

SLOVENSKI STANDARD
oSIST prEN ISO 11855-8:2023
01-januar-2023

Načrtovanje notranjega okolja v stavbah - Zasnova, dimenzioniranje, vgradnja in kontrola vgrajenih sevalnih ogrevalnih in hladilnih sistemov - 8. del: Električni sistemi za ogrevanje (ISO/DIS 11855-8:2022)

Building environment design - Design, dimensioning, installation and control of embedded radiant heating and cooling systems - Part 8: Electrical heating systems (ISO/DIS 11855-8:2022)

Umweltgerechte Gebäudeplanung - Flächenintegrierte Strahlungsheiz- und -kühlssysteme - Teil 8: Elektrische Heizsysteme (ISO/DIS 11855-8:2022)

Conception de l'environnement des bâtiments - Conception, dimensionnement, installation et contrôle des systèmes intégrés de chauffage et de refroidissement par rayonnement - Partie 8: Titre manque (ISO/DIS 11855-8:2022)

Ta slovenski standard je istoveten z: prEN ISO 11855-8

ICS:

91.140.10	Sistemi centralnega ogrevanja	Central heating systems
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems

oSIST prEN ISO 11855-8:2023

en,fr,de

DRAFT INTERNATIONAL STANDARD

ISO/DIS 11855-8

ISO/TC 205

Secretariat: ANSI

Voting begins on:
2022-11-25

Voting terminates on:
2023-02-17

Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems —

Part 8: Electrical heating systems

ICS: 91.040.01

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN ISO 11855-8:2023](https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023)

<https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023>

This document is circulated as received from the committee secretariat.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO/DIS 11855-8:2022(E)

© ISO 2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN ISO 11855-8:2023](https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023)

<https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviations	2
4.1 Symbols.....	2
4.2 Subscripts.....	2
5 Calculation procedure	3
Annex A (informative) Calculation Procedure of Electrical Heating System	8
Bibliography	9

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN ISO 11855-8:2023](https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023)

<https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023>

ISO/DIS 11855-8:2022(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*, Working Group 8, *Radiant heating and cooling systems*.

ISO 11855 consists of the following parts, under the general title *Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems*:

- *Part 1: Definition, symbols, and comfort criteria*
- *Part 2: Determination of the design and heating and cooling capacity*
- *Part 3: Design and dimensioning*
- *Part 4: Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS)*
- *Part 5: Installation*
- *Part 6: Control*
- *Part 7: Input parameters for the energy calculation*
- *Part 8: Electrical heating systems*

Part 1 specifies the comfort criteria which should be considered in designing embedded radiant heating and cooling systems, since the main objective of the radiant heating and cooling system is to satisfy thermal comfort of the occupants. Part 2 provides steady-state calculation methods for determination of the heating and cooling capacity. Part 3 specifies design and dimensioning methods of radiant heating and cooling systems to ensure the heating and cooling capacity. Part 4 provides a dimensioning and calculation method to design Thermo Active Building Systems (TABS) for energy-saving purposes, since radiant heating and cooling systems can reduce energy consumption and heat source size by using renewable energy. Part 5 addresses the installation process for the system to operate as intended. Part 6 shows a proper control method of the radiant heating and cooling systems to ensure the maximum performance which was intended in the design stage when the system is actually being operated in a

building. Part 7 presents a calculation method for the product specific input parameters for ISO 52031. Part 8 presents a calculation method for electrical heating systems.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN ISO 11855-8:2023](https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023)

<https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023>

ISO/DIS 11855-8:2022(E)

Introduction

The radiant heating and cooling system consists of heat emitting/absorbing, heat supply, distribution, and control systems. The ISO 11855 series deals with the embedded surface heating and cooling system that directly controls heat exchange within the space. It does not include the system equipment itself, such as heat source, distribution system and controller.

The ISO 11855 series addresses an embedded system that is integrated with the building structure. Therefore, the panel system with open air gap, which is not integrated with the building structure, is not covered by this series.

The ISO 11855 series can be applied to systems that use not only water but also other liquids or electricity as a heating or cooling medium.

The object of the ISO 11855 series is to provide criteria to effectively design embedded systems. To do this, it presents comfort criteria for the space served by embedded systems, heat output calculation, dimensioning, dynamic analysis, installation, operation, and control method of embedded systems.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN ISO 11855-8:2023](https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023)

<https://standards.iteh.ai/catalog/standards/sist/ded96608-aeb3-4bc0-8159-24b6640d1d27/osist-pren-iso-11855-8-2023>

Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems —

Part 8: Electrical heating systems

1 Scope

This part of ISO 11855 specifies procedures and conditions to enable the heat flow in electrical surface heating systems to be determined relative to the medium differential temperature for systems. The determination of thermal performance of electrical surface heating systems and their conformity to this part of ISO 11855 is carried out by calculation in accordance with design documents and a model. This should enable a uniform assessment and calculation of surface heating systems.

The surface temperature and the temperature uniformity of the heated surface, nominal heat flow density between electrical heated layer and space are given as the result.

The ISO 11855 series is applicable to water based embedded surface heating and cooling systems in residential, commercial and industrial buildings¹⁾. The methods apply to systems integrated into the wall, floor or ceiling construction without any open air gaps. It does not apply to ceiling mounted panel systems with open air gaps which are not integrated into the building structure.

The ISO 11855 series also applies, as appropriate, to the use of fluids other than water as a heating or cooling medium. The ISO 11855 series is not applicable for testing of systems. The methods do not apply to heated or chilled ceiling panels or beams.

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.

ISO 52031, *Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies — Space emission systems (heating and cooling)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11855-1, *Building environment design — Embedded radiant heating and cooling systems — Part 1: Definitions, symbols, and comfort criteria* apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

1) Part 7 of the ISO 11855 series can also be used for electrical heated embedded systems.

ISO/DIS 11855-8:2022(E)

4 Symbols and abbreviations

4.1 Symbols

For the purposes of this document, the symbols given in ISO 52000-1, *Energy performance of buildings — Overarching EPB assessment — Part 1: General framework and procedures*, and the following symbols (see [Table 1](#)) apply.

Table 1 — Example

Symbol	Quantity	Unit
a	division	m
B	level area	m
b	width of the electrical heating element	m
l	fin length	m
m	size of the fin	1/m
n_a	operand	—
n_i	operand	—
\dot{q}	specific heat flux	W / m ²
\dot{Q}	heat flux	W
R	resistance	(m ² ·K)/W
U	length	m
α	heat transfer coefficient	W/(m ² ·K)
δ	thickness	m
$\bar{\delta}$	thickness of the spare fin	m
δ_L	thickness of the heat conducting layer	m
δ_F	thickness of the filling layer	m
κ	part heat transfer coefficient	(m ² ·K)/W
λ	thermal conductivity	W/(m ² ·K)
ϑ	temperature	°C
φ	angle	°

4.2 Subscripts

For the purposes of this document, the subscripts are in accordance with ISO 52000-1 and the following subscripts (see [Table 2](#)) apply. Additional subscripts are documented in ISO 11855-1.

Table 2 — Subscripts

a	Room a
S	air gap
R	in accordance to the fin / pipe
Ra	spare fin - Room a
RBa	Coverage to Room a
RBi	Coverage to Room i
Ri	spare fin - to room i
i	Room i
ges	total
1 ... 5	layers