



# SLOVENSKI STANDARD

## SIST EN 50291:2002

01-april-2002

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### Electrical apparatus for the detection of carbon monoxide in domestic premises – Test methods and performance requirements

Electrical apparatus for the detection of carbon monoxide in domestic premises - Test  
methods and performance requirements

Elektrische Geräte für die Detektion von Kohlenmonoxid in Wohnhäusern - Prüfverfahren  
und Anforderungen an das Betriebsverhalten

Appareils électriques pour la détection de monoxyde de carbone dans les locaux à  
usage domestique - Méthodes d'essais et prescriptions de performances

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EUROPEAN STANDARD

**EN 50291**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2001

ICS 13.320

English version

**Electrical apparatus for the detection of carbon monoxide  
in domestic premises -  
Test methods and performance requirements**

Appareils électriques pour la détection  
de monoxyde de carbone dans les  
locaux à usage domestique -  
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das Betriebsverhalten

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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# CENELEC

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

### Foreword

This European Standard has been prepared by the Technical Committee CENELEC TC 216, Gas detectors.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50291 on 2000-08-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-04-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A and B are informative.

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## 1 Scope

This European Standard specifies general requirements for the construction, testing and performance of electrically operated carbon monoxide gas detection apparatus, designed for continuous operation in domestic premises. The apparatus may be mains or battery powered. Such apparatus is intended to warn of an accumulation of CO, enabling the occupant to react before being exposed to significant risk.

This standard specifies two types of apparatus, these are:

Type A - 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.

Type B - to provide a visual and audible alarm only.

This standard excludes apparatus:

- for the detection of combustible gases, other than carbon monoxide itself; (see EN 50194:2000);
- for the detection of CO in industrial installations or commercial premises; (see EN 45544 series);
- for use in boats, caravans or mobile homes;
- for CO measurement for smoke and fire detection (see prEN 12239).

## 2 Normative references

[SIST EN 50291:2002](https://standards.iteh.ai/catalog/standards/sist/654a9baf-c401-4214-8101-0956c054d1c1/sist-en-50291-2002)

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This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50270	1999	Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen
EN 50292	2001	Electrical apparatus for the detection of carbon monoxide in domestic premises – Guide on the selection, installation, use and maintenance
EN 60335-1	1994	Safety of household and similar electrical appliances Part 1: General requirements (IEC 60335-1:1991, mod.)
EN 60529	1991	Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)
EN 60704-1	1997	Household and similar electrical appliances - Test code for the determination of airborne acoustical noise Part 1: General requirements (IEC 60407-1:1997)

### 3 Definitions

For the purposes of this European Standard the following definitions apply:

#### 3.1

**ambient air**

the normal atmosphere surrounding the apparatus

#### 3.2

**clean air**

air which is free of carbon monoxide, interfering and contaminating substances

#### 3.3

**domestic premises**

any house or building being a place of residence or home of a household, family or person

#### 3.4

**fixed installation**

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

#### 3.5

**latching alarm**

an alarm which, once activated, requires deliberate action for resetting

#### 3.6

**sensor**

an assembly in which the sensing element is housed and which may contain associated circuit components

#### 3.7

**sensing element**

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

#### 3.8

**volume ratio (V/V)**

ratio of the volume of a component to the volume of the gas mixture

#### 3.9

**output signal**

a signal characterised by a standby and an activation state by which action may be initiated, e.g. triggering a ventilation device

#### 3.10

**warm-up time**

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

#### 3.11

**alarm set point**

a 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

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**3.12****fault signal**

a visual and/or audible signal indicating a faulty or failed apparatus

**3.13****mains-powered apparatus**

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

**3.14****battery-powered apparatus**

an apparatus designed to be powered by batteries only

**3.15****continuous operation**

apparatus which is continuously powered with continuous or intermittent automatic sensing

**4 General requirements****4.1 General**

Unless otherwise stated, the requirements specified are applicable to both type A and type B apparatus.

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The apparatus shall reliably detect the presence of carbon monoxide in domestic premises under the stated application conditions, shall produce an alarm, and in the case of Type A apparatus, shall be able to initiate executive actions whenever the conditions (in terms of both level and duration) exceed pre-set alarm set points. [SIST EN 50291:2002](https://standards.iteh.ai/catalog/standards/sist/654a9baf-c401-4214-8101-129c)

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Apparatus which includes functionality additional to carbon monoxide detection shall perform according to the requirements of this standard and to the requirements of any standards relevant to the additional functionality.

The apparatus, electrical assemblies and components shall comply with the requirements of 4.2 to 4.6 and the performance requirements of clause 5. Apparatus shall be designed for continuous operation. The apparatus shall not be class 0 as defined in EN 60335-1.

**4.2 Construction**

The apparatus shall comply with the appropriate requirements of EN 60335-1 as listed in Table 1.

**Table 1 - Construction requirements**

Constructional requirement	EN 60335-1:1994 clause
Protection against accessibility to live parts	8
Heating	relevant parts of 11
Leakage current and electrical strength at operating temperature	13
Moisture resistance	15.1 and 15.3
Leakage current and electrical strength	16
Overload protection of transformers and associated circuits	17
Abnormal operation	19
Construction	22
Internal wiring	23
Components	24.1, 24.2, 24.4, 24.5
Supply connection and external flexible cords	25.3
Terminals for external conductors	26
Provision for earthing	27
Screws and connections	28
Creepage distances, clearances and distances through insulation	29
Resistance to heat, fire and tracking	30
Resistance to rusting	31

### 4.3 Indicators and alarms

#### 4.3.1 Visual indicators shall be fitted and coloured as follows:

- a) power supply indicators shall be coloured green;
- b) alarm indicators shall be coloured red;
- c) where fitted, the visual fault alarm shall be yellow.

The indicators shall be marked to show their function.

The indicators shall be visible when the apparatus is installed in its operating position according to the manufacturer's instructions.

#### 4.3.2 The apparatus shall have an audible alarm, see 5.3.16.

4.3.3 Alarm indicators and audible alarms shall operate simultaneously at the set points as listed in Table 2.

**Table 2 - Alarm conditions**

CO Concentration	No alarm before	Alarm before
30 ppm	120 minutes	-
50 ppm	60 minutes	90 minutes
100 ppm	10 minutes	40 minutes
300 ppm	-	3 minutes

Once activated, the alarm shall remain in operation at carbon monoxide concentrations above 50 ppm.

NOTE A latching alarm may be used to accomplish the requirements of this clause.

**4.3.4** All adjustment devices and tools intended for adjustment of, or access to, such adjustment devices shall be designed so as to discourage unauthorised interference with the apparatus.

#### **4.4 Fault signals**

The apparatus shall provide a fault signal in the event of loss of continuity or short circuit to the sensor.

The fault signal shall be clearly identified and different from a gas alarm.

#### **4.5 Output signal (applicable for type A apparatus only)**

The apparatus shall provide an output signal at each of the alarm conditions listed in Table 2.

#### **4.6 Labelling and instructions**

##### **4.6.1 General**

All text on the apparatus, its packaging and in the instruction book shall be in accordance with National regulations.

##### **4.6.2 Labelling**

The apparatus shall carry durable label(s) carrying the following information:

- a) The manufacturer's or supplier's name, trademark or other means of identification;
- b) The name of apparatus, model number, if any, and the type of gas to be detected;
- c) The number of this European standard;
- d) The type of apparatus, A or B; [SIST EN 50291:2002](https://standards.iteh.ai/catalog/standards/sist/654a9baf-c401-4214-8101-6976cc0542e/sist-en-50291-2002)
- e) The serial number or manufacturing date code of the apparatus;
- f) For mains powered apparatus the electricity supply voltage and frequency and maximum power consumption;
- g) For battery powered apparatus the type and size of replacement batteries;
- h) Recommendations on the replacement procedures and lifetime of the apparatus.

The markings b) and h) shall be clearly visible with the apparatus in a typical installed position.

The markings shall be legible and shall comply with 7.6 and 7.14 of EN 60335-1:1994.

##### **4.6.3 Cautions**

All gas detection apparatus shall carry a caution, on a label attached to the apparatus, for example:

CAUTION: READ THESE INSTRUCTIONS CAREFULLY  
BEFORE OPERATING OR SERVICING.

##### **4.6.4 Instruction booklet**

The apparatus shall be provided with an instruction booklet or leaflet. The instruction book or leaflet shall give complete, clear and accurate instructions for the installation, safe and proper operation, and regular checking of the apparatus. It shall include at least the following information:

- a) For mains powered apparatus, the correct operating voltage, frequency, fuse-rating (if any) and method of connection to the mains supply system;

- b) For battery powered apparatus the type and size of replacement batteries, normal operating life, battery replacement instructions, and information on low battery conditions;
- c) Guidance on siting and mounting of the apparatus and the warning that the apparatus should be installed by a competent person, see, EN 50292;
- d) Actions to take if the apparatus alarms, see EN 50292;
- e) An explanation of all warning (visual and audible) and other indicators, including re-setting facilities where relevant;
- f) A list of commonly occurring materials, vapours or gases, e.g. in cleaning fluids, polishes, paints, cooking operations, etc., which may affect the reliability of the apparatus in the short or long term;
- g) Warning of the possible hazards of electric shock or malfunction if the apparatus is tampered with;
- h) Instructions on the use of any relevant test procedure supplied with the apparatus;
- i) The expected lifetime of the apparatus;
- j) For type A apparatus, instructions on the use and characteristics of the output signal;
- k) A note stating the working ranges of both temperature and humidity;
- l) The alarm conditions;
- m) A description of the effects of carbon monoxide on the human body, stating that the apparatus may not prevent the chronic effects of carbon monoxide exposure, and that the apparatus will not fully safeguard individuals at special risk, see annex A of EN 50292;
- n) Warning that installation of the apparatus should not be used as a substitute for proper installation, use and maintenance of fuel burning appliances including appropriate ventilation and exhaust systems.

#### 4.6.5 Packaging

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The apparatus packaging shall:

- Carry a warning that the apparatus should be installed by a competent person;
- Carry relevant information regarding storage and transport.

The package shall clearly display the following message:

This apparatus is designed to protect individuals from the acute effects of carbon monoxide exposure. It will not fully safeguard individuals with specific medical conditions. If in doubt consult a medical practitioner.

## 5 Test and performance requirements

### 5.1 General requirements for tests

#### 5.1.1 Test samples

For the purposes of type testing:

- Compliance with 4.2 and 5.3.15 to 5.3.18 shall be verified using samples as required. These samples should not be used for subsequent tests unless agreed by the manufacturer;
- Three samples shall be subjected to the tests specified in 5.3.2 to 5.3.13 and for battery powered apparatus, clause 6. All three samples shall pass the tests;