
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 6300 kPa

Sicherheits- und Regeleinrichtungen für Gasbrenner und Gasbrennstoffgeräte - Automatische Absperrventile für einen Betriebsdruck über 500 kPa bis einschließlich 6300 kPa

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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 16678:2015

ICS:

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

SIST EN 16678:2016**en,fr,de**

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EUROPEAN STANDARD

EN 16678

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2015

ICS 23.060.40

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

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 6 300 kPa

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 19 September 2015.

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EN 16678:2015 (E)**European foreword**

This document (EN 16678:2015) 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of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives 2009/142/EC and 97/23/EC.

For relationship with EU Directives, see informative Annexes ZA and ZB, which are an integral part of this document.

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.

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1 Scope

This European Standard specifies the safety, design, construction and performance requirements and testing for automatic shut-off valves with or without modulating control functions (hereafter referred to as 'valves') for burners and appliances burning one or more gaseous fuels according to EN 437:2003+A1:2009.

This European Standard is applicable to valves with declared maximum inlet pressures of more than 500 kPa (5 bar) and up to and including 6 300 kPa (63 bar).

This European Standard is applicable to

- electrically operated valves and to 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;
- automatic shut-off valves where the flow rate is controlled by external electrical signals proportional to the applied signal.

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

NOTE Provisions for final product inspection and testing by the manufacturer are not specified.

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 161:2011+A3:2013, *Automatic shut-off valves for gas burners and gas appliances*

EN 549:1994, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 682:2002, *Elastomeric Seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

EN 1092-1:2007+A1:2013, *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, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

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, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 3: Copper alloy flanges*

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

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

EN 12516-3:2002, *Valves — Shell design strength — Part 3: Experimental method*

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

EN 12627:1999, *Industrial valves — Butt welding ends for steel valves*

EN 12760:1999, *Valves — Socket welding ends for steel valves*

EN 13611:2007+A2:2011, *Safety and control devices for gas burners and gas burning appliances — General requirements*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60730-1:2011, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1:2010)*

EN 61058-1:2002, *Switches for appliances — Part 1: General requirements (IEC 61058-1:2000)*

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

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

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

ISO 1817, *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 13611:2007+A2:2011, EN 161:2011+A3:2013, and the following apply.

3.101

pilot valve

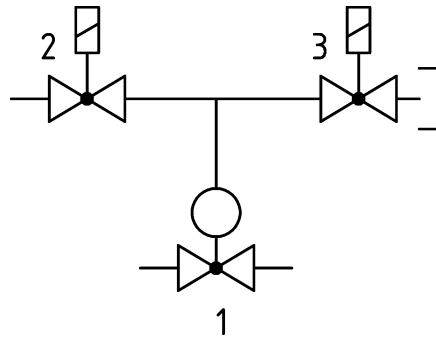
valve which controls the fluid (e.g. compressed air) supplied to the actuating mechanism

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

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 1.



Key

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

Figure 1 — Typical pilot and release valve application

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3.103 maximum allowable pressure PS

maximum pressure for which the body, its inner metallic partition walls and some other pressure containing parts are designed

3.104 specific maximum allowable pressure PS_d

differential pressure between pressure containing parts with different maximum allowable pressures

4 Classification

4.1 Classes of control

EN 13611:2007+A2:2011, 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 standard are Class A valves.

- Class D valves

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

EN 16678:2015 (E)**4.2 Groups of control**

Shall be according to EN 13611:2007+A2:2011, 4.2.

4.3 Classes of control functions

EN 13611:2007+A2:2011, 4.3 is not applicable.

5 Units of measurement and test conditions

Shall be according to EN 13611:2007+A2:2011, Clause 5.

6 Construction requirements**6.1 General**

Shall be according to EN 13611:2007+A2:2011, 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 standard, these are considered to be part of the automatic shut-off valve and shall be specified in the installation and operating instructions. The combination of automatic shut-off valve and release and/or pilot valve shall conform to all requirements of this standard.

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

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6.2.1 Appearance

Shall be according to EN 13611:2007+A2:2011, 6.2.1.

6.2.2 Holes

Shall be according to EN 13611:2007+A2:2011, 6.2.2.

6.2.3 Breather holes

EN 13611:2007+A2:2011, 6.2.3 is not applicable.

6.2.4 Test for leakage of breather holes

EN 13611:2007+A2:2011, 6.2.4 is not applicable.

6.2.5 Screwed fastenings

EN 13611:2007+A2:2011, 6.2.5 is replaced by the following:

Screwed fastenings shall be specified in the installations and operating 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 provided that they can be replaced by metric machine screws.

6.2.6 Jointing

Shall be according to EN 13611:2007+A2:2011, 6.2.6.

6.2.7 Moving parts

Shall be according to EN 13611:2007+A2:2011, 6.2.7 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.

6.2.8 Sealing caps

Shall be according to EN 13611:2007+A2:2011, 6.2.8.

6.2.9 Dismantling and reassembly

Shall be according to EN 13611:2007+A2:2011, 6.2.9.

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.

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 installation and operating instructions. If the adjustment of one flow rate affects the setting of any other flow rate, this shall be clearly stated in the installation and operating instructions. The setting of any flow rate shall require the use of mechanical or electrical tools and shall be designed to discourage unauthorized adjustment.

6.2.103 Other controls assembled to a valve

Other controls assembled to a valve shall not interfere with its shut-off function.

6.2.104 Balanced valves

The closure member of a balanced valve shall have a resulting force in the closing direction where the sealing force is not decreased by the gas inlet pressure.

For a balanced valve with one single valve seat a resulting force in the closing direction shall remain, if the balancing force is removed. The closure member shall have the same closing direction as the flow direction through the valve.

6.2.105 Additional requirements for shut-off function

6.2.105.1 Diaphragms that assist the shut-off function

Shut-off functions using a diaphragm to apply (part of) the closing force to the closure member shall be designed in such a way that, when the diaphragm is damaged, the closure member closes and the maximum internal leakage rate of the valve is limited to 1 dm³/h. Conformity shall be verified by the method given in 6.2.105.2.

6.2.105.2 Leakage test

Rupture the diaphragm assisting the shut-off function. De-energize the valve. Measure the internal leakage rate of the valve according to EN 161:2011+A3:2013, 7.3.3.