SLOVENSKI PREDSTANDARD

oSIST prEN 62086-1:2005

november 2005

Električne naprave za eksplozivne plinske atmosfere – Segrevanje sledi z električno upornostjo – 1. del: Splošno in zahteve za preskušanje

Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements

ICS 29.260.20

Referenčna številka
oSIST prEN 62086-1:2005(en)

31/584/CDV

COMMITTEE DRAFT FOR VOTE (CDV)
PROJET DE COMITÉ POUR VOTE (CDV)

Project number Numéro de projet	IEC 62086-1 Ed. 2.0	
IEC/TC or SC: **TC 31** CEI/CE ou SC:	Date of circulation Date de diffusion **2005-07-15**	Closing date for voting (Voting mandatory for P-members) Date de clôture du vote (Vote obligatoire pour les membres (P)) **2005-12-16**
Titre du CE/SC: Équipement pour atmosphères explosives gazeuses	TC/SC Title: Electrical equipment for explosive atmospheres	
Secretary: UK — G F Thompson Secrétaire:		
Also of interest to the following committees Intéresse également les comités suivants TC 18	Supersedes document Remplace le document 31/501/CD and 31/537A/CC	
Functions concerned Fonctions concernées ☐ Safety / Sécurité ☐ EMC / CEM ☐ Environment / Environnement ☐ Quality assurance / Assurance qualité		

CE DOCUMENT EST TOUJOURS À L'ÉTUDE ET SUSCEPTIBLE DE MODIFICATION. IL NE PEUT SERVIR DE RÉFÉRENCE.

LES RÉCIPIENDAIRES DU PRÉSENT DOCUMENT SONT INVITÉS À PRÉSENTER, AVEC LEURS OBSERVATIONS, LA NOTIFICATION DES DROITS DE PROPRIÉTÉ DONT ILS AURAIENT ÉVENTUELLEMENT CONNAISSANCE ET À FOURNIR UNE DOCUMENTATION EXPLICATIVE.

THIS DOCUMENT IS STILL UNDER STUDY AND SUBJECT TO CHANGE. IT SHOULD NOT BE USED FOR REFERENCE PURPOSES.

RECIPIENTS OF THIS DOCUMENT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

Titre : CEI 62086-1 Ed. 2.0: Matériel électrique pour atmosphères explosives gazeuses – Traçage par résistance électrique – Partie 1: Règles générales et d'essais

Title : IEC 62086-1 Ed. 2.0: Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements

Note d'introduction

Introductory note

ATTENTION	ATTENTION
CDV soumis en parallèle au vote (CEI) et à l'enquête (CENELEC)	**Parallel IEC CDV/CENELEC Enquiry**

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES – ELECTRICAL RESISTANCE TRACE HEATING –

Part 1: General and testing requirements

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62086-1 has been prepared by IEC technical committee 31: Electrical apparatus for explosive atmospheres.

The general revisions and updating of Edition 1 are as a result of National comments received.

The main technical differences apart from the general revision and updating from Edition 1 are:

a) The inclusion of Thermal safety requirements for the manufacturer's quality program.

b) The inclusion of a 14 day water resistance test.

c) The further harmonization of Edition 1 with several national standards.

The text of this standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date[1)] indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

1) The National Committees are requested to note that for this publication the maintenance result date is ....

INTRODUCTION

This part of IEC 62086 is intended to provide a comprehensive overview of the essential requirements and testing appropriate to electric surface heating equipment used in explosive gas atmospheres. The requirements of this standard are considered to be the minimum requirements for zone 1 or zone 2. While some of this work already exists in national standards or international standards, this standard has collated much of this existing work and added considerably to it. This standard should be read in conjunction with IEC 62086-2: Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 2: Application guide for design, installation and maintenance.

ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES – ELECTRICAL RESISTANCE TRACE HEATING –

Part 1: General and testing requirements

1 Scope

This part of IEC 62086 specifies general and testing requirements for electrical resistance trace heaters for application in explosive gas atmospheres. The standard covers trace heaters that may comprise either factory- or field- (work-site) assembled units, and which may be series heating cables, parallel heating cables or heating pads and heating panels that have been assembled and/or terminated in accordance with the manufacturer's instructions.

This standard also includes requirements for termination assemblies and control methods used with trace heating. The hazardous areas referred to by this standard are those defined in IEC 60079-10.

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 60050-151, *International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices*

IEC 60050-426, *International Electrotechnical Vocabulary (IEV) – Part 426: Electrical apparatus for explosive atmospheres*

IEC 60079-0:2004, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*

IEC 60079-7:2001, *Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety 'e'*

IEC 60079-10:2002, *Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas*

IEC 60364-3, *Electrical installations of buildings – Part 3: Assessment of general characteristics*

3 Definitions

For the purpose of this part of IEC 62086, the following definitions as well as the definitions given in IEC 60050-426, IEC 60079-0, and IEC 60079-7 apply.

3.1
ambient temperature
temperature surrounding the object under consideration. Where electrical trace heaters are enclosed in thermal insulation, the ambient temperature is the temperature exterior to such thermal insulation

3.2
branch circuit
that portion of the wiring installation between the overcurrent device protecting the circuit and the trace heater unit(s)

3.3
connections (terminations)

3.3.1
cold lead
electrically insulated conductor or conductors used to connect a trace heater to the branch circuit and designed so that it does not produce significant heat

3.3.2
end termination
termination, which may be heat producing, applied to a trace heater at the end opposite that where the power is supplied

3.3.3
power termination
termination applied to the end of a trace heater at which the power is supplied

3.4
tee
electrical connection of trace heaters, in series or in parallel, to accommodate a tee or branch

3.5
dead leg
segment of process piping segregated from the normal flow pattern for the purpose of providing a heat-loss reference

3.6
design loading
minimum power that will meet the design requirements, in the worst conditions, after voltage and resistance tolerances and appropriate safety factors have been considered

3.7
factory-fabricated
trace heaters, including the necessary terminations and connections, assembled into units or sets

3.8
field-assembled
trace heaters supplied in bulk with terminating components to be assembled at the work site

3.9
heat loss
energy flow from a pipe, vessel or equipment to its surroundings

3.10
heat sink
part that conducts and dissipates heat away from a workpiece

NOTE Typical heat sinks are pipe shoes, pipe supports and items of large mass such as valve actuators or pump bodies.

3.11
heat-transfer aids
thermally conductive materials, such as metallic foils or heat-transfer compounds used to increase the heat-transfer efficiency from trace heaters to the workpiece

3.12
heating pad
trace heater comprising series- or parallel-connected elements having sufficient flexibility to conform to the shape of the surface to be heated

3.13
heating panel
non-flexible trace heater comprising series- or parallel-connected elements fabricated to conform to the general shape of the surface to be heated

3.14
high-limit temperature
maximum allowable temperature of the system, including piping, fluid and heating system

3.15
maximum withstand temperature
maximum operating or exposure temperature that will not adversely effect the thermal stability of the trace heater and its component parts

3.16
metallic covering
metal sheath or braid used to provide physical protection for a trace heater, and/or an electrical earth path

3.19
minimum ambient temperature
lowest ambient temperature specified at which heat-loss calculations are based and the trace heating is operable and performs according to the specified requirements

3.20
operating voltage
actual voltage applied to the trace heater when in service

3.21
overjacket
continuous layer of insulating material applied outside the metallic sheath, screen or armouring to protect against corrosion