

ICS 17.200.20

CCS N 11



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

GB/T 30121-2026

Replacing GB/T 30121-2013

**Industrial platinum resistance thermometers and platinum
temperature sensors**

工业铂热电阻及铂感温元件

(English Translation)

Issued on: July 2, 2026

Implemented on: February 1, 2027

Issued by: State Administration for Market Regulation

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document replaces GB/T 30121-2013 "Industrial Platinum Resistance Temperature Detectors and Platinum Temperature Sensing Elements". Compared with GB/T 30121-2013, except for the junction...

Aside from structural adjustments and editorial changes, the main technical changes are as follows.

--The definitions of the terms "tolerance," "insulation resistance," "self-heating coefficient," "thermal response time," "thermoelectric effect," and "hysteresis" have been changed (see section 3).

Chapter 3 (2013 edition).

--The terms "expanded uncertainty" and "coverage factor" have been added (see 3.15, 3.16).

--Numerical tables derived from the equations relating temperature and resistance will no longer be considered standard normative content, but will be included as informative content.

Appendix (see 4.3 and Appendix A, 4.2 of the 2013 edition);

--Added "Compliance and Requirements" (see Chapter 5);

--Added distinguishing marks between special platinum resistance thermometers and standard platinum resistance thermometers, along with related identification examples (see 5.2.3.2 and 5.2.3.3);

--The "Tolerance Routine Test" and "Sealing" test items have been added to Table 3, and the corresponding test item numbers have been changed (see Table 3, 2013 edition).

(Table 5)

--The description of component tolerance routine tests has been changed (see 6.2.1, 2013 version of 6.2.1).

--The description of the room temperature insulation resistance test for platinum resistance thermometers has been changed (see 6.3.2, 6.3.1 in the 2013 edition).

--The description of the liquid nitrogen test has been changed (see 6.3.3.4, 6.3.2.3 in the 2013 version).

--An additional test method for sheath integrity testing has been added. helium leakage test

(see 6.3.3.5);

--The parameters for the self-heating test have been changed (see 6.4.3 and 6.5.3, and 6.4.3 and 6.5.7 in the 2013 version).

--The parameters and descriptions for the thermal response time test have been changed (see 6.5.5, 6.5.2 in the 2013 version).

--Added a method for handling platinum resistance thermometers operating outside room temperature in the temperature cycling effect test (see 6.5.7).

--The vibration test method has been changed (see 6.6.5, 6.6.4 in the 2013 version).

--An additional type test, "Sealing," has been added (see 6.6.7).

This document is equivalent to IEC 60751:2022 "Industrial platinum resistance thermometers and platinum temperature sensing elements".

The following minimal editorial changes have been made to this document.

--Added Note 2 to 3.2 and Note 6.6.7 to improve the application of the standard;

--Delete section 6.3.1 from Table 3 regarding platinum resistance thermometer type testing, because the tolerance test for platinum resistance thermometer type testing is based on section 6.5.1.

The content of the tolerance routine test in 6.3.1 is already included in 6.5.1 and will not be listed again;

--Added Appendix NA, Appendix NB, and Appendix NC (information).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Industrial Process Measurement, Control and Automation (SAC/TC 124).

1 Scope

This document specifies the requirements for industrial platinum resistance thermometers (hereinafter referred to as "platinum resistance thermometers") and industrial platinum temperature sensing elements (hereinafter referred to as "elements").

Find its temperature-resistance relationship. The resistance of a platinum resistance thermometer and its components is a defined function of temperature.

The temperature values in this document are based on the 1990 International Temperature

Scale (ITS-90). Except for Table A.1, temperatures in degrees Celsius (°C) are expressed in accordance with...

The symbol 't' indicates that, in Table A.1, its full formal name 't₉₀/°C' is used.

$\alpha = \frac{R_{100} - R_0}{R_0 \cdot 100} \text{ } ^\circ\text{C}^{-1}$ in the formula.

R₁₀₀ -- Resistance value at t=100 °C;

R₀ -- Resistance value at t=0 °C.

This document covers components or platinum resistance thermometers with different tolerance levels in the temperature range of -200 °C to 850 °C, and is also applicable to areas covering specific regions.

Components or platinum resistance thermometers within this temperature range.

The temperature-resistivity relationship with a measurement uncertainty of less than 0.1 °C can only be used for components with extremely high stability and requiring individual calibration, or for platinum thermocouples.

Resistance. This may require more complex interpolation equations than those shown in this document. Detailed explanations of such equations are beyond the scope of this document.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 18404-2022 Armored thermocouple cables and armored thermocouples (IEC 61515:2016, IDT) IEC 60068-2-6 Environmental testing - Part 2-6. Test Fc. Vibration (sine) Part 2-6: Tests - Test Fc: Vibration (sinusoidal) Note. GB/T 2423.10-2019 Environmental testing - Part 2: Test methods - Test Fc. Vibration (sine) (IEC 60068-2-6:2007, IDT) IEC 61152 Dimension of metal-sheathed thermometer elements Note. GB/T 19900-2005 Dimensions of metal-clad thermometer elements (IEC 61152:1992, IDT)

3 Terms and Definitions

The URLs for the terminology databases maintained by ISO and IEC for standardization are as follows.

(Platinum temperature sensing) element platinum resistor A temperature-sensing element