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مشخصات فنی خرید

دستگاه الکترونیکی تصحیح کننده حجم گاز کنتورهای گاز

Gas Meters , Gas Volume Electronic Conversion Device (PTZ)



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باسلام،

به استحضار می‌رساند در جلسه ۱۹۹۷ مورخ ۱۴۰۱/۱۱/۰۲ هیأت مدیره، نامه شماره بگ/دب/۰-۱۶۸۶۱۱/۰۰۰/۹ مورخ ۱۴۰۱/۱۰/۱۴ آن مدیریت در مورد تصویب نهایی مقررات فنی شرکت ملی گاز ایران به شرح زیر مطرح و مورد تصویب قرار گرفت.

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Foreword

This standard specification is intended to be mainly used by N.I.G.C. and contractors, and has been prepared base on interpretation of recognized standards and technical documents, as well as knowledge, backgrounds and experiences in gas industries at national and international levels.

Iranian Gas Specification (IGS) are prepared, reviewed and amended by technical standard committees within NIGC standardization division of research and technology management and submitted to "the standards council of NIGC" for approval.

IGSs are subjected to revision, amendment or withdrawal, if required, and thus the latest edition of IGS shall be checked / inquired by NIGC'S users.

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The technical standard committee welcomes comments and feedbacks from concerned or interested corporate and individuals about this standard, and may revise this document accordingly based on the received feedbacks.

General Definitions

Throughout this standard the following definitions, where applicable, should be followed:

- 1- "STANDARDIZATION DIV." is organized to deal with all aspects of industry standards in NIGC. Therefore, all enquiries for clarification or amendments are requested to be directed to mentioned division.
- 2- "COMPANY": refers to National Iranian Gas Company (NIGC).
- 3- "SUPPLIER": refers to a firm who will supply the service, equipment or material to IGS specification whether as the prime producer or manufacturer or a trading firm.
- 4- "SHALL ": is used where a provision is mandatory.
- 5- "SHOULD": is used where a provision is advised only.
- 6- "MAY": is used where a provision is completely discretionary.

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1. SCOPE

This standard together with the appendices specifies the minimum requirements and tests for the construction, performance, design, material, safety and conformity of gas – volume electronic conversion devices associated to gas meters, used to Measure volumes of natural gases. (Fuel gas composition is according to IGS-M-CH-033)

Only second kinds of conversion is treated in this standard:

Conversion as a function of the pressure and of the temperature with constant compression factor (called PT conversion);

Conversion as a function of the pressure and of the temperature and taking into account the compression factor (called PTZ conversion)

For application of this document, a conversion device may be, as a choice of the manufacturer, considered as a complete instrument (Type 1) or made of separate elements (Type 2), according to the definitions given in 3.1.20.1 and 3.1.20.2.

Gas – volume conversion devices consist of a calculator, a temperature transducer And a pressure transducer locally installed.

This standard is according to EN 12405-1:2021 (E) but with the following requirements, which have been mention at this standard.

Note: Base conditions in this standard are: $P_b = 1.01325 \text{ bar}$ (14.696 psia) and $T_b = 15.56 \text{ °C}$ (60 °F)

2. REFERENCE

Throughout this standard the following standards and cods are referred to

EN 12405-1:2021: Gas meters conversion devices part 1: volume conversion

IGS-CH- 033(0): 2004: Quality Specification for Pipeline Natural Gas

3. DEFINITIONS

3.1 absolute static pressure

Value of the static pressure of the gas relative to vacuum

3.1.1 adjustment

Set of operations carried out on a measuring system so that it provides prescribed indications corresponding to give values of a quantity to be measured

3.1.2Base conditions

Fixed conditions to which a volume of gas is converted (e.g. base gas temperature 273, 15 K plus 15 K at base gas pressure of 1 013, 25 mbar)

3.1.3 Calculator

Electronic device that receives the output signals from the associated gas meter and transducers and processes them.

3.1.4 conversion factor

Factor equal to the volume at base conditions divided by the corrected volume, or if there is no gas meter Correction, equal to the volume at base conditions divided by the volume at measurement conditions

3.1.5 Conventional true value (of a quantity)

Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose

3.1.6 Corrected volume

Volume at measurement conditions corrected for the error curve of the gas meter

3.1.7 Correction

Value added algebraically to the uncorrected result of a measurement to correct the systematic error

3.1.8 Correction factor

Numerical factor by which the measured volume is multiplied to correct it to compensate the error curve of the gas meter

3.1.9 display

Device which shows information from the meter (e.g. liquid crystal that display registers, volume or flags)

3.1.10 disturbance

Influence quantity having a value within the limits specified but outside the specified rated operating conditions of the measuring instrument

Note 1 to entry: An influence quantity is a disturbance if the rated operating conditions for that influence quantity are not specified.

3.1.11 durability

Ability of an instrument to maintain its performance characteristics over a specified period of use

3.1.12 environmental class

Class referring to the ambient temperature, humidity and power supply

3.1.13 error of conversion

Difference between the conversion factor C displayed by a conversion device and the conventional true value

of the conversion factor CCV, expressed as a percentage of the conventional true value of the conversion factor

3.1.14 error of indication

Value which shows the relationship in percentage terms of the difference between the volume indicated by

the meter and the volume which has actually flowed through the meter, to the latter value

Note 1 to entry:

$$E = 100 \frac{V_i - V_c}{V_c}$$

where

V_i is the indicated volume;

V_c is the volume which has actually flowed through the meter.

3.1.15 error of the calculator unit

Error of the indicated volume at base conditions V_b , when the gas volume, pressure and temperature are

Simulated by signals, in accordance to the manufacturer specification of interfaces

Note 1 to entry: The calculator error includes all conversion errors with the exception of the pressure and temperature

Transducer errors (i.e. signal conditioning, Z factor calculation (if applicable), other mathematical calculations, etc.).

3.1.16 error of the pressure transducer

Difference between the measured output signals from the pressure transducer and the nominal signal at the applied physical value

3.1.17 error of the temperature transducer

Difference between the measured output signals from the temperature transducer and the nominal signal at the applied physical value

3.1.18 gas-volume conversion device

device that computes, integrates and indicates the volume increments measured by a gas meter if it were operating at base conditions, using as inputs the volume at measurement conditions as measured by the gas meter, and other parameters such as gas temperature and gas pressure

Note 1 to entry: The conversion device can also compensate for the error curve of a gas meter and associated measuring transducers.

Note 2 to entry: The deviation from the ideal gas law can be compensated by the compression factor.

3.1.19.1 Gas volume conversion device type 1 (complete system)

Conversion device with specific types of transducers for pressure and temperature or for temperature only

3.1.19.2 Gas volume conversion device type 2 (separate component)

Conversion device with external separate transducers for pressure and temperature or for temperature only and for separate calculator, which may be approved separately

Note 1 to entry: The matching of the various elements constituting a conversion device type 2 is subjected to verification.

3.1.20 indicating device

Part of a measuring instrument that displays an indication (alphanumeric string)

3.1.21 influence factor

Influence quantity having a value within the specified rated operating conditions of the measuring instrument

3.1.22 Influence quantity

Quantity that is not a measurand but that affects the result of the measurement (e.g. ambient temperature)

3.1.23 intrinsic error

Error of a measuring instrument, determined under reference conditions

3.1.24 maximum operating pressure MOP

Maximum pressure at which a system can be operated continuously under normal conditions

Note 1 to entry: Normal conditions are: no fault in any device or stream.

3.1.25 measurement conditions

Conditions of the gas, the volume of which is measured at the point of measurement (e.g. the temperature and
The pressure of the gas)

3.1.26 measuring transducer

Device that provides an output quantity having a determined relationship to the input quantity

Note 1 to entry: The transducer can include a transmitter that provides an output to the calculator.

3.1.27 memory

Element which stores digital information

3.1.28 overpressure

Maximum static pressure to which the transducer may be submitted without durable alteration of its metrological characteristics: it is set in accordance with the maximum allowable pressure

3.1.29 rated operating conditions

Values for the measurand and influence quantities making up the normal working conditions of an instrument

3.1.30 reference conditions

Condition of use prescribed for testing the performance of a measuring instrument or for inter-comparison of results of measurements

3.1.31 sensor

Element of a measuring instrument or measuring chain that is directly affected by the measurand

3.1.32 specified measuring range of transducers

Set of values of measurands (the pressure for the pressure transducer or temperature for the temperature transducer) for which the errors of the conversion device are intended to lie within the limits specified in this European standard

Note 1 to entry: The upper and lower limits of the specified measuring range are called maximum value and minimum value respectively.

EXAMPLE Maximum absolute pressure: 12 bar; minimum absolute pressure: 4 bar.

3.1.33 specified field of measurement of a conversion device

Set of values at measurement conditions for which the errors of the conversion device are within specified limits

Note 1 to entry: A conversion device has a measuring range for every quantity that it processes.

Note 2 to entry: The specified field of measurement applies to the characteristic quantities of the gas that are used to determine the conversion factor.

3.1.34 static gauge pressure

Value of the static pressure of the gas relative to the ambient atmospheric pressure

3.1.35 uncertainty of value

Parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand

3.1.36 volume

Volume without specifying whether it is a corrected volume at measurement conditions or an uncorrected volume at measurement conditions

3.1.37 measurand

Particular quantity subject to measurement

3.1.38 critical change value

Value at which the change in the measurement result is considered undesirable

3.2 Symbols

For the purposes of this document, the symbols listed in Table 1 apply.

Table 1 — Symbols

Symbols	Represented quantity	Units
V	volume: V _m or V _c	m ³
V _m	volume at measurement conditions	m ³
V _c	corrected volume (gas meter error)	m ³
V _b	volume at base conditions	m ³
VCV	conventional true value of the volume	m ³
C	conversion factor	-
C _c	calculator conversion	-
C _f	correction factor	-
CCV	conventional true value of the conversion factor	-
f(Q)	correction function	-
K or K'	coefficients	-
p	absolute pressure at measurement conditions	bar or MPa
p _b	absolute pressure at base conditions	bar or MPa
p _g	gauge pressure	bar or MPa
pCV	conventional true value of the absolute pressure	bar or MPa
T	absolute temperature at measurement conditions	K
T _b	absolute temperature at base conditions	K
T _{min}	minimum absolute temperature	K
T _{max}	maximum absolute temperature	K
TCV	conventional true value of the absolute temperature	K
Z	compression factor of the gas at measurement conditions	-
Z _b	compression factor of the gas at base conditions	-
ZCV	conventional true value of the compression factor	-
p _{atm}	atmospheric pressure	bar or MPa
p _{max}	maximum absolute gas pressure	bar or MPa
p _{min}	minimum absolute gas pressure	bar or MPa
Q	flowrate	m ³ /h
Q _{max}	maximum flowrate	m ³ /h
Q _{min}	minimum flowrate	m ³ /h
t _{am}	ambient temperature	°C