



AEROSPACE RECOMMENDED PRACTICE

ARP485™**REV. B**

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Cancelled	2024-06

Superseded by AIR1900

Temperature Measuring Devices Nomenclature

RATIONALE

This SAE Aerospace Recommended Practice (ARP) has been superseded by AIR1900, "Guide to Temperature Monitoring in Aircraft Gas Turbine Engines." AIR1900 consolidates the contents of this document (ARP485) plus ARP464, "Mount - Thermocouple" and ARP465, "Flange - Thermocouple." As such, AIR1900 provides a comprehensive document covering temperature monitoring in aircraft gas turbine engines making the contents of ARP464, ARP465, and ARP485 redundant and unnecessary. This document consolidation strategy was agreed to by the SAE E-32 Aerospace Propulsion Systems Health Management Committee as part of the Committee's Master Plan.

CANCELLATION NOTICE

This technical report has been declared "CANCELLED" as of June 2024 and has been superseded by AIR1900. By this action, this document will remain listed in the respective index, if applicable. Cancelled technical reports are available from SAE.

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1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) defines the nomenclature of temperature measuring devices. General temperature measurement related terms are defined first, followed by nomenclature specific to temperature measuring devices, particularly thermocouples.

2. REFERENCES:

There are no referenced publications specified herein.

3. OBJECTIVE:

To establish the nomenclature and related terminology of temperature measuring devices as applied to aircraft gas reaction type power plants for use by:

- a. Power plant manufacturers
- b. Airframe manufacturers
- c. Procurement organizations
- d. Equipment organizations
- e. Service and maintenance personnel
- f. Other interested organizations

4. TEMPERATURE:

The temperature of a body is its thermal state considered with reference to its ability to communicate heat to other bodies.

4.1 Static Temperature (Gas and Thermal Equilibrium):

Static temperature is a measurable property which is directly proportional to the mean kinetic energy of the particles. In a moving gas, the static temperature would be indicated by a conventional error free instrument moving in the same direction and at the same velocity as the gas.

4.2 Total Temperature (Gas and Thermal Equilibrium):

Total temperature is the temperature indicated by an error free instrument having a fixed position in the gas stream and is the sum of the static temperature and the temperature rise due to the conversion of kinetic energy to heat, as the compression occurs at the sensing element.

5. TEMPERATURE MEASUREMENT:

Temperature measurement is the observation of the relative heat energy present as it affects engine performance and/or life (i.e., bearing, compressor inlet, turbine in or out, blade temperature, and any other pertinent material or gas temperature).

6. TEMPERATURE MEASUREMENT SYSTEM:

A temperature measurement system is a system consisting of one or more measuring elements to quantitatively measure temperature by heat transfer including a means of transmitting the resultant single output to and including the indicator, and if applicable, to the engine control device.

6.1 Temperature Indicating System:

A temperature indicating system is that part of the temperature measurement system extending physically from the engine-airframe disconnect up to and including the aircraft cockpit indicator.

6.2 Temperature Sensing System:

A temperature sensing system is that part of the temperature measurement system extending physically from and including the temperature measuring element to the engine-airframe disconnect and if applicable to the engine control.

6.3 Temperature Measuring System Engine-Airframe Disconnect:

Self-explanatory.

7. TEMPERATURE MEASURING ELEMENT:

A temperature measuring element is that element or portion of a temperature measuring system which yields a measurable signal that is reproducible as a function of temperature.

- a. Probe: A probe is an immersion type temperature measuring element.
- b. Contact Element: A contact element is a temperature measuring element used in intimate contact with the solid state body to be measured.
- c. Remote Measuring Element: A remote measuring element is a temperature measuring device removed from the medium to be measured.