SLOVENSKI STANDARD
oSIST prEN 298:2010

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Naprave za samodejni nadzor gorilnikov in aparatov na plin ali tekoča goriva (gorilniški avtomati)

Automatic burner control systems for burners and appliances burning gaseous or liquid fuels

Feuerungsautomaten für Brenner und Brennstoffgeräte für gasförmige oder flüssige Brennstoffe

Systèmes automatiques de commande pour brûleurs et appareils utilisant des combustibles gazeux ou liquides

Ta slovenski standard je istoveten z: **prEN 298**

ICS:

27.060.10	Gorilniki na tekoče in trdo gorivo	Liquid and solid fuel burners
27.060.20	Plinski gorilniki	Gas fuel burners

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EUROPEAN STANDARD

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Will supersede EN 230:2005, EN 298:2003

English Version

Automatic burner control systems for burners and appliances burning gaseous or liquid fuels

Systèmes automatiques de commande pour brûleurs et appareils utilisant des combustibles gazeux ou liquides

Feuerungsautomaten für Brenner und Brennstoffgeräte für gasförmige oder flüssige Brennstoffe

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 58.

If this draft becomes a European Standard, 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.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 298:2010) has been prepared by Technical Committee CEN/TC 58 “Safety and control devices for burners and appliances burning gaseous or liquid fuels”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 230:2005, EN 298:2003.

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

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

This document refers to clauses of EN 13611:2007 or adapts it by stating "with the following modification", "with the following addition", "is replaced by the following" or "is not applicable" in the corresponding clause. This Document adds clauses or sub clauses to the structure of EN 13611:2007 which are particular to this standard. It should be noted that these clauses and sub clauses are not indicated as an addition.

During the public enquiry stage this Document refers to some IEC standards, i.e. IEC 60730-1 and IEC 60730-2-5. These IEC standards are in the process of becoming European Standards. It is the intention of the responsible working group to update the IEC references to the related EN references, if the revised EN 60730-1 and EN 60730-2-5 are publicly available before this Document is launched for formal vote.

Note that the following provides details of significant technical changes between this document and the previous edition:

a) Alignment with EN 13611:2007.

b) Integration of the requirement from EN 230 (EN 230 is merged into prEN 298)
Note: if due to the reference of EN 13611 the term “gas” will be part of a requirement or test, then the term “gas” shall be substituted by the term “fuel”.

c) Requirements and tests were updated where necessary.

1 Scope

This document specifies requirements for the construction and function, test methods and marking of automatic burner control systems, for programming units as well as for flame detector devices for gas and oil burners and gas and oil burning appliances with or without fans.

This Document also applies to automatic burner control systems, programming units and their associated flame detector devices that include additional functions.

Automatic burner control systems utilizing thermo-electric flame supervision devices are not covered by this standard.

This Document covers type testing only.

NOTE European standards for burners, appliances or processes which use automatic burner control systems, programming units or flame detectors can override the requirements of this standard.

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 267:2009, *Automatic forced draught burners for liquid fuels*

EN 13611:2007 *Safety and control devices for gas burners and gas burning appliances — General requirements*

EN 60127-1, *Miniature fuses — Part 1: definitions for miniature fuses and general requirements for miniature fuse-links (IEC 60127-1:2006)*

EN 60947-1:2007, *Low-voltage switchgear and controlgear — Part 1: General rules (IEC 60947-1:2007)*

EN 60947-5-1:2004, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements; electromechanical control circuit devices (IEC 60947-5-1:2003)*

IEC 60730-1:2010, *Automatic electrical controls for household and similar use — Part 1: General requirements*

IEC 60730-2-5:2009, *Automatic electrical controls for household and similar use — Part 2-5: Particular requirements for automatic electrical burner control systems* [1)]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2007 and the following apply.

3.1
flame detector device
device by which the presence of a flame is detected and signalled

NOTE It can consist of a flame sensor, an amplifier and a relay for signal transmission. These parts, with the possible exception of the actual flame sensor, can be assembled in a single housing for use in conjunction with a programming unit.

1) The Edition 3.2 combines IEC 60730-2-5 (2000-04), AMD 1 (2004-07) and AMD 2 (2008-11) or IEC 60730-2-5 Edition 3.1 (2004-09) and AMD 2 (2008-11).

3.2
flame sensor
device which reacts to the presence of the flame by providing an output signal that is used as the input for the flame detector amplifier

3.3
extinction safety time
flame failure response time
FFRT
response time between loss of sensed flame and the resulting de-energizing of the terminals for the safety shut-off valves of the burner control system

3.3.1
sensed flame
physical value monitored by the flame sensor

3.3.2
flame signal
signal given by the flame detector device in case of sensed flame

3.4
flame simulation
condition which occurs when the flame signal indicates the presence of a flame when in reality no flame is present

3.5
programming unit
unit which reacts to signals from control and safety devices, gives control commands, controls the start-up sequence, supervises the burner operation and causes controlled shut-down, and if necessary safety shut-down and lock-out

NOTE The programming unit follows a predetermined sequence of actions and always operates in conjunction with a flame detector device.

3.6
automatic burner control system
system comprising at least a programming unit and all the elements of a flame detector device

NOTE The various functions of an automatic burner control system can be in one or more housings.

3.7
start position
stage, where the system is not in lock-out position, has not yet received the start signal but can proceed with the start-up sequence when required

NOTE At this stage, the output terminals for any automatic shut-off valve and ignition device are not energized.

3.8
start signal
signal e.g. from a thermostat, which releases the system from its start position and commences the predetermined programme

3.9
programme
sequence of control operations determined by the programming unit involving switching on, starting up, supervising and switching off the burner (for fuel oil see diagrams in Annex DD)

NOTE Safety actions such as safety shut down and lock out are also part of the programme.

3.10
purge
forced introduction of air through the combustion chamber and flue passages in order to displace any remaining fuel/air mixture and/or products of combustion

3.10.1
pre-purge
purge which takes place between the start signal and the energization of the ignition device

3.10.2
post-purge
purge which takes place immediately following shut-down

3.11
first safety time
interval between the pilot fuel valve, the start fuel valve or main fuel valve, as applicable, being energized and the pilot fuel valve, start fuel valve or main fuel valve, as applicable, being de-energized if no flame is present

NOTE Where there is no second safety time, this is called the safety time.

3.12
second safety time
where there is a first safety time applicable to either a pilot or start fuel flame only, the second safety time is the interval between the main fuel valve being energized and the main fuel valve being de-energized if no main flame is present

3.13
burner without fan
burner where the primary air required for combustion is provided by the action of the fuel and the secondary air is freely available from the surroundings

3.14
burner with fan
burner in which some or all of the air required for the combustion is supplied by means of a fan (i.e. forced draught or induced draught)

3.15
running position of the system
position of the system in which the burner is in normal operation under the supervision of the programming unit and its flame detector device

3.16
controlled shut-down
process by which the power to the fuel shut-off valve(s) is removed before any other action takes place, e.g. as a result of the action of a controlling function

3.17
safety shut-down
process which is effected immediately following the response of a protection device or the detection of a fault in the automatic burner control system and puts the burner out of operation

NOTE The resulting state of the system is defined by deactivated terminals for the fuel shut-off valves and the ignition device.

3.18
lock-out

3.18.1
non-volatile lock-out
safety shut-down condition of the system, such that a restart can only be accomplished by a manual reset of the system and by no other means

3.18.2
volatile lock-out
safety shut-down condition of the system, such that a restart can only be accomplished by either the manual reset of the system, or an interruption of the main power and its subsequent restoration

3.19
ignition-restoration
spark restoration
process by which, following loss of flame signal, the ignition device will be switched on again without total interruption of the fuel supply

3.20
recycling
process by which, after a safety shut-down a full start-up sequence is automatically repeated

3.21
functions of automatic burner control systems

3.21.1
waiting time
<gas> for burners without fans, interval between the start signal being given and the energization of the ignition device or gas valves, which ever comes first

NOTE During this time natural ventilation of the combustion chamber and the flue passages can take place.

3.21.2
waiting time
<oil> interval between the start signal being given (and air registers in purge position, if applicable) and the energization of the ignition device

NOTE During this time natural ventilation of the combustion chamber and the flue passages takes place.

3.21.3
pre-purge time
<gas> period during which purge takes place at the proven air rate prior to the energization of the ignition device or gas valves, which ever comes first

3.21.4
purge time
<oil> period during which the combustion chamber is compulsorily ventilated without any fuel being supplied

3.21.5
pre-purge time
<oil> period preceding the signal to open the fuel valve during which the combustion chamber is compulsorily ventilated

3.21.6
post-purge time
<gas> period during which purge takes place at the proven air rate between any shut-down and the moment the fan is switched off

3.21.7
post-purge time
<oil> period following the signal to close the fuel valve during which the combustion chamber is compulsorily ventilated

3.21.8
inter-purge time
period during which purging of the combustion chamber takes place at the proven air rate after unsuccessful ignition and prior to the next recycle attempt

3.21.9
inter-waiting time
period during which natural ventilation of the combustion chamber takes place after unsuccessful ignition and prior to the next recycle attempt

3.22
sequences

3.22.1
start-up sequence
sequence of actions executed by the system which brings the burner from the start position to the running position

3.22.2
first stage
part of the start-up sequence which allows the release of start fuel into the combustion chamber

3.22.3
second stage
part of the start-up sequence which allows the release of further fuel into the combustion chamber (if applicable)

3.23
system for permanent operation
system that is designed to remain in the running position for longer than 24 h without interruption

3.24
system for non-permanent operation
system that is designed to remain in the running position for less than 24 h

3.25
self-checking function of the flame detector device
automatic internal function of the system which checks the operation of the flame detector device

3.26
air flow simulation
condition which occurs when the air flow sensor indicates the presence of air flow when in reality no air flow is present

3.27
spark supervision
process of monitoring the ignition spark

3.28
pilot or start fuel flame proving period
interval between the end of the first safety time and the beginning of the second safety time which is used to prove that the pilot or fuel flame is stable

3.29
intermittent first stage
first stage that is ignited prior to ignition of the main flame and is shut off simultaneously with it

3.30
interrupted first stage
first stage that is ignited each time the burner is started up and which is extinguished at the end of the second safety time

3.31
burner ignition systems

3.31.1
automatic electrical ignition
system in which the fuel is ignited using only electrical energy

3.31.1.1
ignition by controlled spark
system which allows the fuel to be released only when the presence of the ignition spark has been proven

3.31.1.2
ignition by non controlled spark
system in which the ignition spark is not proven

3.31.2
automatic ignition with liquid or gaseous fuel
system by which the fuel is ignited by a pilot burner using liquid or gaseous fuel; the operation of the pilot burner may be either interrupted or intermittent

NOTE 1 Interrupted pilot burners may be operated manually.

NOTE 2 Intermittent pilot or first stage burners are operated automatically.

3.31.2.1
ignition by controlled pilot burner
system which release the main fuel when the ignition burner flame is present

3.31.2.2
ignition by non-controlled pilot burner
system in which the release of the main fuel is not prevented by the absence of the flame of the pilot burner

3.32
ignition

3.32.1
total ignition time
period during which the ignition device is in operation. Pre-ignition, actual ignition and post-ignition times make up the total ignition time

3.32.2
pre-ignition time
period between the start of the ignition cycle and the signal to open the valve

3.32.3
ignition time
period between the signal to open the valve and the first indication of the flame signal

3.32.4
post-ignition time
period between the first indication of the flame signal and the shut-off signal to the ignition device

3.33
maximum throughput
mass of fuel consumed during one hour at the highest throughput stated by the manufacturer

NOTE Maximum throughput is expressed in kilograms per hour (kg/h).

[EN 267:2009, 3.2.1.1]

3.34
common mode error
failure of more than one component by a single external event

4 Classification

4.1 Classes of control

Classification is neither given for burner control systems nor for flame detector devices.

4.2 Groups of control

EN 13611:2007, 4.2 is not applicable.

4.3 Classes of control functions

Shall be according to EN 13611:2007, 4.3 with the following addition:

The burner control system and the flame detector device are class C control functions.

5 Units of measurement and test conditions

5.1 Dimensions

Shall be according to EN 13611:2007, 5.1.

5.2 Pressures

Shall be according to EN 13611:2007, 5.2.

5.3 Bending moments and torques

EN 13611:2007, 5.3 is not applicable.

5.4 Test conditions and measurement tolerances

EN 13611:2007, 5.4 is replaced by the following:

Tests are carried out in the mounting position declared by the manufacturer. Where there are several mounting positions, tests are carried out in the least favourable position.