

METHODOLOGY OF INSPECTION OF GAS METERS

Khojjiyev Mamurjon Yangiboyevich

Bukhara Engineering-Technological Institute

Senior lecturer of the "Metrology and standardization" department (PhD)

mxojjiyev@bk.ru

Karshiyev Zohidjon Abdirahim o'g'li

Bukhara Engineering-Technological Institute

Teacher-intern of the "Metrology and Standardization" department

МЕТОДИКА ПРОВЕРКИ СЧЕТЧИКОВ ГАЗА

Хужжиев Мамурджон Янгибаевич

Бухарский инженерно-технологический институт

Старший преподаватель кафедры «Метрология и стандартизация»(PhD)

Қаршиев Зоҳиджон Абдирахимович

Бухарский инженерно-технологический институт

Преподаватель-стажер кафедры «Метрология и стандартизация»

Annotation

In this article testing of measuring instruments specified in the type description of measuring instruments. At present, the majority of household gas meters are checked by individual inspection methods, i.e., in accordance with GOST 8.324-2002, and proposals for household inspection of households by accredited organizations have been developed and information has been clarified.

Аннотация

В данной статье рассмотрены испытания средств измерений, указанные в описании типа средств измерений. В настоящее время большинство бытовых счетчиков газа проверяются индивидуальными методами проверки, т.е. в соответствии с ГОСТ 8.324-2002, а также разработаны предложения по проведению бытового осмотра домовладений аккредитованными организациями и уточнены сведения.

Key words: GOST 8.324–2002, GOST 8.324, measuring unit, measuring instrument, calibration, comparative analysis, standard requirement.

Ключевые слова: ГОСТ 8.324–2002, ГОСТ 8.324, единица измерения, средство измерений, калибровка, сравнительный анализ, требования стандарта.

Introduction

Currently, most household gas meters are tested using individual testing methods or in accordance with GOST 8.324–2002.

The gas meter is supposed to be checked on inspection devices after disassembly from the gas pipeline using air as a test device. Checking household gas meters without removing them from the gas pipeline, but they are not published by the manufacturers as methods of checking. However, some accredited organizations offer and conduct. To simplify the process of organizing the inspection of household gas meters for their owners, the new edition of GOST 8.324 establishes the methodology for on-site inspection of household gas meters using natural gas as a means of inspection.

Also, the updated GOST 8.324 regulates the procedures for checking the tightness of the meter and checking the operation of the meter when exposed.

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-4, ISSUE-11

The updated GOST 8.324 contains the necessary requirements for checking gas meters. Some rules and sections of the standard are recommended and used in the development of individual inspection methods for certain types of gas meters.

The international standard GOST 8.324–2002 is being updated. Gas meters. Verification methodology” [2]. As part of the update of the standard, the authors have developed a number of important changes and additions aimed at solving the problems that arise in this area. Mandatory periodic inspection of household gas meters by owners of apartments and private households. The costs of using the meter, including the costs of its maintenance and inspection. When the next inspection is due, certain rules must be followed to ensure that the owner of the meter is contacted. Gas service service with a request to dismantle the meter, transportation of the dismantled meter to an accredited organization for inspection;

Rules of inspection:

"On the approval of the procedure for checking measuring instruments, requirements for the inspection mark and the content of the inspection certificate" [1] during the inspection of measuring instruments, it is carried out according to the specified inspection method. For the purpose of type approval, measuring instruments and testing of measuring instruments specified in the type description. At present, most of the household gas meters are tested according to GOST 8.324–2002 [2] using individual testing methods. Accredited organizations offer households to check the gas meter without disassembling it, by connecting the calibrator to the gas pipe between the device under test and the existing gas equipment. .

Additional features

GOST 8.324 Organization of inspection of household gas meters for their owners to simplify the process. The new edition of GOST 8.324 also establishes a methodology for inspection of household gas meters at the place of use using natural gas as a test tool, which includes several steps. Before the inspection, the inspection device (standard) is stored according to the requirements at the workplace. Stay in the room for at least 2 hours to reduce the temperature. During this time, turn off the gas supply in advance, disconnect the meter from the gas supply line and test the meter [3]. In GOST 8.324-2002, one of the conditions for submitting an invoice is proof of this - the presence of a test report, for density, but for checking for the procedure, there are no requirements for test equipment, and it is not specified who will carry it out, it is the owners of the meter and the organizations that carry out the inspection raises questions between [4].

When conducting the inspection, it is necessary to take into account the differences in the subjects temperature and pressure of the medium measured in the meter and standard. If the temperature of the environment (air) measured in laboratory conditions does not change on the counter and in standard practice, then when checking the meter on site using natural gas, the temperature difference can be significant. A change in temperature along with a change in pressure causes a change in density along the length of the gas pipe. For example, the fact that the temperature difference between the meter and the standard is 1 °C and the pressure drop between the meter and the standard of 300 Pa is not taken into account (equal to the maximum permissible pressure drop per head) Additional method of checking the meter according to GOST R 8.915–2016 [7] gives a relative error: ± 0.35 and $\pm 0.3\%$, respectively. This leads to non-objective inspection results, in which the working gas meter can be considered incorrect.

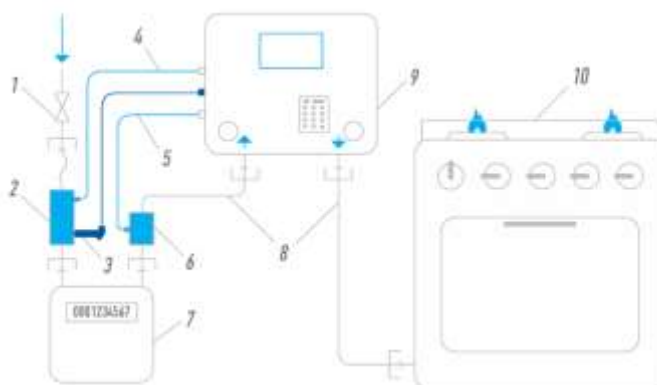


Figure 1: Connection diagram of the testing outfit for on-site calibration of gas meters: 1 – gas valve; 2 – adapter for connecting a thermometer and taking pressure at the inlet of the meter; 3 – thermometer; 4, 5 – pressure take-off tube; 6 – adapter for the pressure take-off at the outlet of the meter; 7 – calibrated gas meter; 8 – connecting pipe; 9 – standard (testing outfit); 10 – gas-using equipment

In this regard, it is necessary to control the temperature and pressure of the gas when performing on-site testing, not only at the entrance to the building where the test will be conducted, but also at the entrance, the meter must be adjusted. As a result, the meter must be connected to the gas supply line through an adapter with a fitting for connecting the means for measuring the temperature and pressure at the entrance to the meter, as shown in the figure [6]. An adapter with an output device should also be installed across the meter to monitor the drop in pressure at its outlet. Next, connect the standard to the gas supply line, between the meter and the gas-using equipment, check the tightness of the connections in accordance with the operating documents of the inspection standard, and conduct an inspection. If a heat-insulated supply (hose) with a length of no more than 1.5 m is used to connect the meter to the standard and there are no sources of heat and cold, it is allowed not to measure the gas temperature at the entrance to the meter being tested. 1 m distance. When checking meters with temperature correction of the measured volume, the gas temperature at the entrance to the meter is not measured, but the volume is set to a temperature of 20 ° C in the standard measurement mode.

In addition, the new edition of GOST 8.324 introduced previously unregulated verification of the performance of meters, when the gas is exposed to a magnetic field, in addition, the types of meters that the manufacturer operates according to the documents, metrological and technical specifications of the meter of the influence of the magnetic field. This new innovation aims to detect gas meters that have been modified to tamper with readings by magnetically affecting the operation of the meter mechanism. Taking into account the fact that such gas meters can pose a danger to life during operation, the process of calibration of measuring devices is considered important.

In conclusion, we can say that GOST 8.324 contains the necessary requirements for checking gas meters. It is recommended to use separate rules and sections of the standard when developing individual inspection methods for certain types of gas meters. Counters that can be used for GOST 8.324, the procedure for checking their type as a document has been optimally improved on the basis of standards, so we can say that compliance with the standard requirements of each measuring instrument in the field of metrology means saving human life and nature.

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-4, ISSUE-11

Literature

1. ГОСТ 8.324–2002. Государственная система обеспечения единства измерений. Счетчики газа. Методика поверки [Электронный ресурс]. Режим доступа: <http://docs.cntd.ru/document/1200032261> (дата обращения: 07.02.2019).
2. МИ 2944–2005. Счетчики газа бытовые. Методика поверки на месте эксплуатации с помощью эталонного счетчика [Электронный ресурс]. Режим доступа: <http://gostrf.com/normadata/1/4293788/4293788971.pdf> (дата обращения: 07.02.2019).
3. МИ 3400–2013. Счетчики объема газа. Методика поверки на месте эксплуатации установкой поверочной СПУ-3 [Электронный ресурс]. Режим доступа: <http://normativ.su/catalog/69368.php> (дата обращения: 07.02.2019).
4. ГОСТ Р 8.915–2016. Государственная система обеспечения единства измерений. Счетчики газа объемные диафрагменные. Общие технические требования, методы испытаний и поверки [Электронный ресурс]. Режим доступа: <http://docs.cntd.ru/document/1200137302> (дата обращения: 07.02.2019).
5. Rajabovich, S. R. (2024). Methods Of Improving Technological Quality In Cleaning Grain Mixtures From Waste Based On Gost Requirements. *Texas Journal of Multidisciplinary Studies*, 29, 127-130.
6. Хужжиев, М. Я., & Салимова, З. С. (2021). Очистка природного газа от меркап и серных растворов. *Universum: технические науки*, (3-3 (84)), 83-86.
7. Хужжиев, М. Я., Бабаев, Ф. Ф., & Тиллаева, Ш. Ф. (2022). ТЕХНОЛОГИЯ ПОЛУЧЕНИЯ БИОГАЗА ПУТЕМ ПЕРЕРАБОТКИ ОТХОДОВ, ВЫБРАСЫВАЕМЫХ ИЗ ГОРОДСКИХ КАНАЛИЗАЦИЙ. *Universum: технические науки*, (4-10 (97)), 22-24.