

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electrical safety in low voltage distribution systems up to 1 000 V a.c. and
1 500 V d.c. – Equipment for testing, measuring or monitoring of protective
measures –**

Part 12: Performance measuring and monitoring devices (PMD)

**Sécurité électrique dans les réseaux de distribution basse tension
de 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 mesure et de surveillance des performances (PMD)



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 12: Performance measuring and monitoring devices (PMD)

FOREWORD

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International Standard IEC 61557-12 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

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

FDIS	Report on voting
85/311/FDIS	85/312/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is to be used in conjunction with IEC 61557-1 (unless otherwise specified).

A list of all parts of the IEC 61557 series, published under the general title *Electrical safety in low voltage distribution systems up to 1000 V a.c. and 1500 V d.c. – Equipment for testing, measuring or monitoring of protective measures*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

As a complement to protection measures, it becomes more and more necessary to measure different electrical parameters, in order to monitor the required performances in energy distribution systems due to:

- installation standards evolutions, for instance over current detection is now a new requirement for the neutral conductor due to harmonic content;
- technological evolutions (electronic loads, electronic measuring methods, etc.);
- end-users needs (cost saving, compliance with aspects of building regulations, etc..);
- safety and continuity of service;
- sustainable development requirements where energy measurement for instance is recognised as an essential element of energy management, part of the overall drive to reduce carbon emissions and to improve the commercial efficiency of manufacturing, commercial organisations and public services.

The devices on the current market have different characteristics, which need a common system of references. Therefore there is a need for a new standard in order to facilitate the choices of the end-users in terms of performance, safety, interpretation of the indications, etc. This standard provides a basis by which such devices can be specified and described, and their performance evaluated.

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Part 12: Performance measuring and monitoring devices (PMD)

1 Scope

This part of IEC 61557 specifies requirements for combined performance measuring and monitoring devices that measure and monitor the electrical parameters within electrical distribution systems. These requirements also define the performance, in single and three-phase a.c. or d.c. systems having rated voltages up to 1 000 V a.c. or up to 1 500 V d.c.

These devices are fixed installed or portable. They are intended to be used indoors and/or outdoors. This standard is not applicable for:

- electricity metering equipment that complies with IEC 62053-21, IEC 62053-22 and IEC 62053-23. Nevertheless, uncertainties defined in this standard for active and reactive energy measurement are derived from those defined in the IEC 62053 standards series.
- simple remote relays or simple monitoring relays.

This standard is intended to be used in conjunction with IEC 61557-1 (unless otherwise specified), which specifies the general requirements for measuring and monitoring equipment, as required in IEC 60364-6.

The standard does not include the measurement and monitoring of electrical parameters defined in Parts 2 to 9 of IEC 61557 or in IEC 62020.

Combined performance measuring and monitoring devices (PMD), as defined in this standard, give additional safety information, which aids the verification of the installation and enhances the performance of the distribution systems. For instance, those devices help to check if the level of harmonics is still compliant with the wiring systems as required in IEC 60364-5-52.

The combined performance measuring and monitoring devices (PMD) for electrical parameters described in this standard are used for general industrial and commercial applications. A PMD-A is a specific PMD complying with requirements of IEC 61000-4-30 class A, which may be used in "power quality assessment" applications.

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

- energy management inside the installation;
- monitoring and/or measurement of electrical parameters that may be required or usual;
- measurement and/or monitoring of the quality of energy.

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 mentioned below:

- measurement and indication of several electrical parameters simultaneously;

- energy measurement and/or monitoring, and also sometimes compliance with aspects of building regulations;
- alarms functions;
- power quality (harmonics, over/undervoltages, voltage dips and swells, etc).

2 Normative references

The following referenced documents are indispensable for the application 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, *Environmental testing – Part 2-1: Tests – Test A: Cold*

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

IEC 60068-2-30, *Environmental testing – Part 2-30 – Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60364-6, *Low-voltage electrical installations – Part 6: Verification*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-15, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 15: Flickermeter – Functional and design specifications*

IEC 61000-4-30:2003, *Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods*

IEC 61010 (all parts), *Safety requirements for electrical equipment for measurement, control, and laboratory use*

IEC 61010-1:2001, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61326-1:2005, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

IEC 61557-1:2007, *Electrical safety in low voltage distribution systems up to 1000 V a.c. and 1500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements*

IEC 62053-21:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2)*

IEC 62053-22:2003, *Electricity metering equipment (a.c.) – Particular Requirements – Part 22: Static meters for active energy (classes 0,2 S and 0,5 S)*

IEC 62053-23:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)*

IEC 62053-31:1998, *Electricity metering equipment (a.c.) – Particular requirements – Part 31: Pulse output devices for electromechanical and electronic meters (two wires only)*