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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 22065-2008

Pressure type SF6 gas density monitor

压力式六氟化硫气体密度控制器

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1 Scope

GB/T 22065-2008 is the Chinese national standard on pressure type sf6 gas density monitor, in the field of metrology and measurement. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 20 June 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 January 2009. Classification: ICS 17.100, CCS N11. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the product classification, technical requirements, test methods, inspection rules and markings, packaging and storage of pressure type SF6 gas density monitor. This standard is applicable to pressure type SF6 gas density monitor (hereinafter referred to as instrument) that use spring tubes as measuring elements, temperature compensation devices, and has the indicating and controlling the on/off function of electrical signals.

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 4208 Degrees of protection provided by enclosure(IP code) (GB 4208- 2008, IEC 60529.2001, IDT)

GB/T 1226-2001 General pressure gauge

GB/T 2423.10 Environmental testing for electric and electronic products - Part 2. Tests methods - Test Fc. Vibration (sinusoidal) (GB/T 2423.10-2008, IEC 60068-2-6.1995, IDT)

GB/T 11023-1989 Test guide of SF6 gas tightness for high-voltage switchgear

GB/T 11287 Electrical relays - Part 21. Vibration, shock, bump and seismic tests on measuring relays and protection equipment - Section one. Vibration tests (sinusoidal) (GB/T 11287-2000, idt IEC 60255-21-1.1988)

GB/T 14598.3-2006 Electrical relays - Part 5. Insulation coordination for measuring relays and protection equipment - Requirements and tests (IEC 60255-5.2000, IDT)

GB/T 15464 General-purpose specification for the packaging of instrumentation products

JB/T 5528 Scale and distribution for pressure gauge

JB/T 9329 Basic environmental conditions and testing methods for instruments transportation and storage in the transportation

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Rated pressure Under standard atmospheric pressure conditions, the pressure of SF6 gas which is charged into the equipment chamber as required before the equipment is put into operation or during gas replenishment.

3.2 Alarm pressure The pressure at which the instrument is required to issue alarm signal when the SF6 gas pressure in the equipment chamber is reduced to a certain setting value.

3.3 Atresia pressure The pressure at which the instrument is required to issue atresia signal when the SF6 gas pressure in the equipment chamber is reduced to a certain setting value.

4.1 Type

4.1.1 The instrument measurement type is. pressure vacuum.

4.1.2 The instrument is divided into radial installation and axial installation in accordance with the thread installation method.

4.1.3 The instrument is divided into enclosure oil filling type and enclosure non- oil filling type in accordance with the aseismic requirements.

6 Test methods

The test sequence of the instrument and the rest interval between each test item shall be in accordance with Appendix A (normative appendix).

6.1 Test conditions Refer to

5.2 Reference working conditions.

6.2 Test instruments The absolute value of the basic error limit of the standard instrument for testing is not greater than $1/4$ of the absolute value of the basic error limit of the instrument being tested.

6.3 Inspection point

- a) The inspection points for basic errors are marked with a numbered scale line and rated pressure points (except for set-points).
- b) The inspection points for set-point deviations and switching errors are the alarm pressure and atresia pressure marked on the dial.
- c) The inspection points for temperature compensation is the rated pressure marked on the dial.

6.4 Test methods It is tested by comparing the measured instrument with a standard instrument.

6.5 Basic error test

6.5.1 During the test, load shall be increased from zero uniformly and slowly, check each specified inspection point to the upper limit of measurement (the vacuum inspection point shall not be less than 90% of the local extractable ultimate vacuum), and keep it for 3 minutes, and then evenly and slowly reduce the load and check each inspection point to zero.

6.5.2 At the time of inspection, each inspection point shall make two readings, one reading made when the load reaches the specified inspection value stably, the other reading made after tapping gently the instrument enclosure.

6.5.3 The basic error shall be measured once before and after gentle tapping in both positive and negative strokes. The difference between the indication value before and after

tapping and the indication value at the inspection point shall meet the requirements of clause 5.3.

6.6 Return difference test provisions of clause 5.10. After removing the load, the test is to be carried out within 30 min in accordance with clauses 6.5 ~ 6.10.

6.13 Alternating pressure test The instrument is installed on an alternating pressure tester capable of generating a sinusoidal waveform with a frequency of (60 ± 5) times/min, an alternating pressure amplitude and an alternation number in compliance with the prescribed values as specified in clause 5.11, and is inspected within 30 minutes after the test in accordance with clause 6.5 ~ 6.10.

6.14 Insulation test Under the environmental conditions specified in clause 5.12, connect the 500 V megohmmeter between each terminal of the instrument and each terminal and the enclosure, measure their insulation resistance respectively. Then, in the same way, connect it into the insulation strength test bench to gradually increase the test voltage from zero to 2 kV (1 kV between each terminals of the micro switch type), maintain it for 1 min, there shall be free from arcing and breakdown. Then smoothly reduce the test voltage to zero, finally cut off the power.

6.15 Sealing performance test Increase the charged SF₆ gas pressure to 110% of rated pressure, blow out residual SF₆ gas around the instrument, use a plastic film to cover the instrument, after 24 h, use the SF₆ gas leak detector with a sensitivity of at least 10⁻⁸ to detect the SF₆ gas concentration in the plastic film and in the enclosure, calculate the absolute leakage rate of the instrument in accordance with the method as specified in clause

4.2.1 of GB/T 11023-1989, the value shall be not more than the values as specified in clause 5.13.

6.16 Enclosure protection class test It is tested in accordance with the relevant requirements in GB 4208. After the test, it shall be inspected in accordance with 6.14.

6.17 Lightning impulse withstand voltage test It is tested in accordance with the relevant requirements in clause

6.1.3.2 of GB/T 14598.3-2006. After the test, it shall be inspected in accordance with 6.14.

6.18 Impact resistance test Put the instrument in the normal working position and perform test in accordance with the impact parameters as specified in clause

5.16 of this standard. After the test, it shall be inspected in accordance with 6.5 ~ 6.10. with the technical requirements of this standard.

a) New product trial production finalization;