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**Industrijski in komercialni sistemi električnih uporovnih grelnih trakov - 1. del:
Splošno in zahteve za preskušanje (IEC/IEEE 62395-1:2024)**

Electrical resistance trace heating systems for industrial and commercial applications -
Part 1: General and testing requirements (IEC/IEEE 62395-1:2024)

Elektrische Widerstands-Begleitheizungen für industrielle und gewerbliche Zwecke - Teil
1: Allgemeine Anforderungen und Prüfanforderungen (IEC/IEEE 62395-1:2024)

Systèmes de traçage par résistance électrique pour applications industrielles et
commerciales - Partie 1 : exigences générales et d'essai (IEC/IEEE 62395-1:2024)

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ICS:

25.180.10 Električne peči Electric furnaces

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**Electrical resistance trace heating systems for industrial and
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(IEC/IEEE 62395-1:2024)**

Systèmes de traçage par résistance électrique pour
applications industrielles et commerciales - Partie 1 :
exigences générales et d'essai
(IEC/IEEE 62395-1:2024)

Elektrische Widerstands-Begleitheizungen für industrielle
und gewerbliche Zwecke - Teil 1: Allgemeine
Anforderungen und Prüfanforderungen
(IEC/IEEE 62395-1:2024)

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European Committee for Electrotechnical Standardization
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EN IEC/IEEE 62395-1:2026 (E)**European foreword**

This document (EN IEC/IEEE 62395-1:2026) consists of the text of IEC/IEEE 62395-1:2024 prepared by IEC/TC 27 "Industrial electroheating and electromagnetic processing".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2027-07-31
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2029-07-31

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In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC/IEEE 60079-30-1:2015	NOTE	Approved as EN 60079-30-1:2017
IEC/IEEE 60079-30-2:2015	NOTE	Approved as EN 60079-30-2:2017
IEC 61010-1	NOTE	Approved as EN 61010-1
IEC 60730-2-9	NOTE	Approved as EN IEC 60730-2-9
IEC 60068-2-5	NOTE	Approved as EN IEC 60068-2-5
IEC 62368-1	NOTE	Approved as EN IEC 62368-1

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60519-1	-	Safety in installations for electroheating and electromagnetic processing - Part 1: General requirements	EN IEC 60519-1	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60695-11-3	2012	Fire hazard testing - Part 11-3: Test flames - 500 W flames - Apparatus and confirmational test methods	EN 60695-11-3	2012
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	EN IEC/IEEE 62395-2	2026
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 ζ 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 nonmetallic materials	-	-

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INTERNATIONAL STANDARD



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

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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

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ELECTRICAL RESISTANCE TRACE HEATING SYSTEMS FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS –

Part 1: General and testing requirements

FOREWORD

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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]¹ 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. The main document types developed by IEC are described in greater detail at 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 in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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¹ 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.

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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*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO, IEC and IEEE maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEEE Standards Dictionary Online: available at <http://dictionary.ieee.org>

NOTE 1 General definitions are given in the International Electrotechnical Vocabulary, IEC 60050 (all parts) [5]. Terms relating to industrial electroheat are defined in IEC 60050-841 [6].

NOTE 2 The terms defined in this Clause 3 are used both in IEC/IEEE 62395-1 and IEC/IEEE 62395-2.

3.1

ambient temperature

temperature surrounding the object under consideration

Note 1 to entry: Where trace heaters or surface heaters are enclosed in thermal insulation, the ambient temperature is the temperature exterior to such thermal insulation.

3.1.1

maximum ambient temperature

highest specified ambient temperature

3.1.2

minimum ambient temperature

lowest specified ambient temperature

Note 1 to entry: Heat-loss calculations in IEC 62395-2 are based on the minimum ambient temperature.

3.2

branch circuit

portion of the wiring installation between the overcurrent device protecting the circuit and the trace heater(s) or surface heater(s)

3.3

cold lead

electrically insulated conductor or conductors used to connect a trace heater or surface heater to the branch circuit and designed so that it does not produce significant heat