SLOVENSKI STANDARD
SIST EN 298:2023

01-februar-2023

Nadomešča:
SIST EN 298:2012

Naprave za avtomatski nadzor gorilnikov in aparatov na plin ali tekoča goriva

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: **EN 298:2022**

ICS:

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

SIST EN 298:2023 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 298

November 2022

ICS 27.060.01

Supersedes EN 298:2012

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 European Standard was approved by CEN on 2 October 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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Ref. No. EN 298:2022 E

Contents

Page

European foreword

This document (EN 298:2022) 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 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 May 2023, and conflicting national standards shall be withdrawn at the latest by November 2025.

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

This document supersedes EN 298:2012.

In comparison with the previous edition, the following significant changes have been incorporated in this document:

a) alignment with EN 13611:2019, as impacted by EN 13611:2019/AC:2021;

b) inclusion of Annex J, Annex K, Annex L, Annex M, Annex N, Annex O, Annex ZB and Annex ZC;

c) alignment with Regulation (EU) 2016/426 on appliances burning gaseous fuels (GAR) and addition of Annex ZB;

d) addition of the high-temperature operation (HTO).

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document is intended to be used in conjunction with EN 13611:2019.

This document refers to clauses of EN 13611:2019 or adapts clauses 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 subclauses to the structure of EN 13611:2019 which are particular to this document. Subclauses which are additional to those in EN 13611:2019 are numbered starting from 101. Additional Annexes are designated as Annex AA, Annex BB, Annex CC, etc. It should be noted that these clauses, subclauses and Annexes are not indicated as an addition.

If by reference to EN 13611:2019 the term “control” is given, this term should be read as automatic burner control systems, flame detector devices or HTO detectors.

EN 298 compliance for automatic burner control systems, flame detector devices or HTO detectors cannot be claimed based upon SIL classification according to the EN 61508 series.

SIL classification cannot be claimed based upon compliance with this standard only. A supplementary method for SIL determination is specified in EN 13611:2019, Annex J.

1 Scope

EN 13611:2019, Clause 1 is replaced by the following:

This document specifies the safety, design, construction and performance requirements, and testing for automatic burner control systems, programming units, flame detector devices and High Temperature Operation (HTO) detectors, intended for use with gas and oil burners and gas and oil burning appliances, with or without fans and similar use.

This document is applicable to automatic burner control systems that include additional functions.

This document is not applicable to automatic burner control systems utilizing thermo-electric flame supervision devices.

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

2 Normative references

Shall be according to EN 13611:2019, Clause 2 with the following additions:

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 267:2020, *Forced draught burners for liquid fuels*

EN 1643:2022, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — Valve proving systems for automatic shut-off valves*

EN 13611:2019[1], *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements*

EN 60730-1:2016[2], *Automatic electrical controls — Part 1: General requirements (IEC 60730-1:2013, modified)*

EN 60730-2-5:2015[3], *Automatic electrical controls — Part 2-5: Particular requirements for automatic electrical burner control systems (IEC 60730-2-5:2013)*

EN 60947-5-1:2017[4], *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices (IEC 60947-5-1:2016, modified)*

EN 61810-1:2015[5], *Electromechanical elementary relays — Part 1: General and safety requirements (IEC 61810-1:2015)*

EN ISO/IEC 80079-20-1:2019, *Explosive atmospheres — Part 20-1: Material characteristics for gas and vapour classification — Test methods and data (ISO/IEC 80079-20-1:2017, including Cor 1:2018)*

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1 As impacted by EN 13611:2019/AC:2021.
2 As impacted by EN 60730-1:2016/A1:2019 and EN 60730-1:2016/A2:2022.
3 As impacted by EN 60730-2-5:2015/A1:2019 and EN 60730-2-5:2015/A2:2021.
4 As impacted by EN 60947-5-1:2017/AC:2020-05.
5 As impacted by EN 61810-1:2015/AC:2017-07, EN 61810-1:2015/AC:2018-04 and EN 61810-1:2015/A1:2020.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2019 apply with the following modifications.

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

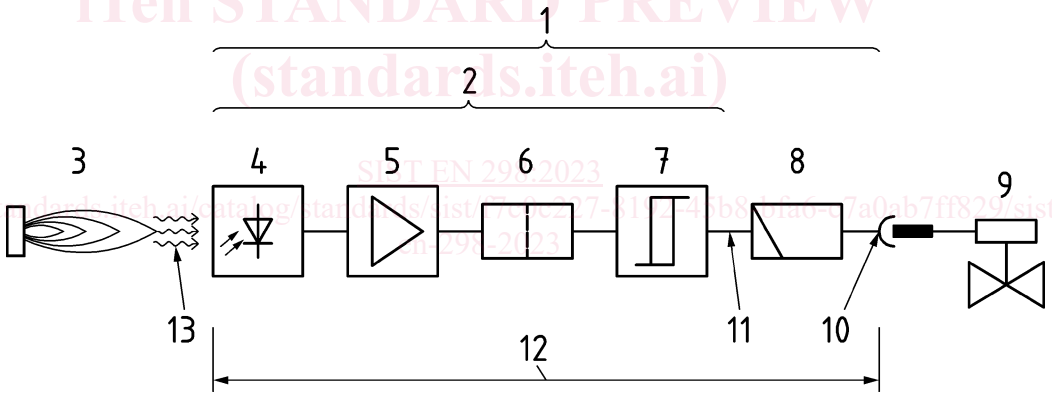
- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org/

3.23
safety shutdown
EN 13611:2019, 3.23 is replaced by 3.120

3.101
flame detector device
device by which the presence of a flame is detected and signalled

Note 1 to entry: Flame detector devices 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.

Note 2 to entry: Figure 1 contains an example of the composition of a flame detector device.



Key

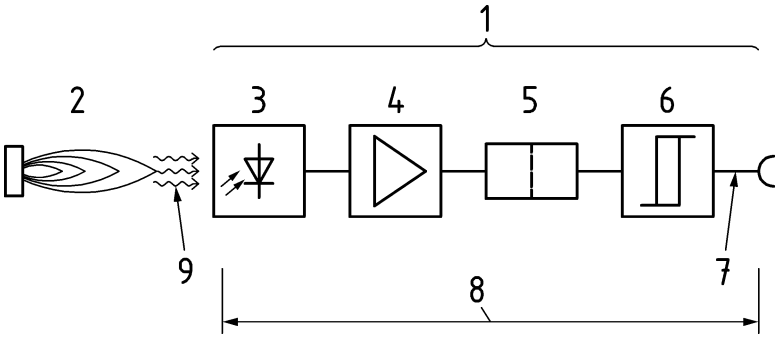
1	automatic burner control system (see 3.110)	8	programming unit (see 3.109)
2	flame detector device (see 3.101)	9	shut-off valve (see 3.104)
3	flame	10	shut-off valve terminal
4	flame sensor (see 3.103)	11	flame signal (see 3.107)
5	amplifier	12	flame failure response time (see 3.105.1)
6	filter	13	sensed flame (see 3.106)
7	threshold		

Figure 1 — Basic functional chain of a typical flame supervision

3.102
independent flame detector device
flame detector device which operates independent of the programming unit

Note 1 to entry: Self-checking functions are incorporated in this type of flame detector device.

Note 2 to entry: Figure 2 shows an example of the composition of a flame detector device.



Key

1 independent flame detector device (see 3.102)
2 flame
3 flame sensor (see 3.103)
4 amplifier
5 filter
6 threshold
7 flame signal (see 3.107)
8 flame failure detection time (see 3.105.2)
9 sensed flame (see 3.106)

Figure 2 — Basic functional chain of an independent flame detector device

3.103
flame sensor
device which reacts to the presence of the flame by providing an output signal that is used for further signal processing

3.104
shut-off valve
safety device which releases the fuel flow when energized and stops the fuel flow automatically when de-energized

Note 1 to entry: For further information refer to EN 161 or EN 126 for gas and EN ISO 23553-1 for oil, or to other similar devices if mentioned in the relevant appliance standard.

3.105
flame failure response/detection time

3.105.1
flame failure response time
FFRT
response time between the loss of a sensed flame and the resulting de-energizing of the shut-off valve terminals

Note 1 to entry: FFRT may be referred to as “extinction safety time” in appliance standards.

3.105.2
flame failure detection time
FFDT
response time of an independent flame detector device between the loss of a sensed flame and the flame signal indicating the absence of a flame

3.106
sensed flame
physical value of the monitored flame

3.107
flame signal
signal given by the flame detector device in case of sensed flame

3.108
flame simulation
condition which occurs when the flame signal indicates the presence of a flame when in reality no flame is present

3.109
programming unit
unit which executes the program, reacts to signals from control and safety devices, gives the control commands, controls the start-up sequence, supervises the burner operation and causes controlled shutdown, and if necessary, safety shutdown and lock-out

Note 1 to entry: The programming unit follows a predetermined sequence of actions and always operates in conjunction with a flame detector device or HTO detector.

3.110
automatic burner control system
system comprising at least a programming unit and all the elements of a flame detector device or, if applicable, HTO detector

Note 1 to entry: The various functions of an automatic burner control system can be in one or more housings.

3.111
start position
stage where the system is not in lock-out position and has not yet received the start signal but can proceed with the start-up sequence when required

Note 1 to entry: At this stage, the output terminals for any shut-off valve and ignition device are not energized.

3.112
start signal
signal which releases the system from its start position and commences the predetermined program

Note 1 to entry: A thermostat is an example from which such a signal could be generated.

3.113
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

3.114
pre-purge
purge which takes place between the start signal and the energization of the shut-off valve or, in the case of gas, the energization of the ignition device, if this comes first

3.115
post-purge
purge which takes place immediately following shutdown

3.116
first safety time
interval between the pilot shut-off valve, the start shut-off valve or the main shut-off valve, as applicable, being energized and the pilot shut-off valve, start shut-off valve or the main shut-off valve, as applicable, being de-energized if no flame signal is present

Note 1 to entry: Where there is no second safety time, this is called the safety time.

3.117
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 shut-off valve being energized and the main shut-off valve being de-energized if no main flame signal is present

3.118
running position
position of the system in which the burner is in normal operation under the supervision of the programming unit and its flame detector device or the burner is in HTO and supervised

3.119
controlled shutdown
process by which the power to the shut-off valve(s) is removed before any other action takes place as a result of the action of a controlling function

3.120
safety shutdown
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 1 to entry: The resulting state of the system is defined by deactivated terminals for the shut-off valves and the ignition device.

3.121
lock-out

3.121.1
non-volatile lock-out
safety shutdown condition of the control, where a restart can only be accomplished by a manual reset of the control and by no other means

3.121.2
volatile lock-out
safety shutdown condition of the control, where a restart can only be accomplished by either a manual reset of the control, or an interruption of the main power and its subsequent restoration

3.122
ignition restoration
spark restoration
process by which, following loss of flame signal, the ignition device is switched on again without total interruption of the fuel supply

3.123
recycling
process by which, after a safety shutdown, a full start-up sequence is automatically repeated

3.124
timings

3.124.1
waiting time
<gas> for burners without fans, interval between the start signal being given and the energization of the ignition device or shut-off valves, whichever comes first

Note 1 to entry: During this time natural ventilation of the combustion chamber and the flue passages can take place.

3.124.2
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 1 to entry: During this time natural ventilation of the combustion chamber and the flue passages takes place.

3.124.3
pre-purge time
<gas> period during which purging takes place at the proven air rate prior to the energization of the ignition device or shut-off valves, whichever comes first

3.124.4
pre-purge time
<oil> period preceding the signal to energize the shut-off valve during which the combustion chamber is compulsorily ventilated

3.124.5
post-purge time
<gas> period during which purging takes place at the proven air rate between any shutdown and the moment the fan is switched off

3.124.6
post-purge time
<oil> period following the signal to de-energize the shut-off valve during which the combustion chamber is compulsorily ventilated

3.124.7
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

3.124.8
inter-waiting time
period during which natural ventilation of the combustion chamber takes place after unsuccessful ignition and prior to the next recycle attempt

3.125
sequences

3.125.1
start-up sequence
sequence of actions executed by the system which brings the burner from the start position to the running position

3.125.2
first stage
part of the start-up sequence which allows the release of start fuel into the combustion chamber

3.125.3
second stage
part of the start-up sequence which allows the release of further fuel into the combustion chamber

3.126
system for permanent operation
system that is designed to remain in the running position for longer than 24 h without interruption

3.127
system for non-permanent operation
system that is designed to remain in the running position for less than 24 h

3.128
self-checking function of the flame detector device/HTO detector
automatic internal function of the control which checks the operation of the flame detector device/HTO detector

3.129
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

3.130
spark supervision
process of monitoring the ignition spark

3.131
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 start fuel flame is stable

3.132
intermittent first stage
first stage that is ignited prior to ignition of the main flame and is shut off simultaneously with the main flame

3.133
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

3.134
burner ignition systems

3.134.1
ignition by supervised gas-fired pilot burner
system which releases the main fuel when the ignition burner flame is present

3.134.2
ignition by non-supervised gas-fired pilot burner
system in which the release of the main fuel is not prevented by the absence of the flame of the pilot burner

3.135
ignition timings

3.135.1
total ignition time
period during which the ignition device is energized

Note 1 to entry: This time includes pre-ignition, ignition and post-ignition times.

3.135.2
pre-ignition time
period between the energization of the ignition device and the start of the safety time

3.135.3
ignition time
period between the start of the safety time and the first detection of a flame signal

Note 1 to entry: The maximum ignition time ends prior to or simultaneous with the safety time when no flame signal has been detected.

3.135.4
post-ignition time
period between the first detection of the flame signal and the de-energization of the ignition device

3.136
maximum fuel flow rate
constant mass of oil consumed during a period of time at maximum heat input as stated in the instructions

Note 1 to entry: Maximum fuel flow rate is expressed in kilograms per hour (kg/h).

[SOURCE: EN 267:2020, 3.2.1.1]