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Power quality measurement in power supply systems -  
Part 1: Power quality instruments (PQI)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 62586-1:2017 sisaldab Euroopa standardi EN 62586-1:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 62586-1:2017 consists of the English text of the European standard EN 62586-1:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.11.2017.	Date of Availability of the European standard is 10.11.2017.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English Version

Power quality measurement in power supply systems -  
Part 1: Power quality instruments (PQI)  
(IEC 62586-1:2017)

Mesure de la qualité de l'alimentation dans les réseaux  
d'alimentation - Partie 1: Instruments de qualité de  
l'alimentation (PQI)  
(IEC 62586-1:2017)

Messung der Spannungsqualität in  
Energieversorgungssystemen - Teil 1: Messgeräte für die  
Spannungsqualität  
(IEC 62586-1:2017)

This European Standard was approved by CENELEC on 2017-06-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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.

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Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

## European foreword

The text of document 85/586/FDIS, future edition 2 of IEC 62586-1, 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 62586-1:2017.

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) 2018-05-10
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-11-10

This document supersedes EN 62586-1:2014.

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.

## Endorsement notice

The text of the International Standard IEC 62586-1:2017 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 60359	NOTE	Harmonized as EN 60359.
IEC 61010 Series	NOTE	Harmonized as EN 61010 Series.

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## INTRODUCTION

Electricity as delivered to the customers has several characteristics that are variable and that affect its usefulness to the customers.

Power quality instruments on the market have different characteristics. This document provides a common system of references in order to facilitate their selection, comparison and evaluation. This document specifies a classification based on product performance, environment and safety.

It is acknowledged that IEC 61000-4-30 is a basic EMC publication. Detailed guidance on instrument performance, performance verification methods, additional influence quantities and other similar information should, in general, be found in a product standard.

IEC 62586-1 is a product standard that refers to IEC 61000-4-30, IEC 61000-4-7 and IEC 61000-4-15 for measuring methods. IEC 62586-2 specifies functional tests and uncertainty requirements for instruments in the scope of IEC 62586-1.

IEC 62586-1 is therefore complementing basic EMC standards with environmental, safety and performance requirements.

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# POWER QUALITY MEASUREMENT IN POWER SUPPLY SYSTEMS –

## Part 1: Power quality instruments (PQI)

### 1 Scope

This part of IEC 62586 specifies product and performance requirements for instruments whose functions include measuring, recording and possibly monitoring power quality parameters in power supply systems, and whose measuring methods (class A or class S) are defined in IEC 61000-4-30.

These requirements are applicable in single, dual- (split phase) and 3-phase AC power supply systems at 50 Hz or 60 Hz.

These instruments can be used:

- in the generation, transmission and distribution of electricity, for example inside a power station, substation or a distributed generator connection;
- at the interface point between the installation and the network, e.g. in order to check the compliance of the connection agreement between a network operator and the customer.

NOTE These instruments can also be used for other applications, e.g. inside commercial / industrial installations especially where comparable measurements are needed (i.e. data centres or petrochemical plants).

These instruments are fixed-installed or portable. They are intended to be used both indoors and/or outdoors.

Devices such as digital fault recorders, energy/power meters, protection relays or circuit breakers can include power quality functions of class A or class S defined in IEC 61000-4-30. If such devices are specified according to this document, then this document fully applies and applies in addition to the relevant product standard. This document does not replace the relevant product standard.

This document does not address the user interface or topics unrelated to measurement performance of device.

This document does not cover post-processing and interpretation of the data with, for example, dedicated software.

### 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 60068-1, *Environmental testing – Part 1: General and guidance*

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

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

- IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*
- IEC 60068-2-14, *Environmental testing – Part 2-14 Tests – Test N: Change of temperature*
- IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*
- IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*
- IEC 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*
- IEC 60068-2-57, *Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history and sine-beat method*
- IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*
- IEC 60529, *Degrees of protection provided by enclosures (IP Code)*
- IEC 60654-1, *Industrial-process measurement and control equipment – Operating conditions – Part 1: Climatic conditions*
- IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*
- IEC 60721-3-1, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 1: Storage*
- IEC 60721-3-2, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 2: Transportation*
- IEC 60721-3-3, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weatherprotected locations*
- IEC 61000-4-7:2002, *Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques – General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto*  
Amendment 1:2008
- IEC 61000-4-15, *Electromagnetic compatibility (EMC) – Part 4-15: Testing and measurement techniques – Flickermeter – Functional and design specifications*
- IEC 61000-4-30:2015, *Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods*
- IEC 61000-6-5, *Electromagnetic compatibility (EMC) – Part 6-5: Generic standards – Immunity for power station and substation environments*
- IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*
- IEC 61010-2-030, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits*

IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

IEC 62586-2, *Power quality measurement in power supply systems – Part 2: Functional tests and uncertainty requirements*

CISPR 32, *Electromagnetic compatibility of multimedia equipment – Emission requirements*

### **3 Terms, definitions, symbols and abbreviated terms**

For the purposes of this document, the terms and definitions given in IEC 61000-4-30 and the following 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 General 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

##### **3.1.2**

##### **power quality instrument class A**

##### **PQI-A**

PQI whose measuring methods comply with class A of IEC 61000-4-30

##### **3.1.3**

##### **power quality instrument class S**

##### **PQI-S**

PQI whose measuring methods comply with class S of IEC 61000-4-30

##### **3.1.4**

##### **portable instrument**

##### **portable measuring instrument**

measuring instrument designed to be easily carried by hand and to be connected and disconnected by the user

[SOURCE: IEC 60050-300:2001, 312-02-18]

##### **3.1.5**

##### **fixed installed instrument**

##### **fixed installed measuring instrument**

measuring instrument designed to be permanently mounted and which is intended to be connected by means of permanently installed connectors

[SOURCE: IEC 60050-300:2001, 312-02-17, modified – “conductors” has been replaced by “connectors”.]