GE GE □□□ Series Service Manual

IS220PAICH1B

1. Description

SPECIFICATIONS

2. Specifications

Specification	Value
Ambient	**Temperature Range -40 to 158°F**
Analog	**Transmitter Power 22.8 VDC**
ATEX	**Zone 2, Group IIC Location Standards EN 60079-11:2012; EN 60079-7:2015; and EN 60079-0:2018**
Delta	**Method Percentage of Configured Span**
Functional	**Acronym PAIC**
Non-Hazardous	**Certification UL E207685**
PAIC	**Alarm 66-67 Description Individual Output Current too High to Relative to Total Current**
Product	**Description Analog I/O Module/Pack**
About	**the IS220PAICH1B**
IS220PAICH1B	**Customized Product Hardware**
Produced	**by General Electric the IS220PAICH1B module is an analog input/output pack part of the Mark VI series. This model is the second version of the PAIC units and operates on a different minimum voltage compared to that of the previous version of the PAIC pack. The minimum voltage for this specific unit is twenty-two and a half volts of direct current. The nominal power supply used with this model is twenty-four or twenty-eight volts of direct current. The IS200TBAIH1C model is a barrier-type terminal box and requi**

3. Product Information

SPECIFICATIONS

Part No.: IS220PAICH1B

Manufacturer: General Electric

Country of Manufacture: United States(USA)

Product Type: Analog I/O pack

Series: Mark VIe

The IS220PAICH1B is a GE Analog I/O pack from the Mark VIe series. The PAIC pack serves as the electrical interface between one or two I/O Ethernet networks and an analog input terminal board. The pack includes a processor board shared by all Mark VIe distributed I/O packs and an acquisition board dedicated to the analog input function.

IS220PAICH1B Functional Description

The pack can handle up to ten analog inputs, the first eight of which can be configured as 5 V or 10 V inputs or 0-20 mA current loop inputs. The last two inputs can be set to 1 mA or 0-20 mA current inputs.

The load terminal resistors for the current loop inputs are located on the terminal board, and the PAIC senses voltage across these resistors. The PAICH1 also has two 0-20 mA current loop outputs. The PAICH2 includes additional hardware to support 0-200 mA current on the first output.

The pack is powered by a three-pin power input and two RJ45 Ethernet connectors. Output is via a DC-37 pin connector that is directly connected to the associated terminal board connector. LED indicator lights provide visual diagnostics.

Processor features

The processor board is linked to an acquisition board dedicated to the function of the I/O pack or module. When input power is applied, the soft-start circuit increases the voltage available on the processor board. The local power supplies are turned on in sequence, and the processor reset is disabled.

After finishing self-test routines, the processor loads application code specific to the I/O pack or module type from flash memory. The application code reads board ID information to ensure that the application code, acquisition board, and terminal board are all correctly matched.

Auto-Reconfiguration

The Auto-Reconfiguration feature allows the operator to replace I/O packs without having to manually reconfigure each pack or module.

When the controller detects an I/O pack booting with a different configuration and the Auto-Reconfiguration feature is enabled, a reconfiguration file is automatically downloaded from the controller to the I/O pack. The bootload, baseload, firmware, and parameters are all reconfigured.

Unless it already has the latest version, each I/O pack is updated with the current configuration that matches the configuration used by the controller.

Analog Input Hardware

For all ten input channels, the PAIC accepts input voltage signals from the terminal board. An analog multiplexer block, several gain and scaling options, and a 16-bit analog-to-digital converter comprise the analog input section (DAC).

Depending on the input configuration, the inputs can be configured as 5 V or 10 V scale signals. When configured for current inputs, the terminal board includes a 250 burden resistor that produces a 5 V signal at 20 mA.

Analog Output Hardware

The PAIC has two 0-20 mA analog outputs that can operate at 18 V compliance in simplex or TMR mode. A 14-bit DAC sends a current reference to the PAIC's current regulator loop, which detects current in both the PAIC pack and the terminal board.

Each analog output circuit also includes a normally open mechanical relay for enabling or disabling output operation. The relay is used in a TMR system to remove a failed output, allowing the remaining two PAICs to create the correct output without interference from the failed circuit.

When the suicide relay is deactivated, the output opens through the relay, short-circuiting the PAIC's analog output from the terminal board's customer load.

IS220PAICH1B Characteristics

Number of channels

12 channels per terminal board (10 AI, 2 AO)

Input span

1 - 5 V dc, ±5 V dc, ±10 V dc, or 0-20 mA (Inputs 1-8)

0-20 mA or ±1 mA (Inputs 9-10)

Input converter resolution

16-bit analog-to-digital converter

Scan time

Normal scan 5 ms (200 Hz). Note that maximum controller frame rate is 100 Hz

Power consumption

5.3 W typical, 6.2 W worst case

Compressor stall detection

Detection and relay operation within 30 seconds

IS220PAICH1B Technical Specifications

Ambient Temperature Range -40 to 158°F

Analog Transmitter Power 22.8 VDC

ATEX Zone 2, Group IIC Location Standards EN 60079-11:2012; EN 60079-7:2015; and EN 60079-0:2018

Delta Method Percentage of Configured Span

Functional Acronym PAIC

Non-Hazardous Certification UL E207685

PAIC Alarm 66-67 Description Individual Output Current too High to Relative to Total Current

Product Description Analog I/O Module/Pack

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IS220PAICH1B Customized Product Hardware

Produced by General Electric the IS220PAICH1B module is an analog input/output pack part of the Mark VI series. This model is the second version of the PAIC units and operates on a different minimum voltage compared to that of the previous version of the PAIC pack. The minimum voltage for this specific unit is twenty-two and a half volts of direct current. The nominal power supply used with this model is twenty-four or twenty-eight volts of direct current. The IS200TBAIH1C model is a barrier-type terminal box and requires a minimum wire size of 22 AWG when being connected and used with the IS220PAICH1B pack. This IS220PAICH1B PCB is actually not the originally-developed GE Mark VI Series product of its specific functional role; as that would be considered the IS220PAICH1 parent PCB notably missing this IS220PAICH1B device's sole B-rated functional product revision. While the IS220PAICH1B pack is being used in the Mark VI series it can be used with some accessories otherwise known as terminal boards; the terminal boards used with this specific analog I/O pack are all IS200 boards and are:

IS200TBAIH1C

IS200TAIH1A

IS200TAIH2A

IS220PAICH1B Pack Diagnostics

There are specific alarms that will come about when this model is in use, one of the alarms is labeled as 82-83 which focuses on the output and indicates that the suicide relay within the IS220PAICH1B pack is non-functional. The possible cause of this alarm is often that the suicide relay command in the pack does not match the associated feedback, the hardware has failed, or a relay failure has occurred on the acquisition board. The main solution to this problem is replacing the I/O pack itself. The IS220PAICH1B pack can be used in many different locations including hazardous and non-hazardous locations, the certification for the non-hazardous location in accordance with this model is UL E207685. This IS220PAICH1B device is not surrounded by any extreme wealth of originally-released instructional manual materials; almost certainly a reflection of its attribution to the Mark V Turbine Control System Series that suffered a manufacturer-led production and documentation discontinuation.The IS220PAICH1B functional product number begins with a dual-functional initial naming chunk in its IS220 series tag specially designed to indirectly reveal the IS220PAICH1B product's normal Mark V Series assembly iteration as well as its domestic original manufacture location. Some of the other important hardware details embedded in the IS220PAICH1B functional product number include this IS220PAICH1B device's:

PAIC functional product acronym

Conformal PCB coating style

Group one Mark V Series product grouping

B-rated primary functional revision