

INTERNATIONAL STANDARD

IEC 61779-4

First edition
1998-04

Electrical apparatus for the detection and measurement of flammable gases –

Part 4:

Performance requirements for group II apparatus indicating a volume fraction up to 100 % lower explosive limit

*Appareils électriques de détection et de mesure
des gaz combustibles –*

Partie 4:

*Règles de performance des appareils du groupe II pouvant indiquer
une fraction volumique jusqu'à 100 % de la limite inférieure
d'explosivité*

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* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL APPARATUS FOR THE DETECTION AND MEASUREMENT OF FLAMMABLE GASES –

Part 4: Performance requirements for group II apparatus indicating a volume fraction up to 100 % lower explosive limit

FOREWORD

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International Standard IEC 61779-4 has been prepared by subcommittee 31L: Electrical apparatus for the detection of flammable gases, of IEC technical committee 31: Electrical apparatus for explosive atmospheres.

This standard should be read in conjunction with IEC 61779-1.

The text of this standard is based on the following documents:

FDIS	Report on voting
31L/50/FDIS	31L/55/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

A bilingual version of this standard may be issued at a later date.

ELECTRICAL APPARATUS FOR THE DETECTION AND MEASUREMENT OF FLAMMABLE GASES –

Part 4: Performance requirements for group II apparatus indicating a volume fraction up to 100 % lower explosive limit

1 Scope

1.1 This part of IEC 61779 specifies requirements for group II (as defined in part 1) 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 requirements and test methods applicable to the apparatus covered by this standard are specified in part 1.

1.2 This 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).

2 Definitions

For the purpose of this part of IEC 61779, the definitions given in part 1 apply.

3 General requirements

The apparatus shall comply with the general requirements specified in part 1 and with the performance requirements specified in clause 4 of this standard.

Compliance shall be determined in accordance with the appropriate test requirements and methods, including initial calibration, specified in part 1.

It shall be verified that the contents of the manufacturer's instruction manual are in accordance with the requirements specified in part 1.

4 Performance requirements

4.1 General

The normal conditions for tests are specified in 4.3 of part 1. Compliance shall be determined in accordance with the test methods specified in 4.4 of part 1.

4.2 Unpowered storage

After being submitted to the conditions specified in 4.4.2 of part 1, the apparatus shall meet the requirements specified in 4.3 to clause 5 of this 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 individual indication in the three sets of indications (after correction using the manufacturer's calibration curve, if necessary) obtained for each of the four gas volume ratios distributed over the measuring range, shall not differ

from these volume ratios by more than $\pm 5\%$ of the measuring range or $\pm 10\%$ of the indication, 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 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 the greater.

4.4 Stability (continuous duty apparatus)

Continuous duty apparatus shall comply with the following requirements.

a) short-term stability

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

b) long-term stability (fixed and transportable apparatus)

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

c) long-term stability (portable apparatus)

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

4.5 Stability (spot-reading apparatus)

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

4.6 Alarm

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

4.7 Temperature

The variation of the indication from that at $20\text{ }^{\circ}\text{C}$, over the specified temperature ranges, shall not exceed the following:

- a) for portable or transportable apparatus where the control unit and the sensor are used in the same general environment, the variation over the temperature range $-10\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ shall not exceed $\pm 5\%$ of the measuring range or $\pm 10\%$ of the indication, whichever is the greater. Tests shall be carried out at temperatures of $-10\text{ }^{\circ}\text{C}$, $20\text{ }^{\circ}\text{C}$ and $40\text{ }^{\circ}\text{C}$;
- b) for fixed apparatus with remote sensors, where the control unit and sensor are not used in the same general environment, the following temperatures shall be applied:

1) Sensors

With the control unit under normal ambient test conditions, the sensor shall be tested in air and in the standard test gas at $-25\text{ }^{\circ}\text{C}$ and $+55\text{ }^{\circ}\text{C}$. The variation shall not exceed $\pm 10\%$ of the measuring range or $\pm 20\%$ of the indication, whichever is the greater.

2) Control units

With the sensor under normal ambient test conditions, the variation at $+5\text{ }^{\circ}\text{C}$ and $+55\text{ }^{\circ}\text{C}$ shall not exceed $\pm 5\%$ of the measuring range or $\pm 10\%$ of the indication, whichever is the greater;