


# Alternate Operation Relay

# 61F-AO

## Perfect for Alternate Operation of Two Pumps Free Power Supply Makes Maintenance Easy

- Electronic Relay with the same operation as the G4Q Latching Relay. Compared with the G4Q, the 61F-AO has a shorter power supply application time and no restrictions on mounting direction.
- Compact form allows space-saving design
- Free power supply makes design/inventory management easy
- Easy to replace during maintenance due to compatibility with the 61F-APN2



 Refer to *Safety Precautions* on page 9.

### Model Number Legend

**61F - AO - CP 08 - N R A**  
 (1) (2) (3) (4) (5) (6)

**(1) Control Applications**  
 AO: Alternate operation

**(3) No. of Pins**  
 08: 8 pins

**(5) Output**  
 R: Relay

**(2) Structure**  
 CP: Compact, plug-in

**(4) Function**  
 N: Normal type

**(6) Supply Voltage**  
 A: 100 - 240 VAC

### Ordering Information

Type	Model
Alternate Operation Relay	61F-AO-CP08-NRA

### Specifications

#### Ratings

	61F-AO-CP08-NRA
Supply voltage/frequency	100 VAC - 240 VAC 50/60 Hz
Operating voltage range	85 to 110% of rated voltage
Operating frequency range	± 5 Hz of the rated frequency
Power consumption	1.6 VA max.
Contact ratings	3 A at 250 VAC (Resistive load (cosφ = 1)) 1.5 A at 250 VAC (Inductive load (cosφ = 0.4))
Ambient temperature	-10 to 55°C
Ambient humidity	25% to 85% RH
Ambient storage temperature	-10 to 55°C
Ambient storage humidity	25% to 85% RH
Weight	Approx. 100 g
Accessories	PFC-N8

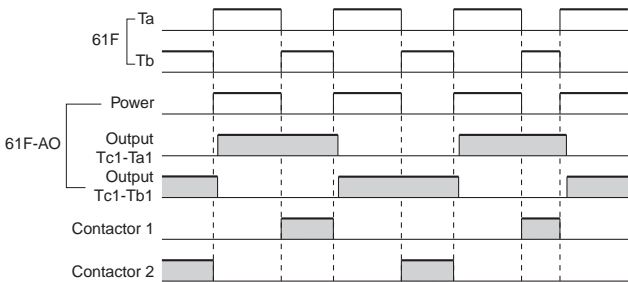
#### Characteristics

	61F-AO-CP08-NRA
Response time	Operate: 25 ms max. Release: 30 ms max.
Minimum pulse width	Min. ON time: 40 ms min. Min. OFF time: 2 s min.
Insulation resistance	10 MΩ min. at 500 VDC (between each terminal and power supply)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between each terminal and power supply)
Life expectancy	Electrical: 100,000 operations min. Mechanical: 1,000,000 operations min.

■ Operation

Time Chart for Alternate Operation of Water Supply

When the 61F-AO Alternate Operation Relay is combined with a Floatless Level Switch, the Relay output contacts switch (break) while the contactor is engaged. The Relay output contacts will not switch simultaneously with engaging the contactor. In other words, the contactor or other load is switched with the output contacts from the Floatless Level Switch, not directly with the output contacts from the 61F-AO Alternate Operation Relay. Using water supply as an example, after the control level is reached and the 61F Controllers' NC contacts turn OFF (break), the Relay's output contacts switch. The next time the 61F Controller's NC contacts turn ON, the output contacts have already switched. Thus, only the continuous carry current needs to be considered for the load capacity of the 61F-AO, enabling application to the rated carry current of 3 A.

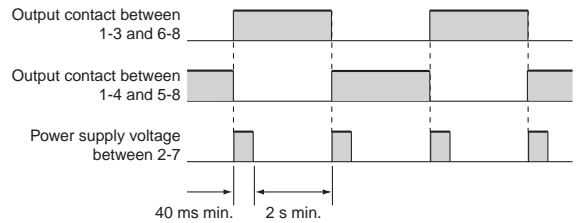


Used in combination with a Floatless Level Switch

- The 61F-AO is used in combination with a Floatless Level Switch for alternate operation when using two pumps for level control in one location.
- When power is applied to the input terminals 2 and 7, NO contacts 1 and 3, and NO contacts 6 and 8 are turned ON via the alternate operation control circuit and the output circuit. This state is held with a magnetic lock even if the power supply is turned OFF.
- When power is applied to the input terminals again, the NO contacts are turned OFF and the NC contacts 1 and 4 and NC contacts 5 and 8 are turned ON. This state is held with a magnetic lock even if the power supply is turned OFF.
- The above operation is repeated each time the power supply is turned ON. (Power Supply Pulse Response Method)

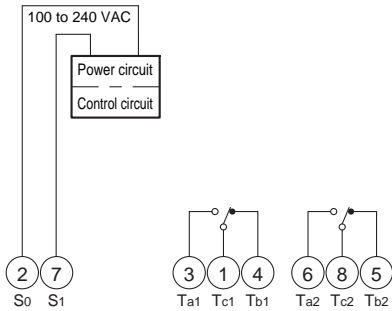
Connections (Refer to connection diagram)

- Connect output terminal Ta in the 61F-G example (page 3) to input terminal 2 on the 61F-AO.
- Connect coil terminal A on each of the two contactors to the switching contact terminals 3 and 4 on the 61F-AO.
- Use the switching contact terminals 5 and 6 on the 61F-AO to control the operation of the two pumps.



■ Connections

61F-AO-CP08-NRA

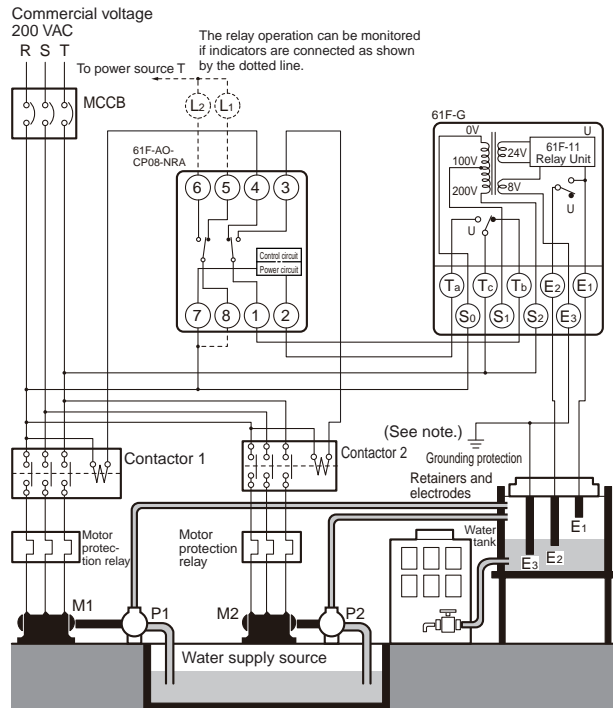


**Connections**

**Combining with the 61F-G**

**Combining with the 61F-G**

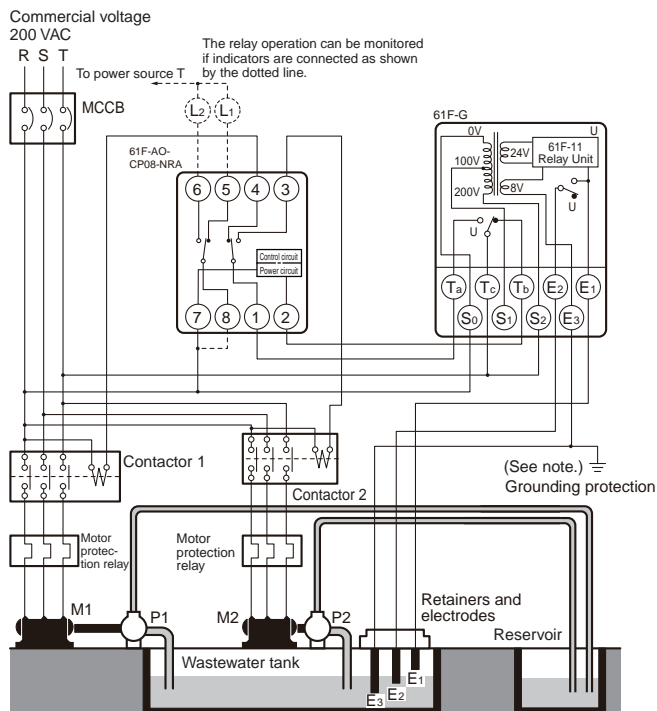
**Water Supply**



Connection Sockets  
 PF083A (Front-connecting)  
 PL08 (Rear-connecting)

**Note:** Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

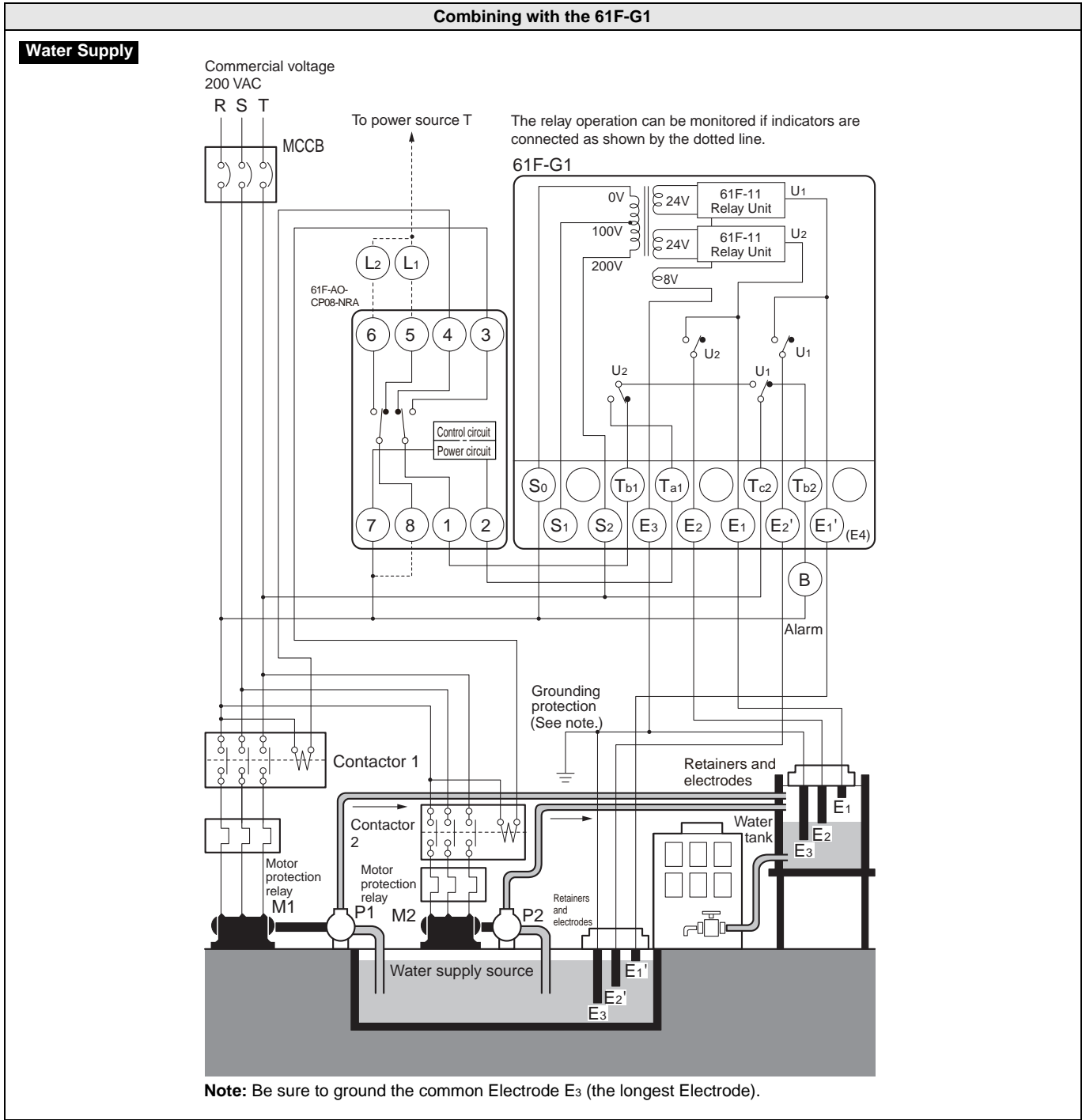
**Drainage**



Connection Sockets  
 PF083A (Front-connecting)  
 PL08 (Rear-connecting)

**Note:** Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

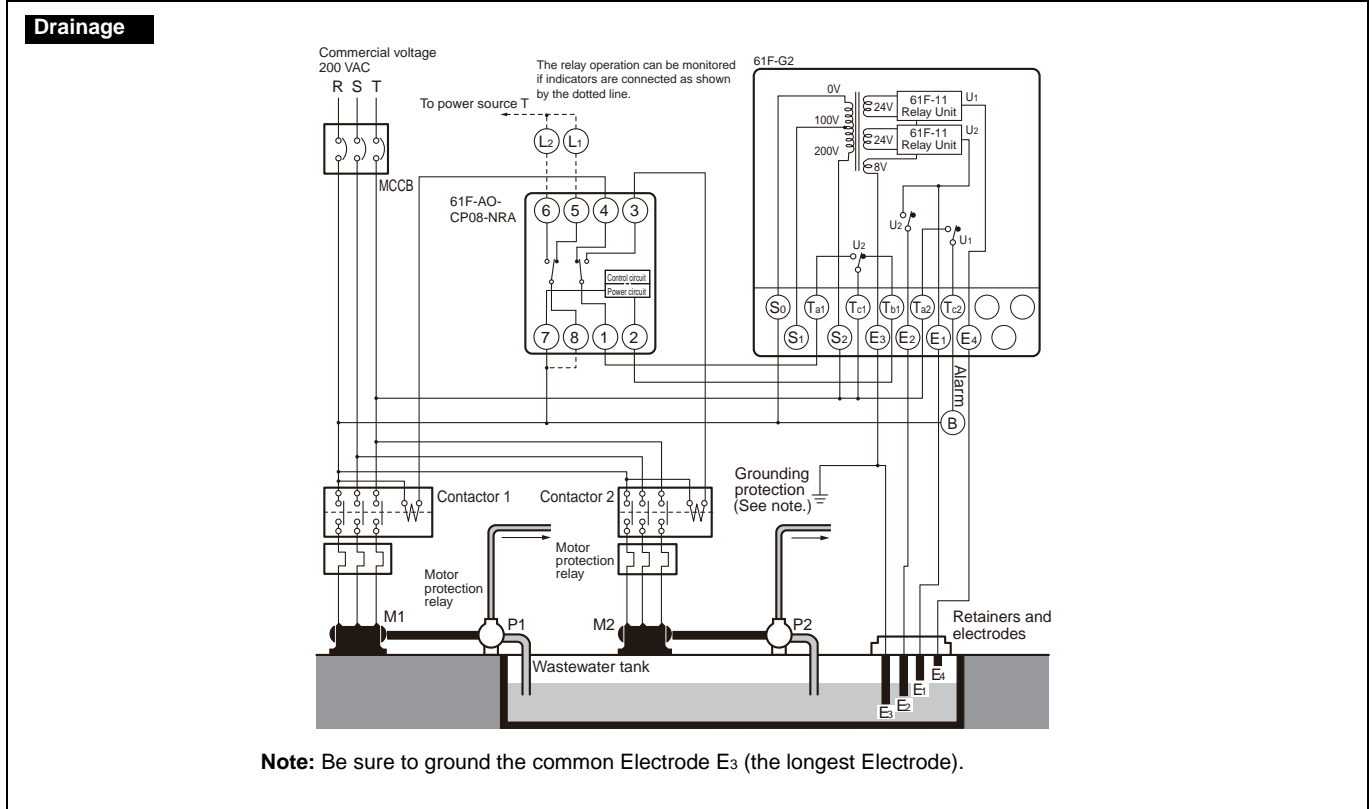
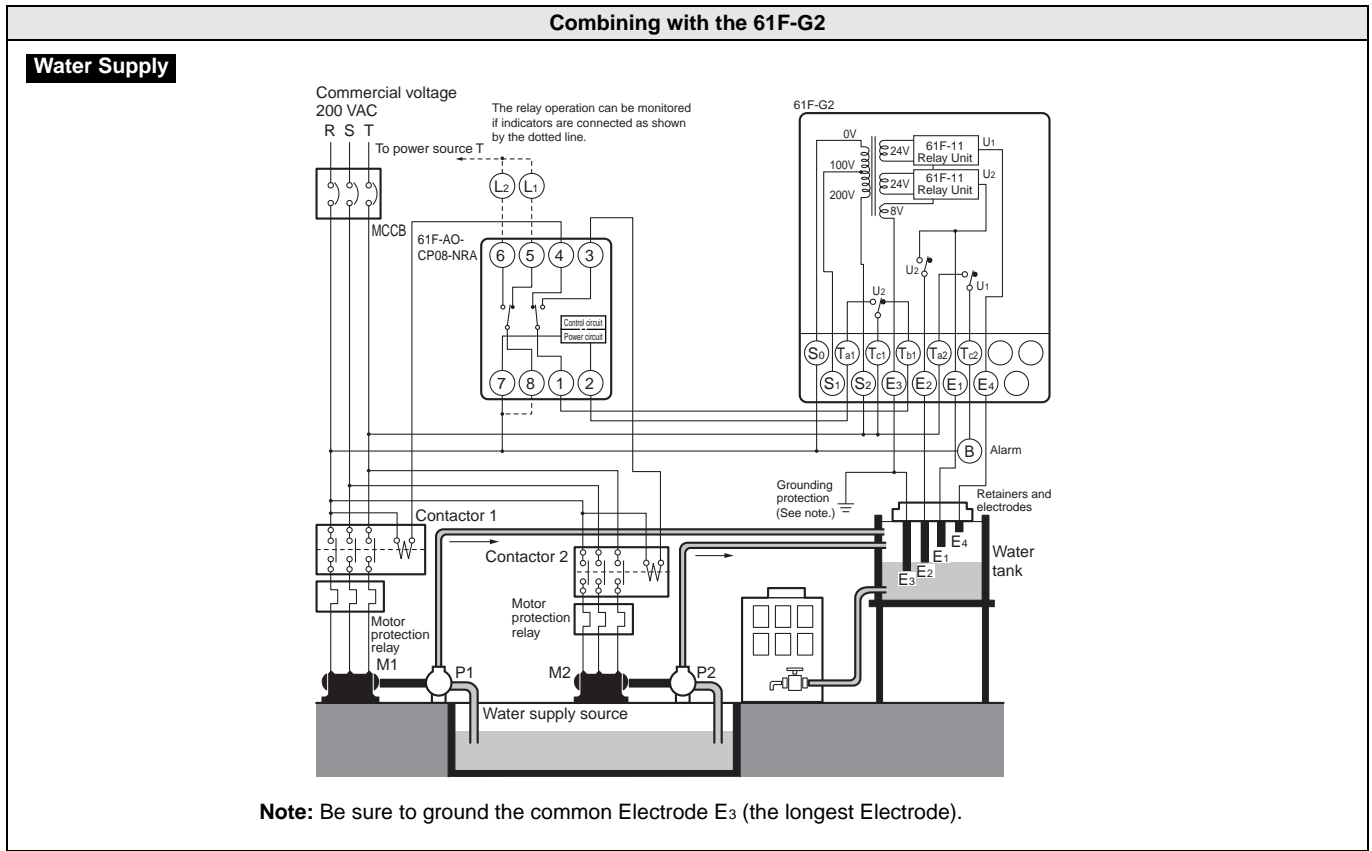
Combining with the 61F-G1



**Water Drainage**

The 61F-G1N is to be used only for supplying water and cannot be used for alternate operation for controlling drainage.

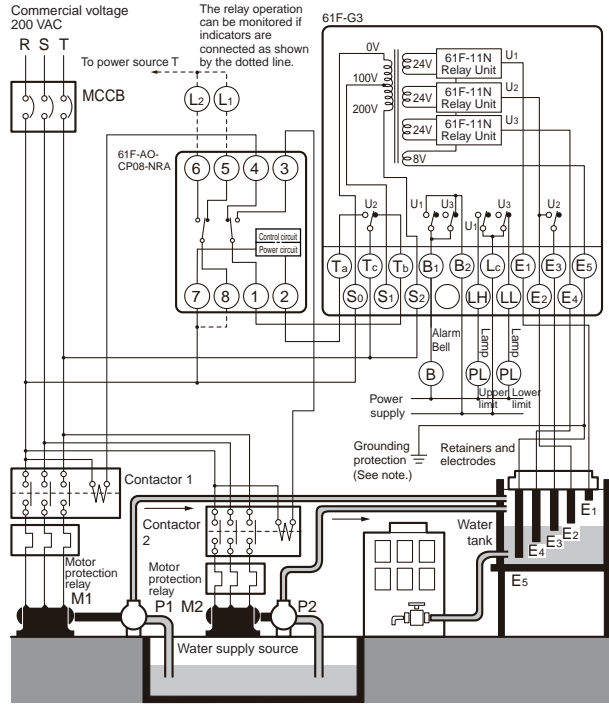
Combining with the 61F-G2



Combining with the 61F-G3

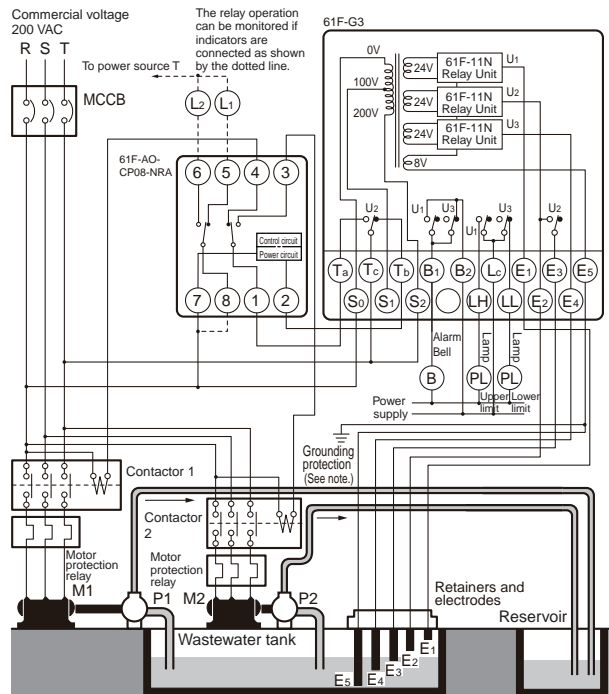
Combining with the 61F-G3

Water Supply



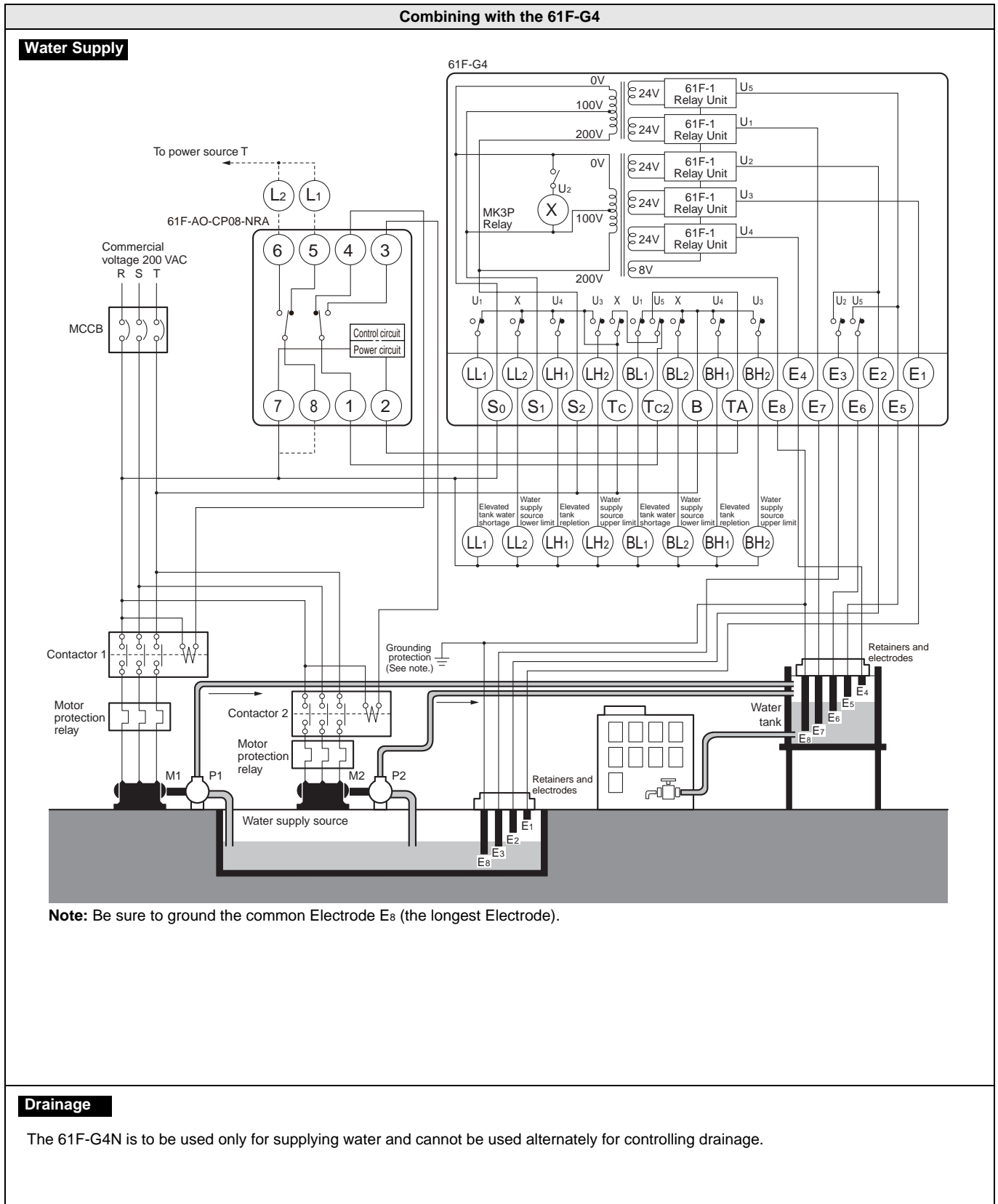
Note: Be sure to ground the common Electrode E<sub>5</sub> (the longest Electrode).

Drainage



Note: Be sure to ground the common Electrode E<sub>5</sub> (the longest Electrode).

Combining with the 61F-G4

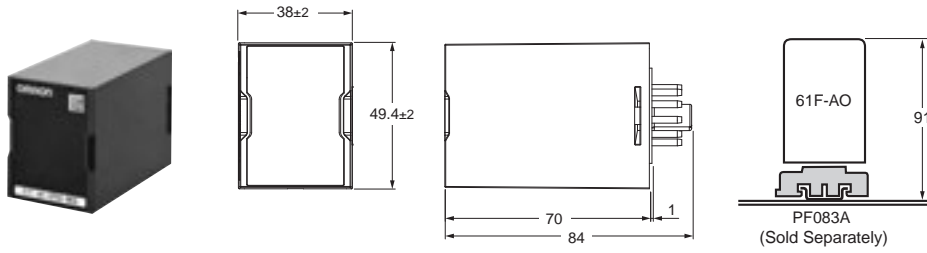


# 61F-AO

## ■ Dimensions

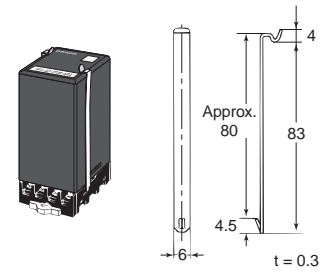
(Unit: mm)

### 61F-AO



Use a PFC-N8 Mounting Bracket to mount the Level Controller to a PF083A Rail-mounted Socket.

### PFC-N8



**Note:** PFC-N8 Mounting Bracket (provided with 61F-AO)

## ■ Replacement for the alternate operation relay 61F-APN2 is as follows.


Previous	New
61F-APN2 AC□□V	61F-AO-CP08-NRA







## Safety Precautions

Be sure to read the precautions for all models in the website at the following URL: <http://www.ia.omron.com/>.

### Meanings of the warning indications

 <b>CAUTION</b>	It may result in minor to moderate injury or property damage due to this risk if the product is not handled correctly.
<b>Precautions for Safe Use</b>	It indicates the actions that should be taken or avoided in order to use the product safely.
<b>Precautions for Correct Use</b>	It indicates the actions that should be taken or avoided to prevent product inoperability, malfunction, or adverse effects on its performance or functions.

### Meaning of graphic symbols

	<p>●<b>Caution on electric shock</b> A notice that warns of the possibility of electric shock under certain conditions.</p>
	<p>●<b>Prohibition symbols in general</b> A general and non-specific notice of prohibition.</p>
	<p>●<b>No disassembly</b> A notice of prohibition where disassembly of the equipment may cause injury such as electric shock.</p>
	<p>●<b>General forced action symbol</b> A graphic symbol indicating the general action of an unspecified user.</p>

### CAUTION

Minor injury may be caused by electric shock in rare cases. Turn off the power supply when wiring, and do not touch the terminals while the power is on. Do not touch the product with wet hands.



Slight electric shock, ignition, or equipment failure may occur in rare cases. Do not allow metal, wires, or chips from installation process to enter the product.



If the contact output is suddenly switched due to a failure in the product, physical damage to the facility, equipment, etc. connected to this product may occur in rare cases. Please be sure to conduct periodic inspections on this product.



Minor injury may be caused by explosion in rare cases. Do not use this product under presence of flammable or explosive gases.



Slight electric shock, ignition, or equipment failure may occur in rare cases. Do not disassemble, modify or repair this product, or touch its interior parts.



### Precautions for Safe Use

Please be sure to thoroughly read and understand this manual before handling the product.

- Do not use or store this product under the following environments:
  - Any outdoor environment or one that comes under direct sunlight
  - Any environment where it may be splashed with water or oil
  - Any environment where it is exposed to the weather
  - Any environment where there is significant vibration and impact
  - Any environment where the temperature changes are drastic
  - Any environment where there is a risk of freezing or condensation
  - Any environment where there is dust or corrosive gas (especially sulfide gas, ammonia gas, etc.)
  - Any environment where it may be affected by static electricity or noise
  - Any environment where there are insects or small animals
  - Any environment where it may be splashed with flammable or soluble liquid
  - Any environment where it is exposed to sea breeze
- Install the product as far away as possible from equipment that generates strong high frequency or surge voltage.
- Do not place the product on an unstable surface. It poses a risk of the product falling and becoming damaged, or hitting someone and causing injury.
- Do not use the product if the product is dropped by mistake, as the inside of the product may be damaged.
- Install a switch or circuit breaker and provide an appropriate indication so that the operator can turn OFF the power immediately.
- Install the product in the correct orientation.
- Use the power supply voltage and load within the specifications and ratings.
- Use a power supply that will reach the rated voltage within 1 second after the power is turned ON.
- Do not connect anything to unused terminals.
- This product should be handled by a specialist with knowledge about electricity.
- When using the equipment, make sure to check the wiring before turning on the power.
- It may be prone to radio disturbance. Do not use any radio wave receivers near the product.
- Use or store the product while keeping the ambient temperature and humidity within the specification range. In particular, do not install the product close to other heating equipment (equipment containing coil or winding). Implement forced cooling if necessary.
- Install the product while ensuring not to apply any load on the main body.
- Check that the output contacts are operating properly. Depending on the operating environment, deterioration of the internal relay may be accelerated and result in malfunction.
- To prevent smoke generation and ignition, check the rating of the wires and use the wires that are listed below.

Type of wire	Wire material	Recommended wire diameter
Single wire/ stranded wire	Copper	0.25 to 1.5 mm <sup>2</sup> AWG24 to AWG16

- To clean, use commercially available alcohol and no thinners.
- Dispose of this product as industrial waste.

## Precautions for Correct Use

1. It cannot be used for flammable liquids such as gasoline, kerosene, and heavy oil.
2. When measuring the insulation resistance, never conduct megger tests between the electrode terminals.
3. This product requires a certain response time during operation and recovery. Employ caution regarding designs that require subtle timing for sequence control. For details, please check the product specifications for the model to be used.
4. Install the socket and DIN rail with screws to prevent loosening. If the screws are loose, vibration, impact, etc. may cause the DIN rail, socket, product main body, or wiring to come off.
5. When attaching a crimped terminal to a terminal screw, tighten it with the tightening torque within the range from 0.45 to 0.6 N·m.

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