GE GE □□□ Series Service Manual

IS200ERDDH1ABA

1. Description

SPECIFICATIONS

3. Product Information

SPECIFICATIONS

Part No.: IS200ERDDH1ABA

Manufacturer: General Electric

Product Type: Dynamic Discharge Board

Series: EX2100

Availability: In Stock

Country of Origin: USA

IS200ERDDH1ABA is an IGBT Exciter Regulator Interface and the Dynamic Discharge board (ERDD) is used in the EX2100 Regulator Control, simplex, and redundant applications. One ERDD is installed in the IS200ERBP Exciter Regulator Backplane (ERBP) and interfaces with the IS200ERIOH A Exciter Regulator I/O board (ERIO) and the Exciter Regulator Static Converter board for simplex applications (ERSC). In redundant applications, one ERDD is installed in the ERBP (M1), while the other is installed in the Exciter Regulator Redundant Backplane (ERRB, M2/C) and interfaces with the ERIO, ERSC, and the Exciter Regulator Redundant Relay board (ERRR). The ERDD's main functions are as follows:

Field excitation gate drive control

Dynamic discharge to manage dc-link voltage that is too high

Monitor the dc-link voltage, output shunt current, output field voltage, bridge temperature, and IGBT gate drive status using bridge feedback (power supplies and desaturation conditions)

In simplex applications, control of the de-excitation relay (K41) or in redundant applications, control of the charging relay (K3)

With both P1 and P2 backplane connectors, the ERDD is a single-slot double-height (6U) form factor board. The ERDD board surface has seven connectors that link it to the boards it connects with. A board ID device is included in the ERDD and contains the following information:

Barcode Serial Number

Board Type

Hardware Revision

ERDD Interface to Simplex IGBT Bridge Block Diagram

Fig 1: ERDD Interface to Simplex IGBT Bridge Block Diagram

BRIDGE HEATSINK TEMPERATURE SENSING

For temperature monitoring of the regulator bridge, one resistive temperature device (RTD) input is provided. This RTD input is scaled as a 0–140 °C input with a 0–10 V dc analog output. A block diagram of this function can be found below:

Bridge RTD Temperature Sensing Functional Block Diagram

Fig 2: Bridge RTD Temperature Sensing Functional Block Diagram

CONTROL POWER DISTRIBUTION

On ERDD, both control and dc-link voltages are present. The control power is isolated from any circuit or component connected to the IGBT bridge. The P1 and P2 backplane connectors supply non-isolated ERDD control circuits directly from the Exciter Power Supply Module (EPSM) input. The EPSM input also provides power for IGBT gating. The EPSM input and a redundant power source are used to power dynamic discharge (DD). The ERDD contains a redundant power source that is derived directly from the dc-link bus. The DD circuits monitor the dc-link voltage directly and apply control as needed (independent from the control processor). There are also six isolated power supplies derived from the secondary windings of

two transformers on ERDD.

BRIDGE FEEDBACKS

Overcurrent Feedback: When a predefined full-scale shunt voltage level is achieved, the ERDD output current circuit detects overcurrent conditions. The feedback signal changes state when it reaches the overcurrent threshold level. The leg U IGBT gate driver and the output voltage VCO feedback circuit share transformer T1 with the output current feedback circuits (overcurrent and bridge output current VCO).

Bridge Output Current VCO Feedback: The voltage created across the bridge shunt is used to determine the output field current. At connection P6, the shunt output voltage is linked to the ERDD. After that, the 100 mV shunt signal is amplified and utilized to power a VCO (biased so that zero-field current produces a VCO frequency of 333 kHz). The shunt current feedback circuits have failed if frequencies less than the zero input signal frequency level is detected.

Bridge Output Voltage VCO Feedback: The output field voltage is monitored by an ERSC voltage attenuator. This attenuator generates a scaled feedback voltage in the -600 to +600 V dc output field voltage range. The ERDD is then connected to the attenuated signal, which is utilized to generate the output voltage feedback VCO (biased so that zero output voltage produces a VCO frequency of 1 MHz).

About the IS200ERDDH1ABA

The IS200ERDDH1A model is part of the EX2100 series and is an Exciter Regulator Dynamics Discharge Board. The ERDD model has two operating modes, simplex and redundant. Each application mode is used differently as well as mounted differently.

When the IS200ERDDH1A is being used in simplex mode the model controls the K3 charging relay; when the board is being used in the redundant mode it will control the K41 de-excitation relay. The mounting places of the ERDD mode when operating in simplex and redundant mode are different, when in simplex mode the IS200ERDDH1A is mounted in the ERBP backplane and when in redundant mode two ERDD models must be used, one is mounted in the same location as the model in simplex mode and the other board will be mounted in the ERRB backplane.

Another function of the board is to provide feedback from the bridge to observe the output field and DC link voltages. When monitoring these the board also allows for observation of output shunt currents, IGBT gate drive statuses, and bridge temperature. The IS200ERDDH1A board is also typically used to control the excess DC link voltages through the dynamic discharge of the model.