PD IEC TS 62898-3-2:2024

BSI Standards Publication

Microgrids

Part 3-2: Technical requirements — Energy management systems

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/8, Systems Aspects for Electrical Energy Supply.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2024

ISBN 978 0 539 00401 4

ICS 29.240.01

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 January 2024.

Amendments/corrigenda issued since publication

Date	Text affected

IEC TS 62898-3-2

Edition 1.0 2024-01

TECHNICAL SPECIFICATION

colour inside

Microgrids –
Part 3-2: Technical requirements – Energy management systems

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.240.01

ISBN 978-2-8322-8075-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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IEC TS 62898-3-2 has been prepared by subcommittee 8B: Decentralized electrical energy systems, of IEC technical committee TC 8: System aspects of electrical energy supply. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
8B/153/DTS	8B/177/RVDTS

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62898 series, published under the general title *Microgrids*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Microgrids can serve various purposes depending on the primary objectives of their applications. They are usually seen as a technical means to manage reliability of supply and to facilitate local optimization of energy supply by controlling distributed energy resources (DER). Microgrids also present a way to provide electricity supply in remote areas, to use renewable energy as a systematic approach for rural electrification and to increase resiliency and security of supply to end users.

IEC TS 62898 series is intended to provide general guidelines and technical requirements for microgrid projects.

IEC TS 62898-1 mainly covers the following issues:

- determination of microgrid purposes and application,
- preliminary study necessary for microgrid planning, including resource analysis, load forecast, DER planning and power system planning,
- principles of microgrid technical requirements that should be specified during planning stage,
- Microgrid evaluation to select an optimal microgrid planning scheme.

IEC TS 62898-2 mainly covers the following issues:

- operation requirements and control targets of microgrids under various operation modes,
- the basic control strategies and methods under various operation modes,
- the requirements of electrical energy storage (EES), relay protection, monitoring and communication under various operation modes,
- power quality.

IEC TS 62898-3-XX subseries technical specifications deal with the technical requirements of microgrids.

IEC TS 62898-3-1 covers the protection and dynamic control of microgrids.

The present document covers microgrid energy management systems (MEMS).

MICROGRIDS –

Part 3-2: Technical requirements – Energy management systems

1 Scope

The purpose of this part of IEC 62898 is to provide technical requirements for the operation of energy management systems of microgrids. This document applies to utility-interconnected or islanded microgrids. This document describes specific recommendations for low-voltage (LV) and medium-voltage (MV) systems.

This document focuses on developing standards of energy management systems aimed for microgrids integrated in decentralized energy systems or public distribution grids. It concerns some particularities that are not totally covered by the existing conventional energy system. The microgrid energy management systems are being studied by various actors (utilities, manufacturers, and energy providers) on actual demonstration projects and application use case. The aims of this document are to make the state of the art of existing energy management systems used in actual microgrids projects, to classify the relevant functions which can be accomplished by microgrid energy management systems, and to recommend necessary technical requirements for energy management systems of future microgrids.

This document includes the following items:

- main performances of key components of microgrid: decentralized energy resources, energy storages and controllable loads),
- description of main functions and topological blocks of microgrid energy management systems (MEMS),
- specification of information exchange protocol between main function blocks, linked to microgrid monitoring and control systems (MMCS).

Main functions of MEMS:

- power and energy management among different resources within microgrid including active and reactive power flows with different time scales,
- power and energy forecasts of microgrid,
- energy balancing between upstream grid and microgrid energy resources according to power and energy forecast and upstream and local constraints,
- economic and environmental optimization,
- possible service capacities such as capacity market auctions and resiliency anticipation: new business models,
- data archiving, trending, reporting and evaluation of operation capacities in various operation modes.

MEMS can have some other additional functions according to microgrid size and actual application cases:

- tariff and market trading management,
- utility ancillary services such as frequency regulation, voltage regulation, power quality and reliability improvement, demand response possibilities, change of operation modes linked to MMCS.