SLOVENSKI STANDARD
SIST EN IEC 61557-12:2022/A1:2022

01-marec-2022

Električna varnost v nizkonapetostnih razdelilnih sistemih za izmenične napetosti do 1 kV in enosmerne napetosti do 1,5 kV - Oprema za preskušanje, merjenje ali nadzorovanje zaščitnih ukrepov - 12. del: Naprave za merjenje in nadzorovanje moči (PMD) - Dopolnilo A1 (IEC 61557-12:2018/A1:2021)

Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 12: Power metering and monitoring devices (PMD) (IEC 61557-12:2018/A1:2021)

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 12: Geräte zur Energiemessung und -überwachung (PMD) (IEC 61557-12:2018/A1:2021)

Sécurité électrique dans les réseaux de distribution basse tension jusqu'à 1 000 V c.a. et 1 500 V c.c. - Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection - Partie 12: Dispositifs de comptage et de surveillance du réseau électrique (PMD) (IEC 61557-12:2018/A1:2021)

Ta slovenski standard je istoveten z: EN IEC 61557-12:2022/A1:2022

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
29.080.01	Električna izolacija na splošno	Electrical insulation in general
29.240.01	Omrežja za prenos in distribucijo električne energije na splošno	Power transmission and distribution networks in general

SIST EN IEC 61557-12:2022/A1:2022 en,fr,de

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61557-12:2022/A1

January 2022

ICS 17.220.20; 29.080.01; 29.240.01

English Version

Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 12: Power metering and monitoring devices (PMD) (IEC 61557-12:2018/A1:2021)

Sécurité électrique dans les réseaux de distribution basse tension jusqu'à 1 000 V c.a. et 1 500 V c.c. - Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection - Partie 12: Dispositifs de comptage et de surveillance du réseau électrique (PMD) (IEC 61557-12:2018/A1:2021)

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 12: Geräte zur Energiemessung und -überwachung (PMD) (IEC 61557-12:2018/A1:2021)

This amendment A1 modifies the European Standard EN IEC 61557-12:2022, it was approved by CENELEC on 2021-06-25. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 85/755/FDIS, future IEC 61557-12/A1, prepared by IEC/TC 85 "Measuring equipment for electrical and electromagnetic quantities" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61557-12:2022/A1:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-07-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-11-10

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 61557-12:2018/A1:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60688	NOTE	Harmonized as EN 60688
IEC 61869 (series)	NOTE	Harmonized as EN IEC 61869 (series)

IEC 61557-12

Edition 2.0 2021-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 12: Power metering and monitoring devices (PMD)

Sécurité électrique dans les réseaux de distribution basse tension jusqu'à 1 000 V en courant alternatif et 1 500 V en courant continu – Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection – Partie 12: Dispositifs de comptage et de surveillance du réseau électrique (PMD)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 17.220.20; 29.080.01; 29.240.01

ISBN 978-2-8322-9662-2

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS UP TO 1 000 V AC AND 1 500 V DC – EQUIPMENT FOR TESTING, MEASURING OR MONITORING OF PROTECTIVE MEASURES –

Part 12: Power metering and monitoring devices (PMD)

AMENDMENT 1

FOREWORD

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Amendment 1 to IEC 61557-12:2018 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

The text of this amendment is based on the following documents:

FDIS	Report on voting
85/755/FDIS	85/764/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 Amendment 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/standardsdev/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,
- replaced by a revised edition, or
- amended.

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1 Scope

Replace the existing text of this clause by the following new text:

This part of IEC 61557 specifies requirements for power metering and monitoring devices (PMD) that measure and monitor the electrical quantities within electrical distribution systems, and optionally other external signals. These requirements also define the performance of PMD in single- and three-phase AC or DC systems having rated voltages up to 1 000 V AC or up to 1 500 V DC.

These devices are fixed or portable. They are intended to be used indoors and/or outdoors.

Power metering and monitoring devices (PMD), as defined in this document, give additional safety information, which aids the verification of the installation and enhances the performance of the distribution systems.

Additionally, this document specifies requirements for measurement functions dedicated to metering and monitoring of electrical parameters called power metering and monitoring function (PMF) which can be embedded in equipment (EPMF) that is not classified as PMD and for which the main function is not power metering and monitoring.

Requirements for power metering and monitoring function (PMF) and additional requirements for equipment embedding power metering and monitoring function (EPMF) are described in Annex H.

The power metering and monitoring devices (PMD) for electrical parameters described in this document are used for general industrial and commercial applications.

The power metering and monitoring devices (PMD) can be associated with sensing devices such as but not limited to instruments transformers compliant to IEC 61869 series of standards or with transducers compliant to IEC 60688.

This document does not address functional safety and cyber security aspects.

This document is not applicable to:

– electricity metering equipment that complies with IEC 62053-21, IEC 62053-22, IEC 62053-23 and IEC 62053-24. Nevertheless, uncertainties defined in this document for active and reactive energy measurement are derived from those defined in IEC 62053 (all parts);
– the measurement and monitoring of electrical parameters defined in IEC 61557-2 to IEC 61557-9 and IEC 61557-13 or in IEC 62020;
– power quality instrument (PQI) according IEC 62586 (all parts);
– devices covered by IEC 60051 (all parts) (direct acting analogue electrical measuring instrument).

NOTE 1 Generally such types of devices are used in the following applications or for the following general needs:

– energy management inside the installation, such as facilitating the implementation of documents such as ISO 50001 and IEC 60364-8-1;
– monitoring and/or measurement of electrical parameters;
– measurement and/or monitoring of the quality of energy inside commercial/industrial installations.

NOTE 2 A measuring and monitoring device of electrical parameters usually consists of several functional modules. All or some of the functional modules are combined in one device. Examples of functional modules are:

– measurement and monitoring of several electrical parameters simultaneously;
– energy measurement and/or monitoring, as well as sometimes compliance with aspects of building regulations;
– alarms functions;
– demand side quality (current and voltage harmonics, over/under voltages, voltage dips and swells, etc.).

NOTE 3 PMD are historically called power meter, power monitor, power monitor device, power energy monitoring device, power analyser, multifunction meter, measuring multifunction equipment, energy meters.

NOTE 4 Metering, measuring and monitoring applications are explained in Annex A.

3 Terms, definitions and notations

Add the following new definitions:

3.1.16
power metering and monitoring function
PMF
measurement function dedicated to metering and monitoring electrical parameters within electrical distribution systems embedded in an equipment that is not a PMD and complies to another IEC product standard

3.1.17
equipment embedding PMF
EPMF
equipment or arrangement of equipment embedding PMF whose main function is not metering and monitoring of electrical parameters

Note 1 to entry: Such equipment are uninterruptible power systems (UPS), static transfer systems (STS), circuit breakers, transfer switching equipment (TSE), switches, disconnectors, switch-disconnectors, fuse-combination units, programmable controllers (PLC), inverter for use in photovoltaic power systems, adjustable speed electrical power drive systems, protection relay, residual current devices (RCDs, RCBOs), residual current monitoring devices (RCM), load-shedding equipment (LSE), bi-directional grid connected power converters.

Add the following new Annex H:

Annex H
(normative)

Requirements for power metering and monitoring function (PMF) and additional requirements for equipment embedding power metering and monitoring function (EPMF)

H.1 Scope

This annex specifies additional requirements and tests for equipment embedding a power metering and monitoring function (EPMF) whose main function is not measurement and its embedded power metering and monitoring function (PMF).

When not otherwise stated in this annex, the core of this document is applied to EPMF or PMF as appropriate when reading “PMD” in the core document.

NOTE The annex follows the same structure as the core document.

H.2 Normative references

Clause 2 applies.

In addition, the following standards apply:

IEC 60255 (all parts), *Measuring relays and protection equipment*

IEC 60755, *General safety requirements for residual current operated protective devices*

IEC 60898 (all parts), *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations*

IEC 60947-2, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

IEC 60947-3, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60947-6-1, *Low-voltage switchgear and controlgear – Part 6-1: Multiple function equipment – Transfer switching equipment*

IEC 61000-4-8, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-19, *Electromagnetic compatibility (EMC) – Part 4-19: Testing and measurement techniques – Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports*

IEC 61008 (all parts), *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)*

IEC 61009 (all parts), *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)*

IEC 61131 (all parts), *Programmable controllers*

IEC 61800 (all parts), *Adjustable speed electrical power drive systems*

IEC 62020 (all parts), *Electrical accessories – Residual current monitors (RCMs)*

IEC 62040 (all parts), *Uninterruptible power systems (UPS)*

IEC 62109-2, *Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters*

IEC 62310 (all parts), *Static transfer systems (STS)*

IEC 62423, *Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses*

IEC 62909 (all parts), *Bi-directional grid connected power converters*

IEC 62962, *Particular requirements for load-shedding equipment (LSE)*

H.3 Terms, definitions and notations

Clause 3 applies.

H.4 Requirements for PMF and additional requirements for EPMF

H.4.1 General requirements

The equipment that may embed EPMF shall be chosen in the equipment list defined in Table H.1.

Table H.1 – List of equipment that may embed EPMF

Equipment	IEC Standard
Uninterruptible power systems (UPS)	IEC 62040 series
Static transfer systems (STS)	IEC 62310 series
Circuit-breakers	IEC 60947-2, IEC 60898 series
Transfer switching equipment (TSE)	IEC 60947-6-1
Switches, disconnectors, switch-disconnectors and fuse-combination units	IEC 60947-3
Programmable controllers (PLC)	IEC 61131 series
Inverter for use in photovoltaic power systems	IEC 62109-2
Adjustable speed electrical power drive systems	IEC 61800
Protection relay	IEC 60255
Residual current devices (RCD, RCBO)	IEC 61008 series, IEC 61009 series, IEC 62423, IEC 60947-2, IEC 60755 series
Residual current monitoring devices (RCM)	IEC 62020 series
Load-shedding equipment (LSE)	IEC 62962
Bi-directional grid connected power converters	IEC 62909 series

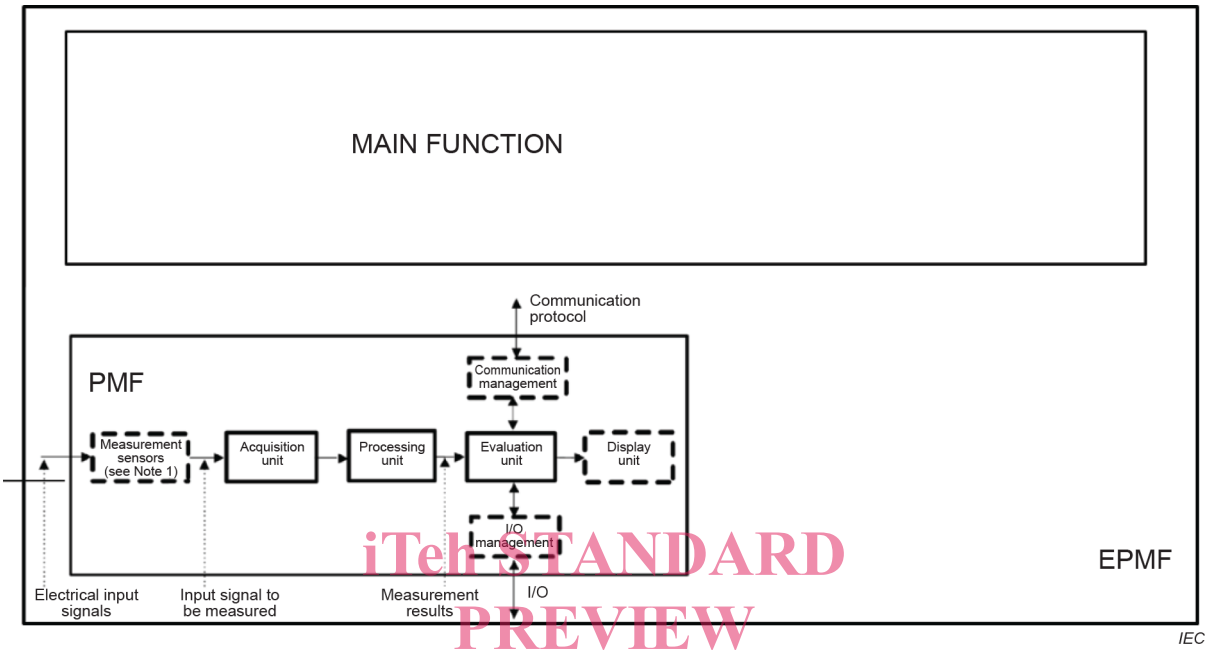
The requirements of 4.2 to 4.12 apply with the modifications specified in this annex.

H.4.2 EPMF general architecture

This subclause provides information about a possible implementation of a PMF in an EPMF.

Figure H.1 shows the common organization of an EPMF including its main function and PMF.

Organization of the measurement chain of EPMF: the electrical quantity can be measured either directly or via voltage and/or current sensors (see also H.4.4).



NOTE 1 It is not necessary that the parts in the dotted lines be included in PMF.

NOTE 2 I/O are analog and/or digital signals with alarms.

NOTE 3 Communications may be ensured by the EPMF or by the PMF part.

Figure H.1 – Example of architecture of EPMF

H.4.3 Classification of PMF

4.3 applies to PMF classified according to Table H.2.

Table H.2 – Functional classification of PMF with minimal required functions

Functionalities symbol [a]	PMF type [b]		
	PMF-I Energy efficiency	PMF-II Basic power monitoring	PMF-III Advanced power monitoring /network performance
P		■	■
Q		■	■
S		■	■
E_a	■	■	■
E_r		■	■
E_{ap}			■
f		■	■
I		■	■
I_N			■
U and/or V		■	■