

PROVEN

## Quality, Dependability and Reliability

Avtech's Freezing Protection Control Unit (FPCU) controls and monitors the heating elements of the Waste Water System to prevent freezing of the components. The FPCU interacts with a Control Panel and communicates equipment status via an ARINC 429 bus to the Central Maintenance Computer (CMC).



### FREEZER PROTECTION CONTROL UNIT (FPCU)

Avtech's FPCU is installed as optional equipment on Embraer's ERJ series of aircraft. The unit monitors and protects the plumbing, tanks and valves associated with the Water and Waste System (WWS) by applying power to heaters on a as-needed basis

- Prevents expensive failures to the WWS by preventing freezing of system components
- The FPCU contains an RS232 bus used to set temperature thresholds, reduced power mode functionality and other configured features
- The FPCU provides 32 independent heater channels
- Each heater driver will use current sensing circuitry and shut down if an over current is detected and report the fault via the CMC interface
- Heater circuitry uses GFCI (Ground Fault Circuit Interrupter) and shut down the corresponding driver when a ground fault is detected
- Each heater channel utilizes an analog input to acquire temperature information from a temperature sensor.
- Temperature sensors have sensor fail open and short protection and faults are sent to the CMC for reporting

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## SPECIFICATIONS

| Requirement   | DO-160D Section | Category         | Remarks                           |
|---|-----------------|------------------|-----------------------------------|
| Temperature and Altitude                              | 4               | A3               |                                   |
| In-Flight Loss of Cooling                             | 4.5.4           | -                | Not Applicable                    |
| Temperature Variation                                 | 5               | B                |                                   |
| Humidity  | 6               | A                |                                   |
| Operational Shocks and Crash Safety                   | 7               | B                |                                   |
| Vibration   | 8               | S or S2          | Curve C                           |
| Explosion Proofness                                   | 9               | E2               | Category H                        |
| Waterproofness  | 10              | X                |                                   |
| Fluids Susceptibility                                 | 11              | X                |                                   |
| Sand and Dust   | 12              | X                |                                   |
| Fungus Resistance                                     | 13              | F                |                                   |
| Salt Spray  | 14              | X                |                                   |
| Magnetic Effect                                       | 15              | Z                |                                   |
| Power Input   | 16              | AC = E<br>DC = Z | FPCU contain dual power AC and DC |
| Voltage Spike   | 17              | A                |                                   |
| Audio Frequency Conducted Susceptibility, Power Input | 18              | Z                |                                   |
| Induced signal Susceptibility                         | 19              | Z                |                                   |
| R. F. Susceptibility, Radiated & Conducted            | 20              | R                |                                   |
| Emission of RF Energy                                 | 21              | M                |                                   |
| Lightning Induced Transient Susceptibility            | 22              | XXC2 and<br>XXE2 |                                   |
| Lightning Direct Effects                              | 23              | X                |                                   |
| Icing   | 24              | X                |                                   |

