SVENSK STANDARD SS-EN 50271

Fastställd	Utgåva	Sida	Ansvarig kommitté
2010-10-25	2	1 (1+28)	SEK TK 31

Elektriska apparater för detektering och mätning av syre eller brännbara eller giftiga gaser – Särskilda fordringar på digitala apparater och apparater med programvara

Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen – Requirements and tests for apparatus using software and/or digital technologies

Som svensk standard gäller europastandarden EN 50271:2010. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50271:2010.

Nationellt förord

Tidigare fastställd svensk standard SS-EN 50271, utgåva 1, 2002, gäller ej fr o m 2013-06-01.

ICS 13.320

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50271

June 2010

ICS 13.320

Supersedes EN 50271:2001

English version

Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies

Appareils électriques de détection et de mesure des gaz combustibles, des gaz toxiques ou de l'oxygène - Exigences et essais pour les appareils utilisant un logiciel et/ou des technologies numériques

Elektrische Geräte für die Detektion und Messung von brennbaren Gasen, giftigen Gasen oder Sauerstoff - Anforderungen und Prüfungen für Warngeräte, die Software und/oder Digitaltechnik nutzen

This European Standard was approved by CENELEC on 2010-06-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 50271:2010 E

SEK Svensk Elstandard

Foreword

This European Standard was prepared by SC 31-9, Electrical apparatus for the detection and measurement of combustible gases to be used in industrial and commercial potentially explosive atmospheres, of Technical Committee CENELEC TC 31, Electrical apparatus for potentially explosive atmospheres. It was submitted to the formal vote and approved by CENELEC as EN 50271 on 2010-06-01.

This document supersedes EN 50271:2001.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The State of the Art is included in Annex ZY "*Significant changes between this European Standard and EN 50271:2001*".

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)	2011-06-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-06-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 94/9/EC. See Annex ZZ.

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Introduction

This European Standard specifies minimum requirements for functional safety of gas detection apparatus using software and/or digital technologies and defines criteria for reliability and avoidance of faults. Functional safety is that part of the overall safety which is related to the measures within the gas detection apparatus to avoid or to handle failures in such a manner that the safety function will be assured.

Gas detection apparatus will fail to function if dangerous failures occur. The aim of this European Standard is to reduce the risk of dangerous equipment failures to levels appropriate to typical applications of such apparatus.

Failure to function will also occur if such apparatus are not selected, installed or maintained in an appropriate manner. In some applications failures of this type will dominate the functional safety achieved. Users of gas detection apparatus will therefore need to ensure that selection, installation and maintenance of such apparatus are carried out appropriately. Guidance for the selection, installation, use and maintenance of gas detection apparatus are set out in EN 60079-29-2 and EN 45544-4, respectively.

This European Standard does not include requirements for operational availability which will need to be considered separately.

Regarding the requirements for the software development process, this European Standard specifies a practical approach to comply with the requirements of EN 61508-3 for SIL 1 without using this generic standard.

It is recommended to apply this European Standard for apparatus used for safety applications with SIL-requirement 1 instead of EN 50402 because EN 50402 is designed for the assessment of more complex gas detection systems with SIL-requirements greater than 1. However, the technical requirements of EN 50271 and EN 50402 are the same for SIL 1.

1 Scope

This European Standard specifies minimum requirements and tests for electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen using software and/or digital technologies. Additional requirements are specified if compliance with safety integrity level 1 (SIL 1) according to EN 61508 series is required for low demand mode of operation.

NOTE 1 It is recommended to apply this European Standard for apparatus used for safety applications with SIL-requirement 1 instead of EN 50402. However, the technical requirements of EN 50271 and EN 50402 are the same for SIL 1.

NOTE 2 For fixed apparatus used for safety applications with SIL-requirements higher than 1 EN 50402 is applicable.

This European Standard is applicable to fixed, transportable and portable apparatus intended for use in domestic premises as well as commercial and industrial applications.

This European Standard does not apply to external sampling systems, or to apparatus of laboratory or scientific type, or to apparatus used only for process control purposes.

This European Standard supplements the requirements of the European Standards for the detection and measurement of flammable gases and vapours (e.g. EN 60079-29-1, EN 50241-1, EN 50241-2, EN 50194-1, EN 50194-2), toxic gases (e.g. EN 45544 series, EN 50291-1, EN 50291-2) or oxygen (e.g. EN 50104).

NOTE 3 These European Standards will be mentioned in this European Standard as "metrological standards".

NOTE 4 The examples above show the state of the standardisation for gas detection apparatus at the time of publishing this European Standard. There may be other metrological standards for which this European Standard is also applicable.

This European Standard is a product standard which is based on EN 61508 series. It covers part of the phase 9 "realisation" of the overall safety life cycle defined in EN 61508-1.

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.

EN 45544-1	Workplace atmospheres – Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours – Part 1: General requirements and test methods
EN 45544-2	Workplace atmospheres – Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours – Part 2: Performance requirements for apparatus used for measuring concentrations in the region of limit values
EN 45544-3	Workplace atmospheres – Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours – Part 3: Performance requirements for apparatus used for measuring concentrations well above limit values
EN 45544-4	Workplace atmospheres – Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours – Part 4: Guide for selection, installation, use and maintenance
EN 50104	Electrical apparatus for the detection and measurement of oxygen – Performance requirements and test methods

EN 50194-1	Electrical apparatus for the detection of combustible gases in domestic premises – Part 1: Test methods and performance requirements
EN 50194-2	Electrical apparatus for the detection of combustible gases in domestic premises – Part 2: Electrical apparatus for continuous operation in a fixed installation in recreational vehicles and similar premises – Additional test methods and performance requirements
EN 50241-1	Specification for open path apparatus for the detection of combustible or toxic gases and vapours – Part 1: General requirements and test methods
EN 50241-2	Specification for open path apparatus for the detection of combustible or toxic gases and vapours – Part 2: Performance requirements for apparatus for the detection of combustible gases
EN 50291-1	Electrical apparatus for the detection of carbon monoxide in domestic premises – Part 1: Test methods and performance requirements
EN 50291-2	Electrical apparatus for the detection of carbon monoxide in domestic premises – Part 2: Electrical apparatus for continuous operation in a fixed installation in recreational vehicles and similar premises including recreational craft – Additional test methods and performance requirements
EN 50402:2005 + A1:2008	Electrical apparatus for the detection and measurement of combustible or toxic gases or vapours or of oxygen – Requirements on the functional safety of fixed gas detection systems
EN 60079-29-1:2007	Explosive atmospheres – Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases (IEC 60079-29-1:2007, mod.)
EN 60079-29-2	Explosive atmospheres – Part 29-2: Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen (IEC 60079-29-2)
EN 61508-1:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1: General requirements (IEC 61508-1:1998 + corr. May 1999)
EN 61508-2:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems (IEC 61508-2:2000)
EN 61508-3:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements (IEC 61508-3:1998 + corr. Apr. 1999)
EN 61508-4:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 4: Definitions and abbreviations (IEC 61508-4:1998 + corr. Apr. 1999)
EN 61508-5:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 5: Examples of methods for the determination of safety integrity levels (IEC 61508-5:1998 + corr. Apr. 1999)
EN 61508-6:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3 (IEC 61508-6:2000)
EN 61508-7:2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 7: Overview of techniques and measures (IEC 61508-7:2000)