

Irish Standard I.S. EN 88-1:2011+A1:2016

Pressure regulators and associated safety devices for gas appliances - Part 1: Pressure regulators for inlet pressures up to and including 50 kPa

© CEN 2016 No copying without NSAI permission except as permitted by copyright law.

I.S. EN 88-1:2011+A1:2016

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R.~xxx: Standard~Recommendation-recommendation~based~on~the~consensus~of~an~expert~panel~and~subject~to~public~consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

Published:

EN 88-1:2011+A1:2016

2016-02-10

This document was published under the authority of the NSAI

ICS number:

and comes into effect on:

23.060.40

2016-02-28

NOTE: If blank see CEN/CENELEC cover page

NSAI T +353 1 807 3800 Sales:

 1 Swift Square,
 F +353 1 807 3838
 T +353 1 857 6730

 Northwood, Santry
 E standards@nsai.ie
 F +353 1 857 6729

 Dublin 9
 W NSAI.ie
 W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

This is a free page sample. Access the full version online.

National Foreword

I.S. EN 88-1:2011+A1:2016 is the adopted Irish version of the European Document EN 88-1:2011+A1:2016, Pressure regulators and associated safety devices for gas appliances - Part 1: Pressure regulators for inlet pressures up to and including 50 kPa

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

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This is a free page sample. Access the full version online.

This page is intentionally left blank

EUROPEAN STANDARD

EN 88-1:2011+A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2016

ICS 23.060.40

Supersedes EN 88-1:2011

English Version

Pressure regulators and associated safety devices for gas appliances - Part 1: Pressure regulators for inlet pressures up to and including 50 kPa

Régulateurs de pression et dispositifs de sécurité associés pour appareils à gaz - Partie 1: Régulateurs de pression pour pression amont inférieure ou égale à 50

Druckregler und zugehörige Sicherheitseinrichtungen für Gasgeräte - Teil 1: Druckregler für Eingangsdrücke bis einschließlich 50 kPa

This European Standard was approved by CEN on 26 February 2011 and includes Amendment 1 approved by CEN on 1 December 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		
Europ	ropean foreword			
1	Scope	8		
2	•			
3				
4				
4.1				
4.2				
4.3				
5	Units of measurement and test conditions	13		
6				
6.1	General			
6.2	Mechanical parts of the control			
6.2.1	Appearance			
6.2.2	Holes			
6.2.3	Breather holes			
6.2.4	Test for leakage of breather holes			
6.2.5	Screwed fastenings			
6.2.6	Jointing			
6.2.7	Moving parts			
6.2.8	Sealing caps			
6.2.9	Dismantling and reassembly			
6.2.10	• • • • • • • • • • • • • • • • • • • •			
6.2.10				
6.2.10	0			
6.2.10	· · · · · · · · · · · · · · · · · · ·			
6.3	Materials			
6.3.1	General material requirements			
6.3.2	Housing			
6.3.3	Test for leakage of housing after removal of non-metallic parts			
6.3.4	Zinc alloys			
6.3.5	Springs providing closing and/or sealing force			
6.3.6	Resistance to corrosion and surface protection			
6.3.7	Impregnation			
6.3.8	Seals for glands for moving parts			
6.4	Gas connections			
6.4.1	Making connections			
6.4.2	Connection sizes			
6.4.3	Threads			
6.4.4	Union joints			
6.4.5	Flanges			
6.4.6	Compression fittings			
6.4.7	Nipples for pressure test			
6.4.8	Strainers			
6.5	Electronic parts of the control			
6.6	Protection against internal faults for the purpose of functional safety	16		
7	Performance	16		

7.1	General	16
7.2	Leak tightness	16
7.3	Test for leak tightness	16
7.3.1	General	16
7.3.2	External leak-tightness	
7.3.3	Internal leak-tightness	
7.3.10	6	
7.4	Torsion and bending	
7.5	Torsion and bending tests	
7.6	Rated flow rate	
7.7	Test for rated flow	
7.7.1	Apparatus	
7.7.2	Test procedure	
7.7.3	Conversion of air flow rate	
7.7.3 7.8	Durability	
7.9	Performance tests for electronic controls	
7.10	Long-term performance for electronic controls	
	Pressure regulator performance	
7.101		
7.101.2		
7.101.3	1	
7.101.4		
7.101.	1 2 1	
7.101.	1 0 1	
7.101.		
7.101.8		
7.101.6	· · · · · · · · · · · · · · · · · · ·	
	Pneumatic gas/air ratio pressure regulator performance	
7.102 7.102.1		
7.102.2		
7.102.3	•	
7.102.4	<u>*</u>	
7.102.5	8	
7.102.	,	
	•	
7.102.	/ Endurance	4 /
8	EMC/Electrical requirements	27
8.1	Protection against environmental influences	27
8.2	Supply voltage variations below 85 % of rated voltage	28
8.3	Short term voltage interruptions and decreases	28
8.4	Supply frequency variations	28
8.5	Surge immunity test	28
8.6	Electrical fast transient/burst	28
8.7	Immunity to conducted disturbances	28
8.8	Immunity to radiated fields	28
8.9	Electrostatic discharge immunity test	28
8.10	Power frequency magnetic field immunity test	28
8.11	Electrical requirements	
	General	
	Electrical equipment	
	• •	
9	Marking, installation and operating instructions	
9.1	Marking	
9.2	Installation and operating instructions	29

9.3	Warning notice	. 31
Annex	A (informative) Gas connections in common use in the various countries	. 32
Annex	B (informative) Leak-tightness test — volumetric method	. 33
Annex	C (informative) Leak-tightness test — pressure loss method	. 34
Annex	D (normative) Conversion of pressure loss into leakage rate	. 35
Annex	E (normative) Electrical/electronic component fault modes	. 36
	F (normative) Additional requirements for safety accessories and pressure ories as defined in EC Directive 97/23/EC	. 37
	G (normative) Materials for pressurized parts	
Annex	H (informative) Additional materials for pressurized parts	. 39
	I (normative) Requirements for controls used in DC supplied gas burners and gas appliances	. 40
Annex	AA (informative) Typical pressure regulators and pressure regulator parts	. 41
	BB (informative) Overview of requirements and test conditions (as given in Clause 7), amples of performance curves for pressure regulators	. 42
	ZA (informative) Relationship between this European Standard and the Essential rements of EC Directive 2009/142/EC relating to appliances burning gaseous fuels	. 48
Bibliog	graphy	. 50
Figure Figure	${f s}$ — Step response of a transfer element	11
Figure	2 — Performance test apparatus	19
Figure	3 — Gas/air modulation curves	26
A ₁) Fig	ure 4 街 — Delta p versus rated flow rate curve	31
Figure	AA.1 — Types of constant pressure regulators	41
_	BB.1 — Example for class A pressure regulator including maximum outlet pressure variations constant outlet setting pressure p_{2s} and lock-up pressure p_{2f} including typical results	
for	BB.2 — Example for class A pressure regulator including maximum outlet pressure variation adjustable outlet setting pressures $p_{2\text{smin}}$, $p_{2\text{smax}}$, and lock-up pressures $p_{2\text{fmin}}$, $p_{2\text{fmax}}$, including results	ding
	BB.3 — Example for class A pressure regulator including maximum outlet pressure variation is an example for class A pressure regulator including maximum outlet pressure p_{2s} including typical results	
_	BB.4 — Example for class B pressure regulator including maximum outlet pressure variation is a stant outlet setting pressure p_{2s} including typical results	
	BB.5 — Example for class C pressure regulator including maximum outlet pressure variation astant outlet setting pressure $p_{2{ m s}}$ including typical results	
Tables Table 1	Gas pressure at inlet to the pressure regulator	18
	<u>.</u>	

This is a free page sample. Access the full version online. I.S. EN 88-1:2011+A1:2016

Table 2 — Outlet pressure variation from the outlet setting pressure $p_{2\mathrm{s}}$	18
Table 3 — Control performance test procedure	25
Table BB.1 — Overview of pressure regulator requirements	42
Table BB.2 — Test procedure	47
Table ZA.1 — Correspondence between this European Standard and Directive 2009/142/EC relating appliances burning gaseous fuels	,

European foreword

This document (EN 88-1:2011+A1:2016) 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 August 2016, and conflicting national standards shall be withdrawn at the latest by August 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 includes Amendment 1 approved by CEN on 2015-12-01.

This document supersedes (A) EN 88-1:2011. (A)

The start and finish of text introduced or altered by amendment is indicated in the text by tags (A).

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 Directive(s).

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

This document is intended to be used in conjunction with EN 13611:2007. This document refers to clauses of EN 13611:2007 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 European Standard adds clauses or sub-clauses to the structure of EN 13611:2007 which are particular to this European Standard. It should be noted that these clauses and sub-clauses are not indicated as an addition. Sub-clauses or annexes which are additional to those in EN 13611:2007 are numbered starting from 101 or are designated as Annex AA, BB, CC etc.

A1) deleted text (A1

EN 88 *Pressure regulators and associated safety devices for gas appliances* consists of the following parts:

- EN 88-1, Pressure regulators and associated safety devices for gas appliances Part 1: Pressure regulators for inlet pressures up to and including 50 kPa;
- EN 88-2, Pressure regulators and associated safety devices for gas appliances Part 2: Pressure regulators for inlet pressures above 500 mbar up to and including 5 bar.

Performance Level (PL) or Safety Integrity Level (SIL) classifications according to EN ISO 13849-1 or EN 61508-1 cannot automatically be claimed based upon compliance with this European Standard. Pressure regulators with PL or SIL classification do not automatically meet the requirements of this European Standard.

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 the safety, construction and performance requirements for pressure regulators and pneumatic gas/air ratio pressure regulators (zero pressure regulators are included as a special type of pneumatic gas/air ratio pressure regulator), intended for use with gas burners, gas appliances and similar use, hereafter referred to as 'pressure regulators'.

This European Standard is applicable to

- pressure regulators with declared maximum inlet pressures up to and including 50 kPa (500 mbar) of nominal connection sizes up to and including DN 250 for use with one or more fuel gases in accordance with EN 437,
- pressure regulators which use auxiliary energy,
- pneumatic gas/air ratio pressure regulators, which function by controlling a gas outlet pressure in response to an air signal pressure, air signal differential pressure, and/or to a furnace pressure signal (zero pressure regulators are included as a special type of pneumatic gas/air ratio pressure regulator),
- gas/air ratio pressure regulators which change an air outlet pressure in response to a gas signal pressure or a gas signal differential pressure.

This European Standard does not cover

- pressure regulators connected directly to gas distribution network or to a container that maintains a standard distribution pressure,
- pressure regulators intended for gas appliances to be installed in the open air and exposed to the environment,
- mechanically linked gas/air ratio controls,
- electronic gas/air ratio controls (EN 12067-2).

2 Normative references

The following referenced documents are indispensable for the application 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 161:2011¹, Automatic shut-off valves for gas burners and gas appliances

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

EN 60529, Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)

EN 60730-1:2000, Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1:1999, modified)

_

¹⁾ To be published.



Product Page

- Dooking for additional Standards? Visit Intertek Inform Infostore
- Dearn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation