GE GE □□□ Series Service Manual

IS200ESELH2AAA

1. Description

SPECIFICATIONS

2. Specifications

Specification	Value
Manufacturer	**GE Industrial Systems**
Series	**EX2100**
Part	**Number IS200ESELH2AAA**
Functional	**Acronym ESEL**
Functional	**Description GE Printed Circuit Board**
PCB	**Coating Conformal Coating**
Functional	**Revision 1 A**
Functional	**Revision 2 A**
Artwork	**Revision A**
About	**the IS200ESELH2AAA**
This	**IS200ESELH2AAA printed circuit board was manufactured by GE Industrial Systems for use specifically in their EX2100 Series of Excitation Control Systems and Excitation Control System component products. This printed circuit board is more accurately definable as a EX2100 Exciter Selector Board, and is modified from its original IS200ESELH2 parent board status through its inclusion of three A-rated significant product revisions.**

3. Product Information

SPECIFICATIONS

Part Number: IS200ESELH2AAA

Manufacturer: General Electric

Country of Manufacture: United States (USA)

Series: EX2100

Number of Bridge Drivers: 1

Number of ESEL Boards for Redundant Controls: 2

Function: Exciter Selector Board

Functional Description

IS200ESELH2AAA is an Exciter Selector Board developed by GE. It is part of the GE Speedtronic EX2100 excitation system. It is mounted within the control rack of a power generation system. Its primary function is to interface with the master I/O (EMIO) board, which receives six logic-level gate pulse signals. These signals are crucial for the system, operation as they dictate the timing and control of the excitation process.

Features

The Exciter Selector Board plays an integral role in ensuring the accurate distribution and transmission of gate pulses, which is a critical element for the proper functioning of the power generation system. These gate pulses are directly responsible for controlling the excitation process, and as such, their precise timing and synchronization are essential for maintaining optimal system performance.

Ensures that these pulses are distributed and transmitted with precision, effectively managing the excitation level of the generator. Any deviation in pulse timing or sequencing could lead to voltage instability or reactive power imbalances, which can disrupt the power generation process and compromise system performance. By ensuring the accurate distribution of gate pulses, the Exciter Selector Board helps maintain the stability and efficiency of the power generation system.

Designed to work seamlessly within the EX2100 excitation system, an advanced control system used in large-scale power generation. This system is known for its high precision and reliability, and the Exciter Selector Board is an essential component that helps it operate at peak performance. By providing precise control over the timing and application of excitation, improves the efficiency and reliability of the entire excitation system. Its role in ensuring correct pulse transmission helps prevent issues such as voltage fluctuations or over-excitation, which could otherwise lead to reduced efficiency or equipment damage.

Excitation is the process of supplying the rotor of a generator with a controlled amount of DC to produce a magnetic field, which induces voltage in the stator. Along with its connected components, optimizes the excitation performance by ensuring that the excitation system operates within its designed parameters. This optimization is critical for maintaining stable voltage and reactive power within the generator. By controlling these parameters accurately, the Exciter Selector Board helps achieve a consistent and reliable power output, reducing the risk of voltage instability or generator inefficiency.

Supports the seamless conversion of power by efficiently processing and relaying the logic-level gate pulse signals. These signals dictate when and how much excitation is applied to the generator’s rotor, directly impacting the system’s ability to convert mechanical energy into electrical power. The board ensures that these signals are transmitted without delay or error, facilitating the smooth operation of the excitation system and, by extension, the power conversion process. This helps to maintain the quality of the electrical output, ensuring it meets grid requirements and is free from fluctuations that could affect connected loads.

The interaction between the ESEL (Exciter Selector Board) and the EGPA (Exciter Gate Pulse Amplifier) boards is crucial in maintaining the excitation system’s stability. The EGPA board amplifies the signals from the ESEL, ensuring that the gate pulses are of sufficient strength to effectively control the excitation process. This coordination between the two boards ensures that the excitation system remains within its designed operational parameters, minimizing the risks of power instability or generator inefficiencies.

In essence, the communication between the ESEL and EGPA boards acts as a failsafe mechanism, ensuring that any issues with pulse timing or strength are quickly addressed, maintaining the integrity and efficiency of the overall system. Together, these boards optimize the excitation process, contributing to the system's reliability and consistent performance, even under fluctuating operational conditions.

Offline Replacement Procedure

De-Energize the Exciter: Ensure that the exciter is completely de-energized.

Verify Power Off: Open the control cabinet door. Check that the power indicators on the EPDM and EPSM power supplies are off. Confirm that the three LEDs on the board are off.

Remove the Board: Loosen the screws at the top and bottom of the faceplate, near the ejector tabs. These screws are captive and should not be removed. Raise the ejector tabs to unseat the board. Using both hands, gently pull the board from the rack.

Install the Replacement Board: Slide the replacement board into the correct slot in the rack. Firmly press the top and bottom of the faceplate simultaneously with your thumbs to begin seating the board. Start and alternately tighten the screws at the top and bottom of the faceplate to finish seating the board. Tighten the screws evenly to ensure the board is seated squarely.

Application Data

The board is designed without any jumpers or test points. This simplifies the board's design and eliminates the need for manual adjustments or testing points on the board itself.

The board features two connectors, P1 and P2, which interface with the VME backplane. These connectors are crucial for the board's integration into the system, but the individual pin signals for these connectors are typically not referenced or checked during routine troubleshooting and maintenance procedures. Therefore, detailed pin signal definitions for P1 and P2 are not provided in this document.

The layout of the ESEL board is depicted in the following figure (refer to the actual document or schematic provided with the board). This layout illustration is essential for understanding the physical arrangement and components on the board.

Status LEDs

Equipped with three green LEDs located at the top of the front panel. These LEDs serve as status indicators, providing important information about the board's operational state

Power Indicator: One LED illuminates to indicate that power is being supplied to the board.

Active Indicator: Another LED indicates that the board is active and has been enabled by a control signal from the control system (Control C).

Gating Indicator: The third LED indicates that the board is in gating mode, driven by gate inputs received from the EMIO (Exciter Master Input/Output) board.

IS200ESELH2AAA Technical Specifications

Manufacturer GE Industrial Systems

Series EX2100

Part Number IS200ESELH2AAA

Functional Acronym ESEL

Functional Description GE Printed Circuit Board

PCB Coating Conformal Coating

Functional Revision 1 A

Functional Revision 2 A

Artwork Revision A

About the IS200ESELH2AAA

This IS200ESELH2AAA printed circuit board was manufactured by GE Industrial Systems for use specifically in their EX2100 Series of Excitation Control Systems and Excitation Control System component products. This printed circuit board is more accurately definable as a EX2100 Exciter Selector Board, and is modified from its original IS200ESELH2 parent board status through its inclusion of three A-rated significant product revisions.

Hardware Tips and Specifications

The IS200ESELH2AAA EX2100 Exciter Selector Board is primarily describable through its intended functionality within the greater EX2100 Series drive assembly. This IS200ESELH2AAA PCB is created with the intention of acting as a receiver for six logic level gate pulse signals, which are emitted from its corresponding EMIO board. The gate pulse signals that this ESEL-abbreviated board receives drive up to six total cables, which should then distribute to their own corresponding exciter gate pulse amplifier or EGPA boards, which should themselves be mounted in the EX2100 drive assembly's power conversion cabinet. In terms of this ESEL-abbreviated board's compatibilities, the number of ESEL boards required for normative function of EX2100 drive assemblies depends on the control systems type being used; redundant or simplex. If redundant controls are active within your EX2100 drive assembly, two IS200ESELH2AAA EX2100 Exciter Selector Boards are necessitated; one being driven by M1 and the other being drive by M2. This board assembly's active ESEL, which is selected by its C controller, transmits necessary control signals to the ESEL's corresponding EGPA boards.

While original instructional manual materials surrounding this IS200ESELH2AAA PCV provide us with valuable insights into its hardware and performance specifications, additional information can be revealed through a diligent breakdown of the unique IS200ESELH2AAA product number, which would begin with the dually-functional IS200 series tag. This series tag has dual naming functionality for this ESEL-abbreviated PCB; identifying it as a domestically-manufactured product with no special assembly version. Another notable hardware specification retrieved from the customized IS200ESELH2AAA product number can be described as its H2 series grouping tag, which also has dual IS200ESELH2AAA naming responsibilities. This H2 series grouping tag defines this PCB as a conformally-coated printed circuit board with three total bridge drivers in its assembly. The three final "A" digits in the IS200ESELH2AAA product number detail this part's three-fold revision history.