



SLOVENSKI STANDARD
kSIST-TP FprCEN/TR 16478:2012
01-september-2012

[Not translated]

Surveillance from first commissioning on measuring devices used in natural gas supply to the installations of the activities under the Directive 2003/87/EC establishing a scheme of CO₂ emissions trading

Ta slovenski standard je istoveten z: FprCEN/TR 16478

ICS:

75.180.30	Oprema za merjenje prostornine in merjenje	Volumetric equipment and measurements
-----------	--	---------------------------------------

kSIST-TP FprCEN/TR 16478:2012 **en**

TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

FINAL DRAFT
FprCEN/TR 16478

June 2012

ICS 75.180.30

English Version

**Surveillance from first commissioning on measuring devices
used in natural gas supply to the installations of the activities
under the Directive 2003/87/EC establishing a scheme of CO₂
emissions trading**

This draft Technical Report is submitted to CEN members for Technical Committee Approval. It has been drawn up by the Technical Committee CEN/SS S12.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a Technical Report. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a Technical Report.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents		Page
Foreword		3
1 Scope		4
2 Terms and definitions		4
3 Surveillance		6
3.1 General		6
3.2 Activities of the surveillance for conversion devices, gas chromatographs and gas meters		6
3.3 Planning of surveillance		6
3.3.1 General		6
3.3.2 First commissioning		7
3.3.3 Specific activities related to warnings from, self-diagnostic means		7
3.3.4 Periodical visual inspection / verification / re-lubrication		7
3.4 Recalibration for gas chromatograph		8
3.4.1 General		8
3.4.2 Specific requirements for surveillance		8
3.5 Specific surveillance activities on gas meters and on gas converters		9
3.5.1 Periodical recalibration		9
3.5.2 Periodical monitoring of the difference of indication of gas meters		10
3.5.3 Monitoring of the changing of the difference of indication of gas meters during operation		12
4 Proposal for a European scheme related to common provisions and limit values		14
4.1 General		14
4.2 Summary of requirements for surveillance on metrological performance		14
Annex A (informative) National Situations regarding Devices Measuring the Supply of Gas		
Natural for the Activities Listed in Annex 1 of ETD		16
A.1 BELGIUM (devices in own Fluxys'Emission Trading Sites)		16
A.2 GERMANY		18
A.3 SPAIN		20
A.4 FRANCE		22
A.5 GREECE		24
A.6 ITALY		27
A.7 SLOVAKIA		30
Bibliography		31

Foreword

This document (FprCEN/TR 16478:2012) has been prepared by “CEN Sector Forum Gas Infrastructure”, the secretariat of which is held by CCMC.

This document is submitted to a Technical Committee Approval.

The document C(2007) 3416 — COMMISSION DECISION of 18 July 2007 (2007/589/EC) establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council — shall be used as common guidelines in the determination of the greenhouse gas emissions for all categories of activities listed in the Annex I of the Directive itself.

In the 5th paragraph of Clause 3, these guidelines establish that “It shall be ensured that the emission determination is systematically neither over nor under true emissions. Sources of uncertainties shall be identified and reduced as far as practicable. (...) All metering or other testing equipment used to report monitoring data shall be appropriately applied, maintained and calibrated, and checked.”

This Technical Report is intended to be used as a guideline in conjunction with the document C(2007) 3416 and to be applied to measuring instrument of natural gas measuring stations based on EN 1776 and possibly stand alone measuring instruments measuring the natural gas used in the categories of activities listed in the Annex I of the Directive 2003/87/EC.

As inside European Union, at the time of writing this document, there is not any common guideline dealing with how to ensure an established difference of indication of a natural gas metering equipment in the use throughout their technical life; there is the risk to manage the greenhouse gas emissions data declared by different Member States that are not completely comparable because of their determination by calculations based on consumption of natural gas data not homogeneous as regard the reliability of the accuracy of their measurements.

The intent of this Technical Report is to give minimum provisions for surveillance in use of natural gas measuring equipment in order to ensure the compliance with an established difference of indication, leading so to comparable greenhouse gas emissions data.

In the same time it is a proposal addressed to the Commission and the Member States to reflect on a consistent procedure enabling an equivalent determination of the CO₂ amounts of emissions across the EU countries.

FprCEN/TR 16478:2012 (E)

1 Scope

This Technical Report establishes minimum provisions for the surveillance, based on available standards, from first commissioning, on the devices and systems with measuring function throughout their technical life when used in the activities of the categories listed in the Annex I of the European Directive 2003/87/EC, in order to ensure the compliance with the expected maximum allowable difference of indication.

This Technical Report applies to devices / systems with the function to measure:

- volumetric or mass amount of natural gas consumption (any type of gas meters),
- volumetric amount of natural gas consumption at specified base conditions (conversion devices),
- composition of natural gas (gas chromatographs),

for calculating, in accordance with the applicable provisions of the guidelines C(2007) 3416, the amount of the CO₂ emissions from the source stream of natural gas.

Users of this document should be aware that more detailed national recommendations/standards and/or codes of practice as well as national measures possibly approved by National Regulator may exist inside the EU Member States.

When national regulations have to be applied, this document should not be considered.

Except in the aforementioned case, this Technical Report is intended to be applied in association with applicable national recommendations/standards and/or codes of practice setting out the above mentioned surveillance provisions.

In the event of conflicts in terms of different requirements in national regulations/standards with the provisions of this document, the national regulations/standards shall take precedence.

Referring to the aforesaid Commission's guidelines C(2007) 3416, SFG_I opts for the calculation based method to determine the amount of the CO₂ emissions.

As regards commercially traded of natural gas, competent Authorities may permit the determination of the annual gas consumption leading to evaluation of CO₂ emissions based solely on the invoiced amount of gas without further individual proof of associated uncertainties, provided that national legislation or the documented application of standards ensures that respective uncertainty requirements for activity data are met for commercial transactions (guidelines C(2007) 3416 -annex 1 §7).

Referring to 5.2 and to Chapter 16, annex 1 of guidelines C(2007) 3416, for installations with “de minimis” source streams and with low emissions respectively, the provisions of this document can be waived.

2 Terms and definitions

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

NOTE The pilot terms are listed in alphabetic order. The derived terms from a pilot term, if any, are listed in the appropriate order just after the relevant pilot term.

2.1

competent person

person who is trained, experienced and approved to perform measuring surveillance activities

Note 1 to entry: Adapted from EN 12186:2000.

2.2**difference of indication**

difference between the indicated value V_m of a device with measuring function and the one of a reference instrument V_r for a specific operating datum of the same measurand expressed as percentage of the value measured by the reference instrument:

$$D = \frac{V_m - V_r}{V_r} \times 100$$

2.3**System Operator**

SO

natural or legal person who carries out the function of transmission and/or distribution and is responsible for operating, ensuring the surveillance of, and, if necessary, developing the transmission and/or distribution system/s in a given area and, where applicable, their interconnections, and for ensuring the long-term ability of the system to meet reasonable demands for the transportation and/or distribution of gas

2.4**maximum allowable difference**

maximum absolute value of the difference of indication

2.5**measuring device**

measuring instrument capable to measure a process datum (e.g. gas meters, pressure transducer, pressure indicator, temperature transducer, etc.)

2.6**measuring systems**

assembly of several measuring devices capable to measure a process datum via several other process data (e.g. a gas meter + pressure and temperature transducer + conversion device)

[SOURCE: MID, Directive 2004/22/EC of the European Parliament and the Council of 31 March 2004 on measuring instruments]

2.7**recalibration**

activities consisting in the verification that the differences of indication of a device with measuring function are within the limits specified in the relevant standard and re-alignment of the indication when needed

2.8**self-diagnostic**

mean, e.g. software, capable to warn when the measuring device / system is not operating properly

2.9**self-recalibration**

recalibration activity carried out automatically by the measuring device itself, e. g. gas chromatograph

2.10**significant parameter**

measurable characteristic involved in the measuring process (of the measuring devices / system) which, in case of drift out from pre-established limits, may imply errors of the measuring process (e.g. when in an ultrasonic gas meter, the transient times reflect a significant different speed of sound for one of the paths compared with the average speed of all paths)

Note 1 to entry: This document considers following limits for significant parameter:

FprCEN/TR 16478:2012 (E)

- **normal thresholds:** the maximum and/or minimum values of a significant parameter identified in the type test of a measuring device / system for normal operating conditions; when these limits are met it is presumed that the necessary conditions for proper measurements occur;
- **care thresholds:** values of a significant parameter still ensuring proper measurement but signalling the risk that the significant parameter may further drift and reach the alarm level;
- **alarm thresholds:** values of a significant parameter that imply unacceptable differences of indication of the measuring process and that, when they occur, require the activation of corrective actions to reestablish the necessary conditions under which it is presumed that proper measurement process occurs.

2.11

warnings

visible / perceptible signal noticing that malfunctions have occurred in the measuring device / system

3 Surveillance

3.1 General

All those activities carried out from the 1st commissioning of measuring devices / systems throughout their technical life until the last de-commissioning aimed at ensuring that the differences of indication during the operating life are not higher than the maximum allowable difference.

3.2 Activities of the surveillance for conversion devices, gas chromatographs and gas meters

The activities of the surveillance should include:

- a) First commissioning;
- b) Specific activities related to warnings from self-diagnostic means only where applicable;
- c) Periodical:
 - 1) visual inspection and
 - 2) verification and
 - 3) re-lubrication where requested as per the relevant maintenance manual
- d) Recalibration applicable only to gas chromatograph; periodical recalibration applicable to gas meters and converters;
- e) Periodical monitoring of the difference of indication and, when needed, subsequent recalibration (not applicable to gas chromatograph).

The System Operator fulfilling activities d) does not need to consider the activities e).

3.3 Planning of surveillance

3.3.1 General

The stability during operation of the metrological performance depends on both the measuring equipment and the operating conditions. When establishing the surveillance policy, the following should be considered: the specific composition of fuel gas, the specific location and layout of the measuring system (e.g. redundancy of measuring devices), the reliability of the historical measured-performance data, the measuring-reliability of the stations, the impact of the difference of indication on the involved parties (e.g. global amount of measured gas, uncertainty thresholds requested by the document C(2007) 3416,

etc.), the need for the continuity of the gas supply, the presence of the auto-diagnosis function and any other elements that may affect the measuring-performances of any measuring devices / systems.

For the surveillance activities on devices/systems with measuring controls it should be considered that:

- the 1st commissioning takes place only at initial start up of a single new measuring device / system / stations,
- the periodical monitoring of the difference of indication should be followed by a subsequent recalibration only when needed as described in 3.5.2;

and the advantage to combine, for each intervention at site, surveillance activities for other equipment of the same installation.

3.3.2 First commissioning

The 1st commissioning should be carried out in accordance with:

- national regulations/standards where available;
- codes of practices of System Operator (SO)

but at least according to this guideline in case of lack of national regulations/standards or codes of practice.

The task of 1st commissioning should include following verifications:

- the conformity of installation with the applicable prescriptions;
- compliance with MID or national standards for meters, converters and other measuring devices where applicable (markings and integrity of the seals);
- a self calibration of gas chromatographs (followed by self-recalibrations which take place periodically);
- the availability of the relevant user's manual and test certificate according to relevant standard.

3.3.3 Specific activities related to warnings from, self-diagnostic means

Where measuring devices and/or systems provide specific warnings, in case of their activation the recommended actions detailed in the relevant user's manual should be implemented within due time in accordance with the provisions in force.

3.3.4 Periodical visual inspection / verification / re-lubrication

Commonly the periodical specific visual inspections / verifications / re-lubrication activities are listed and described in the concerned use/maintenance manual.

In general these activities should be carried out in the period between two consecutive recalibrations and/or monitoring of the difference of indication. The activities listed in Table 1 should be selected by the operator, where applicable.

FprCEN/TR 16478:2012 (E)

Table 1 — Periodical visual inspection / verification and maintenance (meters + converters) ¹⁾

Description of the activities	Equipment concerned	Acceptance criteria
Visual inspection of external conditions of indicating device	All measuring devices	No visible damages, Readable over operating temperature range
		External Surface protection in normal conditions
		No any abnormal corrosion
Noise emissions	Measuring devices with mobile parts (e.g. turbine gas meters)	No any emission of abnormal noise
Verification of: <ul style="list-style-type: none"> ➤ cleaning, ➤ external aspect and ➤ dimensions of orifice plate and other internal parts	Orifice meters	As per the relevant standard and user's manual
Maintenance activities (e.g. lubrication and re-lubrication) as listed in the user's manual	Those measuring devices for which the use/maintenance manual specifies the need of periodical re-lubrication	As per relevant use/maintenance manual

3.4 Recalibration for gas chromatograph

3.4.1 General

The gas chromatograph is a measuring device that can undertake self-recalibration at periodical interval or can be calibrated regularly.

For this equipment the self-recalibration or regularly calibration together with the activities outlined in a), b) and c) of 3.2 should be sufficient to ensure that the specified metrological performances are met.

3.4.2 Specific requirements for surveillance

The planning of surveillance should consider:

a) the frequency of self recalibration should be established on the basis of:

- 1) national regulations/standards where available,
- 2) code(s) of practice of System Operator

but at least according to this guideline in case of lack of national regulations/standards.

The above approach should evaluate following pre-conditions:

- the installation conditions (temperature, protection, etc.) of the bottles of gas samples should be carried out as per the recommendations listed in the relevant installation manual;

1) The applicable activities to be complied with should be selected by the operator.

- the replacement of the bottles of gas samples should be done as per the recommendations listed in the installation manual; the composition of the gas sample should be certified by an accredited test laboratory;
- the electronic memory of gas chromatograph should give evidence of an appropriated number of last automatic self-recalibration carried out (e.g. 10 last self-recalibrations) as well as the relevant errors of indication based on a statistical data collection; all these historical data should be periodically examined by a competent person to evaluate whether there is a need to introduce some corrective actions aimed to ensure in the time the expected reliability of the metrological performance.

Further it shall be noted that the examination of historical data should comply with national regulations / standards where available.

3.5 Specific surveillance activities on gas meters and on gas converters

3.5.1 Periodical recalibration

3.5.1.1 General

System Operators carrying out the surveillance on gas meters and on converter according to the method described in this subclause would not need to consider the method of surveillance described in 3.5.2.

The method of recalibration should be that followed for calibration as per the relevant standard.

The minimum frequency should be established on the basis of:

- national regulations/standards where available,
- codes of practice of System Operator (SO) in case of lack of national regulations/standards but at least on the basis of the frequencies showed in Table 2 of this guideline.

3.5.1.2 Specific conditions for a decreasing of the frequency of periodical recalibrations for gas meters equipped with self-diagnostic means

Where the gas meters are equipped with self-diagnostic means and the periodical recalibration method has been chosen for the surveillance in use, the System Operator can prolong the pre-established period of time between two subsequent recalibrations if the self-diagnostic function is capable to detect care threshold and alarm threshold for significant parameters.

Some gas meters, e.g. the ultrasonic and Coriolis gas meters, are equipped with self-diagnostic software capable to warn when the necessary conditions for proper measurement are not met. These conditions are often identified by limiting minimum and maximum values for certain diagnostic functions or parameters. Practically the warning consists of alarms that notify that some significant measuring parameters are outside the identified limits.

For example in the ultrasonic meters it is very common to introduce some limits for the differences of the various speeds of sound calculated for each path from the average speed of sound of all paths. In other words when these limits are exceeded the cause (dirty, fault, etc.) should be traced and investigated and appropriate corrective actions implemented.

The self-diagnostic function can detect following two different warnings for a significant measuring parameter:

- a care threshold (e.g. yellow light) or
- an alarm threshold (e.g. red light).