



SLOVENSKI STANDARD
SIST ENV 50275-2-1:2002
01-september-2002

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

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

Konduktive Ladung von Elektrofahrzeugen -- Teil 2-1: Anschluß eines Elektrofahrzeuges an eine Wechselstrom-/Gleichstrom-Versorgung

Charge conductive pour véhicules électriques -- Partie 2-1: Raccordement d'un véhicule électrique à une alimentation courant alternatif/courant continu

<https://standards.iteh.ai/catalog/standards/sist/2bd1656-4d50-4866-8b7e-2b194393c633/sist-env-50275-2-1-2002>

Ta slovenski standard je istoveten z: ENV 50275-2-1:1998

ICS:

43.120 01.040.10 Electric road vehicles

SIST ENV 50275-2-1:2002 **en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ENV 50275-2-1:2002

<https://standards.iteh.ai/catalog/standards/sist/f2bd1656-4d50-4866-8b7e-2b194393c633/sist-env-50275-2-1-2002>

EUROPEAN PRESTANDARD
PRÉNORME EUROPÉENNE
EUROPÄISCHE VORNORM

ENV 50275-2-1

October 1998

ICS 43.120

English version

**Conductive charging for electric vehicles
Part 2-1: Connection of an electric vehicle to an a.c./d.c. supply**

Konduktive Ladung von
Elektrofahrzeugen
Teil 2-1: Anschluß eines
Elektrofahrzeuges an
A.C./D.C.-Versorgung

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ENV 50275-2-1:2002](https://standards.iteh.ai/catalog/standards/sist/2bd1656-4d50-4866-8b7e-2b194393c633/sist-env-50275-2-1-2002)

<https://standards.iteh.ai/catalog/standards/sist/2bd1656-4d50-4866-8b7e-2b194393c633/sist-env-50275-2-1-2002>

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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) 1998-12-15

This European Prestandard is to be used in conjunction with several specific European Prestandards listed in the scope.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST ENV 50275-2-1:2002

<https://standards.iteh.ai/catalog/standards/sist/f2bd1656-4d50-4866-8b7e-2b194393c633/sist-env-50275-2-1-2002>



CONTENTS

	Pages
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Definitions.....	5
4 General requirements	5
5 Prestandard conditions for operation in service	5
6 General test provisions	6
7 Electrical safety requirements for the electric vehicle	6
8 Electrical characteristics of the vehicle	6
9 Functional requirements of the vehicle	8
10 Electric vehicle inlet or plug (case A) specific requirements	8
11 Marking and instructions.....	11

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ENV 50275-2-1:2002](https://standards.iteh.ai/catalog/standards/sist/2bd1656-4d50-4866-8b7e-26194399c659/sist-env-50275-2-1-2002)

<https://standards.iteh.ai/catalog/standards/sist/2bd1656-4d50-4866-8b7e-26194399c659/sist-env-50275-2-1-2002>

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ENV 50275-2-1:2002

<https://standards.iteh.ai/catalog/standards/sist/f2bd1656-4d50-4866-8b7e-2b194393c633/sist-env-50275-2-1-2002>

1 Scope

This prestandard together with part 1 gives the requirements for conductive connection of a class I electric vehicle to an a.c. or d.c. supply, for a.c. voltages per IEC 60038 up to 690 V and for d.c. voltages up to 1000 V, when the electric vehicle is connected to the supply network.

NOTE: Class II vehicles are not forbidden but the lack of information on this type of vehicle means that the requirements for the prestandard are unavailable at present.

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

This prestandard is not applicable to trolley buses, rail vehicles, industrial trucks and vehicles designed primarily to be used off-road.

2 Normative references

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

EN 60309-1	1992	Plugs, socket-outlets and couplers for industrial purposes Part 1: General requirements (IEC 60309-1:1988)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 61180-1	1994	High voltage test techniques for low-voltage equipment Part 1: Definitions, test and procedure requirements (IEC 61180-1:1992)
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 overvoltages Section 443: Protection against overvoltages of atmospheric origin or due to switching.

3 Definitions

Clause 3 of part 1 applies.

4 General requirements

The electric vehicle shall be connected to the a.c. or d.c. electric vehicle supply equipment 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.

In general, this is achieved by fulfilling the relevant requirements specified in this prestandard and compliance is checked by carrying out all relevant tests.

5 Prestandard conditions for operation in service

Clause 5 of part 1 applies when the vehicle is supplied by public distribution systems.

The rated value of the d.c. supply is up to 1000 V. The d.c. voltage used by the electric vehicle can be less than the rated d.c. voltage of the off-board charger.

The ambient temperature range during charging may be between $-20\text{ }^{\circ}\text{C}$ and $+40\text{ }^{\circ}\text{C}$.

NOTE: In some countries, different temperature ranges may apply.

6 General test provisions

6.1 All tests in this prestandard are type tests

6.2 Unless otherwise specified, type tests shall be carried out on a single specimen as delivered and connected in accordance with the manufacturer's instructions.

6.3 Unless otherwise specified, the tests shall be carried out in the order of the clauses and sub-clauses in this document.

6.4 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.

6.5 The tests shall be carried out in a draught free location and in general, at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ unless otherwise specified.

6.6 The characteristics of the test voltages shall comply with EN 61180-1.

7 Electrical safety requirements for the electric vehicle

7.1 General

General provisions for electrical safety are dealt with in part 1 of this prestandard. In addition, the following requirements apply.

7.2 Earthing connection and electric vehicle mass continuity

All exposed conductive parts of the electric vehicle which could be connected to the supply voltage source in case of a fault shall be connected together in such a manner that they conduct electricity properly.

This test is intended to check the electrical continuity between exposed conductive parts and the earth circuit.

Continuity shall be checked with a d.c. ELV voltage source that generates a current of at least 16 A.

The value of the resistance between any exposed conductive part and the earth circuit connection shall not exceed $0,1\ \Omega$.

7.3 Inspection of the electrical continuity of the protective conductor

A protective earth conductor shall be provided to establish an equipotential connection between the earthing terminal of the supply and the exposed conductive parts of the vehicle. This protective conductor shall be of sufficient rating to satisfy the requirements of HD 384.5.54 S1.

While charging in modes 2, 3 and 4, the electrical continuity of this protective conductor shall be permanently monitored by the electric vehicle supply equipment. In case of loss of electrical continuity of the protective conductor, the supply shall be switched off.

8 Electrical characteristics of the vehicle

8.1 Dielectric withstand characteristics

8.1.1 Dielectric withstand voltage

An a.c. test voltage of $(2 U + 1000)\text{ V}$, and at least 1500 V at 50 Hz shall be applied between the a.c. and d.c. input connections of the electric vehicle and the electric vehicle earth terminal connectors electrically connected with all accessible connections of signalling circuits. The application duration shall be 1 min. During the test, there shall be no glow conduction, flash-over, burst or breakdown. After the test, the integrity of the basic performance of the vehicle circuits directly connected to the a.c. electric vehicle supply equipment shall be checked.

NOTE: U is the rated voltage(s) of the EV, specified by the manufacturer.

A test voltage of 4 kV shall be applied between all a.c. or d.c. voltage inputs and safety extra low voltage (SELV) circuits, if any.

8.1.2 Electric vehicle insulation resistance

The insulation resistance under a d.c. voltage of 500 V applied for 1 min between all the inputs/outputs joined together (including mains supply) and the exposed conductive parts shall be, for a new vehicle, $R \geq 1\text{M}\Omega$. To achieve this value, the insulation resistance of individual on-board components is greater than this.

NOTE: The traction battery and the auxiliary batteries are disconnected from the circuit during this test.

8.2 Leakage current

The leakage current shall be measured when the vehicle is connected to a.c. supply and the vehicle system is operating at rated capacity. The vehicle is fed through an isolating transformer. The permanent leakage current between any network terminal and the accessible metal parts, connected with each other, and a metal foil covering, as far as practically reasonable, insulated external parts, shall not exceed 5 mA. See figure 1.

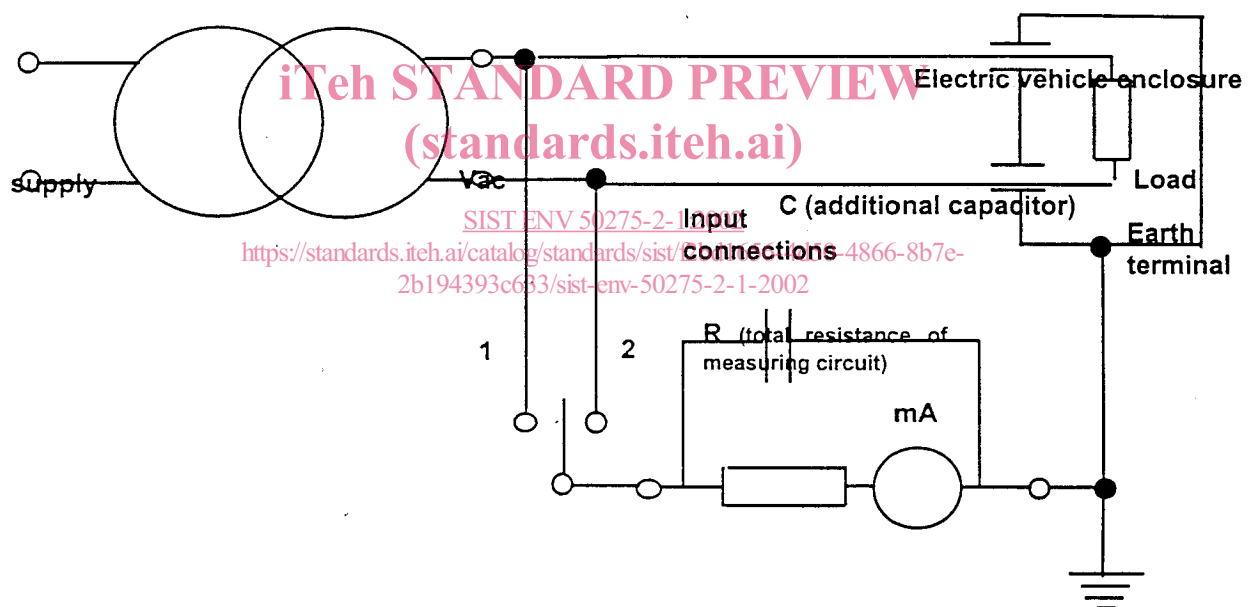


Figure 1: Schematic for the measurement of leakage currents of Class I single phase supply vehicle

The total resistance R of the measuring circuit (including mA meter) shall be: 1750 Ohm +/- 250 Ohm and the time constant of the measuring circuit RC shall be 225 μs +/- 15 μs (i.e. bandwidth 4,5 kHz)

NOTE: Circuitry which is connected through a fixed resistance or referenced to earth should be disconnected before this test.

8.3 Protection measures

The protective measures against overcurrents and overvoltages shall be in accordance with the requirements of HD 384.4.43 and IEC 60364-4-443 respectively.

Protection devices against overcurrents or short-circuits in the EV shall be coordinated with those of the network.