

**MADALPINGELISED ELEKTRIPAIGALDISED. OSA 8-1:
ENERGIATÕHUSUS**

**Low-voltage electrical installations - Part 8-1: Energy
efficiency**

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

See Eesti standard EVS-HD 60364-8-1:2015 sisaldab Euroopa standardi HD 60364-8-1:2015 ingliskeelset teksti.	This Estonian standard EVS-HD 60364-8-1:2015 consists of the English text of the European standard HD 60364-8-1:2015.
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.
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English Version

**Low-voltage electrical installations - Part 8-1: Energy efficiency
(IEC 60364-8-1:2014 , modified)**

Installations électriques basse tension - Partie 8-1:
Efficacité énergétique
(IEC 60364-8-1:2014 , modifiée)

Errichten von Niederspannungsanlagen - Teil 8-1:
Energieeffizienz
(IEC 60364-8-1:2014 , modifiziert)

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

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Foreword

The text of document 64/1969/FDIS, future edition 1 of IEC 60364-8-1, prepared by IEC/TC 64 "Electrical installations and protection against electric shock" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as HD 60364-8-1:2015.

A draft amendment, which covers common modifications to IEC 60364-8-1:2014, was prepared by CLC/TC 64 "Electrical installations and protection against electric shock" and approved by CENELEC.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-12-22
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2017-12-22

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Endorsement notice

The text of the International Standard IEC 60364-8-1:2014 was approved by CENELEC as a European Standard with agreed common modifications.

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

IEC 60364-6	NOTE	Harmonized as HD 60364-6.
ISO 50001	NOTE	Harmonized as EN ISO 50001.

COMMON MODIFICATIONS

8.6.2

Add at the end of the clause the following note:

NOTE The use of carefully selected software for energy management purposes facilitates the implementation of all these requirements.

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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60034-30	-	Rotating electrical machines -- Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors (IE code)	EN 60034-30	-
IEC 60287-3-2	-	Electric cables - Calculation of the current rating - Part 3: Sections on operating conditions - Section 2: Economic optimization of power cable size	-	-
IEC 60364	series	Low-voltage electrical installations -- Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364	series
IEC 60364-5-52 (mod)	2009	Low-voltage electrical installations -- Part 5-52: Selection and erection of electrical equipment - Wiring systems	HD 60364-5-52	2011
IEC 60364-5-55 (mod)	2011	Electrical installations of buildings -- Part 5-55: Selection and erection of electrical equipment - Other equipment	HD 60364-5-559	2012
IEC 60364-7-712	2002	Electrical installations of buildings -- Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems	HD 60364-7-712	2005
IEC 61557-12	2007	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)	EN 61557-12	2008
IEC 62053-21	-	Electricity metering equipment (a.c.) - Particular requirements -- Part 21: Static meters for active energy (classes 1 and 2)	EN 62053-21	-
IEC 62053-22	-	Electricity metering equipment (a.c.) - Particular requirements -- Part 22: Static meters for active energy (classes 0,2 S and 0,5 S)	EN 62053-22	-

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INTRODUCTION

The optimization of electrical energy usage can be facilitated by appropriate design and installation considerations. An electrical installation can provide the required level of service and safety for the lowest electrical consumption. This is considered by designers as a general requirement of their design procedures in order to establish the best use of electrical energy. In addition to the many parameters taken into account in the design of electrical installations, more importance is nowadays focused on reducing losses within the system and its use. The design of the whole installation therefore takes into account inputs from users, suppliers and utilities.

The rate of replacement of existing properties is low, between 2 % and 5 % annually, depending on the state of the local economy. It is therefore important that this standard covers existing electrical installations in buildings, in addition to new installations. It is in the refurbishment of existing buildings that significant overall improvements in energy efficiency can be achieved.

The optimization of the use of electricity is based on energy efficiency management which is based on the price of electricity, electrical consumption and real-time adaptation. Efficiency is checked by measurement during the whole life of the electrical installation. This helps identify opportunities for any improvements and corrections. Improvements and corrections may be implemented through major investment or by an incremental method. The aim is to provide a design for an efficient electrical installation which allows an energy management process to suit the user's needs, and in accordance with an acceptable investment.

This standard first introduces the different measures to ensure an energy efficient installation based on kWh saving. It then provides guidance on giving priority to the measures depending on the return of investment, i.e. the saving of electrical energy costs divided by the amount of investment.

This standard is intended to provide requirements and recommendations for the electrical part of the energy management system addressed by ISO 50001 [1]¹.

Account should be taken, if appropriate, of induced works (civil works, compartmentalization) and the necessity to expect, or not, the modifiability of the installation.

This standard introduces requirements and recommendations to design the adequate installation in order to give the ability to improve the management of performance of the installation by the tenant/user or for example the energy manager.

All requirements and recommendations of this part of IEC 60364 enhance the requirements contained in Parts 1 to 7 of the standard.

¹ Numbers in square brackets refer to the Bibliography.

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 8-1: Energy efficiency

1 Scope

This part of IEC 60364 provides additional requirements, measures and recommendations for the design, erection and verification of all types of low-voltage electrical installation including local production and storage of energy for optimizing the overall efficient use of electricity.

It introduces requirements and recommendations for the design of an electrical installation within the framework of an energy efficiency management approach in order to get the best permanent functionally equivalent service for the lowest electrical energy consumption and the most acceptable energy availability and economic balance.

These requirements and recommendations apply, within the scope of the IEC 60364 series, for new installations and modification of existing installations.

This standard is applicable to the electrical installation of a building or system and does not apply to products. The energy efficiency of these products and their operational requirements are covered by the relevant product standards.

This standard does not specifically address building automation systems.

2 Normative references

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.

IEC 60034-30, *Rotating electrical machines – Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors (IE-code)*

IEC 60287-3-2, *Electric cables – Calculation of the current rating – Part 3-2: Sections on operating conditions – Economic optimization of power cable size*

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60364-5-52:2009, *Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60364-5-55:2011, *Low-voltage electrical installations – Part 5-55: Selection and erection of electrical equipment – Other equipment*

IEC 60364-7-712:2002, *Electrical installations of buildings – Part 7-712: Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems*

IEC 61557-12:2007, *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)*

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General

3.1.1 zone

area (or a surface) defining part of an installation

Note 1 to entry: Examples of a zone can be a kitchen of 20 m² or a storage area of 500 m².

3.1.2

current-using equipment

electrical equipment intended to convert electrical energy into another form of energy, for example light, heat, mechanical energy

[SOURCE: IEC 60050-826:2004, 826-16-02] [2]

3.1.3

electrical distribution system

set of coordinated electrical equipment such as transformers, protection relays, circuit-breakers, wires, busbars, etc. for the purpose of powering current-using equipment with electrical energy

3.1.4

usage

type of application for which electricity is used such as lighting, heating, etc.

3.1.5

distribution system design

design of cabling and associated electrical equipment for the distribution of electrical energy

3.1.6

load energy profile

electrical energy consumed over a specified period of time for a mesh or a group of meshes

3.1.7

electrical energy efficiency

EEE

system approach to optimize the efficiency of electrical energy use

Note 1 to entry: Energy efficiency improvement measures take into account the following considerations:

- both the consumption (kWh) and the price of electricity technology;
- environmental impact.

Note 2 to entry: “Energy efficiency” is considered to represent “Electrical energy efficiency” in this standard.