

# **SLOVENSKI STANDARD**

## **SIST EN 16678:2022**

**01-december-2022**

**Nadomešča:**  
**SIST EN 16678:2016**

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**Varnostne in nadzorne naprave za plinske gorilnike in plinske aparate - Samodejni zaporni ventili za delovni tlak nad 500 kPa do vključno 6300 kPa**

Safety and control devices for gas burners and gas burning appliances - Automatic shut-off valves for operating pressure of above 500 kPa up to and including 6 300 kPa

Sicherheits- und Regeleinrichtungen für Gasbrenner und Gasbrennstoffgeräte - Automatische Absperrventile für einen Betriebsdruck über 500 kPa bis einschließlich 6 300 kPa

Équipements auxiliaires pour brûleurs à gaz et appareils à gaz - Robinets automatiques de sectionnement pour pression de service supérieure à 500 kPa et inférieure ou égale à 6300 kPa

**Ta slovenski standard je istoveten z: EN 16678:2022**

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**ICS:**

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

**SIST EN 16678:2022**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 16678**

October 2022

ICS 23.060.40

Supersedes EN 16678:2015

English Version

**Safety and control devices for gas burners and gas burning  
appliances - Automatic shut-off valves for operating  
pressure of above 500 kPa up to and including 6 300 kPa**

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Sicherheits- und Regeleinrichtungen für Gasbrenner  
und Gasbrennstoffgeräte - Automatische  
Absperrventile für einen Betriebsdruck über 500 kPa  
bis einschließlich 6 300 kPa

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.

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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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**EN 16678:2022 (E)****European foreword**

This document (EN 16678:2022) 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 16678:2015.

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

- a) alignment with EN 13611:2019;
- b) terms and definitions are aligned with EN 13611:2019;
- c) requirements from EU Directive 2014/68/EU were not adopted;
- d) reference to EN 437 removed;
- e) valves fitted with closed position indicator switches added to the scope;
- f) Clause “Other controls assembled” to a valve removed;
- g) Clause “Resistance to pressure” / safety factor removed;
- h) Clause “Electronic component – sensing element” is not applicable;
- i) Clause “Protection against internal faults for the purpose of functional safety” is not applicable;
- j) information on lifetime for safe function (designed lifetime) added to instructions.

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.

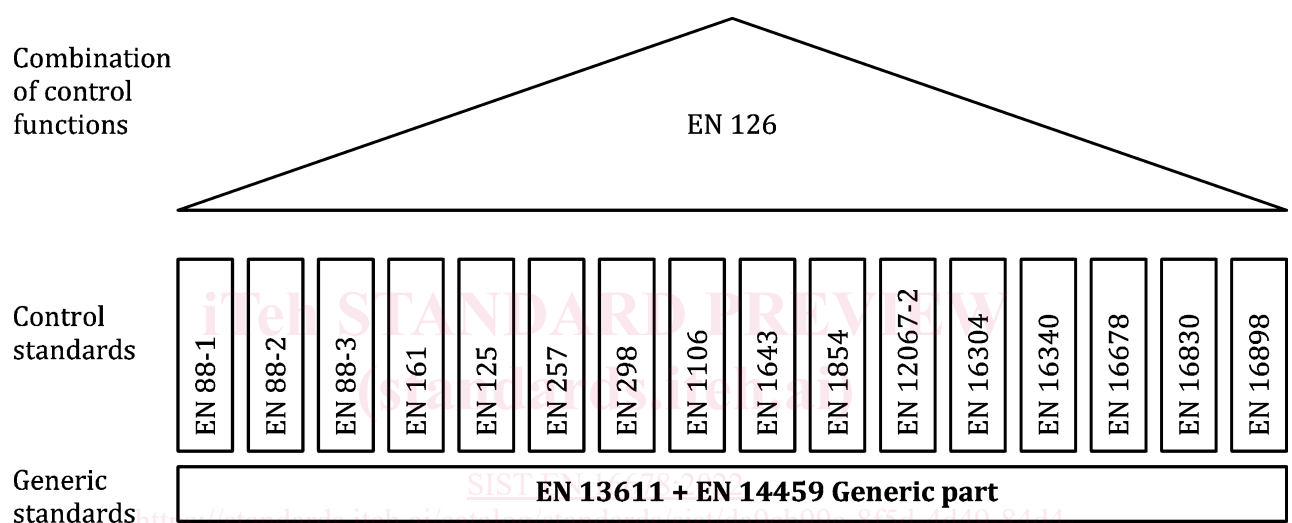
According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, 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:—<sup>1</sup>, 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.

<sup>1</sup> Under preparation. Stage at the time of publication: FprEN 1854:2022.

**EN 16678:2022 (E)**

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 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 “valve”.

This document establishes methodologies for the determination of a Performance Level (PL) in accordance with EN 13611:2019, Annexes K and L.

EN 16678 compliance for valves cannot be claimed based upon Performance Level (PL) classification according to EN ISO 13849-1:2015 or Safety Integrity Level (SIL) classification according to EN 61508-1:2010.

Valves with PL or SIL classification do not automatically meet the requirements of this document.

Performance Level (PL) classification according to EN ISO 13849-1:2015 or Safety Integrity Level (SIL) classification according to EN 61508-1:2010 cannot be claimed based upon compliance with this standard only.

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SIST EN 16678:2022

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## 1 Scope

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

Modification:

The 1<sup>st</sup> paragraph of EN 13611:2019, Clause 1 is replaced by:

This document specifies the safety, design, construction, and performance requirements and testing for automatic shut-off valves for burners and appliances burning one or more gaseous fuels, hereafter referred to as “valves”.

This document is applicable to valves with declared maximum inlet pressures of more than 500 kPa and up to and including 6 300 kPa and of nominal connection sizes up to and including DN 250.

Addition:

This document is applicable to:

- electrically actuated valves;
- valves actuated by fluids including the pilot valves for these fluids if actuated electrically and including release valves, but not to any external electrical devices for switching the actuating energy;
- valves where the flow rate is controlled by external electrical signals proportional to the applied signal;
- valves fitted with closed position indicator switches.

This document is not applicable to valves specifically designed for use in transmission and distribution networks.

The 4<sup>th</sup> 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 161:2022, *Automatic shut-off valves for gas burners and gas appliances*

EN 549:2019, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 1092-1:2018, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2:1997, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

EN 1092-3:2003<sup>2</sup>, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

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<sup>2</sup> As impacted by EN 1092-3:2003/AC:2007.

**EN 16678:2022 (E)**

EN 1092-4:2002, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 4: Aluminium alloy flanges*

EN 1759-1:2004, *Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 1: Steel flanges, NPS 1/2 to 24*

EN 1759-3:2003<sup>3</sup>, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 3: Copper alloy flanges*

EN 1759-4:2003, *Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, class designated — Part 4: Aluminium alloy flanges*

EN 10226-1:2004, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

EN 10226-2:2005, *Pipe threads where pressure tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation*

EN 12266-1:2012, *Industrial valves — Testing of metallic valves — Part 1: Pressure tests, test procedures and acceptance criteria — Mandatory requirements*

EN 12516-1:2014+A1:2018, *Industrial valves — Shell design strength — Part 1: Tabulation method for steel valve shells*

EN 12516-2:2014+A1:2021, *Industrial valves — Shell design strength — Part 2: Calculation method for steel valve shells*

EN 12516-3:2002<sup>4</sup>, *Valves — Shell design strength — Part 3: Experimental method*

EN 12516-4:2014+A1:2018, *Industrial valves — Shell design strength — Part 4: Calculation method for valve shells manufactured in metallic materials other than steel*

EN 12627:2017, *Industrial valves — Butt welding ends for steel valves*

EN 12760:2016, *Industrial valves — Socket welding ends for steel valves*

EN 13611:2019<sup>5</sup>, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements*

EN 60730-1:2016<sup>6</sup>, *Automatic electrical controls — Part 1: General requirements (IEC 60730-1:2013, modified)*

EN IEC 61058-1:2018, *Switches for appliances — Part 1: General requirements (IEC 61058-1:2016)*

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<sup>3</sup> As impacted by EN 1759-3:2003/AC:2004.

<sup>4</sup> As impacted by EN 12516-3:2002/AC:2003.

<sup>5</sup> As impacted by EN 13611:2019/AC:2021.

<sup>6</sup> As impacted by EN 60730-1:2016/A1:2019 and EN 60730-1:2016/A2:2022.

EN 175301-803:2006, *Detail Specification: Rectangular connectors — Flat contacts, 0,8 mm thickness, locking screw not detachable*

ISO 188:2011, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 1431-1:2022, *Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static and dynamic strain testing*

ISO 1817:2022, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 8573-1:2010, *Compressed air — Part 1: Contaminants and purity classes*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2019, EN 161:2021 and the following apply.

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

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

#### 3.101

##### **pilot valve**

valve which controls the fluid (e.g. compressed air) supplied to the actuating mechanism

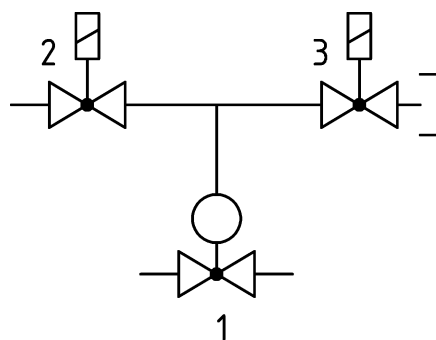
Note 1 to entry: A typical pilot and release valve application is shown in Figure 2.

#### 3.102

##### **release valve**

valve in the line from the pilot valve to the actuating mechanism which closes the vent automatically when the actuating fluid is released by the pilot valve and opens it automatically when the pilot valve is closed

Note 1 to entry: A typical pilot and release valve application is shown in Figure 2.



#### **Key**

- 1 control under test
- 2 pilot valve (normally closed)
- 3 release valve, normally open

**Figure 2 — Typical pilot and release valve application**

**EN 16678:2022 (E)****4 Classification****4.1 Classes of control**

EN 13611:2019, 4.1 is replaced by the following:

— Class A valves:

Valves where the sealing force is not decreased by the gas inlet pressure. They are classified A according to the sealing force requirements of 7.105. Balanced valves according to this document are also classified as Class A valves.

— Class D valves:

Valves which are not subject to the requirements for the sealing force and fixed closing time.

**4.2 Groups of control**

Shall be according to EN 13611:2019, 4.2.

**4.3 Classes of control functions**

EN 13611:2019, 4.3 is not applicable.

**4.4 Types of DC supplied controls**

Shall be according to EN 13611:2019, 4.4.

**5 Units of measurement and test conditions**

Shall be according to EN 13611:2019, Clause 5.

**6 Construction requirements****6.1 General**

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

If an automatic shut-off valve requires a release and/or a pilot valve to fulfil the requirements of this document, these are considered to be part of the automatic shut-off valve and shall be specified in the instructions. The combination of automatic shut-off valve and release and/or pilot valve shall conform to all requirements of this document.

The interaction of all valves participating in the closing mechanism shall be evaluated. An appropriate risk assessment shall be carried out.

For each pressurized compartment the local maximum pressure shall be considered for the strength design and for the selection of the material. It shall be ensured by mechanical means that parts for different pressures are separated. A diaphragm shall not be used for this purpose.

**6.2 Mechanical parts of the control****6.2.1 Appearance**

Shall be according to EN 13611:2019, 6.2.1.

**6.2.2 Holes**

Shall be according to EN 13611:2019, 6.2.2.

**6.2.3 Breather holes**

EN 13611:2019, 6.2.3 is not applicable.

**6.2.4 Screwed fastenings**

EN 13611:2019, 6.2.4 is replaced by the following:

Screwed fastenings shall be specified in the instructions.

Self-tapping screws which cut a thread and produce swarf shall not be used for connecting gas-carrying parts or parts which can be removed for service.

Self-tapping screws which form a thread and do not produce swarf may be used under the condition that they can be replaced by metric machine screws.

**6.2.5 Jointing**

Shall be according to EN 13611:2019, 6.2.5.

**6.2.6 Moving parts**

Shall be according to EN 13611:2019, 6.2.6 with the following addition:

There shall be no exposed shafts or operating levers which could adversely affect the ability of valves to close by unintended blockage.

**6.2.7 Sealing caps**

Shall be according to EN 13611:2019, 6.2.7.

**6.2.8 Dismantling and reassembly**

Shall be according to EN 13611:2019, 6.2.8.

**6.2.9 Auxiliary canals and orifices**

Shall be according to EN 13611:2019, 6.2.9.

**6.2.10 Presetting devices**

Shall be according to EN 13611:2019, 6.2.10.

**6.2.101 Closed position indicator switch**

Closed position indicator switches, where fitted, shall not impair the correct operation of valves. Adjusters shall be sealed to indicate interference. Any drift of the switch and actuating mechanism from its setting shall not impair correct valve operation. Conformity with these requirements is determined by the test according to 7.107.3.

**6.2.102 Valve with modulating control**

Flow rates of valves with modulating control shall be adjustable over the full range as stated in the instructions. If the adjustment of one flow rate affects the setting of any other flow rate, this shall be clearly stated in the instructions for setting up. The setting of any flow rate shall require the use of mechanical or electrical tools and shall be designed to discourage unauthorized adjustment.