# OPTO 22

## G4 DIGITAL AC OUTPUT MODULES

### Features

> 4000 volts optical isolation (transient)
> Built-in LED status indicator
> Logic levels of 5, 15, and 24 VDC
> Removable fuse
> Current rating: 3 amps at 45° C
> UL Motor Load rating: 1.5 amps
> Ability to withstand one-cycle surge of 80 amps
> Operating temperature: -30 °C to 70 °C



G4OAC5A and G4OAC5AMA
Modules

## DESCRIPTION

Opto 22's G4 AC output modules are used to control or switch AC loads. Each module provides up to 4000 volts of optical isolation (transient) between field outputs and the control side of the circuit, and each features zero voltage turn-on and zero current turn-off.

All AC output modules are equivalent to single-pole, single-throw, normally open contacts (Form A, SPST-NO) except the G4OAC5A5, which is equivalent to a single-pole, single-throw, normally closed contact (Form B, SPST-NC).

Each module is equipped with a 4 amp fast-blow fuse. The fuse breaking capacity is 40 amps at 250 VAC. Current should be limited to prevent the short circuit current from exceeding the rated breaking capacity of the fuse.

Typical applications for AC output modules include switching loads such as AC relays, solenoids, motor starters, heaters, lamps, and indicators.

The G4OAC5MA and the G4OAC5AMA are special modules featuring a manual-on/manual-off/automatic switch, ideal for diagnostic testing of control applications.

Part numbers ending in FM are Factory Mutual approved.

### Compatible with Raspberry Pi

The following G4 digital AC output modules can be used with the Digital I/O Carrier Board for Raspberry Pi® (part number OPTO-P1-40P) to monitor and control industrial devices with your Raspberry Pi:

G4OAC5
G4OAC5A
G4OAC5A5
G4OAC5MA
G4OAC5AMA

## Part Numbers

| Part | Description |
|------|-------------|
| G4OAC5* | G4 AC Output 12–140 VAC, 5 VDC Logic |
| G4OAC5FM | G4 AC Output 12–140 VAC, 5 VDC Logic, Factory Mutual Approved |
| G4OAC5A* | G4 AC Output 24–280 VAC, 5 VDC Logic |
| G4OAC5AFM | G4 AC Output 24–280 VAC, 5 VDC Logic, Factory Mutual Approved |
| G4OAC5A5* | G4 AC Output 24–280 VAC, 5 VDC Logic NC |
| G4OAC5A5FM | G4 AC Output 24–280 VAC, 5 VDC Logic NC, Factory Mutual Approved |
| G4OAC5MA* | G4 AC Output 12–140 VAC, 5 VDC Logic With Manual/Auto Switch |
| G4OAC5AMA* | G4 AC Output 24–280 VAC, 5 VDC Logic With Manual/Auto Switch |
| G4OAC15 | G4 AC Output 12–140 VAC, 15 VDC Logic |
| G4OAC15A | G4 AC Output 24–280 VAC, 15 VDC Logic |
| G4OAC24 | G4 AC Output 12–140 VAC, 24 VDC Logic |
| G4OAC24A | G4 AC Output 24–280 VAC, 24 VDC Logic |

* Compatible with Raspberry Pi

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## SPECIFICATIONS

| | Units | G4OAC5*<br>G4OAC5FM** | G4OAC5A*<br>G4OAC5AFM** | G4OAC5A5*<br>G4OAC5A5FM** | G4OAC5MA* | G4OAC5AMA* |
|---|---|---|---|---|---|---|
| Nominal line voltage | VAC | 120 | 120/240 | 120/240 | 120 | 120/240 |
| Output voltage range | VAC | 12–140 | 24–280 | 24–280 | 12–140 | 24–280 |
| Key feature | — | — | — | Normally closed | Diagnostic switch | Diagnostic switch |
| Current rating:<br>At 45 °C ambient<br>At 70 °C ambient | A<br>A | 3<br>2 | 3<br>2 | 3<br>2 | 3<br>2 | 3<br>2 |
| UL Motor Load Rating | A | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Isolation input-to-output (transient):<br>1 ms<br>1 minute | volts | 4000<br>1500 | 4000<br>1500 | 4000<br>1500 | 4000<br>1500 | 4000<br>1500 |
| Off-state leakage at nominal voltage (60 Hz) | mA$_{RMS}$ | 5 | 1.25/2.5 | 1.25/2.5 | 5 | 1.25/2.5 |
| Nominal logic voltage | VDC | 5 | 5 | 5 | 5 | 5 |
| Logic voltage range | VDC | 4–8 | 4–8 | 4–8 | 4–8 | 4–8 |
| Logic pickup voltage | VDC | 4 | 4 | 4 | 4 | 4 |
| Logic dropout voltage | VDC | 1 | 1 | 1 | 1 | 1 |
| Logic input current at nominal logic voltage | mA | 12 | 12 | 12 | 12 | 12 |
| Control resistance (Rc in schematic) | ohms | 220 | 220 | 220 | 220 | 220 |
| One-cycle surge | A peak | 80 | 80 | 80 | 80 | 80 |
| Turn-on time @ 60 Hz | milliseconds | ≤8.3*** | ≤8.3*** | ≤8.3*** | ≤8.3*** | ≤8.3*** |
| Turn-off time @ 60 Hz | milliseconds | ≤8.3**** | ≤8.3**** | ≤8.3**** | ≤8.3**** | ≤8.3**** |
| Peak repetitive voltage | VAC | 500 | 500 | 500 | 500 | 500 |
| Minimum load current | mA | 20 | 20 | 20 | 20 | 20 |
| Output voltage drop maximum peak | V | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| Operating frequency | Hz | 25–65 | 25–65 | 25–65 | 25–65 | 25–65 |
| dV/dT-off-state | V/micro-seconds | 200 | 200 | 200 | 200 | 200 |
| dV/dT-commutating | -- | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load |
| Temperature<br>Operating:<br>Storage: | °C<br>°C | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 |

\* Compatible with Raspberry Pi
\*\* Part numbers ending in FM are Factory Mutual approved.
\*\*\* One-half cycle maximum. Module turns on at the zero volt crossing of the AC sine wave.
\*\*\*\* One-half cycle maximum. Module turns off at the zero current crossing of the AC sine wave.

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# SPECIFICATIONS (CONT.)

| | Units | G4OAC15*** | G4OAC15A*** | G4OAC24*** | G4OAC24A*** |
|---|---|---|---|---|---|
| Nominal line voltage | VAC | 120 | 120/240 | 120 | 120/240 |
| Output voltage range | VAC | 12–140 | 24–280 | 12–140 | 24–280 |
| Key feature | — | — | — | — | — |
| Current rating:<br>At 45 °C ambient<br>At 70 °C ambient | A<br>A | 3<br>2 | 3<br>2 | 3<br>2 | 3<br>2 |
| UL Motor Load Rating | A | 1.5 | 1.5 | 1.5 | 1.5 |
| Isolation input-to-output (transient):<br>1 ms<br>1 minute | volts | 4000<br>1500 | 4000<br>1500 | 4000<br>1500 | 4000<br>1500 |
| Off-state leakage at nominal voltage (60 Hz) | mA$_{RMS}$ | 5 | 1.25/2.5 | 5 | 1.25/2.5 |
| Logic voltage range | VDC | 10.5–16 | 10.5–16 | 19.5–32 | 19.5–32 |
| Logic pickup voltage | VDC | 10.5 | 10.5 | 19.5 | 19.5 |
| Logic dropout voltage | VDC | 1 | 1 | 1 | 1 |
| Logic input current at nominal logic voltage | mA | 15 | 15 | 18 | 18 |
| Control resistance<br>(Rc in schematic) | ohms | 1 K | 1 K | 2.2 K | 2.2 K |
| One-cycle surge | A peak | 80 | 80 | 80 | 80 |
| Turn-on time @ 60 Hz | micro-seconds | ≤8.3* | ≤8.3* | ≤8.3* | ≤8.3* |
| Turn-off time @ 60 Hz | micro-seconds | ≤8.3** | ≤8.3** | ≤8.3** | ≤8.3** |
| Peak repetitive voltage | VAC | 500 | 500 | 500 | 500 |
| Minimum load current | mA | 20 | 20 | 20 | 20 |
| Output voltage drop maximum peak | V | 1.6 | 1.6 | 1.6 | 1.6 |
| Operating frequency | Hz | 25–65 | 25–65 | 25–65 | 25–65 |
| dV/dT-off-state | V/micro-second | 200 | 200 | 200 | 200 |
| dV/dT-commutating | -- | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load | snubbed for 0.5 power factor load |
| Temperature<br>Operating:<br>Storage: | °C<br>°C | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 | -30 to +70<br>-30 to +85 |

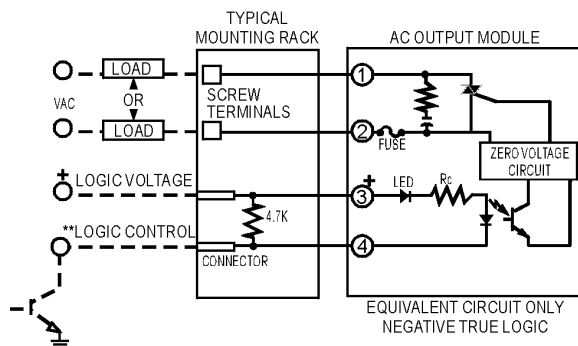\* One-half cycle maximum. Module turns on at the zero volt crossing of the AC sine wave.
\*\* One-half cycle maximum. Module turns off at the zero current crossing of the AC sine wave.
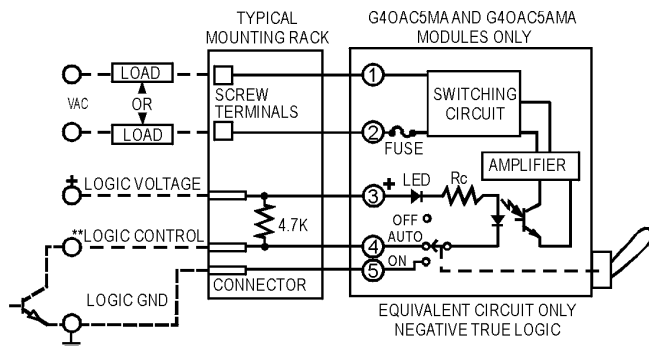\*\*\* Not for use with Opto 22 brains.

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# DIMENSIONS
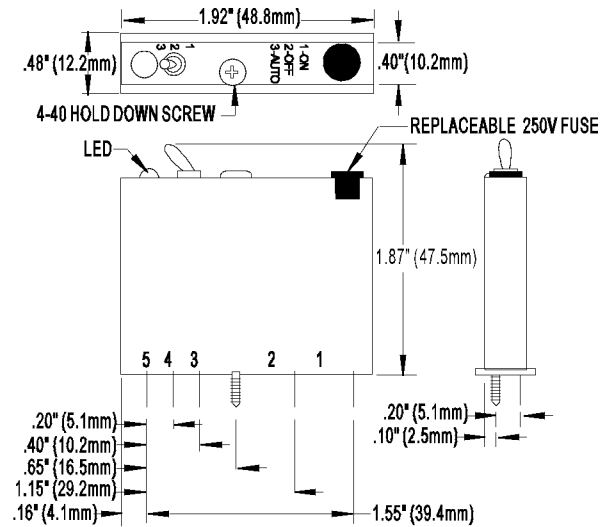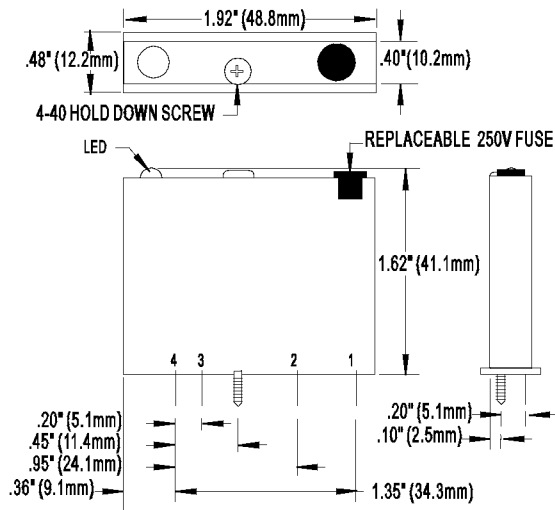


# SCHEMATICS



**Control line is compatible with totem pole or tri-state output device.