



SLOVENSKI STANDARD
SIST EN 50194:2000

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Električni aparati za odkrivanje vnetljivih plinov v domačih prostorih - Preskusne metode in zmogljivostne zahteve

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

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

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

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English version

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

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

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

This European Standard was approved by CENELEC on 1999-08-01. CENELEC 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 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 was prepared by the Technical Committee TC 216, Gas detectors.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50194 on 1999-08-01.

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) 2000-10-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2002-08-01

Annexes designated "informative" are given for information only.
In this standard, annexes A, B and C are informative.

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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.

This 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.

The standard excludes apparatus:

- for use in boats, caravans or mobile homes.
- for the detection of toxic gases such as carbon monoxide (see EN 50291)
- for industrial or commercial installations for which European Standards EN 50054, EN 50055, EN 50056, EN 50057 and EN 50058 apply.

NOTE Apparatus tested in accordance with EN 50054 etc. will not necessarily comply with this standard.

2 Normative references

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 437	1993	Appliances using combustible gases - Test gases, test pressure and categories of appliances
EN 1775	1998	Gas supply - Gas pipework for buildings - Maximum operating pressure \leq 5 bar Functional recommendations
EN 50054	1998	Electrical apparatus for the detection and measurement of combustible gases General requirements and test methods
EN 50055	1998	Electrical apparatus for the detection and measurement of combustible gases Performance requirements for Group I apparatus indicating up to 5% (v/v) methane in air
EN 50056	1998	Electrical apparatus for the detection and measurement of combustible gases Performance requirements for Group I apparatus indicating up to 100% (v/v) methane in air
EN 50057	1998	Electrical apparatus for the detection and measurement of combustible gases Performance requirements for Group II apparatus indicating up to 100% lower explosive limit
EN 50058	1998	Electrical apparatus for the detection and measurement of combustible gases Performance requirements for Group II apparatus indicating up to 100% (v/v) gas

EN 50244	2000	Electrical apparatus for the detection of combustible gases in domestic premises - Guide on the selection, installation, use and maintenance
EN 50270	1999	Electromagnetic compatibility – Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen
EN 50291	¹⁾	Electrical apparatus for the detection of carbon monoxide in domestic premises Test methods and performance requirements
EN 60335-1	1994	Safety of household and similar electrical appliances -- Part 1: General requirements (IEC 60335-1:1991, modified)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 60704-1	1997	Test code for the determination of airborne acoustical noise emitted by household and similar appliances -- 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 50054:1991 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 methane and propane).

1) In preparation

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 pre-defined 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

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 60335-1:1994.

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 60335-1:1994 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 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 equipment.
- f) For mains powered apparatus, the electricity supply voltage and frequency.
- 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.

4.6.2 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, 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 range and humidity range;
- o) The gas volume ratio at which the alarm shall operate. This factory set value shall be between 3 % LEL and 20 % LEL.

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4.6.4 Packaging

The apparatus packaging shall:

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