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Electrical measuring transducers for converting AC and DC electrical quantities to analogue or digital signals

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Transducteurs électriques de mesure convertissant les grandeurs électriques alternatives ou continues en signaux analogiques ou numériques

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**ELECTRICAL MEASURING TRANSDUCERS FOR CONVERTING AC AND DC
ELECTRICAL QUANTITIES TO ANALOGUE OR DIGITAL SIGNALS**

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This fifth edition cancels and replaces the fourth edition published in 2021. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) updating normative references;
- b) updating definitions;
- c) updating structure;
- d) adding DC power measurement.

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The language used for the development of this International Standard 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.

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IEC 60688:2024

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INTRODUCTION

Energy distribution systems need to guarantee energy efficiency, availability, and network performance to address the following challenges:

- meet sustainable development requirements, where energy measurement is necessary to identify sources of energy savings, and to improve the energy performance of manufacturing, commercial organisations, and public services;
- adjust to technological evolutions (electronic loads, electronic measuring methods, etc.);
- address end-user needs (cost saving, compliance building regulations, etc.) regarding electrical energy management;
- ensure safety and continuity of service;
- adjust to the evolution of installation standards;
- meet the needs of new applications for DC systems (photovoltaic, electrical vehicle, DC distribution, etc.).

Monitoring electrical quantities in internal networks contributes to addressing these challenges.

To set up this monitoring, transducers:

- perform the measurement of different types of electrical quantities,
- convert AC and DC electrical quantities to analogue or digital signals,
- can be combined with measuring equipment to monitor and analyse electrical quantities.

NOTE Some of the terms used in this document are different from those used in IEC 60051 (all parts) due to the fundamental differences between indicating instruments and measuring transducers.

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ELECTRICAL MEASURING TRANSDUCERS FOR CONVERTING AC AND DC ELECTRICAL QUANTITIES TO ANALOGUE OR DIGITAL SIGNALS

1 Scope

This document applies to transducers (TRD) with electrical inputs and outputs for making measurements of AC or DC electrical quantities. The output signal can be in the form of an analogue or digital signal.

This document applies to measuring transducers used for converting electrical quantities such as:

- current,
- voltage,
- active power,
- reactive power,
- power factor,
- phase angle,
- frequency,
- harmonics or total harmonic distortion,
- apparent power, and
- DC power

to an output signal.

NOTE The above electrical quantities include AC and/or DC components.

This document applies

- a) if the fundamental frequency of the input(s) lies between 0 Hz and 1 500 Hz,
- b) to the electrical measuring transducer if it is part of a system for the measurement of an electrical or non-electrical quantity,
- c) to transducers for use in a variety of applications such as telemetry and process control and in one of a number of defined environments.

This document is not applicable for:

- instrument transformers that comply with IEC 61869 (all parts),
- transmitters for use in an industrial process application that comply with IEC 60770 (all parts),
- power metering and monitoring devices (PMD) that comply with IEC 61557-12,
- meters that comply with the IEC 62053 series,
- handheld sensors,
- residual current monitoring devices (RCMs) that comply with IEC 62020-1,
- residual current detecting devices (RDC-DD) that comply with IEC 62955,
- in-cable control and protection devices (IC-CPDs) that comply with IEC 62752,
- modular residual current devices (MRCDs) that comply with IEC 60947-2:2016/AMD1:2019, Annex M.