

This document is a preview generated by EVS

**Elektrimõõteseadmed vahelduvvoolule. Osa 2:
Erinõuded. Elektromehaanilised aktiivenergia
arvestid (klass A ja B)**

Electricity metering equipment (a.c.) - Part 2: Particular requirements - Electromechanical meters for active energy (class indexes A and B)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50470-2:2007 sisaldb Euroopa standardi EN 50470-2:2006 ingliskeelset teksti.	This Estonian standard EVS-EN 50470-2:2007 consists of the English text of the European standard EN 50470-2:2006.
Standard on kinnitatud Eesti Standardikeskuse 14.12.2006 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 14.12.2006 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kätesaadavaks tegemise kuupäev on 27.10.2006.	Date of Availability of the European standard text 27.10.2006.
Standard on kätesaadav Eesti standardiorganisatsionist.	The standard is available from Estonian standardisation organisation.

ICS 91.140.50

Võtmesõnad: elektrimõõtseadmed, katsetused, vahelduvvool

Standardite reproduutseerimis- ja levitamisõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

English version

**Electricity metering equipment (a.c.)
Part 2: Particular requirements -
Electromechanical meters for active energy
(class indexes A and B)**

Equipement de comptage
d'électricité (c.a.)
Partie 2: Prescriptions particulières -
Compteurs électromécaniques
d'énergie active
(classes de précision A et B)

Wechselstrom-Elektrizitätszähler
Teil 2: Besondere Anforderungen -
Elektromechanische
Wirkverbrauchszähler
der Genauigkeitsklassen A und B

This European Standard was approved by CENELEC on 2006-05-01. 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 Central Secretariat or to any CENELEC member.

This European Standard 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 13, Equipment for electrical energy measurement and load control.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50470-2 on 2006-05-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-05-01

This EN 50470-2 is related to EN 62053-11:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2)*.

The structure of the two standards is similar, modifications in this European Standard are provided in the perspective of compliance with the Essential Requirements of the Directive 2004/22/EC on Measuring Instruments (MID).

This standard is to be used with EN 50470-1:2006, *Electricity metering equipment (a.c.) – Part 1: General requirements, tests and test conditions – Metering equipment (class indexes A, B and C)*.

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 2004/22/EC. See Annex ZZ.

Contents

1	Scope.....	5
2	Normative references	5
3	Terms, definitions and abbreviations	5
4	Standard electrical values	6
5	Mechanical requirements.....	6
5.1	General	6
5.2	Register (counting mechanism)	6
5.3	Direction of rotation and marking of the rotor.....	6
6	Climatic conditions	6
7	Electrical requirements	6
7.1	Power consumption	6
7.1.1	Measuring method	6
7.1.2	Voltage circuits.....	7
7.1.3	Current circuits	7
7.2	AC voltage test.....	7
8	Accuracy requirements and tests	9
8.1	Limits of percentage error due to variation of the load	9
8.2	Repeatability	9
8.3	Limits of additional percentage error due to influence quantities.....	9
8.4	Maximum permissible error (MPE).....	11
8.5	Effect of disturbances of long duration.....	11
8.6	Short time overcurrents	13
8.7	Performing the tests	13
8.7.1	Accuracy test conditions	13
8.7.2	Accuracy test at reference conditions	15
8.7.3	Interpretation of accuracy test results	15
8.7.4	Repeatability	15
8.7.5	Test of effects of influence quantities.....	15
8.7.6	Calculation of the composite error	16
8.7.7	Test of effects of disturbances of long duration.....	16
8.7.8	Short time overcurrents	19
8.7.9	Test of starting and no-load condition	19
8.7.10	Meter constant.....	20
8.7.11	Adjustment	20
9	Durability.....	21
10	Reliability	21
11	Protection against corruption	21
	Annex A (informative) Calculation of the composite error	22
	Annex B (normative) Test circuit diagram for the test of immunity to earth fault	23
	Annex ZZ (informative) Coverage of Essential Requirements of EC Directives.....	24
	Bibliography.....	25

Figures

Figure B.1 – Circuit to simulate earth fault condition in phase 1	23
Figure B.2 – Voltages at the meter under test	23

Tables

Table 1 – Power consumption in voltage circuits	7
Table 2 – Power consumption in current circuits	7
Table 3 – AC voltage tests	8
Table 4 – Percentage error limits at reference conditions (single-phase meters and polyphase meters with balanced loads)	9
Table 5 – Percentage error limits at reference conditions (polyphase meters carrying a single-phase load, but with balanced polyphase voltages applied to voltage circuits)	9
Table 6 – Limits of additional percentage error due to influence quantities (single-phase meters and polyphase meters with balanced loads).....	10
Table 7 – Limits of additional percentage error due to influence quantities (polyphase meters carrying a single phase load, but with balanced polyphase voltages applied to voltage circuits).....	10
Table 8 – Maximum permissible error (MPE).....	11
Table 9 – Effect of disturbances of long duration – Critical change values	12
Table 10 – Effect of short time overcurrents – Critical change value	13
Table 11 – Voltage and current balance	13
Table 12 – Reference conditions	14
Table 13 – Test points for determining the intrinsic error and the additional percentage error due to influence quantities	15
Table 14 – Interpretation of test results.....	15
Table 15 – Starting current	20
Table 16 – Minimum range of adjustment.....	20

1 Scope

This European Standard applies to newly manufactured electromechanical watt-hour meters intended for residential, commercial and light industrial use, of class indexes A and B, for the measurement of alternating current electrical active energy in 50 Hz networks. It specifies particular requirements and type test methods.

It applies to electromechanical watt-hour meters for indoor and outdoor application, consisting of a measuring element and register(s) enclosed together in a meter case. It also applies to operation indicator(s) and test output(s).

If the meter has (a) measuring element(s) for more than one type of energy (multi-energy meters), or when other functional elements, like maximum demand indicators, electronic tariff registers, time switches, ripple control receivers, data communication interfaces etc. are enclosed in the meter case (multi-function meters) then this standard applies only for the active energy metering part.

This standard distinguishes between:

- meters of class indexes A and B;
- direct connected and transformer operated meters;
- meters for use in networks equipped with or without earth fault neutralizers.

It does not apply to:

- watt-hour meters where the voltage across the connection terminals exceeds 600 V (line-to-line voltage for meters for polyphase systems);
- portable meters.

Methods for acceptance testing are covered by the IEC 62058 series of standards¹⁾.

The dependability aspect is covered by the documents of the IEC 62059 series.

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.

Publication	Year	Title
EN 50470-1	2006	<i>Electricity metering equipment (a.c.) – Part 1: General requirements, tests and test conditions – Metering equipment (class indexes A, B and C)</i>

3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions given in EN 50470-1 apply.

¹⁾ At draft stage.