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Power measurement applications within electrical distribution networks and electrical installations

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TECHNICAL REPORT

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Power measurement applications within electrical distribution networks and electrical installations

INTERNATIONAL
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POWER MEASUREMENT APPLICATIONS WITHIN ELECTRICAL DISTRIBUTION NETWORKS AND ELECTRICAL INSTALLATIONS

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IEC TR 63213, 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:

Draft TR	Report on voting
85/662/DTR	85/690/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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INTRODUCTION

Utility engineers and facility managers are requesting rich power and energy data from many locations, with guaranteed and reliable accuracy. This data is essential for helping to understand and ensure the reliability, efficiency, and cost effectiveness of their power distribution systems and the energy generated or consumed.

A good understanding of the different kinds of measurement applications is critical to choosing the proper type and capabilities of measuring devices for each location that will deliver the required information.

To achieve these goals, a complete energy measurement plan supported by a network of metering devices.

This report offers an overview of the different categories of measurement applications, with detailed descriptions and illustrations of each, including references to the most relevant international standards.

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POWER MEASUREMENT APPLICATIONS WITHIN ELECTRICAL DISTRIBUTION NETWORKS AND ELECTRICAL INSTALLATIONS

1 Scope

This Technical Report intends to provide state-of-the-art information on the various electricity measurement applications made in the grid (supply side) or in electrical installation (demand side), and on the related standards covering these applications.

This Technical Report does not address measurements made for specific purposes such as protection, control, automation or indication.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and notations

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 Measurement definitions

3.1.1
power quality instrument
PQI
instrument whose main function is to measure, record and possibly monitor power quality parameters in power supply systems, and whose measuring methods (class A or class S) are defined in IEC 61000-4-30

[SOURCE: IEC 62586-1:2017, 3.1.1]

3.1.2
power quality assessment function
power quality functions whose measurement methods are defined in IEC 61000-4-30

[SOURCE: IEC 61557-12:2018, 3.1.2]

3.1.3
energy meter
instrument intended to measure electrical energy by integrating power with respect to time

[SOURCE: IEC 60050-313:2001, 313-01-35]

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3.1.4
watt-hour meter
active energy meter
energy meter
instrument intended to measure active energy by integrating active power with respect to time

[SOURCE: IEC 60050-313:2001, 313-06-01, modified – The term "(active) energy meter" has been changed to "active energy meter" and the term "energy meter" has been added to comply with the ISO/IEC Directives Part 2:2018]

3.1.5
var-hour meter
reactive energy meter
instrument intended to measure reactive energy by integrating reactive power with respect to time

[SOURCE: IEC 60050-313:2001, 313-06-02]

3.1.6
power metering and monitoring device
PMD
combination in one or more devices of several functional modules dedicated to metering and monitoring electrical parameters in energy distribution systems or electrical installations, used for applications such as energy efficiency, power monitoring and network performance

Note 1 to entry: Under the generic term "monitoring" are also included functions of recording, alarm management, etc.

Note 2 to entry: These devices may include demand side quality functions for monitoring inside commercial/industrial installations.

[SOURCE: IEC 61557-12:2018, 3.1.1, modified – Note 3 to entry has been deleted.]

3.1.7
revenue meter
utility meter
billing meter
electricity meters for billing
energy meter used to meter energy delivered by an energy supplier and to calculate the related amount of money according to an agreed contract, defining the rate(s) and the time of use

Note 1 to entry: These devices are used to bill or invoice final customers.

3.1.8
rate
amount to be paid per unit purchased (e.g. 1 kWh, 1 kW, 1 kVA)

[SOURCE: IEC 60050-691:1973, 691-11-21]

3.1.9
time of use
segregation of energy rates based on the time in which the energy is being consumed

3.1.10
meter index
non-resettable numerical value representing the total energy measured by the meter

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