SLOVENSKI STANDARD
oSIST prEN IEC 55012:2024

01-junij-2024

Vozila, plovila in naprave, ki jih poganjajo motorji z notranjim zgorevanjem - Karakteristike občutljivosti za radijske motnje - Mejne vrednosti in merilne metode za zaščito zunanjih sprejemnikov

Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers

Fahrzeuge, Boote und von Verbrennungsmotoren angetriebene Geräte - Funkstöreigenschaften - Grenzwerte und Messverfahren zum Schutz von außerhalb befindlichen Empfängern

Véhicules, bateaux et moteurs à combustion interne - Caractéristiques de perturbation radioélectrique - Limites et méthodes de mesure pour la protection des récepteurs extérieurs

Ta slovenski standard je istoveten z: **prEN IEC 55012:2024**

ICS:

27.020	Motorji z notranjim zgorevanjem	Internal combustion engines
33.100.10	Emisija	Emission

oSIST prEN IEC 55012:2024 **en**

CIS/D/498/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **CISPR 12 ED7**	
DATE OF CIRCULATION: **2024-04-12**	CLOSING DATE FOR VOTING: **2024-07-05**
SUPERSEDES DOCUMENTS: **CIS/D/497/RR**	

IEC CIS/D : ELECTROMAGNETIC DISTURBANCES RELATED TO ELECTRIC/ELECTRONIC EQUIPMENT ON VEHICLES AND INTERNAL COMBUSTION ENGINE POWERED DEVICES

SECRETARIAT: Germany	SECRETARY: Mr Holger Hirsch
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 69,TC 125,CIS/H	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☒ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

Attention IEC-CENELEC parallel voting

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers

PROPOSED STABILITY DATE: 2030

NOTE FROM TC/SC OFFICERS:

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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VEHICLES, BOATS AND DEVICES WITH INTERNAL COMBUSTION ENGINES OR TRACTION BATTERIES – RADIO DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT FOR THE PROTECTION OF OFF-BOARD RECEIVERS

FOREWORD

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International Standard CISPR 12 has been prepared by CISPR subcommittee D: Electromagnetic disturbances related to electric/electronic equipment on vehicles, boats and internal combustion powered devices.

This seventh edition cancels and replaces the sixth edition published in 2007 and its Amendment 1 (2009). This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) test setups for electric vehicles and hybrid electric vehicles in charging mode were added,
b) antenna positions relative to the vehicle were defined,
c) some statements dealing with series surveillance and type approval were deleted,
d) annexes for measurement instrumentation uncertainty were added,

e) an annex describing networks to be used for the charging mode was added and

f) general improvements were made.

g) the vehicles, boats and devices subject to this standard are separated into three groups with corresponding limits applied accordingly

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

FDIS	Report on voting
CISPR/XX/FDIS	CISPR/XX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

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

INTRODUCTION

There is a specific need for standards to define acceptable radio frequency performance of all electrical/electronic products. CISPR 12 has been developed to serve the vehicles, boats, internal combustion engines and related industries with test methods and limits that provide satisfactory protection for radio reception.

CISPR 12 has been used for many years as a regulatory requirement in numerous countries, to provide protection for radio receivers at a 10 m distance. It has been effective in protecting the radio environment outside the vehicle.

VEHICLES, BOATS AND DEVICES WITH INTERNAL COMBUSTION ENGINES OR TRACTION BATTERIES – RADIO DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT FOR THE PROTECTION OF OFF-BOARD RECEIVERS

1 Scope

The limits in this International Standard are designed to provide protection in the frequency range of 30 MHz to 1 000 MHz for off-board receivers. Compliance with this document might not provide adequate protection for receivers nearer than 10 m to the vehicle, boat or device.

This document applies to the emission of electromagnetic energy that can cause interference to radio reception and which is emitted from:

1) vehicles propelled by an internal combustion engine (ICE), electrical means or both (see 3.1.30);
2) boats propelled by an ICE, electrical means or both (see 3.1.4). Boats are to be tested in the same manner as vehicles except where they have unique characteristics as explicitly stated in this document;
3) devices equipped with ICE (see 3.1.8). In the case of hybrid devices (e.g. equipped with both ICE and traction batteries), only the ICE mode is included in this document;
4) inboard and outboard boat engines/ motors [i.e. equipped with ICE, electric motor (EM), or both], when marketed independently.

See Annex D for a flow chart and a list of examples to help determine the applicability of CISPR 12.

This document does not apply to aircraft, household appliances, medical devices, traction systems (railway engine or locomotive, streetcar or tram and electric trolley bus), vehicle / boat / device off-board chargers or to incomplete vehicles/boats/devices. In the case of a dual-mode trolley bus (e.g. propelled by power from either AC/DC mains or an ICE), the ICE propulsion system is included, but the EM propulsion portion of the vehicle is excluded from this document. In addition, domestic helper robots, such as household cleaning robots, hotel service robots and personal safety robots are also excluded from the scope of this document.

NOTE 1 Other than inboard or outboard boat engines/ motors that are marketed independently, this document does not apply to components or incomplete products, such as an ICE, an incomplete vehicle/boat that has not yet been fitted with an ICE or EM, or spare parts. This document only applies to the final product, which is equipped with all necessary parts and components to be able to function as intended.

NOTE 2 Appliances without ICE for typical housekeeping and service functions in the household and similar environment are covered by the requirements of CISPR 14-1.

NOTE 3 Protection of receivers used on board the same vehicle as the disturbance source(s) are covered by CISPR 25.

This document does not prescribe measurement methods or limits for conducted disturbances, for the charging mode of operation, where the (electric or hybrid) vehicle/boat is connected to power mains, either directly (i.e. plug-in vehicle or boat) or indirectly (i.e. wireless power charging). The user is referred to appropriate IEC and CISPR standards, which define measurement techniques and limits for this condition.

NOTE 4 See IEC 61851-21-1 for road vehicles and IEC 61000-6-3, IEC 61000-6-4 and IEC 61000-6-8 for other types of vehicles or boats.

The emission requirements in this document are not applicable to the intentional transmissions from a radio transmitter, as defined by the ITU-R, including their spurious emissions.

Equipment that is covered by other CISPR product and product family emission standards are excluded from the scope of this standard, except where they include ICE(s). In the latter case, the equipment shall comply with this standard in all modes of operation where the ICE(s) is(are) active.

NOTE 5 The other CISPR product or product family emission standard might also apply to the equipment for those modes of operation where the ICE(s) is (are) not active. In case the ICE(s) is (are) always in operation, the other CISPR product or product family emission standard might still apply, for verifying the emissions from the other components and circuitry of the equipment.

Annex B and Annex C contain methods to evaluate the disturbance characteristics of high voltage ignition systems.

Annex H lists work being considered for future revisions.

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 each reference, only the edition cited applies.

IEC 61851-1:2017, *Electric vehicle conductive charging system – Part 1: General requirements*

IEC 61980-1:2020, *Electric vehicle wireless power transfer (WPT) systems - Part 1: General requirements*

CISPR 16-1-1:2019, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-1-2:2014, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measurement apparatus – Coupling devices for conducted disturbance measurements*
CISPR 16-1-2:2014/AMD1:2017

CISPR 16-1-3:2004, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-3 Radio disturbance and immunity measuring apparatus – Ancillary equipment – Disturbance power*
CISPR 16-1-3:2004/AMD1:2016
CISPR 16-1-3:2004/AMD2:2020

CISPR 16-1-4:2019, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*
CISPR 16-1-4:2019/AMD1:2020

CISPR 16-1-6:2014, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-6: Radio disturbance and immunity measuring apparatus – EMC antenna calibration*
CISPR 16-1-6:2014/AMD1:2017

CISPR 16-2-1:2014, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements*
CISPR 16-2-1:2014/COR1:2020

CISPR 16-2-3:2016, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*
CISPR 16-2-3:2016/AMD1:2019

CISPR 16-4-2:2011 *Specification for radio disturbance and immunity measuring apparatus and networks – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty*
CISPR 16-4-2:2011/AMD1:2014
CISPR 16-4-2:2011/AMD2:2018

CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment – Emission requirements*
CISPR 32:2015/AMD1:2019

ANSI C63.5:2017, *American National Standard for Electromagnetic Compatibility – Radiated Emission Measurements in Electromagnetic Interference (EMI) Control - Calibration and Qualification of Antennas (9 kHz to 40 GHz)*
Corrigendum 1:2018.

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

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

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

3.1.1
absorber lined shielded enclosure
ALSE
shielded enclosure or screened room with radio frequency absorbing material on its internal ceiling and walls

3.1.2
artificial mains network
AMN
network that provides a defined impedance to the EUT at radio frequencies, couples the disturbance voltage to the measuring receiver, and decouples the test circuit from the supply mains

Note 1 to entry: There are two basic types of this network, the V-network (V-AMN), which couples the unsymmetric voltages, and the delta-network (Δ-AMN), which couples symmetric (DM) and asymmetric (CM) voltages separately.

Note 2 to entry: The coupling feature of the AMN is not used for CISPR 12 testing. The coaxial port (“receiver port”) of the AMN is equipped with a 50 Ω termination for all measurements according to this standard.

[SOURCE: CISPR 16-1-2:2014/AMD1:2017, 3.1.6 modified – added Note 2 to entry]

3.1.3
asymmetric artificial network
AAN
network used to measure (or inject) asymmetric (common mode) voltages on unshielded symmetric signal (e.g., telecommunication) lines while rejecting the symmetric (differential mode) signal

Note 1 to entry: The term “Y-network” is a synonym for AAN.

Note 2 to entry: The coupling feature of the AAN is not used for CISPR 12 testing. The coaxial port of the AAN is equipped with a 50 Ω termination for all measurements according to this standard.

[SOURCE: CISPR 16-1-2:2014/AMD1:2017, 3.1.7 modified – added Note 2 to entry]

3.1.4
boat
vessel intended to be used on the surface of water, its length being no greater than 15 m, intended to carry persons or goods and equipped with inboard or outboard boat engine(s)/motor(s)

3.1.5
bond, verb
connect to ground using a ground connection complying with 5.3 of CISPR 16-2-1:2014, with a DC resistance not exceeding 2,5 mΩ

Note 1 to entry: A low current (≤ 100 mA) 4-wire milliohm meter is recommended for these measurements.

3.1.6
charging mode
mode of operation intended for charging the rechargeable energy storage system (REESS)

3.1.6.1
charging mode 1
charging mode as defined in 6.2.1 of IEC 61851-1:2017

Note 1 to entry: In some countries, mode 1 charging can be prohibited or requires special precautions.

3.1.6.2
charging mode 2
charging mode as defined in 6.2.2 of IEC 61851-1:2017, where the vehicle is connected to AC mains using a charging cable, which has an electric vehicle supply equipment (EVSE) box in-line (e.g. In-cable control box / In-cable control and protection device), providing control pilot signalling between the vehicle and the EVSE box and personal protection against electric shock

Note 1 to entry: In some countries, special restrictions have to be applied for mode 2 charging.

Note 2 to entry: There is no communication between the vehicle and the charging infrastructure.

3.1.6.3
charging mode 3
charging mode as defined in 6.2.3 of IEC 61851-1:2017, where the vehicle is connected to a fixed installation (EVSE; e.g. AC charging station, AC wallbox) providing AC power to the vehicle, with communication between the vehicle and the EVSE (through signal/control lines and/or through wired network lines)

3.1.6.4
charging mode 4
charging mode as defined in 6.2.4 of IEC 61851-1:2017, where the vehicle is connected to a fixed installation (EVSE; e.g. DC charging station), providing DC power to the vehicle (with an off-board charger), with communication between the vehicle and the EVSE (through signal/control lines and/or through wired network lines)