SLOVENSKI STANDARD
SIST-TP CEN/TR 12098-6:2018

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Energijske lastnosti stavb - Naprave za regulacijo sistemov za ogrevanje - 6. del: Razlaga in utemeljitev prEN 12098-1:2015 - Moduli M3-5, 6, 7, 8

Controls for heating systems - Part 6: Accompanying TR prEN 12098-1:2015 - Modules M3-5,6,7,8

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ICS:

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97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

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Begleitender TR zu EN 12098-1

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

This document (CEN/TR 12098-6:2016) has been prepared by Technical Committee CEN/TC 247 “Building Automation, Controls and Building Management”, the secretariat of which is held by SNV.

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This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document is currently divided into the following parts:

— Controls for heating systems — Part 1: Control equipment for hot water heating systems;

— Controls for heating systems — Part 3: Control equipment for electrical heating systems;

— Controls for heating systems — Part 5: Start-stop schedulers for heating systems;

— Controls for heating systems — Part 6: Accompanying TR prEN 12098-1:2016 Modules M3-5,6,7,8 [the present Technical Report; currently at Voting stage];

— Controls for heating systems — Part 7: Accompanying TR prEN 12098-3:2016 Modules M3-5,6,7,8 [Technical Report; currently at Voting stage];

— Controls for heating systems — Part 8: Accompanying TR prEN 12098-5:2016 Modules M3-5,6,7,8 [Technical Report; currently at Voting stage].

Introduction

The CENSE project, the discussion between CEN and the Concerted action highlighted the high page count of the entire package due to a lot of “textbook” information. This resulted in flooding and confusing the normative text.

A huge amount of informative contents shall indeed be recorded and available for users to properly understand, apply and nationally adapt the EPB standards.

The detailed technical rules CEN/TS 16629 ask for a clear separation between normative and informative contents:

— to avoid flooding and confusing the actual normative part with informative content;

— to reduce the page count of the actual standard;

— to facilitate understanding of the package.

Therefore each EPB standard shall be accompanied by an informative technical report, like this one, where all informative content is collected.

Table 1 shows the relative position of this TR within the EPB set of standards.

Table 1 — Relative position of this TR within the EN EPB package standards

	Over-arching	Building (as such)	Technical Building System									
Submodule	**Descriptions**	**Descriptions**	**Descriptions**	**Heating**	**Cooling**	**Ventilation**	**Humidification**	**Dehumidification**	**Domestic Hot waters**	**Lighting**	**Building automation and control**	**PV, wind, ..**
sub1	**M1**	**M2**		**M 3**	**M 4**	**M5**	**M6**	**M7**	**M8**	**M 9**	**M10**	**M 11**
1	General	General	General									
2	Common terms and definitions; symbols, units and subscripts	Building Energy Needs	Needs									
3	Application	(Free) Indoor Conditions without Systems	Maximum Load and Power									
4	Ways to Express Energy Performance	Ways to Express Energy Performance	Ways to Express Energy Performance									
5	Building Functions and Building Boundaries	Heat Transfer by Transmission	Emission and control	x								
6	Building Occupancy and Operating Conditions	Heat Transfer by Infiltration and Ventilation	Distribution and control	x								
7	Aggregation of Energy Services and Energy Carriers	Internal Heat Gains	Storage and control	x								
8	Building	Solar	Generation	x								

	Over-arching	Building (as such)	Technical Building System									
Submodule	**Descriptions**	**Descriptions**	**Descriptions**	**Heating**	**Cooling**	**Ventilation**	**Humidification**	**Dehumidification**	**Domestic Hot waters**	**Lighting**	**Building automation and control**	**PV, wind, ..**
sub1	**M1**	**M2**		**M 3**	**M 4**	**M5**	**M6**	**M7**	**M8**	**M 9**	**M10**	**M 11**
	Partitioning	Heat Gains	and control									
9	Calculated Energy Performance	Building Dynamics (thermal mass)	Load dispatching and operating conditions									
10	Measured Energy Performance	Measured Energy Performance	Measured Energy Performance									
11	Inspection	Inspection	Inspection									
12	Ways to Express Indoor Comfort		BMS									
13	External Environment Conditions											
14	Economic Calculation											

1 Scope

This Technical Report refers to EN 12098-1:2016, *Controls for heating systems — Part 1: Control equipment for hot water heating systems — Modules M3-5,6,7,8*.

It contains information to support the correct understanding, use and national adaption of prEN 12098-1:2016.

This Technical Report does not contain any normative provisions.

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.

EN 215, *Thermostatic radiator valves - Requirements and test methods*

prEN 12098-1:2016, *Controls for heating systems — Part 1: Control equipment for hot water heating systems — Modules M3-5,6,7,8*

prEN 15232-1:2016, *Energy performance of buildings — Part 1: Impact of Building Automation, Controls and Building Management — Modules M10-4,5,6,7,8,9,10*

EN 15316–2-3:2007, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 2-3: Space heating distribution systems*

prEN 15316-3:2016, *Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 3: Space distribution systems (DHW, heating and cooling)*

prEN 15316-4-1:2016, *Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass)*

prEN 15500-1:2016, *Control for heating, ventilating and air-conditioning applications — Part 1: Electronic individual zone control equipment — Modules M3-5,M4-5,M5-5*

prEN ISO 52000-1:2016, *Energy performance of buildings — Overarching EPB assessment — Part 1: General framework and procedures (ISO/DIS 52000-1:2016)*

EN ISO 7345:1995, *Thermal insulation - Physical quantities and definitions (ISO 7345:1987)*

3 Terms and definitions

For the purposes of this technical report, the terms and definitions given in EN ISO 7345:1995, prEN ISO 52000-1:2016, prEN 12098-1:2016 and prEN 15232-1:2016 apply.

4 Symbols and abbreviations

4.1 Symbols

For the purposes of this European Standard, the symbols given in prEN ISO 52000-1:2016 and prEN 12098-1:2016 (the accompanied EPB standard) apply.

4.2 Abbreviations

Abbreviation	Term
OTC	outside temperature compensated
RTC	room temperature control
FSS	fixed start-stop scheduling
OSS	optimum start –stop scheduling
TRV	thermostatic radiator valve

5 Control heating systems, main design rules

5.1 Control heating systems, main design rules, general

Efficient Heating control system consists on integrated functions applied to all parts of the water heating system: emission or room control by TRV or RTC, flow temperature control by OTC control, FSS, OSS, pumps and generators sequencing and controls, thermal storage management, cost optimization of thermal resources taking account smart metering, predictable or detected occupancy.

5.2 Partitioning control heating zones in buildings

5.2.1 General

For efficiently control heating, the flow temperature level of generation and distribution system shall satisfy heat demand to the lowest flow temperature. For this purpose, flow temperature is compensated by outside temperature and scheduled for intermittent heating in relation with conditions of use. For efficiency of control systems:

— The heating system distribution building shall be partitioned into zones or spaces with uniform conditions of use;

Partitioning of heating systems described on EN 5200-1:2016, Clause 10, D.2, D.3, may usefully be applied for the design of heating systems.

— The zone partitioning of the building shall take account thermal characteristics of emitters (all identical emitters) of a zone;

— BAC heating control system shall have multiple controls and intermittent scheduling adapted to zones or spaces conditions of use. Special attention shall be done to keep watch for update set points and schedulers to real conditions of use and needs, during exploitation.

For satisfy these indications; size of zones shall be limited.

NOTE An indication is given in EN 15316–2–3:2007, A2: limit zones area to 1000 m2 (one pump for a maximum of 1 000 m2).

As a general rule, heating control systems consists to integrate many functions applied to central (generation, storage), zone (distribution) and room (emission) parts of heating systems.

OTC control and OSS and complementary integrated functions specified by prEN 12098-1:2016 and fulfil items in prEN 15232-1:2015, Table 1, 1.3, 1.4, 1.4, 1.5.

NOTE Better control and scheduling of heating systems imply a data communication network linking control devices for integration of these functions and other technical building management capabilities for energy performance.

For these parts, objectives of control functions are: the lowest flow temperature and the longest reduced or stop heat generation periods and pumps operation.

Generation (see prEN 15316-4-1:2016) and distribution (see EN 15316–2-3) parts are controlled acting water flow temperature while emission is controlled via the flow through emitters.

These central controls applied to building, zones and spaces (see Figure 1) taking into account thermal characteristics and conditions of use (see prEN ISO 52000-1:2016, Clause 10, D.2, D.3).

Emitters of a zone or space controlled by an OTC controller shall be of the same model, for conformity with a single heating curve shape common to all emitters of the controlled zone, i.e. don't mix different types of steel radiators, heating floor or fan coil on a distribution controlled by an OTC controller.

5.2.2 Emission control

Individual control of emitters or RTC completes central control by individual emitter's controllers acting flow through emitters. The aim of individual control consist to adapt conditions of operation (individual set point, individual scheduling), to consumers' needs (see prEN 15232-1:2016, Figure 1) and to compensate room heat gains, reducing heating for comfort and energy saving.

However, individual room temperature control performance doesn't depend only of individual controllers; it depends also of the flow temperature central (generation, distribution) control, mainly for these cases:

— Emitters are not equipped with efficient electronic individual RTC (conform to prEN 15500-1:2016);

— Users are not encouraged to adapt the set point of their room temperature controller considering their comfort needs related to energy consumption;

— Heated room or space don't permit to measure a representative temperature for individual (closed loop) RTC, e.g.: entrance, corridor, reception hall, exhibition hall, atrium, Emission control is operated only by the flow temperature control (generation, distribution parts).

Whatever:

— For accuracy of a room controller, the flow temperature of emitters shall be adapted to the heating load; i.e. related to the main influence, the outside temperature. OTC control improves control efficiently of individual controllers limiting the role of these controllers to compensate heat gains and avoiding hanging process of these closed control loops;

— For avoid energy wasting by unusual use, inattentive settings or defaults of room controllers, the central OTC control limit the higher room temperature able to be reached.

EXAMPLE Room temperature able to be reached by OTC control may be limited to 22 °C, room controller reduce this level, modulating flow through emitter.