SLOVENSKI STANDARD

SIST EN 62086-2:2005

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Električne naprave za eksplozivne plinske atmosfere - Električni uporovni grelni trakovi - 2. del: Vodila za zasnovo, vgraditev in vzdrževanje (IEC 62086-2:2001)

Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part 2: Application guide for design, installation and maintenance (IEC 62086-2:2001)

ICS 29.260.20

Referenčna številka
SIST EN 62086-2:2005(en)

EUROPEAN STANDARD **EN 62086-2**

NORME EUROPÉENNE

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English version

Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating Part 2: Application guide for design, installation and maintenance (IEC 62086-2:2001)

Matériel électrique pour atmosphères explosives gazeuses – Traçage par résistance électrique Partie 2: Guide d'application pour la conception, l'installation et la maintenance (CEI 62086-2:2001)

Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche – Elektrische Widerstands-Begleitheizungen Teil 2: Anwendungsleitfaden für Entwurf, Installation und Instandhaltung (IEC 62086-2:2001)

This European Standard was approved by CENELEC on 2005-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 62086-2:2005 E

Foreword

The text of the International Standard IEC 62086-2:2001, prepared by IEC TC 31, Electrical apparatus for explosive atmospheres, was submitted to the CENELEC Unique Acceptance Procedure and was approved by CENELEC as EN 62086-2 on 2005-02-01 without any modification.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2006-05-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2008-02-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62086-2:2001 was approved by CENELEC as a European Standard without any modification.

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 Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60079-0	1998 [1]	Electrical apparatus for explosive gas atmospheres Part 0: General requirements	-	-
IEC 60079-10	1995	Part 10: Classification of hazardous areas	EN 60079-10	1996 [2]
IEC 60079-14	1996	Part 14: Electrical installations in hazardous areas (other than mines)	EN 60079-14	1997 [3]
IEC 60079-17	1996	Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)	EN 60079-17	1997 [4]
IEC 62086-1	2001	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating Part 1: General and testing requirements	EN 62086-1	2005

[1] IEC 60079-0:1998 is superseded by IEC 60079-0:2004, which is harmonized as EN 60079-0:2005 (mod).

[2] EN 60079-10:1996 is superseded by EN 60079-10:2003, which is based on IEC 60079-10:2002.

[3] EN 60079-14:1997 is superseded by EN 60079-14:2003, which is based on IEC 60079-14:2002.

[4] EN 60079-17:1997 is superseded by EN 60079-17:2003, which is based on IEC 60079-17:2002.

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Matériel électrique pour atmosphères explosives gazeuses –
Traçage par résistance électrique –

Partie 2:
Guide d'application pour la conception, l'installation et la maintenance

Electrical apparatus for explosive gas atmospheres –
Electrical resistance trace heating –

Part 2:
Application guide for design, installation and maintenance

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2: Application guide for design, installation and maintenance

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62086-2 has been prepared by IEC technical committee 31: Electrical apparatus for explosive atmospheres.

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

FDIS	Report on voting
31/347/FDIS	31/359/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 3.

The committee has decided that the contents of this publication will remain unchanged until 2003. At this date, the publication will be

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

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

Part 2: Application guide for design, installation and maintenance

1 Scope

This part of IEC 62086 provides guidance for the application of electrical resistance trace-heating systems in areas where explosive gas atmospheres may be present.

It provides recommendations for the design, installation and maintenance of trace-heating equipment and associated control and monitoring equipment.

This part supplements the requirements specified in IEC 62086-1.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 62086. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 62086 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60079-0:1998, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*

IEC 60079-10:1995, *Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas*

IEC 60079-14:1996, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 60079-17:1996, *Electrical apparatus for explosive gas atmospheres – Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)*

IEC 62086-1, *Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements* [1)]

3 Definitions

For the purposes of this part of IEC 62086, the definitions in IEC 62086-1 apply.

[1)] To be published.

4 Application considerations

4.1 General

This standard supplements the requirements of IEC 60079-14 and IEC 60079-17.

Where trace-heating systems are to be installed in explosive gas atmospheres, full details of the hazardous area classification(s) (IEC 60079-10) should be specified. The specification should state the zone of risk (1 or 2), gas group (IIA, IIB or IIC) and temperature classification in accordance with IEC 60079-0. Where special considerations apply or where site conditions may be especially onerous, these conditions should be detailed in the trace-heating specification.

Where trace-heating systems are to be installed on mobile equipment or interchangeable skid units, the specification for these trace-heating systems should be designed to accommodate the worst conditions in which the trace-heating system may be used.

Where any parts of the trace-heating system are likely to be exposed to ultraviolet radiation, those parts should be suitable for use in such conditions.

4.2 Corrosive areas

All components of electric trace-heating systems should be examined to verify that they are compatible with any corrosive materials that may be encountered during the lifetime of the system. Trace-heating systems operating in corrosive environments may have a higher potential for failure than in non-corrosive environments. Deterioration of the thermal insulation system is made worse by corrosion of the weather barrier and the possibility of pipeline and vessel leaks soaking the thermal insulation. Particular attention should be given to the materials of piping systems, as well as the electric trace-heating systems, as related to the effective earth-leakage/ground-fault return path. The use of non-metallic or hybrid piping systems may further complicate the earth-leakage/ground-fault return path and special consideration should be given to these piping systems. Earth-leakage/ground-fault return paths that are established at the time of installation may become degraded due to corrosion during the operation of the plant.

4.3 Installation considerations

For convenience, various process types, according to the degree of application criticality and process temperature accuracy required, may be specified (see table 1). However, it should be recognized that each specific application may involve a combination of considerations.

Table 1 – Process types

Application criticality	Process temperature accuracy required		
	Above a minimum point type I	Within a moderate band type II	Within a narrow band type III
Critical (C-)[a]	C – I	C – II	C – III
Non-critical (NC-)[b]	NC – I	NC – II	NC – III

[a] Critical applications

[b] Non-critical applications

When the trace heating is critical to the process, consideration should be given to circuit monitoring (heating circuits should be monitored for correct operation and alarms provided to indicate damage or fault) and to back up (redundant) heating systems. Spare or back-up trace heating controls may be specified to be automatically activated in the event of a fault being indicated by the monitoring/alarm system. This is sometimes known as “redundance”. Back-up trace heating allows maintenance and repairs to be performed without a process shutdown.

4.4 Process temperature accuracy

4.4.1 Type I

A type I process is one for which the temperature should be maintained above a minimum point. Ambient sensing control may be acceptable. Large blocks of power may be controlled by means of a single control device and an electrical distribution panel board. Heat input may be provided unnecessarily at times and wide temperature excursions should be tolerable. Energy efficiency may be improved through the use of dead-leg control techniques (see 6.13).

4.4.2 Type II

A type II process is one for which the temperature should be maintained within a moderate band. Pipeline sensing mechanical thermostats may be typical.

4.4.3 Type III

A type III process is one for which the temperature should be controlled within a narrow band. Pipe-sensing controllers using thermocouple or resistance-temperature detector (RTD) units facilitate field (work site) calibration and provide maximum flexibility in the selection of temperature alarm and monitoring functions. Heat input capability may be provided to heat up or raise the fluid temperature, or both, within a specified range and time interval. Type III considerations require strict adherence to flow patterns and thermal insulation systems.

5 Thermal insulation

5.1 General

The selection, installation and maintenance of thermal insulation should be considered a key component in the performance of an electrical trace-heating system. The thermal insulation system is normally designed to prevent the majority of heat loss with the trace-heating system compensating for the remainder. Therefore, problems with thermal insulation will have a direct impact on the overall system performance.

The primary function of thermal insulation is to reduce the rate of heat transfer from a surface that is operating at a temperature other than ambient. This reduction of energy loss may

– reduce operating expenses;
– improve system performance;
– increase system output capability.