

Electrical apparatus for use in the presence of combustible dust —

Part 4: Type of protection “pD”

The European Standard EN 61241-4:2006 has the status of a
British Standard

ICS 29.260.20

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61241-4:2006. It is identical with IEC 61241-4:2001. It supersedes BS IEC 61241-4:2001, which will be withdrawn on 1 April 2009.

The UK participation in its preparation was entrusted by Technical Committee GEL/31, Equipment for explosive atmospheres, to Subcommittee GEL/31/20, Apparatus for use in the presence of ignitable dust.

A list of organizations represented on GEL/31/20 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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Electrical apparatus for use in the presence of combustible dust
Part 4: Type of protection "pD"
(IEC 61241-4:2001)

Matériels électriques destinés
à être utilisés en présence
de poussières combustibles
Partie 4: Type de protection "pD"
(CEI 61241-4:2001)

Elektrische Betriebsmittel zur Verwendung
in Bereichen mit brennbarem Staub
Teil 4: Zündschutzart "pD"
(IEC 61241-4:2001)

This European Standard was approved by CENELEC on 2006-04-01. 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, 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

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Foreword

The text of the International Standard IEC 61241-4:2001, prepared by SC 31H, Apparatus for use in the presence of combustible dust, of IEC TC 31, Electrical apparatus for explosive atmospheres, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 61241-4 on 2006-04-01.

This European Standard is to be read in conjunction with EN 61241-0 as applicable to "Equipment Group II, Categories 2D and 3D".

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) 2007-07-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-04-01

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.

Annexes ZA and ZZ have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61241-4:2001 was approved by CENELEC as a European Standard without any modification.

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ELECTRICAL APPARATUS FOR USE IN THE PRESENCE OF COMBUSTIBLE DUST –

Part 4: Type of protection "pD"

1 Scope

This part of IEC 61241 gives requirements on the design, construction, testing and marking of electrical apparatus for use in combustible dust atmospheres in which a protective gas (air or inert gas), maintained at a pressure above that of the external atmosphere, is used to prevent the entry of dust which might otherwise lead to the formation of a combustible mixture within enclosures which do not contain a source of combustible dust.

This standard contains the specific requirements for construction and testing, including protective requirements that apply to electrical apparatus with type of protection pressurization "pD" intended for use in potentially combustible dust atmospheres.

This standard includes the requirements for the construction of the enclosure and its associated components, including, if any, the inlet and outlet ducts for the protective gas, and for the safety provisions and devices necessary to ensure that pressurization is established and maintained for type of protection pressurization "pD".

Requirements for pressurized enclosures with an internal source of dust release are not included in this standard.

This standard does not cover the requirements for pressurized rooms with or without internal sources of dust release.

This standard does not apply to dusts of explosives which do not require atmospheric oxygen for combustion or to pyrophoric substances.

This standard does not cover combined gas and dust hazard. Those requirements are under consideration.

The requirements contained in this standard are supplementary to those in IEC 61241-1-1.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61241. 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 61241 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed 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 60034-1:1996, *Rotating electrical machines – Part 1: Rating and performance* ¹⁾

¹⁾ There exists a consolidated edition 10.2 (1999) that includes edition 10.0 and its amendments.

IEC 61241 (all parts), *Electrical apparatus for use in the presence of combustible dust*

IEC 61241-1-1:1999, *Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures and surface temperature limitation – Specification for apparatus*

IEC 61241-1-2:1999, *Electrical apparatus for use in the presence of combustible dust – Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation – Selection, installation and maintenance*

IEC 61241-3:1997, *Electrical apparatus for use in the presence of combustible dust – Part 3: Classification of areas where combustible dusts are or may be present*

3 Definitions

For the purpose of this part of IEC 61241, the definitions from IEC 61241-1-1 and the following apply.

3.1

type of protection "pD"

technique of applying a protective gas to an enclosure in order to prevent the formation of an explosive dust atmosphere inside the enclosure by maintaining an overpressure against the surrounding atmosphere

3.2

overpressure

pressure above ambient pressure within a pressurized enclosure

3.3

pressurization

technique of guarding against the ingress of the external dust atmosphere, which may be explosive, into an enclosure by maintaining a protective gas therein at a pressure above that of the external atmosphere

3.4

protective gas

air or inert gas used for maintaining an overpressure

NOTE For the purpose of this standard inert gas means nitrogen, carbon dioxide, argon or any gas which, when mixed with oxygen in the ratio of 4:1 as found in air, does not make the ignition and combustible properties, such as combustible limits, more onerous.

3.5

enclosure

all the walls which surround the live parts of electrical apparatus including doors, covers, cable entries, rods, spindles and shafts and which ensure the protection of the electrical apparatus

3.6

pressurized enclosure

enclosure in which protective gas is maintained at a pressure greater than that of the external atmosphere

NOTE The pressurized enclosure may or may not also be the enclosure surrounding the live parts and ensuring the protection in other respects of the electrical apparatus.

3.7

static pressurization

maintenance of an overpressure within a pressurized enclosure without the addition of protective gas in a hazardous area

3.8

pressurization with leakage compensation

maintenance of an overpressure within a pressurized enclosure so that, when the outlet apertures – if any – are closed, the supply of protective gas is sufficient to compensate for any leakage from the pressurized enclosure and its ducts

3.9

pressurization with continuous flow of the protective gas

maintenance of an overpressure within a pressurized enclosure with continuous flow of the protective gas through the enclosure

3.10

electrical apparatus

items applied as a whole or in part for the utilization of electrical energy. These include, among others, items for the generation, transmission, distribution, storage, measurement, regulation, conversion, and consumption of electrical energy and items for telecommunications

3.11

ignition-capable apparatus

apparatus which, in normal operation, constitutes a source of ignition for a specified combustible dust atmosphere. This includes electrical apparatus not protected by a type of protection listed in IEC 61241-1-2

3.12

self-revealing fault

fault which would cause a malfunction of the apparatus necessitating correction before proceeding with further operation of the apparatus and which may be indicated, for example, by an audible or visible signal

3.13

opening

aperture, door, window or non-airtight fixed panel

3.14

protective device

device provided to protect a system against conditions which could result in a fire or explosion

3.15

alarm

piece of apparatus that generates a visual or audible signal that is intended to attract attention

3.16

indicator

piece of apparatus that shows flow or pressure and is monitored periodically, consistent with the requirement of the application

3.17

protected apparatus

electrical apparatus internal to the pressurized enclosure