

SURGE PROTECTION DEVICES FOR RESIDENTIAL AND/OR LIGHT DUTY COMMERCIAL TYPE 1 LOW-VOLTAGE (LESS THAN 1000 VOLTS AC) ELECTRICAL POWER CIRCUITS

PART 1.0 GENERAL

This Specification covers Surge Protective Device(s) Type 1 (formally known as Secondary Surge Arrestor(s)) for residential and/or light duty commercial low-voltage ac power applications and shall provide effective protection against transient surges induced on to power or control lines by lightning, utility load switching and/or downstream equipment contamination. Type 1 SPDs shall be listed for purpose to *ANSI/UL Standard 1449 Third Edition* and shall be in compliance with *Article 285 of the NEC*. Device modes of protection are to be in compliance with the recommendations of *IEEE Std C62.72TM-2007 IEEE Guide for the Application of Surge-Protective Devices for Low-Voltage (1000 V or Less) AC Power Circuits*.

1.1 DEFINITIONS

- A. ANSI: American National Standards Institute
- B. ATS: Acceptance Testing Specifications
- C. I_n : Repetitive Discharge Ratings
- D. MCOV: Maximum Continuous Operating Voltage
- E. NEC: National Electric Code
- F. NRTL: Nationally Recognized Testing Laboratory
- G. OSHA: Occupational Safety and Health Organization
- H. SPD: Surge Protection Device
- I. TOV: Temporary Over Voltage
- J. VPR: Voltage Protection Rating
- K. BPL: Broadband over Power Lines
- L. PLC: Power Line Carrier

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated, include rated capacities, operating and physical characteristics, standard features and available accessories and/or options. Include documentation of the following:
 - 1. VPR Ratings

2. Symmetrical fault current ratings
 3. I_n Ratings
 4. NRTL Authorization to Produce or Manufacture to Confirm Product Listing
- B. Product Certifications: For SPDs Listed by NRTL agencies certifying compliance with industry requirement to the following standards:
1. ANSI/UL 1449 Third Edition (effective September 2009)
 2. IEEE C62 Guidelines
- C. Qualifying NRTL: OSHA approved
- D. Operational and Maintenance Data: For SPDs to include operational and maintenance manuals.
- E. Warranties: As specified in Section 1.5.

1.3 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent testing agency that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
- B. Source Limitations: Obtain suppression devices and accessories through one source from a single manufacturer.
- C. Comply with IEEE C62.41, "IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits," and test devices according to IEEE C62.45, "IEEE Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits."
- D. Comply with UL 1449 3rd Edition, "Surge Protective Devices" and Listed as a SPD device.
- E. Tested and Listed by a NRTL as a complete assembly to a symmetrical fault current rating equal to or greater than the fault current rating of the connected panel, in accordance with NEC Article 285.

1.4 SERVICE CONDITIONS

- A. Service Conditions: Rate SPD devices for continuous operation under the following conditions, unless otherwise indicated:
1. Maximum Continuous Operating Voltage: Not less than 125 percent of nominal system operating voltage for any power system.

2. Operating Frequency: 47 to 63Hz
 3. Operating Temperature: -40 to +140 degrees F (-40 to +60 degrees C).
 4. Humidity: 0 to 95 percent, non-condensing.
- B. Internally-Generated Environmental Influence:
1. Audible Noise: No audible noise under normal operating conditions
 2. Surface Temperature: Less than 131 degrees F (55 degrees C).

1.5 WARRANTY

- A. Warranties for both Meter Based and Permanently Connected (Hardwired) SPDs: Manufacturer's standard form in which manufacturer agrees to repair or replace components of SPD that fail in material or workmanship within fifteen (15) years from date of manufacture.
- B. A Connected Load Warranty should be inclusive with product pricing with a stipulation that it covers "white good" appliances for SPDs installed for Residential applications.
- C. Warranties should meet all of the requirements set forth by the *Magnuson Moss Warranty Act* as approved by the Federal Trade Commission.

PART 2.0 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. M-Ti (Meter-Treater Inc) – Meter Based, RCHW and MAP Product Series
 2. Approved Equivalent

2.2 METER BASED SERVICE ENTRANCE TYPE 1 (50kA/Phase) 575 Series

- A. Surge Protection Device Description: A plug-in low profile meter container suitable for direct insertion without modification into meter sockets. Meter Based SPDs are to be designed with the following features, accessories and options:
1. SPD tested to 25 thousand amperes interrupting capacity (AIC).
 2. I_n Ratings – 20kA
 3. Housing must be rated 3R (UL414) with UV inhibitors.

4. Forward facing LED indicator light for power and protection status.
 5. Product (low profile) dimensions: 3.2" x 6.9" (1.5" installed depth) or smaller.
 6. Weight: 1.4 lbs or less.
- B. Per Phase Surge Current Rating: 50kA Line to Neutral/Ground mode.
- C. Connection Method/Means: Meter Socket Plug-In with Hardwired Ground connection.
- D. Protection mode(s) and UL1449 VPR rating(s): Grounded wye circuits with Protection modes and UL1449 VPR for 240/120-V, single-phase, 3-wire circuits shall be as follows:
1. Line-to-Neutral/Ground: 600V
 2. Line-to-Line: 1200V
- E. Options
1. Audible alarm, with silencing switch, to indicate when protection has failed.
 2. AMR interface for remote monitoring of protection status.
 3. BPL/PLC Compatibility option.

2.3 METER BASED SERVICE ENTRANCE TYPE 1 (60kA/Phase) 400 Series

- A. Surge Protection Device Description: A plug-in meter container suitable for direct insertion without modifications into meter sockets. Meter Based SPDs are to be designed with the following features, accessories and options:
1. SPD tested to 10 thousand amperes interrupting capacity (AIC).
 2. I_n Ratings – 20kA
 3. Housing must be rated 3R (UL414) with UV inhibitors.
 4. Dual LED indicator lights for power and protection status.
 5. Product dimensions: 4.2" x 6.9" (2.45" installed depth)
 6. Weight: 2.5 lbs
- B. Per Phase Surge Current Rating: 60kA Line to neutral/ground mode.
- C. Connection Method/Means: Meter Socket (4/5 Jaw) Plug-In with Hardwired Ground connection.

D. Protection mode(s) and UL1449 VPR rating(s): Grounded wye circuits with Protection modes and UL1449 VPR for 240/120-V, single-phase, 3-wire circuits shall be as follows:

1. Line-to-Neutral/Ground: 500V
2. Line-to-Line: 1000V

E. Options

1. BPL/PLC Compatibility option.

2.4 METER BASED SERVICE ENTRANCE TYPE 1 (50kA/Phase) CL320

A. Surge Protection Device Description: A standard profile plug-in meter container suitable for direct insertion without modifications into Class 320/400 Amp max meter sockets. Meter Based SPDs are to be designed with the following features, accessories and options:

1. SPD tested to 25 thousand amperes interrupting capacity (AIC).
2. I_n Ratings – 20kA
3. Housing must be rated 3R (UL414) with UV inhibitors.
4. Dual LED indicator lights for power and protection status.
5. Product dimensions: 4.2" x 6.9" (2.45" installed depth)
6. Weight: 3 lbs

B. Per Phase Surge Current Rating: 50kA Line to neutral/ground mode.

C. Connection Method/Mean: Meter Socket Plug-In with Hardwired Ground connection.

D. Protection mode(s) and UL1449 VPR rating(s): Grounded wye circuits with Protection modes and UL1449 VPR for 240/120-V, single-phase, 3-wire circuits shall be as follows:

1. Line-to-Neutral/Ground: 600V
2. Line-to-Line: 1200V

E. Options

1. BPL/PLC Compatibility option.

2.5 METER BASED SERVICE ENTRANCE TYPE 1 (50kA/Phase) 675 Series

- A. Surge Protection Device Description: A three phase plug-in meter container suitable for direct insertion without modifications into meter sockets. Meter Based SPDs are to be designed with the following features, accessories and options:
1. SPD tested to 10 thousand amperes interrupting capacity (AIC).
 2. I_n Ratings – 20kA
 3. Housing must be rated 3R (UL414) with UV inhibitors.
 4. Dual LED indicator lights for power and protection status.
 5. Product dimensions: 4.2" x 6.9" (2.45" installed depth)
 6. Weight: 3 lbs
- B. Per Phase Surge Current Rating: 50kA Line to neutral/ground mode.
- C. Connection Method/Mean: Meter Socket Plug-In with Hardwired Ground connection.
- D. Protection mode(s) and UL1449 VPR rating(s): Grounded wye circuits with Protection modes and UL1449 VPR for 260 Vac maximum, three phase, 4-wire circuits shall be as follows:
1. Line-to-Neutral/Ground: 1200V
 2. Line-to-Line: 2400V

2.6 HARDWIRED SERVICE ENTRANCE TYPE 1 (50kA/Phase) RCHW SERIES

- A. Surge Protection Device Description: A hardwire device designed for installation at the meter can housing. Hardwire SPDs are to be designed with the following features, accessories and options:
1. SPD tested to 100 thousand amperes interrupting capacity (AIC).
 2. I_n Ratings – 20kA
 3. Housing must be rated to NEMA 1, 2, 3, 3X, 4X, 12 or 13.
 4. LED indicator light for power and protection status.
 5. Product dimensions: 6" x 4.25" x 2.9"
 6. Weight: 2.5 lbs.
- B. Per Phase Surge Current Rating: 50kA Line to neutral/ground mode.

- C. Connection Method/Means: Hardwired.
- D. Protection mode(s) and UL1449 VPR rating(s): 240/120 Volts, single phase, 3 wire circuits, should be as follows:
 - 1. Line-to-Neutral/Ground: 600 V
 - 2. Line-to-Line: 1200 V
- E. Options
 - 1. BPL/PLC Compatibility option.

2.7 HARDWIRED SERVICE ENTRANCE TYPE 1 (50kA/Phase) MAP SERIES

- A. Surge Protection Device Description: A hardware device designed for installation in the meter can housing. Hardware SPDs are to be designed with the following features, accessories and options:
 - 1. SPD tested to 100 thousand amperes interrupting capacity (AIC).
 - 2. I_n Ratings – 20kA
 - 3. Fiber Optic indicator light for power and protection status.
 - 4. Product dimensions: 5.125” x 2.8” x 1.062”
 - 5. Weight: 1.25 lbs.
- B. Per Phase Surge Current Rating: 50kA Line to neutral/ground mode.
- C. Connection Method/Means: Hardwired.
- D. Protection mode(s) and UL1449 VPR rating(s): 240/120 volts, single phase, 3 wire circuits, should be as follows:
 - 1. Line-to-Neutral/Ground: 700V
 - 2. Line-to-Line: 1400V
- E. Options
 - 1. BPL/PLC Compatibility option.

3.0 SPECIFICATION MODIFICATIONS

- A. These specifications are subject to change without notice, due to any of the following:
 - 1. Product innovation
 - 2. Modifications to industry test standards requirement
 - 3. Revisions of safety requirements