



# SLOVENSKI STANDARD

## SIST EN 50292:2014

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Nadomešča:  
SIST EN 50292:2002

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**Električni aparati za zaznavanje ogljikovega monoksida v stanovanjskih prostorih, bivalnih prikolicah in čolnih - Navodilo za izbiro, vgradnjo, uporabo in vzdrževanje**

Electrical apparatus for the detection of carbon monoxide in domestic premises, caravans and boats - Guide on the selection, installation, use and maintenance

Elektrische Geräte für die Detektion von Kohlenmonoxid in Wohnhäusern - Leitfaden für Auswahl, Installation, Benutzung und Instandhaltung

Appareils électriques pour la détection de monoxyde de carbone dans les locaux à usage domestique, caravanes et bateaux - Guide de sélection, d'installation, d'utilisation et de maintenance

**Ta slovenski standard je istoveten z: EN 50292:2013**

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97.030	Električni aparati za dom na splošno	Domestic electrical appliances in general

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 50292**

August 2013

ICS 13.320

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English version

**Electrical apparatus for the detection of carbon monoxide in domestic premises, caravans and boats -  
Guide on the selection, installation, use and maintenance**

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**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## Foreword

This document (EN 50292:2013) has been prepared by CLC/TC 216, "Gas detectors".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-07-15
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-07-15

This document supersedes EN 50292:2001.

EN 50292:2013 includes the following significant technical changes with respect to EN 50292:2001 (various minor changes have also been made).

- Title and definitions are revised to be more general, i.e. to cover domestic premises, boats and caravans. This is a result of the splitting of EN 50291 into EN 50291-1 and EN 50291-2.
- In 4.3.1 of EN 50292:2001, incorrect terminology "warm air systems" is replaced by "ducted air heaters" (in 4.3.2 of EN 50292:2013).
- In 4.7, a more general title replaces the previous one as CO migration applies not only to multi-occupancy and multi-storey buildings but also to any premises connected to other premises, such as semi-detached and terrace premises, where the migration of CO is possible.
- In 5.2.1 and 5.2.2, the use of caravans and boats is included in installation/location information.
- In 5.3, an additional type of apparatus is added, capable of identifying lower concentrations of CO than would be needed to trigger an alarm. Such features are available in certain products, and may be useful to some at-risk groups, especially people who have respiratory health issues.
- In 6.2, the text is modified so that triggering a shut-off valve should be on the main gas supply, ideally at the gas meter/cylinder outlet, so that the entire installation is isolated (and not only individual appliances as stated in the previous version), as the source may not be that appliance.
- In 6.4, the text is modified to state that it is more important that the gas supply is isolated rather than the electrical supply. There is no need to make an exception for a gas appliance with an electrical connection. The carbon monoxide detection apparatus should not be used to operate the mains electrical switch, since such action may create unnecessary hazard for occupants of the premises.
- A new subclause 7.1 "Use of alarm" is added. It includes the requirement to advise the user that a CO alarm does not replace the correct installation, commissioning and regular maintenance by a competent person. This is required in the instruction booklet by EN 50291-1:2010, 4.7.4, item 'n'.

NOTE This was already stated in the introduction to EN 50292 but it is emphasised in the new 7.1.

- In 7.5, text relating to hydrogen interference is added.
- In Clause 8, recommendation to isolate the emergency control valve for gas installations is added.
- In Clause 8, text advising that the Gas Emergency Service Provider should be contacted in the first instance is added.
- A new Figure A.1 is added, showing CO-concentration and exposure time curves for various COHb levels including 2,5 % COHb (the protection level recommended by WHO).
- In A.2, text about health effects on vulnerable groups, derived from WHO, is added.
- Figure B.1 is modified to illustrate how alarm set points in EN 50291-1 align with the 2,5 % and 5 % COHb curves, providing a more practical rationale rather than the previous theoretical one.

## Introduction

This European Standard is intended to be a guide for people who, in the course of their professional activities, are required to install apparatus for the detection of carbon monoxide (CO) in domestic premises. It is also aimed at anyone who might supply such detectors to members of the public for subsequent installation according to national regulations, so that advice may be given based on good engineering practice.

Apparatus for the detection of carbon monoxide are not a substitute for good installation and regular servicing of fuel burning appliances or regular cleaning of chimneys, although they may provide an added margin of reassurance for users. Domestic carbon monoxide detectors with or without some form of executive function may overcome fears of fuel safety and may be particularly beneficial in certain circumstances.

It is necessary to understand that carbon monoxide toxicity may have different consequences according to the physical condition of the individual. Thus, a carbon monoxide detector designed according to EN 50291 series may not fully safeguard individuals with specific medical conditions.

Carbon monoxide detectors are not intended to be used as an alternative to a smoke alarm.

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## 1 Scope

This European Standard serves as a guide on the selection, installation, use and maintenance of apparatus for the detection of carbon monoxide, intended for continuous operation in a fixed installation in domestic premises, caravans and boats. This guide is intended to cover any type of domestic or residential accommodation, including leisure accommodation vehicles such as touring and static caravans, and motor homes; and recreational craft such as canal barges. Some static caravans are used as permanent dwellings, in such cases EN 50291-1 is appropriate. For all other types of caravan, EN 50291-2 is appropriate. This guide should be read in conjunction with EN 50291-1 and EN 50291-2 together with any additional relevant national or local regulations.

This European Standard refers to the installation of two types of apparatus:

- a) Type A apparatus, to provide a visual and audible alarm and an executive action in the form of an output signal that can be used to actuate directly or indirectly a ventilation or other ancillary device;
- b) Type B apparatus, to provide a visual and audible alarm only.

This European Standard excludes apparatus for the detection of combustible gases (see EN 50244) and for industrial installations or commercial premises.

## 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 1775, *Gas supply – Gas pipework for buildings – Maximum operating pressure less than or equal to 5 bar – Functional recommendations*

## 3 Terms and definitions

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

### 3.1

#### **domestic premises**

any house or building, or part thereof, residential park homes, or non-recreational boats such as canal barges, being the place of residence or home of a household, family or person

### 3.2

#### **fixed installation**

apparatus which is intended to have all parts except replaceable batteries permanently installed

### 3.3

#### **sensor**

assembly in which the sensing element is housed that may contain associated circuit component

### 3.4

#### **sensing element**

device, the output of which will change in the presence of carbon monoxide

### 3.5

#### **continuous operation**

apparatus that is continuously powered with continuous or intermittent automatic sensing

**3.6****apparatus**

carbon monoxide detection device, comprising the sensor, remote sensor if applicable, alarm indicators and any other circuit components, power supply and, for type A apparatus, a means of providing an output signal

Note 1 to entry: Carbon monoxide detection devices may also be generically termed "gas detectors" or "CO alarms",

**3.7****volume ratio****V/V**

ratio of the volume of carbon monoxide to the volume of the gas mixture

Note 1 to entry: Volume ratio (V/V) is often expressed in units of parts per million (ppm); it is commonly referred to as concentration.

**3.8****output signal**

signal characterised by a standby and an activation state, by which action may be initiated

Note 1 to entry: In many cases, such action will entail triggering an ancillary device.

**3.9****warm-up time**

time interval between the time when the apparatus is switched on and the time when the apparatus is fully operational

**3.10****alarm set point**

fixed setting of the apparatus that determines the volume ratio and duration of exposure at which the apparatus will automatically initiate an alarm and, for type A apparatus, an output signal

**3.11****fault signal**

visual, audible or other type of output indicating a faulty or failed apparatus

**3.12****mains-powered apparatus**

apparatus designed to be powered by the normal domestic mains electrical supply, with or without an additional power source

**3.13****battery-powered apparatus**

apparatus designed to be powered by batteries only

**3.14****leisure accommodation vehicle**

vehicles including caravans, caravan holiday homes and motor caravans (EN 13878), also known as touring and static caravans and motor homes

Note 1 to entry: Other motorised vehicles like trucks are known to have residential accommodation. They are not leisure accommodation vehicles but are considered as similar vehicles in this European Standard.

**3.15****recreational craft**

boat of a minimum length of 2,5 m and a maximum length of 24 m as specified in Directive 94/25/EC, which is intended for sports or leisure purposes

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## 4 Sources of carbon monoxide

### 4.1 General information

Carbon monoxide is a colourless, odourless, non-irritating gas which is classified as a chemical asphyxiant, whose toxic action is a direct result of the hypoxia produced by a given exposure (see Annex A and Annex B).

### 4.2 Normal exposure levels

Carbon monoxide can be generated within the home or enter from outside. The normal average background levels of carbon monoxide in domestic premises, measured over periods of 1 h to 24 h, are less than 10 ppm. In cases of climatic inversion, higher levels of carbon monoxide are possible.

### 4.3 Burning of carbonaceous materials for heating and cooking

#### 4.3.1 General

Most of the carbon monoxide in the environment is produced during combustion of carbonaceous material, e.g. solid fuels (such as coal, coke and wood), liquid fuels (such as oil and petrol) and gaseous fuels (such as natural gas, town gas and liquefied petroleum gas (LPG)).

It should be noted that town gas is still used in some EU countries and it can contain a significant proportion of carbon monoxide prior to combustion.

The proportion and constituents of the combustion products from carbonaceous fuels will depend on the particular fuel and the combustion conditions.

Varying concentrations of carbon monoxide are produced from most combustion processes. Exhaust gases from burning solid and liquid fuels may contain significant concentrations of carbon monoxide: levels of 20 000 ppm to 50 000 ppm (2% to 5%) are not unexpected. For example, burning coal, wood or peat can produce concentrations of 20 000 ppm, 40 000 ppm and 50 000 ppm respectively. Efficient burning of natural gas and LPG in well-designed burners in an excess of air will not produce significant flue concentrations of carbon monoxide, usually in the range 10 ppm to 200 ppm. However, poorly maintained and inefficient burners can produce considerably higher levels of carbon monoxide.

Flue reversal may occur under certain climatic conditions with appliances using combustion air taken from within the premises. This is normally a temporary phenomenon that may occur with certain types of appliance, even when correctly maintained.

#### 4.3.2 Space and water heating

Solid, liquid and gaseous fuels may be used for space and water heating. They are used in a variety of ways, either as a local heat source or as a remote central heat source, including

- appliance with flue using room air,
- appliance without flue using room air,
- appliance with flue using external air.

In the case of a defective ducted air heater, carbon monoxide can be distributed into remote rooms.

#### 4.3.3 Cooking

Natural gas, town gas or LPG are the main fuels for cooking, typically using flueless appliances including cooking ranges. In some cases, solid fuels or oil are used in cooking appliances that are generally fitted with flues.

It should be emphasised that barbecue grills using charcoal, emit very high amounts of carbon monoxide and should only be used outdoors and should not be used as air heaters in any leisure accommodation, including tents.

#### 4.4 Uncontrolled burning

Carbon monoxide is a major gaseous product from fires resulting from uncontrolled burning of carbonaceous material. Varying concentrations of carbon monoxide are produced, depending on the material, burning conditions, etc.

#### 4.5 Tobacco smoking

Smoking produces a significant concentration of carbon monoxide.

#### 4.6 Internal combustion engines

A major source of carbon monoxide in the non-industrial environment is the combustion engine. The concentration of carbon monoxide in exhaust gas is normally in the range 1 % to 3 % (10 000 ppm to 30 000 ppm) but may reach 7 % (70 000 ppm) in a badly maintained or badly tuned engine.

The exhaust gases from internal combustion engines (vehicles or electricity generators for example) running in an enclosed space will quickly produce dangerous levels of carbon monoxide.

#### 4.7 Migration of CO

Carbon monoxide produced in one area within an individual dwelling or in connected premises such as semi-detached and terraced premises, maisonettes, and particularly multi-occupancy and multi-storey buildings, can be transported to and leak into another part of the building, e.g. across roof spaces, between floors, along ducting, in shared flues, chimneys and other re-entry points such as air vents.

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### 5 Installation

#### 5.1 General

The manufacturer is required to provide suitable instructions for the correct and safe installation of the apparatus and to indicate on the apparatus and its packaging that these instructions should be read carefully before installing or operating the apparatus.

Generally, the same considerations apply to both type A and type B apparatus.

#### 5.2 Location of the apparatus

##### 5.2.1 General

The design and layout of domestic premises, caravans and boats and the number, type and position of carbon monoxide sources vary widely. General guidance is given in the following clauses on where and where not to locate the apparatus in order to minimise the risk of misleading indications.

## 5.2.2 Which room?

### 5.2.2.1 General

Ideally, an apparatus should be installed in every room containing a fuel-burning appliance and additional apparatus should be installed to ensure that adequate warning is given for occupants in other rooms, by locating apparatus

- in remote rooms in which the occupant(s) spend considerable time whilst awake and from which they may not be able hear an alarm from apparatus in another part of the premises, and
- in every sleeping room.

If there is a fuel-burning appliance in more than one room and the number of apparatus is limited, the following points should be considered when deciding where best to position the apparatus:

- a) locate the apparatus in a room containing a flueless or open-flued appliance, and
- b) locate apparatus in a room where the occupant(s) spend most time.

If the domestic premises are a bedsit (a single room serving as both sitting and bedroom), then the apparatus should be positioned as far from the cooking appliances as possible but near to where the person sleeps.

If the appliance is in a room not normally frequented (for example a boiler room), the apparatus should be positioned so that the alarm may be heard more easily. Alternatively, an interlinked apparatus or a remote alarm siren may be connected to a type A apparatus located in a room(s) containing a fuel-burning appliance.

Where a fuel-burning appliance has an extended and/or concealed flue, an apparatus should be installed in each room through which the flue passes.

### 5.2.2.2 Caravans and boats

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Caravans and boats may have additional risks of carbon monoxide ingress through air vents due to the nearby presence of other vehicles, engines, generators or barbecues; however, this does not change the basic guidance on location of the alarm. Caravans and boats should be fitted with an alarm in the same room as any combustion appliance(s), located in accordance with 5.2.3.3. If the caravan or boat has a single living space which incorporates the sleeping accommodation, it can be considered to be equivalent to a bedsit, and a single alarm is sufficient. However, any sleeping accommodation that is in a separate room from the combustion appliance(s) should also contain an alarm, located in accordance with 5.2.3.4.

## 5.2.3 Where in the room?

### 5.2.3.1 General

It should be possible to view all the light indicators when in the vicinity of the chosen location for the apparatus.

It is not possible to give specific guidance on the exact location of a detector that suits all types of room and their usage. The guidance in 5.2.3.2, 5.2.3.3, 5.2.3.4 and 5.2.3.5 should be taken into consideration when determining an optimum location for any appropriate situation.

### 5.2.3.2 Where not to install the apparatus

The apparatus should not be installed

- in an enclosed space (for example in a cupboard or behind a curtain),
- where it can be obstructed (for example by furniture),
- directly above a sink,