

Controls for heating systems —

Part 5: Start-stop schedulers for heating systems

The European Standard EN 12098-5:2005 has the status of a British Standard

ICS 91.140.10; 97.120

National foreword

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The UK participation in its preparation was entrusted to Technical Committee RHE/16, Performance requirements for control systems, which has the responsibility to:

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 24, an inside back cover and a back cover.

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

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Programmateurs d'intermittences pour les systèmes de
chauffage

Mess-, Steuer- und Regeleinrichtungen für Heizungen - Teil
5: Schalteinrichtungen zur programmierten Ein- und
Ausschaltung von Heizungsanlagen

This European Standard was approved by CEN on 1 August 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

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Contents

	Page
Foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Functionality	7
5 Graphical symbols and abbreviations	11
6 Requirements	11
7 Test methods	18
8 Marking	19
9 Documentation	20
Bibliography	24

Foreword

This European Standard (EN 12098-5:2005) has been prepared by CEN/TC 247 "Building automation control 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 March 2006, and conflicting national standards shall be withdrawn at the latest by March 2006.

This European Standard is one of a series of product standards for "Controls for heating systems". It considers Definitions, Functionality, Requirements, Test methods, and Documentation for heating controls with fixed start-stop functions. This European Standard consists of the following parts:

Part 1: Outside temperature compensated control equipment for hot water heating systems;

Part 2: Optimum start-stop control equipment for hot water heating systems;

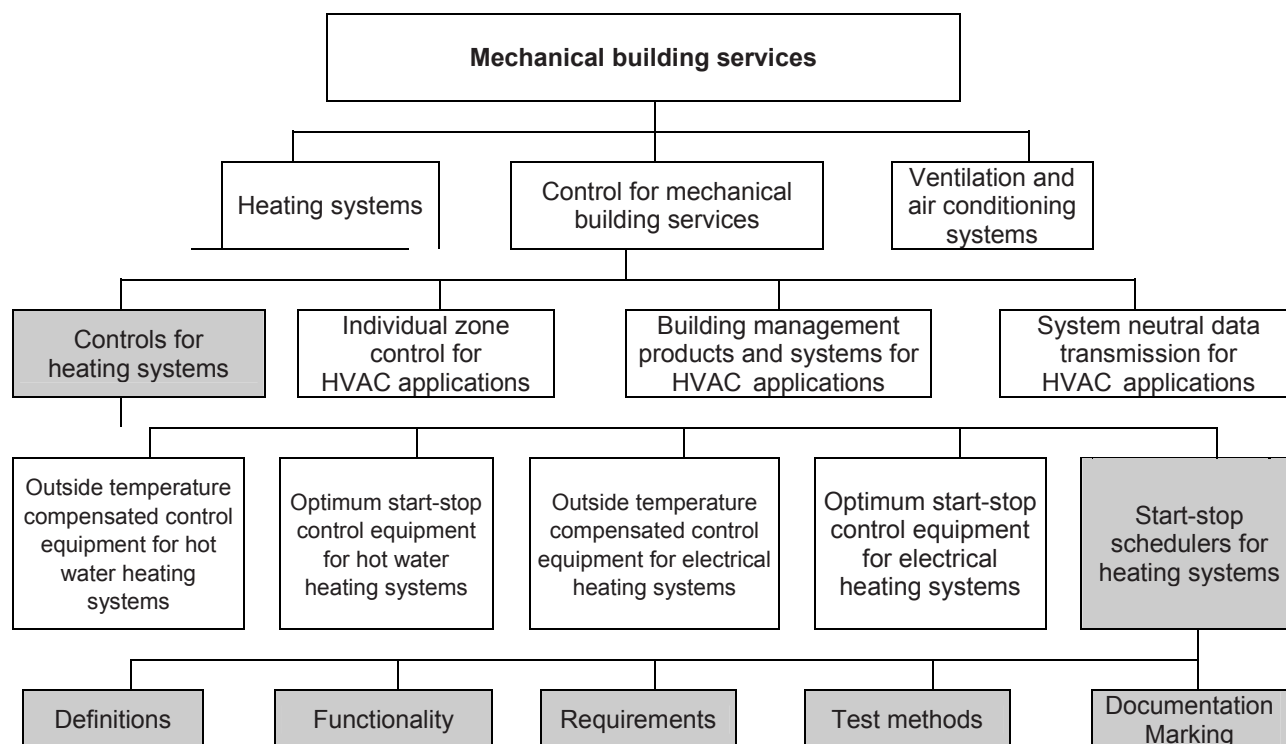
Part 3: Outside temperature compensated control equipment for electrical heating systems;

Part 4: Tariff compensated optimum start-stop control equipment for electrical systems;

Part 5: Start-stop schedulers for heating systems.

No existing European Standard is superseded.

The position of this European Standard in the series of standards for mechanical building services is illustrated below:



HVAC = Heating, Ventilation, Air Conditioning.

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

Introduction

Equipment which controls scheduling of the heating supply in buildings is necessary to reduce the energy consumption of heating plants and maintain comfort level, either for water or electrical heating systems. Clock schedulers lead to energy saving by switching heating modes in relation with predictable occupancy. Timers and schedulers derogation functions start-stop heating modes for non periodic needs of heating.

Switch times may have to be manually changed to achieve energy savings and acceptable comfort levels.

NOTE 1 Fixed start-stop basic function is illustrated by Figure 1. In this example, mode I is nominal mode, J is stand-by mode.

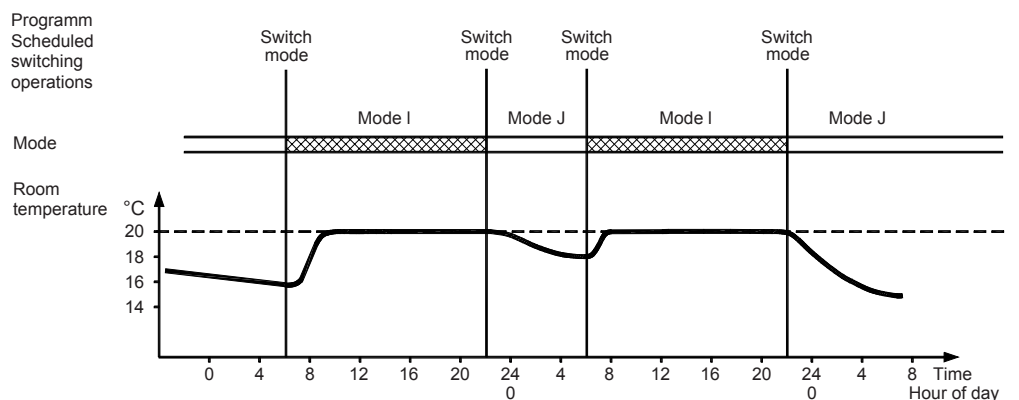


Figure 1 - Relation between occupation, heating modes and room temperature, example

Included in this European Standard are the main equipment characteristics reaching these energy saving and comfort objectives.

NOTE 2 This European Standard, therefore, conforms to the requirements and objectives of the interpretative document n° 6 "Energy Economy and Heat Retention" relating to the Construction Product Directive (89/106/EEC).

1 Scope

This European Standard applies to equipment which controls scheduling heating systems. The signals can be processed by using either analogue or digital techniques, or both. The particular equipment to which this document applies covers both:

- stand-alone fixed start-stop schedulers;
- controllers which contain fixed start-stop scheduling function.

It applies to basic and added start-stop control functions and sets minimum acceptable standards for functions, performance and documentation.

NOTE The start-stop function can be integrated within a main control device. In this case the controller would be expected to this standard for scheduling function.

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

This control equipment may or may not be connected to a data network.

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.

EN 60529, *Degrees of protection provided by enclosures (IP code)* (IEC 60529: 1989)

EN 60730-1, *Automatic electrical controls for household and similar use – Part 1: General requirements* (IEC 60730-1:1999, modified)

EN 60730-2-7, *Automatic electrical controls for household and similar use – Part 2: Particular requirements for timers and time switches* (IEC 60730-2-7:1990, modified)

IEC 60038, IEC standard voltages

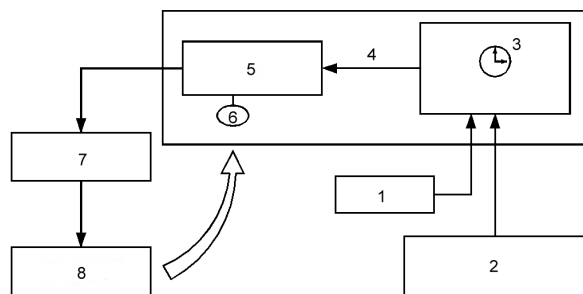
3 Terms and definitions

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

3.1

start-stop scheduler

device which switches heating modes affecting the heating control system (see Figure 2) according to a program



Key

- 1 Tariff
- 2 Derogation possibility
- 3 Start-stop scheduler according to ENV 12098-5
- 4 Switch code I, J, K...
- 5 Room temperature controller
- 6 Temperature sensor
- 7 Actuating equipment
- 8 Heat generation and distribution

Figure 2 - Example of heating control system. Scheduler and controller are either separated stand alone devices or both integrated on a device

3.2

start-stop timer

start-stop scheduler switching heating modes for a single programmed period, started by an user

3.3

switch times

points in time at which the scheduler switches from a mode to another one

3.4

mode

state of a device or system defining the manner by which it performs its functions. A heating system or a heating controller should have many heating modes (or heating operation modes), e.g. nominal, reduced, on, off, start, stand-by. It should be noted that other modes can also exists

NOTE Heating stand-by mode: in this mode, heating system is switched off and, if it applies, enable frost protection function. It's important to make a difference between the heating stand-by mode and a so-called device stand-by mode for mains powered equipment and house hold appliances. It concerns devices itself for non-operational, lowest power consumption mode which cannot be switched off (influenced) by the user and that may persist for an indefinite time.

3.5

output signal

signal generated by the scheduler to the control system for switch heating mode. It can affect the controller or the actuating equipment or modify the room temperature controller set point

3.6

program

memorised switch times, reproducing periods or periodic cycles, daily, weekly or yearly. Program may include periods for derogation, start period or tariff compensation functions

3.7

type of daily program

daily program able to be reproduced for many days of the week or the year

3.8

derogation

temporary override of the program by an user

3.9

start period

operating period between switch-on heating time and the beginning of nominal occupation period during which heating rises room temperature

NOTE A start-stop optimiser conforming to EN 12098-2 controls the switch-on heating time modifying the start period in relation with measured variables. On a scheduler, start period set is a constant parameter, the switch-on time being fixed by start period and beginning of nominal occupation period user settings.

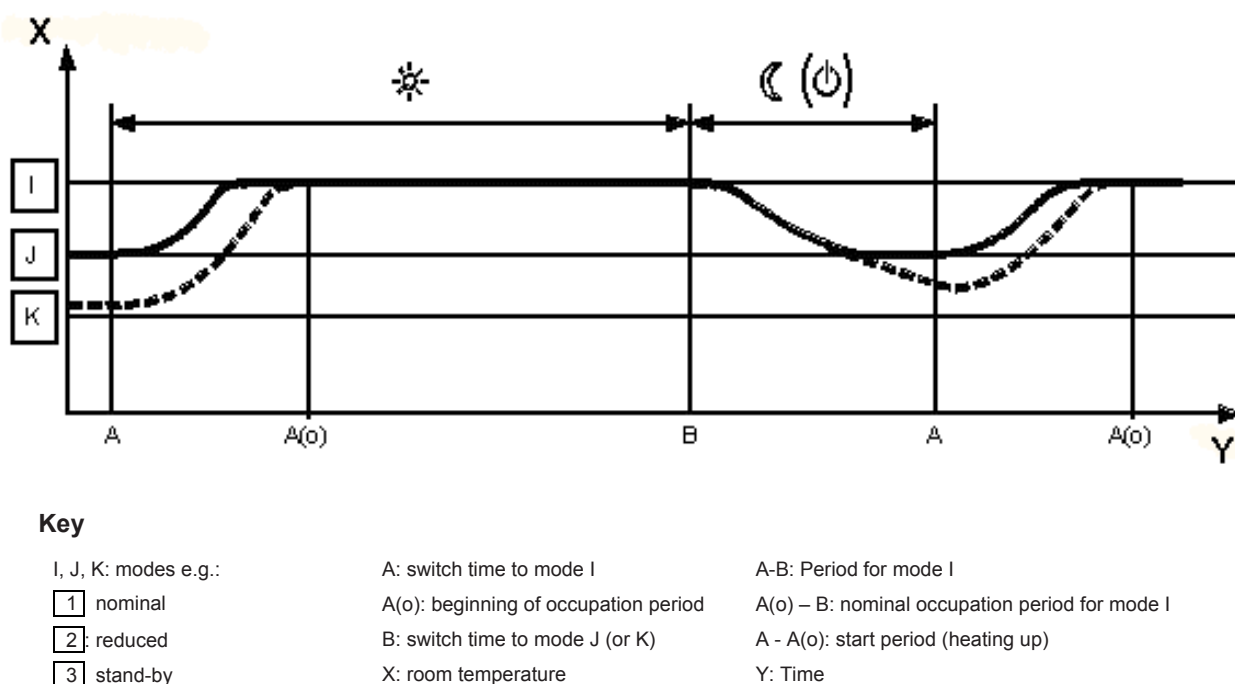


Figure 3 - Example of temperature-time curve obtained by a mode scheduled controller

3.10

tariff compensation

unction anticipating the switch time, related to the programmed switch time and tariff rising time I. This function make benefits, according to cost reflective message from electric utility.

3.11

manual operation

during manual operation the mode of the scheduler is directly changed by the operator

3.12

clock retention time

duration which allows to recover the actual time after a power failure

4 Functionality

Start-stop scheduling equipment achieves energy saving by reducing, or preferably, switching off heating systems.