BSI Standards Publication

Flame supervision devices for gas burning appliances — Thermoelectric flame supervision devices

National foreword

This British Standard is the UK implementation of EN 125:2022. It supersedes BS EN 125:2010+A1:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GSE/22, Safety and control devices for gas and oil burners and gas burning appliances.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication has been prepared under a mandate given to the European Standards Organizations by the European Commission and the European Free Trade Association. It is intended to support requirements of the EU legislation detailed in the European Foreword. A European Annex, usually Annex ZA or ZZ, describes how this publication relates to that EU legislation.

For the Great Britain market (England, Scotland and Wales), if UK Government has designated this publication for conformity with UKCA marking (or similar) legislation, it may contain an additional National Annex. Where such a National Annex exists, it shows the correlation between this publication and the relevant UK legislation. If there is no National Annex of this kind, the relevant Annex ZA or ZZ in the body of the European text will indicate the relationship to UK regulation applicable in Great Britain. References to EU legislation may need to be read in accordance with the UK designation and the applicable UK law. Further information on designated standards can be found at www.bsigroup.com/standardsandregulation.

For the Northern Ireland market, UK law will continue to implement relevant EU law subject to periodic confirmation. Therefore Annex ZA/ZZ in the European text, and references to EU legislation, are still valid for this market.

UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

Published by BSI Standards Limited 2022

ISBN 978 0 539 06235 9

ICS 27.060.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2022.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD **EN 125**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2022

ICS 27.060.20

Supersedes EN 125:2010+A1:2015

English Version

Flame supervision devices for gas burning appliances - Thermoelectric flame supervision devices

Dispositifs de surveillance de flamme pour appareils à gaz - Dispositifs thermoélectriques de surveillance de flamme

Flammenüberwachungseinrichtungen für Gasgeräte - Thermoelektrische Zündsicherungen

This European Standard was approved by CEN on 8 August 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.

CEN members are the national standards bodies of 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 United Kingdom.

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

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

Ref. No. EN 125:2022 E

Contents

Page

European foreword ... 4

Introduction ... 5

1 Scope ... 7

2 Normative references ... 7

3 Terms and definitions ... 7

4 Classification ... 8
4.1 Classes of control ... 8
4.2 Groups of control ... 8
4.3 Classes of control functions ... 8
4.4 Types of DC supplied controls ... 8

5 Test conditions and uncertainty of measurements ... 8

6 Design and construction ... 9
6.1 General ... 9
6.2 Mechanical parts of the control ... 9
6.3 Materials ... 9
6.4 Gas connections ... 10
6.5 Electronic parts of the control ... 10
6.6 Protection against internal faults for the purpose of functional safety ... 11

7 Performance ... 11
7.1 General ... 11
7.2 Leak-tightness ... 11
7.3 Torsion and bending ... 12
7.4 Rated flow rate ... 12
7.5 Durability ... 13
7.6 Performance tests for electronic controls ... 13
7.7 Long-term performance for electronic controls ... 13
7.8 Data exchange ... 13
7.101 Operating torque and force ... 13
7.102 Interlocks ... 14
7.103 Closing current ... 14
7.104 Sealing force ... 15
7.105 Endurance ... 16

8 EMC/Electrical requirements ... 17

9 Electromagnetic compatibility (EMC) ... 17

10 Marking, instructions ... 17
10.1 Marking ... 17
10.2 Instructions ... 17
10.3 Warning notice ... 18

Annex A (informative) Abbreviations and Symbols ... 19

Annex B (informative) Leak-tightness test for gas controls – volumetric method ... 20

Annex C (informative) Leak-tightness test – pressure loss method ... 21

Annex D (normative) Calculation of pressure loss into leakage rate **22**

Annex E (normative) Electrical/electronic component fault modes **23**

Annex F (normative) Additional requirements for safety accessories and pressure accessories as defined in EU Directive 2014/68/EU **24**

Annex G (normative) Materials for pressurized parts **25**

Annex H (normative) Additional materials for pressurized parts **26**

Annex I (normative) Requirements for controls used in *DC* supplied burners and burning gaseous or liquid fuels appliances **27**

Annex J (normative) Method for the determination of the Safety Integrity Level (SIL) **28**

Annex K (normative) Method for the determination of a Performance Level (PL) **29**

Annex L (informative) Relationship between Safety Integrity Level (SIL) and Performance Level (PL) **30**

Annex M (normative) Reset functions **31**

Annex N (informative) Guidance document on Environmental Aspects **32**

Annex O (normative) Seals of elastomers, cork and synthetic fibre mixtures **33**

Annex AA (informative) Types of flame supervision devices **34**

Bibliography **39**

European foreword

This document (EN 125:2022) 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 April 2023, and conflicting national standards shall be withdrawn at the latest by October 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 125:2010+A1:2015.

The following significant changes compared to the previous edition have been incorporated in this document:

a) alignment with EN 13611:2019;

b) requirements from EU Directive 2014/68/EU were not adopted;

c) terms and definitions are aligned with EN 13611:2019;

d) reference to EN 437 removed;

e) clarification regarding sealing forces in the same and opposite direction of closing member.

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

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

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.

EN 13611:2019 recognizes the safety level specified by CEN/TC 58 and is regarded as a horizontal standard dealing with the safety, construction, performance and testing of controls for burners and appliances burning gaseous and/or liquid fuels.

The general requirements for controls are given in EN 13611:2019, and methods for classification and assessment for new controls and control functions are given in EN 14459:2021 (see Figure 1). EN 126:2012 (see Figure 1) specifies multifunctional controls combining two or more controls and Application Control Functions, one of which is a mechanical control function. The requirements for controls and Application Control Functions are given in the specific control standard (see Figure 1, control functions).

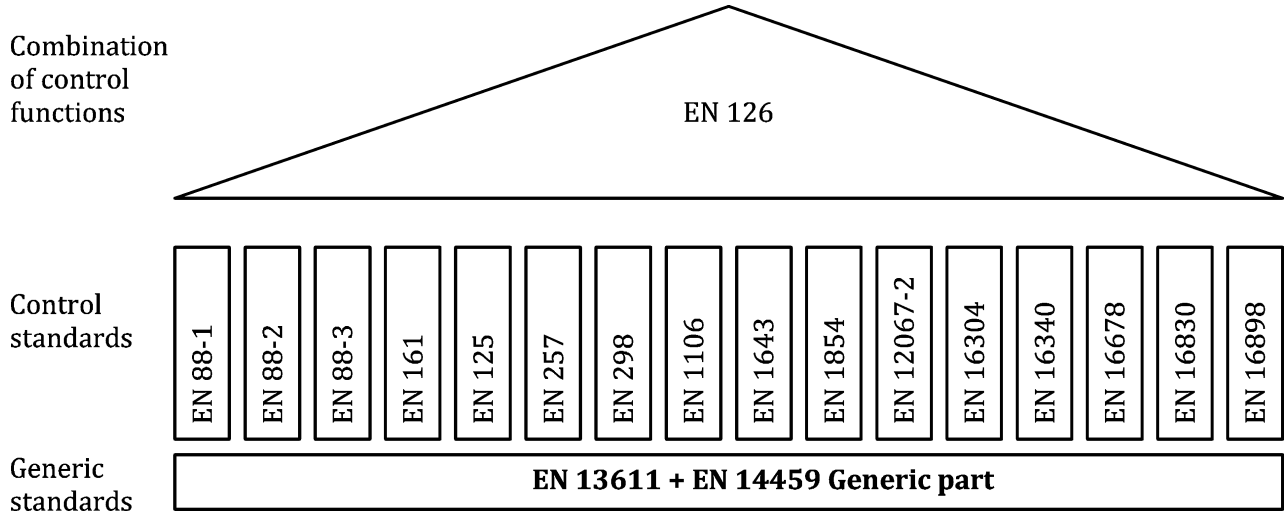

Figure 1 — Interrelation of control standards

EN 13611:2019 should be used in conjunction with the specific standard for a specific type of control (e.g. EN 88-1:2022, EN 88-2:2022, EN 88-3:2022, EN 125:2022, EN 126:2012, EN 161:2022, EN 257:2022, EN 298:2022, EN 1106:2022, EN 1643:2022, EN 1854:—[1], EN 12067-2:2022, EN 16304:2022, EN 16340:2014, EN 16678:2022 and EN 16898:2022), or for controls for specific applications.

EN 13611:2019 can also be applied, so far as reasonable, to controls not mentioned in a specific standard and to controls designed on new principles, in which case additional requirements can be necessary. EN 14459:2021 provides methods for classification and assessment of new control principles.

Primarily in industrial applications it is common practice to rate the safety of a plant based on values describing the likelihood of a dangerous failure. These values are being used to determine Safety Integrity Levels or Performance Levels when the system is being assessed in its entirety.

CEN/TC 58 standards for safety relevant controls do go beyond this approach, because for a certain life time for which the product is specified, designed and tested a dangerous failure is not allowed at all. Failure modes are described and assessed in greater detail.

---

1 Under preparation. Stage at the time of publication: FprEN 1854:2022.

Measures to prevent from dangerous situations are defined. Field experience over many decades is reflected in the CEN/TC 58 standards. Requirements of EN 13611:2019 can be considered as proven in practice.

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 designed as Annex AA, BB, CC, etc. It should be noted that these clauses, subclauses and Annexes are not indicated as an addition.

1 Scope

EN 13611:2019, Clause 1 applies with the following modification and addition:

Modification:

The 1st paragraph of EN 13611:2019, Clause 1 is replaced by:

This document specifies the safety, design, construction, and performance requirements and testing for thermoelectric flame supervision devices, energized by a thermocouple intended for use with burners and appliances burning one or more gaseous fuels, hereafter referred to as “controls”.

This document is applicable to controls with declared maximum inlet pressures up to and including 500 kPa and of nominal connection sizes up to and including DN 50.

Addition:

This document is not applicable to:

— the thermocouple;

— controls which use auxiliary energy (e.g. electrical energy supplied externally).

The 4th paragraph of EN 13611:2019, Clause 1 is removed.

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[2], *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 and the following apply.

ISO and IEC maintain terminological 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/

3.101
thermocouple
thermoelectric flame sensing element that responds to the temperature of the supervised flame, and in which the flame effect produces an electromotive force (e.m.f.)

[2] As impacted by EN 13611:2019/AC:2021.