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Electrical resistance trace heating systems for industrial and commercial applications – Part 2: Application guide for system design, installation and maintenance

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ELECTRICAL RESISTANCE TRACE HEATING SYSTEMS FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS –

Part 2: Application guide for system design, installation and maintenance

FOREWORD

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IEC/IEEE 62395-2 was prepared by IEC technical committee 27: Industrial electroheating and electromagnetic, in cooperation with the 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 standard cancels and replaces IEC 62395-2:2013. This edition constitutes a technical revision.

This standard includes the following significant technical changes with respect to IEC 62395-2:2013:

a) Design considerations for trace heating on sprinkler systems have been expanded and a figure has been added to illustrate how to avoid undue shadowing of spray patterns from insulated sprigs close to sprinkler heads;
b) Specific details of design considerations for trace heating for emergency eyewash units and safety showers have been added.

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

Draft	Report on voting
27/1183/FDIS	27/1185/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/.

This standard is intended to be used in conjunction with IEC/IEEE 62395-1.

A list of all parts in the IEC 62395 series, 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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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, maintenance and repair of electrical resistance trace heating systems in industrial and commercial applications which can include piping, vessels, roofs and concrete slab heating 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 so as to meet the test criteria and requirements 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 2: Application guide for system design, installation and maintenance

1 Scope

This part of IEC/IEEE 62395 provides detailed recommendations for the system design, installation, maintenance and repair of electrical resistance trace heating systems in industrial and commercial applications. This document does not include or provide for any applications in potentially explosive atmospheres.

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

The products covered by 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 cover induction, impedance or skin effect heating.

Trace heating systems and surface heating systems can be grouped into different types of installations. These are characterized by different requirements for testing and are usually certified for a specific type of installation or application. Typical applications for the different types of installation are shown in Table 1.

Table 1 – Trace heater and surface heater types and related attributes

Trace heater type	Intended installations	Examples of installations	Required attributes
A	Insulated surfaces (including pipe)	Hot water lines Freeze protection Grease lines Fuel oil lines Pre-insulated pipe Below grade trace heating Sprinkler systems	Dielectric, thermal, mechanical, moisture exclusion, and performance characteristics verification Sprinkler system verification (if specified for use)
B	Outdoor exposed areas	Roof deicing Gutter and downspouts deicing Catch basins and drains Rail heating systems	Dielectric, thermal, mechanical, moisture exclusion, and performance characteristics verification Increased moisture resistance UV and condensation resistance Resistance to cutting Abrasion resistance Tension test Rail system tests (if specified for use)

Trace heater type	Intended installations	Examples of installations	Required attributes
C	Installations with embedded trace heating	Embedded snow melting Embedded frost heave protection Embedded floor warming Embedded energy storage systems Embedded door frames	Dielectric, thermal, mechanical, moisture exclusion, and performance characteristics verification Resistance to cutting Resistance to crushing
D	Installations with trace heater inside conduit or piping	Embedded snow melting Embedded frost heave protection Embedded floor warming Embedded energy storage systems Embedded door frames Internal trace heating for freeze protection of potable water lines Enclosed drains and culverts	Dielectric, thermal, mechanical, moisture exclusion, and performance characteristics verification Increased moisture resistance (pressurized or non-pressurized) Pull-strength evaluation
NOTE Trace heating systems intended for use in explosive atmospheres are the subject of IEC/IEEE 60079-30-1 and IEC/IEEE 60079-30-2.			

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/IEEE 62395-1:2024, *Electrical resistance trace heating systems for industrial and commercial applications – Part 1: General and testing requirements*