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WHY APT?

Advanced Protection Technologies, Inc. (APT) has been a worldwide leader in the surge suppression industry since 1985. Headquartered in Central Florida, heart of lightning activity, APT’s surge protection products have long set the standard for protection of commercial and industrial facilities.

In addition to superior products, APT has received numerous awards for customer service including the coveted Frost and Sullivan Market Engineering Award.

Our commitment to service and exceeding expectations comes from our people and sophisticated system integration. We value the client relationship and support it with integrity, responsiveness and technical excellence.

We are, “Professionals Serving Professionals”

WHAT MARKETS DO WE SERVE?

Construction
Industrial/Commercial
OEM
International

ITS/DOT
Specialty Sales
Medium Voltage
Residential

protecting
THE ELECTRONIC WORLD FROM SURGES
### SPD Sizing Chart

#### Service Entrance Greater than 2000A

<table>
<thead>
<tr>
<th>Exposure Level</th>
<th>High Exposure</th>
<th>Medium Exposure</th>
<th>Low Exposure</th>
<th>Lowest Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>kA per phase</td>
<td>300 kA</td>
<td>200 kA</td>
<td>150 kA</td>
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</tr>
<tr>
<td>Model</td>
<td>XAS30</td>
<td>XAS20</td>
<td>XAS15</td>
<td>XDS10</td>
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#### Service Entrance 1200A - 2000A

<table>
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<tr>
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<tr>
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<tr>
<td>Model</td>
<td>XAS25</td>
<td>XAS20</td>
<td>XDS15</td>
<td>XCS10</td>
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#### Service Entrance 800A - 1200A

<table>
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<tbody>
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<td>200 kA</td>
<td>150 kA</td>
<td>100 kA</td>
<td>50 kA</td>
</tr>
<tr>
<td>Model</td>
<td>XDS20</td>
<td>XDS15</td>
<td>XCS10</td>
<td>SPDee</td>
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#### Distribution/Branch Panel 800A - 1200A

<table>
<thead>
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<th>Low Exposure</th>
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</thead>
<tbody>
<tr>
<td>kA per phase</td>
<td>200 kA</td>
<td>150 kA</td>
<td>100 kA</td>
<td>50 kA</td>
</tr>
<tr>
<td>Model</td>
<td>XDS20</td>
<td>XDS15</td>
<td>XCS10</td>
<td>SPDee</td>
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#### Distribution/Branch Panel Less than 800A

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<th>High Exposure</th>
<th>Medium Exposure</th>
<th>Low Exposure</th>
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</thead>
<tbody>
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<td>kA per phase</td>
<td>150 kA</td>
<td>100 kA</td>
<td>100 kA</td>
<td>50 kA</td>
</tr>
<tr>
<td>Model</td>
<td>XDS15</td>
<td>XDS10</td>
<td>XCS10</td>
<td>SPDee</td>
</tr>
</tbody>
</table>

---

**Pricing & Product Information**

*Call 800.237.4567 or visit www.apt surge.com*
**Green = Go  Visual Diagnostic Monitoring**

- Green LED = A-OK, Out = replace
- LED Visible from Multiple Sides & Angles - Better Viewing
- Every MOV is Monitored as opposed to ‘power is present’

**Tri-Mount Installation**

- Same unit mounts on Pipe Nipple, Bracket or DIN-Rail
- Easy to See; Easy to Understand

**Performance Specifications**

- 50kA 8 x 20µs Per Mode
- UL 1449 tested Innominal: 20kA (highest available)
- UL 1449 tested SCCR: 200kA (most models)
- Large-Block, 34mm square, 50kA MOVs
- Individually Fused & Thermally Protected MOVs
- UL 1449 Voltage Protection Ratings (VPRs):
  - 600V for 120V, 120/240, 208Y/120
  - 1000V for 277V, 480Y/277V
- Repetitive Impulse: 5000 - 3kA - 8 x 20µs; 1000 - 10kA - 8 x 20µs
- Data table on backpage

**Physical Specifications**

- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47 - 63Hz
- Peak Operating Temperature: +85°C (185°F)
- Typical Operating Temperature: +40°C (+104°F) to +60°C (140°F)
- Response Time: < 1 nanosecond
- Solid State Bi-directional Operation
- NEMA 4X Polycarbonate Enclosure—UL746C(f1), UL 94-5VA
- Pre-wired with 3’ (1m) of #10 AWG conductor
- Typical Type 2 Connection: #10 AWG to 30A breaker

**Options**

- N-G protection
- Dry Contact & Audible Alarm
- Dry Contact connection leads exit through nipple via #18 AWG
- Other configurations available for OEM - Call

**Quality, Standards & Validation**

- 2 year warranty (longer optional)
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.1
- Type 2 (Opt.): UL 1449 Fourth Edition, CSA 22.2 No. 269.2
- NEMA LS-1
- IEC 61643, CE
- Burn-In tested prior to shipment
- ISO 9001:2008 Certified Quality Management System
- ISO 17025:2005 Certified Test Lab
- RoHS-compliant

**Dimensions**

- Weight: 1.60 lbs (0.73 kg)
- Sized for std 35mm Din-Rail

**Features:**

- UL 1449 Fourth Edition Listed
- 50kA 8 x 20µs
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 200kA SCCR (most models)
- All UL-required OCP & Safety Coordination Included Inside
- Voltage Specific Design: Performs better than ‘one-size fits all’
- Tri-Mount Installation for more mounting flexibility:
  - Same unit mounts on Pipe Nipple, Bracket or DIN-Rail
- Visual Diagnostics: Easy to See; Easy to Understand
Surge Current Rating

50A = 50kA/Phase

EXAMPLES:

- **S50A120V2P** 120V 600 600* 1000* 20kA 200kA 150
- **S50A127V2P** 127/254V 700 1200 600* 1200* 20kA 100kA 180
- **S50A220V2P** 120/240V -
- **S50A220V3Y** 208Y/120V 600 1000 600* 1000* 20kA 200kA 150
- **S50A240V2P** 120/240V -
- **S50A240V3D** 240V Delta -
- **S50A277V2P** 240/480V 1200 2000 1000* 1800* 20kA 200kA 320
- **S50A277V1P** 277V 1200 1000* 1800* 20kA 200kA 320
- **S50A277V3Y** 480Y/277V 1200 2000 1000* 1800* 20kA 200kA 320
- **S50A480V3H** 240/480V -
- **S50A480V3D** 480V Delta -
- **S50A600V3D** 600V Delta -

Voltage & System Config

- **N-G Bonded** - Does not require N-G protection
- **N-G Bonded** - N-G protection suggested

Performance Data

<table>
<thead>
<tr>
<th>MODEL</th>
<th>System Voltage &amp; Config</th>
<th>Voltage Protection Rating</th>
<th>VPR 3000A In SCCR MCOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>S50A120V1P</td>
<td>120V 600 600* 1000* 20kA 200kA 150</td>
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<td></td>
</tr>
<tr>
<td>S50A120V2P</td>
<td>120V/240V 600 1000 600* 1000* 20kA 200kA 150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S50A120V3Y</td>
<td>208Y/120V 600 1000 600* 1000* 20kA 200kA 150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S50A127V1P</td>
<td>127V 700 600 1200* 20kA 100kA 180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S50A127V2P</td>
<td>127/254V 700 1200 600* 1200* 20kA 100kA 180</td>
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<td></td>
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<tr>
<td>S50A220V1P</td>
<td>200V-1 pole 1200 1000* 1800* 20kA 200kA 320</td>
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<td></td>
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<tr>
<td>S50A220V2P</td>
<td>240V-2 pole 1200 1000 1800 20kA 200kA 320</td>
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<tr>
<td>S50A240V2P</td>
<td>240V Delta -</td>
<td></td>
<td></td>
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<tr>
<td>S50A240V3D</td>
<td>240V Delta -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S50A277V1P</td>
<td>277V 1200 1000* 1800* 20kA 200kA 150</td>
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<tr>
<td>S50A277V3Y</td>
<td>480Y/277V 1200 1000* 1800* 20kA 200kA 150</td>
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<td>S50A480V1P</td>
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<td>S50A480V3D</td>
<td>480V Delta - 3 pole 300 1800 20kA 200kA 550</td>
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<td>S50A480V3H</td>
<td>480V Delta - 3 pole 300 1800 20kA 200kA 550</td>
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<td>S50A600V3D</td>
<td>600V Delta - 3 pole 2500 2500 20kA 200kA 600</td>
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<tr>
<td>S510A120V2P</td>
<td>120/240V 600 1000 600 1000* 20kA 200kA 150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S510A277V2P</td>
<td>240/480V 1000 1800 1000 1000* 20kA 200kA 320</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optional Form C Dry Contact & Audible Alarm

Form C Dry Contact:
Three (3) #18 wires exit the pipe nipple
Gray is Common, Blue is Normally Open, Red is Normally Closed
- Normally Open: Use Gray & Blue
- Normally Closed: Use Gray & Red

Audible Alarm:
Alarm sounds when any protection is lost (If diagnostic LED extinguishes (i.e. problem), alarm will sound)
Advanced Protection Technologies

UL Listed to UL 1449 Photovoltaic Standard
(VZCA.E321351 & VZCA7.E321351)

- UL Listed as opposed to Recognized - avoids scrutiny over Technical Considerations of Recognized products
- Avoids Certification Surprises
- No Unexpected Installation Requirements

Listed to UL 1449 as DC SPD for use in PV applications
Options & Configurations for OEMs (see back)

Does not require additional upstream fusing for SPD safety protection
- 100kA DC Short Circuit Current Rating (SCCR)
- Fail-Safe operation – arc breaking, slide-gate thermal disconnectors built-in
- Avoids safety challenges and fusing shortcomings of overseas-standard SPDs

Performance Specifications
- 50kA 8x20µs Per Mode
- 300VDC, 600VDC, 1000VDC, 1500VDC & OEM models
- All modes of protection: DC+ – G, DC- – G, DC+ – DC-
- UL 1449 tested Iₐ: 20kA (1500V: 10kA)
- UL 1449 tested SCCR: 100kA DC
- UL 1449 Listed as Type 1 SPD
- UL 1449 Type 2 optional for cUL Mark
- Large-Block arrestor-grade 34mm square MOVs
- Individually Fused and Thermally Protected MOVs
- Repetitive Impulse: 5000 - 3kA-8 x 20µs; 1000 - 10kA-8 x 20µs
- Response Time: < 1nanosecond

Physical Specifications
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: DC
- Operating Temperature: -40°C (-40°F) to +65°C (149°F)
- Solid State Bi-directional Operation
- NEMA 4X Polycarbonate Enclosure – UL746C(f1), UL 94-V5A
- Pre-wired with 3’ (1m) of #8 AWG & #6 AWG ground conductor
(1500VDC: #10 AWG)

Dimensions

- 3.26" 3.26" 4.13"
- 3.31" 3.57" 

Monitoring Configurations
- Standard - Low consumption LED; monitors every MOV
  - Illuminates when power is produced
- Options
  - R - Removes LED and its circuitry
  - M - MOV Microswitch access option (requires R above)

Quality, Standards & Validation
- 2 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025: Certified Test Lab
- IEC 61643, CE
- UL 96A Lightning Protection Master Label Eligible @ 20kA Iₐ
### Applications & Models

<table>
<thead>
<tr>
<th>UL 1449 Model Number</th>
<th>S50A300VDC</th>
<th>S50A600VDC</th>
<th>S50A1000VDC</th>
<th>S50A1500VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Voltage</td>
<td>0-300VDC</td>
<td>0-600VDC</td>
<td>0-1000VDC</td>
<td>0-1500VDC</td>
</tr>
<tr>
<td>Maximum Continuous Operating Voltage (V&lt;pvdc&gt;)</td>
<td>424VDC</td>
<td>905VDC</td>
<td>1188VDC</td>
<td>1500VDC</td>
</tr>
<tr>
<td>Voltage Protection Level (Up) @ 6kV/3kA</td>
<td>&lt;1000Vp</td>
<td>&lt;2000Vp</td>
<td>&lt;2500Vp</td>
<td>&lt;3000Vp</td>
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</tbody>
</table>

### SPD<sub>EE</sub> DC Model Number Configurator & Options

<table>
<thead>
<tr>
<th>UL 1449</th>
<th>S50A</th>
<th>Voltage</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>50kA default</td>
<td>300VDC</td>
<td>600VDC</td>
<td>1000VDC</td>
</tr>
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</table>

Examples:
- S50A300VDCRM = 50kA, 300VDC, Remove LED, Microswitch Monitoring
- S50A1000VDC2 = 50kA, 1000VDC, Type 2 marking for Canada

### Schematic: All Modes of Protection

```
   DC + red wire  DC - black wire
          |           |
          |           | GROUND green/yellow wire
          |           |
```

- Available Z Mounting Bracket Accessory
- AC Voltage SPD<sub>EE</sub>’s Also Available

### OEM & Brand Label Opportunities

Please call 800.237.4567

Advanced Protection Technologies
14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com
**TEXCS Series**

**Type 1/Type 2 Surge Protective Device/SPD**

### Features
- UL 1449 Fourth Edition Listed
- 100kA per phase rating
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Innominal (Iₙ)
- 200kA SCCR (most models)
- UL 96A Lightning Protection Master Label compliant
- Voltage Specific Design – highly configurable
- All MOV suppression elements monitored
- All Modes of Protection

### Performance Specifications

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>100kA Per Phase</td>
<td>50kA</td>
<td>50kA</td>
<td>50kA</td>
<td>100kA</td>
</tr>
</tbody>
</table>

- UL 1449 Fourth Edition Listed
- UL 1449 Fourth Edition Listed Type 1, CSA 22.2 No. 269.1
- Optional UL 1449-4 Type 2 SPD, CSA 22.2 No. 269.2
- UL 1449-4 tested Innominal (Iₙ): 20kA
- UL 1449-4 tested SCCR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs)
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V (data table on back)
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits

### Design Features
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643, CE
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused & Thermally Protected MOVs
- Large-Block, 34mm square, 50kA MOVs
- Solid State Bidirectional Operation

### Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Phase Loss monitoring (toggles LED & dry contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Optional: Audible Alarm & Form C Dry Contact (Contact rated 240V, 5A; leads are pre-wired through nipple with #18 AWG)

### Physical Specifications
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47 - 63Hz (also 400Hz on <480V)
- Operating Temperature: -40°C (-40°F) to +85°C (185°F)
- Weight: 3 lbs (1.4 kg)
- NEMA 4X Polycarbonate enclosure – UL 746C(f1) & UL 94-5VA
- Dimensions: 8.3” x 3.6” x 3.0” (211mm x 91mm x 77mm)
- 3/4” threaded hub - weather resistant 4X
- Pre-wired with 3’ (1m) of #10 AWG conductor
- Typical connection: #10 AWG and 30A breaker

### Quality, Standards & Validation
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.1
- Type 2 (Opt.): UL 1449 Fourth Edition, CSA No. 269.2
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
Common North American Systems:
01 = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
02 = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
03 = 240/120V High Leg Delta (B High) (Fig 3)
04 = 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)
05 = 480V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
08 = 600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)

Other Available Systems - Confirmation encouraged:
15 = 254/127V Split Phase - 1Ø 3W+Grnd (Fig 1)
18 = 480/277V 2-Pole, (480/240V Split Phase) (Fig 1)
21 = 220Y/127V Wye - 3Ø 4W+Grnd (Fig 2)
41 = 520Y/300V Wye - 3Ø 4W+Grnd (Fig 2)
42 = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
43 = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
44 = 440Y/250V Wye - 3Ø 4W+Grnd (Fig 2)
51 = 480V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
06 = 240V Delta - 3Ø 3W+Grnd (Fig 4)
61 = 240V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
07 = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)
09 = 600V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
91 = 600V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
11 = 120V Single Phase (Fig 5)
12 = 240V Single Phase (Fig 5) - Not split phase
13 = 127V Single Phase (Fig 5)
14 = 300V Single Phase (Fig 5)
16 = 277V Single Phase (Fig 5)
17 = 480V Single Phase (1 Hot, 1 Neu, 1 Grnd) (Fig 5)

Performance Data

UL 1449 Fourth Edition Test Data
Voltage Protection Ratings (VPR - 3kA)

<table>
<thead>
<tr>
<th></th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
<th>I_n</th>
<th>SCCR</th>
<th>MCOV</th>
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<tbody>
<tr>
<td>01</td>
<td>240/120V Split Phase</td>
<td>600</td>
<td>700</td>
<td>500</td>
<td>1000</td>
<td>20kA</td>
<td>100kA</td>
</tr>
<tr>
<td>02</td>
<td>208Y/120V 3Ø Wye</td>
<td>600/1200</td>
<td>700/1200</td>
<td>500</td>
<td>1000</td>
<td>20kA</td>
<td>200kA</td>
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<tr>
<td>04</td>
<td>480Y/277V 3Ø Wye</td>
<td>1200</td>
<td>1200</td>
<td>1000</td>
<td>1800</td>
<td>20kA</td>
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<td>06</td>
<td>480V 3Ø Delta</td>
<td>1800</td>
<td>1800</td>
<td>1500</td>
<td>2500</td>
<td>20kA</td>
<td>200kA</td>
</tr>
</tbody>
</table>

Other Available Systems:
Please see supplementary data sheet, contact us at info@aptsurge.com
or confirm at www.UL.com using CCN of VZCA.
**Features:**
- UL 1449 Fourth Edition Listed
- 100kA – 200kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Innominal (Iₚ)
- 200kA SCCRs (most models)
- UL 96A Lightning Protection Master Label compliant
- Voltage Specific Design – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection

**Performance Specifications**

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
</table>
| 100kA Per Phase  | 50kA| 50kA| 50kA| 100kA
| 150kA Per Phase  | 100kA| 50kA| 50kA| 150kA
| 200kA Per Phase  | 100kA| 100kA| 100kA| 200kA

- UL 1449 Fourth Edition Listed Type 1, CSA 22.2 No. 269.1
- Optional UL 1449-4 Type 2 SPD, UL 1283 Listed, CSA 22.2 No. 269.2
- UL 1449-4 tested Innominal (Iₚ): 20kA
- UL 1449-4 tested SCCR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V (data table on back)
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Listing)

**Design Features**
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643, CE
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused & Thermally Protected MOVs
- Large-Block, 34mm square, 50kA MOVs
- Solid State Bidirectional Operation

**Diagnostic Monitoring**
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Phase Loss monitoring (toggles LED & dry contact)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Optional: Audible Alarm & Form C Dry Contact (Contact rated 240V, 5A)

**Quality, Standards & Validation**
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.1
- Type 2 (Opt.): UL 1449 Fourth Edition, CSA No. 269.2, UL 1283
- UL file: VZCA.E321351 at [www.UL.com](http://www.UL.com)
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification

Advanced Protection Technologies
14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com
TeXDS Model Number Configurator & Options

Voltage Code for Electrical System

Common North American Systems:
01 = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
02 = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
03 = 240/120V High Leg Delta (B High) (Fig 3)
04 = 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)
05 = 480V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
08 = 600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)

Other Available Systems - Confirmation encouraged:
15 = 254/127V Split Phase - 1Ø 3W+Grnd (Fig 1)
18 = 480/277V 2-Pole, (480/240V Split Phase) (Fig 1)
21 = 220Y/127V Wye - 3Ø 4W+Grnd (Fig 2)
41 = 520Y/300V Wye - 3Ø 4W+Grnd (Fig 2)
42 = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
43 = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
44 = 440Y/250V Wye - 3Ø 4W+Grnd (Fig 2)
51 = 480V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
06 = 240V Delta - 3Ø 3W+Grnd (Fig 4)
61 = 240V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
07 = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)
09 = 600V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
   (Available: 100kA)
91 = 600V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
   (Available: 100kA)
11 = 120V Single Phase (Fig 5)
12 = 240V Single Phase (Fig 5) - Not split phase
13 = 127V Single Phase (Fig 5)
14 = 300V Single Phase (Fig 5)
16 = 277V Single Phase (Fig 5)
17 = 480V Single Phase (1 Hot, 1 Neu, 1 Grnd) (Fig 5)

Performance Data

UL 1449 Fourth Edition Test Data

<p>| Voltage Protection Ratings (VPR - 3kA) |</p>
<table>
<thead>
<tr>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
<th>I_o</th>
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<tbody>
<tr>
<td>01</td>
<td>02</td>
<td>03</td>
<td>04</td>
<td>05</td>
</tr>
<tr>
<td>700</td>
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<td>1500</td>
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<td>1500</td>
<td>2500</td>
<td>20kA</td>
</tr>
</tbody>
</table>

Other Available Systems:
Please see supplementary data sheet, contact us at info@aptsurge.com
or confirm at www.UL.com using CCN of VZCA.
Texas Series
Type 1/Type 2 Surge Protective Device/SPD

Features:
- UL 1449 Fourth Edition Listed
- 100kA – 500kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Innominal
- 200kA SCCRs (most models)
- UL 96A Lighting Protection Master Label compliant
- Voltage Specific Design – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection
- Optional Rotary Disconnect Switch

Design Features
- Designed, Manufactured & Tested consistent with:
  - ANSI/IEEE C62.72-2007
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused & Thermally Protected MOVs
- Large-Block, 34mm square, 50kA MOVs
- Replaceable Module Construction
- Solid State Bidirectional Operation

Physical Specifications
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 24 lbs (11 kg)
- Standard NEMA 1/12/3R/4 enclosure
- Standard size: 12” x 12” x 7” (305mm x 305mm x 177mm)
- Lug size: #2 - #14 AWG (w/opt. disconnect: #6 - #1/0)
- Typical connection: #6 AWG and 60A breaker

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring (toggles LED & dry contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, six-digit LCD, with test function, reset & no-maintenance Eeprom memory

Performance Capacities

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
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<tbody>
<tr>
<td>100kA Per Phase</td>
<td>50kA</td>
<td>50kA</td>
<td>50kA</td>
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<tr>
<td>150kA Per Phase</td>
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<tr>
<td>200kA Per Phase</td>
<td>100kA</td>
<td>100kA</td>
<td>100kA</td>
<td>200kA</td>
</tr>
<tr>
<td>250kA Per Phase</td>
<td>150kA</td>
<td>100kA</td>
<td>100kA</td>
<td>250kA</td>
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<tr>
<td>300kA Per Phase</td>
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<td>150kA</td>
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<tr>
<td>400kA Per Phase</td>
<td>200kA</td>
<td>200kA</td>
<td>200kA</td>
<td>400kA</td>
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<tr>
<td>500kA Per Phase</td>
<td>250kA</td>
<td>250kA</td>
<td>250kA</td>
<td>500kA</td>
</tr>
</tbody>
</table>

- UL 1449 Fourth Edition Listed Type 1, CSA 22.2 No. 269.1
- Optional UL 1449-4 Type 2 SPD, UL 1283 Listed, CSA 22.2 No. 269.2
- UL 1449-4 tested Innominal: 20kA
- UL 1449-4 tested SCCRs: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 10000V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Listing)

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www.apt surge.com · info@apt surge.com

RoHS-compliant
IEC 61643, CE
10 year warranty (longer optional)
Burn-In tested prior to shipment
ISO 9001:2008 Quality Management System
ISO 17025:2005 Laboratory Qualification
**Texas Model Number Configurator & Options**

### Voltage Code for Electrical System

#### Common North American Systems:
- **01** = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
- **02** = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
- **03** = 240/120V High Leg Delta (B High) (Fig 3)
- **04** = 480V/277V Wye - 3Ø 4W+Grnd (Fig 2)
- **05** = 480V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye (450kA replaces 400kA or 500kA)
- **06** = 600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)

**Other Available Systems:** Confirmation encouraged:
- **07** = 61 = 240/120V High Leg Delta 700/1200 700/1200 700 1800 20kA 200kA 150 / 320
- **08** = 600Y/347V 3Ø Wye (<300kA)

#### Performance Data

**Common North American Systems**

<table>
<thead>
<tr>
<th>Voltage Code</th>
<th>UL 1449 Fourth Edition Test Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L-N</strong></td>
<td><strong>L-G</strong></td>
</tr>
<tr>
<td>01 = 240/120V Split Phase (&lt;300kA)</td>
<td>700</td>
</tr>
<tr>
<td>02 = 208Y/120V 3Ø Wye (&lt;300kA)</td>
<td>700</td>
</tr>
<tr>
<td>03 = 208Y/120V B High Leg Delta</td>
<td>700/1200</td>
</tr>
<tr>
<td>04 = 480Y/277V 3Ø Wye (&lt;300kA)</td>
<td>1200</td>
</tr>
<tr>
<td>05 = 480V 3Ø Delta (&lt;300kA)</td>
<td>1200</td>
</tr>
<tr>
<td>07 = 380Y/220V 3Ø Wye (&lt;300kA)</td>
<td>1200</td>
</tr>
<tr>
<td>08 = 600Y/347V 3Ø Wye (&lt;300kA)</td>
<td>1500</td>
</tr>
</tbody>
</table>

### Surge Current Rating

<table>
<thead>
<tr>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = Surge Counter, six-digit LCD counter includes maintenance-free Eprom memory backup</td>
</tr>
<tr>
<td>E = Remote Locatable Display on 4 ft Cable custom cable lengths available</td>
</tr>
<tr>
<td>F = Noise Filtering - Extended Range &amp; Attenuation (available on 400kA &amp; 500kA models)</td>
</tr>
<tr>
<td>D = Rotary Disconnect Switch, ABB, UL98</td>
</tr>
<tr>
<td>T = Thru-Door Rotary Disconnect Switch, ABB, UL98, E1 enclosure only (Consult factory for other disconnect switch options)</td>
</tr>
<tr>
<td>2 = Type 2 SPD, incl. UL 1283 EM/RFI Filters</td>
</tr>
</tbody>
</table>

Delete Options - Consult Factory for Order Code
- Delete L-N Protection (reduces kA rating)
- Delete L-G Protection (reduces kA rating)
- Delete N-G Protection (reduces kA rating)
- Delete Noise Filtering

Available Accessory (order separately)
- RM = Remote Monitor

**Enclosure Rating**

- **E1** = NEMA 1/12/3R/4 (size: 12” x 12” x 7”)
- **4X** = NEMA 4X Stainless Steel (size: 12” x 12” x 6”)

**Performance Data**

- **DELTA & HRG WYE**
- **HI-LEG DELTA (B High)**
- **SINGLE POLE**
- **CORNER GROUND DELTA (B grounded)**

**Other Available Systems:**
Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA. Optional disconnect switch may increase VPRs.

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Advanced Protection Technologies

TEXAL Series
Type 1/Type 2 Surge Protective Device/SPD

Features:
- Directly Connected, Discrete Protection Elements Between All Possible Modes
- UL 1449 Fourth Edition Listed
- 150kA – 450kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Innominal (Iₐ) (Type 1)
- 200kA SCRRs (most models)
- UL 96A Lightning Protection Master Label compliant (@20kA Iₐ)
- All MOV suppression elements monitored
- All Modes of Protection

Performance Specifications
- Directly Connected, Discrete Protection Elements Between All Possible Modes with True 10-Mode Protection

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>150kA Per Phase</td>
<td>50kA</td>
<td>50kA</td>
<td>50kA</td>
<td>50kA</td>
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<tr>
<td>300kA Per Phase</td>
<td>100kA</td>
<td>100kA</td>
<td>100kA</td>
<td>100kA</td>
</tr>
<tr>
<td>450kA Per Phase</td>
<td>150kA</td>
<td>150kA</td>
<td>150kA</td>
<td>150kA</td>
</tr>
</tbody>
</table>

- Optional UL 1449-4 Type 2 SPD, UL 1283 Listed, CSA 22.2 No. 269.2
- UL 1449-4 tested Innominal (Iₐ): 20kA
- UL 1449-4 tested SCRR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave True Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Listing)

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring
- Electrically isolated diagnostic circuitry
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, sixdigit LCD, with test function, reset & no-maintenance Eprom memory

Design Features
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643, CE
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused & Thermally Protected MOVs
- Large-Block, 34mm square, 50kA MOVs
- Replaceable Module Construction
- Solid State Bidirectional Operation

Physical Specifications
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 24 lbs (11 kg)
- Standard NEMA 1/12/3R/4 enclosure
- Standard size: 12” x 12” x 7” (305mm x 305mm x 177mm)
- Lug size: #2 - #14 AWG (w/opt. disconnect: #6 - #1/0)
- Typical connection: #6 AWG and 60A breaker

Quality, Standards & Validation
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.1
- Type 2 (Opt.): UL 1449 Fourth Ed., CSA No. 269.2, UL 1283
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
**Voltage Code for Electrical System**

Common North American Systems:
- **01** = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
- **02** = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
- **03** = 240/120V High Leg Delta (B High) (Fig 3)
- **04** = 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)

Other Available Systems - Confirmation encouraged:
- **15** = 254/127V Split Phase - 1Ø 3W+Grnd (Fig 1)
- **18** = 480/277V 2-Pole, (480/240V Split Phase) (Fig 1)
- **21** = 220Y/127V Wye - 3Ø 4W+Grnd (Fig 2)
- **42** = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
- **43** = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
- **07** = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)

**Surge Current Rating**

- **15** = 150kA/Phase
- **30** = 300kA/Phase
- **45** = 450kA/Phase

**Options**
- **X** = Surge Counter, six-digit LCD counter includes maintenance-free Eprom memory backup
- **E** = Remote Locatable Display on 4 ft Cable custom cable lengths available
- **F** = Noise Filtering - Extended Range & Attenuation (available on 450kA & 500kA models)
- **D** = Rotary Disconnect, ABB, UL98
- **T** = Thru-door Rotary Disconnect Switch, Katko, UL 508, E1 enclosure only (Consult factory for other disconnect switch options)

Delete Options - Consult Factory for Order Code
- Delete L-N Protection (reduces kA rating)
- Delete L-G Protection (reduces kA rating)
- Delete N-G Protection (reduces kA rating)
- Delete Noise Filtering

Available Accessory (order separately)
- **RM** = Remote Monitor

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**Performance Data**

<table>
<thead>
<tr>
<th>Common North American Systems</th>
<th>UL 1449 Fourth Edition Test Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voltage Protection Ratings (VPR - 3kA)</td>
</tr>
<tr>
<td></td>
<td>L-N</td>
</tr>
<tr>
<td>01 = 240/120V Split Phase</td>
<td>700</td>
</tr>
<tr>
<td>02 = 208Y/120V Wye</td>
<td>700</td>
</tr>
<tr>
<td>03 = 240Y/120V High Leg Delta</td>
<td>800/1500</td>
</tr>
<tr>
<td>04 = 480Y/277V 3Ø Wye</td>
<td>1200</td>
</tr>
</tbody>
</table>

Other Available Systems - Confirmation encouraged:
- **15** = 254/127V Split Phase
- **21** = 220Y/127V 3Ø Wye
- **42** = 415Y/240V 3Ø Wye
- **43** = 400Y/230V 3Ø Wye
- **07** = 380Y/220V 3Ø Wye

**Enclosure Rating**

- **E1** = NEMA 1/12/3R/4 (size: 12” x 12” x 7”)
- **4X** = NEMA 4X Non-Metallic (size: 14” x 12” x 6”) (polycarbonate, display inside clear front door)
- **4S** = NEMA 4X Stainless Steel (size: 12” x 12” x 6”) (display inside door)
- **FM** = NEMA 1 Flush Mount (wall cavity size: 12” x 12” x 6” deep)
- **P1** = NEMA 1 pullbox 'indoor' (size: 12” x 12” x 6”) - includes ‘E’ option (Optional rotary disconnect increases enclosure sizes to 16” x 14” x 6” on 450kA only)

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Other Available Systems:
Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.
Optional disconnect switch may increase VPRs.

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Design Features:
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  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643, CE
• High Energy Parallel Design for Category C3 & C-High applications
• For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
• Individually Fused & Thermally Protected MOVs
• Large-Block, 34mm square, 50kA MOVs
• Dual Replaceable Module Construction
• Solid State Bidirectional Operation

Performance Specifications

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
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<tr>
<td>400kA Per Phase</td>
<td>200kA</td>
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</table>

- UL 1449 Fourth Edition Listed Type 1, CSA 22.2 No. 269.1
- Optional UL 1449-4 Type 2 SPD, UL 1283 Listed, CSA 22.2 No. 269.2
- UL 1449-4 tested Inominal (In): 20kA
- UL 1449-4 tested SCCR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 700V
  - 480Y/277V: as low as 1200V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Listing)

Diagnostic Monitoring
• 100% monitoring – Every MOV is monitored, incl. N-G
• Green LED Status indicator per phase
• Red LED service indicator
• Audible Alarm with Silence Switch
• Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
• N-G overvoltage detection
• Phase Loss monitoring (toggles LED & dry contacts)
• Electrically isolated circuitry ensures surges do not damage diagnostics
• Form C Dry Contacts, 240V, 5A (two sets)
• Optional Surge Counter, six-digit LCD, with test function, reset & no-maintenance Eprom memory

Physical Specifications
• Relative Humidity Range: 0 -95% non-condensing
• Operating Frequency: 47-63Hz
• Operating Temperature: -25°C (-15°F) to +60°C (140°F)
• Weight: 52 lbs (23.6 kg)
• Standard NEMA 1/12/3R/4 enclosure
• Standard size: 20” x 20” x 7.5” (50.8cm x 50.8cm x 19cm)
• Lug size: #6 - #1/0 AWG
• Typical connection: #6 AWG and 60A breaker

Quality, Standards & Validation
• Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.1
• Type 2 (Opt.): UL 1449 Fourth Ed., CSA 22.9.2, UL 1283
• UL file: VZCA.E321351 at www.UL.com
• RoHS-compliant
• IEC 61643, CE
• 10 year warranty (longer optional)
• Burn-In tested prior to shipment
• ISO 9001:2008 Quality Management System
• ISO 17025:2005 Laboratory Qualification

Advanced Protection Technologies
14550 58th Street North - Clearwater, Florida 33760
(800) 237-4567 - (727) 535-6339 - Fax (727) 539-8955
www.apt surge.com - info@apt surge.com
Common North American Systems:

<table>
<thead>
<tr>
<th>Voltage Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 = 240/120V Split Phase</td>
<td>2 Hots, 1 Neu, 1 Grnd (Fig 1)</td>
</tr>
<tr>
<td>02 = 208Y/120W Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>03 = 240/120V High Leg Delta</td>
<td>3Ø 4W+Grnd (Fig 3)</td>
</tr>
<tr>
<td>04 = 480Y/277V Wye</td>
<td>3Ø 4W+Grnd (Fig 4)</td>
</tr>
<tr>
<td>05 = 480V Delta</td>
<td>3Ø 3W+Grnd (Fig 4) &amp; HRG Wye</td>
</tr>
<tr>
<td>08 = 600Y/347V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
</tbody>
</table>

Other Available Systems - Confirmation encouraged:

<table>
<thead>
<tr>
<th>Voltage Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 = 220Y/127V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>41 = 520Y/300V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>42 = 415Y/240V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>43 = 400Y/230V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>44 = 440Y/250V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>51 = 480V B Corner Grnd Delta</td>
<td>3Ø 3W+Grnd (Fig 6)</td>
</tr>
<tr>
<td>06 = 240V Delta</td>
<td>3Ø 3W+Grnd (Fig 4)</td>
</tr>
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<td>61 = 240V B Corner Grnd Delta</td>
<td>3Ø 3W+Grnd (Fig 6)</td>
</tr>
<tr>
<td>07 = 380Y/220V Wye</td>
<td>3Ø 4W+Grnd (Fig 2)</td>
</tr>
<tr>
<td>09 = 600V Delta</td>
<td>3Ø 3W+Grnd (Fig 4) &amp; HRG Wye</td>
</tr>
<tr>
<td>91 = 600V B Corner Grnd Delta</td>
<td>3Ø 3W+Grnd (Fig 6)</td>
</tr>
</tbody>
</table>

**Voltage Code for Electrical System**

- **TE**: Single Pole
- **XBS**: 1Ø 3W+Grnd

**Surge Current Rating**

<table>
<thead>
<tr>
<th>Voltage Code</th>
<th>Surge Current Rating (kA/Phase)</th>
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<tbody>
<tr>
<td>40</td>
<td>400kA/Phase</td>
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<tr>
<td>50</td>
<td>500kA/Phase</td>
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<tr>
<td>60</td>
<td>600kA/Phase</td>
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<tr>
<td>80</td>
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<tr>
<td>90</td>
<td>900kA/Phase</td>
</tr>
<tr>
<td>1000</td>
<td>1000kA/Phase</td>
</tr>
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</table>

**Options**

- **X**: Surge Counter, six-digit LCD counter includes maintenance-free Eprom memory backup
- **E**: Remote Locatable Display on 4 ft Cable custom cable lengths available
- **F**: Noise Filtering - Extended Range & Attenuation (available on 400kA & 500kA models)
- **T**: Thru-Door Rotary Disconnect Switch, ABB, UL98, E1 enclosure only
- **K**: Rotary Disconnect Switch, Katko, UL508
- **S**: Thru-Door Rotary Disconnect Switch, Katko, UL 508, E1 enclosure only
- **2**: Type 2 SPD, incl. UL 1283 EMI/RFI Filters

**Performance Data**

<table>
<thead>
<tr>
<th>Common North American Systems</th>
<th>UL 1449 Fourth Edition Test Data: Voltage Protection Ratings (VPR - 3kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 = 240/120V High Leg Delta</td>
<td>700/2000</td>
</tr>
<tr>
<td>04 = 480Y/277V Wye</td>
<td>1200</td>
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<tr>
<td>05 = 480V Delta</td>
<td>1500</td>
</tr>
<tr>
<td>08 = 600Y/347V Wye</td>
<td>1500</td>
</tr>
</tbody>
</table>

Other Available Systems:

- Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.

Advanced Protection Technologies
14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com
TEXBL Series
Type 1/Type 2 Surge Protective Device/SPD

Features:
- Directly Connected, Discrete Protection Elements Between All Possible Modes
- UL 1449 Fourth Edition Listed
- 600 & 900kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Innominal (Iₗ)
- 200kA SCCRs (most models)
- UL 96A Lightning Protection Master Label compliant
- Rotary Disconnect Switch included as Standard Equipment
- Dual Redundant Replaceable Module Construction
- All MOV suppression elements monitored
- All Modes of Protection

Performance Specifications
- Directly Connected, Discrete Protection Elements Between All Possible Modes with True 10-Mode Protection

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>600kA Per Phase</td>
<td>200kA</td>
<td>200kA</td>
<td>200kA</td>
<td>200kA</td>
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<tr>
<td>900kA Per Phase</td>
<td>300kA</td>
<td>300kA</td>
<td>300kA</td>
<td>300kA</td>
</tr>
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</table>

- UL 1449 Fourth Edition Listed Type 1, CSA 22.2 No. 269.1
- Optional UL 1449-4 Type 2 SPD, UL 1283 Listed, CSA 22.2 No. 269.2
- UL 1449-4 tested Innominal (Iₗ): 20kA
- UL 1449-4 tested SCCR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 700V
  - 480Y/277V: as low as 1200V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave True Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Listing)

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring
- Electrically isolated diagnostic circuitry
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, sixdigit LCD, with test function, reset & no-maintenance Eprom memory

Physical Specifications
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 52 lbs (23.6 kg)
- Standard NEMA 1/12/3R/4 enclosure
- Standard size: 20” x 20” x 7.5” (50.8cm x 50.8cm x 19cm)
- Lug size: #6 - #1/0 AWG
- Typical connection: #6 AWG and 60A breaker

Quality, Standards & Validation
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.1
- Type 2 (Opt.): UL 1449 Fourth Ed., CSA No. 269.2, UL 1283
- UL file: V2CA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
## Voltage Code for Electrical System

### Common North American Systems:

- **01** = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
- **02** = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
- **03** = 240/120V High Leg Delta (B High) (Fig 3)
- **04** = 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)

### Other Available Systems - Confirmation encouraged:

- **01** = 520Y/300V Wye - 3Ø 4W+Grnd (Fig 2)
- **02** = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
- **03** = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
- **04** = 440Y/250V Wye - 3Ø 4W+Grnd (Fig 2)
- **07** = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)

### Options

- **X** = Surge Counter, six-digit LCD counter includes maintenance-free Eprom memory backup
- **E** = Remote Locatable Display on 4 ft Cable custom cable lengths available
- **F** = Noise Filtering - Extended Range & Attenuation (available on 400kA & 500kA models)
- **T** = Thru-Door Rotary Disconnect Switch, ABB, UL98, E1 enclosure only
- **K** = Rotary Disconnect Switch, Katko, UL 508 (display inside door)
- **S** = Thru-Door Rotary Disconnect Switch, Katko, UL 508, E1 enclosure only
- **2** = Type 2 SPD, incl. UL 1283 EMI/RFI Filters

### Delete Options - Consult Factory for Order Code

- Delete L-N Protection (reduces kA rating)
- Delete L-G Protection (reduces kA rating)
- Delete N-G Protection (reduces kA rating)
- Delete Noise Filtering

### Available Accessory (order separately)

- **RM** = Remote Monitor

### Enclosure Rating

- **E1** = NEMA 1/12/3R/4 (size: 20" x 20" x 7.5")
- **4X** = NEMA 4X Non-Metallic (size: 24" x 24" x 8") (fiberglass, display inside door)
- **4S** = NEMA 4X Stainless Steel (size: 20" x 20" x 7.5") (display inside door)
- **P1** = NEMA 1 pulbox ‘indoor’ (size: 20" x 20" x 6") - includes ‘E’ option
- **FM** = NEMA 1 Flush Mount (wall cavity size: 20" x 20" x 6" deep) (Dimensions include standard rotary disconnect switch. Optional Thu-Door handle does not increase enclosure sizes.)

## Performance Data

### UL 1449 Fourth Edition Test Data

<table>
<thead>
<tr>
<th>Voltage Protection Ratings (VPR - 3kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-N</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>01</td>
</tr>
<tr>
<td>02</td>
</tr>
<tr>
<td>03</td>
</tr>
<tr>
<td>04</td>
</tr>
</tbody>
</table>

### Less Common & Specialty

- **42** = 415V/240V 3Ø Wye | 1200 | 1200 | 1200 | 1800 | 20kA | 200kA | 320
- **43** = 400V/230V 3Ø Wye | 1200 | 1200 | 1200 | 1800 | 20kA | 200kA | 320
- **44** = 440V/250V 3Ø Wye | 1200 | 1200 | 1200 | 1800 | 20kA | 200kA | 320
- **07** = 380V/220V 3Ø Wye | 1200 | 1200 | 1200 | 1800 | 20kA | 200kA | 320

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**Other Available Systems:**

Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.

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14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com
**TE/HP Series**

**Type 2 Surge Protective Device/ SPD**

**Features:**
- UL 1449 Fourth Edition Listed & CSA 22.2 No. 269.2
- 120kA & 160kA per phase ratings
- Type 2 SPD –
  - All UL required OCP & Safety Coordination included inside
  - Can be installed load-side of main disconnect
- Replaceable module construction
- 200kA SCRs
- Voltage Specific Design – Highly configurable
- MOV suppression elements monitored

**Design Features**
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused Suppression Modules
- Large-Block 34mm square MOVs
- Replaceable Phase Module Construction
- Thermal Cutout in Each Mode
- Busbar Construction
- Solid State Bidirectional Operation

**Performance Specifications**

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>120kA Per Phase</strong></td>
<td>120kA</td>
<td>120kA</td>
<td>120kA</td>
</tr>
<tr>
<td><strong>160kA Per Phase</strong></td>
<td>160kA</td>
<td>160kA</td>
<td>160kA</td>
</tr>
</tbody>
</table>

- UL 1449 4th Edition Listed, UL 1283 Listed & CSA 22.2 No. 269.2
- UL 1449-4 Type 2 SPD
- UL 1449-4 tested SCCR: 200kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz

**Diagnostic Monitoring**
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm
- Redundant monitoring LEDs on modules
- Phase Loss monitoring (toggles LED & dry contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Optional Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, six-digit LCD, with test function, reset & no-maintenance SuperCap energy storage device

**Physical Specifications**
- Relative Humidity Range: 0 -95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 25 lbs (11.4 kg)
- Standard NEMA 1/12/3R/4 enclosure
- Standard size: 12” x 12” x 7.5” (30.5cm x 30.5cm x 19cm)
- Lug size: #1/0 - #14 AWG
- Typical connection: #6 AWG and 60A breaker

**Quality, Standards & Validation**
- UL 1449 4th Edition, UL 1283 Listed & CSA 22.2 No. 269.2
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested Prior to Shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
**Common North American Systems:**

1. **1 = 240/120V Split Phase - 1Ø 3W+Grnd** (Fig 1)
2. **2 = 208Y/120V Wye - 3Ø 4W+Grnd** (Fig 2)
3. **3 = 240/120V High Leg Delta (B High)** (Fig 3)
4. **4 = 480Y/277V Wye - 3Ø 4W+Grnd** (Fig 2)
5. **5 = 480V Delta - 3Ø 3W+Grnd** (Fig 4) & HRG Wye
6. **6 = 600Y/347V Wye - 3Ø 4W+Grnd** (Fig 2)

**Other Available Systems - Confirmation encouraged:**

11. **11 = 120V Single Phase - 1Ø 2W + Grnd** (Fig 5)
12. **12 = 240V Single Phase - 1Ø 2W + Grnd** (Fig 5)
51. **51 = 480V B Corner Grnd Delta, 3Ø 3W+Grnd** (Fig 6)
6. **6 = 240V Delta - 3Ø 3W+Grnd** (Fig 4)
61. **61 = 240V B Corner Grnd Delta, 3Ø 3W+Grnd** (Fig 6)
7. **7 = 380Y/220V Wye - 3Ø 4W+Grnd** (Fig 2)
9. **9 = 600V Delta - 3Ø 3W+Grnd** (Fig 4) & HRG Wye
91. **91 = 600V B Corner Grnd Delta, 3Ø 3W+Grnd** (Fig 6)

**Enclosure Rating**

- **04** = Standard: NEMA 1/3R/04/12 (size: 12"x12"x7.5")
- **FM** = Flush Mount Enclosure, NEMA 1 only (wall cavity size: 12"x12"x6")
- **4X** = NEMA 4X Non-Metallic (size: 14"x12"x6") (polycarbonate, display inside clear front door)
- **4S** = NEMA 4X Stainless Steel (size: 12"x12"x6") (display inside door)

**Performance Data**

<table>
<thead>
<tr>
<th>Common North American Systems</th>
<th>UL 1449 Fourth Edition Test Data</th>
<th>Voltage Protection Ratings (VPR - 3kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L-N</td>
<td>N-G</td>
</tr>
<tr>
<td>1 = 240/120V Split Phase</td>
<td>800</td>
<td>600</td>
</tr>
<tr>
<td>2 = 208Y/120V 3Ø Wye</td>
<td>800</td>
<td>600</td>
</tr>
<tr>
<td>3 = 240Y/120V B High Leg Delta</td>
<td>800/1200</td>
<td>600</td>
</tr>
<tr>
<td>4 = 480Y/277V 3Ø Wye</td>
<td>1200</td>
<td>1000</td>
</tr>
<tr>
<td>5 = 480V 3Ø Delta</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>8 = 600Y/347V 3Ø Wye</td>
<td>1500</td>
<td>1200</td>
</tr>
</tbody>
</table>

**Other Available Systems:**
Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.
**Design Features**
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused Suppression Modules
- Large-Block 34mm square MOVs
- Replaceable Phase Module Construction
- Thermal Cutout in Each Module
- Busbar Construction
- Solid State Bidirectional Operation

**Physical Specifications**
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 25 lbs (11.4 kg)
- Standard NEMA 1/12/3R/4 enclosure
- Standard size: 12” x 12” x 7.5” (30.5cm x 30.5cm x 19cm)
- Lug size: #1/0 - #14 AWG
- Typical connection: #6 AWG and 60A breaker

**Quality, Standards & Validation**
- UL 1449 4th Edition, UL 1283 Listed & CSA 22.2 No. 269.2
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested Prior to Shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
### TE/HPS Model Number Configurator & Options

**TE** = Transient Eliminator, Listed Type 2 SPD in NEMA 1/3R/04/12 enclosure

**HPS** = HPS Family 80kA rating standard

#### Model Family

**HPS** = UL 1449 Fourth Edition Test Data

#### Voltage Protection Ratings (VPR - 3kA)

<table>
<thead>
<tr>
<th>Type</th>
<th>Method</th>
<th>SCCR</th>
<th>MCOV</th>
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<tbody>
<tr>
<td>1</td>
<td>240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)</td>
<td>800</td>
<td>600</td>
</tr>
<tr>
<td>2</td>
<td>208Y/120V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)</td>
<td>800</td>
<td>600</td>
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<tr>
<td>3</td>
<td>240/120V High Leg Delta (B High) (Fig 3)</td>
<td>800/1200</td>
<td>600</td>
</tr>
<tr>
<td>4</td>
<td>480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)</td>
<td>1200</td>
<td>1000</td>
</tr>
<tr>
<td>5</td>
<td>480V Delta - 3Ø 3W+Grnd (Fig 4) &amp; HRG Wye</td>
<td>1200</td>
<td>1000</td>
</tr>
<tr>
<td>6</td>
<td>600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)</td>
<td>1200</td>
<td>1000</td>
</tr>
<tr>
<td>7</td>
<td>600V Delta - 3Ø 3W+Grnd (Fig 4) &amp; HRG Wye</td>
<td>1200</td>
<td>1000</td>
</tr>
<tr>
<td>8</td>
<td>600V B Corner Gnd Delta, 3Ø 3W+Grnd (Fig 6)</td>
<td>1200</td>
<td>1000</td>
</tr>
</tbody>
</table>

#### Performance Data

**Common North American Systems:**

1. 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
2. 208Y/120V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)
3. 240/120V High Leg Delta (B High) (Fig 3)
4. 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)
5. 480V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
6. 600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)

**Other Available Systems - Confirmation encouraged:**

- 11 = 120V Single Phase - 1Ø 2W + Gnd (Fig 5)
- 12 = 240V Single Phase - 1Ø 2W + Gnd (Fig 5)
- 51 = 480V B Corner Gnd Delta, 3Ø 3W+Gnd (Fig 6)
- 52 = 240V Delta - 3Ø 3W+Gnd (Fig 4)
- 53 = 480V Delta - 3Ø 3W+Gnd (Fig 4)
- 7 = 380Y/220V Wye - 3Ø 4W+Gnd (Fig 2)
- 8 = 6000 Delta - 3Ø 3W+Gnd (Fig 4) & HRG Wye
- 91 = 600V B Corner Gnd Delta, 3Ø 3W+Gnd (Fig 6)

**Common North American Systems:**

1. 120V Single Phase - 1Ø 2W + Gnd (Fig 5)
2. 240V Single Phase - 1Ø 2W + Gnd (Fig 5)
3. 240/120V High Leg Delta (B High) (Fig 3)
4. 480V Delta - 3Ø 3W+Gnd (Fig 4) & HRG Wye
5. 480V Delta - 3Ø 3W+Gnd (Fig 4)
6. 600V Delta - 3Ø 3W+Gnd (Fig 4) & HRG Wye

**Other Available Systems:**

- 11 = 120V Single Phase - 1Ø 2W + Gnd (Fig 5)
- 12 = 240V Single Phase - 1Ø 2W + Gnd (Fig 5)
- 51 = 480V B Corner Gnd Delta, 3Ø 3W+Gnd (Fig 6)
- 52 = 240V Delta - 3Ø 3W+Gnd (Fig 4)
- 53 = 480V Delta - 3Ø 3W+Gnd (Fig 4)
- 7 = 380Y/220V Wye - 3Ø 4W+Gnd (Fig 2)
- 8 = 6000 Delta - 3Ø 3W+Gnd (Fig 4) & HRG Wye
- 91 = 600V B Corner Gnd Delta, 3Ø 3W+Gnd (Fig 6)

**Performance Data**

**UL 1449 Fourth Edition Test Data**

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<th>Voltage Protection Ratings (VPR - 3kA)</th>
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<tbody>
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<td>L-N</td>
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<td>5</td>
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<td>6</td>
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</tbody>
</table>

Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.
**TE/XGA Series**

**Type 2 Surge Protective Device/ SPD**

### Features:
- UL 1449 Fourth Edition Listed and CSA 22.2 No. 269.2
- 160kA & 240kA per phase ratings
- Type 2 SPD –
  - All UL required OCP & Safety Coordination included inside
  - Can be installed load-side of main disconnect
- Replaceable module construction
- 200kA SCCRs
- Voltage Specific – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection
- Optional Silicon Avalanche Diode (SAD) Hybrid System

### Design Features:
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Individually Fused Suppression Modes
- Large-Block utility grade 34mm square MOVs
- Replaceable Phase Module Construction
- Thermal Sensitivity in Each Mode
- Busbar Construction
- Solid State Bidirectional Operation
- Busbar connection
- Enclosure-less version for OEM available (XTE Series)

### Physical Specifications:
- Relative Humidity Range: 0 -95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 25 lbs (11.5 kg)
- Standard NEMA 4 (Other Enclosures Optional)
- Standard size: 12” x 12” x 7.5” (30.5cm x 30.5cm x 190.5 cm)
- Lug size: #2 - #14 AWG
- Typical connection: #6 AWG and 60A breaker

### Surge Capacities

<table>
<thead>
<tr>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
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<tbody>
<tr>
<td>160kA</td>
<td>80kA</td>
<td>80kA</td>
<td>160kA</td>
</tr>
<tr>
<td>240kA</td>
<td>120kA</td>
<td>120kA</td>
<td>240kA</td>
</tr>
<tr>
<td>90kA</td>
<td>50kA</td>
<td>40kA</td>
<td>90kA</td>
</tr>
<tr>
<td>130kA</td>
<td>50kA</td>
<td>80kA</td>
<td>130kA</td>
</tr>
<tr>
<td>170kA</td>
<td>90kA</td>
<td>80kA</td>
<td>170kA</td>
</tr>
</tbody>
</table>

- Optional Silicon Avalanche Diode (SAD) Hybrid (120/240 & 208Y/120)

### Diagnostic Monitoring:
- Tri-color Green, Amber, Red LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm
- Redundant monitoring LEDs on modules
- Phase Loss monitoring (toggles LED & dry contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Optional Form C Dry Contacts, 24V, 1A (two sets)
- Optional Surge Counter, six-digit LCD, with test function, reset & no-maintenance SuperCap energy storage device

### Quality, Standards & Validation:
- UL 1449 4th Edition Listed, UL 1283 Listed & CSA 22.2 No. 269.2
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested Prior to Shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
**TE/XGA Model Number Configurator & Options**

<table>
<thead>
<tr>
<th>TE</th>
<th>XGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>= Transient Eliminator, Listed Type 2 SPD in NEMA 1 enclosure</td>
</tr>
<tr>
<td>XTE</td>
<td>= Transient Eliminator, Recognized Type 2 Component Assembly SPD on backplane for installation within gear (display on 6' cable)</td>
</tr>
</tbody>
</table>

**Model Family**

<table>
<thead>
<tr>
<th>XGA</th>
<th>XGA Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>/XGA</td>
<td>160kA rating standard</td>
</tr>
</tbody>
</table>

**Voltage Code for Electrical System**

**Common North American Systems:**

- 1 = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
- 2 = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
- 3 = 240/120V High Leg Delta (B High) (Fig 3)
- 4 = 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)
- 5 = 480V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
- 8 = 600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)

**Other Available Systems - Confirmation encouraged:**

- 11 = 120V Single Phase - 1Ø 2W + Grnd (Fig 5)
- 12 = 240V Single Phase - 1Ø 2W + Grnd (Fig 5)
- 51 = 480V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
- 6 = 240V Delta - 3Ø 3W+Grnd (Fig 4)
- 61 = 240V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
- 7 = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)
- 9 = 600V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
- 91 = 600V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)

**Enclosure Rating**

- 04 = Standard: NEMA 1/3R/04/12 (size: 12” x 12” x 7.5”)
- FM = Flush Mount Enclosure, NEMA 1 only
  (wall cavity size: 12” x 12” x 6”)
- 4X = NEMA 4X Non-Metallic (size: 14” x 12” x 6”)
  (polycarbonate, display inside clear front door)
- 4S = NEMA 4X Stainless Steel (size: 12” x 12” x 6”)
  (display inside door)

(Note: Endurance-less version for OEM uses XTE prefix)

**Performance Data**

<table>
<thead>
<tr>
<th>Common North American Systems</th>
<th>UL 1449 Fourth Edition Test Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Protection Ratings (VPR - 3kA)</td>
<td></td>
</tr>
<tr>
<td>L-N</td>
<td>L-G</td>
</tr>
<tr>
<td>01 = 240/120V Split Phase</td>
<td>600</td>
</tr>
<tr>
<td>02 = 208Y/120V 3Ø Wye</td>
<td>600</td>
</tr>
<tr>
<td>03 = 240Y/120V B High Leg Delta</td>
<td>600/800</td>
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<tr>
<td>04 = 480Y/277V 3Ø Wye</td>
<td>900</td>
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<tr>
<td>05 = 480V 3Ø Delta</td>
<td>—</td>
</tr>
<tr>
<td>06 = 600Y/347V 3Ø Wye</td>
<td>1200</td>
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**SAD Models**

<table>
<thead>
<tr>
<th>SAD Models</th>
<th>UL 1449 Fourth Edition Test Data</th>
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</thead>
<tbody>
<tr>
<td>Voltage Protection Ratings (VPR - 3kA)</td>
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</tr>
<tr>
<td>L-N</td>
<td>L-G</td>
</tr>
<tr>
<td>01 = 240/120V Split Phase</td>
<td>500</td>
</tr>
<tr>
<td>02 = 208Y/120V 3Ø Wye</td>
<td>500</td>
</tr>
</tbody>
</table>

**Other Available Systems:**

Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.

Advanced Protection Technologies
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(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com

10.7.16th.RevE #8391
**Features**
- UL 1449 Fourth Edition Listed
- 180kA - 36kA Per Phase ratings (single & split phase)
- 20kA I-nominal (10kA I, on 36kA models)
- 100kA SCCRs
- UL 96A Lightning Protection Master Label compliant (@20kA)
- Optional Sinewave Tracking EMI/RFI Noise Filtering
- Pre-attached 10 AWG Leads
- All Modes of Protection
- Data table on back

**Performance Specifications**

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>180kA Per Phase</td>
<td>90kA</td>
<td>90kA</td>
<td>90kA</td>
<td>180kA</td>
</tr>
<tr>
<td>144kA Per Phase</td>
<td>72kA</td>
<td>72kA</td>
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<tr>
<td>108kA Per Phase</td>
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<td>54kA</td>
<td>108kA</td>
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<tr>
<td>72kA Per Phase</td>
<td>36kA</td>
<td>36kA</td>
<td>36kA</td>
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<tr>
<td>36kA Per Phase*</td>
<td>18kA</td>
<td>18kA</td>
<td>18kA</td>
<td>36kA</td>
</tr>
</tbody>
</table>

*10kA I,
- UL 1449 Fourth Edition Listed and CSA 22.2 No. 269.2
- UL 1449-4 tested I-nominal: 20kA
- UL 1449-4 tested SCCR: 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - as low as 700V, including circuit breaker
- Less than 1 nanosecond response time
- Optional AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz
- Repetitive Impulse: 5,000 hits
- Data table on back

**Design Features**
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643, CE
- High Energy Parallel Design for Category C3 & C-High applications
- For External Mounting next to Switchgear, Motor Controls Centers or Panelboards
- Robust 25mm Thermally Protected MOVs
- Solid State Bidirectional Operation

**Diagnostic Monitoring**
- LED indicator monitoring:
  - Separate LEDs for LN and LG on each phase
  - LEDs extinguish upon Phase Loss
- Optional on Split & Single Phase: Form C Dry Contact, (Contact rated 240V, 5A; leads are pre-wired through nipple with 18 AWG )

**Physical Specifications**
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 40 - 500Hz
- Operating Temperature: -40°C (-40°F) to +85°C (185°F)
- Weight: 3lbs (1.5kg)
- NEMA 4X Polycarbonate enclosure
  - UL 746C(11) & UL 94-5VA
- Dimensions: 8.3” x 3.6” x 3.0”
- 3/4” female threaded hub
- Pre-wired with 3’ (1m) of 10 AWG conductor
- Typical connection: 10 AWG and 20 - 30A breaker

**Quality, Standards & Validation**
- UL 1449 Fourth Edition Listed and CSA 22.2 No. 269.2
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification

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www.aptsurge.com · info@aptsurge.com
**Common North American Systems:**

- **01** = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
- **11** = 120V Single Phase (Fig 2)

**Standard Enclosure:**

- **4X** = NEMA 4X Non-Metallic (size 8.3" x 3.6" x 3")

**Voltage Code for Electrical System**

- TE
- XMS
- 0
- C

**Build Configuration**

- XMS = Standard Model

**Options**

- C = Dry Contacts Form C, 240V, 5A (pre-wired)
- L = Delete L-N Protection (reduces kA rating)
- G = Delete L-G Protection (reduces kA rating)
- N = Delete N-G Protection
- F = Noise Filtering

Available Accessory (order separately)

- XMFMKIT = Flush Mount Kit

**Surge Current Rating**

- **XMS**
  - 18 = 180kA/Phase
  - 14 = 144kA/Phase
  - 10 = 108kA/Phase
  - 07 = 72kA/Phase
  - 03 = 36kA/Phase (10kA Iₙ)

(Other UL 1449 Listed surge current ratings are available for OEM or special order. Please contact factory)

**Performance Data TBD**

**Common North American Systems**

<table>
<thead>
<tr>
<th>Code</th>
<th>System</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
<th>Type</th>
<th>Iₙ</th>
<th>SCCR</th>
<th>MCOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>240/120V Split Phase</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>1000</td>
<td>Type 2</td>
<td>20kA</td>
<td>100kA</td>
<td>150</td>
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<tr>
<td>11</td>
<td>120 Single Phase</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>1000</td>
<td>Type 2</td>
<td>20kA</td>
<td>100kA</td>
<td>150</td>
</tr>
</tbody>
</table>

**Other Available Systems:**

Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.
Component Assembly SPDs
Type 1 and Type 2

Features:
- UL 1449 Fourth Edition Recognized
- 100kA – 300kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Innomal (I_{n})
- 200kA SCCR (most models)
- UL 96A Lightning Protection Master Label compliant
- Voltage Specific Design – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection
- Display on 28” cable

Performance Specifications

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>100kA Per Phase</td>
<td>50kA</td>
<td>50kA</td>
<td>50kA</td>
<td>100kA</td>
</tr>
<tr>
<td>150kA Per Phase</td>
<td>100kA</td>
<td>50kA</td>
<td>50kA</td>
<td>150kA</td>
</tr>
<tr>
<td>200kA Per Phase</td>
<td>100kA</td>
<td>100kA</td>
<td>100kA</td>
<td>200kA</td>
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<tr>
<td>250kA Per Phase</td>
<td>150kA</td>
<td>100kA</td>
<td>100kA</td>
<td>250kA</td>
</tr>
<tr>
<td>300kA Per Phase</td>
<td>150kA</td>
<td>150kA</td>
<td>150kA</td>
<td>300kA</td>
</tr>
</tbody>
</table>

• UL 1449 4th Edition Recognized Type 1 CA, CSA 22.2 No. 269.4-1
• Optional UL 1449-4 Type 2 CA, UL 1283 Rec., CSA 22.2 No. 269.4-2
• UL 1449-4 tested Innomal (I_{n}): 20kA
• UL 1449-4 tested SCCR: 200kA & 100kA
• UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V
• Less than 1 nanosecond response time
• Repetitive Impulse: 5,000 hits
• AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring (toggles LED & Dry Contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, sixdigit LCD, with test function, reset & no-maintenance Eprom memory
- Installer-locatable display on 28” cable

Design Features
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643
- High Energy Parallel Design for Category C3 & C-High applications
- For Mounting Internal to Switchgear, Motor Controls Centers, Panelboards or Control Panels
- Individually Fused & Thermally Protected MOVs
- Large-Block 34mm square MOVs
- Replaceable Module Construction
- Solid State Bidirectional Operation

Physical Specifications
- Relative Humidity Range: 0 -95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 5 lbs (2.3 kg)
- Standard size: 6.5” x 11” x 4.5” (16.5cm x 29.9cm x 11.4cm)
- Lug size: #2 - #14 AWG (w/opt. disconnect: #6 - #1/0)
- Typical connection: #6 AWG and 60A breaker
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

Quality, Standards & Validation
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.4-1
- Type 2 (Opt.): UL 1449-4 Type 2 CA, UL 1283 Rec., CSA 22.2 No. 269.4-2
- UL 1449-4 tested Innomal (I_{n}): 20kA
- UL 1449-4 tested SCCR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring (toggles LED & Dry Contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, sixdigit LCD, with test function, reset & no-maintenance Eprom memory
- Installer-locatable display on 28” cable

Surge Capacities

<table>
<thead>
<tr>
<th></th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>100kA</td>
<td>50kA</td>
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<td>150kA</td>
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</table>

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www.apt surge.com · info@aptsurge.com

TexRS Model Number Configurator & Options

Voltage Code for Electrical System

<table>
<thead>
<tr>
<th>Voltage Code</th>
<th>Current Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 = 240/120V Split Phase</td>
<td>10 = 100kA/Phase</td>
</tr>
<tr>
<td>02 = 208Y/120V Wye</td>
<td>15 = 150kA/Phase</td>
</tr>
<tr>
<td>03 = 240/120V High Leg Delta (B High)</td>
<td>20 = 200kA/Phase</td>
</tr>
<tr>
<td>04 = 480Y/277V Wye</td>
<td>25 = 250kA/Phase</td>
</tr>
<tr>
<td>05 = 480V Delta - 3Ø 3W+Grnd</td>
<td>30 = 300kA/Phase</td>
</tr>
</tbody>
</table>

Common North American Systems:

- **01** = 240/120V Split Phase - 1Ø 3W+Grnd (Fig 1)
- **02** = 208Y/120V Wye - 3Ø 4W+Grnd (Fig 2)
- **03** = 240V High Leg Delta (B High) (Fig 3)
- **04** = 480Y/277V Wye - 3Ø 4W+Grnd (Fig 2)
- **05** = 480V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
- **08** = 600Y/347V Wye - 3Ø 4W+Grnd (Fig 2)

Other Available Systems - Confirmation encouraged:

- **15** = 254/127V Split Phase - 1Ø 3W+Grnd, (Fig 1)
- **18** = 480/277V 2-Pole, (480/240V Split Phase) (Fig 1)
- **21** = 220Y/127V Wye - 3Ø 4W+Grnd (Fig 2)
- **41** = 520Y/300V Wye - 3Ø 4W+Grnd (Fig 2)
- **42** = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
- **43** = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
- **44** = 440Y/250V Wye - 3Ø 4W+Grnd (Fig 2)
- **51** = 480V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
- **06** = 240V Delta - 3Ø 3W+Grnd (Fig 4)
- **61** = 240V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
- **07** = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)
- **09** = 600V Delta - 3Ø 3W+Grnd (Fig 4) & HRG Wye
  - Available: 100kA, 150kA
- **91** = 600V B Corner Grnd Delta, 3Ø 3W+Grnd (Fig 6)
  - Available: 100kA, 150kA
- **11** = 120V Single Phase (Fig 5)
- **12** = 240V Single Phase (Fig 5) - Not split phase
- **13** = 127V Single Phase (Fig 5)
- **14** = 300V Single Phase (Fig 5)
- **16** = 277V Single Phase (Fig 5)
- **17** = 480V Single Phase (1 Hot, 1 Neu, 1 Grnd) (Fig 5)

**Performance Data**

<table>
<thead>
<tr>
<th>Common North American Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 = 240/120V Split Phase</td>
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<tr>
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</tr>
<tr>
<td>05 = 480V 3Ø Delta</td>
</tr>
<tr>
<td>08 = 600Y/347V 3Ø Wye</td>
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</tbody>
</table>

**UL 1449 Fourth Edition Test Data**

<table>
<thead>
<tr>
<th>Voltage Protection Ratings (VPR - 3kA)</th>
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<tbody>
<tr>
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</tr>
<tr>
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<tr>
<td>1500</td>
</tr>
</tbody>
</table>

Other Available Systems:
Please see supplementary data sheet, contact us at CustomerCare@ASCO.com or confirm at www.UL.com using CCN of VZCA. Optional disconnect switch may increase VPRs.

10.16.17.RevD
Design Features:
- Designed, Manufactured & Tested consistent with:
  - NEMA LS-1
  - NEC® Article 285
  - IEC 61643
- High Energy Parallel Design for Category C3 & C-High applications
- For Mounting Internal to Switchgear, Motor Controls Centers, Panelboards or Control Panels
- Individually Fused & Thermally Protected MOVs
- Large-Block 34mm square MOVs
- Replaceable Module Construction
- Solid State Bidirectional Operation

Performance Specifications
- Relative Humidity Range: 0 -95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 5 lbs (2.3 kg)
- Standard size: 6.5” x 11” x 4.5” (16.5cm x 29.9cm x 11 .4cm)
- Lug size: #2 - #14 AWG (w/opt. disconnect: #6 - #1/0)
- Typical connection: #6 AWG and 60A breaker

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring (toggles LED & Dry Contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, sixdigit LCD, with test function, reset & no-maintenance Eprom memory
- Installer-locatable display on 28” cable
Common North American Systems:
01 = 240/120V Split Phase - 1Ø 3W+Grnd, (Fig 1)
02 = 208Y/120V Wye - 3Ø 4W+Grnd, (Fig 2)
03 = 240/120V High Leg Delta (B High), (Fig 3)
04 = 480Y/277V Wye - 3Ø 4W+Grnd, (Fig 2)

Other Available Systems - Confirmation encouraged:
15 = 254/127V Split Phase - 1Ø 3W+Grnd, (Fig 1)
18 = 480/277V 2-Pole, (480/240V Split Phase) (Fig 1)
21 = 220Y/127V Wye - 3Ø 4W+Grnd (Fig 2)
42 = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
43 = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
44 = 440Y/250V Wye - 3Ø 4W+Grnd (Fig 2)
07 = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)

Performance Data

<table>
<thead>
<tr>
<th>Common North American Systems</th>
<th>UL 1449 Fourth Edition Test Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voltage Protection Ratings (VPR - 3kA)</td>
</tr>
<tr>
<td></td>
<td>L-N</td>
</tr>
<tr>
<td>01 = 240/120V Split Phase</td>
<td>700</td>
</tr>
<tr>
<td>02 = 208Y/120V 3Ø Wye</td>
<td>700</td>
</tr>
<tr>
<td>03 = 240Y/277V 3Ø Wye</td>
<td>800/1500</td>
</tr>
</tbody>
</table>

Other Available Systems - Confirmation Encouraged:
15 = 254/127V Split Phase - 1Ø 3W+Grnd, (Fig 1)
21 = 220Y/127V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)
42 = 415Y/240V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)
43 = 400Y/230V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)
44 = 440Y/250V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)
07 = 380Y/220V 3Ø Wye - 3Ø 4W+Grnd (Fig 2)

Other Available Systems:
Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA. Optional disconnect may increase VPRs.

Advanced Protection Technologies
14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com
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- Individually Fused & Thermally Protected MOVs
- Large-Block 34mm square MOVs
- Replaceable Module Construction
- Solid State Bidirectional Operation

**Physical Specifications**
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47-63Hz
- Operating Temperature: -25°C (-15°F) to +60°C (140°F)
- Weight: 7 lbs (3.2 kg)
- Standard size: 9” x 11” x 5.3” (22.9cm x 28.0cm x 13.5cm)
- Lug size: #2 - #14 AWG (w/ opt. disconnect: #6 - #1/0)
- Typical connection: #6 AWG and 60A breaker
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

**Diagnostic Monitoring**
- 100% monitoring – Every MOV is monitored, incl. N-G
- Green LED Status indicator per phase
- Red LED Service indicator
- Audible Alarm with Silence Switch
- Test Function: toggles Red Service LED, Audible Alarm & Dry Contact (if equipped)
- N-G overvoltage detection
- Phase Loss monitoring (toggles LED & dry contacts)
- Electrically isolated circuitry ensures surges do not damage diagnostics
- Form C Dry Contacts, 240V, 5A (two sets)
- Optional Surge Counter, six-digit LCD, with test function, reset & no-maintenance Eprom memory
- Installer-locatable display on 28” cable

**Performance Specifications**

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
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</thead>
<tbody>
<tr>
<td>300kA Per Phase</td>
<td>150kA</td>
<td>150kA</td>
<td>150kA</td>
<td>300kA</td>
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<tr>
<td>400kA Per Phase</td>
<td>200kA</td>
<td>200kA</td>
<td>200kA</td>
<td>400kA</td>
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<tr>
<td>500kA Per Phase</td>
<td>250kA</td>
<td>250kA</td>
<td>250kA</td>
<td>500kA</td>
</tr>
</tbody>
</table>

- UL 1449 4th Edition Recognized Type 1 CA, CSA 22.2 No. 269.4-2
- Option UL 1449-4 Type 2 CA, UL 1283 Rec., CSA 22.2 No. 269.4-2
- UL 1449-4 tested Inominal (I_n): 20kA
- UL 1449-4 tested SCCRs: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

**Features:**
- UL 1449 Fourth Edition Recognized
- 300kA - 500kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Inominal (I_n)
- 200kA SCCRs (most models)
- UL 96A Lightning Protection Master Label compliant
- Voltage Specific Design – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection
- Display on 28” cable

**Surge Capacities**

- **L-N**
  - 300kA: 150kA
  - 400kA: 200kA
  - 500kA: 250kA
- **L-G**
  - 300kA: 150kA
  - 400kA: 200kA
  - 500kA: 250kA
- **N-G**
  - 300kA: 150kA
  - 400kA: 200kA
  - 500kA: 250kA
- **L-L**
  - 300kA: 300kA
  - 400kA: 400kA
  - 500kA: 500kA

- **Type 1 and Type 2**
  - UL 1449 4th Edition Recognized Type 1 CA, CSA 22.2 No. 269.4-1
  - Optional UL 1449-4 Type 2 CA, UL 1283 Rec., CSA 22.2 No. 269.4-2
  - UL 1449-4 tested Inominal (I_n): 20kA
  - UL 1449-4 tested SCCRs: 200kA & 100kA
  - UL 1449-4 Voltage Protection Ratings (VPRs):
    - 208Y/120V: as low as 600V
    - 480Y/277V: as low as 1000V
  - Less than 1 nanosecond response time
  - Repetitive Impulse: 5,000 hits
  - AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

**Quality, Standards & Validation**
- Type 1: UL 1449 Fourth Edition, CSA 22.2 No. 269.4-1
- Type 2 (Opt.): UL 1449 Fourth Ed., CSA No. 269.4-2, UL 1283 Rec.
- UL file: VZCA2.E321351 at [www.UL.com](http://www.UL.com)
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested Prior to Shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
## TEXWS Model Number Configurator & Options

### Voltage Code for Electrical System

<table>
<thead>
<tr>
<th>Voltage Code</th>
<th>System Description</th>
<th>Current Rating (VPR - 3kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>240/120V Split Phase - 1Ø 3W + Grnd (Fig 1)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>02</td>
<td>208Y/120V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>03</td>
<td>240/120V High Leg Delta (B High) (Fig 3)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>04</td>
<td>480V/277V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>05</td>
<td>480V Delta - 3Ø 3W + Grnd (Fig 4) &amp; HRG Wye (Available: 300kA, 450kA)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>08</td>
<td>600Y/347V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
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</table>

### Other Available Systems - Confirmation encouraged:

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<tr>
<th>Voltage Code</th>
<th>System Description</th>
<th>Current Rating (VPR - 3kA)</th>
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<tbody>
<tr>
<td>15</td>
<td>254/127V Split Phase - 1Ø 3W + Grnd, (Fig 1)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>18</td>
<td>480/277V 2-Pole, (480/240V Split Phase) (Fig 1)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>21</td>
<td>220V/127V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>22</td>
<td>520V/300V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>23</td>
<td>415/240V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>24</td>
<td>400V/230V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>25</td>
<td>440V/250V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>51</td>
<td>480V B Corner Grnd Delta, 3Ø 3W + Grnd (Fig 6)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>06</td>
<td>240V Delta - 3Ø 3W + Grnd (Fig 4)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>61</td>
<td>240V B Corner Grnd Delta, 3Ø 3W + Grnd (Fig 6)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>07</td>
<td>380V/220V Wye - 3Ø 4W + Grnd (Fig 2)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>09</td>
<td>600V Delta - 3Ø 3W + Grnd (Fig 4) &amp; HRG Wye (Available: 200kA, 250kA)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>91</td>
<td>600V B Corner Grnd Delta, 3Ø 3W + Grnd (Fig 6)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
</tbody>
</table>

### Other Available Systems - Confirmation encouraged:

<table>
<thead>
<tr>
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<th>System Description</th>
<th>Current Rating (VPR - 3kA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>120V Single Phase (Fig 5)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>12</td>
<td>240V Single Phase (Fig 5) - Not split phase</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>13</td>
<td>127V Single Phase (Fig 5)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>14</td>
<td>300V Single Phase (Fig 5)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>16</td>
<td>277V Single Phase (Fig 5)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
<tr>
<td>17</td>
<td>480V Single Phase (1 Hot, 1 Neu, 1 Grnd) (Fig 5)</td>
<td>200kA, 250kA, 300kA, 400kA, 450kA, 500kA</td>
</tr>
</tbody>
</table>

### Performance Data

#### UL 1449 Fourth Edition Test Data

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<thead>
<tr>
<th>Common North American Systems</th>
<th>Voltage Protection Ratings (VPR - 3kA)</th>
</tr>
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<td></td>
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<td>03</td>
<td>700</td>
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<tr>
<td>04</td>
<td>700</td>
</tr>
<tr>
<td>05</td>
<td>1500</td>
</tr>
</tbody>
</table>

### Other Available Systems:

Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA. Optional disconnect may increase VPRs.

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www.aptsurge.com · info@aptsurge.com
Features:
- Directly Connected, Discrete Protection Elements Between All Possible Modes
- UL 1449 Fourth Edition Recognized
- 300kA - 450kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA In nominal (I_n)
- 200kA SCRRs (most models)
- UL 96A Lightning Protection Master Label compliant
- Voltage Specific Design – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection
- Display on 28” cable

Performance Specifications
- Directly Connected, Discrete Protection Elements Between All Possible Modes with True 10-Mode Protection

<table>
<thead>
<tr>
<th>Surge Capacities</th>
<th>L-N</th>
<th>L-G</th>
<th>N-G</th>
<th>L-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>300kA Per Phase</td>
<td>100kA</td>
<td>100kA</td>
<td>100kA</td>
<td>100kA</td>
</tr>
<tr>
<td>450kA Per Phase</td>
<td>150kA</td>
<td>150kA</td>
<td>150kA</td>
<td>150kA</td>
</tr>
</tbody>
</table>

- UL 1449 4th Edition Recognized Type 1 CA, CSA 22.2 No. 269.4-1
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- UL 1449-4 tested In nominal (I_n): 20kA
- UL 1449-4 tested SCCR: 200kA & 100kA
- UL 1449-4 Voltage Protection Ratings (VPRs):
  - 208Y/120V: as low as 600V
  - 480Y/277V: as low as 1000V
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

Diagnostic Monitoring
- 100% monitoring – Every MOV is monitored, incl. N-G
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- Lug size: #2 - #14 AWG (w/opt. connect: #6 - #1/0)
- Typical connection: #6 AWG and 60A breaker

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- Type 2 (Opt.): UL 1449 Fourth Ed., CSA No. 269.4-2, UL 1283 Rec.
- UL file: VZCA2.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 10 year warranty (longer optional)
- Burn-In tested Prior to Shipment
- ISO 9001:2008 Quality Management System
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### Voltage Code for Electrical System

<table>
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<tr>
<th>Code</th>
<th>System Description</th>
<th>Options</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>240/120V Split Phase - 1Ø 3W+Grnd</td>
<td>TE XWL</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>208Y/120V Wye - 3Ø 4W+Grnd</td>
<td>TE XWL</td>
<td>2</td>
</tr>
<tr>
<td>03</td>
<td>240/120V High Leg Delta (B High)</td>
<td>TE XWL</td>
<td>3</td>
</tr>
<tr>
<td>04</td>
<td>480Y/277V Wye - 3Ø 4W+Grnd</td>
<td>TE XWL</td>
<td>2</td>
</tr>
<tr>
<td>07</td>
<td>380Y/220V Wye - 3Ø 4W+Grnd</td>
<td>TE XWL</td>
<td>2</td>
</tr>
</tbody>
</table>

### Surge Current Rating

- **TE XWL**: 31 = 300kA/Phase
- **TE XWL**: 45 = 450kA/Phase

### Options

- **X**: Surge Counter, six-digit LCD counter includes maintenance-free Eprom memory backup
- **F**: Noise Filtering - Extended Range & Attenuation
- **M**: Mount Display on SPD instead of cable
- **D**: Rotary Disconnect Switch, ABB, UL98, SPD & Disconnect mounted on alum. backplane (14.75” x 12.88” x 5.25”)
- **K**: Rotary Disconnect Switch, Katko UL 508, SPD & Disconnect mounted on alum. backplane (14.75” x 12.88” x 5.25”)
- **2**: Type 2 SPD, incl. UL 1283 EMI/RFI Filters

Other Available Systems - Confirmation encouraged:

<table>
<thead>
<tr>
<th>Code</th>
<th>System Description</th>
<th>Figure</th>
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<tbody>
<tr>
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<td>254Y/127V Split Phase - 1Ø 3W+Grnd</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>480/277V 2-Pole, (480/240V Split Phase)</td>
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<td>21</td>
<td>220Y/127V Wye - 3Ø 4W+Grnd</td>
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<td>700</td>
</tr>
<tr>
<td>03 - 240Y/120V High Leg Delta</td>
<td>700/1000</td>
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<tr>
<td>04 - 480Y/277V 3Ø Wye</td>
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### Other Available Systems - Confirmation Encouraged:

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<tr>
<th>Code</th>
<th>System Description</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>254Y/127V Split Phase</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>220Y/127V 3Ø Wye</td>
<td>2</td>
</tr>
<tr>
<td>42</td>
<td>415Y/240V 3Ø Wye</td>
<td>2</td>
</tr>
<tr>
<td>43</td>
<td>400Y/230V 3Ø Wye</td>
<td>2</td>
</tr>
<tr>
<td>44</td>
<td>440Y/250V 3Ø Wye</td>
<td>2</td>
</tr>
<tr>
<td>07</td>
<td>380Y/220V 3Ø Wye</td>
<td>2</td>
</tr>
</tbody>
</table>

### Other Available Systems:

- Please see supplementary data sheet, contact us at info@aptsurge.com or confirm at www.UL.com using CCN of VZCA.
- Optional disconnect may increase VPRs.
Design Features
- Designed, Manufactured & Tested consistent with:
  - NEC® Article 285
  - IEC 61643-11, CE
- High Energy Parallel Design for Category C3 & C-High Applications
- For Internal mounting within control panels, medical, telecom, drives, security systems, robotics, etc.
- Less than 1 nanosecond response time
- Repetitive Impulse: 5,000 hits
- Solid State Bidirectional Operation
- Optional Dry Contact
  - ‘M’ Suffix Option
  - Form C: Normally Open or Normally Closed
  - Contact Wire Size: #16 - #30 AWG  Torque: 2.0 lb-in
  - Contact Rating: 125Vac, 3A maximum

Performance Specifications
- Data Table on Back

Physical Specifications
- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 47 - 63Hz
- Operating Temperature: -40°C (-40°F) to +85°C (185°F)
- Polymeric Enclosure: Flame rated UL94 V-0
- Weight: 0.25 lbs (114 kg) per pole
- Wire Lug Size: #6 - #14 AWG

Dimensions
- Uses standard 35mm DIN-Rail (4-pole shown)

<table>
<thead>
<tr>
<th></th>
<th>Width</th>
<th>Length</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Pole</td>
<td>0.70” (178mm)</td>
<td>4.09” (103.9mm)</td>
<td>2.70” (68.5mm)</td>
</tr>
<tr>
<td>2-Pole</td>
<td>1.39” (35.5mm)</td>
<td>4.09” (103.9mm)</td>
<td>2.70” (68.5mm)</td>
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<tr>
<td>3-Pole</td>
<td>2.10” (53.3mm)</td>
<td>4.09” (103.9mm)</td>
<td>2.70” (68.5mm)</td>
</tr>
<tr>
<td>4-Pole</td>
<td>2.80” (71.0mm)</td>
<td>4.09” (103.9mm)</td>
<td>2.70” (68.5mm)</td>
</tr>
</tbody>
</table>

Quality, Standards & Validation
- UL 1449 Fourth Edition Recognized, cUL
- UL file: VZCA2.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 5 year warranty (longer optional)
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification
**Advanced Protection Technologies**

**Application & Installation Guide**

**Parallel Electrical Connections for Easy Installation**

<table>
<thead>
<tr>
<th>Model</th>
<th>System Configuration</th>
<th>Installed at Service Entrance or Transformer</th>
<th>Installed &gt; 10' (3m) From Service Entrance or Transformer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N-G BONDED: Does NOT require N-G protection</td>
<td>DOWNSTREAM OF N-G BOND: N-G protection suggested</td>
</tr>
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</table>

**Performance Data**

<table>
<thead>
<tr>
<th>Model</th>
<th>System Voltage &amp; Config</th>
<th># of Poles</th>
<th>UL 1449 VPR (6kV - 3kA)</th>
<th>( I ) SCCR</th>
<th>MCOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>D120V1P</td>
<td>120V</td>
<td>1</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
</tr>
<tr>
<td>D120V2P</td>
<td>120/240V</td>
<td>2</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
</tr>
<tr>
<td>D120V3P</td>
<td>208Y/120V</td>
<td>3</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
</tr>
<tr>
<td>D120V3PNG</td>
<td>208Y/120V w/N-G</td>
<td>4</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
</tr>
<tr>
<td>D127V1P</td>
<td>127V</td>
<td>1</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
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<tr>
<td>D127V2P</td>
<td>127/254V</td>
<td>2</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
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<tr>
<td>D127V3P</td>
<td>220Y/127V</td>
<td>3</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
</tr>
<tr>
<td>D127V3PNG</td>
<td>220Y/127V w/N-G</td>
<td>4</td>
<td>600</td>
<td>20kA</td>
<td>200A</td>
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<td>D230V1P</td>
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<td>800</td>
<td>20kA</td>
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<td>800</td>
<td>20kA</td>
<td>200A</td>
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<td>D240V3PD</td>
<td>240V Delta</td>
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<td>800</td>
<td>20kA</td>
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<td>240V Delta</td>
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<td>800</td>
<td>20kA</td>
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<td>240V Delta</td>
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<td>800</td>
<td>20kA</td>
<td>200A</td>
</tr>
<tr>
<td>D347V3P</td>
<td>600Y/347V</td>
<td>3</td>
<td>1200</td>
<td>20kA</td>
<td>200A</td>
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<td>3</td>
<td>1500</td>
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<td>200A</td>
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<td>D480V3PDG</td>
<td>480V Delta</td>
<td>3</td>
<td>1500</td>
<td>20kA</td>
<td>200A</td>
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</tbody>
</table>

**Photovoltaic DC**

<table>
<thead>
<tr>
<th>Model</th>
<th>System Voltage &amp; Config</th>
<th># of Poles</th>
<th>UL 1449 VPR (6kV - 3kA)</th>
<th>( I ) SCCR</th>
<th>MCOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>D600VPV</td>
<td>600V DC</td>
<td>2</td>
<td>2000</td>
<td>20kA</td>
<td>10kADC</td>
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<tr>
<td>D600VPV</td>
<td>600V DC</td>
<td>3</td>
<td>2000</td>
<td>20kA</td>
<td>10kADC</td>
</tr>
<tr>
<td>D1000VPV</td>
<td>1000V DC</td>
<td>3</td>
<td>3000</td>
<td>20kA</td>
<td>10kADC</td>
</tr>
<tr>
<td>D1000VPV</td>
<td>1000V DC</td>
<td>3</td>
<td>3000</td>
<td>20kA</td>
<td>10kADC</td>
</tr>
</tbody>
</table>

(PV DC models are URus. Canadian PV SPD standards not yet established.)

**DIN Model Configurator & Option:**

**AC Voltage**

- 1P = One Pole, Single Phase
- 2P = Two Pole, Split Phase
- 3P = Three Pole Wye
- 3PD = Three Pole Delta

**Photovoltaic DC Voltages**

- 600V (DC)
- 1000V (DC)

**PV = Photovoltaic DC (DC+, DC-, Ground)**

**1 Pole / Single Phase**

- 120V
- 127V
- 230V
- 240V
- 277V
- 347V
- 480V
- 600V (DC)
- 1000V (DC)

**2 Pole / Split Phase**

- 120V (120 / 240V)
- 127V (127 / 254V)
- 230V (230 / 460V)
- 240V Delta
- 277V (480Y / 277V)
- 347V (600Y / 347V)
- 600V N/A

**3 Pole / Yoke**

- 120V (208Y / 120V)
- 127V (200Y / 127V)
- 277V (480Y / 277V)
- 347V (600Y / 347V)
- 1000V (DC)

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10.19.15.h.RevC #8776

Advanced Protection Technologies
14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-6955
www.aptsurge.com · info@aptsurge.com

Modularity allows for many additional configurations. Call factory for assistance.
**Arrester SPD Robustness for In-Line, Series-Connected DIN-Rail Applications**

**Features & Where This Makes Sense:**
- **50kA Service Entrance rated SPD**
  - Suitable for UL 96A Lightning Protection System
- **High Surge Environments:** Outdoor, Pole-Mount, Traffic, ITS
- **Robust Arrester Grade Components**
  - No ‘dwarf’ suppression elements
- **UL 1449 4th Edition Listed SPD – ULMark**
  - Avoids regulatory or compliance issues
- **Type 1 SPD - does not require separate overcurrent protection at additional cost & space**
- **Includes On-Board LED diagnostics**
- **No More Costly Than Traditional In-Line SPD (Maybe Less When Extra Fusing is Required)**

**Disadvantages of Traditional Series-Connected SPDs:**
- Not robust (take one apart: small dwarf/electronic grade MOVs)
- Usually need extra cost & extra space for overcurrent protection
- Not UL Listed (Series SPDs are historically Recognized, not Listed)
- Not UL Recognized (dangerous? - mfg knew it would not pass recent UL 1449 changes?)
- UL Recognized with substantial shortcomings? ('Surprises' buried in File's Conditions of Acceptability?)
- Series SPDs can completely deenergize their loads if their fuse/breaker clears. Unacceptable to critical loads such as traffic control cabinets, fire alarm panels, etc.

**Installation Instructions & Photos on Back**
- For Indoor Use Only - Up to 600V, 35A, UL Recognized Connectors
- APT Technical Support at (800) 237-4567

**Ordering Information (SPDee is Ordered Separately):**
- **SKIT 1** – for 120V (true single phase): 1 Hot, 1 Neutral, 1 Ground Includes two Altech CMC1-2 term blocks, two Altech CGT6N term blocks, one EPCMC-1-2 end plate, label
- **SKIT 2** – for 120/240V (split phase): 2 Hots, 1 Neutral, 1 Ground Includes three Altech CMC1-2 term blocks, two Altech CGT6N term blocks, one EPCMC-1-2 end plate, label
- **SKIT 3** – for 208Y/120V (three phase, rare for series application): 3 Hots, 1 Neutral, 1 Ground
- **‘D’ suffix option** – Adds 6” 35mm DIN-Rail and two mounting screws (example: SKIT1D)

**Component Specifics (Or To Build Your Own):**
- **Energized and Neutral Feed-Through Terminal Blocks:** Altech CMC1-2, Gray, tri-connect, 600V, 35A, 22-10 AWG, Altech EPCMC1-2 end plate, cRUus, file E220514
- **Ground Feed-Through Terminal Blocks:** Altech CGT6N, Green/Yellow, 600V, 35A, 22-10 AWG, cRUus, file E220514 (two required – one connects feed-through ground leads to DIN rail ground, other connects SPD to DIN-Rail ground)
- **Identification Label** for affixing to SPDee SPD.
**Installation:**

- Qualified Personnel Only - Follow all applicable codes - Ensure all loads are de-energized - Do not install during lightning storm.
- Select appropriate **SPD** from **SPD** datasheet. **SPD** mounts to DIN-Rail as standard feature.
  
  (Alternate mounting possible - **SPD** does not have to be mounted on DIN-Rail)
- Select appropriate S-KIT, or build your own from Feed-Through Terminal Blocks (Altech, Wago, etc.).
- Ensure DIN-Rail is solidly electrically grounded.
- Connect **SPD** and Feed-Through Terminal Blocks to DIN-Rail, covering exposed side(s) with end plate.
- Wire **SPD** hot and neutral leads to terminal blocks. Cut leads as short as possible. (May fit better in top terminals) Torque: 7 lb-in
- Wire load connections into and out-of terminal blocks. Torque: 7 lb-in
- Wire **SPD** ground to one of two grounding blocks. (One grounds **SPD** to DIN-Rail, other grounds feed-through ground leads).
- Ensure leads are tight. Energize. Ensure LED illuminates.

---

![Diagram of SPD installation](image-url)

**KEY**

- **---** = Power
- **-** = Neutral (white)
- **-** = Ground

---

3.10.15.lh #8678
**Features:**
- Budget Surge Protection
- Intended for outdoor loads, light poles, DOT, etc.
- 20kA and 40kA Per Mode Surge Current Ratings
- Hi-Energy MOV based design
- Low Clamping Voltages – better protection than air-gap, spark-gap, GDT or silica oxide varistor technologies
- Encapsulated in Ceramgard® elastomeric potting compound for below grade application
- Voltage Specific Design – Highly configurable
- Pre-attached 12 AWG 24” Leads
- Parallel Connection - Solid State Bidirectional Operation
- Optional EMI/RFI Noise Filter (1 & 2 pole models)
- Optional series type connection (aka two-port, Kelvin-connected or feed-thru connection)
- All Modes of Protection

**Model Number Configurator on Back**

**Performance Specifications:**
- Available Surge Current Capacities:
  - 20kA in each of all specified modes
  - 40kA in each of all specified modes
- Nominal Discharge Current Rating (Iₓ): 20kA
- Operating Frequency: DC-500Hz
- Operating Temperature: -40°C (-40°F) to +85°C (185°F)
- Weight: 1.65 lbs (0.75 kg)
- Polycarbonate enclosure – UL 746C(f1) & UL 94-5VA
- 3/4” male threaded hub
- 10A upstream overcurrent protection recommended
- Maximum Continuous Operating Voltage (MCOV):
  - Nominal System Voltage: SPD MCOV:
    - 120-127V: 175V
    - 220-240V: 320V
    - 277V: 420V
    - 347V: 550V
    - 480V: 625V
    - 600V: 1000V

**Lead Configurations:** (graphic on back)
- Standard configuration: 12 AWG leads exit the mouth of the SPD enclosure, not the nipple. This ensures maximum potting coverage around the leads for environmental & moisture protection.
- N suffix option: Moves 12 AWG leads to exit thru the nipple area (unit is still potted).
- S suffix option: Provides Series connection leads thru the mouth (not available with N option). This is also known as two-port, Kelvin or feed-thru connection. Some DOT light pole configurations require this. Steady state current rating for S option is 12A. Not intended for continuous loads above 12A.

**Mounting Configurations:** (graphic on back)
- Intended for mounting via nipple hub (1.05” OD)
- B suffix option mounting bracket permits mounting on flat surface or standard 35mm DIN-Rail

**Quality, Standards & Validation:**
- Designed, Manufactured & Tested consistent with:
  - High Energy Parallel Design for Category C3 & C-High applications
  - UL Recognized MOVs & EMI/RFI Filter
  - RoHS-compliant
  - 2 year warranty (longer optional)
  - Burn-In tested Prior to Shipment
  - ISO 9001:2008 Quality Management System
  - ISO 17025:2005 Laboratory Qualification
### LA Model Number Configurator & Options

#### Voltage (see Figures)
- 120V
- 127V
- 220V
- 240V
- 277V
- 347V
- 480V
- 600V

#### Power System (see Figures)
- 1P = One Pole, Single Phase (powered L-N, see Figure 5)
- 2P = Two Pole, Split Phase (powered L-L, see Figure 1)
- 3Y = Three Pole Wye (Figure 2)
- 3C = B Phase Corner Grounded Delta (Figure 6)
- 3D = Three Pole Delta (Figure 4)
- 3H = Three Pole Hi-Leg Delta (Figure 3)

#### Modes of Protection Configuration
- **A** = L-G and N-G protection (suggested for tall poles, or when far from service entrance)
- **B** = L-G protection only
- **C** = L-N protection only (B or C suggested when at service entrance)
- **D** = L-N and N-G protection (suggested when close to service entrance)
- **E** = L-G and L-N protection
- **F** = L-L and L-G protection (for Delta systems)
- **G** = L-L protection (for Delta Systems)
- **H** = L-N, L-G & N-G protection (Available up to 20kA per mode and 40kA N-G. Not available with F or S options)

#### kA Rating Per Mode
- 20 = 20kA
- 40 = 40kA

#### Options
- **B** = Aluminum Mounting Bracket
- **E** = EMI/RFI Noise Filter (1 and 2 pole only)
- **N** = Thru-nipple conductors (not available with S option)
- **S** = Series connected, aka Kelvin connection
- **Q** = Call for Custom or Special Builds

#### Examples:
- LA480V1PA40S = L-G and N-G protection of 40kA for 480V true single phase (Meets FDOT Light Pole specs)
- LA240V2PA40S = L-G and N-G protection of 40kA for 240/480V split phase (Meets FDOT Light Pole specs)
- LA120V2PD20BFN = L-N and N-G protection of 20kA for 120/240V split phase with bracket, filter and thru-nipple wires
- LA120V1PB40BFS = L-G protection of 40 kA for 120V true single phase with bracket, filter and series connection wires

#### Lead Configurations:
**Standard configuration (blank)** 12 AWG leads exit the mouth of the SPD enclosure, not the nipple. This ensures maximum potting coverage around the leads for environmental & moisture protection.

**N suffix option** moves 12 AWG leads to exit thru the nipple area (unit is still potted)

**S suffix option** provides Series connection leads thru the mouth (not available with N option). This is also known as two-port, Kelvin or feed-thru connection. Some DOT light pole configurations require this. Steady state current rating for S option is 12A. Not intended

#### Mounting Configurations:
Intended for mounting via nipple hub (1.05" OD, needs appropriately sized hole)

- **B** suffix option mounting bracket permits mounting on flat surface or standard 35mm DIN-Rail

---

Please call APT at 800.237.4567 for questions and application assistance
Intended Application

- Primary Protector at Service Entrance for life safety protection from power line crosses and lightning.
- SAVFF is UL 497C Listed (QVKC.E303380)
- Suitable for use in UL 96A Master Label Lightning Protection System
- Per regulatory & industry convention, cascaded SPDs provide maximum protection. An additional Secondary SPD is highly recommended for critical electronics applications.

Design Features

- Designed, Manufactured & Tested consistent with:
  - IEEE C62.43-2005
  - IEEE C62.64-2009
  - IEEE C62.41.1, C62.41.2 & C62.45
  - IEC 61643-21
- Integral Fail-Short Mechanism

Quality, Validation

- 5 year warranty (longer optional)
- UL 497C Listed (QVKC.E303380)
- APT employs an ISO 9001:2008 Quality Management System
- CE Mark: Yes

Features

- Primary Protector Kit for Coaxial Communication Lines
- Includes SAVFF UL 497C Listed Coaxial SPD
- Includes two F to BNC connectors for BNC applications
- Coaxial Gas Discharge Tube (GDT) Technology
- Protects personnel and equipment from lightning and power induced overvoltage surges

Performance Specifications

- Breakdown Voltage: 150V
- Maximum Operating Voltage: 100V
- Maximum Signal Current: 300mA
- $I_{\text{max}}$ Surge Current Rating (8/20µs): 5kA
- Analog Frequency Range: DC-1GHz
- SPD Insertion Loss: 0.2 dB typical
- Response Time: <25ns
- Listing: UL 497C

Physical Specifications

- Intended for use within a weather-resistant enclosure
- Relative Humidity Range: 0-95% non-condensing
- Operating Temp: -40°C (-40°F) to +176°F (+80°C)
- Weight: 0.2lbs (56g) (excluding BNC conn.)
- Length: 3.0” (76mm long)
- Metallic Case
- Female F Connectors
- Two (2) F-BNC connectors included
- Pin-Grounded Shield Mode of Protection

Grounding

- Requires reliable ground
- SPD may be grounded via its legs with screw connections, or via screw terminal that accepts up to 8 AWG (wire and attachment screws not included)

Installation

- SPD is bidirectional; not direction-sensitive. Industry ‘Best Practices’ recommend SPDs at both ends of cabling and/or cascade protection.
- SPD must be connected to a reliable ground via screw-down connection or ground wire (or both). Locate SPD such that ground lead is as short and straight as possible. Inches matter! Connect to a reliable ground, which should be the same ground reference for power and Pan-Tilt-Zoom (if equipped).
- SPD redirects damaging energy to ground. If equipment/SPD are atop tall pole, the long path to earth ground adds inductive impedance and may affect performance
- This SPD intentionally short-circuit the line when failed. Remove SPD, and test system. If system operates normally, replace SPD.
- If signal quality decreases when SPD is installed, most likely cause is a ground loop. Disconnect ground lead, and test system. If system operates normally, contact APT for BNCA10kA, which has ground isolation circuitry.
BNCA10kA
BNC In-Line Coax Surge Protective Device/SPD

Features
The BNCA10kA is a premium SPD intended for Severe Service at BNC coaxial connections for video equipment such as CCTV cameras.

The BNCA10kA SPD features Three Stage Series Hybrid Surge Protection
• Primary ‘Course’ Protection: Gas Discharge Tubes (GDTs)
• Series Current Limiting Component
• Secondary ‘Fine’ Protection: Silicon Avalanche Diodes (SADs)

Easy to Install, Din-Rail Mounting Bracket Included

Design Features
• Designed, Manufactured & Tested consistent with:
  - IEEE C62.43-2005
  - IEEE C62.64-2009
  - IEEE C62.41.1, C62.41.2 & C62.45
  - IEEE Location Categories C, B and A
  - NFPA 780 Lightning Protection
  - IEC 61643-21

Shield - Ground Isolation
• The BNCA10kA includes separate protection modes for Pin to Shield and Shield to Ground.
• This prevents SPD ground loops and possible signal interference caused if a long run of cable references a different ground than the head-end ground.

Physical Specifications
• Intended for use within a weather-resistant enclosure
• Relative Humidity Range: 0 - 95% non-condensing
• Operating Temp: -40°C (-40°F) to +176°F (+80°C)
• Weight: 0.25lbs (100g)
• Dimensions: 3.35” (85mm long) x 1” square (25mm)
• Pre-wired with 2’ (60cm) of #12 AWG ground conductor (User to cut to shortest length possible)
• Anodized Extruded Aluminum Case; metallic bracket
• BNC gender changers are available

Performance Specifications
• Nominal Operating Voltage: 5V
• Maximum Operating Voltage: 8V
• Maximum Signal Current: 300mA
• Inrush Surge Current Rating (8/20µs): 10kA
• Clamping Voltage (Pin-Shield): 8/20µs, 5kA: 13.2V
  - 10/700µs, 1kV: 14.7V
• Digital Transmission Rate: ≤10Mbps
• Analog Frequency Range: 0-10Mhz
• Insertion Loss: ≤0.5dB@10MHz
• Response Time: <1ns
• Connection Type: BNC, 50 / 75 ohm
• Discrete Modes of Protection: Pin-Shield, Shield-Ground

Quality & Validation
• RoHS - compliant
• 5 year warranty (longer optional)
• Individually Tested prior to shipment
• APT employs an ISO 9001:2008 Quality Management System
• CE Mark: Yes

Installation:
• This is a directional, in-line series-connected SPD. PROTECTED end of SPD must be at equipment or camera end. UNPROTECTED end must be at cable end. Industry ‘Best Practices’ recommend SPDs at both ends of cabling.
• Grounding: Locate SPD such that Ground lead is as short and straight as possible. Connect to a reliable ground, which should be the same ground reference for power and Pan-Tilt-Zoom (if equipped). Trim Ground lead as appropriate. Inches matter! Do not coil excess lead - cut off excess lead. Crimp-attach included wire terminal and connect to reliable ground. Din-Rail bracket does not electrically ground this SPD. SPD attachment to Din-Rail is not mandatory.
• All applicable Code(s) and regulation(s) must be followed.
• If SPD problems are suspected, remove SPD and test system. If system operates normally, replace SPD.
Protecting Coax Cables from Surges

Most surges on coax cable originate on the shield, not the pin.
- In a coax application, the pin is protected by the shield. For example, lightning induces onto the shield, as would accidental contact with a power line. Consequently, excessive emphasis on protecting the pin may be misguided.
- According to IEEE C62.43 research:
  - Surge current injected equally onto the pin and shield will propagate unequally. Due to inductance, the shield will carry about four times more surge current than the pin.
  - “Surge propagation speed is faster on the shield than the pin, leading to voltage differentials between pin and shield on long runs of coax cable.”
- Coax surge protection is different than AC power surge protection:
  - Focus is on the grounded shield conductor as opposed to the ‘active’ conductor. (On AC systems, focus is usually on the energized conductor.)
  - MOV suppression components may degrade signal quality due to higher capacitance.

Primary & Secondary SPDs are intended for use together in a cascade arrangement.
- Irony: People routinely protect AC circuits with sizeable cascade SPDs, but do not do it with coax, despite smaller SPDs and sometimes a harsher environment. Cascade SPDs as appropriate.

UL 497 Listing categories are often misunderstood.
- UL has two generalized categories for Communication SPDs: Primary and Secondary Protectors.
  - Primary Protectors: e.g., UL 497, UL 497C. “Primary protectors are intended to suppress abnormal overvoltage conditions that may exist on the circuit due to accidental contact with electric light or power conductors operating at or over 300 V to ground…” Translation: These are more intended for life safety protection from power line crosses & lightning, and may not clamp low enough to protect sensitive electronics.
  - Secondary Protectors: e.g., UL 497A. “Secondary protectors are intended to suppress abnormal voltage and/or current conditions that bypass the primary protector.” Translation: Secondary Protectors offer better clamping protection for sensitive electronics.
- Hiccup?: There are single SPDs having the robust componentry of Primary SPDs and the lower and better clamping performance of Secondary SPDs. However, by quirk, the lower clamping voltage and better performance prevents them from passing UL’s testing as a Primary Protector. The resulting confusion factor is one reason why various manufacturers do not UL List coax SPDs. Note that UL 96A Lightning Protection applications mandate a UL 497C unit. Good practice suggests an additional Secondary Protector to protect sensitive electronics.

Concept of Cascade Protection

Hiccup: Ground Loops and resulting signal loss
- Coax cable shields are grounded at their ‘head-end’. The shield is not supposed to be grounded further downstream. Reason: If the shield is grounded at multiple locations, and those grounds are at different potentials, then current will ‘loop’ through the shield as the ground potentials attempt to equalize themselves. This is called a Ground Loop, and can/will cause signal decay.

Avoiding Ground Loops

- Away from the ‘head-end’, if the SPD’s shield protection is directly connected to ground, it can/will cause a ground loop. Different SPD technology with ground isolation is required to prevent this. The APT SPD will not cause ground loops.
Premium SPDs intended for use on a wide range of low voltage applications inside appropriate enclosures, including high speed communication circuits. Terminals are finger-safe.

- SPDs include three stage high-energy surge suppression in a Pi (π) configuration:
  - 1st Stage: Parallel-connected Gas Discharge Tubes
  - 2nd Stage: Series-connected impedance
  - 3rd Stage: Parallel-connected Transorbs
- Each SPD protects two (2) Pairs of Wire
- UL 497B Recognized UL File: QVGQ.E244864
- Circuit schematic printed on side of SPD
- Dual grounding:
  - Ground Wire Lug (recommended)
  - Through DIN-Rail Connection

<table>
<thead>
<tr>
<th>Application</th>
<th>Two or Four Wire Data Lines such as Camera PTZ or Vehicle Detectors</th>
<th>Low Voltage Power Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Protocol Operating Voltage</td>
<td>SPD Max Cont Op Volt</td>
</tr>
<tr>
<td>Model Number</td>
<td>+/- 25V</td>
<td>+/- 6V</td>
</tr>
<tr>
<td>RS232/D1</td>
<td>28VDC</td>
<td>15VDC</td>
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<tr>
<td>RS423/D1</td>
<td>28VDC</td>
<td>15VDC</td>
</tr>
<tr>
<td>RS422/D1</td>
<td>28VDC</td>
<td>15VDC</td>
</tr>
<tr>
<td>RS485/D1</td>
<td>28VDC</td>
<td>15VDC</td>
</tr>
</tbody>
</table>

Other Applications
- Other Low Voltage: See D60401 series data sheets
- BNC: See BNCA10KA or BNCB5KA data sheets
- 120V: See AC DIN-Rail data sheets

Specifications & Features
- Surge Current Rating: 15kA
- Rated Operating Current: (mA): 800mA
- Number Wires Protected: up to 4 wires (2 pair)
- Wire Size: 14 AWG - 26 AWG
- Response Time (ns): <1 ns
- Mounting Type: 35mm DIN-Rail
- Temperature Rating: -40°F to 185°F (-40°C to 85°C)
- Enclosure Material: Thermoplastic UL 94-V0
- Enclosure: NEMA 1 (IP 20)
- Dimensions: 3.9" x 2.6" x 0.47" (99mm x 65mm x 12mm)
- Weight: 4.75oz (135g)
- Thermal Protection: Yes
- Color: Gray
- IEEE C62.41-2002, Cat C, B & A: Yes
- IEC 61643-21Compliant: Yes
- IEC Max. Discharge Current I_{max} (8x20µs): 15kA
- IEC Max. Discharge Current I_{max} (8x20µs): 10kA
- IEC Max. Lightning Pulse Imp (10x350µs): 2.5kA
- CE Mark: Yes
- Warranty: 2 Year

Easy to Install
In-line series connected SPD. Normal signal goes through this unit.

Unprotected side
Install such that surge hits this side

Protected side
Camera, MVDS, widget, etc.

Ground Lug internally connects to tab contacting DIN-Rail. We recommend cable connection from Ground Lug to Verified Ground.

Dimensions
Weight: 4.75oz (135g)
Advanced Protection Technologies
14550 58th Street North · Clearwater, Florida 33760
(800) 237-4567 · (727) 535-6339 · Fax (727) 539-8955
www.aptsurge.com · info@aptsurge.com

Model Number Configurator

D60401 - [ ] [ ] [ ]

Voltage Codes

005 = 5VDC (3.5VAC) S (Standard) = Analog, DC
012 = 12VDC (8.5VAC) B (Bandwidth) = Digital up to 35MHz
024 = 24VDC (17VAC)
048 = 48VDC (34VAC)
060 = 60VDC (42VAC)

Suggested Applications

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Nominal Voltage</th>
<th>Suggested SPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>+/- 25V</td>
<td>D60401-024S</td>
</tr>
<tr>
<td>RS-423</td>
<td>+/- 6V</td>
<td>D60401-012S</td>
</tr>
<tr>
<td>RS-422</td>
<td>-0.25V  - +6V</td>
<td>D60401-012B</td>
</tr>
<tr>
<td>RS-485</td>
<td>-7V  - + 12V</td>
<td>D60401-012B</td>
</tr>
<tr>
<td>Modbus (usually RS-485)</td>
<td></td>
<td>D60401-012B</td>
</tr>
<tr>
<td>Irrigation/Sprinkler Valves</td>
<td>24VAC</td>
<td>D60401-048S</td>
</tr>
<tr>
<td>4 - 20mA</td>
<td>Need to determine, Could be 24VDC, 12VDC, etc.</td>
<td>Default: D60401-048S</td>
</tr>
</tbody>
</table>

Don’t know? Can’t Find Out? Default: D60401-048S

Voltage Codes

<table>
<thead>
<tr>
<th>&quot;005&quot;</th>
<th>&quot;012&quot;</th>
<th>&quot;024&quot;</th>
<th>&quot;048&quot;</th>
<th>&quot;060&quot;</th>
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<tbody>
<tr>
<td>5 / 3.5</td>
<td>12 / 8.5</td>
<td>24 / 17</td>
<td>48 / 34</td>
<td>60 / 42</td>
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<tr>
<td>MCOV (VDC)</td>
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<tr>
<td>7</td>
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<td>52</td>
<td>64</td>
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<tr>
<td>Clamping Voltage (VDC)</td>
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<td>&lt;27</td>
<td>&lt;46</td>
<td>&lt;85</td>
<td>&lt;105</td>
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<td>Voltage Breakdown (Min/Max VDC)</td>
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<td>7/9</td>
<td>16/20</td>
<td>29.5/36.5</td>
<td>55.5/68.5</td>
<td>67.5/82.5</td>
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<td>IEC Voltage Protection Level (Up @ 1kV/µs, VDC)</td>
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<td></td>
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</tr>
<tr>
<td>12</td>
<td>27</td>
<td>28</td>
<td>52</td>
<td>64</td>
</tr>
<tr>
<td>Maximum Leakage Current (µA)</td>
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<td></td>
<td></td>
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<tr>
<td>200</td>
<td>5</td>
<td>5</td>
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</table>

Features

- Surge Current Rating: 15kA
- UL 96A Lightning Protection Master Label: Yes
- Rated Operating Current IL (mA): 800mA (1000mA for B-suffix models)
- Number Wires Protected: up to 4 wires (2 pair)
- Wire Size: 14 AWG - 26 AWG
- Response Time (ns): <1 ns
- Mounting Type: 35mm DIN-Rail
- Temperature Rating: -40°F to 185°F (-40°C to 85°C)
- Enclosure Material: Thermoplastic UL 94-V0
- Enclosure: NEMA 1 (IP 20)
- Dimensions: 3.9” x 2.6” x 0.47” (99mm x 65mm x 12mm)
- Weight: 4.75oz (135g)
- Thermal Protection: Yes
- Color: Gray
- UL 497B Listed: UL File QVGQ.E244864
- CE Mark: Yes
- IEEE C62.41-2002, Cat C, B & A: Yes
- IEC 61643-21 Compliant: Yes
- IEC Max. Discharge Current Iₜₚ₃ₜ₁₈ (8x20µs): 15kA
- IEC Max. Discharge Current Iₜₚ₃ₜ₂₈ (8x20µs): 10kA
- IEC Max. Lightning Pulse Iₜₚ₃ₜ₅ (10x350µs): 2.5kA
- Warranty: 2 Year

• These premium SPDs are intended for use on a wide range of low voltage applications inside appropriate enclosures, including high speed communication circuits. Terminals are finger-safe.

• D60401 SPDs include three stage surge suppression in a Pi (π) configuration:
  - 1st Stage: Parallel-connected Gas Discharge Tubes
  - 2nd Stage: Series-connected resistor (includes inductor on ‘S’ models)
  - 3rd Stage: Parallel-connected Transors

• Two D60401 SPD families are offered:
  - S-suffix: ‘Standard’ - for Analog, DC voltage, or low-frequency data to 600kHz
  - B-suffix: ‘Bandwidth’ - for Digital or High-Frequency Data up to 35MHz
**Dimensions**

![Diagram of Finger Safe Terminals]

**Unprotected Side**
- Install such that surge hits this side

**Protected Side**
- VALUABLE EQUIPMENT SIDE
  - Series connected (Power/Data goes through SPD)
  - Protects up to 4 wires (2 pairs of 2 wires)

**Information**

**Typical 4-Wire Installation**

![Diagram of Typical 4-Wire Installation]

- Only 2 wires?
  - Use either top or bottom sets.
MVF SPD Component Design Features

- Low clamping voltage for maximum equipment protection
- Parallel design MOV suppression allows installation flexibility
- Bi-directional operation for positive and negative surges
- Solid state, fully automatic action and reset
- Large-Block, 40mm, MOVs
- Solid State Bidirectional Operation
- Intended for High Energy applications including all IEEE C62.41.2 Category A, B and C High Applications
- Pre-wired with 2’ (0.61 Meters) #6 stranded leads for connection to Fuse Box
- Includes internally threaded conduit hub 1 1/4”
- External Mounting Flanges
- Inorganic silica particle encapsulation
  - Noncombustible at extreme temperature
  - Superior gaseous expansion tolerance
- Double insulated against ground fault or arcing with separate polypropylene and polyethylene layers
- Elastomeric Ceramgard® potting protects against environmental contaminants
- High Voltage warning labels standard

MVF SPD Component Specifications

- Surge Current Rating: 120kA per phase
- Proven ‘large block’ 40mm MOV Technology
- Protection Modes: All Modes LL and LG (Normal mode & Common mode)
- Directly connected MOV suppression elements
- NEMA 4 (IP66) Heavy Gauge Steel Enclosure
- Dimensions: 31cm x 31cm x 15.5cm (12” x 12” x 6”)
- Weight: 29.5kg (65 Lbs)
- Relative Humidity Range: 0 – 95% Non-Condensing
- Operating Frequency: 50Hz, 60Hz
- Operating Temperature: -40°C (-40°F) to +85°C (+185°F)

MVF SPD Quality

- Seven (7) Year Warranty on SPD
- Every unit Burn-in tested prior to shipment
- ANSI/IEEE C62.11
Optional Monitoring Package
- Allows for on-site or remote monitoring of suppression circuits
  - Indicator lights for each phase
  - Dry Contacts for each phase
  - Available on 120kA models only

Fuse Box Component Design Features
- Designed to be installed in front of and in-line with APT’s MV Medium Voltage SPD as part of the MVF.
- NEMA 4X Polycarbonate enclosure with stainless steel lockable latches.
- All connecting wires included
  - 2.4m (8 ft) of #6 AWG, 25kV wire each (3 Phase, 1 Ground).
  - Additional 6kV sleeving on each wire for added safety.
- 2 – 1/4” threaded hubs included to enter and exit enclosure.
- Includes 3 Bussman model 5.5CAVE (5.5kV, 15A).
- Includes 6” of conduit for SPD to Fuse Box connection.

Fuse Box Component Specifications
- Enclosure Dimensions: 457.2mm x 406.4mm x 254mm (18” x 16” x 10”)
- Weight: 15.9 kg (35 lbs)
- Maximum Voltage: 5500VAC
- Maximum Current: 15 Amp
- Torque: 80 Inch-Lbs
- Relative Humidity Range: 0 – 95% Non-Condensing
- Operating Frequency: 50Hz, 60Hz
- Operating Temperature: -40°C (-40°F) to +85°C (+185°F)

VOLTAGE CODES

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<thead>
<tr>
<th>Code</th>
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<tr>
<td>10</td>
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<td>15</td>
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<td>30</td>
<td>3000V</td>
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<tr>
<td>36</td>
<td>3600V</td>
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<tr>
<td>41</td>
<td>4160V</td>
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AVAILABLE OPTIONS

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<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Monitoring Package: Indicator lights per phase &amp; dry contacts per phase</td>
</tr>
</tbody>
</table>

ENCLOSURE RATINGS

<table>
<thead>
<tr>
<th>Code</th>
<th>Rating</th>
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</thead>
<tbody>
<tr>
<td>04</td>
<td>NEMA 4</td>
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</table>

SURGE CURRENT RATINGS

<table>
<thead>
<tr>
<th>Code</th>
<th>Rating</th>
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</thead>
<tbody>
<tr>
<td>12</td>
<td>120kA per phase</td>
</tr>
<tr>
<td>24</td>
<td>240kA per phase</td>
</tr>
</tbody>
</table>

Note: Monitoring Package available only on 120kA per phase models
What Electrical System Is It?

- Based on secondary side of upstream transformer, NOT by how load is connected.
- Most SPD/TVSS order errors are misunderstandings related to grounding or neutrals.
- Grounded system means that the system is referenced to ground, NOT that there is a safety ground.
- By convention, ground wires are not ‘counted’ as one of the wires (3-wire, 4-wire, etc.).

3-phase 4-wire Grounded Wye
Neutral bonded to ground. Neutral pulled into facility. Common system configurations.
V = 120V (208Y/120V) APT ‘2’
V = 277V (480Y/277V) APT ‘4’
V = 347V (600Y/347V) APT ‘8’
V = 127V (220Y/127V) APT ‘21’ (non-USA)
V = 220V (380Y/220V) APT ‘7’ (non-USA)

Resistive or Impedance Grounded Wye
Neutral bonded to ground via grounding resistor. Neutral may, or may not, be pulled into facility. Becoming popular system on high-tech applications.馬
V = 120V (208Y/120V) Rare - Call APT
V = 277V (480Y/277V) APT ‘5’
V = 347V (600Y/347V) APT ‘9’

Split-Phase ‘Single-Phase’
Neutral bonded to ground. Neutral usually pulled into facility. Very, very Common.
V = 120V (120/240V APT ‘1’
V = 240V (240/480V Rare - Call APT
V = 127V (127/254V) APT ‘15’ (non-USA)

Hi-Leg Grounded Delta
Neutral bonded to ground. Neutral often pulled into facility. Common system configuration.
V = 120/240V APT ‘3’
V = 240/480V Call APT

3-phase 3-wire Corner Grounded Delta
System has reference to ground because B phase is grounded.
V = 240V APT ‘6’
V = 480V APT ‘5’
V = 600V APT ‘9’
Note NEC 285.3(2)
Occasionally seen at industrial facilities. Normally, this is not used on new construction.

3-phase 4-wire Grounded Wye
Neutral bonded to ground. Neutral NOT pulled into facility. Common system configurations at MCC, pumping and water treatment.
V = 120V (208Y/120V) APT ‘2’
V = 277V (480Y/277V) APT ‘4’
V = 347V (600Y/347V) APT ‘8’
V = 127V (220Y/127V) APT ‘21’ (non-USA)
V = 220V (380Y/220V) APT ‘7’ (non-USA)

3-phase 4-wire Ungrounded Wye
Neutral NOT bonded to ground. Neutral mayor may not be pulled into facility. Rare system configuration; Error/miss-wire?. Note NEC 285.3(2).
V = 120V (208Y/120V) Rare - Call APT
V = 277V (480Y/277V) APT ‘5’
V = 347V (600Y/347V) APT ‘9’
V = 127V (220Y/127V) Call APT (non-USA)
V = 220V (380Y/220V) Call APT (non-USA)

Single-Phase
Verify where neutral and ground are! Often this is used for one leg or one piece of equipment. Neutral is bonded to ground. This configuration is used less commonly than perceived (see “split-phase”).
V = 120V APT ‘11’
V = 240V APT ‘12’
V = 277V APT ‘18’
V = 480V APT ‘17’ Call APT - almost always different
V = 127V APT ‘13’ (non-USA)
V = 220V APT ‘12’ (non-USA)

3-phase 3-wire Ungrounded Delta
System has NO reference to ground. L-L voltages fixed by transformer, but L-G voltages can vary. This configuration is known to become unstable.
V = 240V APT ‘6’
V = 480V APT ‘5’
V = 600V APT ‘9’
Note NEC 285.3(2)
Common system configuration at older industrial facilities. Normally, this is not used on new construction.

Open Delta
3-phase 3 or 4-wire. Could be ungrounded, corner grounded or Hi-leg. Very rare, tend to be rural. Various solutions. Call APT for information.
Frequently Asked Questions

WHAT IS AN SPD?
 SPD is an abbreviation for “Surge Protective Device.” An SPD is a device that attenuates (reduces in magnitude) random, high energy, short duration electrical power anomalies caused by utilities, atmospheric phenomena or inductive loads.

Such anomalies occur in the form of voltage and current spikes with a duration of less than half an AC cycle. These high energy power spikes can damage sensitive electronic equipment, such as computers, instrumentation and process controllers.

WHERE ARE SURGE SUPPRESSORS INSTALLED?
 AC surge suppressors are typically installed in the following areas:
1. a utility service entrance for protection of an entire facility.
2. in distribution panelboards and switchboards for protection of sensitive downstream loads.
3. connected to a wall outlet for individual protection of a specific piece of equipment, such as a computer or solid-state controller.

WHAT FEATURES SHOULD BE CONSIDERED WHEN SELECTING A SURGE SUPPRESSOR?
 Two important areas to consider during the selection of a surge suppressor are performance and safety. The performance of a surge suppressor is measured in surge current capacity and clamping voltage. Safety should also be a priority in this selection process. The individual suppression circuit should be fused to clear an inoperative MOV during an extreme transient event and provide overcurrent protection for the surge suppressor during a fault condition.

SPACE IS A CONCERN, DOES APT OFFER SOLUTIONS FOR DIN-RAIL APPLICATIONS?
 Yes. APT offers a wide range of DIN-Rail SPD solutions. Our AC products range from 120V to 600V. In addition, we have a series of DC and low voltage DIN-Rail surge suppressors. Our SPDee product is also DIN-Rail mountable.

I AM A SYSTEMS INTEGRATOR AND BUILD CUSTOM FABRICATIONS. WHAT DOES APT OFFER THAT WOULD PROTECT MY SOLUTIONS?
 We have a hard wired SPD solution for every type of panelboard, switchgear, motorcontrol and PLC application. Within our line of products we offer external, internal, modular and non-modular configurations. We also custom design.

WHAT SURGE CURRENT CAPACITY IS REQUIRED?
 Surge current capacity is dependent on the application and the amount of required protection. The selection of the proper surge suppressor is not an exact science and cannot be scientifically calculated from a standard algorithm.

Questions to consider when specifying the proper surge current capacity for surge a surge suppressor include:
- What is the geographic location of the facility and its susceptibility to lightning? (For example, Florida is a high-lightning area; California is a low-lightning area.)
- Is the facility in a rural or urban setting?
- Is the facility the tallest building around?
- Is the facility at the end of the utility grid?
- If it is an existing facility, what is its power quality history?

DOES APT OFFER SPD PRODUCTS FOR RENEWABLE ENERGY APPLICATIONS?
 Yes. APT offers a variety of solutions that can accommodate both the needs of the wind and solar markets.

WHAT ARE YOUR STANDARD LEAD-TIMES?
 Our normal ship date is no more than 10 days from the receipt of the purchase order on custom builds and same day shipping for the most common modular and non-modular inventory units ordered before 2:00 pm EST.

WHY WOULD I BUY FROM APT?
 As a leading manufacturer of quality U.S. made products, our highly trained design engineers have designed SPD products that are of high quality, low in cost and contain the highest level of performance and safety features! You are working directly with the manufacturer. Who knows our product better than we do?
Surge protectors are designed to reduce potentially damaging short duration voltage spikes safely out of the system and divert them to ground. Homeowners these days are becoming more educated about surge protection and are realizing how important it is to install protection in and outside of their homes. This means residential is now a huge potential market. We at surgeassure™ can give you all the tools needed to have a successful surge protection program!
FOR TECHNICAL OR APPLICATION QUESTIONS, CONTACT: 800.237.4567

ADVANCED PROTECTION TECHNOLOGIES INC.

14550 58th Street North, Clearwater, FL 33760

info@aptsurge.com

www.aptsurge.com