IEC 62974-1

Edition 2.0 2024-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Monitoring and measuring systems used for data collection, aggregation and analysis –
Part 1: Device requirements

Systèmes de surveillance et de mesure utilisés pour la collecte, l'agrégation et l'analyse de données –
Partie 1: Exigences relatives aux dispositifs

IEC 62974-1:2024-08(en-fr)

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Systèmes de surveillance et de mesure utilisés pour la collecte, l'agrégation et l'analyse de données – Partie 1: Exigences relatives aux dispositifs

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MONITORING AND MEASURING SYSTEMS USED FOR DATA COLLECTION, AGGREGATION AND ANALYSIS –

Part 1: Device requirements

FOREWORD

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IEC 62974-1 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities. It is an International Standard.

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

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

a) the performance criteria have been reviewed;
b) EMC and safety requirements have been improved;
c) mechanical requirements have been clarified and amended.

The text of this International Standard is based on the following documents:

Draft	Report on voting
85/920/FDIS	85/929/RVD

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 International Standard is English.

A list of all parts in the IEC 62974 series, published under the general title *Monitoring and measuring systems used for data collection, aggregation and analysis*, can be found on the IEC website.

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.

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- withdrawn, or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.

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INTRODUCTION

The use of electrical energy needs to be optimised worldwide to increase the efficient use of available energy sources, for enhanced competitiveness, and for reducing greenhouse gas emissions and other related environmental impacts.

Efficient use of energy sources implies better energy management leading to a necessary improvement of energy performance, particularly in terms of efficiency, use and consumption. Aggregating energy data and ensuring its availability is key to providing an energy management system for organizations.

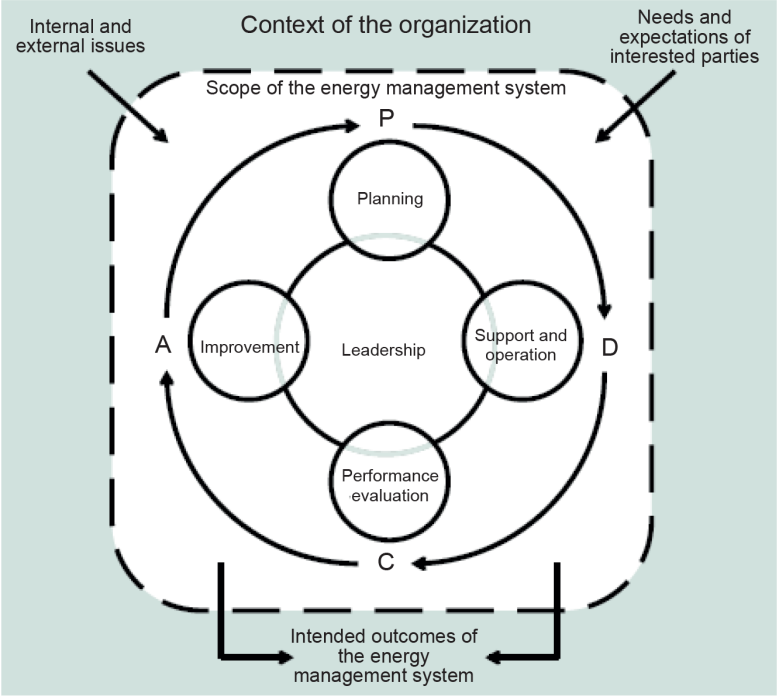
Energy management systems described in documents such as ISO 50001, ISO 50002, ISO 50006, refer to the measurement of energy as an important improvement of energy performance.

ISO 50001:2018 includes a requirement to "implement an energy data collection plan [...] and its measurement and monitoring equipment" to enable the organization to demonstrate energy performance improvement.

Figure 1 shows the link between the ISO 50001:2018 PDCA model and the continuous improvement of this data collection.

In the context of energy management, the Plan-Do-Check-Act (PDCA) approach (see Figure 1) can be outlined as follows:

– Plan: understand the context of the organization, establish an energy policy and an energy management team, consider actions to address risks and opportunities, conduct an energy review, identify significant energy uses (SEUs) and establish energy performance indicators (EnPIs), energy baseline(s) (EnBs), objectives and energy targets, and action plans necessary to deliver results that will improve energy performance in accordance with the organization's energy policy.
– Do: implement the action plans, operational and maintenance controls, and communication, ensure competence and consider energy performance in design and procurement.
– Check: monitor, measure, analyse, evaluate, audit and conduct management review(s) of energy performance and the EnMS.
– Act: take actions to address nonconformities and continually improve energy performance and the EnMS.



[SOURCE: ISO 50001:2018, reproduced with the permission of the authors]

Figure 1 – Plan-Do-Check-Act Cycle

IEC 60364-8-1 provides electrical installation rules for overall energy efficiency functional aspects. It defines requirements, measures and recommendations for the design, erection, operation and verification of all types of low voltage electrical installation including local production and storage of energy for optimizing the overall efficient use of electricity. In particular, it provides recommendations and requirements for the implantation of measurement and data logging devices in low voltage electrical installations, as defined in IEC 62974-1, to improve electrical energy efficiency (EEE) and make energy demand forecasts.

What is not known cannot be changed, and what is not measured is not known. Consequently, there is an increasing need to measure energy within the installations to:

- identify energy saving opportunities; or
- monitor energy performance indicators; or
- educate users.

The measurement data can be gathered manually by employees or automatically by dedicated devices.

Manual data collection can be a restrictive and complicated process to implement. In such a case, measurements would need to be collected by employees at a defined frequency, with a provision for risks of absences being made (vacation, sick leave, etc.), provided the measurements are relevant (number of measurement points to collect) and provided measurements can be relatively coherent (time synchronicity).

This is why data collection should be performed on a fixed schedule and the measurement data relevant to assess the required performance. Commonly, to avoid manual data collection, dedicated devices are used for collection, aggregation and sometimes analysis of measured data. These devices are directly linked to the different measurement devices in the installation to upload or download the energy data. Some typical architectures are given in Annex A.

MONITORING AND MEASURING SYSTEMS USED FOR DATA COLLECTION, AGGREGATION AND ANALYSIS –

Part 1: Device requirements

1 Scope

This part of IEC 62974 specifies product and performance requirements for devices that fall under the heading of "monitoring and measuring systems used for data collection, aggregation and analysis", for industrial, commercial, and similar use rated below or equal to 1 kV AC and 1,5 kV DC.

These devices are fixed and are intended to be used indoors as panel-mounted devices, or as modular devices fixed on a DIN rail, or as housing devices fixed on a DIN rail, or as devices fixed by other means inside a cabinet.

These devices are used to upload or download information (energy measured on loads, power metering and monitoring data, temperature information, etc.), mainly for energy efficiency purposes. These devices are known as energy servers (ESE), energy data loggers (EDL), data gateways (DGW) and I/O data concentrators (IODC) and are grouped together under the family name of Data Management Devices (DMD).

NOTE These systems are embedded or can be connected to a software application capable of consolidating data and delivering automatic analysis. Automatic analysis can include calculation of energy baselines or energy performance indicators as requested for the energy management system required by ISO 50001 or can be used during energy audits as defined in ISO 50002, or can be used in electrical energy efficiency management systems (EEMS) for monitoring an installation complying with IEC 60364-8-1 for the efficient use of electricity. These devices can also be used for certification according to labels such as LEED, BREEAM, HQE, etc.

This document does not cover:

- devices used only in the consumer market (living quarters) or household;
- devices used in the smart metering infrastructure (e.g. smart meters);
- devices used in the smart grid infrastructure;
- devices used as IT servers in the information technology business;
- power metering and monitoring devices (PMD);
- I/O data concentrators already covered by a specific product standard;
- communication protocols and interoperability;
- power quality instruments (PQI);
- software used for the data collection and analysis of the power quality for the supply side.

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 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*