

Model: RES(S)

120 kA Per Phase*
w/ Frequency Responsive Circuitry (RESS)
ANSI/UL 1449



* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- Discrete “All Mode” Circuitry: Directly Connected Protection Elements in “All Modes” (10 modes for 3 phase Wye circuits) as recommend by IEEE Std. 1100-2005
- Industry Leading Measured Limiting Voltage (let-through) Performance
- Local & Remote Diagnostics
- Independent Verification of Performance and Safety
- No moving parts or springs - No mechanical or electro-mechanical thermal/over-current protection
- Type 2 SPD
- Component-Level, Thermal Fusing
- Patented, Internal, Circuit Board Mounted, Over-Current Fusing
- 25 Year Unlimited Free Replacement Warranty

Application: The RES(S) provides the absolute best ring wave transient protection available in a surge suppressor designed for AC residential or light industrial-type sub panels. It is extremely effective in virtually eliminating internally generated transients and is an absolute must on panels feeding high-tech homes, small offices or other locations with microprocessor-based, sensitive equipment and/or computer systems. In addition, the RESS and RES models feature standard clamping protection that provides excellent protection in some of the harshest environments including exposure to lightning, grid switching, pole-mounted applications and other external transient sources.

The RESS and RES blend component-level, thermal fusing and Patented, internal, circuit board mounted, over-current fusing with the field proven advantages of discrete “All Mode” protection. The small size and NEMA 4X composite housing of this product allows maximum application flexibility and ease of installation by a licensed electrician. The product also features suppression status indication through normally-on, LEDs (one per phase indicating suppression status on each phase) and a dry relay contact option (C suffix).

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured combination **Frequency Responsive Circuitry (RESS) and Voltage Responsive Circuitry (RES/RESS)** circuit design incorporating component-level, thermal fusing and **Patented** internal, circuit board mounted, over-current fusing; and discrete “All Mode” protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high-dielectric compound to promote long component life and protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-60 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Insertion Loss Data: (L-N) (RESS Only)

| Frequency: | 10 kHz | 100 kHz | 1 MHz | Max Attenuation & Freq. |
|--------------|--------|---------|-------|-------------------------|
| Attenuation: | 15 dB | 37 dB | 26 dB | 58 dB @ 189 kHz |

Insertion Loss Data: (L-N) (RES Only)

| Frequency: | 280 kHz | 1 MHz | Max Attenuation & Freq. |
|--------------|---------|-------|-------------------------|
| Attenuation: | 3 dB | 17 dB | 40 dB @ 135 kHz |

Standard Enclosure: NEMA 4X

Weight: 5 lbs.

SPD Type: Type 2 SPD

Nominal Discharge Current (*I_n) Rating: 10 kA
(*I_n = Nominal Discharge Current per ANSI/UL 1449-2006)

Diagnostics: Green LEDs, one per phase, normally on.

Circuit Interrupt: Internal component-level, thermal fusing and patented, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC

Product Qualifications:

Listed to ANSI/UL 1449 by UL (E340498), CSA (MC#241804); UL1283 and CE Compliant

RES(S)



| Voltage Code | ANSI/UL 1449 Voltage Protection Rating (VPR) | | | | | | |
|--------------|----------------------------------------------|------|------|------|-------|------|------|
| | L-N | HL-N | L-G | HL-G | N-G | L-L | HL-L |
| 1P1 | 600 | - | 600 | - | 700 | - | - |
| 1S1 | 600 | - | 600 | - | 700 | 1000 | - |
| 3Y1 | 600 | - | 600 | - | 700 | 1000 | - |
| 3D1 | 600 | 1000 | 600 | 1000 | 700 | 1000 | 1000 |
| 3Y2 | 1000 | - | 1000 | - | 1000* | 1800 | - |
| 3N2 | - | - | 1000 | - | - | 1000 | - |
| 3N4 | - | - | 1800 | - | - | 1800 | - |

* Note: S-RESS N-G is 900

| Voltage Code* | Circuit Type | MCOV | ANSI/IEEE C62.41.1™-2002, C62.41.2™-2002, C62.45™-2002, and C62.62™-2010 Measured Limiting Voltages (tested with 6 inches of lead length external to the enclosure per Clauses 6.1.1 of C62.62™-2010 and 37.4.4 of ANSI/UL 1449-2006) | | |
|---------------|--------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------|
| | | | Test Mode | ** Cat A, 30 Ω 100 kHz Ring Wave 2 kV / 67 A @ 270° Phase Angle | Category C (High) 10 kA 8/20 Current Driven Test† |
| 1P1 | 120 V, Single Ø (2 wire + ground) | 150 V 150 V 150 V | L-N L-G N-G | 29 V 505 V 329 V | 962 V 881 V 877 V |
| 1S1 | 120/240 V 1Ø (Split) (3 wire + ground) | 150 V 300 V 150 V 150 V | L-N L-L L-G N-G | 29 V 43 V 505 V 329 V | 962 V 1,258 V 881 V 877 V |
| 3Y1 | 120/208 V 3Ø Wye (4 wire + ground) | 150 V 300 V 150 V 150 V | L-N L-L L-G N-G | 29 V 43 V 505 V 329 V | 962 V 1,258 V 881 V 877 V |
| 3D1 | 120/240 V 3Ø High-Leg Delta (4 wire + ground) | 150 V 320 V 300 V 150 V 320 V 150 V | L-N Hi-L-N L-L L-G Hi-L-G N-G | 29 V 28 V 43 V 505 V 1,074 V 329 V | 962 V 1,411 V 1,258 V 881 V 1,301 V 877 V |
| 3Y2 | 277/480 V 3Ø Wye (4 wire + ground) | 320 V 550 V 320 V 320 V | L-N L-L L-G N-G | 28 V 100 V 1,074 V 681 V | 1,411 V 2,271 V 1,301 V 1,441 V |
| 3N2 | 240 V 3Ø Delta (NN) (3 wire + ground) | 320 V 320 V | L-L L-G | 43 V 1,116 V | 1,258 V 1,301 V |
| 3N4 | 480 V 3Ø Delta (NN) (3 wire + ground) | 550 V 550 V | L-L L-G | 100 V 1,647 V | 2,271 V 2,168 V |

Measured Limiting Voltage (MLV) Test Parameters: Positive polarity, Category A: Line power applied, Category C: No line power applied, Voltages are peak (±10%). Measured Limiting Voltages are measured from the insertion point on the sine wave to the peak of the surge for powered tests. Each phase is the average of the modes within that mode of protection. In order to duplicate the results, the specified mode of protection must be tested in all modes (except N-G) and averaged together. (Individual mode or shot results may vary by more than 10%. *Scope Settings: Time Base = 10 microseconds per division, Sampling Rate = 2.5 GigaSamples/sec, Bandwidth = 400 MHz (200 MHz for Cat C), Probes: Tektronix P5100/P6015A. These settings help to assure MLV results are accurate.* **All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.** The MLVs reported above are certified by Third-Party, Independent Testing. Individual test reports are available upon request.

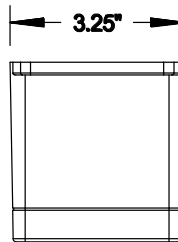
†The MLV reported for the Category C High, 10 kA 8/20 Current Driven Test is determined by measuring the MLV of one of the fifteen 10 kA impulses impressed through the SPD during the Nominal Discharge Current (In) Test from C62.62™-2010 and ANSI/UL 1449-4th Edition. This is not the MLV recorded during the pre- and/or post-test 6 kV / 3 kA Combination Wave Test used to determine the VPR of the SPD. The VPRs are reported on page 1 of this specification.

**** Cat A results only apply to the RESS models.**

Green LED status indicators, one per phase, normally on.

Pre-installed 3/4" hub (As shown)

Circuit Connection: #10 Wire (pre-attached)



Options:

- C = Form C dry relay contacts
 - LP = Remote daylight bright LEDs
 - N = Removes neutral to ground Frequency Responsive Circuitry (available for RESS only)
 - P = Flush mount plate
- Other options may be available upon request.

