GE Service Manual

IS200VTCCH1C

1. Description

IS200VTCCH1C Technical Specifications

2. Specifications

Specification	Value
OEM	**General Electric**
Part	**Number IS200VTCCH1C**
Series	**Mark VI Speedtronic**
Functional	**Acronym VTCC**
Functional	**Description Thermocouple Input Board**
Functional	**Revision 1 C**
PCB	**Coating Style Conformal Coating**

3. Product Information

IS200VTCCH1C Technical Specifications

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About the IS200VTCCH1C

The IS200VTCCH1C is a board component made by GE as part of the Mark VI system. The MKVI is part of the Speedtronic line of gas and steam turbine management that began in the 1960s with the Mark I and has continued for several decades through the Mark VI and Mark VIe. The Mark VI has a Central Control Module that is connected to an Operator Interface. This Operator Interface allows end users to access alarm states and system data using the interface that is built using a Windows platform PC. The Mark VI Turbine Control System Series that this IS200VTCCH1C device belongs to has to be treated as quite a significant functional improvement upon the previously-developed Mark V Turbine Control System Series of basically the same full extended series title, as the Mark VI Series tacked the alternative energy-friendly wind turbine possible functional application onto the gas and steam turbine settings made available with the rollout of the Mark V Series mentioned before.

Hardware Tips and Specifications

As a Thermocouple Input board, the IS200VTCCH1C accepts twenty-four thermocouple inputs through terminal boards like the TBTC and the DTTC terminal boards. The IS200VTCCH1C only supports T, S, K, J, and E types of thermocouples. It also supports mV inputs that have a span of -8mV to +45mV. The board cannot support thermocouples of the B, N or R types, or mV inputs of -20mV to -9mV or from +46mV to +95mV; if these ranges are necessary, a VTCCH2 board will be necessary. The IS200VTCCH1C is built with two backplanes and four other board connectors. These other connectors are made of conductive dots or traces. Capacitors and resistors number in the hundreds on this board; these are numbered and carry reference designators. It also has diodes, inductor coils or beads, and TP test points. It also has many integrated circuits including Dual port SRAM, FPGAs, CMOS static RAM, and digital signal processors. There are three LED components mounted into the front faceplate that are labeled run (green LED,) fail (red LED,) and status (orange LED.)

This IS200VTCCH1C device is warranty-protected upon a purchase.

AX Control offers multiple programs to protect your purchase and lower your final costs. Speak to our team today about warranties, surplus purchasing, and exchange credit. This IS200VTCCH1C device's greater Mark VI Turbine Control System Series is really not surrounded by very many originally-developed instructional manual materials online, which results in the previous part of this IS200VTCCH1C personalized product page being reminiscent of a diligent visual inspection of the IS200VTCCH1C Board itself. One other fine supplemental source of IS200VTCCH1C Board hardware component and component specification information can be identified in its IS200VTCCH1C functional product number, which was actually developed by GE to indirectly indicate a number of relevant IS200VTCCH1C Board details through its characteristic series of consecutive functional naming chunks. One such chunk is the initial dual-functional IS200 series tag that is responsible for delegating this IS200VTCCH1C device's IS200 series tag, which is dual-functional as it described both this IS200VTCCH1C product offering's normal Mark VI Series assembly as well as its domestic original location of GE manufacture. Some of the other important IS200VTCCH1C details indicated in this fashion include this IS200VTCCH1C product's:

VTCC functional product acronym

Group one Mark VI Series grouping

Conformal PCB coating style

C-rated product revision

IS200VTCCH1C – Thermocouple Processor Board

Specifications

Part Number: IS200VTCCH1C

Manufacturer: General Electric (GE)

Country of Manufacture: United States (USA)

Product Type: Thermocouple Input Board

Series: Mark VI

Product Overview

The IS200VTCCH1C is a Thermocouple Processor Board developed by GE for the Mark VI control system.

The board accepts 24 thermocouple inputs of the following types:

Type E

Type J

Type K

Type S

Type T

These inputs connect through two terminal blocks on the TBTC terminal board. Molded-connector cables connect the terminal board to the VME rack that houses the VTCC thermocouple processor board.

The TBTC terminal board supports both:

Simplex mode (TBTCH1C)

Triple Modular Redundant (TMR) mode (TBTCH1B)

Installation

Turn off the VME processor rack.

Insert the VTCC board and press the top and bottom levers to fully seat the edge connectors.

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

Cable Connections

Connections to the TBTC terminal boards are made through the lower J3 and J4 connectors on the VME rack.

These are latching connectors used to secure the cables.

After installation, start the VME rack and verify the front-panel diagnostic indicators.

Operation

The TBTC supports 24 thermocouple inputs.

Inputs may be:

Grounded

Ungrounded

Maximum two-wire cable resistance: 450 Ω

Maximum distance from the turbine control cabinet: 300 m (984 ft)

Additional functions include:

High-frequency noise suppression on the terminal board.

Two cold-junction reference devices for temperature compensation.

Software linearization for individual thermocouple types.

Automatic removal of thermocouple channels that exceed hardware limits to prevent impact on other channels.

Cold Junction Compensation

Compensation Logic

When both cold-junction reference devices are within configured limits, the system uses the average of both measurements.

If only one reference is within limits, that reference is used.

If neither reference is within limits, a default value is applied.

Automatic Calibration

Using filtered calibration references and zero-voltage references:

Thermocouple inputs and cold-junction inputs are automatically calibrated.

Each VTCC board uses:

One cold-junction reference for connector J3

One cold-junction reference for connector J4

Reference Sources

Each cold-junction reference can be configured as:

Remote (from the VME bus)

Local

Both references are treated as sensor inputs and can be:

Averaged

Monitored

Assigned alarm limits

A local and remote reference can be used together.

Monitoring and Accuracy

The average of both references is typically used.

Alarm limits can be configured.

If a cold-junction reference exceeds its limit, a logic signal is generated.

A 1°F error in cold-junction compensation produces approximately a 1°F error in thermocouple temperature measurement.

Characteristics

Channel Capacity

Each terminal board and I/O board supports 24 channels.

Supported Thermocouple Types

E

J

K

S

T

mV Input Support

Supports millivolt input signals.

Measurement Range

−8 mV to +45 mV

A/D Converter

16-bit resolution

Higher resolution than the 14-bit converter used in some other Mark VI input boards.

Cold Junction Compensation (CJC)

Reference-junction temperature is measured twice on each thermocouple terminal board.

Optional remote cold-junction references are supported.

TMR configurations provide six cold-junction reference channels.

Cold Junction Accuracy

Accuracy: ±2°F

Features

Thermocouple Input Processing

Accepts 24 thermocouple inputs through TBTC and DTTC terminal boards.

Supports only:

Type E

Type J

Type K

Type S

Type T thermocouples

Mark VI System Integration

The board is part of the GE Speedtronic gas and steam turbine control platform.

The Mark VI system includes:

Central control module

Operator interface

Alarm management

System data viewing

Windows-based operator workstation

mV Input Capability

In addition to thermocouple inputs, the board supports millivolt inputs over the range:

−8 mV to +45 mV

Unsupported Input Types

The board does not support:

Type B thermocouples

Type N thermocouples

Type R thermocouples

mV ranges:

−20 mV to −9 mV

+46 mV to +95 mV

For these ranges and thermocouple types, a VTCCH2 board is required.

Hardware Design

Two backplanes

Four additional board connectors

Conductive trace and pad interconnections

Electronic Components

The board contains:

Numerous capacitors

Resistors with reference designators

Diodes

Inductors/beads

Test points (TPs)

Integrated Circuits

Major ICs include:

Dual-port SRAM

FPGA devices

CMOS static RAM

Digital signal processors (DSPs)

Front Panel Indicators

The front faceplate includes three status LEDs:

RUN — Green

FAIL — Red

STATUS — Orange

Key Technical Summary

24 thermocouple channels

Supports E, J, K, S, and T thermocouples

16-bit A/D conversion

Input range: −8 mV to +45 mV

Cold-junction compensation with dual references

±2°F cold-junction accuracy

Supports both Simplex and TMR architectures

Maximum field cable length: 300 m (984 ft)

Used in GE Mark VI turbine control systems