GE GE □□□ Series Service Manual

IS200VRTDH1DAB

1. Description

SPECIFICATIONS

2. Specifications

Specification	Value
Original	**Manufacturer General Electric**
Assembly	**Style Normal Assembly**
Product	**Series Mark VIe Speedtronic**
Functional	**Acronym VRTD**
Part	**Number IS200VRTDH1DAB**
Revision	**Quantity 3 Revisions**
Revision	**Quantity 3 Revisions**
Backwards-Compatibility	**1st two revisions**

3. Product Information

SPECIFICATIONS

Part No.: IS200VRTDH1DAB

Manufacturer: General Electric

Country of Manufacture: United States of America (USA)

Number of channels: 16 channels

Span: 0.3532 to 4.054 V

Common mode voltage range: 5 V

Maximum lead resistance: 15 ohm maximum

Fast scan: 40 ms (25 Hz)

Power consumption: Less than 12 W

Product Type: Resistance Temperature Device

Availability: In Stock

Series: Mark VI

Functional Description

IS200VRTDH1DAB is a resistance temperature device developed by GE. It is a part of the Mark VI control system. The RTD processor board (VRTD) and its associated terminal boards form an integrated system for accurate temperature sensing and monitoring. The precise wiring, use of specialized cables, and collaborative processing ensure reliable temperature data collection and transmission within the broader control system.

Signal Excitation and Processing

Excitation by VRTD: The processor board is responsible for exciting the RTDs. This excitation process ensures that the RTDs produce accurate and reliable signals corresponding to the temperature conditions they are monitoring.

Signal Return and Processing: The signals generated by the RTDs in response to the excitation are then returned to the VRTD processor board. The VRTD processes these signals, extracting temperature information for further analysis and transmission.

Digital Temperature Values and Data Transfer

I/O Processor Board Conversion: In collaboration with the I/O processor board, converts the analog signals from the RTDs into digital temperature values. This conversion process enhances the precision and compatibility of the temperature data for subsequent stages.

VME Backplane Communication: The digital temperature values are transmitted over the VME backplane, a high-speed communication channel within the system. This data transfer is a critical step in relaying temperature information to the VCMI board.

Controller Integration: Finally, the board forwards the digital temperature values to the controller, allowing the system to make informed decisions based on the monitored temperature conditions. This integration contributes to the overall control and management of the system.

Operation

High-Frequency Decoupling for Signals: One of the critical features of the Resistance Temperature Device (RTD) processing system is the implementation of high-frequency decoupling for RTD signals at the point of signal entry. This design element serves to safeguard the integrity of RTD signals by effectively mitigating the impact of high-frequency noise. As the RTD signals traverse the system, this decoupling to ground ensures that the temperature readings derived from the RTDs are accurate and reliable, even in the presence of potential electromagnetic interference.

Redundant Pacemakers in Multiplexing: To enhance system robustness and fault tolerance, the RTD multiplexing process on the VRTD boards is orchestrated by redundant pacemakers. This redundancy is crucial in preventing the loss of RTD signals in the control database due to potential failures. Whether it's the loss of a single cable or the failure of a single VRTD board, the redundant pacemakers synchronize the multiplexing operation, ensuring that the control system continues to receive accurate temperature data without interruption.

Simultaneous RTD Reading and Skewing Mechanism: The boards in different modules, denoted as R, S, and T, are designed to read RTDs simultaneously. However, a strategic skewing mechanism is employed to introduce a temporal offset in the readings. Specifically, the readings are skewed by two. For instance, when module R is actively reading RTD3, module S is reading RTD5, and module T is reading RTD7, and this pattern continues. This deliberate skewing ensures that no two VRTD boards simultaneously excite the same RTD, preventing any potential conflicts and inaccurate readings.

Preventing Simultaneous Excitation for Data Integrity: The primary goal of the skewing mechanism is to ensure that the same RTD is not excited by two VRTD boards simultaneously. Simultaneous excitation could lead to conflicting signals, resulting in inaccurate temperature readings. By coordinating the readings such that each module is slightly offset from the others, the system guarantees that each board is excited independently during its dedicated reading time. This meticulous approach contributes to data integrity, preventing the production of misleading or erroneous temperature measurements.

IS200VRTDH1DAB Technical Specifications

Original Manufacturer General Electric

Assembly Style Normal Assembly

Product Series Mark VIe Speedtronic

Functional Acronym VRTD

Part Number IS200VRTDH1DAB

Revision Quantity 3 Revisions

Revision Quantity 3 Revisions

Backwards-Compatibility 1st two revisions

About the IS200VRTDH1DAB

The IS200VRTDH1DAB is a GE Mark VI PCB component. First released by GE under the “Speedtronic” name, the Mark VI is one of a line of steam/gas turbine management systems designed to improve reliability and decrease downtime of heavy-duty turbines. The Mark VI is built with triple-redundant backups on critical controls and includes a central control module that connects to a PC-based HMI (human-machine interface.) This interface allows access to turbine data from one location using specially-designed turbine control software.

The Mark VI Turbine Control System Series that this IS200VRTDH1DAB device belongs to has to be considered an attractive product series on the greater automated industrial marketplace, given the fact that it is one of the lastly-developed GE product series to utilize the patented Speedtronic control system technology first seen with the rollout of the Mark I Series in the mid to later 1960s. This IS200VRTDH1DAB device is not the original product of its specific Mark VI Series functionality; that would be the IS200VRTDH1 parent VME Resistance Temperature Detector Card mot making use of this device's two functional product revisions and singular artwork configuration revision.

Hardware Tips and Specifications

The IS200VRTDH1DAB excites Resistance Temperature Devices (RTDs) and captures the resulting signals, which are then converted into digital temperature values. These values are transferred over the VME backplane to the VCMI and to the controller. RTD short and open circuits are detected by out of range values. These ‘outside of hardware limits’ RTDs are removed from scanned inputs in order to prevent adverse effects on other input channels. These out of range RTDs can be reinstated manually or will be reinstated automatically every twenty seconds if they are within range. This IS200VRTDH1DAB device is not surrounded online by any great amount of originally-available instructional manual materials, given the fact that it belongs to a product series that has been consistently scrubbed from the internet by General Electric for copyright purposes. While this is true, this IS200VRTDH1DAB device makes use of its General Electric primary manufacture well, as it comes standard with a IS200VRTDH1DAB functional product number delegating a number of hardware details in a series of functional naming segments. For instance, the IS200VRTDH1DAB functional product number is started off through the dual-functional IS200 series tag delegating this IS200VRTDH1DAB product's normal Mark VI Series assembly as well as its domestic original manufacture location. Some of the other relevant hardware details embedded in this functional product number includes the IS200VRTDH1DAB PCB's:

VRTD functional product number

Conformal PCB coating style

Group one Mark VI Series product grouping

Three-fold revision history

A front faceplate is attached to the IS200VRTDH1DAB via three screws; this front faceplate would seem to indicate this IS200VRTDH1DAB product's placement in the standard Mark VI Turbine Control System Series's standard VME Rack Mounting Assembly. This IS200VRTDH1DAB product's base printed circuit board is assured a standard style of voltage protection through a series-standardized selection of voltage-limiting hardware components and component specifications. The back edge of the board is populated by two backplane connectors. The IS200VRTDH1DAB has over two hundred integrated circuits, over two hundred capacitors, and several hundred resistors. Some components are located on the rear surface. The board and the faceplate are both marked with the manufacturer’s logo and also carry the board ID number. Codes like “6BA01” and “94V-0” appear on the surface. Please refer to “Mark VI Turbine Control System Guide Vol II” (GEH-6421) for more information on board operation and specifications.