NEMA SPD 1.1-2019

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

NOTICE AND DISCLAIMER

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this document.

The National Electrical Manufacturers Association (NEMA) standards and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards and guideline publications.

NEMA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. NEMA disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of your particular purposes or needs. NEMA does not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, NEMA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

NEMA has no power, nor does it undertake to police or enforce compliance with the contents of this document. NEMA does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health or safety–related information in this document shall not be attributable to NEMA and is solely the responsibility of the certifier or maker of the statement.

CONTENTS

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.

NEMA Standards Publications are subject to periodic review. They are revised frequently to reflect user input and to meet changing conditions and technical progress. Proposed revisions to this Standard Publication should be submitted to:

Technical Director, Operations
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

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
Hubbell Inc.	Shelton, CT
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	Middletown, 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

< This page left intentionally blank. >

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.