SLOVENSKI STANDARD
SIST EN 12098-1:2013

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Nadomešča:
SIST EN 12098-1:2002
SIST EN 12098-2:2002

Regulacijske naprave za sisteme ogrevanja - 1. del: Naprave za regulacijo delovanja toplovodnih ogrevalnih sistemov

Controls for heating systems - Part 1: Control equipment for hot water heating systems

Meß-, Steuer- und Regeleinrichtungen für Raumheizungen - Teil 1: Regelung für Warmwasserheizungen

Régulation pour les systèmes de chauffage - Partie 1: Equipement de régulation pour les systèmes de chauffage à eau chaude

Ta slovenski standard je istoveten z: **EN 12098-1:2013**

ICS:

91.140.10	Sistemi centralnega ogrevanja	Central heating systems
97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

SIST EN 12098-1:2013 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

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ICS 91.140.10; 97.120

Supersedes EN 12098-1:1996, EN 12098-2:2001

English Version

Controls for heating systems - Part 1: Control equipment for hot water heating systems

Régulation pour les systèmes de chauffage - Partie 1: Equipement de régulation pour les systèmes de chauffage à eau chaude

Mess-, Steuer- und Regeleinrichtungen für Heizungen - Teil 1: Regeleinrichtungen für Warmwasserheizungen

This European Standard was approved by CEN on 8 June 2013.

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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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12098-1:2013) has been prepared by Technical Committee CEN/TC 247 “Building Automation, Controls and Building Management”, the secretariat of which is held by SNV.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2014, and conflicting national standards shall be withdrawn at the latest by February 2014.

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

This document supersedes EN 12098-1:1996 and EN 12098-2:2001.

EN 12098, *Controls for heating systems*, currently consists of the following parts:

— *Part 1: Control equipment for hot water heating systems* (the present document);

— *Part 3: Outside temperature compensated control equipment for electrical heating systems*;

— *Part 4: Optimum start-stop control equipment for electrical systems*[1];

— *Part 5: Start-stop schedulers for heating systems*.

This standard is for products for Outside Temperature Compensated Controls for mechanical building services and covers Outside Temperature Compensated Controls in residential and non-residential buildings. This standard is part of a series of European Standards for Control for HVAC Applications. This standard, therefore, contributes to the general European policy for energy saving, particularly in the fields of the Construction Products Directive (89/106/EEC) Essential Requirements n°6 'Energy economy and heat retention' (and its interpretative document) and of the Energy Performance of Building Directive (2002/91/CE).

This standard covers also controllers which contain an integrated optimum start or an optimum start-stop control function.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1) EN 12098-4:2005 is bound to be superseded in the future by an upcoming new edition of EN 12098-3.

Introduction

Equipment which controls the heating supply in buildings according to outside temperature and time is necessary to reduce the energy consumption of heating plants. This equipment can bring about improved comfort and energy savings.

For this purpose, an outside temperature compensated controller (OTC) is necessary.

This standard describes the main equipment characteristics and functions for reaching energy saving and comfort objectives.

1 Scope

This European Standard applies to electronic control equipment for heating systems with water as the heating medium and a flow water temperature up to 120 °C.

This control equipment controls and regulates the distribution and/or the generation of heat in relation to the outside temperature and time and other reference variables.

This standard covers also controllers which contain an integrated optimum start or an optimum start-stop control function.

Safety requirements on heating systems remain unaffected by this standard. The dynamic behaviour of the valves and actuators are not covered in this standard.

A multi-distribution and/or multi-generation system needs a coordinated solution to prevent undesired interaction and is not part of this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and 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.

CEN/TS 15810, *Graphical symbols for use on integrated building automation equipment*

EN 60038, *CENELEC standard voltages (IEC 60038)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 60730-1, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1)*

3 Terms and definitions

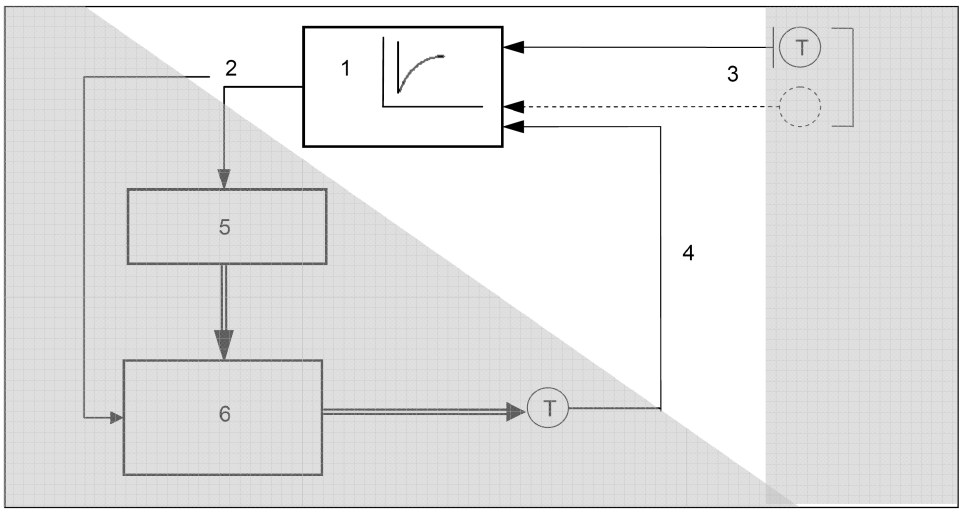
For the purposes of this document, the following terms and definitions apply.

3.1
Outside Temperature Compensated Controller
OTC
instrument that controls and regulates the distribution and/or the generation of heat in relation to the outside temperature and time and other reference variables

Note 1 to entry: The **O**utside **T**emperature **C**ompensated function calculates the flow (supply) temperature in relation to the outside temperature, based on the heating curve.

3.2
control equipment
equipment which consists of the OTC, sensor input signals and output signals, but does not include the sensors and actuating equipment

Note 1 to entry: See Figure 1.



Key

1 OTC
2 output signals
3 input signals: reference variables
4 input signal: controlled variable
5 actuating equipment
6 heat generation & distribution

Figure 1 — Control equipment for heating systems

3.3
actuating equipment
equipment by which the controller affects the controlled variable

3.4
controlled variable (input signal)
supply water temperature and/or boiler water temperature as a result of the heating curve in accordance to the reference variables

3.5
output signals
signals generated by the OTC controller for operating the actuating equipment

3.6
reference variables (input signal)
outside temperature with or without other influences or variables (e.g. room temperature) used to determine the setpoint of the controlled variable

3.7
outside temperature
reference variable that is measured with a sensor fitted outside the building, mainly intended to measure the ambient air temperature

3.8
room temperature
resulting room temperature in the building that arises in comfort, economy or building protection operation mode of the OTC controller and that can be different for individual rooms

3.9
characteristic heating curve
relation between the setpoint value of the controlled variable (e.g. flow water temperature) and the reference variables (outside temperature) defined by two or more parameters and depending on operation mode and additional variables

Note 1 to entry: The flow water temperature is a function of the outside temperature and the present room temperature setpoint. The supply water temperature as function of the outside temperature is graphically represented by the heating curve.

3.10
comfort operation mode
operating period between the switch-on time and the switch-off time for normally occupied rooms

3.11
economy operation mode (reduced mode)
operating period between the switch-off time and the switch-on time, maintaining a reduced room temperature compared to the comfort room temperature

3.12
building protection operation mode (reduced mode)
operating period between the switch-off time and the switch-on time, maintaining a room temperature required for building protection

3.13
automatic operation
mode of operation of equipment when significant control functions are not overridden by the user

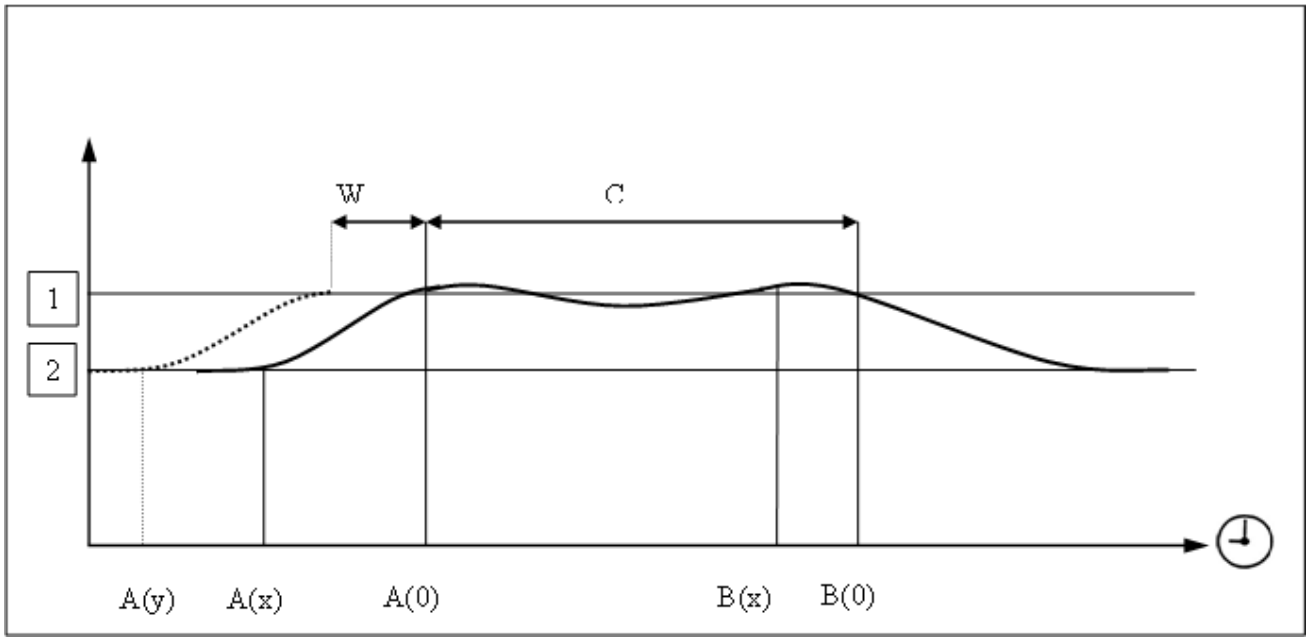
Note 1 to entry: The operation mode is selected automatically according to the scheduler, actual date and time.

3.14
summer/winter switch function
summer/winter switch is used to seasonal switch on/off the heating depending on a function of the outside temperature

3.15
set back function
function to switch off heat generation when the operation mode changes from comfort to economy or building protection until the calculated or measured room temperature drops below the economy or building protection set point, the operation mode switches back to comfort mode or the calculated switch-on time of the optimisation start function is reached

3.16
optimum start function
function that calculates the optimum pre-heat time to reach the comfort temperature level at the beginning of the comfort time period

Note 1 to entry: See Figure 2.

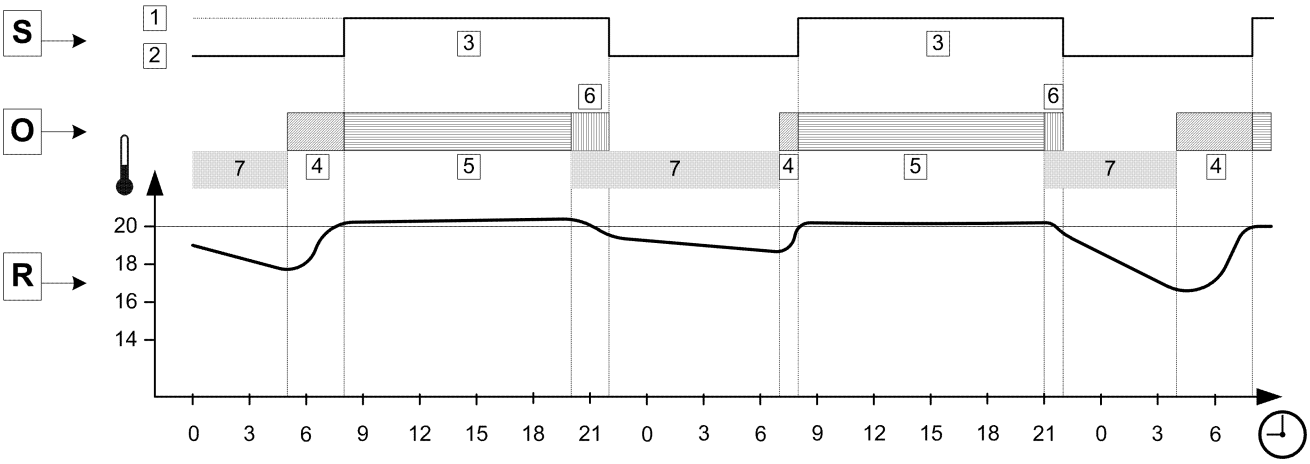


Key

1	comfort room temperature
2	reduced room temperature
A(0)	beginning of comfort occupation period
A(x)	switch-on time with start optimisation (variable start)
A(y)	switch-on time without start optimisation (fixed start)
B(0)	end of comfort occupation period without stop optimisation (fixed stop)
B(x)	switch-off time with stop optimisation (variable stop)
C = A(0) - B(0)	comfort occupation period
A(x) - A(0)	optimum start period
B(x) - B(0)	optimum stop period
W	time period of wasted heat (energy saving potential with start optimisation)

Figure 2 — Temperature time curve with optimiser function

The optimum start and the optimum stop functions are illustrated by Figure 3. Heating periods are different from scheduled occupation periods. These differences, due to thermal inertia, depend mainly on heating loads (or temperatures differences). A start and/or stop optimiser controls these switching points, using outside and/or room temperatures or their differences in relation to setpoints.



Key

S schedule occupation period
O heating operation status
R room temperature profile
1 comfort room temperature
2 reduced room temperature
3 comfort occupation period
4 optimum start period
5 main controller function
6 optimum stop period
7 set back period

Figure 3 — Example Optimum start and stop function

3.17
adaptive optimum start function
added function to optimum start function, which recalculates the parameters used to determine the switch-on time, based on measured room temperature

3.18
optimum stop function
switches off or reduces the heat generation at the earliest possible point in time so that the room temperature will drop max. 0,5 K below the comfort setpoint when the operation mode changes from comfort mode to economy or building protection mode

Note 1 to entry: See Figure 2.

3.19
adaptive optimum stop function
added function to optimum stop function, which recalculates the parameters used to determine the switch-off time, based on measured room temperature

3.20
scheduler
function which switches heating modes affecting the heating control system (see Figure 3) according to a program which includes memorised switch times, reproducing periods or periodic cycles, daily, weekly or yearly, and may also include periods of derogation

3.21
switch points and time periods