

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Rolling stock – Onboard lithium-ion traction batteries

Applications ferroviaires – Matériel roulant – Batteries d'accumulateurs de traction embarquées au lithium-ion





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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	9
2 Normative references	9
3 Terms, definitions and abbreviated terms	10
3.1 Terms and definitions.....	10
3.2 Abbreviated terms.....	17
4 Configuration of battery system	17
4.1 Battery system.....	17
4.2 Battery pack/module	18
4.3 Battery management system (BMS)	19
4.4 Battery thermal management system (BTMS)	20
5 Parameter measurement tolerances	20
6 Operational conditions.....	20
6.1 General.....	20
6.2 Mechanical conditions.....	21
6.3 Environmental conditions	21
6.3.1 General	21
6.3.2 Ambient temperature	21
6.3.3 Temperature in battery enclosure	21
6.3.4 Temperature for life time calculation	21
6.4 Electrical conditions.....	21
6.4.1 Traction circuits.....	21
6.4.2 Control circuits	21
6.4.3 Insulation coordination	22
6.5 Electromagnetic compatibility (EMC).....	22
6.6 Software	22
7 Designation and marking.....	22
7.1 Nameplate	22
7.2 Designations for cells and battery system	22
7.3 Marking.....	23
7.3.1 General	23
7.3.2 Battery pack/module and cells	23
7.3.3 Other components	23
7.3.4 Additional information	23
8 Safety requirements	23
8.1 General safety consideration	23
8.2 Safety signs.....	24
8.2.1 Outside the battery box.....	24
8.2.2 Inside the battery box	24
8.3 Isolation for maintenance or service.....	24
8.4 Fire protection	25
9 Dimensions	25
10 Electrical requirements	25
10.1 Operating voltage range of the battery system	25

10.2	Ripple current	25
10.3	Charge and discharge control of the battery system	25
10.4	Communication	25
10.5	Starting of disabled battery system	26
10.6	Insulation status.....	26
10.7	Battery management system (BMS)	26
11	Mechanical requirement	26
11.1	Mechanical integration	26
11.2	Shock and vibration	26
11.3	Degree of protection	27
12	Performance requirement	27
12.1	Design energy and power calculation methodology	27
12.1.1	General	27
12.1.2	Sizing	27
12.1.3	Documentation	28
12.2	Cooling / heating requirement	28
12.3	End of life performance	28
13	Storage and transportation conditions.....	29
13.1	Transportation	29
13.2	Storage of battery systems	29
13.3	Self-discharge.....	29
14	Tests	29
14.1	Kind of tests.....	29
14.1.1	General	29
14.1.2	Test categories.....	30
14.2	Electrical tests	31
14.2.1	Electrical characteristics tests	31
14.2.2	Battery management system (BMS) tests	32
14.2.3	Performance test	33
14.2.4	Endurance in cycles	34
14.2.5	Dielectric test	37
14.2.6	Self-discharge test.....	37
14.2.7	Operational balancing test	39
14.3	Mechanical tests	40
14.3.1	Physical appearance	40
14.3.2	Mass measurement	40
14.3.3	Shock and vibration test	40
14.3.4	Test of the degree of protection	40
14.4	Safety tests.....	40
14.4.1	Safety test according to IEC 62619:2017	40
14.4.2	Special tests for rolling stock	41
	Annex A (informative) Examples of battery system configuration	45
	Annex B (informative) Examples of parameter ranges for additional high power cycling tests	49
	Bibliography.....	50
	Figure 1 – Hierarchy of standards related to IEC 62928	8
	Figure 2 – Functional block of battery system	18

Figure 3 – Illustration of definitions for cell, cell block and battery pack/module 19

Figure 4 – Illustration of self-discharge test 38

Figure A.1 – Example of configuration for contactor inside of the battery box..... 45

Figure A.2 – Examples of battery box configurations with the contactor outside battery box.. 47

Figure A.3 – Example of configuration of a BTMS outside of battery box..... 48

Figure A.4 – Example of configuration of a BMS and a BTMS included in another system outside of battery box 48

Table 1 – List of tests 30

Table B.1 – Examples of parameter ranges for additional high power cycling tests 19

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RAILWAY APPLICATIONS – ROLLING STOCK – ONBOARD LITHIUM-ION TRACTION BATTERIES

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International Standard IEC 62928 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

The text of this standard is based on the following documents:

FDIS	Report on voting
9/2317/FDIS	9/2329/RVD

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

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

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

- reconfirmed,
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INTRODUCTION

In the 90s the market started developing mainly portable lithium technology batteries. Existing standards for lithium-ion batteries currently focus on small portable batteries:

- IEC 61960-3:2017, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications – Part 3: Prismatic and cylindrical lithium secondary cells and batteries made from them
- IEC 62133 (all parts): Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications.

These above mentioned documents do not cover large cells and batteries for industrial and railway applications, which are non-portable and weigh hundreds of kilograms.

TC 21 and SC 21A decided to start work on large capacity lithium cells and batteries:

- IEC 62619:2017, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries for use in industrial applications,
- IEC 62620:2014, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications.

The documents are often generic and mention railway applications only as an example.

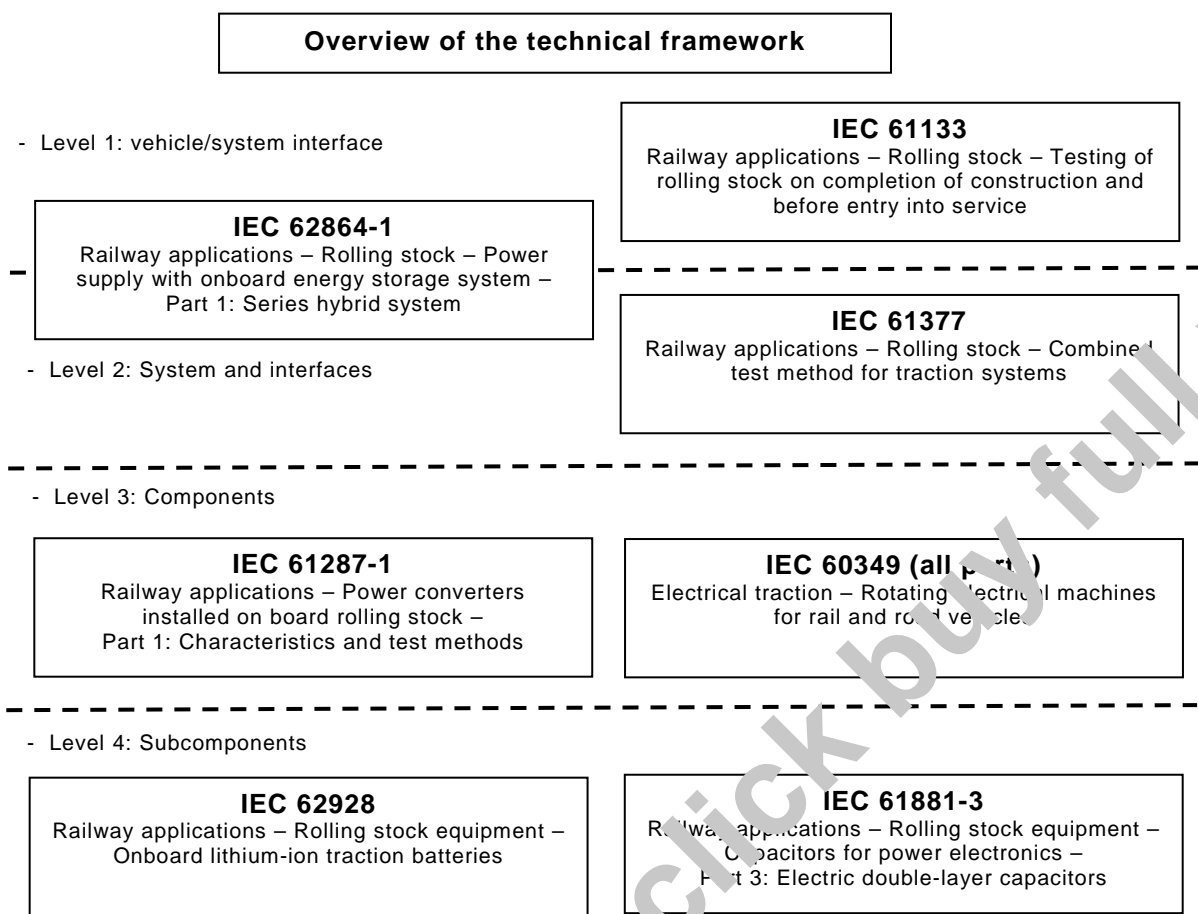
Therefore, this document is developed for specifying the requirements for railway traction applications.

In addition, TC 9 has developed the following document:

- IEC 62864-1:2016, Railway applications – Rolling stock – Power supply with onboard energy storage system – Part 1: Series hybrid system

IEC 62864-1:2016 specifies the general requirements for the onboard energy storage system as a system level. The hierarchy of standards is shown in Figure 1 of IEC 62864-1:2016.

It is part of a series of standards, referring to each other. The hierarchy of the standards used in the railway specific area related to IEC 62928 is as follows:



IEC

Figure 1 – Hierarchy of standards related to IEC 62928

The standards listed in Figure 1 are not exhaustive.

RAILWAY APPLICATIONS – ROLLING STOCK – ONBOARD LITHIUM-ION TRACTION BATTERIES

1 Scope

This document applies to onboard lithium-ion traction batteries for railway applications.

This document specifies the design, operation parameters, safety recommendations, data exchange, routine and type tests, as well as marking and designation.

Battery systems described in this document are used for the energy storage system (ESS) for the traction power of railway vehicles such as hybrid vehicles as defined in IEC 62864-1:2016. Auxiliary batteries to supply power only to the auxiliary equipment are excluded.

Subcomponents within the battery systems, e.g. battery management system (BMS) and battery thermal management system (BTMS), are also covered in this document.

Power conversion equipment (e.g. chopper, converter, etc.), inductors, capacitors and switchgear are excluded from the scope of this document.

General requirements for onboard ESS are described in IEC 62864-1:2016.

This document specifies the lithium-ion battery technology but does not prevent the use of battery technologies other than lithium-ion technology for application as traction batteries.

A hybrid energy storage system, which uses two or more energy storage technologies combined, e.g. a traction battery and double layer capacitors, is not covered in this document. However, if different technologies of energy storage systems are used on the same railway vehicle and managed independently, each independent energy storage system is covered by its own document.

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.

IEC 60050-482:2004, *International Electrotechnical Vocabulary – Part 482: Primary and secondary cells and batteries*

IEC 60050-811:2017, *International Electrotechnical Vocabulary – Chapter 811: Electric traction*

IEC 60051 (all parts), *Direct acting indicating analogue electrical measuring instruments and their accessories*

IEC 60077-1, *Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules*

IEC 60077-5, *Railway applications – Electric equipment for rolling stock – Part 5: Electrotechnical components – Rules for HV fuses*