

NEMA SPD 1.1-2019

Standard for Part 1—
Surge Protective Device
Specification Guide for
Low Voltage Power
Distribution Systems



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*Part 1—Surge Protective Device Specification Guide for
Low Voltage Power Distribution Systems*

Published by:

National Electrical Manufacturers Association

1300 North 17th Street, Suite 900

Rosslyn, Virginia 22209

www.nema.org

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Foreword

This foreword is not part of NEMA SPD1.1—*Surge Protective Device Specification Guide for Low Voltage Power Distribution Systems—Part 1*.

A properly derived and professionally presented product specification enhances the credibility of a manufacturer as it clarifies and verifies the characteristics and capabilities of their product. A manufacturer should completely describe the product by using an accurate product specification sheet.

This guide represents the consensus of NEMA's Low Voltage Surge Protective Device (SPD) Section 5VS. It is intended to serve primarily as a guide for those who use or specify SPDs and others affiliated with the Low Voltage SPD marketplace so that uniformity of specifications, in terms of valid, understandable parameters, will improve the comprehension, application, and utilization of SPDs. The parameters will be defined in adequate detail to allow the user to make a proper interpretation of the relevant specifications and evaluation of aspects necessary for the application. The methods associated with their measure or derivation will be referenced, though most are extensively addressed, since adequate procedural definition and discussion is already available in NEMA, ANSI, IEEE, UL and IEC technical publications.

Historically, SPDs have been known as a Transient Voltage Surge Suppressors (TVSS) or Secondary Surge Arresters (SSA). To harmonize with modern technical literature and international nomenclature, the term "Surge Protective Device" or "SPD" has been adopted to refer to the same product.

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The information detailed in this guide is intended to identify the system compatibility and performance ratings of a surge protective device (SPD), that should be addressed by the manufacturer of the SPD. As such, the ratings detailed herein may not apply to every SPD and/or SPD application. In other applications, the complete list of ratings detailed herein, plus others, may be required to meet the protection needs of the end-use equipment or power distribution system.

For safety requirements of the SPD (i.e., electric shock, overcurrent protection and protection against fire hazard) this document references testing and evaluation to the appropriate safety standards. In the US, the primary standard is ANSI/UL 1449. In Canada, the primary standard is CSA C22.2, No. 269 series. In some countries, the primary standard is IEC 61643-11. The requirements of the above standards do not evaluate the effect of SPDs on connected loads, the effect of SPDs on harmonic distortion of the supply voltage, the degree of attenuation provided by SPDs, nor the adequacy of the Voltage Protection Rating of SPDs to protect specific connected equipment from upset or damage.

This Specification Guide supersedes the rescinded LS1-1992 Standard.

References to the *National Electrical Code*[®] (NEC) are from the 2017 Edition unless otherwise indicated. NFPA 70[®], *National Electrical Code*[®] and NEC are registered trademarks of the National Fire Protection Association, Quincy, MA.

This document consists of: a) Specifications Introduction—Terms, definitions and acronyms, b) Specification documentation, c) SPD ratings, and d) Specification Format—a standard format is

presented for specifying, defining requirements and reporting SPD specifications and applications. This Specification Guide was developed by NEMA Low Voltage Surge Protective Devices Section (5VS). The section approval of the guide does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the section was composed of the following members:

ABB Industrial Solutions	Plano, TX
ABB Power Protection, LLC.	Richmond, VA
ASCO Power Technologies	Clearwater, FL
CITEL Inc.	Miramar, FL
Eaton Corporation	Pittsburgh, PA
Emerson Automation Solutions	Rosemont, IL
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Legrand/Pass & Seymour	Syracuse, NY
Leviton Manufacturing	Chula Vista, CA
Littelfuse, Inc.	Chicago, IL
Mersen USA	Newburyport, MA
MVC-Maxivolt	Amarillo, TX
Pentair Engineered Electrical & Fastening Solutions	Solon, OH
Phoenix Contact	Middlebury, PA
Raycap, Inc.	Post Falls, ID
Schneider Electric USA	Salt Lake City, UT
Siemens Industry, Inc.	Norcross, GA
Southwire Company	Clearwater, FL
Space Age Electronics	Sterling, MA
Surge Suppression, LLC	Brooksville, FL

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Section 1 General

1.1 Scope

This specification guide is Part 1 of a series of such guides that is intended to provide guidance on the evaluation, specification and/or use of surge protective devices (SPDs) deployed in low voltage power distribution system applications. This specification guide describes a uniform specification methodology for SPDs, containing at least one non-linear component, that are connected to or within a 50/60 Hz power distribution equipment that is rated up to 1000 Vac. Such SPDs are specifically intended to mitigate the transient overvoltage effects to end-use equipment.

This guide is not intended to introduce new standards, derive tests, create an evaluation methodology, or define extensive vocabulary. It is intended to guide those who are evaluating and/or comparing the essential parameters of SPDs. The parameters being compared are measurable using available commercial test equipment and/or established standards and measurements as referenced in Section 1.2.

1.1.1 Purpose

The purpose of this specification guide is to complete the Specification Checklist included in Section 4. Sections 1-3 and the included annexes are to provide guidance and definition for the compilation of the data required to complete the Specification Checklist.

Note: Locating the checklist at the end of the guide encourages the user to consider the guidance provided ahead of the checklist.

1.2 References

The following publications are adopted in part, by reference in this publication, and are available from the organizations below.

1.2.1 Normative References

The following normative documents contain provisions, which through reference in this text, constitute provisions of this standards publication. By reference herein, these publications are adopted, in whole or in part as indicated, in this standards publication.

The Institute of Electrical and Electronics Engineers
Three Park Avenue
New York, NY 10016-5997 USA

ANSI/IEEE Std. C62.41.2	<i>IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits</i>
ANSI/IEEE Std. C62.45	<i>IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits</i>
ANSI/IEEE Std. C62.62	<i>IEEE Standard Test Specifications for Surge-Protective Devices (SPDs) for Use on the Load Side of the Service Equipment in Low Voltage (1000 V and less) AC Power Circuits</i>
ANSI/IEEE Std. C62.72	<i>Guide for the Application of Surge-Protective Devices for Use on the Load Side of the Service Equipment in Low-Voltage (1000 V or Less, 50 or 60 Hz) AC Power Circuits</i>