

## Easy-to-use, Space-saving 16-point Output terminal



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

- Slim terminal block is just 135 × 40 mm (W × D).
- Independent contacts and short bars allow easy common connections.
- An Expansion Terminal Block can be mounted for power line connections.
- M3.5 fork-type crimp terminals (with a maximum terminal width of 6.2 mm) can be used.
- Lever mechanism allows Relays to be installed and removed easily without tools.
- Relay models and power MOSFET Relay models are available.
- Equipped with operation indicators.
- Can be combined with a DRT2-OD32ML I/O Terminal for DeviceNet connectivity or an SRT2-VOD16ML Connector Terminal for CompoBus/S connectivity.
- Built-in diode absorbs coil surge.
- Mount either to DIN rail or via screws.

## Ordering Information

### Relay Terminals

| Classification             | Points                   | Internal I/O common | Rated voltage | Model       |
|----------------------------|--------------------------|---------------------|---------------|-------------|
| Relay outputs              | 16 points (SPST-NO × 16) | NPN (+common)       | 24 V DC       | G70D-VSOC16 |
| Power MOSFET relay outputs |                          |                     |               | G70D-VFOM16 |

**Note:** These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

### Accessories (Order Separately)

#### Cables for I/O Relay Terminals XW2Z-R

- Cable with Loose Wire and Crimp Terminals: XW2Z-RY@C
- Cable with Loose Wires: XW2Z-RA@C
- Cable with connectors
  - Fujitsu connectors (1:1): XW2Z-R@C
  - (1:2): XW2Z-RI@C-@
  - XW2Z-RO@C-@
  - (1:3): XW2Z-R@C-@-@
  - MIL connectors (1:1): XW2Z-RI@C
  - XW2Z-RO@C
  - (1:2): XW2Z-RI@-@-D@
  - XW2Z-RM@-@-D@
  - XW2Z-RO@-@-D1

Refer to the **XW2Z-R** Datasheet (Cat. No. G126) for details.

#### Expansion Terminal Block

| Applicable Output Relay Terminals | Appearance | Model     |
|-----------------------------------|------------|-----------|
| G70D-VSOC16                       |            | G70D-ET * |
| G70D-VFOM16                       |            |           |

\* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

#### Short Bar

| Applicable Output Relay Terminals | Appearance | Model    |
|-----------------------------------|------------|----------|
| G70D-VSOC16                       |            | G6D-4-SB |
| G70D-VFOM16                       |            |          |

#### Replacement Relays

| Applicable Output Relay Terminals | Rated voltage | Model                |
|-----------------------------------|---------------|----------------------|
| G70D-VSOC16                       | 24 V DC       | G6D-1A-ASI-AP DC24 * |
| G70D-VFOM16                       |               | G3DZ-2R6PL DC24 *    |

\* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

#### Accessories for DIN Track Mounting

Refer to your OMRON website for details on the PFP-@.

## Specifications

### Ratings

#### Relay Specifications

The following specifications apply to G6D Relays mounted in a G70D Relay Terminal and not the G6D Relay itself.

##### Coil Ratings (per G6D Relay)

|                      |                           |
|----------------------|---------------------------|
| Rated voltage        | 24 V DC                   |
| Rated current        | 10.5 mA                   |
| Coil resistance      | 2,880 $\Omega$            |
| Must-operate voltage | 70% max. of rated voltage |
| Must release voltage | 10% min. of rated voltage |
| Max. voltage         | 130% of rated voltage     |
| Power consumption    | Approx. 200 mW            |

- Note:**
1. The must-operate voltage is 75% or less of the rated voltage if the relay is mounted upside down.
  2. Rated current and coil resistance were measured at a coil temperature of 23° C with a tolerance of  $\pm 10\%$ .
  3. Operating characteristics were measured at a coil temperature of 23° C.
  4. The maximum allowable voltage is the maximum value of the allowable voltage range for the relay coil operating power supply. There is no continuous allowance.
  5. The rated current includes the terminal's LED current.

##### Contact Ratings (per G6D Relay)

|  |                                   |   |
|--|-----------------------------------|---|
| Load                                       | Resistive load ( $\cos\phi = 1$ ) |   |
| Rated load                                 | 3 A at 250 V AC, 3 A at 30 V DC   |   |
| Rated carry current                        | 5 A *1                            |   |
| Max. switching voltage                     | 250 V AC, 30 V DC                 |   |
| Max. switching current                     | 5 A                               |   |
| Max. switching capacity (reference value)  | 1,250 VA, 150 W                   |   |
| Min. permissible load (reference value) *1 | 5 V DC, 1 mA                      |   |
| Endurance                                  | Electrical                        | 100,000 operations min. (under and at the rated load at 1,800 operations/h) |
|  | Mechanical                        | 20,000,000 operations min. (at 18,000 operations/h)                         |

\*1. Up to 5 A can be carried when 8 or fewer outputs are ON.

\*2. This value is for a switching frequency of 120 times per minute.

#### Power MOSFET Relay Specifications

The following values apply to G3DZ Relays mounted in a G70D Output Block and not the G3DZ Relay itself.

##### Input (per G3DZ Power MOSFET Relay)

|                   |                         |                |
|-------------------|-------------------------|----------------|
| Rated voltage     | 24 V DC                 |                |
| Operating voltage | 19.2 to 28.8 V DC       |                |
| Voltage level     | Must-operate            | 19.2 V DC max. |
|                   | Must release            | 1 V DC min.    |
| Input impedance   | 4 k $\Omega$ $\pm 20\%$ |                |
| Rated current     | 8.2 mA $\pm 20\%$       |                |

**Note:** The rated current includes the current consumption of the operation indicator.

##### Output (per G3DZ Power MOSFET Relay)

|                |                              |  |
|----------------|------------------------------|--|
| Load voltage   | 3 to 264 V AC, 3 to 125 V DC |  |
| Load current   | 100 $\mu$ A to 0.3 A         |  |
| Inrush current | 6 A (10 ms)                  |  |

## Characteristics

| Item                         | G70D-VSOC16  | G70D-VFOM16   |
|------------------------------|--|---|
|                              | Relay outputs  | Power MOSFET Relay outputs                              |
| Contact configuration        | 16 points (SPST-NO × 16)   |   |
| Contact structure            | Single   | ---   |
| Contact resistance           | 100 mΩ max. *1   | ---   |
| Isolation method             | ---  | Photocoupler  |
| Must-operate time            | 10 ms max. *2  | 10 ms max.  |
| Release time                 | 10 ms max. *2  | 15 ms max.  |
| Output ON-resistance         | ---  | 2.4 Ω max.  |
| Open-circuit leakage current | ---  | 10 μA max. (at 125 V DC)                                |
| Max. switching frequency     | Mechanical: 18,000 operations/h<br>Rated load: 1,800 operations/h  | ---   |
| Insulation resistance        | 100 MΩ min. (at 500 V DC)  |   |
| Dielectric strength          | 2,000 V AC for 1 min between coil and contact  | 2,000 V AC for 1 min between input and output terminals |
| Noise immunity               | Power input (normal mode): 600 V for 10 min with a pulse width of 100 ns to 1 μs<br>Power input (common mode): 1.5 kV for 10 min with a pulse width of 100 ns to 1 μs<br>Input cable (coiling): 1.5 kV for 10 min with a pulse width of 100 ns to 1 μs<br>Unit body (coiling): 600 V for 10 min with a pulse width of 100 ns to 1 μs |   |
| Vibration resistance         | Destruction: 10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm double)<br>Malfunction: 10 to 55 to 10 Hz, 0.375-mm amplitude (0.75-mm double)  |   |
| Shock resistance             | Destruction: 300 m/s <sup>2</sup> , Malfunction: 100 m/s <sup>2</sup>  |   |
| Operating voltage range      | 24 V DC <sup>+10%</sup> / <sub>-15%</sub>  |   |
| Current consumption          | Approx. 170 mA at 24 V DC *3   | Approx. 125 mA at 24 V DC *4                            |
| Cable length                 | Between block and controller: 5 m max. (reference value for AWG28)<br>Between block and external device: Dependent on load   |   |
| LED color                    | Operation indicator: orange  |   |
| Coil surge absorber          | Diode (600 V, 1 A)   |   |
| Ambient temperature          | Operating: -25 to 55°C (with no icing or condensation)   |   |
| Ambient humidity             | Operating: 45% to 85%  |   |
| Mounting strength            | No damage when 49 N pull load was applied for 1 s in all directions (except for 9.8 N in direction of rail)  |   |
| Terminal strength            | Tightening torque: 0.78 to 118 N·m<br>Pull strength: 49 N for 1 min  |   |
| Weight *5                    | Approx. 280 g  |   |

**Note:** These values are initial values.

\*1. Measurement: 1 A at 5 V DC

\*2. Ambient temperature: 23°C

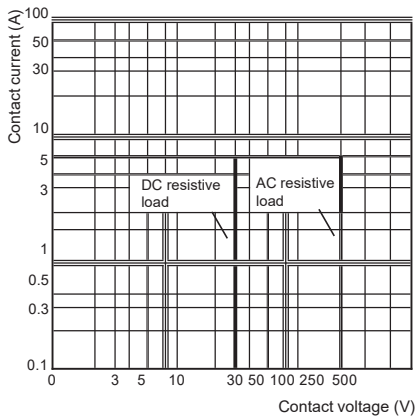
\*3. Current consumption is when all points are ON and includes G6D Relay coil current but does not include any external load current.

\*4. Current consumption is when all points are ON and includes G3DZ input current but does not include any external load current.

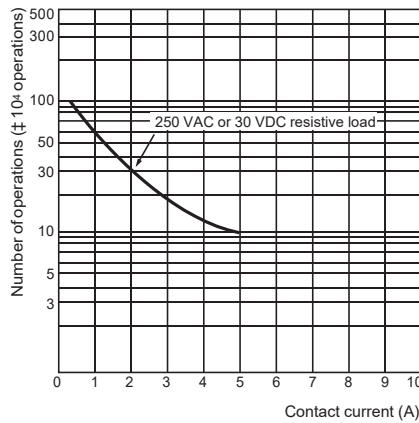
\*5. The Unit weighs approximately 315 g with the Expansion Terminal Block mounted.

# Engineering Data (Reference Value)

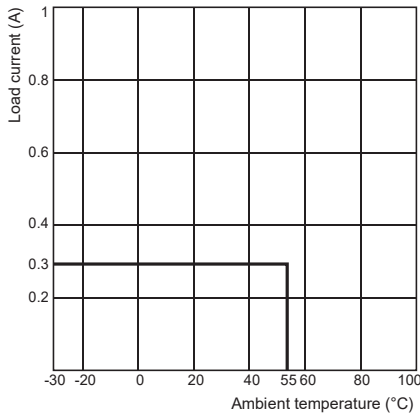
## G70D-VSOC16 Maximum Switching Capacity



## Endurance Curve

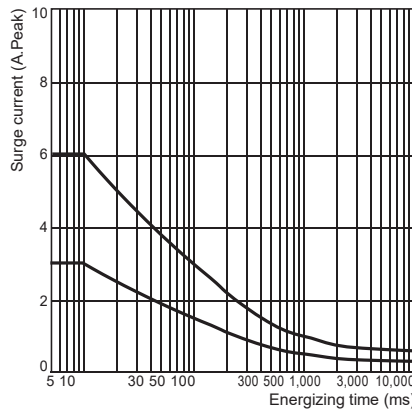


## G70D-VFOM16 Load Current vs. Ambient Temperature



## Surge Withstand Current

Non-repetitive (If repetitive, keep the inrush current below the dotted line.)



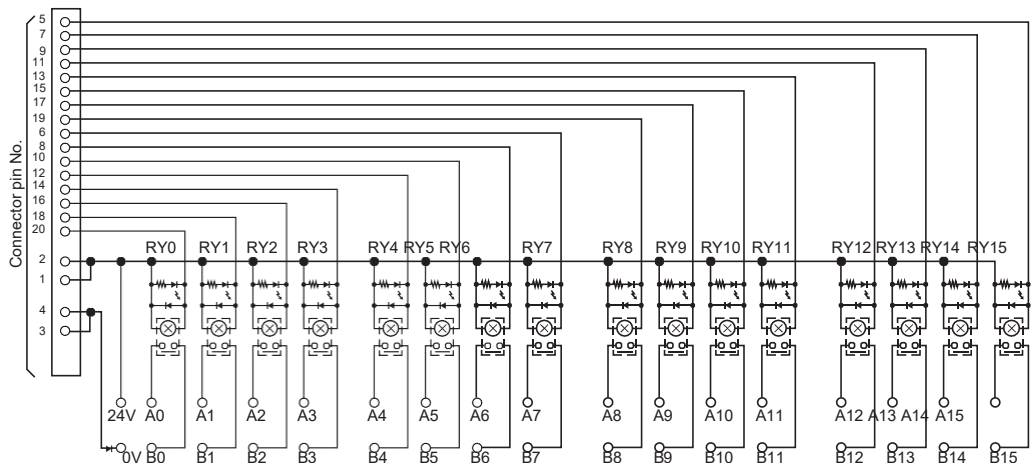
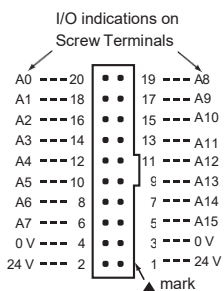
**Note:** The data given here is a graphic representation of actual values that were sampled on a manufacturing line. It is provided here for reference only. The Relays are mass-produced and therefore must be used to allow for a certain amount of variation in characteristics.

# Internal Circuits

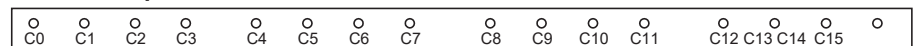
## G70D-VSOC16/G70D-VFOM16 (NPN output/+ common)

**Note:** A controller with an NPN transistor, common output can be connected to the G70D-VSOC16/G70D-VFOM16.

### Connector Pin Configuration (Top View)



### When an expansion terminal block is added

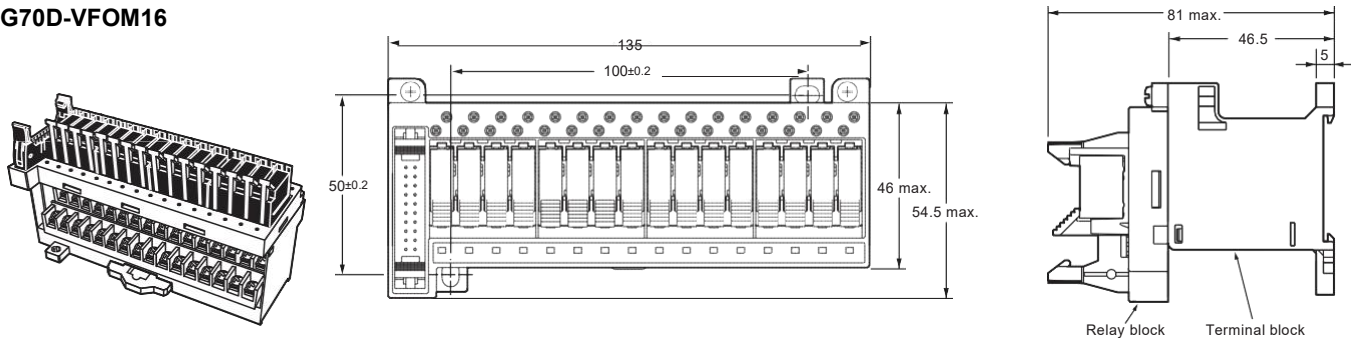


- Note:**
1. The above diagram is for the G70D-VSOC16-1 (model for mounting G6D Relays). The G70D-VFOM16 has a G3DZ Power MOF FET relay for the relay unit.
  2. C0 to C15 are electrically independent.
  3. When the terminal block and relay block are connected, each terminal is electrically connected to the electrical check terminal with the same number on the relay block.

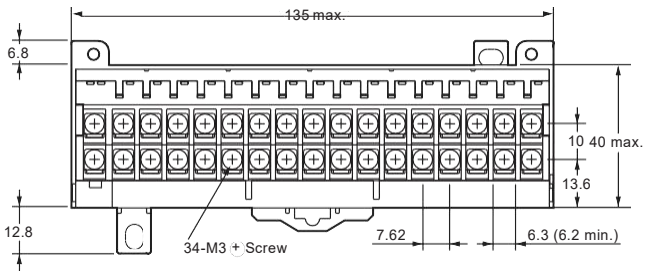
# Dimensions

## Relay Terminals

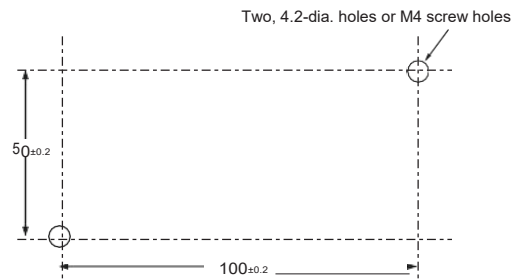
G70D-VSOC16  
G70D-VFOM16



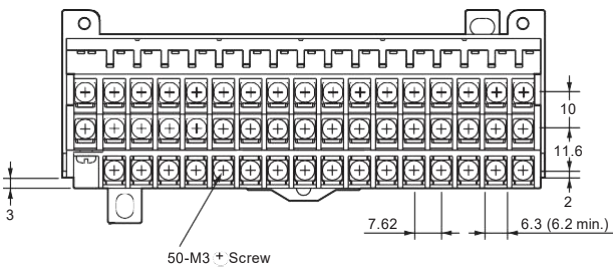
### Terminal block (without expansion terminals)



### Mounting Hole Dimensions



### Terminal block (expansion terminal block connected)

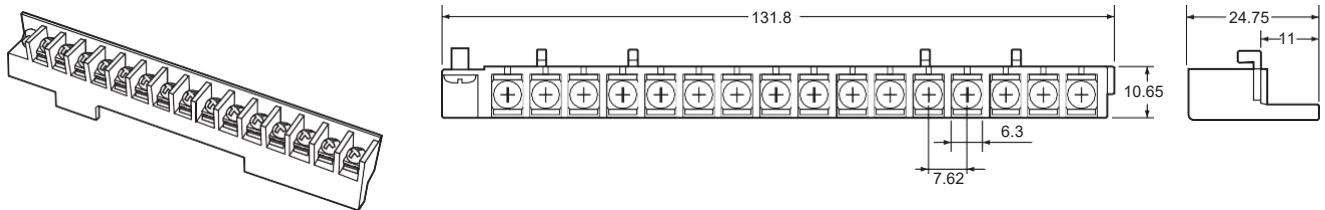


### Examples of compatible Y fork type crimp terminals for M3.5

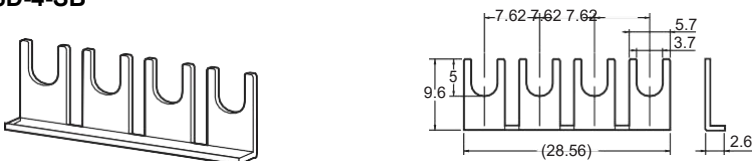
| Manufacturer           | Model        | Terminal width |
|------------------------|--------------|----------------|
| J.S.T. Mfg. Co., Ltd.  | 1.25-C3.5A   | 5.6            |
| Nichifu Co., Ltd.      | 1.25Y-3.5    | 5.8            |
|                        | 2Y-3.5S      |                |
| Nippon Tanshi Co.,Ltd. | VD1.25-3.5SS | 5.7            |
|                        | VD2-3.5SS    |                |

## Accessories (Order Separately)

### Expansion Terminal Block G70D-ET



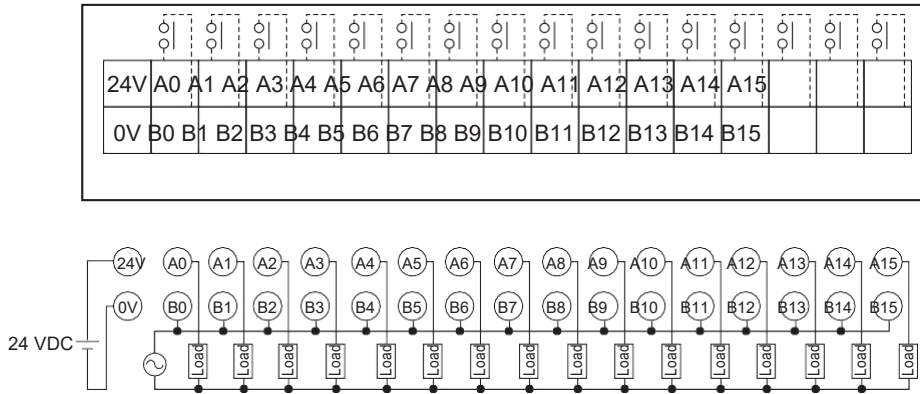
### Short Bar G6D-4-SB



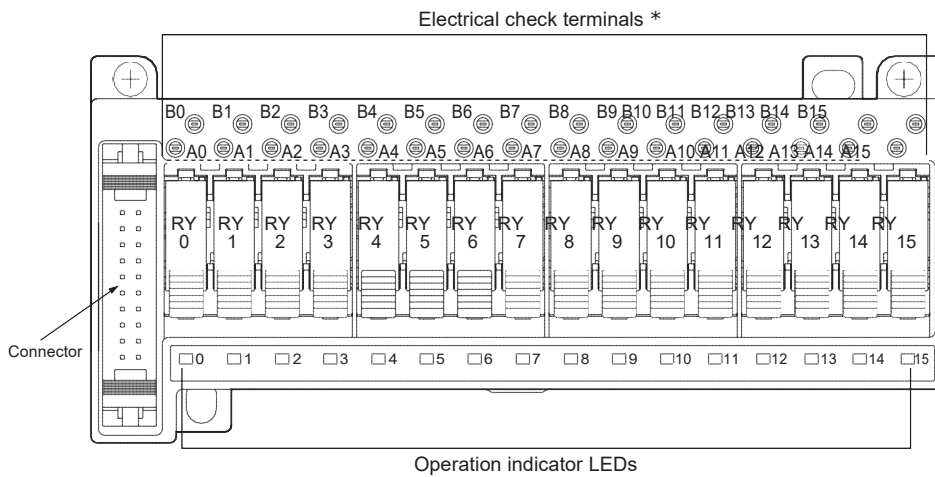
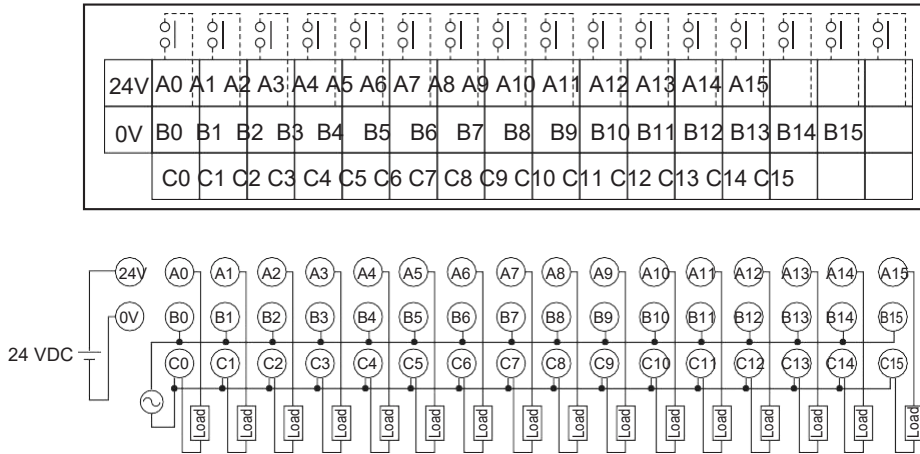
# Terminal Arrangement/Terminal Connection Example

G70D-VSOC16  
G70D-VFOM16

Without expansion terminal block



Expansion terminal block added



\* When the terminal block and relay block are connected, each terminal is electrically connected to the electrical check terminal with the same number on the relay block.

## Safety Precautions

Be sure to read *the Safety Precautions for All I/O Relay Terminals* in the website at: <http://www.ia.omron.com/>.

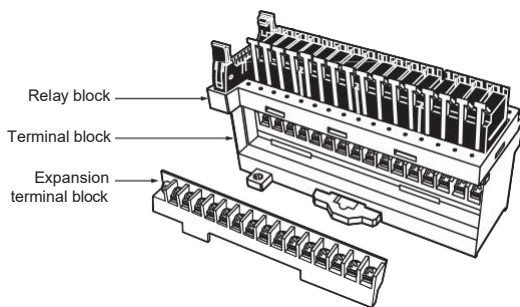
### Warning Indications

|                                    |   |
|------------------------------------|---|
| <b>Precautions for Correct Use</b> | Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction, or undesirable effects on product performance. |
|------------------------------------|---|

### Precautions for Correct Use

#### Main unit structure

- The G70D-VSOC16/VFOM16 is structured to separate the wired terminal block and relay block in order to achieve both ease of use and space savings. The relay block has LEDs for operation confirmation, electrical check terminals, and relays. An expansion terminal block can be added as needed for power supply wiring.



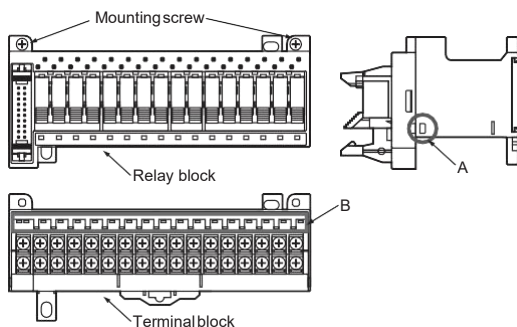
#### How to remove/attach the terminal block and relay block

##### (1) Removal

- Verify that the load power and terminal power are off.
- Alternately and evenly turn the relay block mounting screws counterclockwise. The relay block is pressed up.
- When slightly pressed up, separate the tab on part A of the relay block from the side wall.
- Turn the screws further counterclockwise, remove the screws, and then remove the relay block.

##### (2) Attachment

- Verify that the load power and terminal power are off.
- Verify that there are no metal debris or contaminants on part B of the terminal block.
- Insert the relay block straight along the groove in the terminal block.
- Push in both ends of the relay block, and insert the tab on part A in the side wall.
- Tighten the relay block screws alternately and evenly clockwise to fasten the relay block.



#### Terminal block name plate

- The terminal block name plate is stored under the relay block as shown in Fig. 1.
- If you need to make a new inscription on the name plate, remove from under the relay block, inscribe, and store in the original location.
- To check the content of the inscription after attaching to the control panel or otherwise, pull out from under the relay block and check.

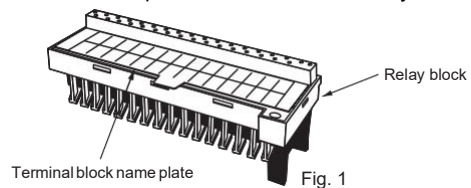


Fig. 1

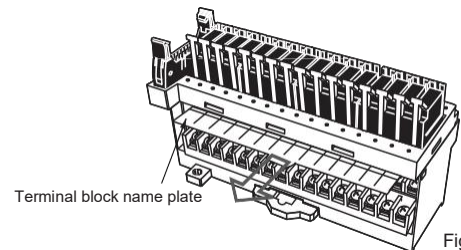
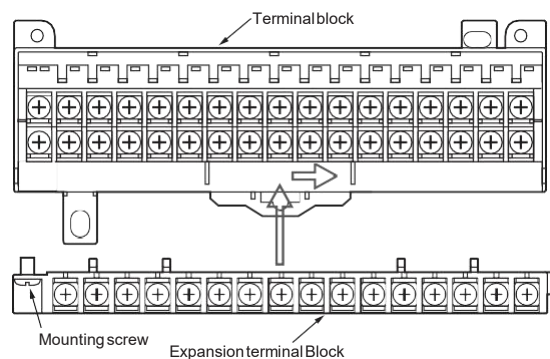


Fig. 2

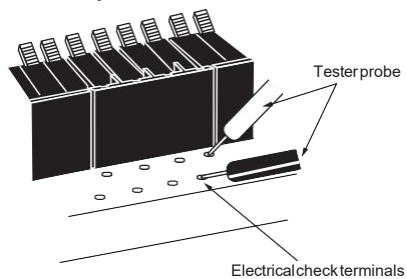
#### Mounting the expansion terminal block

- Insert the catches on the expansion terminal block into the mounting holes in the terminal block, and slide so that the block will not come off.
- Tighten the mounting screw to fasten.



## Electrical check method

- When in use, the terminal block of the G70D-VSOC16/VFOM16 is under the relay block, and an electrical check cannot be performed by touching the tester to the screw heads as is done with a regular terminal block. For this reason, electrical check terminals are provided on the relay block. These check terminals are connected to the terminals with the corresponding numbers.
- To perform an electrical check, the tester probe can be touched to the electrical check terminals to check operation.
- When power is present, do not directly touch with a small metal fragment or other object. Risk of electrical shock.





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