SLOVENSKI STANDARD
SIST EN 14459:2016

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Nadomešča:
SIST EN 14459:2008
SIST EN 14459:2008/AC:2010

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 d'évaluation

Ta slovenski standard je istoveten z: **EN 14459:2015**

ICS:

91.140.40	Sistemi za oskrbo s plinom	Gas supply systems
97.100.20	Plinski grelniki	Gas heaters

SIST EN 14459:2016 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14459

November 2015

ICS 91.140.40; 97.100.20

Supersedes EN 14459:2007

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 European Standard was approved by CEN on 19 September 2015.

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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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 14459:2015) 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 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

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 14459:2007.

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 standard will give 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 a defined safety class and a set of safety measures with additional/modified construction and test requirements for the application and/or the specified control function.

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.

It should be noted that the following significant editorial changes compared to the previous edition have been incorporated in this European Standard:

a) methods for classification and risk assessment are more detailed;

b) methods are described starting on appliance level;

c) controls for burners and appliances burning liquid fuels (electronic) added;

d) introduction of new informative annexes based on the determination of basic risks:

— Annex AA "Example of a risk assessment method",

— Annex BB "Example of a risk assessment with the method described in Annex AA" (former Annex M),

— Annex CC "Realisation of a protective measure",

— Annex DD "Hazards in gas and oil appliances handled by control functions" and

— Annex EE "Classification of control functions based on the determination of basic Annex EE "Classification of control functions".

e) deletion of the following annexes which shall be included into a new standard on temperature control functions (TCF) in CEN/TC 58:

— Annex I "Combustion product discharge function (TTB)",

— Annex K "Temperature control functions (TCF)",

— Annex N "Control standards for gas burners and gas burning appliances".

f) deletion of Annex L "Gas shut-off function" (content moved into EN 161);

g) deletion of the former Annex Q "Examples of new solutions" (content moved into EN 161).

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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 Scope

This European Standard 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 European Standard is applicable to control function blocks, not covered by a dedicated control standard (e.g. EN 88-1:2011, EN 88-2:2007, EN 125:2010, EN 126:2012, EN 126:2012/prA1:2014, EN 161:2011+A3:2013, EN 257:2010, EN 298:2012, EN 1106:2010, EN 1643:2014, EN 1854:2010, EN 12067-2:2004, EN 16304:2013 and EN 16340:2014, EN ISO 23553-1:2014).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13611:2015, *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 13611:2015, Clause 3 and the following apply.

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

Shall be according to EN 13611:2015, 4.1.

4.2 Groups of control

Shall be according to EN 13611:2015, 4.2.

4.3 Classes of control functions

Shall be according to EN 13611:2015, 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 installation and operating instructions.

4.4 Types of DC supplied controls

Shall be according to EN 13611:2015, 4.4.

5 Units of measurement and test conditions

Shall be according to EN 13611:2015, Clause 5.

6 Construction requirements

6.1 General

Shall be according to EN 13611:2015, 6.1 with the following addition:

The outcome of the specific assessment in 6.101 can modify or extend the requirements of 6.1 to 6.6.

6.2 Mechanical parts of the control

Shall be according to EN 13611:2015, 6.2.

6.3 Materials

Shall be according to EN 13611:2015, 6.3.

6.4 Gas connections

Shall be according to EN 13611:2015, 6.4.

6.5 Electrical parts of the control

Shall be according to EN 13611:2015, 6.5.

6.6 Protection against internal faults for the purpose of functional safety

Shall be according to EN 13611:2015, 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 requirements in the available control and appliance standards.

For new control solutions, there is a need for further risk assessment depending on the appliance design for which they are developed for, 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 existing 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 included:

— classification of basic hazard;

  — 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 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 to control requirements

If a new type of control is required which is based on the outcome of the risk assessment on the appliance, the protective measures and, where possible the additional requirements from this risk assessment, have to be translated in 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 safety class according to 4.3;

— on additional or modified construction, performance or EMC requirements;

— on further fault modes for consideration in the fault assessment of 6.6;

— on the need to extend the list of markings and the contents of installation and operating 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 realisation of protective measures by controls.

7 Performance

7.1 General

Shall be according to EN 13611:2015, 7.1 with the following addition:

The outcome of the specific assessment in 6.101 can modify or extend the requirements of 7.1 to 7.8.

7.2 Leak-tightness

Shall be according to EN 13611:2015, 7.2.

7.3 Torsion and bending

Shall be according to EN 13611:2015, 7.3.

7.4 Rated flow rate

Shall be according to EN 13611:2015, 7.4.

7.5 Durability

Shall be according to EN 13611:2015, 7.5.

7.6 Performance test for electronic controls

Shall be according to EN 13611:2015, 7.6.

7.7 Long-term performance for electronic controls

Shall be according to EN 13611:2015, 7.7.

7.8 Data exchange

Shall be according to EN 13611:2015, 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 13611:2015, 8.1 with the following addition:

The outcome of the specific assessment in 6.101 can modify or extend the requirements of Clause 8.

8.2 Protection by enclosure

Shall be according to EN 13611:2015, 8.2.

9 Electromagnetic compatibility (EMC)

9.1 Protection against environmental influences

Shall be according to EN 13611:2015, 9.1 with the following addition:

The outcome of the specific assessment in Clause 6 can modify or extend the requirements of Clause 9.

9.2 Supply voltage variations below 85 % of rated voltage

Shall be according to EN 13611:2015, 9.2.

9.3 Voltage dips and interruptions

Shall be according to EN 13611:2015, 9.3.

9.4 Supply frequency variations

Shall be according to EN 13611:2015, 9.4.

9.5 Surge immunity tests

Shall be according to EN 13611:2015, 9.5.

9.6 Electrical fast transient/burst

Shall be according to EN 13611:2015, 9.6.

9.7 Immunity to conducted disturbances induced by radio frequency fields

Shall be according to EN 13611:2015, 9.7.

9.8 Immunity to radiated disturbances induced by radio frequency fields

Shall be according to EN 13611:2015, 9.8.

9.9 Electrostatic discharge test

Shall be according to EN 13611:2015, 9.9.

9.10 Power frequency magnetic field immunity tests

Shall be according to EN 13611:2015, 9.10.

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

Shall be according to EN 13611:2015, 9.11.

10 Marking, installation and operating instructions

10.1 Marking

Shall be according to EN 13611:2015, 10.1 with the following addition:

Further requirements for marking shall be determined from the specific assessment in 6.101.

10.2 Installation and operating instructions

Shall be according to EN 13611:2015, 10.2 with the following addition:

Further requirements for information in installation and operating instructions shall be determined from the specific assessment in 6.101.

10.3 Warning notice

Shall be according to EN 13611:2015, 10.3.