
**Electrical apparatus for the detection and measurement of combustible gases -
Performance requirements for group II apparatus indicating up to 100 % (v/v) lower
explosive limit**

Electrical apparatus for the detection and measurement of combustible gases -
Performance requirements for Group II apparatus indicating up to 100% lower explosive
limit

Elektrische Geräte für das Aufspüren und die Messung brennbarer Gase -
Anforderungen an das Betriebsverhalten von Geräten der Gruppe II mit einem
Meßbereich bis zu 100 % der unteren Explosionsgrenze

[SIST EN 50057:1997](https://standards.iteh.ai/catalog/standards/sist/837110b5-2800-4b2d-1012-500571997)

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Appareils électriques de détection et de mesure des gaz combustibles - Règles de
performances des appareils du Groupe II pouvant indiquer jusqu'à 100 % de la limite
inférieure d'explosivité

Ta slovenski standard je istoveten z: EN 50057:1991

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29.260.20	Električni aparati za eksplozivna ozračja	Electrical apparatus for explosive atmospheres

SIST EN 50057:1997**en**

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Descriptors: Electrical apparatus, explosive atmosphere, explosive atmosphere other than mines, detector, measuring apparatus, flammable gas, combustible gas, characteristic

ENGLISH VERSION

ELECTRICAL APPARATUS FOR THE DETECTION AND
MEASUREMENT OF COMBUSTIBLE GASES
PERFORMANCE REQUIREMENTS FOR GROUP II APPARATUS
INDICATING UP TO 100 % LOWER EXPLOSIVE LIMIT

Appareils électriques de
détection et de mesure des
gaz combustibles
Règles de performances des
appareils du Groupe II pouvant
indiquer jusqu'à 100 % de la
limite inférieure d'explosivité

Elektrische Geräte für das
Aufspüren und die Messung
brennbarer Gase
Anforderungen an das Betriebs-
verhalten von Geräten der Gruppe II
mit einem Meßbereich bis zu
100 % der unteren Explosionsgrenze

This European Standard was approved by CENELEC on 1990-12-10.

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 list 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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 CENELEC Subcommittee SC 31-9, Gas detectors.

The text of the draft was approved by CENELEC as EN 50057 on 10 December 1990.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1992-03-01
- latest date of withdrawal of conflicting national standards (dow) 1992-03-01

For products which have complied with the relevant national standard before 1992-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1997-03-01.

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Contents	Page
European Standards referred to in European Standard EN 50 057	4
1 Scope	5
2 Definitions	5
3 General requirements	5
4 Performance requirements	6
4.1 General	6
4.2 Unpowered storage	6
4.3 Calibration curve (not applicable to alarm-only apparatus)	6
4.4 Drift (continuous duty apparatus)	6
4.5 Drift (spot reading apparatus)	6
4.6 Alarm	6
4.7 Temperature	7
4.8 Pressure	7
4.9 Humidity	7
4.10 Air speed	7
4.11 Pumping rate	7
4.12 Orientation	8
4.13 Vibration (fixed and transportable apparatus)	8
4.14 Drop test (applicable to portable apparatus and remote sensors)	8
4.15 Warm-up time (not applicable to spot-reading apparatus)	8
4.16 Time of response (not applicable to spot-reading apparatus)	8
4.17 Minimum time of operation (spot reading apparatus)	8
4.18 High gas concentrations above the measuring range	9
4.19 Battery capacity	9
4.20 Power supply variations	9
4.21 Power supply interruptions, voltage transients and step changes of voltage	10
4.22 Addition of sampling probe	10
4.23 Dust	10
4.24 Poisons and other gases	10
4.25 Electromagnetic immunity	10
5 Field calibration kit	10

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Page 4
EN 50057:1991

European standards referred to in European Standard EN 50 057

EN 50 054 (1991) Electrical apparatus for the detection and measurement
of combustible gases.
General requirements and test methods

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1 Scope

1.1 This European Standard specifies performance requirements for Group II (as defined in European Standard EN 50 054) portable, transportable and fixed apparatus for the detection and measurement of combustible gas or vapour concentrations with air. The apparatus, or parts thereof, may be installed or used in potentially explosive atmospheres, other than mines susceptible to firedamp (i.e. Group I). The general requirements and test methods applicable to the apparatus covered by this European Standard are specified in European Standard EN 50 054.

1.2 This European Standard is restricted to apparatus intended for the detection and measurement of combustible gas or vapour concentrations with air up to 100 % lower explosive limit (LEL).

NOTE. Although apparatus of the types covered by this European Standard may be suitable for detecting a wide range of combustible gases, particular gases (e.g. methane or propane) are specified in European Standard EN 50 054 as the components of the test gases for the purpose of practical convenience. The performance requirements specified in this European Standard must therefore be regarded with caution when the apparatus is used to detect other combustible gases, as some parameters - such as speed of response - will be modified.

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2 Definitions

For the purposes of this European Standard, the definitions given in European Standard EN 50 054 apply.

3 General requirements

The apparatus shall comply with the general requirements specified in European Standard EN 50 054 and with the performance requirements specified in clause 4 of this European Standard.

Compliance shall be determined in accordance with the appropriate test requirements and methods, including initial calibration, specified in European Standard EN 50 054.

It shall be verified that the contents of the instruction manual are in accordance with the requirements specified in European Standard EN 50 054.

4 Performance requirements

4.1 General

The normal conditions for test are specified in clause 4.3 of EN 50 054. Compliance shall be determined in accordance with the test methods specified in clause 4.4 of EN 50 054.

4.2 Unpowered storage

After being submitted to the conditions specified in sub-clause 4.4.2 of EN 50 054, the apparatus shall meet the requirements specified in 4.3 to 4.25 of this European Standard.

4.3 Calibration curve (not applicable to alarm-only apparatus)

4.3.1 *Calibration curve.* After initial adjustment with the standard test gas, each of the three indications (after correction using the manufacturer's calibration curves, if necessary) shall not differ from these true volume ratios by more than $\pm 5\%$ of the measuring range or $\pm 10\%$ of the indications whichever is the greater.

4.3.2 *Response to gases other than the test gas.* The apparatus indication (after correction using the manufacturer's calibration curves, if necessary) obtained for each of three gas volume ratios of each gas tested shall not differ from these volume ratios by more than $\pm 7\%$ of the measuring range or $\pm 15\%$ of the indication, whichever is the greater.

4.4 Drift (continuous duty apparatus)

Continuous duty apparatus shall comply with the following requirements.

(a) **Short term drift.** The short term variation shall not exceed $\pm 3\%$ of the measuring range or $\pm 10\%$ of the indication, whichever is the greater.

(b) **Long term drift.** The long term variation shall not exceed $\pm 10\%$ of the measuring range or $\pm 30\%$ of the indication, whichever is the greater.

4.5 Drift (spot reading apparatus)

The variation shall not exceed $\pm 3\%$ of the measuring range or $\pm 10\%$ of the readings, whichever is the greater.

4.6 Alarm

The alarm shall operate during every cycle of the test. If a latching alarm is provided, the manual reset action shall be checked during every cycle.

4.7 Temperature

The variation of the indication from that at 20 °C, over the specified temperature ranges, shall not exceed the following.

(a) For apparatus with integral sensors or for portable or transportable apparatus, where the control unit and sensor are used in the same general environment the variation over the temperature range -10 °C to +40 °C shall not exceed $\pm 3\%$ of the measuring range or $\pm 10\%$ of the indication, whichever is the greater.

(b) For apparatus with remote sensors, where the control unit and sensor are not used in the same general environment the following temperature ranges shall be applied for sensors and control units.

(1) **Sensors.** With the control unit under normal ambient test conditions, the sensor shall be tested in air and in the standard test gas over the temperature range -25 °C to +55 °C. The variation shall not exceed $\pm 7\%$ of the measuring range or $\pm 15\%$ of the indication, whichever is the greater.

(2) **Control units.** With the sensor under normal ambient test conditions, the variation over the temperature range +5 °C to +55 °C shall not exceed $\pm 3\%$ of the measuring range or $\pm 10\%$ of the indication, whichever is the greater.

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4.8 Pressure

The variation of the indication from that at 101.3 kPa, over a pressure range of 95 kPa to 110 kPa, shall not exceed $\pm 5\%$ of the measuring range or $\pm 15\%$ of the indication, whichever is the greater.

4.9 Humidity

The variation of the indication from that at 55 % relative humidity (r.h.) over a humidity range of 5 % to 90 % r.h. at +40 °C, shall not exceed $\pm 5\%$ of the measuring range or $\pm 15\%$ of the indication, whichever is the greater.

4.10 Air speed

The variation of the indication shall not exceed $\pm 5\%$ of the measuring range or $\pm 15\%$ of the indication, whichever is the greater.

4.11 Pumping rate

The variation of the indication shall not exceed $\pm 5\%$ of the measuring range or $\pm 15\%$ of the indication, whichever is the greater.