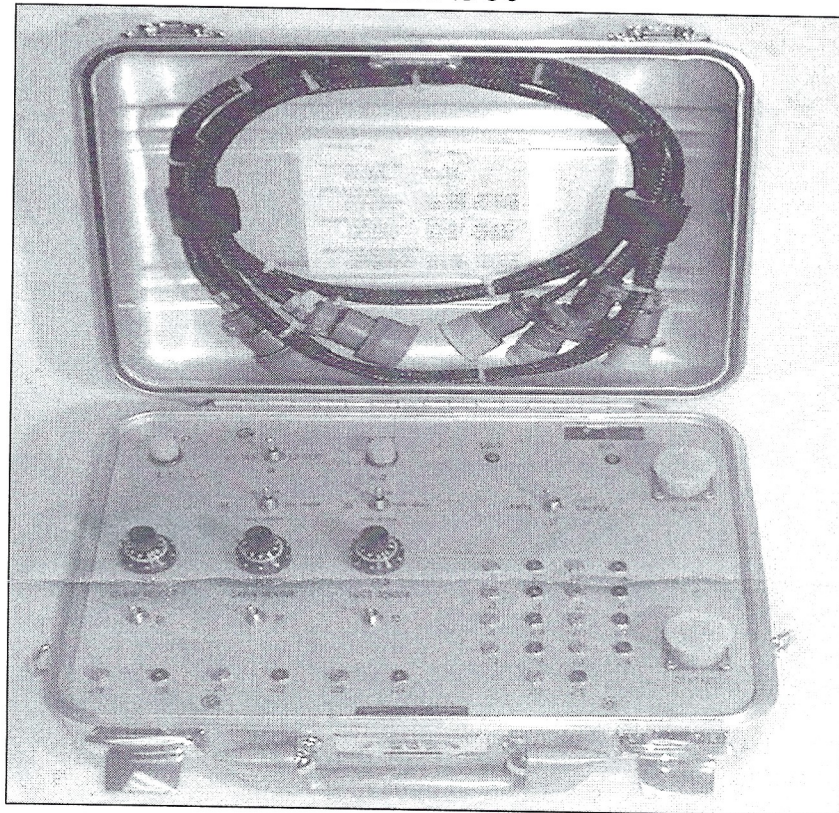


**ACS 200-TS
Environmental Control System
Test Set**



Users Manual

**Precision Electronics Incorporated
5000-A Clark Howell Highway
Atlanta, Georgia 30349
Phone 404-767-4667
Facsimile 404-765-1722**

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Record of Revisions:

Date of Revision	Inserted by	Date of Revision	Inserted by	Date of Revision	Inserted by

Insert the date of the revision and the initials of the person installing the revision in the appropriate box.

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Overview:

The Acs 200-TS provides a means in which operation of the CRJ 200 air conditioning system may be monitored and manipulated to aid in trouble shooting to the defective components.

Cabin and duct sensor values can be read directly from the test set, using a digital multi-meter and the appropriate test jack. The cabin and duct sensor can be simulated without being removed from the aircraft by setting a "known good" resistance value on the appropriate potentiometer.

The controller operation can be verified by manipulating the "known good" resistance values of the cabin and duct sensors and monitoring the response of the controller. For example, if the resistance value of the sensor changes indicating the temperature has decreased, and cabin selector is rotated towards "HOT" does the controller respond by driving the "HOT" valve? The ACS 200-TS allows the technician to "create" this scenario, while actually monitoring the drive signals to the dual bypass valve.

The dual bypass valve operation can likewise be verified by creating a given scenario and seeing the drive signals are in fact coming from the controller. The technician can verify the signal to the dual bypass valve on the ACS 200-TS and by checking for the drive signal at the valve connector. If the signal is there and the valve is not moving, the valve is defective.

The ACS 200-TS will prove itself to be invaluable for trouble shooting the Environmental System. Saving countless man-hours trouble shooting as well as reducing cost by eliminating erroneous "No Fault Found" removals.

Brief description of test box controls:

- R1 Cabin select. This potentiometer simulates the A/C temp selector.
- R2 Cabin sensor. This potentiometer simulates the A/C cabin temp sensor.
- R3 Duct sensor. This potentiometer simulates the A/C duct temp sensor.
- S1 A three position switch. When in the UP position R1 is in control. When in the DOWN position the A/C temp selector in cockpit is in control. The CENTER position is used to effectively remove the test box from A/C system.
- S2 and S3 These switches have the same function has S1, for the cabin sensor and the duct sensor.
- S4 and S5 These switches give an optional resistance of either 0 to 100K, 100 to 200K or 200 to 300K. When using the AC 200-TS on the A/C, only the 0 to 100K range is required. The other two selections are for testing the auto tempo controller when removed from A/C.
- S6 Lamp test. With power applied, L1 will illuminate when selected to LI TEST and L2 will illuminate when selected to L2 TEST.
- S7 Lamp / Valve select. When in the Lamp position, L1 and L2 will flash when a control signal is sent from the auto temp controller to the test box. When selected to Valves position, The COLD and / or HOT LEDs will flash, indicating that a pulse voltage is being supplied to the dual bypass valve.
- L1 COLD lamp
- L2 HOT lamp
- Left LED When flashing, indicates that a COLD pulse control voltage is being sent to the Dual Bypass Valve actuator from the temp controller.
- Right LED When flashing, indicates that a HOT pulse control voltage is being sent to the Dual Bypass Valve actuator from the temp controller.
- J1 and J2 These contacts used to read resistance signals of A/C temp selector being sent to the auto controller with S1 in the down position.
- J3 and J4 These contacts used to read resistance signals of the A/C cabin temp sensor being sent to the auto controller with S2 in the down position.

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- J5 and J6 These contacts used to read resistance signals of the A/C duct temperature sensor being sent to the auto controller with S3 in the down position.
- J7 and J8 These contacts used to read voltage supplied to test box.
- J9 and J10 These contact used to read pulse voltage being supplied to the dual bypass valve when a HOT demand is given from the temp controller.
- J11 and J12 These contact used to read pulse voltage being supplied to the dual bypass valve when a COLD demand is given from the temp controller.
- J13 and J14 These contacts used to read the resistance of the A/C temperature selector with S1 centered and power off to test box.
- J15 and J16 These contacts used to read the resistance of the A/C cabin temp sensor with S2 centered and power off to test box.
- J17 and J18 These contacts used to read the resistance of the A/C duct temperature sensor with S3 centered and power off to test box.
- J19 and J20 These contacts used to read resistance of the TEST BOX temp selector with S1 in the center position and power removed from box.
- J21 and J22 These contacts used to read resistance of the TEST BOX cabin temp sensor with S2 in the center position and power removed from box.
- J23 and J24 These contacts used to read resistance of the TEST BOX duct temp sensor with S3 in the down position and power removed from box.

TEST BOX, INITAIL SET UP:

1. Apply power to aircraft.
2. Select ECS push button switch of affected system to the OFF position.
3. Connect the ASC 200-TS to aircraft auto temp controller.
4. Select S4 and S5 to the UP position.
5. Select S1, S2 and S3 to the MID position.
6. Connect DVM to J19 and J20 and adjust R1 to 5K.
7. Connect DVM to J 21 and J22 and adjust R2 to 35K.
8. Connect DVM to J 23 and J24 and adjust R3 to 35K.

TEST OF AUTO CONTROLLER:

1. After performing INITIAL SET UP, select S1, S2 and S3 to the UP position.
2. Select the ECS push button switch to the on position.
3. Select S7 to the LAMP position.
4. At this time L1 or L2 could be flashing. Adjust R1 CCW or CW as to extinguish both L1 and L2. This is the null position.
5. Turn R1 CCW, L1 will flash.
6. Return R1 to null position, L1 will extinguish.
7. Turn R1 CW, L2 will flash.
8. Return R1 to null position, L2 will extinguish.
9. Select S7 to the VALVE position.
10. Turn R1 CCW, COLD LED will flash.
11. Return R1 to null position, COLD LED will extinguish.
12. Turn R1 CW, HOT LED will flash.
13. Return R1 to null position, HOT LED will extinguish.

TEST OF THE DUAL BYPASS VALVE:

1. After performing INITIAL SET UP, select S1, S2 and S3 to the UP position.
2. Select the ECS push button switch to the on position.
3. Select S7 to the VALVE position.
4. At this time the COLD or HOT LED could be flashing. Adjust R1 CCW or CW as to extinguish both LEDs This is the null position.
5. Turn R1 CCW, the COLD LED will flash. Check for movement of the dual bypass valve.
6. Turn R1 CW, HOT LED will flash. Check for movement of the dual bypass valve.
7. If no movement is evident in steps 5 or 6, verify that the drive voltage and ground are present at valve. If these are correct, replace the dual bypass valve.

CABIN TEMPERTURE SELECTOR CHECK:

1. Remove power from test box by selecting the ECS pack switch to the OFF position.
2. Select S1 to the center position.
3. Connect digital multi-meter to J13 and J14. (It is recommended to use a Simpson meter for this check)
4. Rotate temp selector in cockpit through full range of movement (resistance increases when rotated left and decreases when rotated right).
5. Ensure that resistance value increases and decreases in a smoothly with no interruptions. Any erratic indication are reason for rejection and selector should be replaced.

CABIN / COCKPIT TEMPERATURE SENSOR CHECK:

1. Remove power from test box by selecting the ECS pack switch to the OFF position.
2. Select S2 to the center position.
3. Connect digital multi-meter to J15 and J16 and record this value.
4. Using a digital thermometer, document the temperature of the ambient air around the temperature sensor.
5. Using the Sensor Resistance Chart in the FIM and the values from steps 3 and 4, verify that resistance is in limits. (If there is a substantial difference in the values of chart and A/C, it will be required to know the actual temperature inside the fan sensor unit to confirm that sensor is faulty)

DUCT TEMPERATURE SENSOR CHECK:

1. Remove power from test box by selecting the ECS pack switch to the OFF position.
2. Select S3 to the center position.
3. Connect digital multi-meter to J17 and J18 and record this value.
4. Using a digital thermometer, document the temperature of the ambient air around the temperature sensor.
5. Using the Sensor Resistance Chart in the FIM and the values from steps 3 and 4, verify that resistance is in limits. (If there is a substantial difference in the values of chart and A/C, it will be required to know the actual temperature inside the fan sensor unit to confirm that sensor is faulty)

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Maintenance / Calibration

The ACS 200-TS is designed to be used with a calibrated multi-meter. The multi-meter is used to verify the settings and adjustments made with potentiometers R1, R2 and R3.

Therefore calibration of the ACS 200-TS is not required. However it is recommended that the ACS 200-TS be inspected on an annual basis, for broken wires, proper switch movement, blown lamps and smooth linear operation of the potentiometers.

If you so desire, the ACS 200-TS may be returned to Precision Electronics for this inspection, for a nominal charge of two hours labor.