TECHNICAL SPECIFICATION

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

(IEC/TS 62395-2:2008)

Systèmes de traçage par résistance électrique pour applications industrielles et commerciales -
Partie 2: Guide d'application pour la conception, l'installation et la maintenance du système
(CEI/TS 62395-2:2008)

Elektrische Begleitheizungen (Trace-Widerstandsheizungen) für industrielle und gewerbliche Zwecke -
Teil 2: Anwendungsleitfaden für Systementwurf, Installation und Wartung
(IEC/TS 62395-2:2008)

This Technical Specification was approved by CENELEC on 2010-10-25.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This Technical Specification consists of the text of the Technical Specification IEC/TS 62395-2:2008 prepared by IEC TC 27, Industrial electroheating.

It was circulated for voting in accordance with the Internal Regulations, Part 2, Subclause 11.3.3.3 and was accepted as a CENELEC Technical Specification on 2010-10-25.

The following date was fixed:

– latest date by which the existence of the CLC/TS has to be announced at national level (doa) 2011-04-25

Annex ZA has been added by CENELEC.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-841	-	International Electrotechnical Vocabulary (IEV) - Part 841: Industrial electroheat	-	-
IEC 60519-1	-	Safety in electroheat installations - Part 1: General requirements	EN 60519-1	-
IEC 62395-1	2006	Electrical resistance trace heating systems for industrial and commercial applications - Part 1: General and testing requirements	EN 62395-1	2006

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INTRODUCTION

IEC 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 standard has collated much of this existing work and added considerably to it.

IEC/TS 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 IEC 62395 that, when in normal use, electrical trace heating systems should 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 62395-1. The construction should include a metallic sheath, braid, screen or equivalent electrically conductive covering;

b) operating at safe temperatures when designed, installed, and maintained in accordance with IEC/TS 62395-2;

c) having at least the minimum levels of overcurrent and ground fault protection requirements in IEC 62395-1 (2006) (4.3).

ELECTRICAL RESISTANCE TRACE HEATING SYSTEMS FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS –

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

1 Scope and object

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

This specification pertains to trace heating systems that may comprise either factory constructed or field (work-site) assembled units, and which may be series heater cables, parallel heater cables, heater pads or heater panels that have been assembled and/or terminated in accordance with the manufacturer's instructions for connection to voltage supplies up to and including 450 V/750 V.

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

Trace 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 as follows:

a) Installations of trace heating on pipes, vessels and associated equipment. Applications include:
   - freeze protection and temperature maintenance;
   - hot water lines;
   - oil and chemical lines;
   - sprinkler systems.

b) Outdoor exposed area installations of trace heating. Applications include:
   - roof de-icing;
   - gutter and downspout de-icing;
   - catch basins and drains;
   - rail heating.

c) Installation with embedded trace heating. Applications include:
   - snow melting;
   - floor warming;
   - frost heave prevention;
   - underground thermal energy storage systems;
   - door frames.

d) Installations with trace heating inside conduit or piping. Applications include:
   - snow melting – in conduit;
   - floor warming – in conduit;
   - frost heave prevention – in conduit;

- underground thermal energy storage systems – in conduit;
- internal trace heating of potable water lines;
- enclosed drains and culverts.

2 Normative references

The following referenced documents are indispensable for the application 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 60050-841, *International Electrotechnical Vocabulary – Part 841: Industrial electroheat*

IEC 60519-1, *Safety in electroheat installations – Part 1: General requirements*

IEC 62395-1:2006, *Electrical resistance trace heating systems for industrial and commercial applications – Part 1: General and testing requirements*

3 Terms and definitions

For the purposes of this document, the referenced terms and definitions are given in IEC 60519-1, IEC 62395-1 and IEC 60050-841.

4 Surface heating of vessels and piping systems

4.1 Application description

4.1.1 General

Piping and vessels are often provided with surface-mounted trace heating systems to maintain water above freezing-point and to maintain process fluids and gases at given temperature levels. The trace heaters compensate for heat losses to the environment that are reduced but not eliminated by thermal insulation.

4.1.2 Environmental conditions

Attention should be directed to the surrounding environmental conditions, especially for systems that are exposed to sunlight (ultraviolet exposure), coastal atmospheres (corrosive salt spray and high humidity), and chemical atmospheres such as oil refineries and chemical plants.

Equipment subject to ultraviolet exposure may degrade due to surface oxidation, which can possibly lead to surface embrittlement and cracking. Corrosive atmospheres can affect the same exposed surfaces and can accelerate degradation of surfaces that are also susceptible to ultraviolet exposure. Chemical exposure can affect all equipment, whether covered by thermal insulation or not.

The trace heating equipment for piping and vessels is often protected from corrosion and ultraviolet exposure to some degree by the thermal insulation. However, these systems can have components that are exposed to the environment such as electrical connection components and weather barrier around the thermal insulation. The selection of trace heating equipment shall include a review of the suitability of equipment to the expected environmental conditions.