Electrical installations for lighting and beaconing of aerodromes - Part 3-2: Requirements for power supplies - Particular requirements for series circuits

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 61820-3-2:2023 sisaldab Euroopa standardi EN IEC 61820-3-2:2023 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 61820-3-2:2023 consists of the English text of the European standard EN IEC 61820-3-2:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.11.2023.	Date of Availability of the European standard is 24.11.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.140.50, 93.120

EUROPEAN STANDARD

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English Version

Electrical installations for lighting and beaconing of aerodromes - Part 3-2: Requirements for power supplies - Particular requirements for series circuits (IEC 61820-3-2:2023)

Installations électriques pour l'éclairage et le balisage des aérodromes - Partie 3-2 : Exigences relatives aux alimentations électriques - Exigences particulières relatives aux circuits série
(IEC 61820-3-2:2023)

Elektrische Anlagen für die Beleuchtung und Befeuerung von Flugplätzen - Besondere Anforderungen an Serienkreisstromversorgungen
(IEC 61820-3-2:2023)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 97/264/FDIS, future edition 1 of IEC 61820-3-2, prepared by IEC/TC 97 "Electrical installations for lighting and beaconing of aerodromes" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61820-3-2:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-08-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-11-14

This document supersedes EN 61822:2009 and all of its amendments and corrigenda (if any).

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Endorsement notice

The text of the International Standard IEC 61820-3-2:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60099-4:2014	NOTE	Approved as EN 60099-4:2014 (not modified)
IEC 60529	NOTE	Approved as EN 60529
IEC 60664-1:2020	NOTE	Approved as EN IEC 60664-1:2020 (not modified)
IEC 60721-3-3	NOTE	Approved as EN IEC 60721-3-3
IEC 61000-3-2	NOTE	Approved as EN IEC 61000-3-2
IEC 61000-3-12	NOTE	Approved as EN 61000-3-12
IEC 61140	NOTE	Approved as EN 61140
IEC 61557-8	NOTE	Approved as EN 61557-8
IEC 61558 series	NOTE	Approved as EN 61558 series
IEC 61643-12	NOTE	Approved as CLC/TS 61643-12
IEC 61820-3-4	NOTE	Approved as EN IEC 61820-3-4
IEC 61822:2009	NOTE	Approved as EN 61822:2009 (not modified)
IEC 62305-1	NOTE	Approved as EN 62305-1
IEC 62305-2	NOTE	Approved as EN 62305-2
IEC 62305-3	NOTE	Approved as EN 62305-3
IEC 62443-4-2	NOTE	Approved as EN IEC 62443-4-2

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electrical installations for lighting and beaconing of aerodromes – Part 3-2: Requirements for power supplies – Particular requirements for series circuits

Installations électriques pour l'éclairage et le balisage des aérodromes – Partie 3-2 : Exigences relatives aux alimentations électriques – Exigences particulières relatives aux circuits série

IEC 61820-3-2:2023-10(en-fr)

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INTERNATIONAL STANDARD

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Electrical installations for lighting and beaconing of aerodromes – Part 3-2: Requirements for power supplies – Particular requirements for series circuits

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CONTENTS

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ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES –

Part 3-2: Requirements for power supplies – Particular requirements for series circuits

FOREWORD

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IEC 61820-3-2 has been prepared by IEC technical committee 97: Electrical installations for lighting and beaconing of aerodromes. It is an International Standard.

This first edition cancels and replaces IEC 61822 published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 61822:2009:

a) introduction of power electronic converter systems (PECS) to be used in the aeronautical ground lighting systems other than the 6,6 A aeronautical ground lighting systems;
b) introduction of classification for different device types;

c) introduction of IEC 62477-1:2022 and IEC 62477-2:2018 as the basis for safety related requirements.

The text of this International Standard is based on the following documents:

Draft	Report on voting
97/264/FDIS	97/265/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61820 series, published under the general title *Electrical installations for lighting and beaconing of aerodromes*, can be found on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

This document introduces an open specification for power electronic converter systems (PECS) to be used in aeronautical ground lighting (AGL) series circuit systems. The aim of this open specification is to enable various technologies to be used within AGL systems while ensuring the safe operation and function of the AGL system based on specific items in a series circuit topology.

This document also includes updated requirements for 6,6 A constant current regulators (CCR), previously defined in IEC 61822:2009.

The PECS defined in this document are power supplies for AGL circuits with a series circuit topology. It is possible that a PECS is not interoperable with AGL devices designed for the 6,6 A system. It is also possible that a PECS is not interoperable with AGL devices from other PECS-driven AGL systems. Special care should be taken to ensure the interoperability of the AGL components unless they are specifically designed to be operated together.

To clarify the distinction between different series circuit power supplies, a new classification system is introduced in Clause 4. A base class divides the power supplies into PECS and CCRs. In this document the term PECS refers to series circuit power supplies belonging to the class "General PECS for AGL systems" and the term CCR refers to series circuit power supplies belonging to the class "CCR for 6,6 A systems". The term PECS/CCR refers to both device classes. The class "CCR for 6,6 A AGL systems" corresponds to the traditional series circuit power supplies as defined by IEC 61822:2009.

In addition to the base class, classes for voltage ranges and construction mechanics are introduced. Where a part of this document only refers to one or more specific AGL systems, the systems in question will be clearly indicated.

Meanwhile this updated edition can be partially applicable to PECS dedicated to converting power from a mains supply to power suited for AGL other than series circuit topology. The maintenance work of IEC 61822:2009 into IEC 61820-3-2 started before the writing of the related subparts IEC 61820-3-1 and IEC 61820-3-3 had started. This updated version can therefore be partially applicable to PECS dedicated to converting power from a mains supply to power suited for AGL systems with other than series circuit topology.

ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES –

Part 3-2: Requirements for power supplies – Particular requirements for series circuits

1 Scope

This part of IEC 61820 specifies the requirements for power electronic converter systems (PECS) dedicated to powering aeronautical ground lighting (AGL) circuits with series circuit topology. An example of a traditional implementation is an AGL circuit with 6,6 A RMS nominal current, powered by a constant current regulator (CCR). In addition to revising the requirements for 6,6 A CCR setups, this document introduces requirements for general PECS for new AGL systems including systems specifically designed for LED based luminaires.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60038, *IEC standard voltages*

IEC 60076-11, *Power transformers – Part 11: Dry-type transformers*

IEC 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments*

IEC 61000-6-5, *Electromagnetic compatibility (EMC) – Part 6-5: Generic standards – Immunity for equipment used in power station and substation environment*

IEC 61439-1, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 61439-2, *Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 61820-1:2019, *Electrical installations for aeronautical ground lighting at aerodromes – Part 1: Fundamental principles*

IEC 62477-1:2022, *Safety requirements for power electronic converter systems and equipment – Part 1: General*

IEC 62477-2:2018, *Safety requirements for power electronic converter systems and equipment – Part 2: Power electronic converters from 1 000 V AC or 1 500 V DC up to 36 kV AC or 54 kV DC*

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

CISPR 32, *Electromagnetic compatibility of multimedia equipment – Emission requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
aeronautical ground lighting constant current series circuit
AGL constant current series circuit
apparatus configured as an electrical circuit designed to produce and operate with a constant current, independent of variations in the load, in order to provide a specified light output for aeronautical purposes

3.2
constant current regulator
CCR
apparatus which produces a current output at a constant root mean square (RMS) value independent of variations in the constant current series circuit load, input voltage and service conditions as specified

Note 1 to entry: Within this document, the term CCR is reserved for series circuit power supplies belonging to the class CCR for 6,6 A AGL systems.

Note 2 to entry: It is acknowledged that legacy systems still in use across the world also use alternative current ratings such as 8,33 A and 12 A but 6,6 A is the present standard. For the purposes of this document, 6,6 A systems will be referenced only.

3.3
open circuit
AGL constant current series circuit with an unplanned interruption at any location of the primary current line that produces a hazardous high voltage between the interrupted circuit sections

3.4
forced ventilation
cooling system in which the air is moved by external power

3.5
power electronic converter
PEC
device or part thereof for the purpose of electronic power conversion, including signalling, measurement, control circuitries and other parts, if essential for the power conversion function

[SOURCE: IEC 62477-1:2022, 3.55]

3.6
power electronic converter system
PECS
one or more power electronic converters intended to work together with other equipment

Note 1 to entry: Within this document, the term PECS is reserved for series circuit power supplies belonging to the class General PECS for AGL systems.

[SOURCE: IEC 62477-1:2022, 3.56, modified – "System consisting of" replaced with "one or more" in the definition and Note 1 to entry added.]