

SLOVENSKI STANDARD
SIST-TS CLC/TS 50612:2016**01-oktober-2016****Nadomešča:****SIST-TS CLC/TS 50612:2014**

**Prenosni električni aparati za meritve parametrov zgorevalnih dimnih plinov -
Vodilo za njihovo uporabo pri izročanju v obratovanje, servisiranju in vzdrževanju
plinskih kotlov**Portable electrical apparatus for the measurement of combustion flue gas parameters -
Guide to their use in the process of commissioning, servicing and maintaining gas fired
appliances**iTeh STANDARD PREVIEW**
(standards.iteh.ai)[SIST-TS CLC/TS 50612:2016](http://standards.iteh.ai/catalog/standards/sist/ts-10b-1865-107/c2d45b444514/sist-ts-clc-ts-50612-2016)[Appareils électriques portatifs de mesure des paramètres des gaz de combustion -
Guide d'utilisation lié à la procédure de mise en service, d'entretien et de maintenance
des appareils à gaz](http://standards.iteh.ai/catalog/standards/sist/ts-10b-1865-107/c2d45b444514/sist-ts-clc-ts-50612-2016)**Ta slovenski standard je istoveten z: CLC/TS 50612:2016****ICS:**

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Portable electrical apparatus for the measurement of combustion
flue gas parameters - Guide to their use in the process of
commissioning, servicing and maintaining gas fired appliances

Appareils électriques portatifs de mesure des paramètres
des gaz de combustion - Guide d'utilisation lié à la
procédure de mise en service, d'entretien et de
maintenance des appareils à gaz

To be completed

This Technical Specification was approved by CENELEC on 2016-04-18.

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

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CLC/TS 50612:2016**European foreword**

This document (CLC/TS 50612:2016) has been prepared by Technical Committee CLC/TC 216 "Gas detectors".

This document supersedes CLC/TS 50612:2013.

CLC/TS 50612:2016 includes the following significant technical changes with respect to CLC/TS 50612:2013:

The Scope of the 2013 guidance was limited to the use of portable electrical apparatus for the measurement of combustion flue gas parameters of gas-fired central heating boilers. The Scope of the 2016 guidance has been expanded to cover their use with gas-fired central heating boilers, domestic gas-fired air heaters, independent gas-fired space heaters, gas cooking appliances and domestic gas-fired water heaters.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

The following Technical Committees have collaborated in the development of this document:

- CEN/TC 109 "Central heating boilers using gaseous fuels",
- CEN/TC 62 "Independent gas-fired space heaters",
- CEN/TC 49 "Gas cooking appliances", and
- CEN/TC 48 "Domestic gas-fired water heaters".

NOTE Commentary text is presented in *italic type*. It gives background information and does not constitute a normative element.

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Introduction

This Technical Specification is intended as a guide for operatives who, in the course of their professional activities, are required to measure combustion parameters of gas-fired appliances in domestic premises using combustion flue gas analysers during any or all of the commissioning, servicing and maintenance of such appliances.

It is intended to complement the following through a generic approach:

- a) the gas appliance commissioning, servicing and maintenance instructions, and/or
- b) national or local regulations or standards.

NOTE 1 A Technical Specification is announced and made available at national level, but conflicting national standards can continue to exist.

NOTE 2 Existing national or local regulations or standards conflicting with the guidance in this Technical Specification have precedence over this guidance.

It is not intended that a combustion gas analysis be used as a substitute for commissioning, servicing and/or maintenance carried out in accordance with the gas appliance instructions. It is meant to be regarded and used as a diagnostic tool to help in the process of carrying out these activities to ensure the safe and efficient operation of the appliance installation.

In the preparation of this Technical Specification, it has been assumed that the execution of its provisions will be entrusted to competent operatives (see Clause 4) for whose use it has been produced.

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CLC/TS 50612:2016**1 Scope**

This Technical Specification provides guidance on the selection, use and maintenance of portable electrical apparatus conforming to EN 50379-1 [4] and EN 50379-2 [5] or EN 50379-3 [6] to:

- a) measure combustion flue gas parameters of appliances in domestic premises burning 1st, 2nd or 3rd family gases of the following description:
 - 1) Type A, Type B and Type C gas-fired appliances, except those appliances where the appliance instructions (or design, see 7.3.2.1), prohibit combustion sampling, and,
 - 2) all gas-fired appliances for which the appliance manufacturer has provided a purpose-designed combustion sampling point or specific sampling instructions,
- b) use as a diagnostic instrument to assist an operative:
 - 1) in confirming satisfactory combustion at the time of commissioning, in accordance with appliance instructions or national or local regulations or standards;
 - 2) in confirming satisfactory combustion at the time of servicing in accordance with national or local regulations or standards or following servicing in accordance with appliance instructions;
 - 3) in confirming satisfactory combustion following maintenance, in accordance with appliance instructions or national or local regulations or standards.

NOTE 1 Type A, Type B and Type C classification of gas-fired appliances are defined in 3.1.2 and more fully in CEN/TR 1749 [2].

NOTE 2 Existing national or local regulations or standards conflicting with the guidance in this Technical Specification have precedence over this guidance.

NOTE 3 It is not the intention of this Technical Specification to suggest that portable electrical combustion flue gas analysers are to be used as a substitute for normal service and maintenance carried out in accordance with the gas appliance instructions. Clause 9 describes how analysers can be used in conjunction with the appliance instructions.

NOTE 4 EN 50379-1 [4] specifies general requirements for the construction, testing and performance of portable spot reading apparatus designed to check the combustion performance of appliances in domestic premises using commercially available fuels.

NOTE 5 EN 50379-2 [5] is for apparatus intended to be used for statutory measurements. In several European countries, legal requirements exist for the performance of heating appliances (see EN 50379-1:2012, informative Annex A [4]). Legal consequences resulting from performance measurements makes for strict requirements for the apparatus used (see EN 50379-1:2012, normative Annexes B and C [4]).

NOTE 6 EN 50379-3 [6] is for apparatus intended to be used for non-statutory applications, which allows for reduced performance requirements for the portable electrical apparatus.

NOTE 7 This Technical Specification deals with the determination of levels of combustion gases carbon monoxide (CO), carbon dioxide (CO₂) and/or oxygen (O₂) in combustion products from gas-fired appliances. Combustion products from gas-fired appliances will contain nitrogen oxides (NO_x), predominantly nitrogen monoxide (nitric oxide, NO) and nitrogen dioxide (NO₂). This Technical Specification does not deal with the measurement of combustion products such as NO_x and aldehydes.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Type of equipment

3.1.1

portable electrical combustion flue gas analyser

apparatus that will detect and measure the concentrations of components in combustion gases and clearly display the result

Note 1 to entry: Clause 5 and Annex A provides information on suitable portable electrical combustion flue gas analysers.

3.1.2

gas-fired appliance

unit of the following type placed on the market as a complete appliance designed to deliver safely and effectively the service claimed from burning gaseous fuel:

- Type A – appliance not intended for connection to a flue or to a device for evacuating the products of combustion to the outside of the room in which the appliance is installed;
- Type B - appliance intended to be connected to a flue that evacuates the products of combustion to the outside of the room in which the appliance is installed; the combustion air is drawn directly from the room;
- Type C – appliance in which the combustion circuit (air supply, combustion chamber, heat exchanger and evacuation of the products of combustion) is sealed with respect to the room in which the appliance is installed.

Note 1 to entry: Types A, B and C classifications of gas-fired appliances are described fully in CEN/TR 1749 [2].

3.2 Place of installation

3.2.1

domestic premises

house or building, or part thereof, being the place of residence or home of a household, family or person

3.2.2

appliance compartment

enclosure specifically constructed or adapted to accommodate one or more gas-burning appliance

3.3 Type of person

3.3.1

customer

occupier of the domestic premises, owner of the domestic premises, and person with the authority, for the time being, to take appropriate action in relation to any gas appliance/fitting therein

3.3.2

operative

person who is **competent** (as described in 3.4.8 and Clause 4) in respect of **work** (3.4.1) associated with the inspection, commissioning, servicing or maintenance of the particular gas-fired appliance and the use of a portable electrical combustion flue gas analyser

CLC/TS 50612:2016**3.4 Action of the operative****3.4.1****work**

installation, maintenance, servicing, removal, permanent adjustment, repair, changing the position, alteration or renewal of a gas appliance or fitting, or purging of air or gas

3.4.2**servicing**

regular and planned (usually annual) activity carried out on an appliance to check and ensure that it is working safely and correctly

3.4.3**maintenance**

unplanned work carried out on an appliance to repair any defect

3.4.4**safety check**

examinations and tests to ensure that a gas appliance and any associated chimney operate safely

Note 1 to entry: Some countries have mandatory safety checks written into their national or local regulations.

3.4.5**full strip and clean**

work involving, but not exclusively, the gaining of access to the heat exchanger and burner assemblies and the removal of any corrosion products (such as shale) or debris, which might impair the safe and efficient operation of the appliance

3.4.6**satisfactory combustion**

appliance combustion measured values that meet the requirements detailed in the gas appliance instructions and/or national or local regulations or standards

3.4.7**action levels**

appliance measured combustion values as detailed in the gas appliance instructions and/or national or local regulations or standards, at which corrective action should be taken

Note 1 to entry: See Clause 8.

3.4.8**competence**

ability gained by appropriate training, knowledge and experience to supervise or carry out the work being undertaken in a safe and appropriate manner

Note 1 to entry: See Clause 4.

3.5 Condition of the appliance**3.5.1****shaling**

progressive corrosion of the flueways of a cast iron heat exchanger, leading to the development of rust flakes

Note 1 to entry: Shaling can block the heat exchanger over time.

3.5.2**gas family**

group of gaseous fuels with similar burning behaviour linked together by a range of Wobbe indices

Note 1 to entry: See Clause 8, f), and EN 437:2003+A1:2009, Table 1 [1].

3.5.3**gas quality**

stated composition and energy content of the gas supplied, where the energy content is expressed as a range of Wobbe indices

Note 1 to entry: See Clause 8, f) and Commentary on Clause 8.

4 Competence

For the scope of this Technical Specification, competence shall include, as a minimum:

- a) access to, and appropriate understanding of, the appliance instructions specific to the appliance being worked on;
- b) knowledge of any relevant national or local regulations pertaining to the work being undertaken;
- c) knowledge regarding the selection (Clause 5), care, use and maintenance (Clause 6) of portable electrical combustion flue gas analysers;
- d) knowledge of the properties of the fuel gas for the appliance, the resulting combustion process, the possible dangers resulting from the combustion process and the precautions to take;
- e) knowledge of the electrical services associated with the installation and operation of the appliance being worked on, the dangers they can give rise to and the precautions to take.

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Commentary on Clause 4: *Competence requires sufficient knowledge, practical skill and experience to carry out the job in hand safely, with due regard to good working practice. The installation should be left in a safe condition for use. Knowledge should be kept up-to-date with changes in law, technology and safe working practice.*

Some countries require independently assessed and documented proof of competence in accordance with national or local regulations.

5 Selection of portable electrical combustion flue gas analyser

For the determination of CO, CO₂ and/or O₂ in the combustion products from gas-fired appliances, an analyser should conform to:

- a) EN 50379-2 [5] for statutory inspections and assessment of combustion performance,
- b) EN 50379-2 [5] or EN 50379-3 [6] for non-statutory assessment of combustion performance during commissioning and following servicing and maintenance.

NOTE 1 To provide proof of compliance with EN 50379 series, EN 50379-1 [4] requires that the analyser manufacturer provide a durable label on the apparatus, or moulded into the casing, carrying either the number of the European Standard or the third party certification.

The analyser should have as a minimum the following measuring capabilities:

- oxygen (O₂) and/or CO₂, and
- CO.

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NOTE 2 To determine CO₂ levels, some analysers measure O₂ and calculate CO₂ (see Annex A).

Where appliance instructions require oxygen measurement for the excess air factor, the analyser should use an O₂ sensor. In this case, the analyser manufacturer should be consulted to establish that the O₂ sensor is either insensitive to CO₂ or compensated for CO₂.

Commentary on Clause 5: Appliance manufacturers can require the measurement of room temperature, flue gas temperature, air inlet temperature, heating water flow temperature and chimney draught when measuring combustion values in order to provide “benchmark” reference conditions for comparison purposes in the event of subsequent investigation.

Consequently, some analysers have the ability to:

- measure temperature,
- measure pressure (draught),
- automatically record measured values (see Clause 10).

National or local regulations or standards can also require the ability to measure flue gas temperature and/or other parameters.

6 Care, use and maintenance of portable electrical combustion flue gas analyser

6.1 Before use

Analysers should be treated with care, and used and maintained in accordance with the analyser instructions.

Analysers should only be used by a person who:

- is competent in their use, and
- has an understanding of the results obtained and an awareness of the necessary safety actions detailed in the gas appliance instructions and/or national or local regulations or standards.

Before using the analyser, it is essential to read operator manuals and, as appropriate, ensure that:

- a) the batteries are correctly inserted, charged and not leaking,
- b) the analyser has a current proof of calibration:

NOTE The analyser instructions or specific national or local regulations or standards will identify requirements for verifying the proof of calibration of the analyser.

Commentary on b): Some analysers are designed to accept pre-calibrated sensor modules; however, it should not be assumed that fitting a pre-calibrated sensor module will automatically guarantee accurate calibration of the complete instrument, i.e. in combination with the probe.

- c) the display is functioning correctly;
- d) the analyser is zeroed and purged in accordance with the analyser instructions;
- e) the pump is working;
- f) filters and water traps are clean and dry;
- g) the sensor is working correctly, see 6.2;
- h) the sample tubing from the sample probe to the analyser is free from leaks and damage.