SERIES SIX

PROGRAMMABLE CONTROLLERS

120 VDC OUTPUT MODULE

GEK-90756

GENERAL DESCRIPTION

The 120 Vdc Output module can be utilized in an Input/Output (I/O) rack, or in any of the I/O slots in a Model 60 Central Processor Unit (CPU), to provide discrete (on/off) control of each of its eight outputs. The first four outputs are grouped to share a common power source, as are the second four outputs, The 50 to 150 Vdc power source required by each group of four outputs is to be provided by the user and may be either a single source or two independent sources. Optically coupled isolators provide electrical isolation between the outputs of this module and the busses that link all modules to the CPU. Features and benefits of the 120 Vdc Output module are summarized in Table 1.

Each of the eight outputs uses a Field Effect Transistor (FET) as a switching device. The module also contains logic circuitry that determines which data on the internal Series Six data bus is applicable to this module. A buffer stores the applicable data and presents it to the output switching devices.

All output switching devices are automatically disabled if an I/O chain or CPU failure is detected, thus turning off any outputs which were on. Light-Emitting Diode (LED) indicators display the state (ON or OFF) of each output and the condition of the individual output circuit fuses. These LEDs use only the power from the user-provided power source(s) to provide an indication, so the user-provided power supplies must be energized in order to obtain an output ON or a blown fuse indication.

It is possible to parallel two outputs to obtain higher output current than can be delivered by one output alone, but the two outputs must: (1) be on the same module, (2) be on the same group of four outputs (outputs one through four are in one group and outputs five through eight are in the other group), (3) be adjacent outputs, and (4) be controlled by identical and adjacent rungs on the ladder diagram. Two outputs in parallel can deliver twice the continuous current that one output can deliver, but should not be connected to loads that exceed the inrush capability of one output.

Refer to Figure 1 (next page) for 120 Vdc Output module specifications.

TABLE 1. FEATURES AND BENEFITS

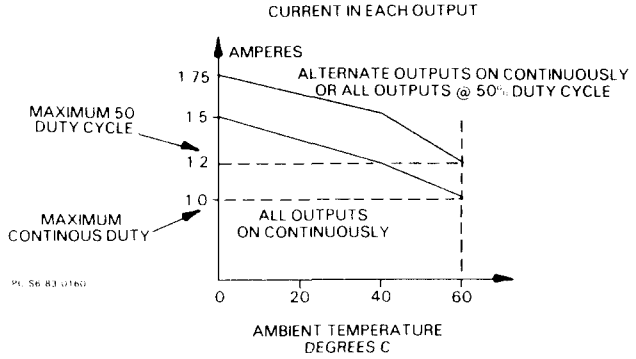
FEATURES	BENEFITS
Wide switching range available: 50 to 150 Vdc. Available in source configuration.	Useful in a variety of applications. Provides output capability with existing user power supplies and devices.
Eight output points per module.	Efficient use of I/O rack space.
Optically coupled output drivers.	Provides electrical isolation between user field devices and the Series Six Programmable Controller.

APPLICATIONS

* High-speed switching: Solenoid valves,
* clutch-brake systems
* Battery-powered I/O systems
* Annunciators
* Indicators
* Relays

- Dimensions:
  Circuit Board: 8.15 x 11.0 x 1.20 (inches)
  208 x 280 x 31 (mm)

  Faceplate: 12.46 x 1.175 (inches)
  317 x 30 (mm)
- Faceplate Color: Yellow
- Storage Temperature: -20 to +80°C ambient
- Operating Temperature: 0 to 60°C ambient
- Humidity: 5% to 95% (non-condensing)
- Operating Altitude: Up to 6,600 feet above sea level
- Number of Outputs: Eight, in two groups of four. Each group shares common power supply H (high) and N (neutral) connections
- Isolation (user common to Series Six common - also between output groups when two independant user power supplies are used for one module):
  Continuous: 240 Vdc or 50/60 Hz ac
  Transient: 1,500 V peak, non-repetitive
- Noise Immunity to: Showering arcs per NEMA ICS 2.230.40
  Surges per ANSI C37.90.9
  5W transmitter, 27-450 MHz
- Radiated Interference: Complies with FCC Rule 15 for Class A computing devices
- Power Requirements:
  - Supplied by the I/O or Model 60 CPU power supply:
    5 Vdc @ 300 mA (maximum) or 5 units of load with all outputs ON
    5 Vdc @ 180 mA (maximum) or 3 units of load with all outputs OFF
  - Supplied by the user: 50 to 150 Vdc @ 50 mA (maximum) plus the current drawn by the output loads
- Total ON-State Current per Module:
  Maximum: 10 A @ 0-40°C, 8 A @ 60°C
  Minimum: 0 A
- ON-State Voltage Drop: 1.75 V (maximum)
- OFF State Leakage Current: 2 mA (maximum)
- Output Current: Any output with all outputs ON continuously: 1 ampere maximum at 60°C.
  See Figure 1A for Duty Cycle Operation
- Non-repetitive Inrush Current peaks: o 10 A for 5 ms o 8 A for 15 ms
  o 7 A for 50 ms o 6 A for 250 ms
- Switching Delays: 10 microseconds OFF to ON, 100 microseconds ON to OFF

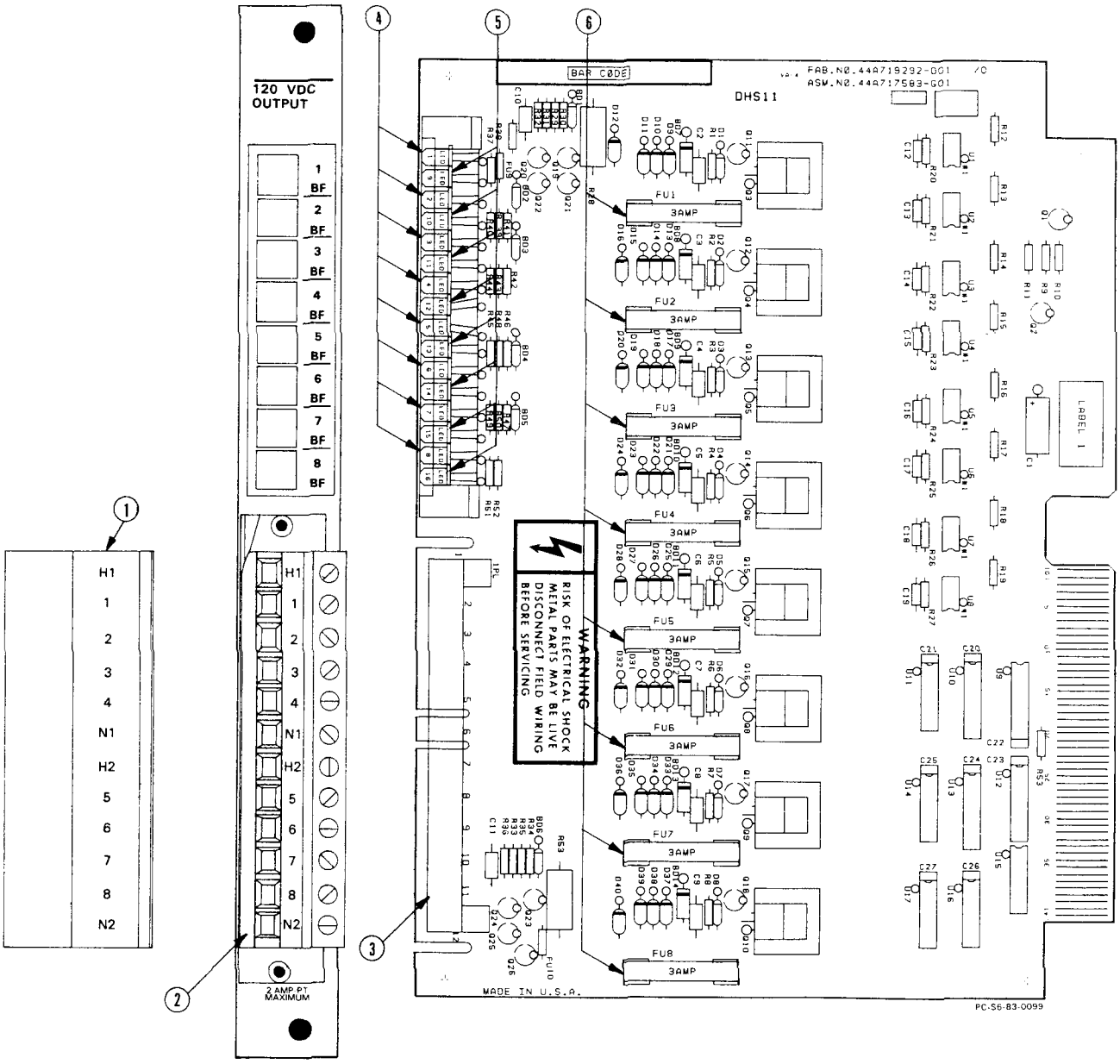


NOTE

Any odd-numbered output with no even-numbered outputs ON, or any even-numbered output with no odd-numbered outputs ON, or any output when no output is operating at a current greater than the continuous rating unless it is operating at a duty cycle of 50% or less and a period of 60 seconds or less: 1.2 amperes maximum at 60°C, increasing as shown in Figure 1A

Figure 1A

FIGURE 1. SPECIFICATIONS



① Terminal Cover

② User Terminal Block:
Accepts connections from user output devices and the DC power source(s). (Refer to Figure 3, Typical User Connections.)

③ Circuit-Board Terminal Block:
Mates with the user terminal block.

④ Output LED 1 →8
On: Corresponding output is in the ON state.
Off: Corresponding output is in the OFF state.

⑤ BF (Blown Fuse) LED 1 →8
On: The fuse for corresponding output is open (blown).
Off: The fuse for corresponding output is OK.

⑥ Output-Circuit Fuses: 3 A, (AGC 3)

FIGURE 2. USER ITEMS

INSTALLATION

The 120 Vdc Output module can be installed in an I/O rack or in the I/O slots of a Model 60 CPU rack. Before the module is installed, the Dual-In-line-Package (DIP) switches on the rack backplane directly behind the card slot should be set. This setting will establish the desired correspondence between the outputs on this module and a group of eight consecutive output numbers in the program. To determine the proper switch settings, refer to the table in the Installation section of the Series Six Installation and Maintenance Manual, GEK-25361,

The circuit board is designed to be installed and removed with the aid of an extraction/insertion tool. This tool should be used each time the board is removed or installed. Once the board is in place in the rack, the faceplate should be placed over it so that the connector at the lower part of the board mates with the faceplate connector. The faceplate should then be secured to the rack using the quarter-turn thumbscrews at the top and bottom of the faceplate.

Refer to Figures 3 for typical user connections to the 120 Vdc Output module. The positive side of each load to be controlled by this module should be connected to one of the output terminals numbered 1 through 8. The negative side of each of the loads connected to terminals I through 4 should be connected to neutral number I (terminal Nl).

The negative sides of the loads connected to terminals 5 through 8 should be connected to neutral number 2 (terminal N2). A user-provided DC power source must be connected with its positive output connected to terminal HI and its negative output connected to terminal Nl to provide power for outputs 1 through 4. A user-provided DC power source must be connected with its positive output connected to terminal H2 and its negative output connected to terminal N2 to provide power for outputs 5 through 8. One source may be used for all eight outputs if the power source positive output is connected to both Hl and H2 and the power source negative output is connected to both Nl and N2. Each terminal on the module faceplate can accommodate one NO. 12 AWG wire or two No. 14 AWG wires. A terminal cover is provided for additional user protection. It is installed by mating the bottom ends of the grooves in the cover with the top ends of the tracks at the sides of the terminal strip and sliding the cover downward over the terminal strip.

A markable area is provided on the plastic lens beside each pair of LED indicators. This area may be used to note the function or destination of each output. The faceplate is color coded yellow to allow the I20 Vdc Output module to be readily distinguished from other types of I/O modules.

WARNING

The exposed metal parts on the circuit board and the field wiring and field wiring terminals may carry dangerous potentials. These potentials are derived from user power supplies which are not under the control of the ON/OFF switches on the Series Six CPU and I/O rack. Be sure all user supplies are de-energized before servicing a circuit board or working on field wiring. The circuit board may also be made safe for servicing by removing the faceplate, which breaks the connection between the board and any user supplies.

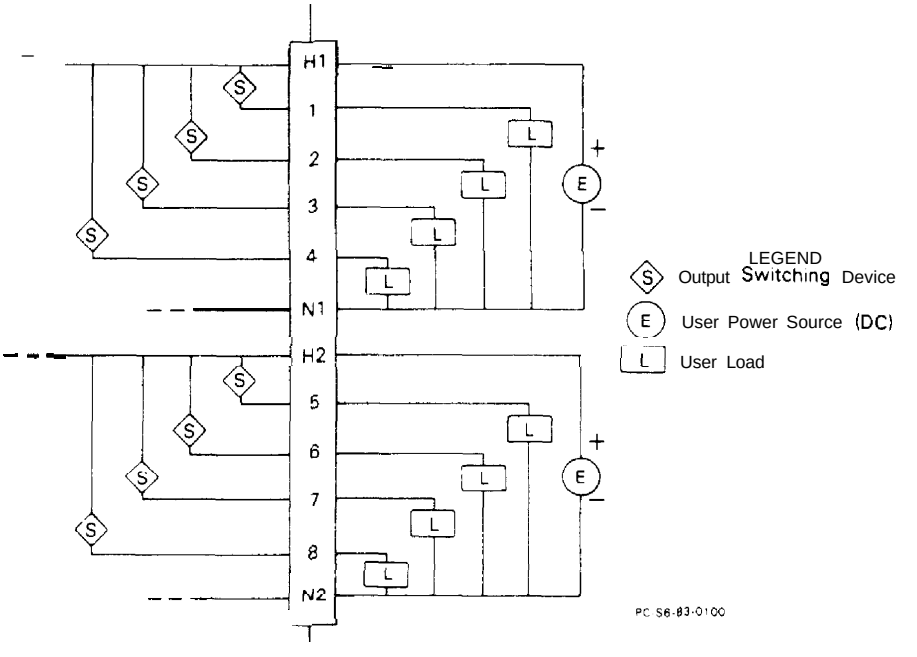


FIGURE 3. TYPICAL USER CONNECTIONS

ORDERING INFORMATION

Circuit Board and Faceplate	Circuit Board	Faceplate
IC600BF924A	IC6OOYB924A	IC600FP924A

CATALOG NUMBER REVISION SUFFIX

The equipment listed above having the catalog numbers shown and the same equipment having a higher alpha suffix is designed for listing by UL for use as auxiliary control devices. The equipment is a direct replacement for equipment having the same catalog number but a lower alpha suffix.

® The UL symbol on the nameplate means the product is listed by Underwriters Laboratories Inc. (UL Standard No. 508, Industrial Control Equipment, subsection Electronic Power Conversion Equipment.)

For further information, contact your local GE Fanuc sales office.

GE Fanuc Automation North America, Inc., Charlottesville, Virginia

FEBRUARY, 1984