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Electrically propelled road vehicles — Specification of voltage sub-classes for voltage class B

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National foreword

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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Terms and definitions ... **1**
3 Voltage sub-classes ... **2**
4 Characteristics of voltage sub-classes ... **3**
4.1 General ... 3
4.2 Component operating status ... 3
4.3 Voltage operating ranges ... 4
4.4 Under- and overvoltage ... 5
4.4.1 General ... 5
4.4.2 Overvoltage ... 5
4.4.3 Undervoltage ... 6
4.5 Allocation of voltage ranges and operation status — Overview ... 6
4.6 Voltage transients and ripple ... 7
4.6.1 General ... 7
4.6.2 Voltage slope ... 7
4.6.3 Voltage ripple ... 8
4.6.4 Load dump ... 10
Annex A (informative) **Example for voltage ranges per voltage sub-class** ... **11**

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Foreword

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The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 37, *Electrically propelled vehicles*.

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Introduction

Electric systems operating at voltage class B are efficient systems for electrically propelled road vehicles. The requirements for voltage class B electric circuits that are used for electric power transfer for the propulsion of electric road vehicles are significantly different to those of voltage class A electric circuits used for powernets at, for example, 12 V d.c. or 24 V d.c.

This PAS provides definition of voltage sub-classes for rechargeable energy storage system (RESS) and electric propulsion system and lists up specified values based on maximum working voltage. Voltage sub-classes listed in this PAS are used for voltage class B systems of all kinds of current or future electrically propelled road vehicles. It enables vehicles manufacturers and automotive supply industry to evaluate the characteristics of a component according to the specified sub-class.

The voltage sub-class itself and the component characteristics have large cost impact on the component design and the overall design of the electric system. A high variety of different voltage sub-class and operating conditions hinders the use of an existing component in different vehicle models.

Today, a huge variety of different RESS and electric propulsion system maximum working voltages are used for electrically propelled road vehicles on the market. Because some systems use voltage boost converters, maximum working voltage of electric propulsion system can be different from that of RESS. This variety of maximum working voltages often results from different numbers of cells in the design of the electrical energy source, e.g. battery stack or variety of power requirement by each vehicle. As a consequence, many system or component designs of a voltage class B electric circuit are currently related to one specific working voltage. When a maximum working voltage is selected for the design, often only one supplier for a component is available. Hence, a change to another component supplier or a change of the dedicated maximum working voltage is not possible, when the system design is finished. It is necessary to reduce the variety of maximum working voltages in order to

— lower the component and system costs by limiting the variety of maximum working voltages,

— decouple the system or component designs of a voltage class B electric circuit from the design of the electric energy source,

— enable an exchange of components from different suppliers during and after the system development and to enable competition and access to the worldwide market for component suppliers, and

— support the system design by specifying basic voltage sub-classes for automotive propulsion systems within voltage class B.

This PAS lists only those RESS and electric propulsion system voltage sub-classes which are used or will be used in current or planned vehicle models and for which electronic parts, e.g. semiconductor switches, are currently available without any restrictions on the market.

The range of voltage class B is too wide to be used for a component design referring to voltage. Therefore, this PAS divides voltage class B in a set of voltages sub-classes, which enable a component design referring to voltage for each voltage sub-class.

This specification is not intended to restrict the development of component performance or technology. It does not exclude the use of other maximum operating voltages for an individual system design.

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