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10 Mar 1965

MILITARY SPECIFICATION

PROBE, TOTAL TEMPERATURE, DEICEABLE

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for total temperature probes capable of operating during atmospheric icing conditions.

1.2 Classification. The total temperature probes shall be of the following types, as specified (see 6.2):

Type I - Single element, MS27188-1
Type II- Dual element, MS27188-2

2. APPLICABLE DOCUMENTS

* 2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solitation, form a part ot this specification to extent specified herein.

SPECIFICATIONS

FEDERAL

PPP-B-601	Boxes, Wood Cleated-Plywood.
PPP-B-636	Box, Fiberboard.

MILITARY

MIL-P-116	Preservation, Methods of.
MIL-B-5087	Bonding, Electrical, and Lighting Protection, for Aerospace Systems.
* DOD-D-1000	Drawing, Engineering and Associated Lists.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: the Engineering Division, San Antonio ALC/MMEDO, Kelly AFB, TX 78241 by using the self addressed Standerdization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 6685

for the performance of the inspection requirements

STANDARDS

MILITARY

MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-130	Identification Marking of U.S. Military Property.
MIL-STD-143	Specifications and Standards Order of Precedence for the Selection of.
MIL-STD-794	Part and Equipment, Procedures for Packaging and Packing of.
MIL-STD-810	Environmental Test Methods.
MIL-STD-831	Test Reports, Preparation of.
MIL-STD-889	Dissimilar Metals.
MS3106	Connector, Plug, Electric, Straight
MS3107	Connector, Plug, Electric, Quick Disconnect.
MS3108	Connector, Plug, Electric, Angle 90°.
MS24694	Screw, Machine, Flat Countersunk Head, 100° Structural, Cross Recessed, UNC-3A and UNF-3A.
MS27188	Probe, Total Temperature, Deiceable.
MS33678	Connector, Receptacle, Electric, Integral Mounting.

* (Copies of specifications and standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

* 2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

* AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3951-82	Standard Practice for Commercial Packaging.

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

* 2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article. When specified, a sample shall be subjected to first article inspection (see 4.4 and 6.3).

3.2 Specification and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143.

3.3 Materials.

3.3.1 Nonmagnetic materials. Nonmagnetic materials shall be used for all parts except where magnetic materials are essential.

3.3.2 Fungusproof materials. Materials that are nutrients for fungi shall not be used where it is practical to avoid them. Where used and not hermetically sealed, they shall be treated with a fungicidal agent acceptable to the procuring activity. However, if they will be used in a hermetically sealed inclosure, fungicidal treatment will not be necessary.

3.3.3 Corrosive fumes. The materials as installed in the probe and under the service conditions specified herein shall not liberate deleterious fumes.

3.3.4 Metals. Metals shall be of the corrosion-resistant type or suitably treated to resist corrosion due to fuels salt spray, or atmospheric conditions likely to be met in storage or normal service.

* 3.3.4.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

3.3.5 Protective treatment. When materials are used in the construction of the probe that are subject to deterioration when exposed to climatic and environmental conditions likely to occur during service usage, they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements or this specification. The use of any protective coating that will crack, chip, or scale with age or with extreme climatic or environmental conditions shall be avoided.

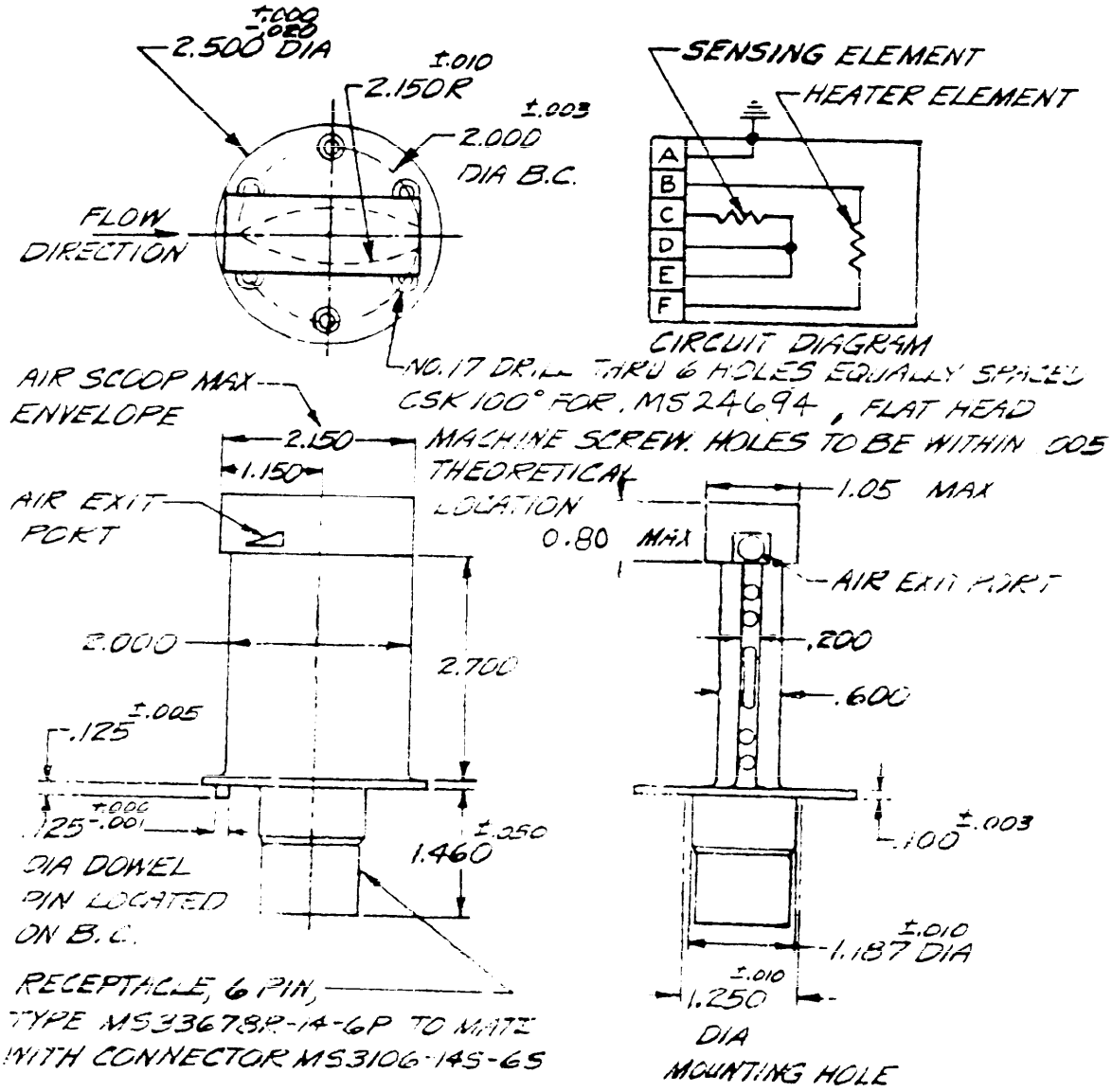
3.4 Design and construction.

3.4.1 Design. The design of the probe shall essentially conform to figures 1 and 2 and shall include a resistance element, air scoop, strut, mounting flange, electrical connector, and heaters necessary to prevent formation of ice. The design details shall in no way constitute a waiver from the performance requirements specified herein.

3.4.1.1 Temperature compensation. The deicing heater element shall be automatically regulated in such a manner that the power dissipated through the heater will be an inverse function of the heater element temperature.

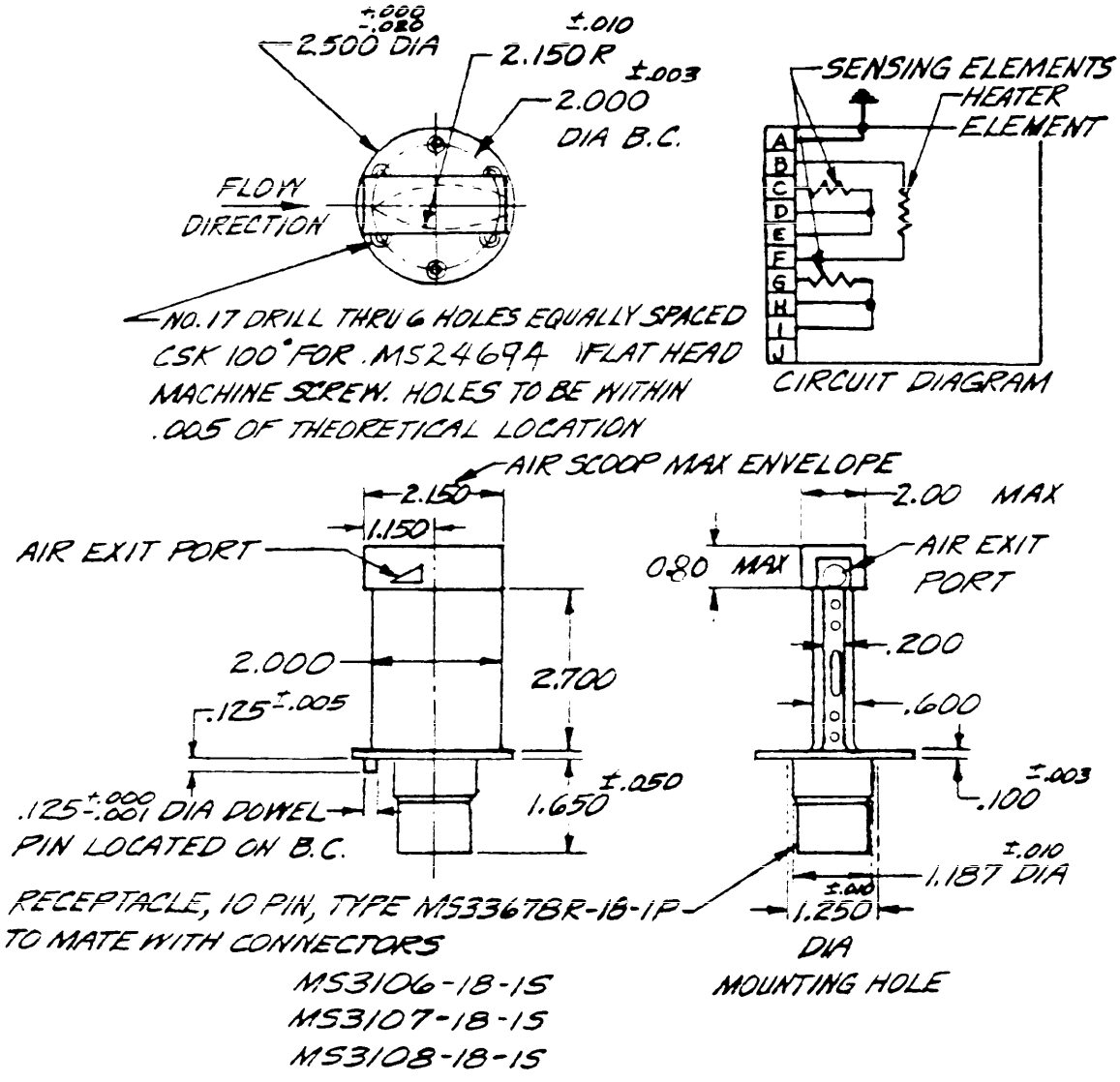
* 3.4.1.2 Installation.

* 3.4.1.2.1 Electrical bonding and lightning protection. When installed, the total temperature probe shall be electrically bonded to the aircraft structure in accordance with MIL-B-5087. The airframe contractor shall be responsible for the design of the bonding method and the tests that are necessary to verify the adequacy of the design. Total temperature probe electrical wiring shall be protected from lightning-induced energy with surge arrestors or other devices which limit the peak surge to one and one-half times the nominal line voltage. A report outlining the proposed design and test methods shall be submitted to the procuring activity for review and approval prior to installation of the probe on the aircraft.



LOCATION OF AIR EXIT PORTS SHOWN FOR REFERENCE ONLY
DIMENSIONS IN INCHES
UNLESS OTHERWISE SPECIFIED, TOLERANCES ±.030

FIGURE 1. SINGLE-ELEMENT PROBE, TOTAL TEMPERATURE, DEICEABLE



LOCATION OF AIR EXIT PORTS SHOWN FOR REFERENCE ONLY
DIMENSIONS IN INCHES
UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS ±.030

FIGURE 2. DUAL-ELEMENT PROBE, TOTAL TEMPERATURE, DEICEABLE

3.4.2 Construction.

3.4.2.1 Temperature resistance relationship. The temperature-sensing element shall be constructed of pure platinum wire and the temperature versus resistance relationship shall be in accordance with the following Collendar-Van Dusen equation:

$$\frac{R_T}{R_0} = 1 + \alpha\left[T - \delta\left(\frac{T}{100} - 1\right)\left(\frac{T}{100}\right) - \beta\left(\frac{T}{100} - 1\right)\left(\frac{T}{100}\right)^3\right]$$

Where: R_T = resistance at temperature T in °C

R_0 = resistance at 0°C

α = 0.003925

δ = 1.45

β = 0.0 (for temperature above 0°C)

β = 0.10 (for temperature below 0°C)

T = temperature in °C

The resistance of the temperature-sensing element shall be adjusted to 50.00 ohms at 0°C. Deviations from the Collendar-Van Dusen equation over the temperature range of the probe shall be no greater than allowed by the following equation:

$$\Delta T = \pm (0.25 + 0.005\ T)$$

Where: T is the temperature in °C, Δ T is allowable deviation in °C. When T is below 0°C, the absolute value in °C shall be used in this equation.

3.4.2.2 Sealing. The temperature-sensing and deicing elements shall be hermetically sealed.

3.5 Performance. The probe shall be capable of meeting the requirements specified herein under the following conditions:

a. Temperature - temperatures ranging from -70° to +350°C.

b. Humidity - relative humidity up to 100 percent.

* c. Vibration - vibration in accordance with method 514.3 of MIL-STD-810.

d. Thermal shock - cycling at temperatures from 0° to ±5° to 200° ±5°C alternately for 30 minute periods.

e. Temperature - resistance - measurable resistance over the range of 0°C to the boiling point of water.

f. Insulation - satisfactory electrical resistance measurements of the temperature-sensing element after being submerged in water for a period of 8 hours.

g. Salt spray - simulated salt sea atmosphere.

h. Fungus - fungus as encountered in tropical climates.

i. Sand and dust - sand and dust particles as encountered in desert areas.

3.5.1 Thermal response. When subjected to an internal airflow of mach 0.3 at sea level, the time constant shall not exceed 1.5 seconds.

3.5.2 Reactance. The impedance of the temperature-sensing element shall not vary more than 0.04 ohm at any frequency from 0 to 2,000 cycles per seconds (cps) when tested for inductive or capacitive reactance effect.

3.5.3 Self-heating. A current of 50 milliampers (ma) in the sensing element shall not change the resistance more than 3°C at sea level with an internal airflow of mach 0.3.

3.5.4 Static loading. The probe shall withstand static impact pressures up to mach 2.0.

3.5.5 Deicing and anti-icing. With the heater operating at rated voltage, accumulated ice shall be removed and ice which would affect the temperature indicator shall not re-form for a continuous period of 15 minutes when the probe is subjected to a wind tunnel speed of 325 ±25 knots at a temperature of -30° +5°C with a liquid water content of 1.25 ±0.25 grams per cubic meter.

3.5.6 Recovery error. The recovery error shall be no greater than 0.5 percent of the absolute total temperature.

3.5.7 Conduction and radiation errors. Conduction and radiation errors shall not exceed the tolerance specified in table I.

TABLE I. Aerodynamic conditions.

Stagnation pressure mm Hg	Stagnation temperature °C	Allowable error in measured stagnation temperature ± percent
1,000	250	0.5
1,000	350	0.5
100	250	0.5
100	350	0.7
30	250	0.7
30	350	1.0

3.5.8 Deicing heater error. The deicing heater element shall not change the indicated temperature of the temperature-sensing element more than 1°C when the deicing heater element is operated at rated voltage and the probe is in an internal airflow of mach 0.3 at sea level conditions.

3.5.9 Insulation resistance of deicing heater element. The deicing heater element shall have an insulation resistance greater than 1 megohm when measured with 500V root mean square (rms) 60-cycle current applied.

3.5.10 Still air operation. The probe, while in still room temperature air, shall be capable of withstanding the heat caused by operation of the deicing heater.

3.5.11 Low temperature exposure and power consumption. After exposure to a temperature of -70°C and when power is applied to the heater element, the initial power surge shall not exceed 1,200w. After 5 seconds, the power consumption shall not exceed 700W and after 20 seconds it shall not exceed 500W.

3.6 Part numbering of interchangeable parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of DOD-D-1000 shall govern the manufacturer's part numbers and changes thereto.

3.7 Operating power. The deicing heater element shall operate on 115V, 400-cycle alternating current (ac).

3.7.1 Heater power consumption. The nominal heater power consumption shall be 350w when the heater is operating under in-flight icing conditions with the static temperature ranging from -10° to -35°C and an indicated airspeed of from 200 to 350 knots.

3.8 Weight. The weight of the single-element probe shall not exceed 400 grams and the weight of the dual-element probe shall not exceed 500 grams.

3.9 Identification of product. Equipment, assemblies, and parts shall be marked for identification in accordance with MIL-STD-130.

3.10 Workmanship. The probe shall be constructed and finished in a thoroughly workmanlike manner. Particular attention shall be given to neatness and thoroughness of soldering, wiring, marking of parts and assemblies, plating, welding, brazing, and freedom of parts from burrs and sharp edges.

3.10.1 Dimensions and tolerances. Dimensions and tolerances not specified shall be as close as is consistent with best shop practices. Where dimensions and tolerances affect the interchangeability operation, or performance of the probe, they shall be held or limited accordingly.

3.10.2 Cleaning. The probe shall be thoroughly cleaned, and loose, spattered or excess solder, metal chips, and other foreign materials removed during and after final assembly.

4. QUALITY ASSURANCE PROVISIONS

* 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of tests. The inspection and testing of the probe shall be classified as:

a. First article inspection (see 4.4).

b. Acceptance tests (see 4.5)

4.3 Test conditions. Unless otherwise specified, the probe shall be tested in air at standard conditions of room temperature (approximately 25°C) and sea level pressure (approximately 760 mm Hg).

4.3.1 Calibration stability. Dring the course of the tests, a change in calibration which does not meet the requirements of 3.4.2.1 shall constitute failure. This does not imply compulsory calibration after each test.

4.3.2 Current measurement. All resistance measurements shall be so made that the current flowing through the temperature-sensing element will be of such magnitude the self-heating effect will not exceed 0.1°C.

* 4.4 First article inspection.

* 4.4.1 First article test samples. The first article test samples shall consist of three probes representative of the production equipment. The probes shall be identified with the manufacturer's part number and other information as required by the procuring activity (see 6.2).

4.4.2 Test report and test sample. When the tests are conducted at a location other than the laboratory of the procuring activity, the following shall be furnished to that activity:

a. Test report, three copies of a test report in accordance with MIL-STD-831.

b. Test sample, the sample that was tested.

* 4.4.3 First article tests. The first article tests shall consist of all the tests specified under 4.6.

4.5 Acceptance tests. Acceptance tests shall consist of:

a. Individual tests (see 4.5.1).

b. Sampling tests (see 4.5.2).

4.5.1 Individual tests. Each probe shall be subjected to the following tests as described under 4.6:

a. Examination of product (see 4.6.1).

b. Packaging, packing and marking (see 4.6.2).

c. Temperature-resistance (see 4.6.3).

d. Insulation resistance of temperature-sensing element (see 4.6.4).

e. Insulation resistance of deicing heater element (see 4.6.5).

f. Still air operation (see 4.6.6).

4.5.2 Sampling tests.

4.5.2.1 Sampling plan A. One probe, selected at random from each 40 or less produced on the contract or order, shall be subjected to the following tests:

a. Individual tests (see 4.5.1).

b. Temperature calibration (see 4.6.7).

c. Vibration (see 4.6.8).

d. Heater power consumption (see 4.6.9).

e. Hermetic sealing (see 4.6.10).

4.5.2.2 Sampling plan B. Unless otherwise specified (see 6.2), 3 probes, selected at random from the first 15 items on the contract or order, shall be subjected to the following tests:

a. Sampling plan A tests (see 4.5.2.1).

b. Thermal response (see 4.6.11).

c. Aerodynamic calibration (see 4.6.12).

d. Reactance (see 4.6.13).

e. Recovery error (see 4.6.14).

f. Self-heating (see 4.6.15).

g. Deicing and anti-icing (see 4.6.16).

h. Deicing heater error (see 4.6.17).

i. Deicing heater element life (see 4.6.18).

j. Humidity (see 4.6.19).

k. High-temperature exposure (see 4.6.20).

l. Low temperature and power consumption (see 4.6.21).

m. Thermal shock (see 4.6.22).

n. Static loading (see 4.6.26).

o. Salt spray (see 4.6.23).

p. Fungus (see 4.6.24).

q. Sand and dust (see 4.6.25).

4.5.3 Rejection and retest. When an item selected from a production run fails to meet the specification, no items still on hand or later produced shall be accepted until the extent and cause of failure have been determined and appropriately corrected. After correction, all of the tests shall be repeated.

4.5.3.1 Individual test may continue. For production reasons, individual tests or other sampling plans may be continued pending the investigation of a sampling test failure, but final acceptance of items on hand or items produced later shall not be made until it is determined that all items meet all requirements of this specification.

4.5.4 Defects in items already accepted. The investigation of a test failure could indicate that defects may exist in items already accepted. If so, the contractor shall fully advise the procuring activity of all defects likely to be found and the method of correcting them.

4.6 Test methods.

4.6.1 Examination of product. The probe shall be inspected to determine compliance with the requirements specified herein with respect to interchangeability, dimensions, materials, workmanship, and marking.

4.6.2 Packaging, packing, and marking. Preparation for delivery shall be examined for conformance to section 5.

4.6.3 Temperature-resistance. The resistance of the temperature-sensing element shall be measured at 0°C and at the boiling point of water. The probe shall meet the temperature-resistance requirements of 3.4.2.1.

4.6.4 Insulation resistance of temperature-sensing element. The probe shall be completely submerged in tap water for a period of 8 hours. Upon completion of the 8 hour period, the probe shall be removed from the water and dried for 1 hour. At the end of this time, a potential of 100V direct current (dc) shall be applied between any electrical receptacle pin contact of the temperature-sensing element (pin C or D) and any ground part of the probe. The resistance measured shall exceed 10 megohms.

4.6.5 Insulation resistance of deicing heater elements. Following the test of 4.6.4, a potential of 500V rms, 60 cps, shall be applied between any electrical pin contact of the deicing heater element (pin B or F) and any ground part of the probe. The resistance measured shall exceed 1 megohm.

4.6.6 Still air operation. The deicing heater element shall be energized at rated voltage for 5 minutes in still air. At the end of the 5 minute period, the heater power consumption shall be less than 200w; the application of power shall cause no damage to the probe. The resistance of the temperature-sensing element shall be determined at 0° and 100°C, and shall not differ from the resistance values before this test by more than the equivalent of 0.2°C. The resistance calibrations at 0° and 100°C need not be made if this test is conducted prior to the temperature-resistance test.

4.6.7 Temperature calibration. The resistance of the temperature-sensing element shall be measured at 0°C, at the boiling point of water, at a temperature between 250° and 350°C, and at -40°C. The resistance at each of these points shall meet the temperature-resistance requirements of 3.4.2.1.

* 4.6.8 Vibration. The probe shall be subjected to a vibration test in accordance with method 514.3 of MIL-STD-810 at room temperature with rated load applied. No visible damage to the probe shall result. After vibration, the resistance of the temperature-sensing element shall be determined at 0°C and at 100°C and shall not differ by more than the equivalent of 0.2°C from the resistance values before vibration testing.

4.6.9 Heater power consumption. The deicing heater element shall be energized at rated voltage with the housing submerged in agitated ice water (as an approximation to icing conditions). The power consumption shall not exceed 350W.

* 4.6.10 Hermetic sealing. The probe shall be subjected to an immersion test in accordance with method 512.2 of MIL-STD-810, using water as the immersion fluid.

4.6.11 Thermal response. The time constant of the temperature-sensing element shall be determined in an internal airflow of mach 0.3 at sea level pressure. The time constant shall not exceed 1.5 seconds. The thermal time constant is the time required for the probe to reach 63 percent of the step function change in temperature as expressed by the following equation:

$$a-b_1 = (a-b)e^{-t/T}.$$

a = final temperature

b_1 = temperature at time t

b = temperature at time t=0

t = time in seconds

T = thermal time constant in seconds

4.16.12 Conduction and radiation errors. The conduction and radiation errors of the probe shall be determine by either dynamic conditions, by analytical means, or by comparison of similarity to other temperature probes. The approval of such methods and results shall be made by the contracting officer. The conduction and radiation errors of the probe as shown by one or more of the above methods shall not exceed the values specified in table I.

4.6.13 Reactance. The probe shall be tested for inductive and capacitive reactance effect on the impedance of the temperature-sensing element. The impedance of the temperature-sensing element shall not vary more than 0.04 ohm at any frequency from 0 to 2,000 cps.

4.6.14 Recovery error. The recovery error of the temperature-sensing element shall be determined at sea level pressure and temperature. The recovery error, as defined by the following equation, shall not be more than 0.005:

$$N = \frac{T_o - T_p}{T_o}$$

Where: T_o = true stagnation temperature in degrees Kelvin

T_p = temperature of the probe in degrees Kelvin

N = recovery error

4.6.15 Self heating. The probe shall be tested in air at room temperature and pressure in an internal air flow of mach 0.3 for the self-heating effect of the temperature-sensing element. Sufficient voltage shall be applied to produce a current of 50 ma through the temperature-sensing element. The change in resistance shall not exceed the equivalent of 3°C.

4.6.16 Deicing and anti-icing. The probe shall be tested in an icing wind tunnel at an indicated tunnel speed of 325 ±25 knots. The tunnel static temperature for the tests shall be between -25° and -35°C. The liquid water content shall be between 1.00 and 1.50 grams per cubic meter of air. The procedure for the test shall be as follows: Ice shall be allowed to form on the air inlet of the probe until the ice cap has extended 1/2 inch from the inlet tip. Power shall then be applied at rated voltage and the total time to remove all accumulated ice from the inlet shall be less than 2 minutes. At the end of this time, the indicated temperature of the temperature-sensing element shall return to within 1°C of the reading before the ice was allowed to accumulate. If temperature fluctuations exist in the icing wind tunnel, the average of several test runs may be used. After the ability of the probe to deice properly has been demonstrated, rated power shall be continually applied for an additional 15 minutes. There shall be no reaccumulation of ice on the probe that would affect the temperature indication.

4.6.17 Deicing heater error. The probe shall be subjected to an internal airflow of mach 0.2 at room pressure and temperature with the deicing heater element de-energized. When the temperature-sensing element has reached the stabilized condition, the deicing heater element shall be energized. After a period of 3 minutes, the temperature indicated shall be not more than 1°C above the temperature indicated with the heater de-energized. If temperature fluctuations exist in the air stream, the average of several test runs may be used.

4.6.18 Deicing heater element life. The heater power consumption (see 4.6.9) shall change no more than 10 percent after a life test consisting of 40 cycles of 10 hours with power on and 2 hours with power off. One hundred of the four hundred hours of operation shall be run in still air at room temperature. The other three hundred hours of operation shall be run with the probe in an airflow at room temperature and with a velocity no greater than 50 knots. No damage shall result that would otherwise affect proper operation of the probe.

* 4.6.19 Humidity. The probe shall be subjected to a humidity test in accordance with method 507.2 of MIL-STD-810. The probe shall then be air dried for 1 hour after which a potential of 100V dc shall be applied between any electrical pin contact of the temperature-sensing element (pin C or D) to any ground part of the probe. The resistance measured shall be greater than 10 megohms. A potential of 500V rms 60 cps, shall be applied between any electrical pin contact of the deicing heater element (pin B or F) and any ground part of the probe. The resistance measured shall be greater than 1 megohm. The resistance of the temperature-sensing element shall be determined at 0° and 100°C and shall not differ from the resistance values before the test by more than the equivalent of 0.2°C.

4.6.20 High temperature exposure. The probe shall be subjected consecutively to a temperature of 250° ±10°C for a period of 7 hours and a temperature of 350° ±10°C for a period of 1 hour for a total of 80 hours (10 cycles). After exposure, the resistance of the temperature-sensing element shall be determined at 0° and 100°C and shall not differ by more than the equivalent of 0.2°C from the resistance values before this test.

4.6.21 Low temperature and power consumption. The probe shall be subjected to a temperature of -70°C for a period of 15 hours. Rated voltage shall then be applied to the heater element through a 5-amp fuse. The initial power surge shall not exceed 1,200w and shall not be of such duration as to render the fuse inoperative. After 5 seconds, the power consumption shall not exceed 700w and after 20 seconds, shall not exceed 500w. Power shall then be removed and the probe subjected to -70°C for an additional 24 hours. After exposure, the resistance of the temperature-sensing element shall be determined at 0° and 100°C and shall not differ by more than the equivalent of 0.2°C from the resistance values before the test. No damage to the probe shall result from this test.

4.6.22 Thermal shock. The probe shall be subjected to a temperature of 0° ±5°C for a period of 30 minutes. It shall be removed from this medium and within 15 seconds subjected to a temperature of 200° ±5° for a perios of 30 minutes. The probe shall then be removed from this medium and within 15 seconds, resubjected to a temperature of 0°C. This thermal cycle shall be repeated 8 times. No visible damage to the probe shall result. The resistance of the temperature-sensing element shall then be determined at 0° and 100°C and shall not differ by more than the equivalent of 0.2° from the resistance values before this test.

* 4.6.23 Salt fog. The probe shall be subjected to a salt fog test in accordance with method 509.2 of MIL-STD-810. No damage shall result from this test which will affect subsequent operation of the probe.

* 4.6.24 Fungus. The probe shall be subjected to a fungus test in accordance with method 508.3 of MIL-STD 810. No damage shall result from this test which will affect subsequent operation of the probe.

* 4.6.25 Sand and dust. The probe shall be subjected to a sand and dust test in accordance with method 510.2 of MIL-STD-810. No damage shall result from this test which will affect subsequent operation of the probe.

4.6.26 Static loading. The probe shall be statically loaded to simulate the impact pressures produced by mach 2.6 flow at sea level pressure. No visible damage to the probe shall result. The resistance of the temperature-sensing element shall then be determined at 0° and 100°C and shall not differ by more than the equivalent of 0.2°C from the resistance values before this test.

* 5. PACKAGING

* 5.1 Preservation and packaging. Preservation and packaging shall be level A, C or standard practice for commercial packaging (see 6.2).

* 5.1.1 Level A. Each probe shall be preserved and packaged in method 1A of MIL-P-116.

* 5.1.2 Level C. The level C preservation and packaging shall conform to the MIL-STD-794 requirements of this level.

or

*The commercial/industrial preservation and packaging of probe shall be in accordance with the requirements of ASTM D 3951.

* 5.2 Packing. Packing shall be level A, B, C or commercial (see 6.2).

* 5.2.1 Level A. The probe preserved and packaged as specified in 5.1.1 shall be packed in a container conforming to PPP-B-601 overseas type. The closure of shipping container shall be in accordance with the appendix of the shipping container specification.

* 5.2.2 Level B. The probe preserved and packaged as specified in 5.1.1 shall be packed in a container conforming to PPP-B-636, weather resistant. The closure of shipping container shall be in accordance with the appendix of the shipping container specification.

* 5.2.3 Level C. The probe preserved and packaged as specified in 5.1.1 shall be packed in a manner to insure carrier acceptance safe delivery at destination. Container shall be in accordance with either the uniform freight classification rules or regulations of other carriers, as applicable to the mode of transportation.

or

Commercial packing shall be accomplished in accordance with ASTM D 3951.

5.3 Marking. In addition to any special marking required by the contract or order, the unit packages and exterior shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The total temperature probe covered by this specification is intended for use in aircraft to determine the total temperature developed by adiabatic heating of the air due to the motion of the aircraft, both during and in the absence of atmospheric icing conditions.

* 6.2 Ordering data.

* 6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Type of probe desired (see 1.2).

c. Where the test samples are to be sent and the activity responsible for the testing (see 4.4).

d. If sampling plan B is to be omitted (see 4.5.2.2).

e. Applicable level of packaging and packing (see 5.1 and 5.2).

* 6.3 First article. When a first article inspection is required, the item will be tested and should be a first article sample or it may be a standard production item from the contractor's current inventory. The first article should consist of three units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, tests and approval of the first article.

6.4 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Navy - AS
Air Force - 99

Reviewers:
DLA - GS

Preparing activity:
Air F e - 82

(Project 6685-0743)

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MIL-P-27723E	Probe, Total Temperature, Deiceable

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5. PROBLEM AREAS

a. Paragraph Number and Wording

b. Recommended Wording

c. Reason/Rationale for Recommendation

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
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