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# INTERNATIONAL STANDARD

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

**Thermomètres à résistance de platine industriels et capteurs thermométriques en platine**

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## CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Characteristics .....	8
4.1 Temperature/resistance relationships .....	8
4.2 Resistance values .....	9
5 General requirements .....	12
5.1 Tolerance classes .....	12
5.1.1 Temperature range of validity .....	12
5.1.2 Resistors .....	12
5.1.3 Thermometers .....	12
5.1.4 Special tolerance classes and special temperature ranges of validity .....	12
5.2 Measuring current .....	13
5.3 Electrical supply .....	13
5.4 Connecting wire configuration .....	13
6 Tests .....	14
6.1 General .....	14
6.1.1 Routine production tests .....	14
6.1.2 Type tests .....	14
6.1.3 Additional type tests .....	14
6.2 Routine production tests for resistors .....	14
6.2.1 Tolerance acceptance test.....	14
6.3 Routine production tests for thermometers .....	15
6.3.1 Insulation resistance at ambient temperature.....	15
6.3.2 Sheath integrity test .....	15
6.3.3 Dimensional test.....	16
6.3.4 Tolerance acceptance test.....	16
6.4 Type tests for resistors .....	16
6.4.1 Tolerances .....	16
6.4.2 Stability at upper temperature limit .....	16
6.4.3 Self-heating .....	16
6.5 Type tests for thermometers .....	16
6.5.1 Insulation resistance at elevated temperatures .....	16
6.5.2 Thermal response time .....	18
6.5.3 Stability at upper temperature limit .....	18
6.5.4 Thermoelectric effect .....	18
6.5.5 Effect of temperature cycling .....	18
6.5.6 Effect of hysteresis .....	18
6.5.7 Self-heating .....	18
6.5.8 Minimum immersion depth .....	19
6.6 Additional type tests for special applications of thermometers .....	19
6.6.1 Capacitance .....	19
6.6.2 Inductance.....	19
6.6.3 Dielectric strength .....	19
6.6.4 Vibration test .....	19

6.6.5	Drop test .....	19
6.7	Summary of tests .....	19
7	Information to be made available by the manufacturer .....	20
7.1	For resistors only .....	20
7.2	For resistors and/or thermometers .....	20
8	Thermometer identification and marking .....	20
Figure 1	– Connecting configurations .....	13
Figure 2	– Examples of test results for selecting or rejecting resistors .....	15
Table 1	– Temperature/resistance relationship, $R_0 = 100.00 \Omega$ .....	10
Table 2	– Tolerance classes for resistors .....	12
Table 3	– Tolerance classes for thermometers .....	12
Table 4	– Minimum insulation resistance of thermometers at maximum temperature .....	16
Table 5	– Table of tests described in this standard .....	20

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL PLATINUM RESISTANCE THERMOMETERS AND  
PLATINUM TEMPERATURE SENSORS**

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International Standard IEC 60751 has been prepared by subcommittee 65B: Devices and process analysis, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 1983, amendment 1 (1986) and amendment 2 (1995). This edition constitutes a technical revision.

The significant technical changes with respect to the previous edition are as follows:

While the temperature/resistance relationship in 4.2 remains unchanged, there are several changes in the other chapters. Most important are:

- tolerance classes follow a new scheme;
- tolerance acceptance test is included;
- hysteresis test is included;
- several changes in the individual tests;
- appendices are deleted.

The text of this standard is based on the following documents:

FDIS	Report on voting
65B/664/FDIS	65B/683/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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# INDUSTRIAL PLATINUM RESISTANCE THERMOMETERS AND PLATINUM TEMPERATURE SENSORS

## 1 Scope

This standard specifies the requirements and temperature/resistance relationship for industrial platinum resistance temperature sensors later referred to as “platinum resistors” or “resistors” and industrial platinum resistance thermometers later referred to as “thermometers” whose electrical resistance is a defined function of temperature.

The International Standard applies to platinum resistors whose temperature coefficient  $\alpha$ , defined as

$$\alpha = \frac{R_{100} - R_0}{R_0 \cdot 100^\circ\text{C}}$$

is conventionally written as  $\alpha = 3.851 \times 10^{-3} \text{ }^\circ\text{C}^{-1}$ , where  $R_{100}$  is the resistance at  $t = 100 \text{ }^\circ\text{C}$  and  $R_0$  is the resistance at  $t = 0 \text{ }^\circ\text{C}$ .

Values of temperature in this standard are in terms of the International Temperature Scale of 1990, ITS-90. Temperatures in degrees Celsius are denoted by the symbol  $t$ , except in Table 1 where the full nomenclature  $t_{90}/^\circ\text{C}$  is used.

The standard covers resistors or thermometers for all or part of the temperature range  $-200 \text{ }^\circ\text{C}$  to  $+850 \text{ }^\circ\text{C}$  with different tolerance classes, which may cover restricted temperature ranges.

For temperature/resistance relationships with uncertainties  $<0,1 \text{ }^\circ\text{C}$ , which are possible only for resistors or thermometers with exceptionally high stability and individual calibration, a more complex interpolation equation than is presented in this standard may be necessary. The specification of such equations is outside the scope of this standard.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:.

IEC 61152, *Dimensions of metal-sheathed thermometer elements*

IEC 61298-1, *Process Measurement and Control devices – General Methods and Procedures for Evaluating Performance – Part 1: General considerations*

## SOMMAIRE

AVANT-PROPOS.....	24
1 Domaine d'application .....	26
2 Références normative.....	26
3 Termes et définitions .....	26
4 Caractéristiques .....	28
4.1 Relations température/résistance .....	29
4.2 Valeurs de résistance.....	29
5 Exigences générales .....	32
5.1 Classes de tolérance.....	32
5.1.1 Domaine valide de température .....	32
5.1.2 Résistances.....	32
5.1.3 Thermomètres .....	32
5.1.4 Classes spéciales de tolérance et domaines spéciaux de validité de température.....	33
5.2 Courant de mesure.....	33
5.3 Alimentation électrique .....	33
5.4 Configuration des fils de connexion.....	33
6 Essais .....	34
6.1 Généralités.....	34
6.1.1 Essais individuels de production.....	34
6.1.2 Essais de type.....	34
6.1.3 Essais de type complémentaires.....	34
6.2 Essais individuels de production pour les résistances .....	35
6.2.1 Essai d'acceptation de la tolérance.....	35
6.3 Essais individuels de production pour les thermomètres.....	35
6.3.1 Résistance d'isolation à la température ambiante .....	35
6.3.2 Essai de l'intégrité de la gaine.....	36
6.3.3 Essai dimensionnel.....	36
6.3.4 Essai d'acceptation de la tolérance.....	36
6.4 Essais de type pour les résistances.....	36
6.4.1 Tolérances .....	36
6.4.2 Stabilité à la température limite haute.....	37
6.4.3 Auto-échauffement .....	37
6.5 Essais de type pour les thermomètres.....	37
6.5.1 Résistance d'isolation à températures élevées .....	37
6.5.2 Temps de réponse thermique .....	37
6.5.3 Stabilité à la température limite haute.....	37
6.5.4 Effet thermoélectrique .....	37
6.5.5 Effet du cyclage en température .....	38
6.5.6 Effet d'hystérésis.....	38
6.5.7 Auto-échauffement .....	38
6.5.8 Profondeur d'immersion minimale.....	38
6.6 Essais de type complémentaires pour les applications spéciales des thermomètres .....	38
6.6.1 Capacité électrique.....	38
6.6.2 Inductance.....	38

6.6.3	Rigidité diélectrique .....	39
6.6.4	Essai de vibration .....	39
6.6.5	Essai de chute .....	39
6.7	Résumé des essais .....	39
7	Informations à mettre à disposition par le fabricant .....	40
7.1	Pour les résistances uniquement .....	40
7.2	Pour les résistances et/ou les thermomètres .....	40
8	Identification des thermomètres et marquage .....	41
Figure 1 – Configurations de connexions .....		34
Figure 2 – Exemples de résultats d'essai pour la sélection ou le rejet des résistances .....		35
Tableau 1 – Relation température / résistance, $R_0 = 100.00 \Omega$ .....		30
Tableau 2 – Classes de tolérance pour les résistances .....		32
Tableau 3 – Classes de tolérance pour les thermomètres .....		32
Tableau 4 – Résistance d'isolation minimale des thermomètres à leur température maximale .....		37
Tableau 5 – Tableau des essais décrits dans cette norme .....		40

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