Carrier cycles - Part 5: Electrical aspects

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NATIONAL FOREWORD

See Eesti standard EVS-EN 17860-5:2024 sisaldab Euroopa standardi EN 17860-5:2024 ingliskeelset teksti.	This Estonian standard EVS-EN 17860-5:2024 consists of the English text of the European standard EN 17860-5:2024.
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 18.12.2024.	Date of Availability of the European standard is 18.12.2024.
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.

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European foreword

This document (EN 17860-5:2024) has been prepared by Technical Committee CEN/TC 333 “Cycles”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2025, and conflicting national standards shall be withdrawn at the latest by June 2025.

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

This document is part of standard series consisting of the following parts:

— EN 17860-1:2024, Carrier cycles — Part 1: Terms and definitions

— EN 17860-2:2024, Carrier cycles — Part 2: Lightweight single track carrier cycles — Mechanical aspects

— EN 17860-3:2024, Carrier Cycles — Part 3: Lightweight multi track carrier cycles — Mechanical aspects

— prEN 17860-4:2024, Carrier Cycles — Part 4: Heavy weight carrier cycles — Mechanical and functional aspects

— FprEN 17860-5:2024, Carrier cycles — Part 5: Electrical aspects

— prEN 17860-6:2024, Carrier Cycles — Part 6: Passenger transport

— FprEN 17860-7:2024, Carrier cycles — Cargo trailers

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document has been developed in response to an increased demand throughout Europe for carrier cycles of a type which are excluded from the scope of Regulation (EU) No 168/2013. Electrical aspects of electric trailers and other peripherals such as chargers are also part of this document.

1 Scope

This document applies to:

— functional and electrical safety aspects of carrier cycles covered in all parts of EN 17860;

— electrical aspects of electrically power assisted cycle trailers (EPACT) covered in prEN 17860-7;

— electrical aspects of batteries used for carrier cycles;

— electrical aspects of chargers used for carrier cycles.

This document does not apply to charging stations.

This document specifies requirements and test methods for motor power management systems, electrical circuits including the charger for the assessment of the design and assembly of carrier cycles and subassemblies for systems having a Safety Extra Low Voltage (SELV) maximum working voltage ≤ 60 V d.c. disregarding transients.

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.

EN 17860-1:2024, *Carrier cycles — Part 1: Terms and definitions*

EN 17860-2:2024, *Carrier cycles — Part 2: Lightweight single track carrier cycles — Mechanical aspects*

EN 15194:2017+A1:2023, *Cycles — Electrically power assisted cycles — EPAC Bicycles*

EN ISO 7010, *Graphical symbols — Safety colours and safety signs — Registered safety signs (ISO 7010)*

EN ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100)*

EN ISO 13849 (all parts), *Safety of machinery — Safety-related parts of control systems*

CEN/TS 17831:2023, *Cycles — Electrically power assisted cycles — Anti-tampering measures*

EN 50604-1:2016, *Secondary lithium batteries for light EV (electric vehicle) applications — Part 1: General safety requirements and test methods*

EN 50604-1:2016/A1:2021, *Secondary lithium batteries for light EV (electric vehicle) applications — Part 1: General safety requirements and test methods*

IEC 60034-1, *Rotating electrical machines — Part 1: Rating and performance*

EN 60068-2-27, *Environmental testing — Part 2-27: Tests — Test Ea and guidance: Shock (IEC 60068-2-27)*

IEC 60335-1:2020, *Household and similar electrical appliances — Safety — Part 1: General requirements*

EN 60335-2-29, *Household and similar electrical appliances — Safety — Part 2-29: Particular requirements for battery chargers (IEC 60335-2-29)*

HD 60364-5-52:2011, *Low-voltage electrical installations — Part 5-52: Selection and erection of electrical equipment — Wiring systems*

IEC 60417, *Graphical symbols for use on equipment*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN IEC 61000-6-1, *Electromagnetic compatibility (EMC) — Part 6-1: Generic standards — Immunity standard for residential, commercial and light-industrial environments*

EN IEC 61000-6-3, *Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for equipment in residential environments*

ISO 6742-1, *Cycles — Lighting and retro-reflective devices —Part 1:Lighting and light signalling devices*

ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17860-1:2024 apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

4 General requirements

4.1 Risk assessment

Carrier EPAC and electrically assisted cycle trailers (EPACT) shall be designed in accordance with the principles of EN ISO 12100 for relevant hazards which are not dealt with by this document. This includes evaluation of such risks for all relevant components.

4.2 Significant hazards and safety functions

4.2.1 Significant hazards

The following significant hazards of carrier EPAC have been considered in this document:

a) mechanical hazards: deceleration, acceleration, instability, kinetic energy, rotating elements and moving elements, rough or slippery surfaces, sharp edges;

b) electrical hazards: electromagnetic phenomena, electrostatic phenomena, overload, short-circuit, thermal radiation;

c) thermal hazards: explosion, flame, radiation from heat sources, objects or materials with a high or low temperature;

d) ergonomic hazards: effort, local lighting, posture;

e) hazards associated with the environment in which the carrier EPAC is used: water (dust).