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

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**Industrial process control devices - Thermographic cameras -
Part 1: Metrological characterization
(English Translation)**

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Foreword

This document is a standard or guiding technical document.

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 is Part 1 of GB/Z 192 "Thermal Imagers for Industrial Process Control Devices". GB/Z 192 has already published the following parts.

---Part 1: Measurement Characteristics this document is equivalent to IEC TS63144-1:2020 "Thermal imagers for industrial process control devices - Part 1: Metrological characteristics".

The document has been changed from an IEC technical specification to a national standardization guiding technical document of my country.

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/TC124).

Technology (Yantai) Co., Ltd., National Institute of Metrology, Shanghai Instrument & Meter Automation System Testing and Inspection Institute Co., Ltd., Zhejiang Baima Lake Laboratory Co., Ltd., Mechanical Industry Instrumentation Comprehensive Technology and Economic Research Institute, Zhejiang Provincial Academy of Quality Sciences, Shanghai Maritime University, etc.

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Introduction

Thermal imagers (also known as "thermal imagers" or "infrared cameras") are increasingly being used for non-contact radiation temperature measurement with spatial and temporal resolution.

Measurement. Tracing the temperature values indicated by these instruments back to the International Temperature Scale (ITS-90) is increasingly important for the comparability of measurements. Accurate description and...

Determining the basic metrological data of a thermal imager is a prerequisite for reducing its calibration uncertainty and metrological applications.

GB/Z 192 is proposed to consist of two parts.

---Part 1: Metrological Characteristics. The aim is to establish clear procedures for indicating and defining the measurement temperature range, noise equivalent temperature difference,

etc.

Measuring technical data such as distance and field of view aims to improve the comparability and measurability of basic metrological technical data of thermal imagers.

---Part 2: Calibration and Measurement Uncertainty. The purpose is to establish clear procedures for calibrating thermal imagers and determining their uncertainty.

Certainty.

Thermal imager for industrial process control devices Part 1: Measurement Characteristics

1 Scope

This document applies to the declaration and testing of technical data in the parameter tables and instruction manuals of thermal imagers used for measuring surface temperature in the field of metrology.

Limitations of machine systems.

This document describes the standard test methods for determining relevant metrological data for thermal imagers. Manufacturers and distributors can select the relevant data and make declarations.

These parameters conform to the requirements of this document.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

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

Note: The term "uncertainty" used in this document is strictly derived from the above database, and more specifically from ISO/IEC Guide 98-3:2008.

blackbody radiator

A radiation source whose radiation characteristics closely approximate Planck's radiation law.

Note: A blackbody radiation source is a thermal radiation source with an effective emissivity close to 1.

Coverage factor

A numerical factor used as a multiplier for synthesizing standard uncertainty to obtain expanded uncertainty.

Note: The inclusion factor k is a number greater than 1, usually between 2 and 3.

The actual number of detector elements (detector pixels) used to record the image.

Note: This document does not use the commonly used term "pixel" because it can refer to both detectors (detector elements) and images (pixels).

exposure time

In the event of a sudden change, to ensure that the thermal imager's output signal reaches a predetermined value, the minimum amount of input (temperature or radiation) must be applied.

Interval.

The range of target emissivity that a thermal imager can be set to.