 wire + ground)  |                 |
| Response Time                             | < 5 nanoseconds   |                 |
| Enclosure                                 | High impact plastic case, 94V-0, Vacuum impregnated magnetics, epoxy encapsulated         |                 |
| Fusing                                    | External  |                 |
| Status Indication                         | Green LED   |                 |
| Connection/Mounting Type                  | Series/Panel Mount  |                 |
| Operating Temperature                     | -40°C to +60°C (-40°F to +140°F) at full load<br>Derate Linearly to 60% at +70°C (+158°F) |                 |
| Operating Humidity                        | 0% to 95% Non-condensing  |                 |
| Mean Time Between Failure (MTBF)          | Greater than 100,000 hours (Mil. Std. 217F)   |                 |
| Packaging                                 | High impact plastic case, vacuum impregnated magnetics, epoxy encapsulated                |                 |
| Peak Surge Current Capability (8 x 20 μs) | Per Phase   | 25,000 Amps     |
|   | Line to Neutral   | 12,500 Amps     |
|   | Line to Ground  | 12,500 Amps     |
|   | Neutral to Ground   | 12,500 Amps     |
| Load Surge Current Rating                 | 10 milliseconds   | 5 x Nominal     |
|   | 1 second  | 3 x Nominal     |
|   | 10 seconds  | 2 x Nominal     |
| Frequency Response (Forward Reverse)      | 100 kHz to 50 MHz   | 90 dB maximum   |
| Transient Reduction ① (IEEE C62.41)       | Typical Category A Ringwave (6 kV, 200A, 100 kHz)   | < 10 volts peak |
|   | Typical Category B Ringwave (6 kV, 500A, 100 kHz)   | < 50 volts peak |
| Warranty                                  | 10 year limited warranty  |                 |

# STFE ELITE SERIES

The SolaHD STF Elite DIN Rail Mount Series combines Active Tracking® technology with UL Listed surge protection to protect against the full spectrum of voltage transients and surges. It continuously tracks the input AC power line responding instantly into action upon detecting extraneous high frequency noise and high voltage transients caused by everyday events such as turning on machinery, motors or equipment.

The STFE Series attenuates or reduces the amplitude of normal mode noise to a minimum of 90dB that occurs in a frequency range of 100KHz to 50MHz, and common mode noise to a minimum of 60dB that occurs in a frequency range of 5MHz to 50MHz. STFE provides the industry's best IEEE C62.41 Category A and B Ringwave protection.

They are built to meet your unique requirements, and are available in hardwired DIN Rail mount, single phase configuration. They are designed for years of trouble free operation and require little or no operator intervention after installation.

## APPLICATIONS

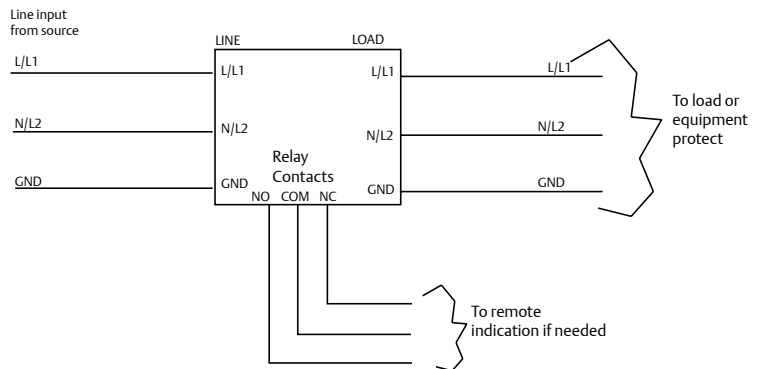
- Control Panels
- Factory Automation Installations
- Point of Use Industrial Equipment
- Programmable Logic Controllers
- Dedicated Industrial and Machine Tools Equipment

## FEATURES

- Series connected DIN Rail mounted filter
- Durable metal mount clip
- UL Listed surge current capacity – 45,000 Amps
- Transient protection in all modes (L-N, L-G, and N-G)
- Single phase applications up to 20 Amps
- Operating temperature from -40°C to +50°C (-40°F to +122°F)
- Screw terminal connections
  - Reliable and convenient screw clamp connections
  - Accepts 10-16 AWG wire
  - Meets IP20 specifications for ingress protection
- LED status indication
- Form C contact for remote monitoring
- Five year limited warranty



## CONNECTION DIAGRAM



# STFE ELITE SERIES

## SELECTION TABLE

| Catalog Number | Amps | Input Voltage |                               |
|----------------|------|---------------|-------------------------------|
| STFE030-10N    | 3.0  | 120 V         | Single Phase, 2 Wire + Ground |
| STFE050-10N    | 5.0  | 120 V         | Single Phase, 2 Wire + Ground |
| STFE100-10N    | 10.0 | 120 V         | Single Phase, 2 Wire + Ground |
| STFE200-10N    | 20.0 | 120 V         | Single Phase, 2 Wire + Ground |
| STFE030-24L    | 3.0  | 240 V         | Single Phase, 2 Wire + Ground |
| STFE050-24L    | 5.0  | 240 V         | Single Phase, 2 Wire + Ground |
| STFE100-24L    | 10.0 | 240 V         | Single Phase, 2 Wire + Ground |
| STFE200-24L    | 20.0 | 240 V         | Single Phase, 2 Wire + Ground |

## SPECIFICATIONS

| Description                          | STFEXX-10N   | STFEXX-24L          |
|--------------------------------------|--|---------------------|
| Input Voltage                        | 120 V (0-150 Vrms)   | 240 V (0-275 Vrms)  |
| Line Frequency                       | 47 - 63 Hz   |                     |
| Response Time                        | < .5 nanoseconds normal mode, <5 nanoseconds common mode                               |                     |
| Enclosure                            | Fully Enclosed Metal Housing   |                     |
| Fusing                               | Reference Fuse/Circuit Breaker Chart   |                     |
| Status Indication                    | Green LED "OK"/Form C Contact/10 Amps @ 250 Vac or 5 Amps @ 100 Vdc                    |                     |
| Connection/Mounting Type             | DIN Rail Mount   |                     |
| Operating Temperature                | -40°C to +50°C (-40°F to +122°F) at full load Derate Linearly to 60% at +70°C (+158°F) |                     |
| Weight - kg ( lbs)                   | 0.70 (1.7)   |                     |
| Dimensions - mm (in)<br>(H x W x D)  | 124.0 x 65.0 x 116.0<br>(4.88 x 2.56 x 4.56)   |                     |
| Operating Humidity                   | 0% to 95% Non-condensing   |                     |
| Peak Surge Current Capability        | Per Phase  | 30,000 Amps         |
|                                      | Line to Neutral  | 20,000 Amps         |
|                                      | Line to Ground   | 10,000 Amps         |
|                                      | Neutral to Ground  | 10,000 Amps         |
| Load Surge Current Rating            | 10 milliseconds  | 5 x Nominal         |
|                                      | 1 second   | 3 x Nominal         |
|                                      | 10 seconds   | 2 x Nominal         |
| Short Circuit Current Rating (SCCR)  | 5kA  |                     |
| Frequency Response                   |  |                     |
| Normal Mode (Forward-Reverse)        | 100 kHz to 50 MHz  | 90 dB maximum       |
| Common Mode (Forward-Reverse)        | 5 MHz to 50 MHz  | 60 dB maximum       |
| Transient Reduction<br>(IEEE C62.41) | Typical Category A Ringwave<br>(6 kV, 200A, 100 kHz)                                   | < 60 V Peak         |
|                                      | Typical Category B Ringwave<br>(6 kV, 500A, 100 kHz)                                   | <100 V Peak UL 1449 |
| Warranty                             | 5 year limited warranty  |                     |

# STC SERIES

The rapid development of automated controls, telecommunications and fire/security systems has made it imperative to have properly coordinated low-voltage protection. Modern networked industrial facilities require error free transmission of information for maximum productivity and integrity of data.

The SolaHD STC series protects all susceptible low-voltage cable routes entering a facility and at key points within the building. These devices can be used as part of a multi-stage protection strategy which involves clamping the initial high-energy impulse, filtering any remaining noise or transients to the PLC or sensitive equipment and finally, protecting the Data/Signal lines entering and leaving the control panel. Modern, networked industrial facilities require error free transmission of information for maximum productivity and data integrity.

The hybrid design of these Data/Signal Line surge suppressors allows them to respond quickly with high energy absorption. These units are available in a variety of application specific voltage levels and packaging configurations. The STC series is used to protect network signal lines entering or leaving control panels including PLCs, universal remote I/O, DeviceNet™ and Data Highway Plus.



## LOW VOLTAGE - DATA/SIGNAL, STC SERIES

| Series   | Application  |
|----------|--|
| STC-POE  | Power-over-Ethernet, Category 5 and Category 6             |
| STC-DRS  | DIN Rail mountable, single-pair surge protection           |
| STC-642  | Two-pair data/signal protection                            |
| STC-CCTV | High-frequency coaxial protection for head and camera ends |

# STC-POE SERIES

The SolaHD STC Power-over-Ethernet (PoE) series is designed to work on Category 5 PoE transmission lines as well as Category 6 applications. They feature both female to female and male to female RJ-45 connection options for ease of installation.

Power-over-Ethernet is a technology for wired Ethernet LANs (Local Area Networks) that allows the electrical current to be carried by the data cables rather than power cords. This minimizes the number of wires that must be strung in order to install the network. The result is lower cost, less downtime, easier maintenance and greater installation flexibility than with traditional wiring.

PoE allows users to power devices over Ethernet cabling. Power and networking is provided over a single cable. PoE has tremendous advantages in industrial applications. The ease of combining signal and power in a single Ethernet cable connection is contributing to the already rapid evolution of Ethernet-based industrial control systems. Category 5e and Category 6 commonly known as Cat5e and Cat6 are the most widely used Ethernet connectivity methods on the market today. Cat5e and Cat6 are defined in ANSI/TIA/EIA 568-B standard for Unshielded Twisted Pair Cabling.

The STC POE series is ideally suited to protect expensive equipment and critical communication/data transfer from internally generated transients and noise.



## FEATURES

- Exceeds CAT6 PoE and 6 transmission values
- Applications up to 60 Vdc @ 300 mA
- Three year limited warranty

## STC-POE-65FF FEATURES

- Single use design
- 60 Vdc @ 300 mA continuous
- Cost effective protection

## STC-CAT6-POE-I FEATURES

- Hybrid PTC (positive temperature coefficient) resettable fuse - up to 5,000 times
- 60 Vdc @ 750 mA continuous
- Isolated ground available
- 10 kA peak surge current
- Premium protection

## SELECTION TABLE

| Catalog Number | Description                                     |
|----------------|---|
| STC-P0E-65FF   | Female to Female Connector                      |
| STC-CAT6-P0E-I | Female to Female Connector with isolated ground |
| STC-C6-MP4     | CAT6 PoE Mounting Plate                         |

## SPECIFICATIONS

| Description                   | STC-P0E-65FF                                   | STC-CAT6-PoE-I  |
|-------------------------------|--|---|
| Mode of Protection            | Normal Mode (L-L)<br>All Lines (1-8) Protected | All Lines (1-8) Protected (L-L) and (L-G)<br>Signal High-Low; High-Ground; Low-Ground |
| DC Breakover Voltage          | 60 Vdc   |   |
| Insertion Loss                | < .1 dB  |   |
| Certified Transmission Speeds | 10 baseT, 100 baseT, 1000 baseT                |   |
| Peak Surge Energy             | 300 Watt                                       | 750 Watt  |
| Response Time                 | <1 nanosecond                                  |   |
| Connectors                    | RJ-45 (Female - Female)                        |   |
| Dimensions - mm (in)          | 58.4 x 25.4 x 20.3 (2.30 x 1.00 x .80)         | 137.2 x 40.7 x 43.2 (5.40 x 1.60 x 1.70)  |
| Warranty                      | 3 year limited warranty                        | 5 year limited warranty   |

# STC-DRS SERIES

Using three-stage hybrid technology, this DIN Rail mountable, single pair, surge suppressor attenuates over-voltage transients with gas tubes and silicon avalanche components while resettable fuses (PTCs) mitigate sneak currents. The PTC increases resistance by several orders of magnitude when over-currents exceed safe levels. A normal state resumes when over-currents are removed. The ability to self-restore in this manner significantly increases suppressor performance and survivability.

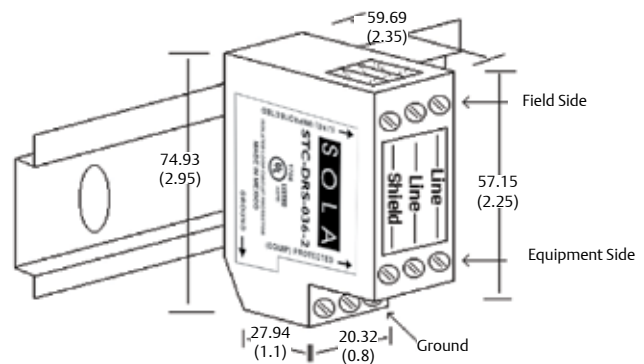
The STC-DRS Series mounts onto a standard 35 mm industrial DIN rail. There are three Field Side and three Electronics Side screw terminals. One is reserved for a shield. Three electrically tied ground terminals are provided for grounding the unit to building-approved ground. The shield is isolated from ground.

## FEATURES

- Low-Voltage data surge protection
- Three-Stage hybrid technology
- Sneak/Fault current protection with resettable fuses (PTCs)
- Low profile packaging
- Easy installation
- Fits standard 35 mm DIN Rail
- Fast response time <1 nanosecond
- Five year limited warranty



## DIMENSIONS IN MILLIMETERS (INCHES)



## SELECTION TABLE

| Catalog Number | Max Peak Signal Voltage | Nominal Breakdown Voltage | Max Current 1p 10X1000 ms (Occurrences) | Peak Current 8X20 ms | Typ. Cap (PF) | Max. Continuous Current | Nominal Series Resistance |
|----------------|-------------------------|---------------------------|---|----------------------|---------------|-------------------------|---------------------------|
| STC-DRS-232    | 15                      | 22                        | >100                                    | 10 KA                | 1500          | 150 ma                  | 5 Ω                       |
| STC-DRS-036    | 30                      | 36                        | >100                                    | 10 KA                | 1500          | 150ma                   | 5 Ω                       |
| STC-DRS-060    | 52                      | 60                        | >100                                    | 10 KA                | 1500          | 150ma                   | 5 Ω                       |

### Notes:

These protectors are intended for indoor use on communication loop circuits that have been isolated from the Public Switch Telephone Network.

The communication loop circuits shall not be exposed to accidental contact with the electric light or power conductors. The protectors shall be installed per the applicable requirements of the National Electric Code, ANSI/NFPA 70.



# STC-642 SERIES

The STC-642 series of surge suppressors are dual pair (four wire) modules using three-stage hybrid technology. This module addresses over voltage transients with gas tubes and silicon avalanche components. In addition, sneak and fault currents are mitigated with resettable fuses (PTCs). The PTCs increase resistance several orders of magnitude when over currents exceed safe levels. A normal state resumes when over currents are removed. The ability to self restore in this manner significantly increases suppressor performance and survivability.

The STC-642 card edge module is gold-plated, double sided and is designed to mate with the STC-642 gold-plated female terminal connector (sold separately). When snapped together, the data circuits pass thru the protector in a serial fashion from the four Field Side terminals to the four Electronics Side terminals. Terminals 1 or 10 of the STC-PCB1B must be attached to building approved ground.

## APPLICATION

- Intended for indoor use on communication loop circuits which have been isolated from the Public Switch Telephone Network.
- RS232 applications used with STC642-020 and STC-PCB1B
- 4-20 ma signal applications used with STC642-036 and STC-PCB1B
- For use in service capable of supplying less than 150 milliamperes continuously.



## FEATURES

- Lightning protection for low voltage data
- Signal lines
- Three-stage protection
- Sneak/fault current protection
- Resettable solid-state fuses - PTCs
- Low capacitance option for high speed data
- Plug-in module / Requires PCB1B base
- Hybrid design of includes series resistance
- Fast response time
- Five year limited warranty

## SELECTION TABLE

| Catalog Number     | Description   |
|--------------------|---|
| <b>STC642-020</b>  | 20 Volt Clamp   |
| <b>STC642-036</b>  | 36 Volt Clamp   |
| <b>STC-PCB1B</b>   | Base for all STC-642 models. Designed to accommodate up to 10 AWG wire. It offers Flat/Phillips screws and can be mounted using 2 #6 size screws. Must be ordered separately. |
| <b>STC-FM4-DRC</b> | Optional DIN Rail Mounting Clip for STC-PCB1B   |

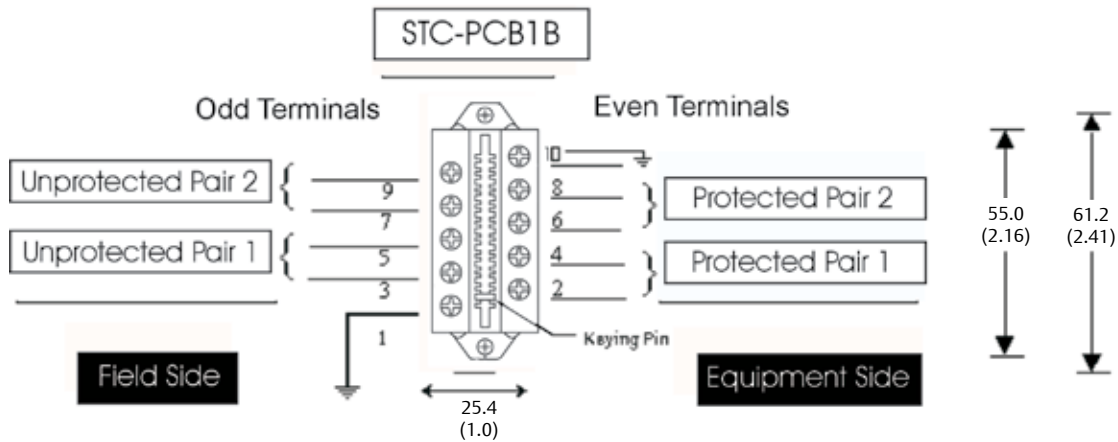
## SPECIFICATIONS

| Description                                      | STC642-020 ①  | STC642-036 ① |
|--|---|--------------|
| Peak Surge Current (10 times)                    | 8x20 s .. 10kA<br>10x700 s 500A per line              |              |
| Life Expectancy                                  | 8x20 s (2000A) .. >100 occurrences<br>10x700 s (400A) |              |
| Response Time                                    | <1 nanosecond   |              |
| Voltage Clamp                                    | 20  | 36           |
| Technology                                       | SAD Hybrid  |              |
| Resistance                                       | 5 (typical)   |              |
| Capacitance (typical)                            | 1500 pf   |              |
| Operating Temperature                            | -40°C to +85°C (-40°F to +185°F)                      |              |
| Weight - g (oz)                                  | 56.7 (2)  |              |
| Dimensions H x W x L - mm (in) (STC-642 & PCB1B) | 52.1 x 25.4 x 61.0<br>(2.05 x 1.00 x 2.40)            |              |
| Warranty   | 5 year limited warranty                               |              |

① Part number STC-PCB1B sold separately

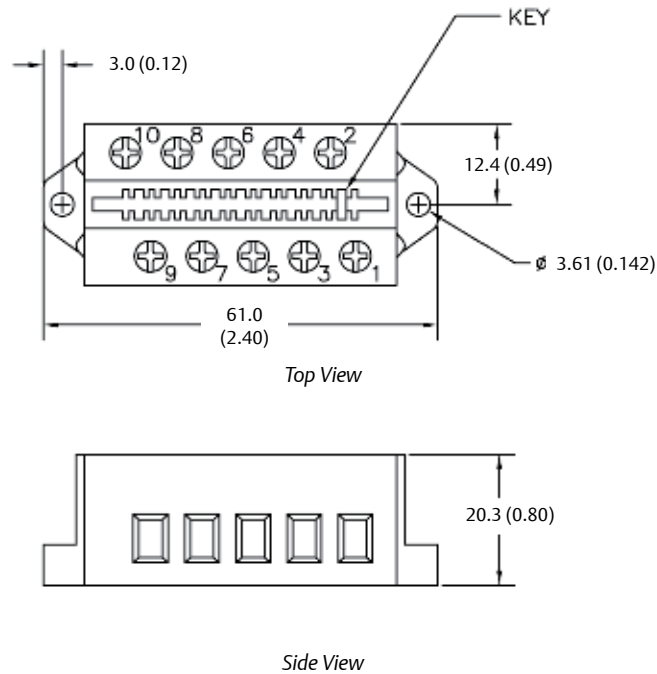
# STC-642 SERIES

## WIRING DIAGRAM (PIN ASSIGNMENTS)



Ground Terminal 1 or 10 (internally tied together) to building approved ground. The STC-PCB1B accommodates 24 to 10 AWG wire.

## DIMENSIONS IN MILLIMETERS (INCHES)



# STC-CCTV SERIES

The STC-CCTV Series is tailored specifically to CCTV, data, audio and cable applications. These units are single Coax Surge Protective Devices implementing three-stage hybrid technology. They address overvoltage transients with a primary gas tube, and secondary silicon avalanche components. Over-currents (e.g. sneak and fault currents) are mitigated with solid-state resettable fuses (PTCs). The STC-CCTV units are designed in accordance with NFPA 780 (2004 Edition) requirements, with up to 20 kA of surge current capability. The STC-CCTV-75I model has an isolated ground and is recommended for use at the camera end.

## APPLICATIONS

- CCTV Head End
- CCTV Camera End

## FEATURES

- Hybrid, three-stage technology
- Sneak/fault current protection
- Low insertion loss
- Shielded case
- Five year limited warranty

## SELECTION TABLE

| Catalog Number       | Description             |
|----------------------|-------------------------|
| <b>STC-CCTV -75</b>  | Without isolated ground |
| <b>STC-CCTV -75I</b> | With isolated ground    |



## SPECIFICATIONS

| Description                        | STC-CCTV-75  | STC-CCTV-75I |
|------------------------------------|--|--------------|
| Operating Voltage                  | 5  |              |
| Clamping Voltage                   | 6  |              |
| Frequency Range                    | 0 to 20 MHz  |              |
| Equipment Location                 | IEEE Category C, and Category B  |              |
| Rated Load Current                 | 0.35 amperes   |              |
| Topology                           | 2-port Series  |              |
| STC Technology                     | Primary Stage: Gas Tubes,<br>Secondary Stage: Silicon Avalanche Components<br>Third Stage: resettable fuses (PTCs) |              |
| Modes of Protection                | Signal to Ground   |              |
| Nominal Discharge Current per Mode | 10.0 kA  |              |
| Maximum Discharge Current per Mode | 20.0 kA  |              |
| EMI Attenuation                    | < 0.1 dB at 20 MHz   |              |
| VSWR                               | < 1.2  |              |
| Continuous Power                   | 0.72 Watts   |              |
| Operating Humidity                 | 0-95 % Non-condensing  |              |
| Operating & Storage Temperature    | -40°C to +85°C (-40°F to +185°F)   |              |
| Input & Output Connection Type     | BNC, 50 Ohm  |              |
| Mounting                           | Flange   |              |
| Enclosure Type                     | Metal  |              |
| Certifications                     | UL 497B Pending, NFPA 780 (2004)<br>Compliant for Communication Protectors   |              |
| Warranty                           | 5 year limited warranty  |              |

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United States  
+ 1.800.621.1506

Appleton Group  
9377 W. Higgins Road  
Rosemont, IL 60018  
1.800.377.4384  
solahd.com

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