SLOVENSKI STANDARD
SIST EN 60531:2002/A11:2019

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Gospodinjski termoakumulacijski grelniki - Metode za merjenje funkcionalnosti - Dopolnilo A11

Household electric thermal storage room heaters - Methods for measuring performance

Elektrische Raumheizgeräte für den Hausgebrauch - Verfahren zur Messung der Gebrauchseigenschaften

Appareils électrodomestiques de chauffage à accumulation des locaux - Méthodes de mesure de l'aptitude à la fonction

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Household electric thermal storage room heaters - Methods for measuring performance

Appareils électrodomestiques de chauffage à accumulation des locaux - Méthodes de mesure de l'aptitude à la fonction

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European Committee for Electrotechnical Standardization
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European foreword

This document (EN 60531:2000/A11:2019) has been prepared by CLC/TC 59X/WG 12 “Electric room heating appliances”.

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)	2020-03-17
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2022-06-17

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

The purpose of this amendment is to specify essential performance characteristics of direct acting room heaters and to describe methods for measuring of these characteristics related to EU Commission regulation (EU) No 2015/1188 and standardization request from the EU Commission M/550.

1 Modification to clause 1, "Scope"

Replace by:

This standard applies to electric storage heaters having a daily operating cycle and intended to heat the room in which they are located.

NOTE 1 This standard does not apply to heating appliances incorporated in the building structure, to central heating systems or to floor heating installations.

NOTE 2 If an appliance is intended to be operated as a storage heater or as a direct-acting room heater, it is also tested in accordance with EN 60675.

NOTE 3 If an appliance has a heat retention of less than 20 %, it is not considered to be a storage heater.

This standard defines the main performance characteristics of storage heaters and specifies methods for measuring these characteristics, for the information of users.

NOTE 4 Information which may be of interest to the consumer is listed in Annex D.

This standard does not specify values for performance characteristics.

NOTE 5 This standard does not deal with:

– safety requirements (EN 60335-2-60);

– acoustical noise of fans heaters (EN 60704-2-2).

2 Modification to clause 2, "Normative references"

Replace by:

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 60584-1:2013, *Thermocouples - Part 1: EMF specifications and tolerances (IEC 60584-1:2013)*

3 Modification to clause 3, "Terms and Definitions"

Replace by:

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

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

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

3.1
storage local space heater
electric local space heater designed to store heat in an accumulating isolated core and to discharge it for several hours after the accumulation phase

3.2
local space heater
space heating device that emits heat by direct heat transfer in combination with heat transfer to a fluid, in order to reach and maintain a certain level of human comfort within an enclosed space in which the product is situated, possibly combined with a heat output to other spaces and is equipped with one or more heat generators that convert electricity or gaseous or liquid fuels directly into heat, through use of the Joules effect or combustion of fuels respectively

3.3
slave heater
electric local space heater which is not capable of autonomous operation and needs to receive signals sent from an external master controller, not being part of the product but connected to it by pilot wire, wireless, power line communication or an equivalent technique, in order to regulate the emission of heat into the room in which the product is installed

3.4
minimum discharge condition
condition under which the appliance is operated, the means for controlling the heat output, such as flaps and fans, being set at the lowest position

3.5
maximum discharge condition
condition under which the appliance is operated, the means for controlling the heat output, such as flaps and fans, being set at the highest position, any boost position being ignored

Note 1 to entry: A boost position is a setting of a control for occasional use which results in a higher temporary fan speed.

3.6
average room temperature
arithmetic average of the maximum and minimum room temperatures for a setting of the room temperature control

3.7
room temperature control
mechanical or electronic device, sensitive to the room temperature and adjustable by the user

3.8
amplitude
difference between the maximum and the minimum room temperatures for a setting of the room temperature control

3.9
drift
difference between the average room temperatures obtained at different charge levels for a setting of the room temperature control

3.10
nominal heat output
P_{nom}
heat output of a local space heater comprising both direct heat output and indirect heat output (where applicable), when operating at the setting for the maximum heat output that can be maintained over an extended period, as declared by the manufacturer, expressed in x,x kW

3.11
minimum heat output
P_{min}
heat output of a local space heater comprising both direct heat output and indirect heat output (where applicable), when operating at setting of the lowest heat output, as declared by the manufacturer, expressed in x,x kW

3.12
maximum heat output
P_{max}
declared heat output of an electric local space heater when operating at the setting of the maximum heat output that can be maintained continuously over an extended period, as declared by the manufacturer, expressed in x,x kW

3.13
auxiliary electricity consumption – at nominal heat output
el_{max}
this value is zero for electric local space heaters. All electric power consumption is included in the nominal heat output (P_{min})

3.14
auxiliary electricity consumption – at minimum heat output
el_{min}
this value is zero for electric local space heaters; all electric power consumption is included in the minimal heat output (P_{min})

3.15
electric power consumption in standby mode
el_{sb}
electric power consumption of the product while in standby mode, expressed in x,xxx kW

Note 1 to entry: This is only applicable if the product has a “standby mode”. For electric local space heaters without a standby mode the value is zero.

3.16
standby mode
state of the product where the heating function has been deactivated without disconnection from mains or switching power off. Independent from external conditions (room temperature, time, or control signals) the unit will not start heating; to resume the heating function a (manual) reactivation by the user is required; in standby mode only the following functions are provided, which may persist for an indefinite time:
— reactivation function, or reactivation function and only an indication of enabled reactivation function, and/or
— information or status display

3.17
seasonal space heating energy efficiency
η_s
ratio between the space heating demand, supplied by a local space heater and the annual energy consumption required to meet this demand, expressed in %; the seasonal space heating energy efficiency is calculated using the methods described in Annex III of regulation (EU) No 2015/1188

3.18
set-back function
function which allows the room temperature to be maintained at a predefined lower value than the pre-set (comfort) temperature without changing the setting of the room temperature control

3.19
manual heat charge control, with integrated thermostat
manually operated sensing device integrated into the product, which measures and regulates its core temperature to vary the accumulated amount of heat

3.20
manual heat charge control with room and/or external temperature feedback
manually operated sensing device integrated into the product which measures its core temperature and varies the accumulated amount of heat in relation with the room temperature and/or outdoor temperature

3.21
electronic heat charge control with room and/or external temperature feedback or regulated by energy supplier
automatically operated sensing device integrated into the product which measures its core temperature and varies the accumulated amount of heat in relation with the room temperature and/or outdoor temperature or a device whose charging regime can be regulated by the energy supplier

3.22
fan assisted heat output
means the product is equipped with an integrated and controllable fan (or fans) to vary the heat output to adjust to the heat demand

3.23
mechanical room temperature control
means the product is equipped with a non-electronic device that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort

3.24
with electronic room temperature control
means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort

3.25
with electronic room temperature control plus day timer
means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort, and allows the setting of timing and temperature level for a 24-hours timer interval

3.26
with electronic room temperature control plus week timer
means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort, and allows the setting of timing and temperature levels for a full week. During the 7-day period the settings shall allow a variation on a day-to-day basis

3.27
room temperature control, with open window detection
means the product is equipped with an electronic device, either integrated or external, that reduces the heat output when a window or door has been opened. Whenever a sensor is used to detect the opening of a window or door, it can be installed with the product, externally to the product, built into the building structure or as a combination of those options

3.28
with distance control option
means the function that allows remote interaction from outside the building in which the product is installed with the control of the product

3.29
with adaptive start control
means the function which predicts and initiates the optimal start of heating up in order to reach the set-point temperature at the desired time

3.30
maximum storage capacity
Q_{max}
amount of thermal energy which can be accumulated inside the storage heater and which is available for space heating after the heating elements are switched off

3.31
period on duty cycle
a duty cycle is the fraction of one period in which the system is suppling power to the heating element; duty cycle is expressed as a % of a period; a period is the time it takes for a system to complete a full cycle; a period (or full cycle) duration is expressed in min; for electric heaters a period is an active mode to perform the intended function of a stream of heat accommodated to the varying demand; period duration could be initiated by an internal clock function integrated in the control device or by the influence of ambient temperature and heat demand

4 Modifications to clause 4, "Classification"

4.1 According to type

Replace by:

a) storage heater without a direct-acting heating function;

b) storage heater with a direct-acting heating function.

4.3 According to heat retention

Deletion of the note.

5 Modification to clause 5, "List of measurements"

Replace by:

a) dimensions and mass (Clause 7);

b) charge acceptance (Clause 8);

c) room heating capability and heat output (Clause 9);

d) heat retention and maximum storage capacity (Clause 10);

e) temperature rises of air-outlet grilles and external surfaces (Clause 11);

f) temperature rises of surfaces surrounding the heater (Clause 12);

g) stability of room temperature (Clause 13);

h) direct-acting heating function (Clause 14);

i) requirements to comply with the functions according to ecodesign regulation (Clause 15);

The results of these measurements may be given in a test report.

NOTE An example of a test report form is shown in Annex E.

6 Modifications to clause 6, "General conditions for measurements"

6.2 Test rooms

Modify first paragraph as follows:

All tests except those of Clauses 9 and 10 are carried out in a draught-free room in which the ambient temperature is maintained at 23 °C ± 3 °C, measured at a distance of approximately 2 m from the appliance and 1,5 m above the floor.

6.7 Ambient temperature thermostat

Modify tile as follows:

Room temperature control

Modify with:

Any room temperature control is rendered inoperative except for the tests of Clause 13.

7 Modification to clause 8, "Charge acceptance"

8.3 Minimum charge acceptance

Addition of a paragraph after the second paragraph:

The energy consumption is measured.

If it cannot be controlled down to zero, the minimum charge should be stated.

8 Modification to clause 9, "Room heating capability"

Modify title as follows:

Room heating capability and heat output

Replace:

9.1 Heating capability

The capability of the storage heater to heat the room is determined.

NOTE 1 The room heating capability of a storage heater is dependent on the energy which can be discharged at a particular level of heat output.

NOTE 2 A method of determining the size of a storage heater suitable for a particular room is given in Annex C.

The storage heater is placed in the calorimeter described in Annex A with its front facing the air outlet and is operated for 24 h. The charging control is short-circuited and the appliance is charged in the minimum discharge condition until the energy consumed equals the continuous charge acceptance measured in 8.1.

The charging supply is switched off and the appliance is operated in the maximum discharge condition until a total period of 24 h has elapsed.

The heat output in kilowatts is measured throughout the cycle of operation and the results expressed as shown in Figure 1. The energy discharged by the storage heater during any period is calculated by integrating the heat output with this period.

The heat content η_{max} of the storage heater at the end of the charging period is calculated as the difference between the continuous charge acceptance and the energy discharged during this period.

The heat content at any point in time during the period of operation in the maximum discharge condition is calculated as the difference between η_{max} and the energy discharged during this period. The heat content is expressed as a function of time as shown in Figure 2.

The room heating capability at any point in time is dependent on the energy discharged during the period of operation in the maximum discharge condition and is expressed as a function of the heat output as shown in Figure 3.