



SLOVENSKI STANDARD
SIST ENV 50275-2-3:2002
01-september-2002

Conductive charging for electric vehicles - Part 2-3: D.C. charging station

Conductive charging for electric vehicles -- Part 2-3: D.C. charging station

Konduktive Ladung von Elektrofahrzeugen -- Teil 2-3: Gleichstrom-Ladestation

Charge conductive pour véhicules électriques -- Partie 2-3: Borne de charge courant continu

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Ta slovenski standard je istoveten z: ENV 50275-2-3:1998

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ICS:

43.120 Electric road vehicles

SIST ENV 50275-2-3:2002 **en**

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EUROPEAN PRESTANDARD
PRÉNORME EUROPÉENNE
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ENV 50275-2-3

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English version

**Conductive charging for electric vehicles
Part 2-3: D.C. charging station**

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This European Prestandard (ENV) was approved by CENELEC on 1998-09-14 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CENELEC will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard (EN).

CENELEC members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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Foreword

This European prestandard was prepared by the Technical Committee CENELEC TC 69X, Electrical systems for electric road vehicles in accordance with the decision taken by CLC/TC 69X at its sixth meeting held on 17 September 1997.

The following date was fixed:

- latest date by which the existence of the ENV
has to be announced at national level (doa)1998-09-16

This European prestandard is to be used in conjunction with several specific European prestandards listed in the scope.

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Introduction

This European prestandard - Conductive Charging for Electric Vehicles - is published in separate parts according to the following structure:

Part 1 of this prestandard - General considerations - is a general description and contains general requirements for charging electric vehicles.

Part 2 of this prestandard covers the physical, electrical and performance requirements concerning devices for the charging system, when they are not already standardized.

Part 2 is further subdivided into parts which are published as European prestandards:

Part 2-1: Connection of an electric vehicle to an a.c./d.c. supply.

Part 2-2: A.C. charging station.

Part 2-3: D.C. charging station.

Part 2-4: Communication protocol between off-board charger and electric vehicle.

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1 Scope

This prestandard, together with part 1, gives the requirements for d.c. electric vehicle charging stations for conductive connection to the vehicle, with an a.c. supply voltage per IEC 60038, up to 690V.

This prestandard does not cover all safety aspects related to maintenance.

This prestandard is not applicable to dedicated off-board charger.

2 Normative references

This clause of part 1 applies with the following additional references.

EN 50160	1994	Voltage characteristics of electricity supplied by public distribution systems
EN 60068-2-1 + A1 + A2	1993 1993 1994	Environmental testing - Part 2: Tests - Tests A: Cold (IEC 60068-2-1:1990 + A1:1993 + A2:1994)
EN 60068-2-2 + A1 + A2	1993 1993 1994	Part 2: Tests - Tests B: Dry heat (IEC 60068-2-2:1974 + A1:1993 + A2:1994)
EN 60068-2-62	1995	Part 2: Test Ef: Impact, pendulum hammer (IEC 60068-2-62:1991 + A1:1993)
EN 60309-1	1997	Plugs, socket-outlets and couplers for industrial purposes Part 1: General requirements (IEC 60309-1:1997)
EN 60439-1 + A1	1994 1995	Low-voltage switchgear and controlgear assemblies Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1:1992 + A1:1995)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 61036	1996	Alternating current static watt-hour meters for active energy (classes 1 and 2) (IEC 61036:1996)
EN 61180-1	1994	High voltage test techniques for low-voltage equipment Part 1: Definitions, test and procedure requirements (IEC 61180-1:1992)
HD 323.2.3 S2	1987	Environmental testing - Part 2: Tests - Test Ca: Damp heat, steady state (IEC 60068-2-3:1969)
HD 323.2.5 S2	1988	Part 2: Tests - Test Sa: Simulated solar radiation at ground level (IEC 60068-2-5:1975)
HD 323.2.14 S2	1987	Part 2: Tests - Test N: Change of temperature (IEC 60068-2-14:1984 + A1:1986)
HD 323.2.30 S3	1988	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle) (IEC 60068-2-30:1980 + A1:1985)
HD 323.2.52 S1	1987	Part 2: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution) (IEC 60068-2-52:1984)

HD 384.4.43 S1	1980	Electrical installations of buildings Part 4: Protection for safety Chapter 43: Protection against overcurrent (IEC 60364-4-43:1977; modified)
HD 384.5.54 S1	1988	Part 5: Selection and erection of electrical equipment Chapter 54: Earthing arrangements and protective conductors (IEC 60364-5-54:1980; modified)
HD 625.1	1996	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests (IEC 60664-1:1992; modified)
IEC 60364-4-443	1995	Chapter 44: Protection against over voltages Section 443: Protection against over voltages of atmospheric origin or due to switching

3 Definitions

Clause 3 of part 1 applies with the following additional definition.

3.1 vehicle charging control unit (VCCU): System embedded in the electric vehicle which controls the charging parameters of the off-board charger.

4 General requirements

The d.c. electric vehicle charging station shall be connected to the electric vehicle so that in normal conditions the charging function operates safely, indoors or outdoors, causing no danger to persons or surroundings, even in the event of carelessness that may occur in normal use.

According to part 1 of this prestandard, the EV charging mode is only mode 4 and the supply cable and connector are permanently attached to the charging station (case C).

In general, this is achieved by fulfilling the relevant requirements specified in this prestandard and compliance is checked by carrying out all relevant tests. General requirements for the d.c. charging station can also be found in EN 60439-1.

5 Prestandard conditions for operation in service and for installation

The rated value of the a.c. supply input voltage is 230/400 V. Allowed variation of the voltage and frequency are defined in EN 50160. Industrial a.c. voltage of 690 V may be used to supply d.c. charging station.

The reference operating temperature range is -20°C to 40°C. In some countries, different temperature range may apply.

The extreme limits of -25°C and 60°C are admissible during storage and transportation, and should be taken into account in the design of the device.

The relative humidity is between 5% and 95 %.

The atmospheric pressure is between 860 and 1060 hPa.

6 Rating of the d.c. electric vehicle charging station

The preferred values of the rated input voltage of the d.c. charging station are 230/400 V and 400/690 V.

The preferred values of the rated output voltage of the d.c. charging station are 250, 500, 750 V.

NOTE: The provision of this clause may be subject to revision.

The preferred values of the rated output current of the d.c. charging station are 200 A and 400 A.

7 General tests provisions

- 7.1 All tests in this prestandard are type tests.
- 7.2 Unless otherwise specified, type tests shall be carried out on a single specimen as delivered and configured in accordance with the manufacturer's instructions.
- 7.3 Unless otherwise specified, the tests shall be carried out in the order of the clauses and sub-clauses in this document.
- 7.4 The tests shall be carried out with the specimen or any movable part of it placed in the most unfavourable position which may occur in normal use.
- 7.5 The tests shall be carried out in a draught free location and in general, at an ambient temperature of $20^{\circ}\text{C} \pm 5\text{ C}$, unless otherwise specified.
- 7.6 The characteristics of the test voltages shall comply with EN 61180-1.

8 Functional and constructional requirements

8.1 Control functions

The d.c. electric vehicle charging station provides part of control functions listed in subclause 6.4 of part 1 of this prestandard, for mode 4 charging.

8.2 Emergency service

If required by national rules, an emergency disconnection device shall be installed to isolate all active conductive parts off the d.c. electric vehicle charging station. Protection of the disconnection device should be provided in order to prevent accidental disconnection.

8.3 Permissible temperature

The maximum permissible temperature of parts of the d.c. electric vehicle charging station which may be touched but not hand grasped, at an ambient temperature of 40°C , is:

- 60°C for metal parts
- 85°C for non-metal parts

8.4 Charging station Protection degree (IP)

The d.c. electric vehicle charging station shall conform to IP 44 degree whether the station is energized or not, according to EN 60529.

Connecting means are dealt with in clause 12.

8.5 Location of the support of the connector

If a support is planned to house the connector when the charge is finished, it should be located at a height between 0,4 m and 1,5 m above ground.

8.6 Cable housing on the d.c. electric vehicle charging station

The design of the d.c. electric vehicle charging station shall encourage the user to store the cable correctly on the station after the disconnection.

8.7 Extension cable

The use of an extension cable for the connection of the electric vehicle to the d.c. charging station is to be prohibited.

8.8 Metering

Metering (if any) and the associated tests shall conform with EN 61036.