

BS EN 16678:2015



BSI Standards Publication

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

This is a preview of "BS EN 16678:2015". [Click here to purchase the full version from the ANSI store.](#)

This British Standard is the UK implementation of EN 16678:2015.

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 secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2015.
Published by BSI Standards Limited 2015

ISBN 978 0 580 83525 4

ICS 23.060.40

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 30 November 2015.

Amendments/corrigenda issued since publication

Date	Text affected
<hr/>	

This is a preview of "BS EN 16678:2015". Click here to purchase the full version from the ANSI store.

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.

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, 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 United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	8
4 Classification.....	9
4.1 Classes of control.....	9
4.2 Groups of control.....	10
4.3 Classes of control functions.....	10
5 Units of measurement and test conditions.....	10
6 Construction requirements.....	10
6.1 General.....	10
6.2 Mechanical parts of the control	10
6.2.1 Appearance.....	10
6.2.2 Holes	10
6.2.3 Breather holes.....	10
6.2.4 Test for leakage of breather holes	10
6.2.5 Screwed fastenings.....	10
6.2.6 Jointing.....	11
6.2.7 Moving parts	11
6.2.8 Sealing caps	11
6.2.9 Dismantling and reassembly	11
6.2.101 Closed position indicator switch	11
6.2.102 Valve with modulating control.....	11
6.2.103 Other controls assembled to a valve	11
6.2.104 Balanced valves	11
6.2.105 Additional requirements for shut-off function	11
6.3 Materials.....	12
6.3.1 General material requirements	12
6.3.2 Housing.....	12
6.3.3 Test for leakage of housing after removal of non-metallic parts.....	12
6.3.4 Zinc alloys	12
6.3.5 Springs providing closing and/or sealing force	12
6.3.6 Resistance to corrosion and surface protection	12
6.3.7 Impregnation	12
6.3.8 Seals for glands for moving parts	12
6.3.101 Closure members	12
6.3.102 Parts transmitting the closing force.....	12
6.3.103 Balanced valves	12
6.3.104 Bellows	12
6.3.105 Resistance to pressure	13
6.4 Gas connections	13
6.4.1 Making connections.....	13
6.4.2 Connection sizes	14
6.4.3 Threads.....	14
6.4.4 Union joints	14

This is a preview of "BS EN 16678:2015". [Click here to purchase the full version from the ANSI store.](#)

6.4.5	Flanges.....	14
6.4.6	Compression fittings.....	14
6.4.7	Nipples for pressure test.....	14
6.4.8	Strainers.....	14
6.4.101	Welded connections	14
6.5	Electrical parts of the control.....	14
6.5.1	General	14
6.5.2	Switching elements.....	14
6.5.3	Electrical components.....	14
6.6	Protection against internal faults for the purpose of functional safety.....	15
6.6.1	Design and construction requirements.....	15
6.6.2	Class A	15
6.6.3	Class B	15
6.6.4	Class C	15
6.6.5	Circuit and construction evaluation	15
6.101	Pneumatic and hydraulic actuating mechanisms	15
7	Performance	15
7.1	General	15
7.2	Leak-tightness.....	15
7.3	Test for leak-tightness	15
7.4	Torsion and bending	16
7.5	Torsion and bending tests	16
7.6	Rated flow rate	16
7.7	Test for rated flow rate.....	16
7.8	Durability.....	16
7.8.1	Elastomers in contact with gas	16
7.8.2	Marking	17
7.8.3	Tests for marking	18
7.8.4	Resistance to scratching.....	18
7.8.5	Scratch test.....	18
7.8.6	Resistance to humidity	18
7.8.7	Humidity test.....	18
7.9	Performance test for electronic controls.....	18
7.10	Long-term performance for electronic controls	18
7.101	Closing function concerning remanence.....	18
7.101.1	Requirement	18
7.101.2	Test of closing function	18
7.102	Closing force	19
7.102.1	Requirement	19
7.102.2	Test of closing force.....	19
7.103	Delay time and opening time.....	19
7.103.1	Requirement	19
7.103.2	Test of delay time and opening time	19
7.104	Closing time	19
7.104.1	Requirement	19
7.104.2	Test of closing time	19
7.105	Sealing force	20
7.105.1	Requirement	20
7.105.2	Test of sealing force.....	20
7.106	Closed position indicator switch.....	20
7.106.1	Requirement	20
7.106.2	Test of closed position indicator switch	21

This is a preview of "BS EN 16678:2015". [Click here to purchase the full version from the ANSI store.](#)

7.107	Endurance.....	21
7.107.1	Requirement.....	21
7.107.2	Endurance test.....	21
8	EMC/Electrical requirements	22
8.1	Protection against environmental influences	22
8.2	Supply voltage variations below 85 % of rated voltage	22
8.3	Short term voltage interruptions and decreases.....	22
8.4	Supply frequency variations	22
8.5	Surge immunity test.....	22
8.6	Electrical fast transient/burst.....	22
8.7	Immunity to conducted disturbances.....	22
8.8	Immunity to radiated fields.....	22
8.9	Electrostatic discharge immunity test.....	22
8.10	Power frequency magnetic field immunity test.....	22
8.11	Electrical requirements.....	23
8.11.101	General	23
8.11.102	Electrical equipment	23
9	Marking, installation and operating instructions	24
9.1	Marking.....	24
9.2	Installation and operating instructions.....	24
9.3	Warning notice.....	25
Annex A (informative)	Gas connections in common use in the various countries.....	26
Annex B (informative)	Leak-tightness test – volumetric method.....	27
Annex C (informative)	Leak-tightness test – pressure loss method	28
Annex D (normative)	Conversion of pressure loss into leakage rate.....	29
Annex E (normative)	Electrical/electronic component fault modes.....	30
Annex F (normative)	Additional requirements for safety accessories and pressure accessories as defined in EU Directive 97/23/EC.....	31
Annex G (informative)	Materials for pressurized parts.....	32
Annex H (informative)	Additional materials for pressurized parts	33
Annex I (normative)	Requirements for controls used in DC supplied gas burners and gas burning appliances.....	34
Annex J (normative)	Method for the determination of a Safety Integrity Level (SIL)	35
Annex K (normative)	Method for the determination of a Performance Level (PL).....	36
Annex L (informative)	Relationship between Safety Integrity Level (SIL) and Performance Level (PL)	37
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2009/142/EC relating to appliances burning gaseous fuels.....	38
Annex ZB (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 97/23/EC relating to pressure equipment.....	41
Bibliography	43

Tables

This is a preview of "BS EN 16678:2015". [Click here to purchase the full version from the ANSI store.](#)

Table 1 — Minimum value of safety factor F 13

Table 2 — Test method and acceptance criteria referred to the properties of elastomeric materials 17

Table 3 — Sealing force requirements 20

Table 4 — Operating cycles 22

Table ZA.1 — Correspondence between this European Standard and Directive 2009/142/EC relating to appliances burning gaseous fuels 38

Table ZB.1 — Correspondence between this European Standard and Directive 97/23/EC relating to pressure equipment 41

Figures

Figure 1 — Typical pilot and release valve application 9

This is a preview of "BS EN 16678:2015". [Click here to purchase the full version from the ANSI store.](#)

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.

This is a preview of "BS EN 16678:2015". [Click here to purchase the full version from the ANSI store.](#)

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*