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OF THE PEOPLE'S REPUBLIC OF CHINA

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CJ/T 112-2008

Replacing CJ/T 112-2000

Integrated circuit card diaphragm gas meter

IC 卡膜式燃气表

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Foreword

This standard shall, from the date of implementation, replace CJ/T 112-2000 “Integrated circuit card diaphragm gas meter for household use”.

In the development process, this standard makes reference to EN 1359 “Gas meter - Diaphragm gas meters”. This standard is the revision of CJ/T 112-2000 “Integrated circuit card diaphragm gas meter for household use”. As compared with CJ/T 112-2000, the main changes are as follows:

- ADD the application scope of integrated circuit card diaphragm gas meter; INCREASE the maximum flow rate from 10 m^3/h to 160 m^3/h; CHANGE the standard name into “Integrated circuit card diaphragm gas meter”;
- CANCEL the memory card;
- CANCEL the IC card gas meter using AC power supply;
- ADD the service life requirements for built-in battery;
- ADD the appearance requirements for IC card gas meter;
- In the environmental requirements, ADD the requirements for IC card gas meter storage temperature;
- CHANGE the enclosure protection level from IP31 to IP53;
- ADD the electrostatic protection requirements;
- ADD the quiescent current and maximum operating current requirements;
- ADD the conversion error requirements;
- ADD the security requirements.

This standard was proposed by the Ministry of Housing and Urban-Rural Development Standard Quota Study Institute.

This standard shall be under the jurisdiction of the Ministry of Housing and Urban-Rural Development Urban Gas Standard Technical Unit - North China Municipal Engineering Design and Research Institute.

The main drafting organizations of this standard: Urban Construction Research Institute, Dandong Sikai Electronic Development Co., Ltd., Zhengzhou Anran I&C Equipment Co., Ltd., Hangzhou Pioneer Electronic Technology Co., Ltd., Shandong Jining Lanwei Intelligent Network Center, Dandong Thermal

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Integrated circuit card diaphragm gas meter

1 Scope

This standard specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of IC card diaphragm gas meters with a maximum flow of 160 m^3/h.

This standard is applicable to the design, production, testing and acceptance of IC card diaphragm gas meter (hereinafter referred to as gas meter).

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 2423.17 Environmental testing for electric and electronic products - Part 2: Test method - Test Ka: Salt mist (GB/T 2423.17-1993, eqv IEC 60068-2-11:1981)

GB/T 2828.1 Sampling procedures for inspection by attribute - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (GB/T 2828.1-2003, ISO 2859-1:1999, IDT)

GB/T 2829 Sampling procedures and tables for periodic inspection by attributes (Apply to inspection of process stability)

GB/T 4208-1993 Enclosure protection class (IP code) (eqv IEC 529:1989)

GB/T 6968 Diaphragm gas meters

GB/T 17626.2-2006 Electromagnetic compatibility (EMC) - Testing and measurement techniques - Electrostatic discharge immunity test (GB/T 17626.2-2006, IEC 61000-4-2:1995, IDT)

GB/T 17626.3-2006 Electromagnetic compatibility (EMC) - Testing and measurement techniques - Radiated radio frequency electromagnetic field immunity test (GB/T 17626.3-2006, IEC 61000-4-3:2002, IDT)

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CJ/T 3074-1998 Electronic controller of household gas burning appliances

CJ/T 3075.2-1998 Laboratory of gas burning appliances - Test equipment and device

JJG 577 Verification regulation of diaphragm gas meter

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1

IC card diaphragm gas meter

It refers to the gas meter which uses the diaphragm gas meter as the basic gas meter and the IC card as the media and is added with controller, having the function of gas pre-purchase.

3.2

Basic gas meter

It refers to the diaphragm gas meter used in the IC card diaphragm gas meter.

3.3

Control unit

It refers to the device used to read the basic gas meter data, display and control.

3.4

Minimum operating voltage

It refers to the minimum set voltage to ensure the normal operation of controller.

3.5

Total pressure loss

It refers to, after the gas meter is installed with control valve, the pressure loss between the gas inlet and gas outlet under the specified conditions.

3.6

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6.2.1.1 Storage temperature: -25 °C ~ +55 °C, after the restoration of normal temperature, its function shall comply with the requirements of 6.3 and 6.4.

6.2.1.2 Operating temperature: -10 °C ~ +40 °C, AND its function shall comply with the requirements of 6.3, 6.4, and 6.6.

6.2.2 Constant heat and humidity

When the relative humidity is 93% and temperature +40 °C, its function shall comply with the requirements of 6.3 and 6.4, AND the appearance shall be free from rust.

6.2.3 Salt mist

Gas meter shall have salt mist resistant performance, AND its function shall comply with the requirements of 6.3 and 6.4.

6.2.4 Vibration

Gas meter shall have anti-vibration performance, the whole machine shall be free from loosening, AND its function shall comply with the requirements of 6.3 and 6.4.

6.3 Prompt function

Gas meter shall have one or more prompt functions of acoustic, light, and graphic display.

6.3.1 Under-voltage of operating power

When the gas meter's operating voltage drops to the designed minimum operating voltage of the product, there will be a clear prompt.

6.3.2 Residual gas volume insufficiency

When the gas meter's residual gas volume drops to the predetermined value, there will be a clear prompt.

6.3.3 Misoperation

When using other cards than that of this meter OR when there is other misoperations, there will be a clear prompt.

6.4 Control functions

6.4.1 Gas pre-purchase volume and gas use control:

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6.5.3.2 Electrostatic protection

It shall comply with the level 2 requirements of GB/T 17626.2-2006; when the contact discharge is 4 kV, the gas meter shall automatically close the valve or operate normally, AND shall comply with the requirements of 6.3 and 6.4.

6.5.3.3 Insensitivity to radiated electromagnetic fields

It shall comply with the level 3 requirements of GB/T 17626.3: when the field strength is 10 V/m and the frequency is 80 MHz ~ 1000 MHz, the gas meter shall be automatically close the valve or operate normally, AND shall comply with the requirements of 6.3 and 6.4.

6.6 Electrical performance

6.6.1 Quiescent current

As for the gas meter using the built-in battery, the quiescent current shall be not less than 20 μA.

6.6.2 Maximum operating current

The maximum operating current of the gas meter shall be less than 500 mA.

6.7 Valves

6.7.1 Sealability

When the valve is closed and the inlet pressure is 5 kPa, the allowable internal leakage of the valve shall not be more than 0.55 L/h.

6.7.2 Durability

After respectively opening and closing the valve for 5000 times, it shall operate normally AND the sealability shall comply with the requirements of 6.7.1.

6.8 Seat durability

After continuously 10000 times of card plugging, its performance shall comply with the requirements of 6.4.1.

6.9 Pulling resistance of external connection line

When the gas meter has external connection line, under the external force of 30 N, the connection line and the connection part shall not be separated or deformed.

6.10 Overall sealability

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Power supply: voltage 0 V ~ 12 V continuously adjustable AND the output current is 1 A;

Voltmeter: the range is adapted to the voltage used by the tested gas meter, AND the accuracy is level 1.

Micro-ammeter: range 50 μA AND accuracy level 1;

Ammeter: range 1 A and accuracy level 1.

7.6.1 Quiescent current

In accordance with the test schematics 3, CONNECT the tested gas meter; MOVE the switch K to position 3; ADJUST the DC stabilized power supply to the voltage equivalent to the normal operating voltage of the gas meter; MOVE the switch K to position 2, to make the gas meter work normally; after the gas meter works steadily, MOVE the switch K to position 1, AND the quiescent current as measured by the ammeter shall comply with the requirements of 6.6.1.

7.6.2 Maximum operating current

In accordance with the test schematics 3, CONNECT the tested gas meter; MOVE the switch K to position 3; ADJUST the DC stabilized power supply to the voltage equivalent to the normal operating voltage of the gas meter; MOVE the switch K to position 2, to make the gas meter work normally; after the gas meter works steadily, MAKE the gas meter initiate valve opening/closing action, during which the current as measured by the ammeter shall comply with the requirements of 6.6.2.

7.7 Valves

7.7.1 Sealability

The leakage detector shall be the volume type leakage detector as specified in Figure C.5 of Appendix C in 3075.2-1998.

When the gas meter valve is under closed state, INFEED gas of pressure 5 kPa at the inlet of the valve and MEASURE the valve sealability, which shall comply with the requirements of 6.7.1.

7.7.2 Durability

During the test, the valve opening and closing action shall make the solenoid valve speed be less than 20 times/min; AND the electric valve speed is 5 times/min ~ 12 times/min. After opening and closing respectively the control

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8.1.2 The gas meter shall pass the inspection by the quality inspection department of the manufacturer for the items as listed in Table 3, AND be accompanied by the product certificate before exit-factory.

8.1.3 As for the gas meter supplied and accepted in batches, the sampling method shall comply with the product sampling plan and the qualification level in GB/T 2828.1, which shall be negotiated between the supplier and the purchaser. The item inspection requirements and defect classification shall comply with the requirements in Table 3.

8.2 Type inspection

8.2.1 Type test sampling method shall follow the provisions of GB/T 2829, BUT the quantity shall not be less than three.

8.2.2 The test items are to be tested in accordance with the items as listed in Table 3, AND the test methods shall follow the corresponding clause in Chapter 7.

8.2.3 Type inspection shall provide the following information:

a) Product technology and the user manual;

b) Product production and inspection standards;

c) Product inspection methods and inspection procedures;

d) Photographs or related technical drawings.

Table 3 Performance test

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i) Pulse equivalent.

9.1.2 The gas meter shall have a permanent indication of the direction of the gas flow.

9.1.3 The gas meter shall have a permanent indication of the IC card insertion direction or the sensing area.

9.2 Packaging

9.2.1 The gas meter shall be fitted with a cover or stopper to prevent the entry of foreign matter into the meter at the time of exit-factory.

9.2.2 The packing box shall contain the following information:

a) Manufacturer name and address;

b) Packing date;

c) Product name and model;

d) Gross weight;

e) Size of packaging box;

f) Moisture-proof marking;

g) Storage and transportation marking;

h) Metering license number.

9.3 Transportation and storage

9.3.1 After storing the gas meter in the transport box, it is preferable to use the transport vehicle without strong shocking. It shall be free from the direct impact of rain or snow in the process of transportation; it shall be placed vertically AND free from extrusion, impact or other damages.

9.3.2 The environment in which the gas meter is stored shall be well ventilated and free from corrosive gases, AND shall comply with the following requirements:

a) Temperature is -5 °C ~ 40 °C;

b) Relative humidity is not more than 70%;

c) Storage time shall not exceed 6 months; otherwise it shall be subjected to performance test again.

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