



SLOVENSKI STANDARD
SIST EN 50194-1:2009

01-september-2009

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SIST EN 50194:2000

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DfYg_i gbY`a YrcXY`]b`nU h^j UbY`Ug]bcgh]

Electrical apparatus for the detection of combustible gases in domestic premises -- Part 1: Test methods and performance requirements

Elektrische Geräte für die Detektion von brennbaren Gasen in Wohnhäusern -- Teil 1: Prüfverfahren und Anforderungen an das Betriebsverhalten

Appareils électriques pour la détection des gaz combustibles dans les locaux domestiques -- Partie 1: Méthodes d'essai et exigences d'aptitude à la fonction

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50194-1

January 2009

ICS 13.320

Supersedes EN 50194:2000

English version

**Electrical apparatus for the detection
of combustible gases in domestic premises -
Part 1: Test methods and performance requirements**

Appareils électriques
pour la détection des gaz combustibles
dans les locaux domestiques -
Partie 1: Méthodes d'essai
et exigences d'aptitude à la fonction

Elektrische Geräte
für die Detektion von brennbaren Gasen
in Wohnhäusern -
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an 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: avenue Marnix 17, B - 1000 Brussels

Foreword

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

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50194-1 on 2008-09-01.

This European Standard supersedes EN 50194:2000.

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) 2009-09-01

- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-09-01

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1 Scope

This European Standard specifies general requirements for the construction, testing and performance of electrically operated apparatus for the detection of combustible gases, designed for continuous operation in a fixed installation in domestic premises. The apparatus may be mains or battery powered.

Additional requirements for apparatus to be used in recreational vehicles and similar premises are specified in EN 50194-2.

NOTE 1 For caravan holiday homes EN 50194-1 applies.

This European Standard specifies two types of apparatus to operate in the event of an escape of town gas, natural gas or liquefied petroleum gas (LPG):

- Type A apparatus - to provide a visual and audible alarm and an executive action in the form of an output signal that may actuate directly or indirectly a shut-off device and/or other ancillary device;
- Type B apparatus - to provide a visual and audible alarm only.

This European Standard excludes apparatus for the detection of toxic hazards of gases such as carbon monoxide (see EN 50291-1 and EN 50291-2).

Apparatus complying with this standard is not considered suitable for industrial or commercial installations for which EN 60079-29-1 apply.

NOTE 2 Apparatus tested in accordance with EN 60079-29-1 will not necessarily comply with this European Standard.

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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 437	1993	Appliances using combustible gases - Test gases, test pressure and categories of appliances
EN 1775	2007	Gas supply - Gas pipework for buildings - Maximum operating pressure less than or equal to 5 bar - Functional recommendations
EN 50244	2000	Electrical apparatus for the detection of combustible gases in domestic premises - Guide on the selection, installation, use and maintenance
EN 50270	2006	Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen
EN 50291	2001	Electrical apparatus for the detection of carbon monoxide in domestic premises - Test methods and performance requirements
EN 60079-29-1	2007	Explosive atmospheres - Part 29-1: Gas detectors - Performance requirements of detectors for flammable gases (IEC 60079-29-1:2007, modified)
EN 60335-1	2002	Household and similar electrical appliances - Safety - Part 1: General requirements (IEC 60335-1:2001, modified)
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 60704-1:1997)

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 from combustible gases, interfering and contaminating substances

3.3

domestic premises

any house or building being the 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

lower explosive limit (LEL)

the volume ratio of flammable gas or vapour in air below which an explosive gas atmosphere will not be formed

NOTE Annex A of EN 61779-1:2000 gives a list of flammability levels which are the internationally agreed basis for the type testing of devices. National regulations may use differing values for the LEL of some substances (for example the values for methane and propane, which were specified in older European Standards).

3.7

sensor

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

3.8

sensing element

a device, the output of which will change in the presence of combustible gas

3.9

volume ratio (v/v)

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

3.10

output signal

signal characterized by a standby state and an activated state by which action may be initiated (for example, triggering of a shut-off device)

3.11

alarm set point

a fixed setting of the apparatus that determines the volume ratio of combustible gas at which the apparatus will automatically initiate an alarm and for Type A apparatus, an output signal

3.12**gas detection apparatus**

apparatus comprising the sensor, remote sensor if applicable, alarm and other circuit components, power supply and for Type A apparatus a means of providing an output signal

3.13**fault signal**

a visual or audible signal indicating a faulty or failed apparatus

3.14**LPG**

butane, propane or mixtures thereof

3.15**mains powered apparatus**

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

3.16**self contained battery powered apparatus**

apparatus provided with an internal battery to provide the necessary amount of energy for a predefined duration of operation

3.17**warm-up time**

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

3.18**continuous operation**

apparatus which is continuously powered with continuous or intermittent automatic sensing

3.19**recreational vehicle**

recreational vehicles considered by this standard include recreational craft, caravans and motor caravans

NOTE Other motorised vehicles like trucks are known to have residential accommodation. They are not recreational vehicles but are considered as similar premises in respect of this standard.

3.20**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 that is for temporary or seasonal occupation [from EN 13878]

4 General requirements**4.1 General**

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

The apparatus shall reliably detect the presence of combustible gas 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 level exceeds a preset alarm volume ratio.

The apparatus, electrical assemblies and components shall comply with the construction requirements of 4.2 to 4.6 and the test and performance requirements of Clause 5. Apparatus shall be designed for fixed installation and continuous operation. The apparatus shall not be class 0 as defined in EN 60335-1:2002, 3.3.7.

When replaceable, the sensor as defined under 3.7 shall guarantee the same constructional characteristics and functions as the previous sensor without modifying the internal detector in such a way as to keep unchanged the compliance of the detector to all the requirements of this standard. The above condition shall be verified using the information and the documentation given by the manufacturer of the detector.

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

4.2 Construction

The apparatus shall comply with the appropriate requirements of EN 60335-1:2002 as listed in Table 1.

Table 1 - Construction requirements

Constructional requirement	EN 60335-1:2002 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 and 24.4
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 and fire	30
Resistance to rusting	31

In addition, when the sensor is replaceable:

Mechanical and/or electrical means shall guarantee the replacement of the sensor without errors. In the case of electrical recognition of the incorrect connection or the absence of the sensor, the detector shall automatically signal a fault and/or alarm. Moreover it shall be impossible, or recognised as an error, to connect a sensor designed for a certain type of gas to a detector designed for a different type of gas.

4.3 Indicators and alarms

4.3.1 Visual indicators shall be fitted and coloured as follows:

- power supply indicators shall be coloured green;
- alarm indicators shall be coloured red;
- where fitted, the visual fault indication shall be yellow.

If a sensor "end-of-life" visual indication is fitted, this shall be clearly different from all other visual indications.

The visual indicators shall be labelled to show their function.

The visual indicators shall be visible when the apparatus is installed in its operating position according to the manufacturers instructions.

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

4.3.3 Visual indicators and audible alarms, shall operate at a volume ratio above 3 % LEL and below 20 % LEL of the gas to be monitored. The alarms shall remain in operation at gas volume ratios above that alarm set point.

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

The manufacturer shall declare the alarm set point of the apparatus. When measured as specified in 5.3.4.2, the alarm shall operate within $\pm 2,5$ % LEL of the declared value. For all tests thereafter, the alarm set point shall be within ± 5 % LEL of the declared value but within the overall band of above 3 % LEL and not exceeding 20 % LEL.

4.3.4 No adjustment shall be possible from outside of the apparatus without breaking or removing seals placed there to prevent access.

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 output signal of the apparatus shall operate at the same conditions as the visual and audible alarm. For triggering an output signal, a built-in delay shall not exceed 2 min.

4.6 Labelling and instructions

4.6.1 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 the apparatus and the type of gas to be detected, for example, 'methane gas detector' and the model number.
- c) The number of this European Standard.
- d) The type of apparatus, A or B.
- e) The serial number or manufacturing date code of the apparatus.
- f) For mains powered apparatus, the electricity supply voltage, 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.
- i) The expected lifetime of the sensor, if different from the lifetime of the apparatus.
- j) When the apparatus has a replaceable sensor the apparatus shall be de-energised before the sensor is replaced.
- k) When the sensor is replaceable, the apparatus shall carry the next replacement date of the sensor. This information shall be provided in such a way that the revision of this date is possible at every replacement of the sensor.

NOTE If the updating procedure requires the application of a pre-printed label, this shall be supplied with the new sensor with a warning to replace the previous label attached to the sensor by the new one. Every sensor shall be provided with a

marking that allows the manufacture and calibration of each sensor to be traced (e.g. serial number, manufacturing batch/production date, expected lifetime of the apparatus, etc.).

The markings b), h), i), j) and k) 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 60335-1:2002.

4.6.2 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.

4.6.3 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 premises 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 Annex A and EN 50244).
- d) Actions to be taken if the apparatus alarms (see Annex B and EN 50244).
- e) An explanation of all warning (visual and audible) and other indications, including re-setting facilities where relevant.
- f) A list of commonly occurring materials, vapours or gases, for example 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) Instruction on the use of any test method supplied with the apparatus and a warning on false conclusions that may be drawn from the application of other methods, such as gas lighters, flammable vapours, etc.
- i) Requirements that the gas installation and shut-off device, if any, shall comply with the national regulations in force in the country where it is being installed, see EN 1775.
- j) The expected lifetime of the apparatus.
- k) For Type A apparatus, instructions on the use and characteristics of the output signal.
- l) Methods and products that may be used for cleaning the apparatus.
- m) The possibility of smelling gas prior to the apparatus giving an alarm.
- n) A note stating the working temperature and humidity ranges.
- o) The gas volume ratio at which the alarm shall operate. This factory set value shall be between 3 % LEL and 20 % LEL.