

STN	Zásobníkové ohrievače vody na plynné palivá na výrobu teplej úžitkovej vody.	STN EN 89 06 1414
------------	---	-------------------------------------

Gas-fired storage water heaters for the production of domestic hot water

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 09/15

Obsahuje: EN 89:2015

Oznámením tejto normy sa ruší
STN EN 89+A1+A2 (06 1414) z novembra 2001

121593

English Version

Gas-fired storage water heaters for the production of domestic hot water

Appareils de production d'eau chaude par accumulation
pour usages sanitaires utilisant les combustibles gazeux

Gasbeheizte Vorrats-Wasserheizer für den sanitären
Gebrauch

This European Standard was approved by CEN on 29 November 2014.

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

Foreword.....	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	10
4 Classification of storage water heaters.....	23
4.1 General.....	23
4.2 Classification of gases.....	23
4.3 Appliance categories.....	23
4.4 Mode of supply of the combustion air and evacuation of the combustion products (appliance types).....	23
5 Construction requirement.....	23
5.1 Introduction	23
5.2 General.....	24
5.2.1 Conversion to different gases	24
5.2.2 Materials	24
5.2.3 Design - Assembly - Strength.....	27
5.2.4 Accessibility - Ease of maintenance - Fitting and removal	27
5.2.5 Gas and water pipe connections.....	27
5.2.6 Means of achieving soundness.....	28
5.2.7 Supply of combustion air and evacuation of the combustion products	29
5.2.8 Checking the state of operation	32
5.2.9 Drainage.....	32
5.2.10 Electrical safety.....	32
5.2.11 Operational safety in the event of failure or restoration of the auxiliary energy	34
5.2.12 Mechanical resistance and stability of ducts, terminal and fitting pieces.....	34
5.3 Adjusting, control and safety devices	35
5.3.1 General.....	35
5.3.2 User controls.....	36
5.3.3 Preset gas rate adjusters	37
5.3.4 Gas pressure regulator	37
5.3.5 Pressure test points	37
5.3.6 Ignition devices.....	38
5.3.7 Flame supervision device	38
5.3.8 Combustion products discharge safety device.....	39
5.3.9 Protection against accidental overheating	40
5.3.10 Control thermostat.....	40
5.3.11 Automatic shut-off valves	40
5.3.12 Combustion products temperature limiter.....	41
5.3.13 Combined temperature and pressure relief valve	41
5.3.14 Flue damper.....	41
5.4 Main burner	42
5.5 Supplementary requirements for condensing water heaters	42
5.5.1 Materials in contact with condensate	42
5.5.2 Discharge of condensate	43
5.5.3 Control of the combustion products temperature	43
5.5.4 Chemical composition of the condensate	43
6 Operational requirements	43

6.1	Carrying out the tests	43
6.1.1	General	43
6.1.2	Characteristics of the test gases	44
6.1.3	Requirements for preparation of the test gases	44
6.1.4	Choice of test gases	44
6.1.5	Test pressures	44
6.1.6	General test conditions	44
6.2	Soundness	48
6.2.1	Soundness of the gas circuit	48
6.2.2	Soundness of the combustion circuit and evacuation of the combustion products	49
6.2.3	Hydraulic test and soundness of the water circuit	53
6.3	Heat inputs	54
6.3.1	General	54
6.3.2	Nominal heat input	55
6.4	Temperature of the control knobs	56
6.4.1	Requirements	56
6.4.2	Test	56
6.4.3	Supplementary requirements for type B ₁₄ , B ₂ and B ₃ water heaters	57
6.5	Temperature of the adjusting, control and safety devices	57
6.5.1	Requirement	57
6.5.2	Test	57
6.6	Limit temperature of the walls and the test panels	57
6.6.1	Side walls, front and top	57
6.6.2	Test panels	58
6.7	Ignition - Cross-lighting - Flame stability	59
6.7.1	Normal conditions	59
6.7.2	Special conditions	60
6.7.3	Reduction of supply to ignition burner	63
6.7.4	Additional requirements relating to operation of the permanent ignition burner when the fan is stopped	63
6.8	Temperature of combustion products in condensing appliances	64
6.8.1	Requirements	64
6.8.2	Tests	64
6.9	Adjusting, control and safety devices	64
6.9.1	General	64
6.9.2	Ignition devices	64
6.9.3	Opening and safety times	66
6.9.4	Endurance of thermostats and temperature limiters	69
6.9.5	Operation of water temperature safety devices	70
6.9.6	Combustion products evacuation safety device for type B _{11BS} appliances	71
6.9.7	Pressure regulator	73
6.9.8	Flue dampers	74
6.10	Repeated draw-off	74
6.10.1	Requirements	74
6.10.2	Tests	74
6.11	Nominal capacity	75
6.11.1	Requirements	75
6.11.2	Tests	75
6.12	Combustion	75
6.12.1	Requirements	75
6.12.2	Tests	75
6.13	Non-condensation in the flue (type B appliances)	79
6.13.1	Requirements	79
6.13.2	Tests	79
6.14	Supplementary tests for condensing water heaters	80
6.14.1	Formation of condensate	80
6.14.2	Temperature of combustion products	81

6.15	Prepurging.....	81
6.15.1	Requirements	81
6.15.2	Test.....	82
6.16	Air monitoring device.....	82
6.16.1	Type B ₁₂ and B ₁₃	82
6.16.2	Type C and other type B	83
6.16.3	Gas/air ratio controls.....	84
6.17	Functioning of the fan of a type C ₄ water heater	85
6.17.1	Requirements	85
6.17.2	Tests.....	85
6.18	Nitrogen oxides.....	86
6.18.1	General.....	86
6.18.2	Weighting.....	87
6.19	Electrical power measurements.....	88
6.19.1	Nominal conditions.....	88
6.19.2	Standby.....	88
7	Rational use of energy	88
7.1	Efficiency	88
7.1.1	Requirements	88
7.1.2	Tests.....	88
7.2	Maintenance consumption	89
7.2.1	Requirements	89
7.2.2	Tests.....	90
8	Fitness for purpose	91
8.1	Heating-up time.....	91
8.1.1	Requirements	91
8.1.2	Tests.....	91
8.2	Mixing factor of the water temperature in the appliance	91
8.2.1	Requirements	91
8.2.2	Tests.....	92
8.3	Draw-off limits causing operation of the burner	92
8.3.1	Requirements	92
8.3.2	Tests.....	92
8.4	Continuous draw-off.....	92
8.4.1	Requirements	92
8.4.2	Tests.....	93
8.5	Requirements for the specific rate.....	93
8.6	Designation and measurement of reference temperatures of flue systems	93
8.6.1	Nominal working combustion products temperature	93
8.6.2	Overheat combustion products temperature	93
8.6.3	Mechanical resistance and stability of ducts, terminal and fitting pieces.....	93
8.7	Requirements for plastic in the combustion product evacuation ducts, terminals and fitting pieces for appliances	95
8.7.1	Thermal resistance	95
8.7.2	Materials	95
8.8	Requirements for elastomeric seals and elastomeric sealants in the combustion product evacuation ducts, terminals and fitting pieces.....	101
8.8.1	Characterization.....	101
8.8.2	Long-term resistance to thermal load	101
8.8.3	Long-term resistance to condensate exposure.....	102
8.8.4	Cyclic condensate resistance test	103
8.8.5	Relaxation behaviour	104
8.8.6	Compression set.....	104
8.8.7	Low temperature resistance	105
8.8.8	Joints in elastomeric seals	105

9	Marking and instructions	105
9.1	Appliance marking	105
9.1.1	Data plate	105
9.1.2	Supplementary markings	106
9.1.3	Packaging	106
9.1.4	Warnings on the appliance and packaging	107
9.1.5	Other information	107
9.1.6	Additional marking for appliances with flue dampers	107
9.2	Instructions	107
9.2.1	Installation instructions	107
9.2.2	Instructions for use	111
9.2.3	Conversion instructions	112
9.3	Presentation	112
10	Ecodesign Data	112
10.1	Water heating energy efficiency (η_{wh})	112
10.2	Nitrogen oxides emissions	113
10.3	Additional product information	113
10.4	Storage volume	113
10.5	Mixed water at 40 °C (V_{40})	113
11	Energy Labelling Data	113
11.1	General	113
11.2	Printed label	113
11.2.1	General	113
11.2.2	Annual Electricity Consumption (AEC)	114
11.2.3	Annual Fuel Consumption (AFC)	114
11.2.4	Sound power level (L_{WA})	114
11.3	Product fiche	114
11.4	Technical documentation	114
12	Figures referenced in this standard	115
Annex A	(informative) National situations	126
Annex B	(normative) Test apparatus for type C₁₁ appliances (see 6.7.2.2.1)	130
Annex C	(normative) Test apparatus for type C₂₁ appliances (see 6.7.2.2.3)	135
Annex D	(informative) Examples of composition of the gas circuit	136
Annex E	(normative) Soundness test - Volumetric method	138
Annex F	(informative) Guidelines for extension to other categories	139
Annex G	(informative) A–deviations	140
Annex H	(informative) NO_x conversion calculation	141
Annex I	(informative) Requirements and test methods for separate air supply and combustion products evacuation ducts of type C₆ water heaters	142
Annex J	(normative) Lists of materials currently used	147
Annex K	(normative) Test methods to determine the effects of to long-term thermal load, long-term condensate exposure, condensing/ non- condensing cycling and resistance to UV radiation	149
Annex L	(normative) Parts in copper or copper alloys	150
Annex M	(informative) Compilation of the test conditions for the various gas families	151
Annex N	(informative) Alternative Method for the determination of the nominal heat input or the maximum and minimum heat input (according to 6.3.1) for appliances using a pneumatic gas/air ratio control system	153

Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of UE Directives	154
Annex ZB (informative) Relationship between this European Standard and the requirements of Commission Regulation (EU) No 814/2013	157
Annex ZC (informative) Relationship between this European Standard and the requirements of Commission Delegated Regulation (EU) No 812/2013	158
Bibliography	159

Foreword

This document (EN 89:2015) has been prepared by Technical Committee CEN/TC 48 "Domestic gas-fired water heaters", the secretariat of which is held by AFNOR.

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 November 2015 and conflicting national standards shall be withdrawn at the latest by November 2015.

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 supersedes EN 89:1999.

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, Annex ZB or Annex ZC, which are integral parts of this document.

The present standard deals with:

- safety;
- rational use of energy;
- fitness for purpose.

It gives specific requirements relative to:

- appliances with burners with a fan;
- combustion products discharge orifice closure devices;
- type C water heaters with a fan incorporated in the combustion air supply circuit or in the combustion products evacuation circuit;
- condensing water heaters;
- measurement of NO_x emissions of water heaters;
- the metallic, plastic and other non-metallic materials that are used in water heaters and which come into contact with water intended for human consumption. It is intended to ensure that products of this kind complying with these requirements meet current technological development and requirements with regard to the service life of the water heaters and their physiological suitability;
- the growth of microorganism on materials in contact with drinking water.

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 defines the specifications and test methods for the construction, safety, rational use of energy and fitness for purpose, environment and classification and marking of gas-fired storage water heaters for domestic hot water uses, hereafter called “appliance”.

This European Standard applies to appliances:

- of selected types B₁, B₂, B₃, B₅, C₁, C₂, C₃, C₄, C₅, C₆, C₇, C₈, C₉ according to CEN/TR 1749;
- fitted with atmospheric burners;
- using one or more combustible gases corresponding to the three gas families and the pressures indicated in EN 437;
- of nominal heat input not exceeding 150 kW (net calorific value);
- fitted with electrically operated mechanical flue dampers that are positioned downstream of the heat exchanger.

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 88-1:2011, *Pressure regulators and associated safety devices for gas appliances — Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

EN 125, *Flame supervision devices for gas burning appliances — Thermoelectric flame supervision devices*

EN 126, *Multifunctional controls for gas burning appliances*

EN 161, *Automatic shut-off valves for gas burners and gas appliances*

EN 298:2012, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

EN 437, *Test gases — Test pressures — Appliance categories*

EN 513, *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors — Determination of the resistance to artificial weathering*

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

EN 573-1, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 1: Numerical designation system*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

CR 1404, *Determination of emissions from appliances burning gaseous fuels during type-testing*

EN 1490, *Building valves — Combined temperature and pressure relief valves — Tests and requirements*

CEN/TR 1749 *European scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types)*

EN 1856-1:2009, *Chimneys — Requirements for metal chimneys — Part 1: System chimney products*

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*

EN 10226-1, *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 13203-1, *Gas-fired domestic appliances producing hot water — Appliances not exceeding 70 kW heat input and 300 l water storage capacity — Part 1: Assessment of performance of hot water deliveries*

EN 13203-2, *Gas-fired domestic appliances producing hot water — Appliances not exceeding 70 kW heat input and 300 l water storage capacity — Part 2: Assessment of energy consumption*

EN 13216-1, *Chimneys — Test methods for system chimneys — Part 1: General test methods*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

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

EN 14241-1:2013, *Chimneys — Elastomeric seals and elastomeric sealants — Material requirements and test methods — Part 1: Seals in flue liners*

EN 14459, *Control functions in electronic systems for gas burners and gas burning appliances — Methods for classification and assessment*

EN 14471:2013, *Chimneys — System chimneys with plastic flue liners — Requirements and test methods*

EN 60335-1:2012, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2010)*

EN 60335-2-102, *Household and similar electrical appliances — Safety — Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102)*

EN 60730-2-9, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9)*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178)*

EN ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)*

EN ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1)*

EN ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

EN ISO 1183 (all parts), *Plastics — Methods for determining the density of non-cellular plastics (ISO 1183)*

EN 89:2015 (E)

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1)*

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969)*

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

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

ISO 262, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts*

ISO 301, *Zinc alloy ingots intended for castings*

ISO 815-1, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

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

ISO 2781, *Rubber, vulcanized or thermoplastic — Determination of density*

ISO 6914, *Rubber, vulcanized or thermoplastic — Determination of ageing characteristics by measurement of stress relaxation in tension*

ISO 7005, *Pipe flanges*

ISO 7619, *Rubber — Determination of indentation hardness by means of pocket hardness meters*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN