SLOVENSKI STANDARD
SIST EN 62058-21:2010

01-september-2010

Nadomešča:
SIST EN 60514:1995

Merjenje električne energije (a.c.) - Sprejemna kontrola - 21. del: Posebne zahteve za elektromehanske števce delovne energije (razredi 0,5, 1 in 2 ter razredni indeksi A in B) (IEC 62058-21:2008, spremenjen)

Electricity metering equipment (a.c.) - Acceptance inspection - Part 21: Particular requirements for electromechanical meters for active energy (classes 0,5, 1 and 2 and class indexes A and B) (IEC 62058-21:2008, modified)

Wechselstrom-Elektrizitätszähler - Annahmeprüfung - Teil 21: Besondere Anforderungen an elektromechanische Zähler für Wirkenergie (Klassen 0,5, 1 und 2 und Klassenzeichen A und B) (IEC 62058-21:2008, modifiziert)

Equipement de comptage de l'électricité (a.c.) - Contrôle de réception - Partie 21: Exigences particulières pour compteurs électromécaniques d'énergie active (classes 0,5, 1 et 2 et indices de classe A et B) (CEI 62058-21:2008, modifiée)

Ta slovenski standard je istoveten z: **EN 62058-21:2010**

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems

SIST EN 62058-21:2010 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62058-21

June 2010

ICS 17.220; 91.140.50

Supersedes EN 60514:1995 (partially)

English version

Electricity metering equipment (a.c.) - Acceptance inspection - Part 21: Particular requirements for electromechanical meters for active energy (classes 0,5, 1 and 2 and class indexes A and B)

(IEC 62058-21:2008, modified)

Equipement de comptage de l'électricité (a.c.) - Contrôle de réception - Partie 21: Exigences particulières pour compteurs électromécaniques d'énergie active (classes 0,5, 1 et 2 et indices de classe A et B) (CEI 62058-21:2008, modifiée)

Wechselstrom-Elektrizitätszähler - Annahmeprüfung - Teil 21: Besondere Anforderungen an elektromechanische Zähler für Wirkenergie (Klassen 0,5, 1 und 2 und Klassenzeichen A und B) (IEC 62058-21:2008, modifiziert)

This European Standard was approved by CENELEC on 2010-06-01. 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, Bulgaria, Croatia, 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

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Foreword

The text of document 13/1431/FDIS, future edition 1 of IEC 62058-21, prepared by IEC TC 13, Electrical energy measurement, tariff- and load control, was submitted to the IEC-CENELEC parallel vote.

A draft amendment, prepared by the Technical Committee CENELEC TC 13, Equipment for electrical energy measurement and load control, was submitted to the formal vote.

The combined texts were approved by CENELEC as EN 62058-21 on 2010-06-01.

EN 62058-21:2010, together with EN 62058-11:2010, supersedes EN 60514:1995.

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

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)	2011-06-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-06-01

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.

Annexes ZA and ZZ have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62058-11:2008 was approved by CENELEC as a European Standard with agreed common modifications as given below.

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

IEC 62052-11:2003 NOTE Harmonized as EN 62052-11:2003 (not modified).

IEC 62053-11:2003 NOTE Harmonized as EN 62053-11:2003 (not modified).

COMMON MODIFICATIONS

Title

Replace the title of EN 62058-21 by the following:

Electricity metering equipment (a.c.) - Acceptance inspection - Part 21: Particular requirements for electromechanical meters for active energy (classes 0,5, 1 and 2 and class indexes A and B)

Scope

Add the following text at the end of Clause 1:

This European standard applies to meters of accuracy classes 0,5, 1 and 2, as well as to meters of class indexes A and B.

Normative references

Add the following references:

Publication	Year	Title
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)*
EN 50470-2	2006	*Electricity metering equipment (a.c.) - Part 2: Particular requirements - Electromechanical meters for active energy (class indexes A and B)*

4 Test conditions

4.2 Reference conditions

Add the following text at the end of 4.2:

For meters of class index A and B, the values in Table 1 and Table 2, specified for meters of class 2 and class 1 apply respectively.

5 Inspection procedure

5.1 Test to be performed and inspection methods

Add the following text above 5.2:

See also EN 62058-11, 5.5.

5.2 Preliminary tests and pre-conditioning

Add the following text above 5.3:

For meters of class indexes A and B, the value of the current shall be I_{tr}.

5.4 Test No. 2: Test of no-load condition

Add the following text after the Note:

The value of the test current for meters of class indexes A and B shall be 0,01 I_{tr}.

5.5 Test No. 3: Starting

Add the following text and table after Table 6:

For meters of class index A and B, instead of the values of Table 6, the values of Table Z1 apply:

Table Z1 – Value of current for starting test for meters of class index A and B

Meters for	Meters of class index		Power factor
	A	B	
Direct connection	0,05 I_{tr}	0,04 I_{tr}	1
Connection through current transformers	0,06 I_{tr}	0,04 I_{tr}	1

5.6 Tests No. 4…9: Accuracy tests

Add the following text and tables after Table 7:

For meters of class index A and B, instead of the values of the values of Table 7, the values of Table Z2 apply:

Table Z2 – Accuracy test points and limits of errors for meters of class index A and B

Test No.	Value of current for direct connected and transformer operated meters	Power factor	Applicable for meter type	Load (in case of polyphase meters)	Percentage error limits for for meters of class index	
					A	B
4	I_{min}	1	Single- and polyphase	Balanced	± 2,5	± 1,5
5	10 I_{tr}	1	Single- and polyphase	Balanced	± 2,0	± 1,0
6	10 I_{tr}	0,5	Single- and polyphase	Balanced	± 2,0	± 1,0
7	10 I_{tr}	1	Polyphase	Single phase [a]	± 3,0	± 2,0
8	10 I_{tr}	1	Polyphase	Single phase [b]	± 3,0	± 2,0
9	I_{max}	1	Single- and polyphase	Balanced	± 2,0	± 1,0

[a] The meter shall be supplied with three phase symmetrical voltage. The current shall be applied to any of the phases.

[b] The meter shall be supplied with three phase symmetrical voltage. The current shall be applied to a phase different from the phase in test 7.

The values of Table Z2 are taken from EN 50470-2, Table 4 and Table 5, Percentage error limits at reference conditions.

To ensure that the requirements of EN 50470-2, Table 8, Maximum Permissible Error (MPE), are also met, and with this the essential requirements of the MID are met, the actual percentage error limits to be used during conformity assessment shall be established using the method described below.

For each test point, the values of variation of percentage error due to temperature, voltage and frequency variation, established during type testing, shall be subtracted from the MPE using the formula:

$$e_{calc}(I,\cos\varphi) = \sqrt{MPE^2 - \delta^2_{Type}(T,I,\cos\varphi) - \delta^2_{Type}(U,I,\cos\varphi) - \delta^2_{Type}(f,I,\cos\varphi)}$$

where:

$e_{calc}(I,\cos\varphi)$ is the value of calculated limit of percentage error under reference conditions;

MPE is the value of maximum permissible error taken from EN 50470-2, Table 8, for the given test point;

$\delta_{Type}(T,I,\cos\varphi)$ is the value of the variation of percentage error due to variation of temperature, established during type testing;

$\delta_{Type}(U,I,\cos\varphi)$ is the value of the variation of percentage error due to variation of voltage, established during type testing;

$\delta_{Type}(f,I,\cos\varphi)$ is the value of the variation of percentage error due to variation of frequency, established during type testing.

The actual limit of percentage error to be applied for each test point shall be the lesser of the value shown in Table Z1, and the value $e_{calc}(I,\cos\varphi)$ calculated as described above.

An eventual correction of the percentage error limits, due to uncertainty of the measurement of percentage error as described in 4.3, also applies.

During manufacturing, the values of the variation of percentage error due to temperature, voltage and frequency variation shall be established in adequate intervals to ensure that they are essentially same as established during type testing.

EXAMPLE:

A meter of class index A, manufactured for the temperature range of 5 °C to 30 °C is tested.

The columns of Table Z3 show the following:

- column 1: the number of test, as identified in Table Z1;
- column 2: the values of the mpe, taken from EN 50470-2, Table 8;
- column 3: the values of temperature variation, established during the type test;
- column 4: the values of voltage variation, established during the type test;
- column 5: the values of frequency variation, established during the type test;
- column 6: the calculated values of percentage error limits;
- column 7: the percentage error limits taken from Table Z2.

Table Z3 – Example for determining the percentage error limits to be applied

Test No.	MPE	$\delta_{Type}(T, I, \cos\varphi)$	$\delta_{Type}(U, I, \cos\varphi)$	$\delta_{Type}(f, I, \cos\varphi)$	$e_{calc}(I, \cos\varphi)$	$e(I, \cos\varphi)$
4	± 3,5	+ 0,5	- 0,2	+ 0,1	± 3,46	± 2,5
5	± 3,5	+ 0,3	- 0,2	+ 0,1	± 3,48	± 2,0
6	± 3,5	+ 0,5	- 0,2	+ 0,1	± 3,46	± 2,0
7	± 4,0	+ 0,4	- 0,2	+ 0,1	± 3,97	± 3,0
8	± 4,0	+ 0,4	- 0,2	+ 0,1	± 3,97	± 3,0
9	± 3,5	+ 0,3	- 0,2	+ 0,1	± 3,48	± 2,0

As the values of $e(I, \cos\varphi)$, taken from Table Z2 are smaller than the values $e_{calc}(I, \cos\varphi)$ calculated from the MPE taking into account the values of variation of percentage error due to temperature, voltage and frequency variation, established during type testing, the values $e(I, \cos\varphi)$ of Table Z2 shall be used.

If the meter is intended for a wider temperature range, then the calculation has to be performed for each temperature range, and the smallest percentage error limits – out of all the calculated values $e_{calc}(I, \cos\varphi)$ and the values $e(I, \cos\varphi)$ of Table Z2 – shall be used.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 62058-11	2008	Electricity metering equipment (AC) - Acceptance inspection - Part 11: General acceptance inspection methods	EN 62058-11	2010
ISO/IEC Guide 98	1995	Guide to the expression of uncertainty in measurement (GUM)	-	-

Annex ZZ
(informative)

Coverage of Essential Requirements of the EC Directives

This European Standard has been prepared under the mandate M/374 given to CENELEC by the European Commission and within its scope, the standard covers methods for statistical verification of conformity with the metrological requirements in connection the Modules F, D and H1.

EN 62058-11 specifies sampling plans, schemes and systems for lot-by-lot inspection by attributes or variables. In addition, a test procedure for 100 % inspection is specified, that can be used if the lot size is too small for sampling inspection or when sampling inspection has to be discontinued.

Considering the Part 11, EN 62058-21 specifies particular requirements for electromechanical electricity meters, including the tests to be performed, the sampling plans applicable and the performance criteria.

Table ZZ.1 provides the relationship between the Essential requirements of the MID and the stipulations of the EN 62058 series.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directives concerned.

WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard.

Table ZZ.1 – Relationship between the Essential requirements of the MID and the stipulations of the relevant standards

MID Annex I		Subject	EN 62058-11	EN 62058-21	EN 62058-31
		NOTE The text in this column is for orientation. For the full text see the MID.			
1		Allowable Errors			
	1.1	Under rated operating conditions and in the absence of disturbance	–	5.6 Accuracy tests, Table Z2 5.7 Verification of the register	5.6 Accuracy tests, Table Z2 5.7 Verification of the register
	1.2	Under rated operating conditions and in the presence of disturbance	–	–	–
	1.3	Climatic, mechanical and EM environment and other influence quantities to be specified by the manufacturer	–	–	–
	1.3.1	Climatic environments, upper and lower temperature limit	–	–	–
	1.3.2	Mechanical environments, vibration and shock	–	–	–
	1.3.3	Electromagnetic environments, unless otherwise laid down in the appropriate instrument-specific annexes.	–	–	–
	1.3.4	Other influence quantities	–	–	–
	1.4	Carrying out the tests	–	–	–
	1.4.1	Basic rules for testing and determination of errors	–	5.6, Accuracy test	5.6, Accuracy test
	1.4.2	Ambient humidity	–	–	–
2		Reproducibility	–	–	–
3		Repeatability	–	4.3	4.3
4		Discrimination and Sensitivity	–	–	–
5		Durability	–	–	–
6		Reliability	–	–	–
7		Suitability		5.3 AC voltage test	5.3 AC voltage test
	7.1	No feature likely to facilitate fraudulent use, possibilities for unintentional misuse minimal	–	–	–
	7.2	Suitable for intended use under practical working conditions, no unreasonable demand of the user	–	–	–

MID Annex I		Subject	EN 62058-11	EN 62058-21	EN 62058-31
	7.3	Errors of a utility measuring instrument at flows or currents outside the controlled range not unduly biased.	–	–	–
	7.4	When the measurand is constant over time, the measuring instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.	N.A.	N.A.	N.A.
	7.5	Robust and materials of construction suitable for the intended use conditions.	–	–	–
	7.6	Designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use. Software that is critical for the metrological characteristics identifiable. Metrological characteristics not inadmissibly influenced by the associated software.	–	–	–
8		Protection against corruption	–	–	–
	8.1	Metrological characteristics not influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the measuring instrument.	–	–	–
	8.2	Hardware component critical for metrological characteristics designed so that it can be secured. Security measures to provide evidence of an intervention.	–	–	–
	8.3	Software that is critical for metrological characteristics shall be identified as such and shall be secured. Software identification. Evidence of an intervention available for a reasonable period of time.	–	–	–
	8.4	Measurement data, critical software and metrologically important parameters stored or transmitted adequately protected against accidental or intentional corruption.	–	–	–
	8.5	For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.	–	–	–