



NSAI
Standards

Irish Standard
I.S. EN 12405-3:2015

Gas meters - Conversion devices - Part 3: Flow computer

I.S. EN 12405-3:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 12405-3:2015 is the adopted Irish version of the European Document EN 12405-3:2015, Gas meters - Conversion devices - Part 3: Flow computer

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EUROPEAN STANDARD

EN 12405-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2015

ICS 91.140.40

English Version

Gas meters - Conversion devices - Part 3: Flow computer

Compteurs de gaz - Dispositifs de conversion - Partie 3:
Calculateurs de débit

Gaszähler - Umwerter - Teil 3: Flowcomputer

This European Standard was approved by CEN on 19 September 2015.

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European foreword

This document (EN 12405-3:2015) has been prepared by Technical Committee CEN/TC 237 “Gas meters”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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

EN 12405 consists of the following parts:

- Part 1: Volume conversion (and its amendments EN 12405-1:2005/A1:2006 and EN 12405-1:2005+A2:2010 to allow the harmonization of the standard with the Measuring Instruments Directive 2004/22/EC);
- Part 2: Energy conversion;
- Part 3: flow computer (this European Standard).

In the preparation of this European Standard, the content of OIML Publication, “Recommendation 140 – measuring systems for gaseous fuel”, has been taken into account.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 12405-3:2015 (E)

Introduction

A high accuracy volume conversion device can be needed depending of the intended use. EN 12405-3 is established in order to meet severe requirements concerning accuracy and related functions.

For the purpose of this European Standard, functions are described, although these functions can be physically located in different components (e.g. calibration curve programmed in the measuring equipment itself or in the calculator).

Four main categories of functions are described to achieve data processing:

- Sensor signal Acquisition functions: to process signals from physical quantity provided by sensors and transducers to measurands;
- Sensor functions: to convert measurands to correct measurements, mostly based upon calibration results and filtering procedures;
- Metering functions: to calculate derived values such as volume, calorific value, compression factor etc. based upon international standards and formulas and to take care of the supervision and monitoring for the purpose of high accuracy and substitution values;
- Long Term Data Storage functions: to keep all relevant information necessary to construct or reconstruct calculated values:
 - for later legally relevant purposes (e.g. the conclusion of a commercial transaction);
 - for back up of the relevant data.

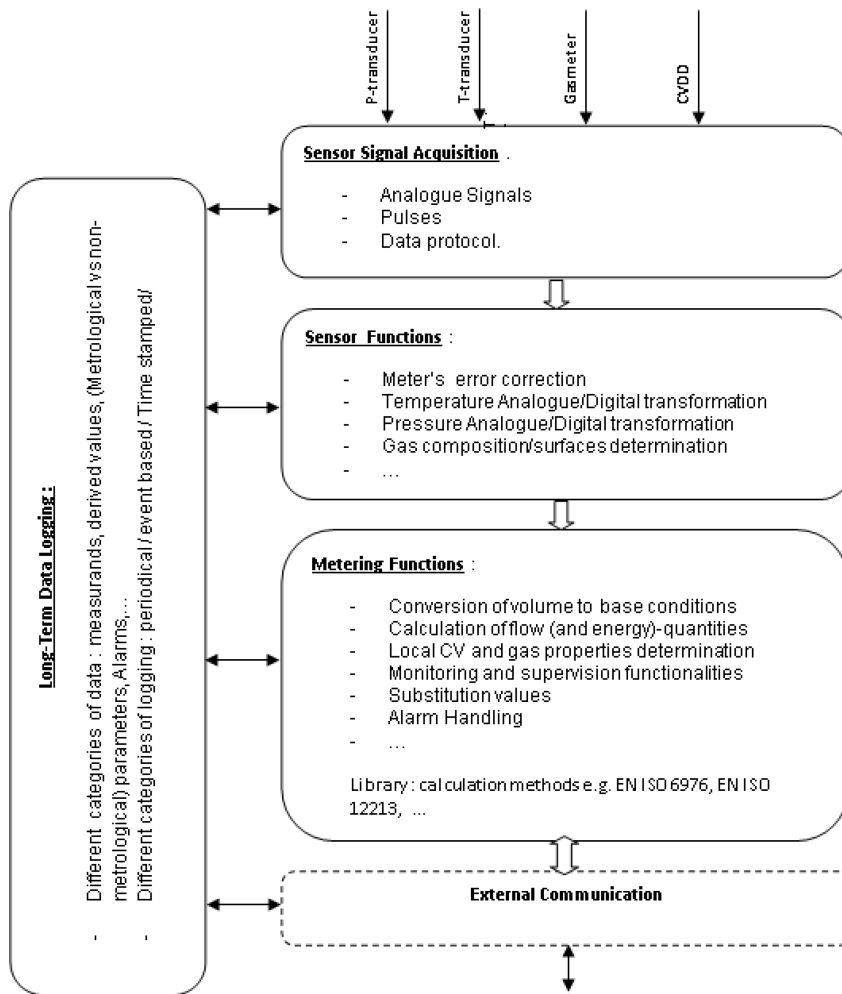


Figure 1 — Description of the functionalities of the flow computer calculator

Modular and global approaches

In the modular approach, the flow computer is an assembly of separate associated measuring instruments and a calculator, which are verified separately. Each instrument is verified according to its testing procedure, using the indication available on the calculator or on the associated measuring instrument itself. In this case, the indication shall correspond to the indication of that measuring instrument, which is directly performing volume conversion. The verification of the functions consists in verifying the calculation concerning each characteristic quantity of the gas and/or the calculation for the volume conversion.

In case of external communication, sufficient resolution of required data is ensured during data transmission.

The associated measuring instruments are validated for or with a type calculator in order to ensure the interoperability of the association.

CVDD is covered in EN 12405-2.

In the global approach, the flow computer is tested as a package including the calculator and its associated measuring instruments and functions.

The testing procedures are given in Annex A.

EN 12405-3:2015 (E)**1 Scope**

Part 3 of this European Standard specifies the requirements and tests for the construction, performance, safety and conformity of flow computers (FCs) used to meet the metrological and technical requirements of a high accuracy volume conversion device.

They are used to determine volume of fuel gases, including those of the first and second families according to EN 437.

For the purpose of this European Standard, only flow computers that are intended to operate with ultrasonic meters according to ISO 17089-1 or gas turbine meters conforming to EN 12261 are considered.

For the purpose of this European Standard only classification classes E2 and M1 are considered for the flow computer calculator.

FCs are equipped with external separate transducers for pressure and temperature which may be approved separately.

The provisions concerning pressure and temperature transducers are given in Annex B and C.

Requirements and tests are given for energy calculator in EN 12405-2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 437, *Test gases — Test pressures — Appliance categories*

EN 1776, *Gas supply systems — Natural gas measuring stations — Functional requirements*

EN 12261, *Gas meters — Turbine gas meters*

EN 12405-1:2005+A2:2010, *Gas meters — Conversion devices — Part 1: Volume conversion*

EN 12405-2, *Gas meters — Conversion devices — Part 2: Energy conversion*

EN 55011, *Industrial, scientific and medical equipment — Radio-frequency disturbance characteristics — Limits and methods of measurement (CISPR 11, modified)*

EN 60068-2-1, *Environmental testing — Part 2-1: Tests — Test A: Cold (IEC 60068-2-1)*

EN 60068-2-2, *Environmental testing — Part 2-2: Tests — Test B: Dry heat (IEC 60068-2-2)*

EN 60068-2-30, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30)*

EN 60068-2-31, *Environmental testing — Part 2-31: Tests — Test Ec: Rough handling shocks, primarily for equipment-type specimens (IEC 60068-2-31)*

EN 60068-2-64, *Environmental testing — Part 2-64: Tests — Test Fh: Vibration, broadband random and guidance (IEC 60068-2-64)*

EN 60068-2-78, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state (IEC 60068-2-78)*

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