GE GE □□□ Series Service Manual

IS220PAOCH1B

1. Description

SPECIFICATIONS:

3. Product Information

SPECIFICATIONS:

Part Number: IS220PAOCH1B, REV B

Manufacturer: General Electric

Series: Mark VIe

Product Type: Analog Output Module

Number of channels: Eight current output channels

Analog Outputs: 0-20 mA, up to 900 Ohms

Accuracy: ±0.5% over -30º to 65ºC

Size: 8.26 cm high x 4.19 cm wide x 12.1 cm

Availability: In Stock

Country of Origin: USA

Operating Temperature: -30 to 65°C

Size: 8.26 cm high x 4.19 cm wide

Availability: In Stock

Country of Origin: USA

Manual: GEH-6721D

FUNCTIONAL DESCRIPTION:

IS220PAOCH1B, REV B is an Analog Output I/O Module manufactured and designed by General Electric as part of the Mark VIe Series used in GE Distributed Control Systems. The PAOC (Analog Output Pack) serves as the electrical interface between one or two I/O Ethernet networks and an analog output terminal board. It includes a common processor board used across all Mark VIe distributed I/O packs, along with a dedicated analog output acquisition board pair. This pack supports up to eight simplex 0–20 mA current loop outputs and features an analog-to-digital converter to provide current feedback for each output channel. Inputs are received via dual RJ45 Ethernet connectors and a three-pin power input, while outputs are delivered through a DC-37 pin connector that directly mates with the corresponding terminal board. The unit also features indicator LEDs for visual diagnostics and supports local diagnostic communication through an infrared port.

COMPATIBILITY:

PAOCH1A is compatible with the analog output terminal board TBAOH1C, and the STAO board, but not the DIN-rail mounted DTAO board. The following table gives details of the compatibility: Control mode refers to the number of I/O packs used in a signal path:

Simplex Configuration: In a simplex setup, a single I/O pack is used to interface with the system. It can connect to the I/O network using either one or two Ethernet ports, providing a cost-effective and straightforward solution for non-critical applications. This configuration offers basic fault detection but lacks redundancy. It is typically used in applications where high availability is not a primary concern, and system continuity can tolerate brief interruptions or single-point failures.

Dual Configuration: The dual configuration employs two I/O packs operating in parallel. Each pack may have one or two Ethernet connections, enabling enhanced communication redundancy and improved fault tolerance. If one I/O pack fails, the other continues to operate, minimizing downtime and supporting continuous control. This setup is commonly used in systems requiring moderate reliability, allowing for automatic failover without interrupting process operations.

Triple Modular Redundant (TMR) Configuration: TMR configuration utilizes three separate I/O packs, each connected to the system via a dedicated Ethernet network. This architecture provides the highest level of reliability and fault tolerance. All three packs operate simultaneously, and a two-out-of-three voting system ensures correct signal processing, even if one module fails or provides incorrect data. TMR is ideal for critical applications where system integrity and uptime are paramount, such as in turbine control, power generation, and other safety-critical environments.

ANALOG OUTPUT HARDWARE:

The PAOC features eight simplex 0-20 mA analog outputs with 18 V compliance. Each output is controlled by a 16-bit digital-to-analog converter (DAC) that drives an external transistor amplifier and regulates the output current. A built-in temperature sensor monitors the internal temperature of the board, alerting the control system if it becomes too high. Each analog output includes a mechanical normally open relay that enables or disables the output. When the relay is disabled, the output is routed through the relay, opening the circuit between the customer load and the PAOC’s analog output. The status of the relay is indicated by an LED, using the second normally open contact of the relay.

CURRENT FEEDBACK HARDWARE:

The PAOC provides current feedback monitoring for each of its eight simplex 0-20 mA analog outputs. The output current is measured using a 16-bit analog-to-digital converter and a 50-ohm resistor on the terminal board. The PAOC I/O pack, featuring eight linear, high-compliance analog outputs, has certain operational limitations based on the ambient environment. For PAOCH1B packs, the operating temperature range is -40 to 70°C (-40 to 158°F) when measured from the outside of the pack. However, due to its dense triple board layout, the maximum ambient temperature must be reduced depending on the specific application. The minimum output impedance is defined by the minimum series equivalent resistance of the customer load, as indicated by the terminal board screws across the 0–20 mA output range.