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**INDUSTRY STANDARD OF THE
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**Verification Regulation of Reference Standard Facility of High
Temperature Platinum Resistance Thermometers
(English Translation)**

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High-temperature platinum resistance thermometer working reference device verification procedure

1 Scope

This procedure applies to the working reference high temperature platinum resistance thermometer and high temperature platinum resistance thermometer working reference

device First verification and subsequent verification in the range of 0 °C ~ 961.78 °C.

2 Overview

The high-temperature platinum resistance thermometer measures the temperature according to the characteristic that the resistance of the metal platinum wire changes with temperature.

Kind of instrument.

High-temperature platinum resistance thermometer working reference device should include working reference high-temperature platinum resistance thermometer and definition fixed point Set. Define fixed point devices including silver freezing point, aluminum freezing point, zinc freezing point, tin freezing point, and water triple point loading Set.

The high-temperature platinum resistance thermometer working reference device is used to verify the first-class standard high-temperature platinum resistance thermometer.

2.1 Definition of temperature value and interpolation method in 1990, the International Temperature Scale (ITS-90) specified temperature values in the temperature range from 0 °C to 961.78 °C as specified in a group.

High-temperature platinum resistance thermometers that define fixed-point graduations, defined fixed points including silver freezing point, aluminum freezing point, zinc condensation Fixation point, tin freezing point and water triple point, and define the fixed point using the specified reference function and deviation function interpolation calculation the temperature value between.

The temperature value is determined by the following formula.

$W(t) = R(t)/R(0.01^\circ\text{C})$ (1) where $W(t)$ ---high-temperature platinum resistance thermometer is at the temperature t and the water triple point temperature (0.01 °C) the ratio of resistance values.

The reference function of the 0°C~961.78°C temperature zone is defined as $W_r(t) = C_0 + \sum_{i=1}^n C_i [(t-481)/481]^i$ (2) the inverse of equation (2) is given by the following equation, which is consistent with equation (2) within 0.13 mK.

$t = D_0 + \sum$

$D_i [(W_r(t) - 2.64)/1.64]^i$ (3) where t ---temperature value, °C;

$W_r(t)$ ---reference function, see the numerical value of the reference function $W_r(t)$ in the temperature range from 0 °C to 961.78 °C.

Appendix A;

C_0 , D_0 , C_i , D_i ---constants are listed in Appendix B.

The deviation function of the temperature range from 0 °C to 961.78 °C is

$\Delta W(t) = W(t) - W_r(t) = a_6[W(t) - 1] + b_6[W(t) - 1]^2 + c_6[W(t) - 1]^3 + d[W(t) - W(660.323^\circ\text{C})]^2$ (4) in the formula a_6 , b_6 , c_6 , d ---coefficient. Below the freezing point of aluminum, $d=0$; the coefficients a_6 , b_6 , c_6 are