GE Service Manual

IS200VRTDH1D

1. Description

IS200VRTDH1D – Resistance Temperature Device (RTD) Input Board

3. Product Information

IS200VRTDH1D – Resistance Temperature Device (RTD) Input Board

Specifications

Part Number: IS200VRTDH1D

Manufacturer: General Electric (GE)

Series: Mark VI

Product Type: Input Board

Function: Converts RTD inputs into digital temperature values

Number of Channels: 16 channels per VRTD board

A/D Converter Resolution: 14-bit

Power Consumption: Less than 12 W

Availability: In Stock

Country of Origin: USA

Product Overview

The IS200VRTDH1D is a Resistance Temperature Device (RTD) Input Board used in the GE Mark VI gas turbine control system.

The board supports 16 three-wire RTD inputs. These inputs are connected through an RTD terminal board (TRTD or DRTD), which interfaces with the VME rack containing the VRTD processor board.

The VRTD board excites the RTDs, receives the resulting signals, converts them into digital temperature values, and transmits the processed data to the controller through the VME backplane using the VCMI communication interface.

Installation Notes

Turn off power to the VME processor rack.

Insert the board and press the top and bottom levers until the edge connectors are fully seated.

Tighten the captive screws on the top and bottom of the front panel.

Functional Description

RTD Signal Processing

The VRTD board supplies a 10 mA DC multiplexed excitation current (not continuous) to each RTD through the terminal board.

The returning RTD signal is processed using:

Voltage-to-frequency converters

Sample counters

A VCO-type A/D converter

Sampling rates:

Normal Mode: 4 samples per second

Fast Mode: 25 samples per second

The digital signal processor performs linearization for 15 selectable RTD types.

Fault Detection

Out-of-range values are used to detect:

RTD short circuits

RTD open circuits

When an RTD exceeds hardware limits:

The affected channel is removed from the scan.

Other channels continue operating normally.

Repaired channels can:

Be automatically restored after approximately 20 seconds, or

Be manually restored.

Triple Modular Redundancy (TMR)

The TRTDH1B configuration supports redundant RTD inputs in a Triple Modular Redundant (TMR) architecture.

Key features include:

Inputs are distributed across three VRTD boards located in the R, S, and T racks.

High-frequency grounding decoupling is provided on all RTD input signals.

RTD multiplexing prevents loss of temperature data if a cable or VRTD board fails.

RTDs are read simultaneously by the R, S, and T VRTD boards.

Each VRTD board reads a different RTD pair than the previous board to prevent simultaneous excitation of the same RTD, improving measurement accuracy.

Diagnostics

Front Panel LEDs

Three LEDs on the VRTD front panel indicate board status:

RUN: Typically solid green.

FAIL: Flashing green.

Diagnostic LED: Normally off; remains steady orange when a diagnostic alarm condition exists.

Diagnostic Functions

The board performs hardware limit checking for each RTD type using predefined, non-configurable high and low thresholds near the operating range limits.

When a hardware limit is exceeded:

The input channel is no longer scanned.

A logic signal is generated instead.

A composite diagnostic alarm (L3DIAG VRTD) is generated if any input reaches a hardware limit.

Diagnostic information is available through the system toolbox.

Individual diagnostic signals can be latched.

The RESET DIA signal can be used to clear latched diagnostics.

Configuration Parameters

System Limits

Enable or disable system limit checking.

Auto Reset

Enable or disable automatic restoration of RTD channels removed from scanning.

Group A Rate

Sampling rate and system-frequency filtering for the first group of 8 inputs.

Options:

4 Hz

50 Hz filter

Group A Gain

Higher measurement accuracy for RTDs with resistance below 190 Ω.

Options:

Normal (1.0)

Gain 2.0 (10 Ω)

Cu_10.0

Group B Rate

Sampling rate and system-frequency filtering for the second group of 8 inputs.

Options:

4 Hz

50 Hz filter

Group B Gain

Higher measurement accuracy for RTDs with resistance below 190 Ω.

Options:

Normal (1.0)

Gain 2.0

System Integration

TRTDH1B and TRTDH1C terminal boards operate with the VRTD processor in the Mark VI control system.

They support both:

Simplex applications

Triple Modular Redundant (TMR) applications

One TRTDH1C terminal board connects to the VRTD processor through two cables.

In TMR systems, six connections link the TRTDH1B terminal board to three VRTD processors.