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BSI Standards Publication

Industrial process control devices — Thermographic cameras

Part 1: Metrological characterization

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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FOREWORD

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Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 63144-1, which is a Technical Specification, has been prepared by subcommittee 65B: Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
65B/1129/DTS	65B/1159/RVDTS

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

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

A list of all parts in the IEC 63144 series, published under the general title *Industrial process control devices – Thermographic cameras*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

INTRODUCTION

Thermographic cameras (also called "thermographic imagers" or "infrared cameras") are being increasingly used for spatially and temporally resolved, non-contact radiation temperature measurement. Tracing the temperature values indicated by these instruments to the International Temperature Scale (ITS-90) is gaining in importance for the comparability of measurements. The precondition for their calibration and metrological application with low uncertainties is to accurately describe and determine the essential metrological data of thermographic cameras. Whereas there are international regulations to determine the technical specifications for radiation thermometers – namely IEC TS 62492-1 and IEC TS 62492-2 – there is a lack of such regulations for thermographic cameras in such a detailed form.

This document is Part 1 of a series of technical specifications for thermographic cameras. It is intended to improve comparability and testability of the essential metrological technical data of thermographic cameras. To this end, unambiguous procedures are laid down for the indication and the determination of this technical data. Future IEC TS 63144-2 is intended to specifically address the absolute calibration procedures and the corresponding uncertainties for thermographic cameras in more depth and detail.

INDUSTRIAL PROCESS CONTROL DEVICES – THERMOGRAPHIC CAMERAS –

Part 1: Metrological characterization

1 Scope

This part of IEC 63144 applies, in the field of metrology, to the statement and testing of technical data in datasheets and instruction manuals for thermographic cameras that are used to measure the temperature of surfaces. This includes, unless otherwise stated, both two-dimensional and one-dimensional (line cameras or line scanners) temperature measuring instruments, independently of the scanning principle (fixed multi-element detector or scanning camera system).

This document describes standard test methods to determine relevant metrological data of thermographic cameras. Manufacturers and sellers can choose relevant data and can state that the data shall be compliant with this Technical Specification.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

NOTE The term “uncertainty” used in this document is precisely derived from the above databases and more specifically from ISO/IEC Guide 98-3:2008 [3].

3.1
blackbody radiator
radiator that emits radiation in a very good approximation of Planck's radiation law

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

3.2
coverage factor
numerical factor used as a multiplier of the combined standard uncertainty in order to obtain an expanded uncertainty

Note 1 to entry: Coverage factor, k, is a number larger than one and, typically, in the range from 2 to 3.

3.3
detector format used
number of detector elements (detector pixels) that have actually been used to record the image

Note 1 to entry: The term "pixel", which is frequently used, will not be used in this document since it can refer both to the detector (detector element) and to the image (image element).