

© Copyright SEK. Reproduction in any form without permission is prohibited.

Mätande reläer och skyddsutrustningar – Del 127: Funktionsfordringar på över- och underspänningsskydd

Measuring relays and protection equipment –

Part 127: Functional requirements for over/under voltage protection

Som svensk standard gäller europastandarden EN 60255-127:2014. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60255-127:2014.

Nationellt förord

Europastandarden EN 60255-127:2014

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60255-127, First edition, 2010 - Measuring relays and protection equipment - Part 127: Functional requirements for over/under voltage protection**

utarbetad inom International Electrotechnical Commission, IEC.

SS-EN 60255-127 tillsammans med SS-EN 60255-151, utgåva 1, 2010, ersätter den tidigare upphävda svenska standarden SS-EN 60255-3, utgåva 1, 1998.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English version

**Measuring relays and protection equipment -
Part 127: Functional requirements for over/under voltage protection
(IEC 60255-127:2010)**

Relais de mesure et dispositifs de protection -
Partie 127: Exigences fonctionnelles pour les
protections à minimum et maximum de tension
(CEI 60255-127:2010)

Messrelais und Schutzeinrichtungen -
Teil 127: Funktionsnorm für Über-
/Unterspannungsschutz
(IEC 60255-127:2010)

This European Standard was approved by CENELEC on 2013-09-19. 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.

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 CEN-CENELEC Management Centre 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

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

Foreword

The text of document 95/254/CDV, future edition 1 of IEC 60255-127, prepared by IEC/TC 95 "Measuring relays and protection equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60255-127:2014.

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) 2014-07-10
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-09-19

This document supersedes EN 60255-3:1998.

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

Endorsement notice

The text of the International Standard IEC 60255-127:2010 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 61850	NOTE	Harmonized in EN 61850 series.
IEC 61850-7-4	NOTE	Harmonized as EN 61850-7-4.
IEC 61850-9-2	NOTE	Harmonized as EN 61850-9-2.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60044	series	Instrument transformers	EN 60044	series
IEC 60255-1	-	Measuring relays and protection equipment Part 1: Common requirements	EN 60255-1	-

CONTENTS

1	Scope and object.....	6
2	Normative references	6
3	Terms and definitions	6
4	Specification of the function.....	8
4.1	General.....	8
4.2	Input energising quantities/Energising quantities	8
4.3	Binary input signals	9
4.4	Functional logic	9
4.4.1	Operating characteristics	9
4.4.2	Reset characteristics	13
4.5	Binary output signals	14
4.5.1	Start (pick-up) signal	14
4.5.2	Operate (trip) signal.....	15
4.5.3	Other binary output signals.....	15
5	Performance specification	15
5.1	Accuracy related to the characteristic quantity.....	15
5.2	Accuracy related to the operate time	15
5.3	Accuracy related to the reset time	16
5.4	Transient performance	16
5.4.1	Overshoot time	16
5.4.2	Response to time varying value of the characteristic quantity	16
5.5	Voltage transformer requirements	16
6	Functional test methodology.....	16
6.1	General.....	16
6.2	Determination of steady state errors related to the characteristic quantity	17
6.2.1	Accuracy of setting (start) value	17
6.2.2	Reset ratio determination.....	18
6.3	Determination of steady state errors related to the start and operate time	18
6.4	Determination of steady state errors related to the reset time	19
6.5	Determination of transient performance	20
6.5.1	Overshoot time for undervoltage protection	20
6.5.2	Response to time varying value of the characteristic quantity for dependent time relays	20
7	Documentation requirements	21
7.1	Type test report.....	21
7.2	Other user documentation	22
	Annex A (informative) Reset time determination for relays with trip output only.....	23
	Bibliography.....	24
	Figure 1 – Simplified protection function block diagram.....	8
	Figure 2 – Overvoltage independent time characteristic	9
	Figure 3 – Undervoltage independent time characteristic	10
	Figure 4 – Dependent time characteristic for overvoltage protection	11
	Figure 5 – Dependent time characteristic for undervoltage protection	12

Figure 6 – Definite time reset characteristic	14
Figure 7 – Definite time reset characteristic (alternative solution with instantaneous reset after relay operation).....	14
Figure 8 – Test waveform	21
Figure A.1 – Dependent reset time determination	23
Table 1 – Test points for overvoltage elements	19
Table 2 – Test points for undervoltage elements	19
Table 3 – Test points for overvoltage elements	20
Table 4 – Test points for undervoltage elements	20
Table 5 – Recommended values for the test	21

MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 127: Functional requirements for over/under voltage protection

1 Scope

This part of IEC 60255 specifies minimum requirements for over/under voltage relays. The standard includes specification of the protection function, measurement characteristics and time delay characteristics.

This standard defines the influencing factors that affect the accuracy under steady state conditions and performance characteristics during dynamic conditions. The test methodologies for verifying performance characteristics and accuracy are also included in this standard.

The over/under voltage functions covered by this standard are as follows:

	IEEE/ANSI C37.2 Function numbers	IEC 61850-7-4 Logical nodes
Phase undervoltage protection	27	PTUV
Positive sequence undervoltage protection	27D	PTUV
Phase overvoltage protection	59	PTOV
Residual/zero-sequence overvoltage protection	59N/59G	PTOV
Negative sequence/ unbalance overvoltage protection	47	PTOV

The general requirements for measuring relays and protection equipment are specified in IEC 60255-1.

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 60044 (all parts), *Instrument transformers*

IEC 60255-1, *Measuring relays and protection equipment – Part 1: Common requirements*