



COMPONENT MAINTENANCE MANUAL

TEMPERATURE SENSOR

Part Number
B7000

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SERVICE BULLETIN LIST

SERVICE BULLETIN	DATE INSERTED	REV.	SUBJECT



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INTRODUCTION

This manual describes the general configuration of Air Temperature Sensor, Model B7000, manufactured by Scientific Instruments, Inc. Identification data, including part number, serial number, and FAA-PMA data, is engraved on the body of the unit.

This manual is divided into separate sections.

Title Page	Testing and Fault Isolation
Record of Revisions	Disassembly
Record of Temporary Revisions	Cleaning
Service Bulletin Information List	Check
List of Effective Pages	Repair
Table of Contents	Assembly including Storage
Introduction	Fits and Clearances
Description and Operation	Special Tools, Fixtures, and Equipment
Specifications	Illustrated Parts List

Refer to the Table of Contents for the page location of applicable sections.

The quantities in this manual are expressed in English units followed by S.I. units in parenthesis.

This manual will be revised as necessary to reflect current information.



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DESCRIPTION AND OPERATION

1. DESCRIPTION

This temperature sensor consists of a calibrated thermistor and trimming resistor housed in a stainless steel probe with a standard MS connector for mounting the unit (see Figure 1). The connector solder terminals, wiring, trimming resistor and body of the thermistor are sealed within the stainless steel probe.

2. OPERATION

This probe senses temperature changes by changes in the resistance value of the thermistor as the ambient temperature changes.

The thermistor-to-receptacle connections are as illustrated in Figure 1.

3. SPECIFICATIONS

Operating Ambient Temperature Range	-55°F to +550°F (-48.3°C to +287.8°C)
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Nominal Sensor Resistance:

At 77°F (25°C)	104 K ohms
At 445°F (229.4°C)	352 ohms
(Control point)	

Receptacle:	MS3102E10SL4P (or equivalent per MIL-C-5015)
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*Mating Plug:	4S3106A10SL4S (or equivalent)
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Weight:	4 oz (0.1 kg)
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Size:

Probe Diameter:	0.215 in. (5.46 mm) maximum
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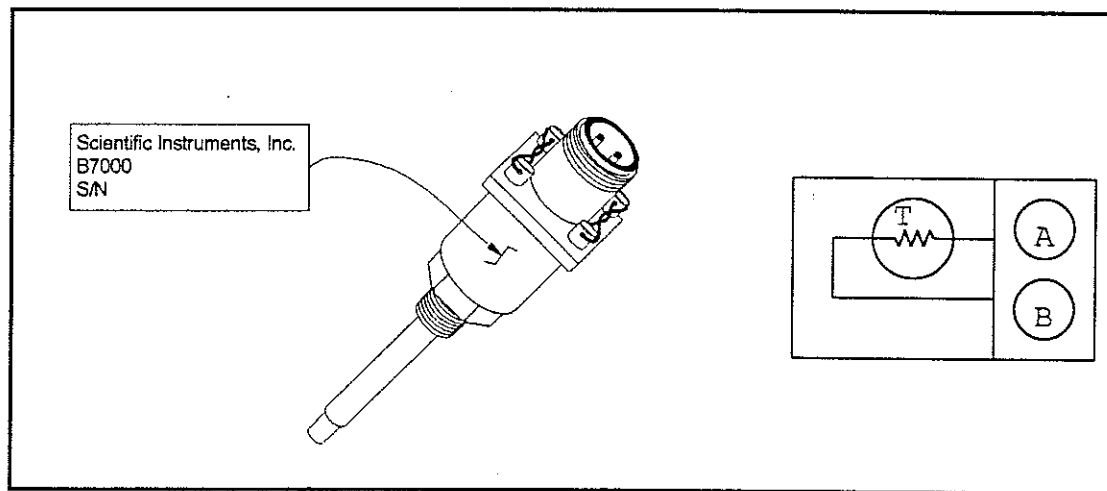
Overall Length:	3.81 in. (96.84 mm) maximum
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Mounting Thread:	1/8 in. NPT
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- * This plug is listed for test purposes only, and is not necessarily used on the aircraft.



Outline and Schematic Drawing

Figure 1

TESTING AND FAULT ISOLATION

4. TESTING AND FAULT ISOLATION

A. The data that follows permits the testing of the sensor to insure correct operation.

B. Special Tools and Test Equipment

- 1) A megohmmeter capable of reading 5 megohms and greater at 500 VDC (AEMC Model 1000, or equivalent)
- 2) Temperature-controlled environmental test chamber. Accuracy 1%.
- 3) Thermometer with temperature accuracy $\pm 0.2^{\circ}\text{F}$ ($\pm 0.11^{\circ}\text{C}$)
- 4) Ohmmeter with:

Current: $<0.1 \text{ mA}$



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Accuracy: 0.05%

Range: 0-100 K Ω

C. Visual Check

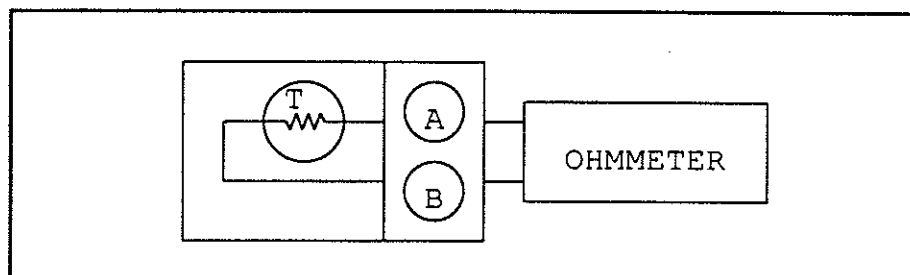
- 1) Visually check the sensor for obvious damage.

D. Insulation Resistance

- 1) Using the megohmmeter, measure the resistance between all receptacle pins connected in parallel and the housing. The reading should exceed 5 megohms @ 500 VDC.

E. Electrical Test (refer to Figure 2)

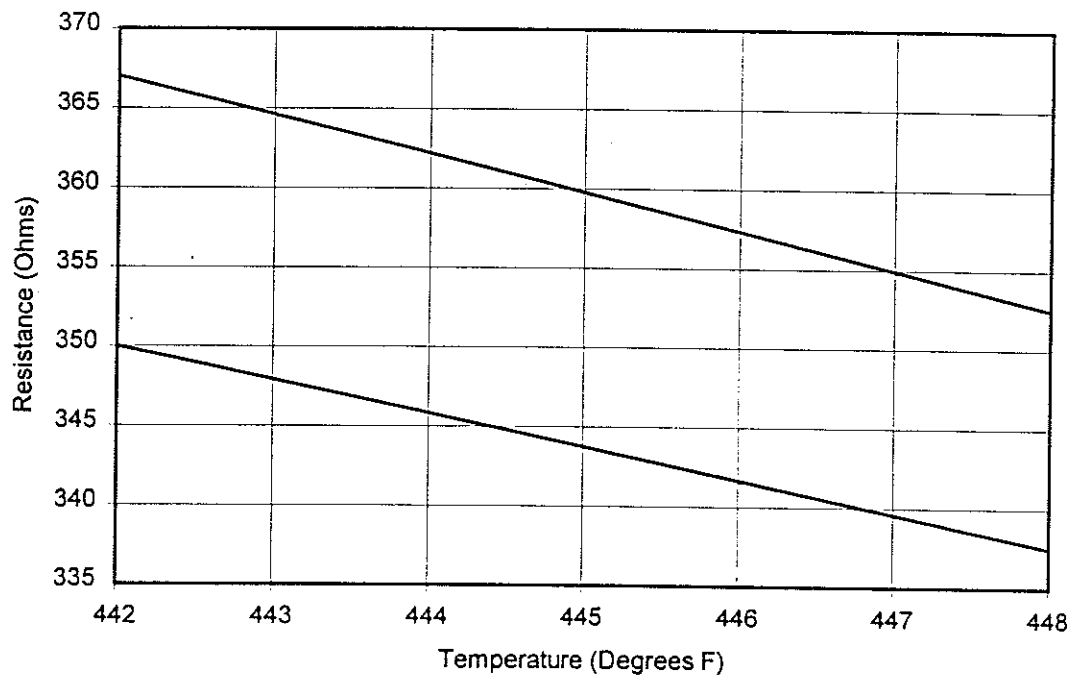
- 1) Connect the Ohmmeter to pins A & B of the temperature sensor. Hold the sensor at a temperature of $445^{\circ}\text{F} \pm 3^{\circ}\text{F}$ ($229.4^{\circ}\text{C} \pm 1.7^{\circ}\text{C}$), within the environmental test chamber. With the thermometer at a stable temperature and located within approximately 1/2 in. (12.7 mm) of the tip of the sensor, measure the temperature. Compare this value to that indicated on Figure 3. The value must be within the limits shown on the drawing.



Schematic for Electrical Test
Figure 2



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Resistance vs Temperature
Figure 3

5. DISASSEMBLY

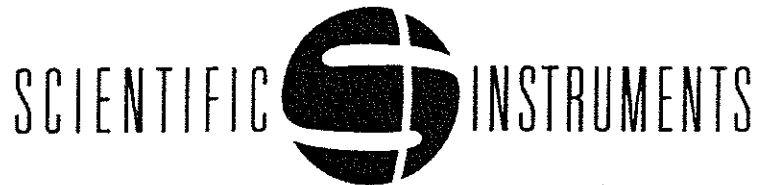
Not Applicable

6. CLEANING

- A. Remove dirt, stains, moisture, etc. with a clean, dry, lint-free cloth.
- B. Use a soft bristle brush moistened in isopropyl alcohol to remove any foreign matter from between the receptacle pins.

7. CHECK

- A. Visually inspect the sensor probe for obvious wear or damage.
- B. Check for bent, broken or missing receptacle pins.
- C. Check probe housing for scratches or cracks.



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8. REPAIR

The temperature sensor is considered non-repairable. Bent receptacle pins may be carefully straightened. For other defects or incorrect operation, the temperature sensor should be discarded.

9. ASSEMBLY INCLUDING STORAGE

A. Assembly

Not Applicable

B. Storage

- 1) Install a protective cap on the electrical connector.
- 2) The sensor must be stored in a clean and dry room open to the air. The temperature must be between 64°F and 82°F (18°C and 28°C) and the relative humidity between 25% and 65%.
- 3) Keep the sensor in its initial packaging. If other containers are put on the sensor container, be careful to prevent damage caused by too much weight.
- 4) Do not keep the sensor near heat, fluids or other sources that can cause corrosion.

10. FITS AND CLEARANCES

No dimensional check of the sensor is necessary.

11. SPECIAL TOOLS, FIXTURES AND EQUIPMENT

No other special tools are necessary.

12. ILLUSTRATED PARTS LIST

Since the unit is non-repairable, no parts list is provided.