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Demand side power quality management

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National foreword

This Published Document is the UK implementation of IEC TR 63191:2018.

The UK participation in its preparation was entrusted to Technical Committee PEL/85, Measuring equipment for electrical and electromagnetic quantities.

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

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Published by BSI Standards Limited 2018

ISBN 978 0 539 00501 1

ICS 33.200

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2018.

Amendments/corrigenda issued since publication

Date	Text affected
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Edition 1.0 2018-11

TECHNICAL REPORT



Demand side power quality management

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.200

ISBN 978-2-8322-6257-3

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DEMAND SIDE POWER QUALITY MANAGEMENT

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a Technical Report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 63191, which is a Technical Report, has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

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

Enquiry draft	Report on voting
85/640/DTR	85/647/RVDTR

Full information on the voting for the approval of this Technical Report 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.

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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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

The effective management of power quality on the demand side (power consumer) is an essential activity to ensure the proper operation of the electrical equipment operating on the consumer site.

While the level of power quality present at the point of supply is generally monitored, and managed by the power provider (utility), the actual level of power disturbances present on the consumer site could be significantly worse and may negatively impact the operation of the electrical equipment. The interaction between these loads and the voltage supply is often the cause of degraded power quality on the demand side.

One effective step in the prevention of the hindrances caused by power quality is the assessment of the level of power quality disturbance present on the demand side. However, proper measurements require adequate planning and understanding of the measurement systems and their results.

This document provides guidance on how to establish, implement, exploit, maintain and improve a demand side power quality monitoring system. This document will also facilitate the tailoring of power quality monitoring concepts to the specific site where it will be deployed.

Disturbances in the electrical energy can have an important impact on the equipment, processes, organization's activities and environment. Some electrical installations (industrial sites, data centres, hospitals, etc.) are particularly impacted by the poor quality of electrical energy.

The quality of the electrical energy has different origins, impacts and measurement indicators on the supply side and on the demand side – see Figure 1 presenting an overview of the electrical network from generation (supply side) to consumer (demand side).

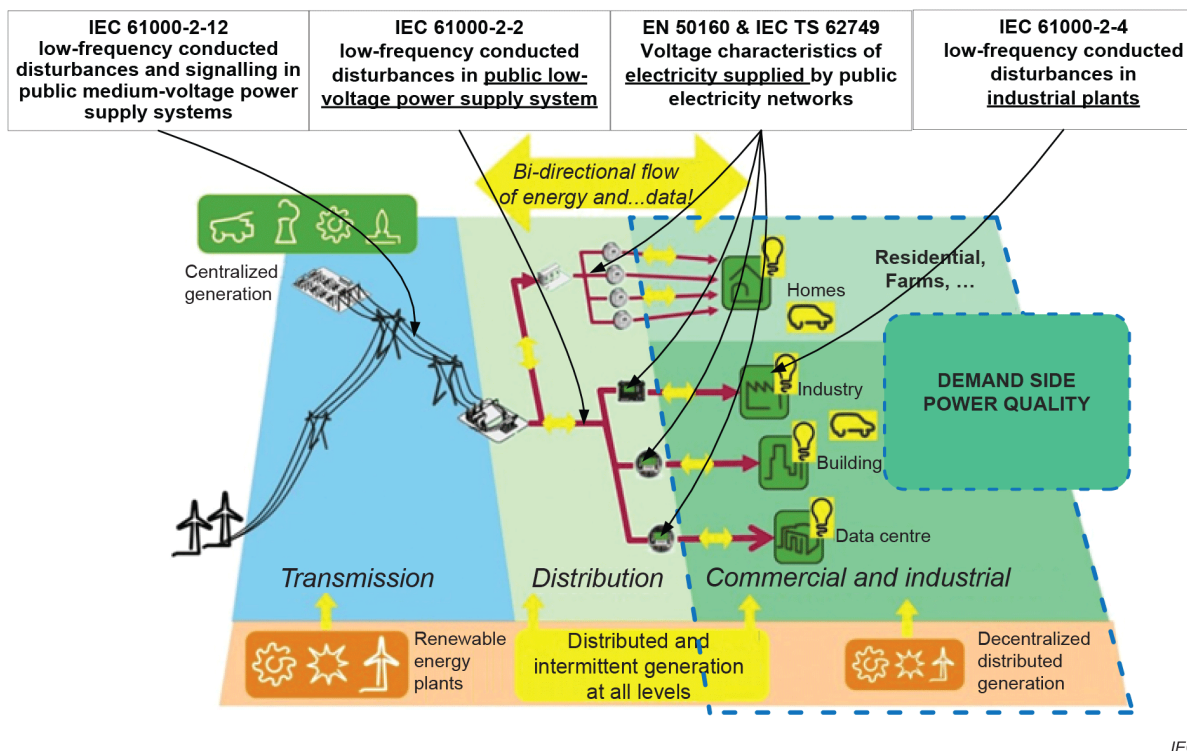


Figure 1 – Overview of electrical distribution system from supply side to demand side

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While documents such as IEC TS 62749 or EN 50160 define the voltage characteristics provided by a public network (called power quality of the grid), this document gives guidance for qualifying the electrical quality of internal networks including voltage and current disturbances (called demand side power quality).

In this document, power quality on the demand side, related to buildings, industrial and data centres applications is referred to as demand side power quality (DSPQ).

See Annex D for a general statement on demand side power quality.

See Annex E for a discussion about grid evolution.

See Annex F for a list of standards related to demand side power quality.

See Annex G for definition of electrical parameters.

It is recommended that readers possess a minimum knowledge of power quality phenomena.

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DEMAND SIDE POWER QUALITY MANAGEMENT

1 Scope

This document specifies recommendations about power quality measurement and assessment within installations.

NOTE 1 Most standards take care of power quality at the delivery point between energy providers and customers.

This document outlines the various phases needed for the establishment of a demand side power quality measurement plan for buildings and industry installations.

NOTE 2 The demand side is defined as the electrical installation, beyond the PCC (point of common coupling), which is under the jurisdiction of facility managers.

Such a power quality measurement plan will enable the optimization of the energy availability and efficiency, improve the assets lifetime and facilitate the resolutions of power quality problems. A power quality measurement plan encompasses the following stages:

- definition of the context, objectives and constraints;
- assessment of the initial power quality situation;
- definition of an action plan for the improvement of the power quality situation;
- implementation of the power quality measuring system;
- exploitation of the measurement system for the improvement of the power quality situation;
- maintenance of the measurement system.

This document will also help facility managers to tailor their measurement plan to the specific needs of the electrical system under their control. It addresses all the disturbances present in such networks, but does not cover the disturbances present in public electrical distribution networks (supply side) as they are governed by specific documents such as EN 50160 and IEC TS 62749.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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>

3.1

demand side

part of the grid where electric energy is consumed by end-use customers within their electric distribution system