

SLOVENSKI STANDARD

SIST EN 1949:2011+A1:2013

01-julij-2013

Nadomešča:
SIST EN 1949:2011

Specifikacija za vgradnjo sistemov na utekočinjeni naftni plin v bivalna vozila za prosti čas in druga vozila (vključno z dopolnilom A1)

Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and accommodation purposes in other vehicles

Festlegungen für die Installation von Flüssiggasanlagen in bewohnbaren Freizeifahrzeugen und zu Wohnzwecken in anderen Fahrzeugen

Spécifications relatives aux installations des systèmes GPL pour les besoins domestiques dans les véhicules habitables de loisirs et dans les autres véhicules

Ta slovenski standard je istoveten z: **EN 1949:2011+A1:2013**

ICS:

43.100	Osebni avtomobili. Bivalne prikolice in lahke prikolice	Passenger cars. Caravans and light trailers
97.200.30	Oprema za taborjenje in tabori	Camping equipment and camp-sites

SIST EN 1949:2011+A1:2013 **en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 1949:2011+A1:2013](https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a87c-3f32a8db62c/sist-en-1949-2011a1-2013)

<https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a87c-3f32a8db62c/sist-en-1949-2011a1-2013>

EUROPEAN STANDARD

EN 1949:2011+A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2013

ICS 43.100; 97.200.30

Supersedes EN 1949:2011

English Version

Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and accommodation purposes in other vehicles

Spécifications relatives aux installations des systèmes GPL pour les besoins domestiques dans les véhicules habitables de loisirs et dans les autres véhicules

Festlegungen für die Installation von Flüssiggasanlagen in bewohnbaren Freizeitfahrzeugen und zu Wohnzwecken in anderen Fahrzeugen

This European Standard was approved by CEN on 1 January 2011 and includes Amendment 1 approved by CEN on 24 December 2012.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	6
4 General requirements	10
4.1 General	10
4.2 Dynamic loads.....	10
4.3 Tightness.....	10
4.3.1 Requirements	10
4.3.2 Test.....	10
4.4 Second LPG supply	10
5 Cylinder compartments	10
5.1 General	10
5.2 Cylinder compartments with internal access.....	12
5.3 Cylinders secured outside the vehicle.....	12
5.4 Requirements for the construction of cylinder compartments.....	13
5.5 Ventilation for cylinder compartments.....	13
5.6 Cylinder compartments with internal access and low capacity cylinders.....	13
5.7 Electric equipment in cylinder compartments.....	14
6 Pressure regulation systems and working pressures.....	14
6.1 Pressure regulation systems.....	14
6.2 Marking of the working pressure.....	16
6.3 Devices to protect against over-pressure.....	16
6.4 Connection of pressure regulators to rigid pipework - Low pressure supply.....	16
6.5 Connection of a dual cylinder system.....	16
6.6 Connection of an external LPG supply by means of a plug-in connector.....	16
7 Components.....	18
7.1 Hoses/Hose assemblies.....	18
7.2 Pipes.....	18
7.3 Pipe fittings	19
7.4 Jointing materials.....	21
7.5 Shut-off valves	21
7.6 Manual change over valve	21
8 Installation design.....	21
8.1 General	21
8.2 Protection against mechanical damage.....	22
8.3 Avoidance of corrosion	22
8.4 Pipe sizing	22
8.5 Pipe fittings	22
8.6 Positioning of LPG pipes near to other services.....	22
8.7 Fixing.....	22
8.8 Shut-off valves	22
8.9 Equipotential bonding of LPG pipes	23
9 Connection of appliances to the LPG supply installation.....	23
10 Appliances.....	24
10.1 Suitability of appliances	24
10.2 Installations	24

10.3	Space heaters.....	24
10.3.1	Space heating appliances in caravans, motor caravans and other road vehicles	24
10.3.2	Space heating appliances in caravan holiday homes.....	24
10.4	Water heaters	25
10.4.1	Water heaters in caravans, motor caravans and other road vehicles.....	25
10.4.2	Water heaters in caravan holiday homes	25
10.5	Cooking appliances.....	26
10.6	Refrigerators.....	26
10.7	Gas lights.....	26
10.8	LPG fuel cells	26
10.9	LPG power generators	26
11	Flueing	27
11.1	Flues	27
11.2	Flue terminals.....	27
11.3	Weather protection.....	29
11.4	Draught diverters	29
11.5	Accessibility of flues	29
12	Installation of LPG tanks supplying LPG appliances	29
12.1	Requirements regarding the LPG tank and accessories	29
12.2	Installation of the LPG tank and system requirements	30
13	User's handbook	31
Annex A	(informative) National situations in the Member States.....	33
Annex B	(informative) Countries where underfloor flue is not permitted.....	34
Annex C	(informative) Manufacturer declaration	35
Bibliography	37

[SIST EN 1949:2011+A1:2013](https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a87c-3f332a8db62c/sist-en-1949-2011a1-2013)

<https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a87c-3f332a8db62c/sist-en-1949-2011a1-2013>

EN 1949:2011+A1:2013 (E)**Foreword**

This document (EN 1949:2011+A1:2013) has been prepared by Technical Committee CEN/TC 181 "Dedicated liquefied petroleum gas 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 August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

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 24 December 2012.

This document supersedes A1 EN 1949:2011 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

Principal changes made to EN 1949:2002 and EN 1949:2002/A1:2005:

- ITC STANDARD PREVIEW
(standards.iteh.ai)
- SIST EN 1949:2011+A1:2013
<https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a870-3b32a8db62c/sist-en-1949-2011a1-2013>
- a) more than one gas supply is permitted in a vehicle;
 - b) hard soldering redefined;
 - c) the provision of a certificate of tightness testing is no longer mandated;
 - d) tightness criteria for high pressure parts of the gas system not verified in the standard tightness test are specified;
 - e) requirements for electric cables in gas cylinder compartments have been revised;
 - f) lengths of hoses and hoses assemblies have been clarified;
 - g) basic requirements for installation of fuel cells added;
 - h) basic requirements for installation of power generators added (including second supply line);
 - i) requirements for plug in connector gas supplies added;
 - j) options for new member states added;
 - k) requirements for LPG tank installation added.

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 requirements for the installation of liquefied petroleum gas systems for habitation purposes in leisure accommodation vehicles and for accommodation purposes in other vehicles. It details safety and health requirements on the selection of materials, components and appliances, on design considerations and tightness testing of installations and on the contents of the user's handbook.

This European Standard does not cover installations supplied from other than 3rd family gases (LPG), water connections or electrical power supplies to the appliance(s). Portable appliances, incorporating their own gas supply, are not considered part of the installation and are outside the scope of this standard. It does not include the installation of LPG appliances to be used for commercial purposes or for boats. Gas supply equipment and gas appliances separate from and external to the body of the vehicle are also not considered by this standard.

2 Normative references

[A1] 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. **[A1]**

EN 331, *Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings*

EN 624, *Specification for dedicated LPG appliances — Room sealed LPG space heating equipment for installation in vehicles and boats*

EN 732, *Specifications for dedicated liquefied petroleum gas appliances — Absorption refrigerators*

EN 751-2, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 2: Non-hardening jointing compounds*

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

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes*

EN 1254-2, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes*

EN 1254-4, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends*

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 10305-1, *Steel tubes for precision applications — Technical delivery conditions — Part 1: Seamless cold drawn tubes*

EN 10305-2, *Steel tubes for precision applications — Technical delivery conditions — Part 2: Welded cold drawn tubes*

EN 12864:2001, *Low pressure, non adjustable regulators having a maximum outlet pressure of less than or equal to 200 mbar with a capacity of less than or equal to 4 kg/h, and their associated safety devices for butane, propane or their mixtures*

EN 12979:2002, *Automotive LPG-systems — Installation requirements*

EN 1949:2011+A1:2013 (E)

EN 13785, *Regulators with a capacity of up to and including 100 kg/h, having a maximum nominal outlet pressure of up to and including 4 bar, other than those covered by EN 12864 and their associated safety devices for butane, propane or their mixtures*

EN 13786:2004+A1:2009, *Automatic change-over valves having a maximum outlet pressure of up to and including 4 bar with a capacity of up to and including 100 kg/h, and their associated safety devices for butane, propane or their mixtures*

EN 14291, *Foam producing solutions for leak detection on gas installations*

EN 15033, *Room sealed storage water heaters for the production of sanitary hot water using LPG for vehicles and boats*

EN ISO 1127, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length (ISO 1127:1992)*

EN ISO 8434-1, *Metallic tube connection for fluid power and general use — Part 1: 24 degree cone connectors (ISO 8434-1:2007)*

ISO 8434-2, *Metallic tube connections for fluid power and general use — Part 2: 37 degree flared connectors*

UN/ECE Regulation No. 67-01: *Uniform provisions concerning the approval of motor vehicles using LPG in their propulsion system*

3 Terms and definitions **STANDARD PREVIEW**

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

3.1
leisure accommodation vehicle
unit of living accommodation for temporary or seasonal occupation that may meet requirements for construction and use of road vehicles

[EN 13878]

3.2
caravan
trailer leisure accommodation vehicle that meets requirements for construction and use of road vehicles

[EN 13878]

3.3
motor caravan
self-propelled leisure accommodation vehicle that meets requirements for construction and use of road vehicles. It contains at least seats and table, sleeping accommodation which may be converted from the seats, cooking facilities and storage facilities

[EN 13878]

3.4
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]

3.5**liquefied petroleum gas (LPG)**

A1 mixture of light hydrocarbons composed mainly of propane, butane and their isomers, gaseous under conditions of normal temperature and pressure

Note 1 to entry: LPG is maintained in its liquid state by increased pressure or lowered temperature. **A1**

A1 Note 2 to entry: **A1** In some countries, UN numbers 1011 and 1978 may also be designated LPG.

3.6**LPG appliance**

appliance that is designed for heating, cooking, lighting, refrigeration, hot water production or electricity production (fuel cell or generator), using LPG as its energy source

3.7**LPG system**

assembly of an installation and its appliances

3.8**liquefied petroleum gas installation**

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

3.9**pressure regulation system**

A1 system incorporating one or more regulators with or without change-over device to reduce the supply pressure of the system to the required working pressure for the appliance(s) **A1**

A1 3.10**regulator**

device which maintains a regulated pressure within preset limits, whatever the upstream pressure, rate and temperature **A1**

3.11**A1 change over device**

device which maintains the gas supply continuity by using gas from a "cylinder", a "tank" or an external supply manually chosen by the user or automatically **A1**

A1 3.12**room sealed appliance**

appliance that has the combustion system, including the air inlet and products outlet, isolated from any internal area

3.13**open-flue appliance**

appliance designed to be connected to a flue via a draught diverter, its combustion air being drawn from the room or internal space in which it is installed **A1**

A1 3.14 A1**closed-flue appliance**

appliance where the flue is closed from a room or internal space due to the absence of a draught diverter, flue break and any draught break within the flue

A1 3.15 A1**flueless appliance**

appliance that discharges its products of combustion into the compartment in which it is installed

EN 1949:2011+A1:2013 (E)**A1 3.16 A1****flue**

duct designed to convey the products of combustion to the exterior of a vehicle

A1 3.17 A1**flue terminal**

part of the flue system through which the products of combustion are discharged to the outside (cowl)

A1 3.18 A1**shut-off valve**

device to interrupt the flow of gas, having one inlet and one or more individually controlled outlets

A1 3.19 A1**liquefied petroleum gas cylinder**

portable container for liquefied petroleum gas

[EN 13878]

A1 3.20 A1**cylinder compartment**

space specially constructed to accommodate one or more liquefied petroleum gas cylinders

A1 3.21 A1**flame supervision device**

device that has a sensing element, activated by the presence or absence of a flame, that causes the inlet of the LPG supply to a burner to be opened or closed

A1 3.22 A1**pilot**

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

A1 3.23 A1**tightness**

absence of leakage greater than the specified limit

A1 3.24 A1**hard soldering**

soldering for which the lowest temperature of the melting range, after application, is not less than 450 °C

A1 3.25 A1**fixed ventilation**

permanent measures that ensure the minimum provision of fresh air

A1 3.26 A1**free area of ventilation**

total area of the apertures in a ventilator or grill

A1 3.27 A1**ventilator**

device that allows the passage of air for the ventilation of a compartment

A1 3.28 A1**hose assembly**

length of hose with suitably attached end fittings

[EN ISO 14113]

STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1949:2011+A1:2013

<https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a87c-3f332a8db62c/sist-en-1949-2011a1-2013>

A1 3.29 A1**low pressure hose assembly**

hose assembly, LPG resistant, for use at working pressure

A1 3.30 A1**high pressure hose assembly**

hose assembly, LPG resistant, for use at high pressure, normally supply pressure

A1 3.31 A1**change-over device**

device to allow selective use of interconnected LPG cylinders

A1 3.32 A1**users handbook**

document that provides information to the user of a leisure accommodation vehicle on its operation, maintenance, repair etc.

A1 3.33 A1**working pressure**

pressure at the inlet of a LPG appliance while it is in operation

A1 3.34 A1**readily accessible**

item capable of being reached quickly and safely for effective use under emergency conditions without the use of tools

NOTE The key of a lock is not regarded as a tool.

A1 3.35 A1**accessible**

item capable of being reached for inspection, removal or maintenance with or without the use of tools

A1 3.36 A1**safety closing device**

device which automatically interrupts the flow of gas due to an accidental disconnection of a hose or pipe

A1 3.37 A1**LPG tank**

storage receptacle permanently fixed to the vehicle, suitable for the storage of LPG

NOTE This may supply LPG for gas appliances only.

A1 3.38 A1**underfloor flue**

flue which discharges all or parts of the products of combustion into the space lying beneath and within the plan view of the vehicle

A1 3.39 A1**consumer leak detection device**

device capable of indicating any downstream leakage

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1949:2011+A1:2013
<https://standards.iteh.ai/catalog/standards/sist/a976d239-387f-454c-a87c-3f332a8db62c/sist-en-1949-2011a1-2013>

EN 1949:2011+A1:2013 (E)**4 General requirements****4.1 General**

The manufacturer or installer of an LPG system may issue a declaration for each leisure accommodation vehicle or other vehicle stating the compliance with EN 1949, including the test result of 4.3.2, it should include the information shown in Annex C.

4.2 Dynamic loads

The LPG system shall be designed to withstand the dynamic loads during normal operation including movement of the vehicle and to fulfil the operational requirements of the appliances.

4.3 Tightness**4.3.1 Requirements**

The LPG system up to the consumer operated controls of the appliances (taps) shall fulfil the following tightness requirements if tested at a test pressure of 150 mbar with air. The decrease in pressure shall not exceed 10 mbar for a test volume of at least 700 cm³. If necessary, an additional test volume of 600 cm³ should be used.

4.3.2 Test

The test is carried out with air using the following procedure. In preparation for the test the taps of the appliances shall be closed but the shut off valves be left open. The system is then pressurized to 150 mbar and closed. After a period of 5 min to allow for temperature equilibrium, the pressure is recorded. After another 5 min the remaining pressure is compared to the first pressure.

All parts of the LPG system operating at pressures above working pressure, if any, are tested with an appropriate leak detection solution according to EN 14291 at operational pressure, no leakage shall be observed within 30 s.

4.4 Second LPG supply

Only if a LPG power generator is installed and the total gas consumption including the appliances exceeds 1,5 kg/h it is allowed to install one additional gas supply.

There shall be no connection between the both gas supplies.

The cylinder(s) for both gas supplies can be installed in the same cylinder compartment.

If two cylinder compartments are used, there shall be a warning sign inside both the compartments which advises the user that there is a second gas supply.

A1 Inside the cylinder compartment it shall be clearly indicated by a label which appliances are supplied by each gas supply. **A1**

5 Cylinder compartments**5.1 General**

For road going vehicles cylinders shall be installed in cylinder compartments, except when they are installed according to 5.3 or when they are used in the conditions of 6.6.