

---

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

Electrical apparatus for the detection and measurement of combustible gases -  
Performance requirements for Group II apparatus indicating up to 100 % (v/v) gas

Elektrische Geräte für die Detektion und die Messung brennbarer Gase - Anforderungen  
an das Betriebsverhalten von Geräten der Gruppe II mit einem Meßbereich bis zu 100 %  
(V/V) Gas

**(standards.iteh.ai)**

Appareils électriques de détection et de mesure des gaz combustibles - Règles de  
performances des appareils du Groupe II pouvant indiquer jusqu'à 100 % (v/v) de gaz

**Ta slovenski standard je istoveten z: EN 50058:1998**

---

**ICS:**

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
29.260.20	Električni aparati za eksplozivna ozračja	Electrical apparatus for explosive atmospheres

**SIST EN 50058:2000****en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 50058:2000

<https://standards.iteh.ai/catalog/standards/sist/f23cef9e-468e-4d8d-8e23-485367afc5bb/sist-en-50058-2000>

EUROPEAN STANDARD

EN 50058

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 1998

ICS 13.220.60;19.080

Supersedes EN 50058:1991

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 % (v/v) gas**

Appareils électriques de détection et de  
mesure des gaz combustibles

Règles de performances des appareils  
du Groupe II pouvant indiquer jusqu'à  
100 % (v/v) de gaz

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 % (V/V) Gas

(standards.iteh.ai)

[SIST EN 50058:2000](https://standards.iteh.ai/catalog/standards/sist/f23cef9e-468e-4d8d-8e23-485367afc5bb/sist-en-50058-2000)

<https://standards.iteh.ai/catalog/standards/sist/f23cef9e-468e-4d8d-8e23-485367afc5bb/sist-en-50058-2000>

This European Standard was approved by CENELEC on 1998-04-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, 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, Electrical apparatus for the detection and measurement of combustible gases to be used in industrial and commercial potentially explosive atmospheres, of Technical Committee CENELEC TC 31, Electrical apparatus for explosive atmospheres.

The text of the draft was approved by CENELEC as EN 50058 on 1990-12-10. The CENELEC Technical Board approved the publication of a new edition on 1998-04-01 (D95/079).

This European Standard replaces EN 50058:1991.

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) 1999-01-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 1999-01-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and covers essential requirements of EC Directive 94/9/EC.

**(standards.iteh.ai)**

SIST EN 50058:2000

<https://standards.iteh.ai/catalog/standards/sist/f23cef9e-468e-4d8d-8e23-485367afc5bb/sist-en-50058-2000>

## Contents

1 Scope .....	4
2 Normative references .....	4
3 Definitions .....	4
4 General requirements .....	4
5 Performance requirements .....	4
5.1 General .....	4
5.2 Unpowered storage .....	4
5.3 Calibration curve (not applicable to alarm only apparatus) .....	4
5.3.1 Calibration curve .....	4
5.3.2 Response to gases other than the test gas .....	5
5.4 Drift (Continuous duty apparatus) .....	5
5.4.1 Short term drift .....	5
5.4.2 Long term drift .....	5
5.5 Drift (Spot reading apparatus) .....	5
5.6 Alarm .....	5
5.7 Temperature .....	5
5.7.1 Apparatus where the control unit and sensors are used in the same environment .....	5
5.7.2 Remote sensors, of apparatus where the control unit and sensor are not used in the same environment .....	5
5.7.3 Control units, of apparatus where the control unit and sensor are not used in the same environment .....	5
5.8 Pressure .....	5
5.9 Humidity .....	5
5.10 Air speed .....	5
5.11 Pumping rate .....	6
5.12 Orientation .....	6
5.13 Vibration (fixed and transportable apparatus) .....	6
5.14 Drop test (applicable to portable apparatus and remote sensors) .....	6
5.15 Warm-up time (not applicable to spot-reading apparatus) .....	6
5.15.1 Fixed and transportable apparatus .....	6
5.15.2 Continuous duty portable apparatus .....	6
5.16 Time of response (not applicable to spot-reading apparatus) .....	6
5.17 Minimum time of operation (spot-reading apparatus) .....	6
5.18 High gas concentrations above the measuring range .....	6
5.19 Battery capacity .....	6
5.19.1 Battery-powered portable continuous duty apparatus .....	6
5.19.2 Battery-powered portable spot-reading apparatus .....	7
5.20 Power supply variations .....	7
5.20.1 A.C. powered apparatus .....	7
5.20.2 External d.c. powered apparatus .....	7
5.20.3 Apparatus with other power supplies .....	7
5.21 Power supply interruptions, voltage transients and step changes of voltage .....	7
5.22 Addition of sampling probe .....	7
5.23 Dust .....	7
5.24 Poisons and other gases .....	7
5.25 Electromagnetic immunity .....	7
6 Field calibration kit .....	7
7 Information for use .....	7

## 1 Scope

1.1 This European Standard specifies performance requirements for Group II (as defined in EN 50054) 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 EN 50054.

1.2 This European Standard is restricted to apparatus intended for the detection and measurement of volume ratios of combustible gas or vapour in air from 0 % (v/v) to 100 % (v/v).

NOTE 1: Apparatus covered by this European Standard will normally be intended to operate in volume ratios greater than 100 % LEL.

NOTE 2: 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 EN 50054 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 time of response - will be modified.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at 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 the European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50054	1998	Electrical apparatus for the detection and measurement of combustible gases General requirements and test methods
----------	------	--

## 3 Definitions

For the purposes of this European Standard, the definitions given in EN 50054 apply.

## 4 General requirements

The apparatus shall comply with the general requirements specified in clause 4 of EN 50054.

## 5 Performance requirements

### 5.1 General

The normal conditions for test are specified in subclause 5.3 of EN 50054. Compliance shall be determined in accordance with the test methods specified in subclause 5.4 of EN 50054.

### 5.2 Unpowered storage

After being submitted to the conditions specified in subclause 5.4.2 of EN 50054, the apparatus shall meet the requirements specified in 5.3 to 5.25 of this European Standard.

### 5.3 Calibration curve (not applicable to alarm only apparatus)

#### 5.3.1 Calibration curve

Each of the three indications (after correction using the manufacturer's calibration curves, if necessary) obtained from these true volume ratios shall not differ from these volume ratios by more than  $\pm 5$  % of the measuring range or  $\pm 10$  % of the indication, whichever is greater.

### 5.3.2 Response to gases other than the test gas

The apparatus indications (after correction using the manufacturer's calibration curves, if necessary, obtained for each of the 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 greater.

## 5.4 Drift (Continuous duty apparatus)

### 5.4.1 Short term drift

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

### 5.4.2 Long term drift

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

## 5.5 Drift (Spot reading apparatus)

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

## 5.6 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.

## 5.7 Temperature

### 5.7.1 Apparatus where the control unit and sensors are used in the same environment

The variation of the indication from that at  $20\text{ }^{\circ}\text{C}$  over the temperature range:

- $-10\text{ }^{\circ}\text{C}$  to  $0\text{ }^{\circ}\text{C}$ , shall not exceed  $\pm 7\%$  of the measuring range or  $\pm 15\%$  of the indication and
- $0\text{ }^{\circ}\text{C}$  to  $+40\text{ }^{\circ}\text{C}$ , shall not exceed  $\pm 5\%$  of the measuring range or  $\pm 10\%$  of the indication, whichever is greater.

### 5.7.2 Remote sensors, of apparatus where the control unit and sensor are not used in the same environment

The variation of the indication from that at  $20\text{ }^{\circ}\text{C}$  over the temperature range  $-25\text{ }^{\circ}\text{C}$  to  $+55\text{ }^{\circ}\text{C}$  shall not exceed  $\pm 2\%$  of the measuring range or  $\pm 3,5\%$  of the indication per  $10\text{ K}$ , whichever is the greater.

### 5.7.3 Control units, of apparatus where the control unit and sensor are not used in the same environment

The variation of the indication from that at  $20\text{ }^{\circ}\text{C}$  over the temperature range  $+5\text{ }^{\circ}\text{C}$  to  $+55\text{ }^{\circ}\text{C}$  shall not exceed  $\pm 3\%$  of the measuring range or  $\pm 10\%$  of the indication whichever is the greater.

## 5.8 Pressure

The variation of the indication from that at  $101,3\text{ kPa}$ , over a pressure range of  $95\text{ kPa}$  to  $110\text{ kPa}$ , shall not exceed  $\pm 7,5\%$  of the measuring range or  $\pm 15\%$  of the indication, whichever is the greater.

## 5.9 Humidity

At  $40\text{ }^{\circ}\text{C}$ , the variation of the indication from that at  $55\%$  relative humidity (r.h.) over a humidity range of  $5\%$  to  $90\%$  r.h. shall not exceed  $\pm 5\%$  of the measuring range or  $\pm 10\%$  of the indication, whichever is the greater.

## 5.10 Air speed

The variation of the indication shall not exceed  $\pm 5\%$  of the measuring range or  $\pm 10\%$  of the indication, whichever is the greater.

**5.11 Pumping rate**

The variation of the indication shall not exceed  $\pm 5\%$  of the measuring range or  $\pm 10\%$  of the indication, whichever is the greater.

**5.12 Orientation**

The variation of the indication shall not exceed  $\pm 5\%$  of the measuring range or  $\pm 10\%$  of the indication, whichever is the greater.

**5.13 Vibration (fixed and transportable apparatus)**

During the vibration test, the apparatus shall not suffer any loss of function and shall not give a false alarm or fault signal. The apparatus shall not suffer damage resulting in hazard or loss of function.

At the conclusion of the vibration test and after the apparatus sensor has then been exposed to clean air followed by the standard test gas mixture, the deviation of the indication from that determined prior to the test shall not exceed  $\pm 5\%$  of the measuring range or  $\pm 15\%$  of the indication, whichever is the greater.

**5.14 Drop test (applicable to portable apparatus and remote sensors)**

The apparatus shall not suffer damage resulting in hazard or loss of function.

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

**5.15 Warm-up time (not applicable to spot-reading apparatus)****5.15.1 Fixed and transportable apparatus**

The apparatus shall warm-up in clean air to indicate zero to within  $\pm 5\%$  of the measuring range in a time not exceeding the warm-up time in clean air, as stated by the manufacturer, and no false alarm shall be generated.

**5.15.2 Continuous duty portable apparatus**

The apparatus shall warm-up in clean air to indicate zero to within  $\pm 5\%$  of the measuring range in a time not exceeding 60 s, and no false alarms shall be generated.

**5.16 Time of response (not applicable to spot-reading apparatus)**

The time of response  $t_{50}$  shall not be greater than 10 s, and  $t_{90}$  shall not be greater than 30 s.

**5.17 Minimum time of operation (spot-reading apparatus)**

For apparatus without probe or sample line, the indication shall reach 90 % of the final value in a time not exceeding 15 s.

For aspirated apparatus, using a sample line or probe length of not more than 3 m, an additional 15 s is permitted.

**5.18 High gas concentrations above the measuring range**

Not applicable.

**5.19 Battery capacity****5.19.1 Battery-powered portable continuous duty apparatus**

The variation shall not exceed  $\pm 3\%$  of the measuring range or  $\pm 10\%$  of the indication, whichever is the greater, at the end of the 8 h or 10 h period as appropriate.

At the end of the further 15 min following the indication of low battery condition, the variation shall not exceed  $\pm 6\%$  of the measuring range or  $\pm 20\%$  of the indication, whichever is the greater.