



**IEEE**

**IEC/IEEE 62395-1**

Edition 1.0 2024-06

# **INTERNATIONAL STANDARD**



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**Electrical resistance trace heating systems for industrial and commercial applications –  
Part 1: General and testing requirements**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 25.180.10

ISBN 978-2-8322-9002-6

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## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions.....	9
4 General requirements.....	14
4.1 General.....	14
4.2 Electrically conductive covering.....	15
4.3 Electrical circuit protection requirements for branch circuits.....	15
4.4 Temperature requirements.....	15
4.4.1 General.....	15
4.4.2 Stabilized design.....	15
4.4.3 Controlled design.....	15
4.4.4 Controls and monitoring for fire sprinkler systems and safety showers.....	16
5 Testing.....	16
5.1 Type tests – General.....	16
5.2 Type tests – All applications.....	19
5.2.1 Dielectric test.....	19
5.2.2 Electrical insulation resistance test.....	20
5.2.3 Flammability test.....	20
5.2.4 Room temperature impact test.....	23
5.2.5 Minimum temperature impact test.....	25
5.2.6 Deformation test.....	26
5.2.7 Cold bend test.....	27
5.2.8 Water resistance test.....	28
5.2.9 Integral components resistance to water test.....	28
5.2.10 Verification of rated output.....	29
5.2.11 Thermal stability of electrical insulating material.....	33
5.2.12 Thermal performance test.....	33
5.2.13 Maximum sheath temperature.....	35
5.2.14 Verification of start-up current.....	46
5.2.15 Verification of the electrical resistance of the electrically conductive covering.....	46
5.2.16 Test for heating device / heating device set glands - General.....	47
5.2.17 Connection Integrity (integral components).....	48
5.3 Type tests – Additional tests for outdoor exposed surface heating installations without thermal insulation.....	50
5.3.1 Verification of rated output.....	50
5.3.2 Determination of maximum sheath temperature.....	50
5.3.3 Increased moisture resistance test.....	50
5.3.4 UV and condensation test.....	51
5.3.5 Resistance to cutting test.....	51
5.3.6 Abrasion test.....	51
5.3.7 Tension test.....	52
5.3.8 Rail system voltage spike test.....	52
5.3.9 Rail system over-voltage test.....	53

- 5.4 Type tests – Additional tests and test modifications for embedded heating applications..... 53
  - 5.4.1 Verification of rated output..... 53
  - 5.4.2 Determination of maximum sheath temperature ..... 53
  - 5.4.3 Resistance to cutting test..... 53
  - 5.4.4 Flammability test ..... 53
- 5.5 Type tests – Additional tests for applications of trace heaters internal to conduit and piping..... 53
  - 5.5.1 Verification of rated output..... 53
  - 5.5.2 Determination of maximum sheath temperature ..... 53
  - 5.5.3 Increased moisture resistance test..... 54
  - 5.5.4 Pull-strength test ..... 54
- 5.6 Type tests – Additional requirements for sprinkler systems ..... 55
  - 5.6.1 Normal and abnormal operation test ..... 55
  - 5.6.2 Normal operation test with controller..... 55
  - 5.6.3 Abnormal operation test with controller malfunctioning..... 58
  - 5.6.4 Abnormal operation test without controller ..... 58
  - 5.6.5 Testing for control systems for fire sprinkler systems ..... 58
- 5.7 Routine tests..... 58
  - 5.7.1 Dielectric test..... 58
  - 5.7.2 Verification of rated output..... 59
- 6 Marking ..... 59
  - 6.1 General..... 59
  - 6.2 Product markings ..... 59
- 7 Installation instructions ..... 60
- Annex A (informative) Determination of test samples for type testing ..... 62
- Bibliography..... 64

- Figure 1 – Flammability test..... 22
- Figure 2 – Example of room temperature impact test apparatus ..... 24
- Figure 3 – Example of minimum temperature impact test apparatus ..... 26
- Figure 4 – Cold bend test..... 27
- Figure 5 – Integral components resistance to water test..... 28
- Figure 6 – Verification of rated output ..... 32
- Figure 7 – Verification of sheath temperatures utilizing pipe sculpture fixture..... 37
- Figure 8 – Verification of sheath temperatures utilizing plate fixture ..... 39
- Figure 9 – Verification of sheath temperatures utilizing plate fixture with serpentine sample..... 40
- Figure 10 – Plate fixture with two samples crossed over ..... 41
- Figure 11 – Plate fixture with a single sample crossed over ..... 42
- Figure 12 – Maximum sheath temperature using the product approach ..... 46
- Figure 13 – Gland temperature measurement – location of thermocouples..... 48
- Figure 14 – Typical splice firm attachment apparatus ..... 49
- Figure 15 – Abrasion test..... 52
- Figure 16 – Sprinkler system temperature control test – branch line arrangement..... 56

Figure 17 – Sprinkler system temperature control test – branch line – alternative arrangement .....	57
Figure 18 – Sprinkler system temperature control test – supply pipe arrangement .....	57
Table 1 – Trace heater and surface heater types and related attributes .....	17
Table 2 – Applicable tests for trace heaters, surface heaters, and integral components, by trace heater and surface heater type .....	18
Table 3 – Test voltages for the dielectric test .....	19
Table 4 – Applicable test subclauses for the verification of rated output.....	29
Table 5 – Pulling forces for strain relief test .....	47
Table 6 – Product marking .....	60
Table A.1 – Determination of test samples .....	62

# ELECTRICAL RESISTANCE TRACE HEATING SYSTEMS FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS –

## Part 1: General and testing requirements

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IEC/IEEE 62395-1 has been prepared by IEC technical committee 27: Industrial electroheating and electromagnetic processing, in cooperation with Petroleum & Chemical Industry Committee of the IEEE Industrial Applications Society, under the IEC/IEEE Dual Logo Agreement between IEC and IEEE. It is an International Standard.

This document is published as an IEC/IEEE Dual Logo standard.

This first edition cancels and replaces the second edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes, apart from general revisions of IEC 62395-1 and harmonization with IEEE 515 [1]<sup>1</sup> and IEEE 515.1 [2], with respect to the previous edition:

- a) Added control and monitoring requirements for fire sprinkler systems and safety showers.
- b) Provided a supplemental ice bath method for verification of rated output.
- c) Provided constructional and type test requirements for glands used to terminate heating devices to an exposed enclosure.

The text of this International Standard is based on the following IEC documents:

Draft	Report on voting
27/1182A/FDIS	27/1186/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications/](http://www.iec.ch/publications/).

A list of all parts in the IEC 62395 series, published under the general title *Electrical resistance trace heating systems for industrial and commercial applications*, can be found on the IEC website.

The IEC Technical Committee and IEEE Technical Committee have decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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<sup>1</sup> Numbers in square brackets refer to the Bibliography.

## INTRODUCTION

IEC/IEEE 62395-1 provides the essential requirements and testing appropriate to electrical resistance trace heating equipment used in industrial and commercial applications. While some of this work already exists in national or international standards, this document has collated much of this existing work and added considerably to it.

IEC/IEEE 62395-2 provides detailed recommendations for the system design, installation and maintenance of electric trace heating systems in industrial and commercial applications.

It is the objective of the IEC/IEEE 62395 series that, when in normal use, electrical trace heating systems operate safely under their defined conditions of use, by

- a) employing heaters of the appropriate construction and meeting the test criteria detailed in IEC/IEEE 62395-1. The construction includes a metallic sheath, braid, screen or equivalent electrically conductive covering;
- b) operating at safe temperatures when designed, installed, and maintained in accordance with IEC/IEEE 62395-2.
- c) having at least the minimum levels of overcurrent and earth-fault protection required in IEC/IEEE 62395-1 and IEC/IEEE 62395-2.

# **ELECTRICAL RESISTANCE TRACE HEATING SYSTEMS FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS –**

## **Part 1: General and testing requirements**

### **1 Scope**

This part of IEC/IEEE 62395 specifies requirements for electrical resistance trace heating systems and includes general test requirements.

This document pertains to trace heating systems that can comprise either factory-fabricated or field-assembled (work-site) units, and which can be series and parallel trace heaters or surface heaters (heater pads and heater panels) that have been assembled and/or terminated in accordance with the manufacturer's instructions.

This document also includes requirements for termination assemblies and control methods used with trace heating systems.

This document provides the essential requirements and testing appropriate to electrical resistance trace heating equipment used in industrial and commercial applications. The products complying with this document are intended to be installed by persons who are suitably trained in the techniques required and that only trained personnel carry out especially critical work, such as the installation of connections and terminations. Installations are intended to be carried out under the supervision of a qualified person who has undergone supplementary training in electric trace heating systems.

This document does not include or provide for any applications in potentially explosive atmospheres.

This document does not cover induction, impedance or skin effect heating.

Trace heating systems are grouped into different types of applications and the different conditions found during and after installation necessitate different requirements for testing. Trace heating systems are usually for a specific type of installation or application. The product type grouping, applications and product attributes are indicated in Table 1.

NOTE Trace heating systems intended for use in explosive atmospheres are the subject of IEC/IEEE 60079-30-1 [3] and IEC/IEEE 60079-30-2 [4].

### **2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60519-1, *Safety in installations for electroheating and electromagnetic processing – Part 1: General requirements*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60695-11-3:2012, *Fire hazard testing – Part 11-3: Test flames – 500 W flames – Apparatus and confirmational test methods*



IEC/IEEE 62395-2:2024, *Electrical resistance trace heating systems for industrial and commercial applications – Part 2: Application guide for system design, installation and maintenance*

ISO 7240-2:2017, *Fire detection and alarm systems – Part 2: Fire detection control and indicating equipment*

ANSI/UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems – Control and Indicating Equipment*

ASTM D 5025-20, *Standard Specification for Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials*

ASTM G155-21, *Standard practice for operating xenon arc light apparatus for exposure of non-metallic materials*