



## COMPONENT MAINTENANCE MANUAL

### TEMPERATURE SENSOR

Part Number  
B7170

Issued by  
SCIENTIFIC INSTRUMENTS, INC.  
4400 W. Tiffany Drive  
West Palm Beach, FL 33407  
USA

Tel (561) 881-8500  
Fax (561) 881-8556

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SERVICE BULLETIN LIST

SERVICE BULLETIN	DATE INSERTED	REV.	SUBJECT



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INTRODUCTION

This manual describes the general configuration the Temperature Control Sensor, Model B7170, 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

The Temperature Control Sensor, Model B7170, consists of two calibrated platinum resistance temperature detectors (RTDs), which are enclosed within a stainless steel housing. These detectors are terminated in a 5-pin hermetically sealed receptacle, which connects to an external temperature control system. Mounting of the unit in the aircraft is accomplished via an external 7/8 – 14 threaded section and hex head configuration, as illustrated in Figure 1.

#### 2. OPERATION

The RTDs detect air temperature in a high temperature duct and furnish outputs, which are directly proportional to this temperature. The associated temperature controller utilizes the RTD outputs to regulate the air temperature in the duct.

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

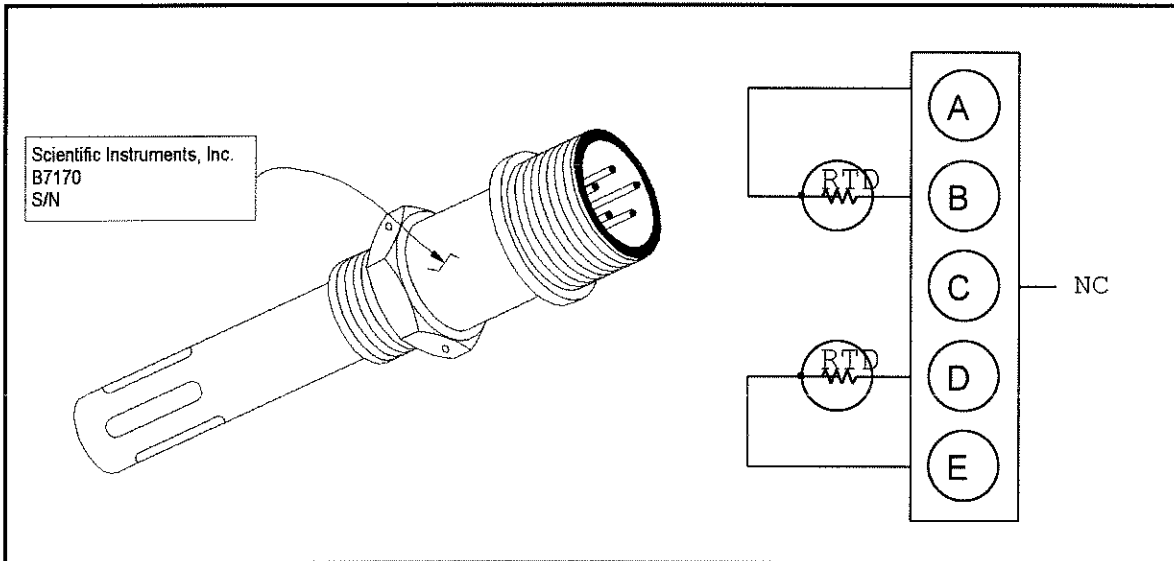
#### 3. SPECIFICATIONS

Receptacle:	HP04-16S-8P-F5SR (or equivalent per MIL-C-5015)
*Mating Connector:	MS3106E16S8S (or equivalent)
Weight:	0.53lb. Max
Size:	
Probe Diameter:	0.730 in. (18.54 mm) maximum
Overall Length:	5.43 in. (137.9 mm) maximum
Mounting Thread:	7/8 – 14 UNF – 3A
Mounting Hexagon:	1.125 in. (28.58 mm)



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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 10 megohms and greater at 50 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 $\Omega$

C. Visual Check

- (1) Visually check the sensor for obvious damage.

D. Insulation Resistance

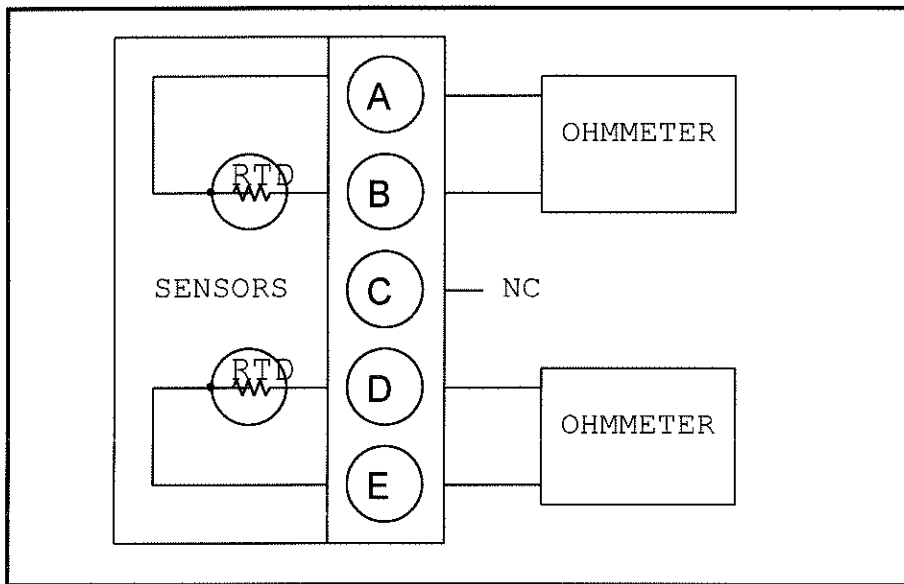
- (1) Using the megohmmeter, measure the resistance between all ungrounded pins connected in parallel and the housing. The reading should exceed 10 megohms @ 50 VDC.

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  $450^{\circ}\text{F} \pm 5^{\circ}\text{F}$  ( $232.2^{\circ}\text{C} \pm 2.7^{\circ}\text{C}$ ), 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. The unit is acceptable if the resistance value is  $943 \pm 2$  ohms at the required temperature.
- (2) Connect the Ohmmeter to pins D & E of the temperature sensor. Hold the sensor at a temperature of  $450^{\circ}\text{F} \pm 5^{\circ}\text{F}$  ( $232.2^{\circ}\text{C} \pm 2.7^{\circ}\text{C}$ ), 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. The unit is acceptable if the resistance value is  $943 \pm 2$  ohms at the required temperature.
- (3) Repeat steps 1 and 2 at  $32^{\circ}\text{F} \pm .5^{\circ}\text{F}$ . The unit is acceptable if the resistance value is  $500 \pm 10$  ohms at the required temperature.



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Schematic for Electrical Test

Figure 2

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.