SLOVENSKI STANDARD
oSIST prEN 14459:2020

01-oktober-2020

Varnostne in nadzorne naprave za gorilnike in aparate na plin ali tekoča goriva - Regulacijske in nadzorne funkcije v elektronskih sistemih - Metode za razvrščanje in ocenjevanje

Safety and control devices for burners and appliances burning gaseous or liquid fuels - Control functions in electronic systems - Methods for classification and assessment

Sicherheits- und Regeleinrichtungen für Brenner und Brennstoffgeräte für gasförmige oder flüssige Brennstoffe - Regel- und Steuerfunktionen in elektronischen Systemen - Verfahren für die Klassifizierung und Bewertung

Dispositifs de commande et de sécurité pour brûleurs et appareils utilisant des combustibles gazeux ou liquides - Fonctions de commande des systèmes électroniques - Méthodes de classification et dévaluation

Ta slovenski standard je istoveten z: **prEN 14459**

ICS:

27.060.01	Gorilniki in grelniki vode na splošno	Burners and boilers in general
91.140.40	Sistemi za oskrbo s plinom	Gas supply systems
97.100.01	Grelniki na splošno	Heating appliances in general

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT prEN 14459

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ICS 91.140.40; 97.100.20

Will supersede EN 14459:2015

English Version

Safety and control devices for burners and appliances burning gaseous or liquid fuels - Control functions in electronic systems - Methods for classification and assessment

Dispositifs de commande et de sécurité pour brûleurs et appareils utilisant des combustibles gazeux ou liquides - Fonctions de commande des systèmes électroniques - Méthodes de classification et d¿évaluation

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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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 14459:2020) 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 14459:2015.

Introduction

Control systems are designed to control and protect gas and/or oil appliances and the combustion process. All functions are performed depending on their safety relevance within a specific tolerance of measures and time with a specific certainty under external influences and internal failures.

It was concluded by CEN/TC 58 that it is not always necessary to protect against the consequences of hazardous events with uniform measures as hazards differ in severity and the probability of unwanted occurrences may differ. As there exist large differences of interpretation on what level of protection is necessary against certain hazards, there is a need for guidance to bring the safety philosophy for gas and oil appliances and controls in line. The discussions of CEN/TC 58 regarding safety related control functions and the use of controls systems in the appliances show that it is worthwhile to refine the basic safety philosophy of gas and oil appliances into different risk levels.

For the evaluation of preventative measures concerning fault tolerance and avoidance of hazards, it is essential to classify control functions with regard to their fault behaviour. For the classification of control functions, their integration into the complete safety concept of the appliance should be taken into account.

In the appliance standards, only specific fault conditions are considered when controls conforming to CEN/TC 58 standards are used, e.g. flame simulation and air proving before each new start. In some cases (e.g. switch contacts) shorting is excluded, when certain tests have proven that the probability of a fault occurrence is low. For gas valves, a single shut-off valve is considered insufficient.

This document gives methods for the assessment of products in the field of gas and oil applications and control solutions for which no specific product standards are actually available. The assessment is described in three steps:

— assessment of the application,

— translation into control requirements,

— assessment of the control solution,

leading to defined classes for the specified control function(s)and a set of safety measures with additional/modified construction and test requirements for the application and/or the specified control function(s).

The assessment is focused on the controlled parameters (e.g. high/low temperature, pressure, flow, combustion quality) in the combustion process and in the functionality of the controls (e.g. open/closed; lock/unlock; start/stop). Each control function needs to be classified according to the required safety aspects (Class A, B, C).

To analyse the effect of fault conditions it is essential to know the specific application and the related risk.

1 Scope

This document specifies methods for the classification and assessment of function blocks designed to operate burners and appliances burning gaseous or liquid fuels with particular regards to their fault behaviour and preventative measures.

This document is applicable to new control function blocks, not covered by dedicated control standards.

2 Normative references

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 13611:2019, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2019, Clause 3 and the following apply.

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

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

3.101
function block
part of an electric or electronic system which realises at least one control function with one input and one output signal

4 Classification

4.1 Classes of control

EN 13611:2019, 4.1 is not applicable.

4.2 Groups of control

Shall be according to EN 13611:2019, 4.2.

4.3 Classes of control functions

Shall be according to EN 13611:2019, 4.3 with the following addition:

The class of the control function shall be determined from the results of the risk assessment in 6.101 and specified in the instructions.

4.4 Types of DC supplied controls

Shall be according to EN 13611:2019, 4.4.

5 Test conditions and uncertainty of measurements

Shall be according to EN 13611:2019, 5.

6 Design and Construction

6.1 General

Shall be according to EN 13611:2019, 6.1 with the following addition:

The specific assessment shall be performed according to 6.101. Its outcome shall be verified concerning its impact to the applicability of the requirements of Clauses 6.1 to 6.6.

6.2 Mechanical parts of the control

Shall be according to EN 13611:2019, 6.2.

6.3 Materials

Shall be according to EN 13611:2019, 6.3.

6.4 Gas connections

Shall be according to EN 13611:2019, 6.4.

6.5 Electrical parts of the control

Shall be according to EN 13611:2019, 6.5.

6.6 Protection against internal faults for the purpose of functional safety

Shall be according to EN 13611:2019, 6.6.

6.101 Requirements for new control solutions

6.101.1 General

Appliance designs are based on safe operation avoiding any harm for persons, domestic animals or property when normally used. Possible hazards arising from the appliance can be expressed in inherent risks, being considered in relation to the combustion (use) of gas and oil and heating of water.

For known control and appliance solutions, risks are considered to be covered by the requirements in the available control standards and appliance standards.

Appliances with new control solutions shall be subjected to a further risk assessment according to Clause 6.101.2 depending on their design, either:

— well-known appliance designs, or

— new appliance solutions.

6.101.2 Assessment of the appliance

The required protective measures, resulting from a risk assessment on the new or well-known appliance design or solution are the basis for the assessment of new control solutions. The risk assessment shall be performed and documented in order to identify the risks and the required protective measures covering these risks.

At least the following information shall be specified:

— classification of basic hazards;

 — Annex AA gives examples of existing basic hazards in gas and/or oil appliances.

— risk assessment and the resulting protective measures;

 — Annex EE specifies a method for classification of control functions.

— classification of protective measures;

— fault tolerating time for specific faults;

— additional requirements for the application.

Based on this information the following measures may be taken:

— specification of controls according to known control standards; and/or

— additional appliance construction requirements; and/or

— specification of new type of control based on the required protective measure and/or the additional requirements.

In Annex AA, a risk assessment method on appliance level is given.

In Annex BB and Annex DD examples are given for the method described in Annex AA.

6.101.3 Translation into control requirements

If – based on the outcome of the risk assessment on the appliance –new types of control are required, the protective measures and, where possible the additional requirements from this risk assessment, have to be translated into control requirements.

A further assessment on the foreseen control solution shall be performed and documented including the assumptions made and reasoning how the required safety level is achieved.

This outcome shall lead to a conclusion:

— on relevant class of control function(s) according to 4.3;

— on additional or modified construction(s), performance or EMC requirements;

— on further fault modes to be considered in the fault assessment of 6.6;

— on the need to extend the list of markings and the contents of the instructions.

For specific faults, a fault reaction time shall be specified for the control, taking into account the fault tolerating time of the application as a maximum.

Annex CC provides guidance for the realization of protective measures by controls.

7 Performance

7.1 General

Shall be according to EN 13611:2019, 7.1 with the following addition:

The outcome of the specific assessment according to 6.101 shall be verified concerning its impact to the applicability of the requirements of Clause 7.

7.2 Leak-tightness

Shall be according to EN 13611:2019, 7.2.

7.3 Torsion and bending

Shall be according to EN 13611:2019, 7.3.

7.4 Rated flow rate

Shall be according to EN 13611:2019, 7.4.

7.5 Durability

Shall be according to EN 13611:2019, 7.5.

7.6 Performance test for electronic controls

Shall be according to EN 13611:2019, 7.6.

7.7 Long-term performance for electronic controls

Shall be according to EN 13611:2019, 7.7.

7.8 Data exchange

Shall be according to EN 13611:2019, 7.8.

7.101 Combined apparatus

If a system consists of two or more combined apparatuses with different control functions, the interconnection and interference of the involved apparatus shall be considered during fault assessment.

Safety of a control function shall not be impaired by its integration in a gas or oil appliance or system.

Responsibilities and safety critical interface parameters shall be declared for incorporating the control in an over-all-system.

8 Electrical requirements

8.1 General

Shall be according to EN 13611:2019, 8.1 with the following addition:

The outcome of the specific assessment according to 6.101 shall be verified concerning its impact to the applicability of the requirements of Clause 8.

NOTE Depending on the outcome of the assessment according to 6.101 specific parts 2 of EN 60730 may be applicable.

8.2 Protection by enclosure

Shall be according to EN 13611:2019, 8.2.

9 Electromagnetic compatibility (EMC)

9.1 Protection against environmental influences

Shall be according to EN 13611:2019, 9.1 with the following addition:

The outcome of the specific assessment according to 6.101 shall be verified concerning its impact to the applicability of the requirements of Clause 9.

9.2 Supply voltage variations below 85 % of rated voltage

Shall be according to EN 13611:2019, 9.2.

9.3 Voltage dips and interruptions

Shall be according to EN 13611:2019, 9.3.

9.4 Supply frequency variations

Shall be according to EN 13611:2019, 9.4.

9.5 Surge immunity tests

Shall be according to EN 13611:2019, 9.5.

9.6 Electrical fast transient/burst

Shall be according to EN 13611:2019, 9.6.

9.7 Immunity to conducted disturbances induced by radio frequency fields

Shall be according to EN 13611:2019, 9.7.

9.8 Immunity to radiated disturbances induced by radio frequency fields

Shall be according to EN 13611:2019, 9.8.

9.9 Electrostatic discharge test

Shall be according to EN 13611:2019, 9.9.

9.10 Power frequency magnetic field immunity tests

Shall be according to EN 13611:2019, 9.10.

9.11 Harmonics and interharmonics including mains signalling at a. c. power port, low frequency immunity tests

Shall be according to EN 13611:2019, 9.11.

10 Marking, instructions

10.1 Marking

Shall be according to EN 13611:2019, 10.1 with the following addition:

Further requirements for marking shall be determined from the specific assessment performed according to 6.101.

10.2 Instructions

Shall be according to EN 13611:2019, 10.2 with the following addition:

Further requirements for information in instructions shall be determined from the specific assessment performed according to 6.101.

10.3 Warning notice

Shall be according to EN 13611:2019, 10.3.

Annex A
(informative)

Abbreviations and symbols

Shall be according to EN 13611:2019, Annex A.