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Flow battery energy systems for stationary applications –
Part 2-1: Performance general requirements and test methods
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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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STANDARD PREVIEW
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FLOW BATTERY ENERGY SYSTEMS FOR STATIONARY APPLICATIONS –**Part 2-1: Performance general requirements and test methods**

FOREWORD

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International Standard IEC 62932-2-1 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
21/1028/FDIS	21/1036/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- withdrawn,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.

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INTRODUCTION

A flow battery system (FBS) can be utilized as a main part of 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 or output via a point of connection (POC).

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

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

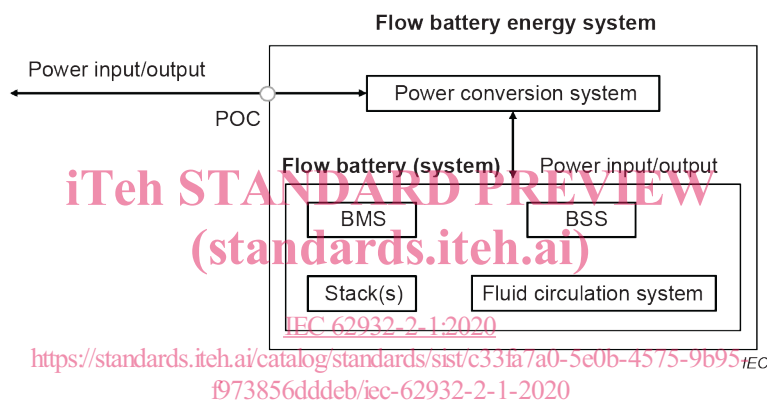


Figure 1 – Flow battery energy system

FLOW BATTERY ENERGY SYSTEMS FOR STATIONARY APPLICATIONS –

Part 2-1: Performance general requirements and test methods

1 Scope

This part of IEC 62932 specifies methods of test and requirements for the flow battery system (FBS) and the flow battery energy system (FBES) for the verification of their performances.

This document is applicable to FBES or FBS which are designed and used for service in stationary locations (i.e. not generally to be moved from place to place).

This document does not cover testing of the system for electromagnetic compatibility (EMC).

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

IEC 62932-2-2, *Flow battery energy systems for stationary applications – Part 2-2: Safety requirements*
<https://standards.iteh.ai/catalog/standards/sist/c33fa7a0-5e0b-4575-9b95-f973856dddeb/iec-62932-2-1-2020>

IEC 61427-2, *Secondary cells and batteries for renewable energy storage – General requirements and methods of test – Part 2: On-grid applications*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 62932-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>.
- ISO Online browsing platform: available at <http://www.iso.org/obp>.

3.2 Abbreviated terms

BMS	battery management system
BSS	battery support system
FBES	flow battery energy system
FBS	flow battery system
PCS	power conversion system
POC	point of connection
POM	point of measurement
TOU	test object unit

4 General requirements

The FBES or FBS shall be designed to withstand mechanical stresses, vibrations and shocks during transportation, handling and use.

The manufacturer shall provide documentation for transportation, installation, commissioning, operation, maintenance, and disposal of the FBES or FBS.

The FBES or FBS shall be characterized by appropriate performance parameters, including rated power, rated energy, rated energy efficiency, maximum output and input powers. More information, such as energy or energy efficiency at different power levels (see Annex A), will help the user know and use the FBES or FBS better.

Safety related requirements and methods of test shall be in accordance with IEC 62932-2-2.

5 General test conditions

5.1 Accuracy of measuring instruments

5.1.1 Voltage measurement

The instruments used shall be of an accuracy class equal to 1 % or better. The internal resistance of the voltmeter used shall be at least 1 k Ω /V.

5.1.2 Current measurement

The instruments used shall be of an accuracy class equal to 1 % or better.

Particular attention shall be given to the accuracy of DC and AC current measurement devices as any degraded accuracy or instability will negatively impact the precision of energy and efficiency determinations.

5.1.3 Electric energy measurement

The instruments used shall be of an accuracy class equal to 1 % or better.

Particular attention shall be given to the accuracy of DC and AC power and energy measurement devices as any degraded accuracy or instability will negatively impact the precision of energy and efficiency determinations.

5.1.4 Temperature measurement

The instruments used shall have a resolution of 0,5 K and the accuracy of the instruments shall be ± 1 K or better.

5.1.5 Time measurement

The instruments used shall have a resolution of 1 s and the accuracy of the instruments shall be 1 % of the measured time interval or better.

5.2 Ambient temperature

All tests of an FBES or FBS shall be carried out at an ambient temperature of 25 °C \pm 5 K unless otherwise specified in a test clause or agreed by the manufacturer and user. The ambient temperature shall be measured and reported. The measuring instrument or probe shall be shielded from draught and radiant heating.