SCIENTIFIC INSTRUMENTS

# COMPONENT MAINTENANCE MANUAL

## TEMPERATURE SENSOR

Part Number
B7220

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## INTRODUCTION

This manual describes the general configuration of Pack Temperature Sensor, Model B7220, manufactured by Scientific Instruments, Inc. Identification data, including part number, serial number, and FAA-PMA data, is etched on the body of the unit.

This manual is divided into separate sections.

| | |
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| Title Page | Testing and Fault Isolation |
| Record of Revisions | Disassembly |
| Record of Temporary Revisions | Cleaning |
| Service Bulletin Information List | Check |
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| 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

The Model B7220 Pack Temperature Sensor consists of two calibrated platinum sensors, which are located within a stainless steel probe body. The probe body is externally threaded for boss mounting to the aircraft, as illustrated in Figure 1.

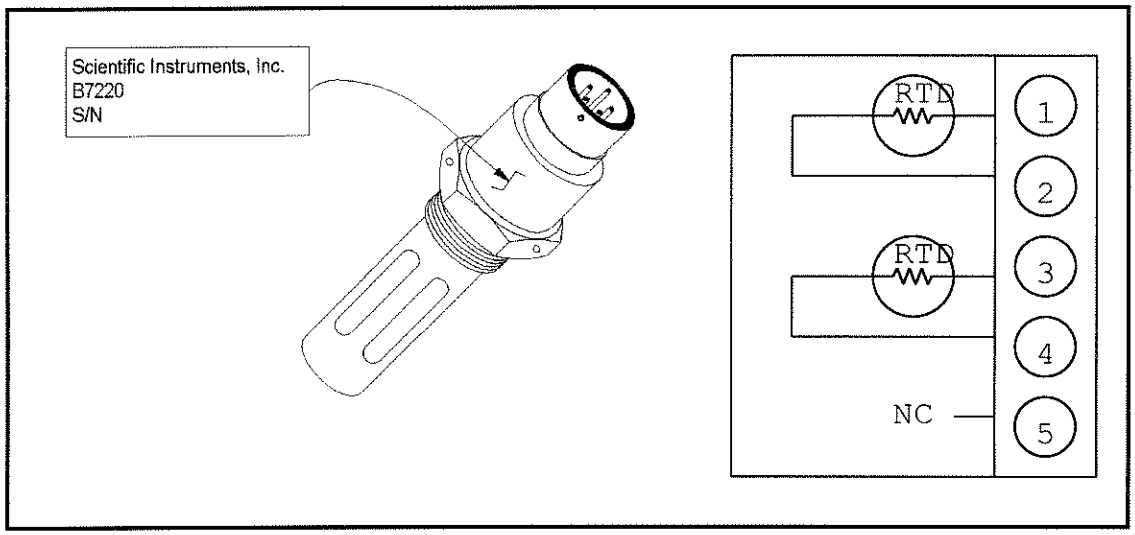
### 2. OPERATION

The resistance of the platinum sensors varies directly with changes in air temperature. The platinum sensors are terminated at pins 1 & 2 and 3 & 4 of a 5-pin hermetically sealed stainless steel receptacle, which is mounted to the probe body. This receptacle provides the interface between the pack temperature sensor and an associated temperature controller. The controller processes the platinum outputs to monitor and regulate the aircraft temperature control system.

### 3. SPECIFICATIONS

| | |
|---|---|
| Receptacle: | MS27034H10B5EN<br>(or equivalent per MIL-C-26500) |
| *Mating Connector: | MS24266R10B55N<br>(or equivalent) |
| Weight: | 3.2 oz (0.09 kg) |
| Size: | |
| Probe Diameter: | 0.65 in. (16.5 mm) maximum |
| Probe Length: | 2.05 in. (52.1 mm) maximum |
| Overall Length: | 3.7 in. (94.0 mm) maximum |
| Mounting Thread: | ¾ - 16 UNF-3A |
| Mounting Hexagon: | 1.00 in. (25.4 mm) across flats |

* 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 megohmeter capable of reading 50 megohms and greater at 500 VDC (AEMC Model 1000, or equivalent)

2) Temperature-controlled environmental test chamber. Accuracy 1%.

3) Thermometer with temperature accuracy ± 0.2°F (± 0.11°C)

4) Ohmmeter with:

Current: <0.1 mA

Accuracy: 0.05%

Range: 0-100 KΩ

C. Visual Check

1) Visually check the sensor for obvious damage.

D. Insulation Resistance

1) Using the megohmeter, measure the resistance between all receptacle pins shorted together and the housing. The reading should exceed 50 megohms @ 500 VDC.

E. Electrical Test (refer to Figure 2)

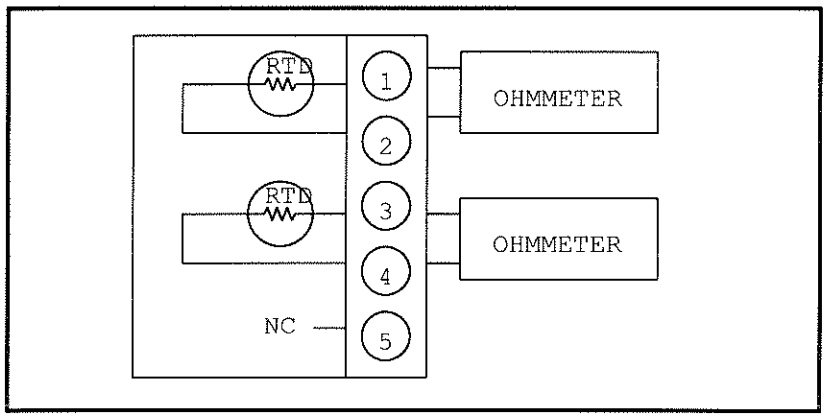
1) Connect the Ohmmeter to pins 1 & 2 of the temperature sensor. Hold the sensor at a temperature of 32°F ± 3°F (0°C ± 1.7°C), within the environmental test chamber. With the thermometer at a stable temperature and located within approximately 1/2 in. (12.7 mm) of the tip of the sensor, measure the temperature. Compare this value to that indicated on Figure 3. The value must be within the limits shown on the drawing.

2) Connect the Ohmmeter to pins 3 & 4 of the temperature sensor. Hold the sensor at a temperature of 32°F ± 3°F (0°C ± 1.7°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.

3) Connect the Ohmmeter to pins 1 & 2 of the temperature sensor. Hold the sensor at a temperature of 160°F ± 3°F (71.1°C ± 1.7°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 4. The value must be within the limits shown on the drawing.

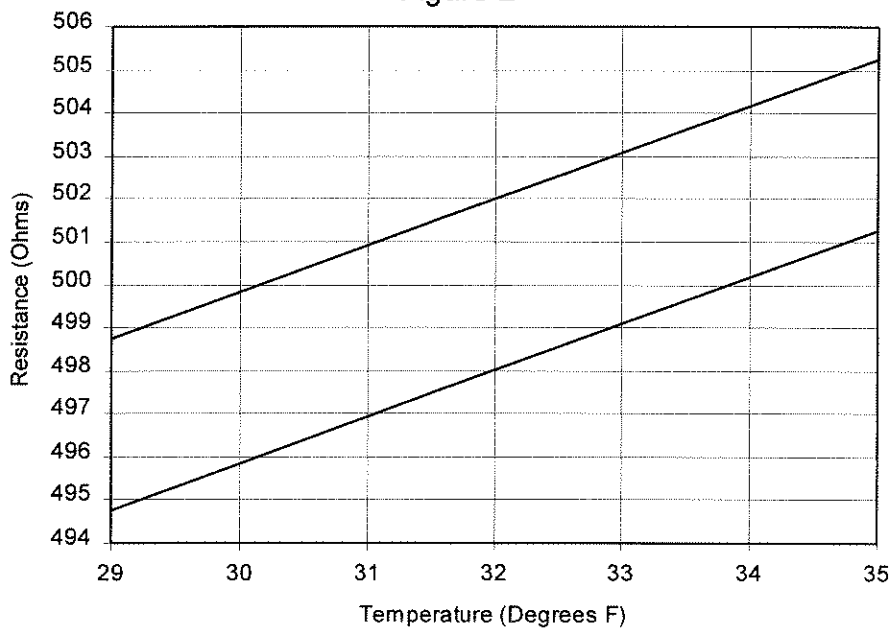
4) Connect the Ohmmeter to pins 3 & 4 of the temperature sensor. Hold the sensor at a temperature of 160°F ± 3°F (71.1°C ± 1.7°C), within the environmental test chamber. With the thermometer at a stable temperature and located within approximately 1/2 in. (12.7 mm) of the tip

of the sensor, measure the temperature. Compare this value to that indicated on Figure 4. The value must be within the limits shown on the drawing.



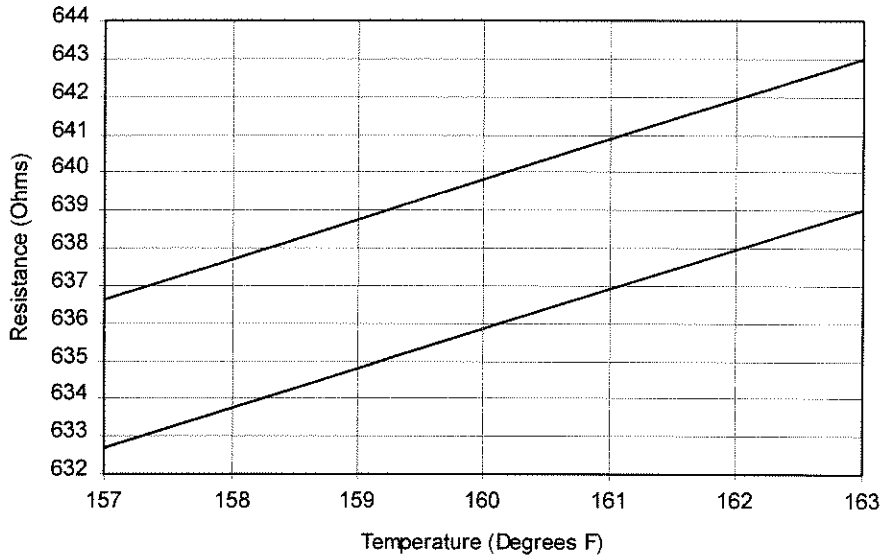

Schematic for Electrical Test

Figure 2




Resistance vs Temperature

Figure 3




Resistance vs Temperature
Figure 4

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.

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.