

Submitted for recognition as an American National Standard

**MINIMUM PERFORMANCE STANDARD
TEMPERATURE INSTRUMENTS**

FOREWORD

Changes in the revision are format/editorial only.

1. SCOPE:

This SAE Aerospace Standard (AS) applies to all temperature instruments used in aircraft applications and environments. The word "instrument" as used in this Standard encompasses only the display device and does not include the temperature sensors. Examples of the types of instruments covered are as follows:

- 1.1 Temperature instruments using a Resistance Temperature Detector for temperature sensing.
- 1.2 Temperature instruments using a thermocouple for temperature sensing.
- 1.3 Temperature instruments using an averaging thermocouple harness for temperature sensing.
- 1.4 Temperature instruments receiving an input from a signal conditioning unit.
- 1.5 Temperature instruments receiving an input from another temperature instrument.
- 1.6 Temperature instruments receiving an input from other temperature sensing devices.

1.7 Purpose:

This document establishes the essential minimum performance requirements for electrical type temperature instruments primarily for use on aircraft which may subject the instruments to environmental conditions specified herein.

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2. APPLICABLE DOCUMENTS:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 RTCA Publications:

Available from RTCA Inc., 1140 Connecticut Avenue, NW, Suite 1020, Washington, DC 20036.

RTCA Document No. DO-138, June 27, 1968

2.2 FAA Publications:

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.

Federal Aviation Regulations, Vol. III, Part 25
Airworthiness Standards: Transport Category Airplanes

3. GENERAL STANDARDS:

3.1 Classification by Instrument Accuracies:

Class I	Class Ia:	$\pm 0.1\%$ of indicated range
	Class Ib:	$\pm 0.2\%$ of indicated range
	Class Ic:	$\pm 0.5\%$ of indicated range

Class II	Class IIa:	$\pm 1\%$ of indicated range
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Class III	Class IIIa:	$\pm 2\%$ of indicated range
	Class IIIb:	$\pm 3\%$ of indicated range
	Class IIIc:	$\pm 5\%$ of indicated range

3.2 Method of Indication:

3.2.1 If applicable, relative motion of the index with respect to the scale (either the index or the scale may be the moving element) shall be clockwise, up, or to the right for increasing temperature.

3.2.2 Sufficient numerals and graduations shall be provided to positively and quickly identify temperature indications. The inscription “°C”, “°F”, or “°K”, as appropriate, shall also appear on the instrument face.

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3.2.3 Indications beyond the normal range of the instrument shall not be displayed in a manner interpretable as an on-scale reading or as an off-scale reading in the wrong direction.

3.3 Power Malfunction:

Means (e.g. warning flags, off-scale indication) shall be incorporated in the instrument to indicate the loss of essential power for proper operation of the indicator. This does not apply to the loss of signal used to drive the instrument where no other power is used.

3.4 Markings:

Where terminal posts are used for thermocouple connections, they shall be of different sizes and shall be distinctly identified to indicate plus for the larger terminal, and minus for the smaller terminal. The thermocouple material, and when applicable, the required external resistance of the lead and thermocouple, or the thermocouple circuit shall be plainly marked.

3.5 Signal (Sensor) Characteristics:

Instruments shall be calibrated to indicate temperature in accordance with the signal characteristic specified by the manufacturer of the instrument in his installation instructions.

3.6 Adjustments:

When provided, external adjustment provisions shall have sufficient friction so that they will not change in the environment encountered in service.

3.7 Accessibility of Controls:

Controls which are not normally adjusted in flight shall not be readily accessible to flight personnel when the equipment is installed in accordance with the manufacturer's instructions.

3.8 Effects of Tests:

Unless otherwise stated, the application of the specified tests shall produce no subsequently discernible condition which would be detrimental to the continued performance of the equipment.

3.9 Interchangeability:

Instruments and components which are identified in accordance with the requirements applicable to this standard and are identified with a manufacturer's part and/or model number shall be directly and completely interchangeable with all items identified with that part and/or model number.