

3200 Series High Reliability Thermostats in Satellite Applications

BACKGROUND

Satellites (see Figure 1) perform a variety of critical functions, from communications and navigation to surveillance and reconnaissance.

The aerospace industry needed a high reliability thermostat that could provide temperature control for a variety of satellite functions, including:

- Directional thrusters
- Battery recharging
- Environmental control
- Propellant lines
- Heaters
- Inertial guidance systems
- Gimbals
- Solar panel monitoring
- Gyros
- Avionics

SOLUTION

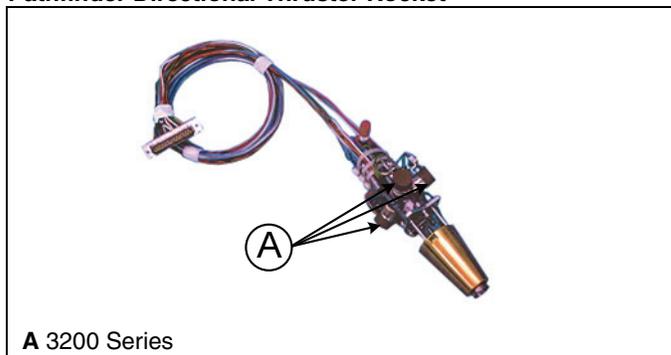
The 3200 Series High Reliability Thermostat was developed in 1979 at the request of the Aerospace Corporation for use in these applications.

The 3200 Series thermostats shown in Figure 2 are designed to control the primary and backup heaters on directional thruster rockets that determine the course and altitude of various satellites. The heaters prevent the flow of rocket fuel (hydrazine) through the nozzle from cooling to the point where the flow is restricted, which would limit thrust.

Figure 1. Satellites



Figure 2. 3200 Series Thermostats Used on the Mars Pathfinder Directional Thruster Rocket



A 3200 Series

Table 1. 3200 Series High Reliability Thermostat

3200 Series
Features and Benefits
<ul style="list-style-type: none"> • Hermetically sealed to withstand most harsh conditions found in space • Withstands most high shock and vibration levels • Contact ratings up to 120 Vdc offer a significant range of electrical loads for use in multiple applications • Tight temperature tolerances of $\pm 1,7\text{ }^{\circ}\text{C}$ [$\pm 3\text{ }^{\circ}\text{F}$] provide tight controls in the application • Wide temperature set point range from $-51,1\text{ }^{\circ}\text{C}$ to $162,8\text{ }^{\circ}\text{C}$ [$-60\text{ }^{\circ}\text{F}$ to $325\text{ }^{\circ}\text{F}$] allows operation in the extreme temperature conditions of space • Individually serialized devices include a test data form for accountability • Qualified to NASA specifications S-311-641 and SA-311-641/01 • Variety of mounting studs, brackets and terminal available for mounting flexibility

3200 Series in Satellite Applications

WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this application note is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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