SLOVENSKI STANDARD
SIST EN 624:2011

01-september-2011

Nadomešča:
SIST EN 624:2002
SIST EN 624:2002/A2:2007

Specifikacija za plinske aparate na utekočinjeni naftni plin - Grelne naprave za zaprte prostore za vgradnjo v vozila in čolne

Specification for dedicated LPG appliances - Room sealed LPG space heating equipment for installation in vehicles and boats

Festlegungen für flüssiggasbetriebene Geräte - Raumluftunabhängige Flüssiggas-Raumheizgeräte zum Einbau in Fahrzeugen und Booten

Spécification pour les appareils fonctionnant exclusivement aux GPL - Appareils de chauffage à circuit étanche fonctionnant aux GPL à installer dans les véhicules et bateaux

Ta slovenski standard je istoveten z: **EN 624:2011**

ICS:

43.040.60	Karoserije in deli karoserij	Bodies and body components
47.020.90	Ladijski prezračevalni, klimatski in ogrevalni sistemi	Marine ventilation, air-conditioning and heating systems
97.100.20	Plinski grelniki	Gas heaters

SIST EN 624:2011 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 624

March 2011

ICS 43.040.60; 47.020.90; 97.100.20

Supersedes EN 624:2000

English Version

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

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Foreword

This document (EN 624:2011) has been prepared by Technical Committee CEN/TC 181 “Dedicated LPG appliances”, 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of an identical text or by endorsement, at the latest by September 2011, and conflicting national standards shall be withdrawn at the latest by September 2011.

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 624:2000.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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

NOTE 1 Attention is drawn in particular to EN 1949, *Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and in other road vehicles*, in regard to the harmonization of operating pressures to be used in vehicles.

NOTE 2 Test methods and means of assessment for Clause 5 are given in Clause 6.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European standard specifies the characteristics of safety, construction, performance and efficiency, the test methods and marking, of room sealed space heating equipment of type C (see CEN/TR 1749) with combustion air intake and outlet for the products of combustion in the wall, roof or floor, combined or not. These are referred to in the body of the text as "heaters", burning LPG, for vehicles and boats.

This European standard only covers room sealed heaters also including those which have a combustion air fan, an integral hot air fan or both, only for vehicles and boats which are used for residential, recreational and commercial purposes.

This European standard applies to heaters which are installed either outside or inside the habitable volume, but which have a combustion circuit sealed from the vehicle's interior, and nominal heat input which does not exceed 10 kW (H_s) operated at supply pressure of 30 mbar, 28 mbar, 37 mbar and 50 mbar, using, where appropriate, 12 V or 24 V DC electrical supply.

Room sealed LPG space heating appliances for vehicles and boats are using very often warm air as a heat transfer medium. Annex B specifies additional requirements for appliances using water as a heat transfer medium.

For private cars and vehicles or boats used for the transport of dangerous goods or for commercial personnel transport additional requirements may be necessary.

This European standard does not cover requirements for storage water heaters (boilers) (see EN 15033). For appliances producing additional sanitary hot water (combi-boilers), see relevant clauses of EN 15033.

NOTE If a LPG operated heater is installed in a motorized vehicle being subject to European road traffic legislation, the directives of the Council for the approximation of the laws, regulations and administrative provisions of the member states relating to the heating of the interior of motor vehicles should be applied.

These heaters are also suitable for caravan holiday homes.

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 161:2001, *Automatic shut-off valves for gas burners and gas appliances*

EN 298:2003, *Automatic gas burner control systems for gas burners and gas burning appliances with or without fans*

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

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

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

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 10226-2, *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 60335-1, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2001, modified)*

EN 60335-2-21, *Household and similar electrical appliances — Safety — Part 2-21: Particular requirements for storage water heaters (IEC 60335-2-21:2002, modified)*

EN 60335-2-102:2006, *Household and similar electrical appliances — Safety — Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102:2004, modified)*

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

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 3166-1:2006, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1:2006)*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
caravan
trailer leisure accommodation vehicle that meets the requirements for the construction and use of road vehicles

[EN 13878:2003]

3.1.2
motor caravan
self-propelled leisure accommodation vehicle that meets requirements for construction and use of road vehicles

NOTE 1 It contains at least:

- seats and table,
- sleeping accommodation which can be converted from the seats,
- cooking facilities and
- storage facilities.

NOTE 2 Definition adapted from EN 13878:2003.

3.1.3
boat
craft up to 24 m in length

3.1.4
caravan holiday home
transportable leisure accommodation vehicle that does not meet requirements for construction and use of road vehicles, that retains means for mobility and is for temporary or seasonal occupation

[EN 13878:2003]

3.1.5
space heater
heating equipment installed inside or outside the habitable volume with a sealed combustion circuit

3.1.6
space heater installation box
enclosure that surrounds the heater in such a manner that a minimum distance is always maintained between the space heater and the adjacent walls

3.1.7
liquefied petroleum gas (LPG)
mixture of light hydrocarbons, gaseous under conditions of normal temperature and pressure and maintained in the liquid state by increase of pressure or lowering of temperature

NOTE The principal components are propane, propene, butane and butenes.

3.1.8
liquefied petroleum gas installation
components usually consisting of fuel container(s), pressure regulator(s), piping, hoses and shut-off devices, providing liquefied petroleum gas to appliances

3.1.9
working pressure
pressure at the inlet of the appliance while it is in operation

3.1.10
piping
pipeline of rigid metallic material

3.1.11
pressure regulator
device or system of devices to reduce the inlet pressure and to maintain the pressure required to operate a heater and/or other appliances

3.1.12
room sealed heater
heater that has the combustion circuit isolated from the habitable volume in which the heater is installed

3.1.13
combustion circuit
entire arrangement inside the habitable volume of the vehicle from the combustion air intake to the flue outlet, including the actual space heater and all connecting pipes and other combustion air or exhaust gas conducting parts

3.1.14
combustion air supply
part of the combustion circuit through which the combustion air is supplied from outside

3.1.15
injector
calibrated component that admits the gas into a burner

3.1.16
flue
duct designed to convey the products of combustion to the exterior of a vehicle or boat

3.1.17
flue outlet
cowl
part of the combustion circuit through which the products of combustion are discharged to the outside

3.1.18
wind protection device
cover over the combustion circuit openings on the outside of the vehicle, which protects the circuit from unacceptable effects of the wind (e.g. deflector plates, covering hoods)

3.1.19
space heater cover
part which encloses the sides of the heat exchanger facing the installation area and conducts the air to be heated past the heat exchanger to the outlet openings

3.1.20
combustion air fan
device which assists the flow of the combustion air or of the products of combustion

3.1.21
integral hot air fan
component of the space heater which provides heat dissipation and is essential for the proper function of the heater

3.1.22
hot air distribution devices
devices which do not form a direct part of the heater (e.g. non-integral fan, pipe fittings, blown-air outlets) and which distribute the hot air generated by the heater around the inside of the vehicle or boat

3.1.23
heating water distribution devices
devices, which do not form a direct part of the heater (e.g. pump, pipes, hoses, convectors) and which distribute heating water generated by the heater around the inside of the vehicle or boat

3.1.24
control devices
devices which change or stop the flow of gas by means of actuating mechanisms consisting of a control valve and a valve actuator

3.1.25
tap
device to open or close the gas supply to the various burners and to adjust their rate during use to a predetermined value, called the reduced rate

3.1.26
tap handle
manually operated component used to open, partially open, or close a tap

3.1.27
control valve
device to change or stop the flow of gas by the closure and/or the partial closure of an orifice

3.1.28
valve actuator
device which operates (manually, electrically, hydraulically or pneumatically) a control valve

3.1.29
flame supervision device
device including a sensing element which causes the gas supply to a burner to be opened or closed according to the presence or absence of the flame which activates the sensing element

3.1.30
automatic burner control
device which consists of a flame detector which signals the presence or absence of a flame and of a control box which is actuated by the signals of the flame detector and which starts or shuts down the burner according to an established programme

3.1.31
fail safe device
device which causes, in the event of internal or external faults, either a safe operation or a safety shut-down

3.1.32
spark restoration
automatic process by which, following flame failure, the ignition device is switched on again without interruption of the gas supply

3.1.33
recycling
automatic process by which, after loss of flame during operation, the gas supply is interrupted and the full start procedure is re-initiated automatically (normally after a minimum required waiting time, without a fan or prepurge time, with a fan)

3.1.34
ignition device
device which lights the ignition burner/main burner(s) with the aid of external energy (e.g. a spark)

3.1.35
ignition interlock
device for preventing direct ignition of the main burner at full rate

3.1.36
restart interlock
device which prevents re-opening of the control element during the time when the flame supervision device is open

3.1.37
ignition process
process which may consist of the following individual stages:

— Stage 1: lighting of the gas stream by an ignition source;

— Stage 2: ignition transfer from an ignition burner to the main burner or between several burners (cross-lighting);

— Stage 3: complete ignition of individual burners (if they do not consist of a single flame)

3.1.38
ignition burner
small burner that provides a continuously burning flame to ignite a main burner, when required

NOTE This is sometimes referred to as a pilot.

3.1.39
waiting time
— for thermoelectric flame supervision devices, the time to be kept by the operator between the closing and re-opening of the gas supply;

— for automatic burner control systems in the case of a restart, the time between valve closure on flame loss and valve re-opening

3.1.40
ignition delay time
time between the signal of loss of flame and start of ignition at re-ignition

3.1.41
extinction safety time
— for a thermoelectric flame supervision device, the time that elapses between the disappearance of the supervised flame and the interruption of the gas supply;

— for automatic burner control units, the time between the extinction of the supervised flame and the start of recycling

3.1.42
ignition safety time
— for a thermoelectric flame supervision device, the time between the ignition of the flame and the moment when the closure element is held open by the flame signal;

— for automatic burner control units, the time at a starting procedure between the signals for the opening and closing of the gas supply if no flame is recognised

3.1.43
thermostat
automatic device to maintain a selected sensibly constant temperature

3.1.44
external gas tightness
tightness of gas-carrying parts to the atmosphere

3.1.45
internal gas tightness
tightness of one gas-carrying part to another

3.1.46
soft solder
solder of which the lowest temperature of the melting range, after application, is less than 450 °C

3.1.47
sound mechanical joint
connection device assuring tightness in an assembly made up of several parts, generally of metal

3.1.48
heat input of burner
product of the volume or mass rate and the calorific value of the gas (brought to the same reference conditions) expressed in kilowatts

3.1.49
nominal heat input of a burner
value of the heat input of the burner, as stated on the data plate of the heater

3.1.50
heat output
value of the heat input multiplied by the efficiency factor

3.1.51
volume rate
volume of gas passed in unit time expressed in cubic metres per hour or in litres per hour (cubic decimetres per hour)

3.1.52
mass rate
mass of the gas passed in unit time expressed in kilograms per hour or grams per hour

3.1.53
calorific value
quantity of heat produced by complete combustion at a constant pressure equal to 1 013,25 mbar, of unit volume or mass of the gas, the components of the fuel mixture being at 15 °C, 1 013,25 mbar and the products of combustion being brought to the same conditions

NOTE 1 There are two calorific values:

- the gross calorific value (H_s): the water produced by combustion is assumed to be condensed;
- the net calorific value (H_i): the water produced by combustion is assumed to be retained in the vapour state.

NOTE 2 For the purposes of this standard only the gross calorific value is used.

NOTE 3 The calorific value is expressed in units of energy to the unit volume of dry gas measured under normal reference conditions: 15 °C, 1 013,25 mbar. It is expressed in kilowatthours per cubic metre (kWh/m^3).

3.1.54
wobbe index
ratio of the calorific value of a gas, by unit of volume, and the square root of the relative density of the same gas

NOTE The Wobbe index is called gross when the calorific value considered is the gross calorific value (see 3.1.53). It is usually expressed in megajoules per cubic metre (MJ/m^3).

3.1.55
stability of flames
condition of the flames at the burner ports when the phenomena of flame lift or light back do not occur

3.1.56
light back
phenomenon characterized by the return of the flame inside the body of the burner

3.1.57
flame lift
phenomenon characterised by the partial or total movement of the base of the flame away from the burner port

3.1.58
cold condition
condition of the heater obtained by allowing the unlit heater to attain equilibrium at room temperature

3.1.59
hot condition
condition of the heater obtained by heating to thermal equilibrium at the adjustment pressure, any thermostat remaining fully open

3.1.60
minimum operational rate
— for any burner or section of a burner that is controlled by a thermostat, the bypass rate;

— for any burner that is manually controlled but where it is only possible to obtain certain predetermined fixed settings, the lowest rate obtainable in normal use

3.1.61
central water heater
room sealed LPG space heating appliance using water as a heat transfer medium (heating water)

3.1.62
heating water
water, which may incorporate additives, used as a heat transfer medium

3.1.63
compensator reservoir
container to hold and which allows for the expansion of heating water when heated up

3.1.64
open system
system, open to the atmosphere, for the heating water

3.1.65
closed system
pressurized system for the heating water

3.1.66
heating water circuit
system of central water heater and all the elements necessary to convey the heating water in the vehicle to the convectors/radiators

3.1.67
drain valve
device for draining the heating water

3.1.68
bleed valve
device for the removal of air from the heating water circuit

3.1.69
anti-freeze
liquid added to the heating water to avoid freezing

3.1.70
circulation pump
pump for circulating the heating water in the water circuit

3.1.71
operating pressure
relative pressure in a container

3.2 Symbols

M mass rate

Q heat input of burner

Q_n nominal heat input of a burner

V volume rate

W_s wobbe index