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# INTERNATIONAL STANDARD

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**Flow battery energy systems for stationary applications –  
Part 2-2: Safety requirements**

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ELECTROTECHNICAL  
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## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references .....	8
3 Terms, definitions and abbreviated terms .....	9
3.1 Terms and definitions.....	9
3.2 Abbreviated terms.....	9
4 Procedure of the risk analysis.....	9
5 Safety requirements and protective measures .....	10
5.1 General.....	10
5.2 Risk information.....	10
5.3 Electrical hazards .....	10
5.3.1 Electrical shock .....	10
5.3.2 Short-circuits .....	10
5.3.3 Leakage currents.....	11
5.4 Hazards of gaseous emissions.....	11
5.4.1 General .....	11
5.4.2 Harmful gas.....	12
5.4.3 Ventilation .....	13
5.4.4 Warning sign .....	13
5.4.5 Close vicinity to emissions.....	14
5.5 Hazard posed by liquids.....	14
5.5.1 General .....	14
5.5.2 Detection of electrolyte leakage.....	14
5.5.3 Protective measures against leakage.....	14
5.5.4 Specific information .....	14
5.5.5 Flow path identification .....	15
5.6 Hazards of mechanical cause .....	15
5.7 Operational hazards and measures.....	15
5.7.1 General .....	15
5.7.2 Start .....	15
5.7.3 Remote monitoring and control systems .....	16
5.7.4 Protection.....	16
5.7.5 Auxiliary power failure .....	16
6 Instructions.....	16
7 Identification labels or marking .....	16
7.1 Name plate information .....	16
7.2 Warning label information and location .....	17
8 Transport, storage, disposal and environmental aspects.....	17
8.1 Packing and transport.....	17
8.2 Dismantling, disposal, and recycling .....	17
9 Inspection.....	17
10 Maintenance.....	18
11 Verification tests for protective measures .....	18

11.1	General.....	18
11.1.1	Tests .....	18
11.1.2	Test object.....	19
11.1.3	Test category.....	19
11.2	Dielectric strength of the parts in contact with the fluid.....	19
11.2.1	Requirements .....	19
11.2.2	Category.....	19
11.2.3	Number of samples.....	19
11.2.4	Test and acceptance criteria.....	19
11.3	Operational sequence .....	19
11.3.1	Requirements .....	19
11.3.2	Category.....	19
11.3.3	Number of samples.....	19
11.3.4	Test.....	20
11.3.5	Acceptance criteria .....	20
11.4	Emergency stop .....	20
11.4.1	Requirement.....	20
11.4.2	Category.....	20
11.4.3	Number of samples.....	20
11.4.4	Test.....	20
11.4.5	Acceptance criteria .....	20
11.5	Protection .....	20
11.5.1	Requirements .....	20
11.5.2	Category.....	21
11.5.3	Number of samples.....	21
11.5.4	Test.....	21
11.5.5	Acceptance criteria .....	21
11.6	Safety requirement for stacks .....	21
Annex A	(informative) Recommended structure of user manual .....	22
A.1	General.....	22
A.2	Table of contents .....	22
A.3	Safety warning.....	22
A.4	Introduction.....	22
A.5	Product description .....	22
A.5.1	Overview .....	22
A.5.2	Technical specifications.....	23
A.5.3	System structure.....	23
A.5.4	Applications .....	23
A.5.5	Operational sequence.....	23
A.6	Site requirements.....	23
A.6.1	Location and load .....	23
A.6.2	Access and clearance.....	23
A.6.3	Precautionary measures for fluid containment.....	23
A.6.4	Ventilation .....	24
A.6.5	Temperature .....	24
A.7	Operation.....	24
A.7.1	General .....	24
A.7.2	Checks before operation.....	24
A.7.3	Energizing and de-energizing the system.....	24

A.7.4	Valve status.....	24
A.7.5	Specific operations .....	24
A.7.6	Notices for operation .....	24
A.8	Alarms and fault finding .....	25
A.9	Maintenance .....	25
A.10	Contact information.....	25
Annex B (normative)	Safety requirements for stacks .....	26
B.1	General.....	26
B.2	External short-circuit of the stack .....	26
B.2.1	Requirements .....	26
B.2.2	Category.....	26
B.2.3	Number of samples.....	26
B.2.4	Test.....	26
B.2.5	Acceptance criteria .....	26
B.3	Heat shock strength.....	27
B.3.1	Requirements .....	27
B.3.2	Category.....	27
B.3.3	Number of samples.....	27
B.3.4	Test.....	27
B.3.5	Acceptance criteria .....	27
B.4	Leakage of the stack .....	27
B.4.1	Requirements .....	27
B.4.2	Category.....	28
B.4.3	Number of samples.....	28
B.4.4	Test.....	28
B.4.5	Acceptance criteria .....	28
Bibliography	.....	29
Figure 1	– Flow battery energy system.....	7
Table 1	– List of verification tests for protective measurements .....	18
Table B.1	– List of verification tests for stacks for protective measurements .....	26

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FLOW BATTERY ENERGY SYSTEMS FOR STATIONARY APPLICATIONS –****Part 2-2: Safety requirements****FOREWORD**

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International Standard IEC 62932-2-2 has been prepared by IEC technical committee 21: Secondary cells and batteries, in collaboration with IEC technical committee 105: Fuel cell technologies.

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

FDIS	Report on voting
21/1029/FDIS	21/1035/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.

A list of all parts in the IEC 62932 series, published under the general title *Flow battery energy systems for stationary applications*, can be found on the IEC website.

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

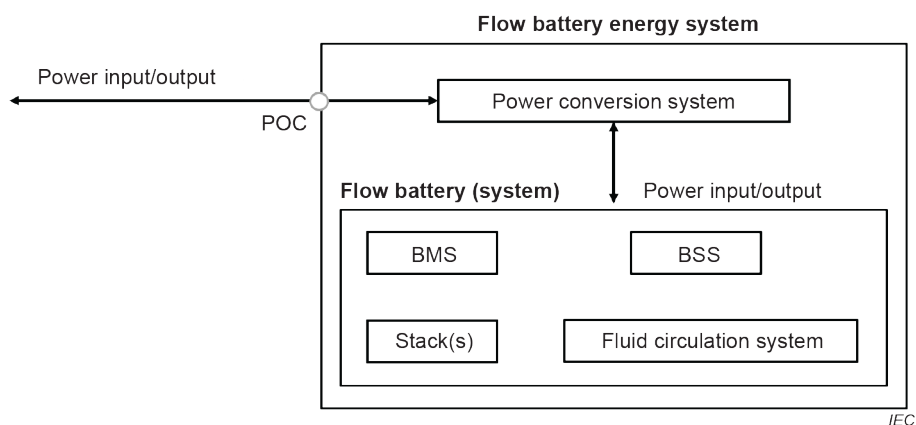
A flow battery system (FBS) can be utilized in a flow battery energy system (FBES). Such an FBES can consist of:

- a flow battery system,
- a power conversion system,
- other equipment and surroundings.

The FBES is connected to the external power input/output via a point of connection (POC).

This document covers the domain of the FBES, as shown in Figure 1. Energy to the auxiliary systems such as the battery management system (BMS), the battery support system (BSS), and the power conversion system (PCS) may be supplied by one of the following:

- a) direct connection to the external power source;
- b) the internal power source of the FBES or FBS itself.



**Figure 1 – Flow battery energy system**

# FLOW BATTERY ENERGY SYSTEMS FOR STATIONARY APPLICATIONS –

## Part 2-2: Safety requirements

### 1 Scope

This part of IEC 62932 applies to flow battery systems for stationary applications and their installations with a maximum voltage not exceeding 1 500 V DC in compliance with IEC 62932-1.

This document defines the requirements and test methods for risk reduction and protection measures against significant hazards relevant to flow battery systems, to persons, property and the environment, or to a combination of them.

This document is applicable to stationary flow battery systems intended for indoor and outdoor commercial and industrial use in non-hazardous (unclassified) areas.

This document covers significant hazards, hazardous situations and events, with the exception of those associated with natural disaster, relevant to flow battery systems, when they are used as intended and under the conditions foreseen by the manufacturer including reasonably foreseeable misuse thereof.

The requirements described in this document are not intended to constrain innovations. When considering fluids, materials, designs or constructions not specifically dealt with in this document, these alternatives are evaluated as to their ability to yield levels of safety equivalent to those specified in this 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 60079-10-1, *Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres*

IEC 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-43, *Low-voltage electrical installations – Part 4-43: Protection for safety – Protection against overcurrent*

IEC 60364-6, *Low voltage electrical installations – Part 6: Verification*

IEC 61936-1, *Power installations exceeding 1 kV a.c. – Part 1: Common rules*

IEC 62485-2:2010, *Safety requirements for secondary batteries and battery installations – Part 2: Stationary batteries*

IEC 62932-1, *Flow battery energy systems for stationary applications – Part 1: Terminology and general aspects*

ISO 7010, *Graphical symbols – Safety colours and safety signs – Registered safety signs*