

# Alternate Operation Relay 61F-AN/-APN2

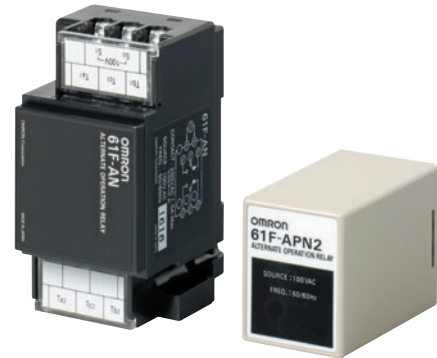
CSM\_61F-AN\_-APN2\_DS\_E\_3\_1

## Increases Motor Life and Enables Operating Only One Pump When Cleaning Tanks or as an Emergency Measure for Pump Failures.

- Electronic Relay with the same operation as the G4Q Latching Relay. Compared with the G4Q, the 61F-AN/-APN2 has a shorter power supply application time and no restrictions on mounting direction.
- Compact Models (61F-AN) and Compact Plug-in Models (61F-APN2) available.

**Note:** A changeover switch must be included in the sequence to enable operating only one pump.

 Refer to *Safety Precautions for Floatless Level Controllers*.



## Ordering Information

| Type                      | Model    |
|---------------------------|----------|
| Alternate Operation Relay | 61F-AN   |
|                           | 61F-APN2 |

**Note:** When ordering, specify the desired operating voltage at the end of the model number.

Example: 61F-AN [220VAC]

\_\_\_\_\_ Desired supply voltage

## Specifications

### Ratings

|                         |                                  |
|-------------------------|----------------------------------|
| Supply voltage          | 100, 110, 200, 220 VAC; 50/60 Hz |
| Operating voltage range | 85% to 110% of rated voltage     |
| Power consumption       | 3 VA                             |
| Accessories             | Hold-down clip PFC-N8 *          |

\* Hold-down clip PFC-N8 is attached only 61F-APN2.

### Contact Ratings (with G2RK Keep Relay)

| Item                    | Resistive load ( $\cos\phi = 1$ ) | Inductive load ( $\cos\phi = 0.4$ , $L/R = 7$ ms) |
|-------------------------|-----------------------------------|---------------------------------------------------|
| Max. load               | 3 A at 250 VAC                    | 1.5 A at 250 VAC                                  |
| Carry contact           | 3 A                               |                                                   |
| Max. operating current  | 3 A                               |                                                   |
| Max. switching capacity | 750 VA                            | 375 VA                                            |

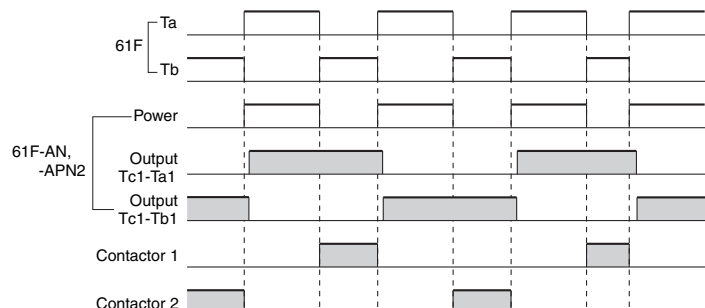
### Characteristics

|                       |                                                                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Response time         | Operate: 25 ms max.<br>Release: 30 ms max.                                                                                             |
| Minimum pulse width   | Min. ON time: 40 ms min.<br>Min. OFF time: 200 ms min.                                                                                 |
| Insulation resistance | 100 M $\Omega$ 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)                                                                 |
| Vibration resistance  | 10 to 55 Hz, 1-mm double amplitude                                                                                                     |
| Shock resistance      | 10 G (approx. 98 m/s <sup>2</sup> )                                                                                                    |
| Life expectancy       | Mechanical: 1,000,000 operations (at operating frequency of 1,800 operations/hour)<br>Electrical: 100,000 operations min. (rated load) |
| Ambient temperature   | Operating: -10 to 55°C                                                                                                                 |
| Ambient humidity      | Operating: 45% to 85% RH                                                                                                               |
| Weight                | 61F-AN: Approx. 215 g<br>61F-APN2: Approx. 190 g                                                                                       |

## Time Chart for Alternate Operation of Water Supply

When the 61F-A□ 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-A□ 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-APN2, enabling application to the rated carry current of 3 A.

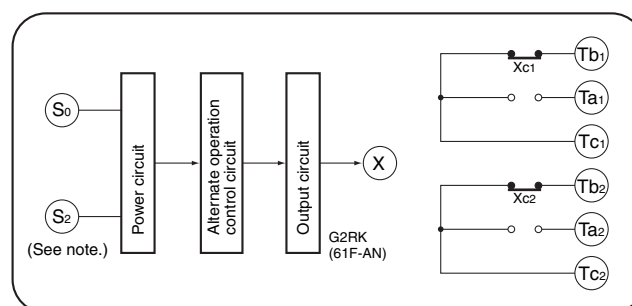


## 61F-AN (Compact Model)

Used in combination with a 61F-G□N Floatless Level Switch.

### Operation

- The 61F-AN 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 S<sub>0</sub> and S<sub>2</sub>, NO contacts Tc<sub>1</sub> and Ta<sub>1</sub>, and NO contacts Ta<sub>2</sub> and Tc<sub>2</sub> 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 Tc<sub>1</sub> and Tb<sub>1</sub> and NC contacts Ta<sub>2</sub> and Tc<sub>2</sub> 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)



(Note: The above diagram is for a rated voltage of 200 or 220 VAC.  
Power is supplied to S<sub>0</sub> and S<sub>1</sub> for 100 or 110 VAC.)

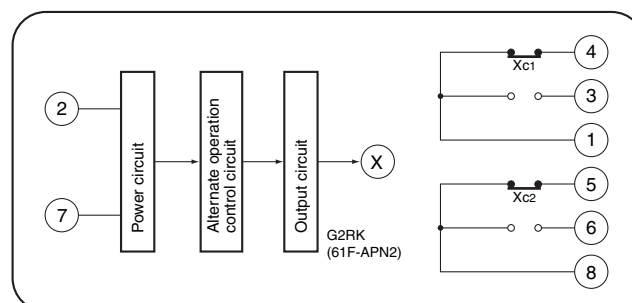
Connections (Refer to connection diagram.)

## 61F-APN2 (Compact Plug-in Model)

Used in combination with a Floatless Level Switch.

### Operation

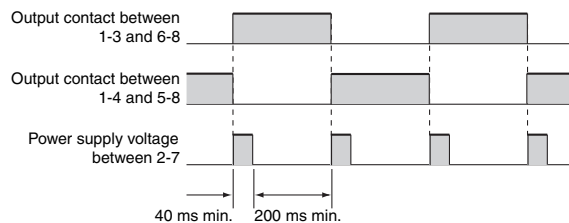
- The 61F-APN2 is used in combination with a Floatless Level Switch for alternate operation when using two pumps for level control in one location.
- When power is applied to the input terminals 2 and 7, NO contacts 1 and 3, and NO contacts 6 and 8 are turned ON via the alternate operation control circuit 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)



Note: Refer to *Connecting Sockets, Mounting Brackets, DIN Rails* for the applicable Sockets.

Connections (Refer to connection diagram.)

- Connect output terminal Ta in the 61F-G example (page 5) to input terminal 2 on the 61F-APN2.
- Connect coil terminal A on each of the two contactors to the switching contact terminals 3 and 4 on the 61F-APN2.
- Use the switching contact terminals 5 and 6 on the 61F-APN2 to control the operation of the two pumps.
- The power supply of the 61F-APN2 is 100, 110, 200, or 220 VAC. Be sure to use the correct power supply.



## ■ Connections

## Combining with the 61F-GN

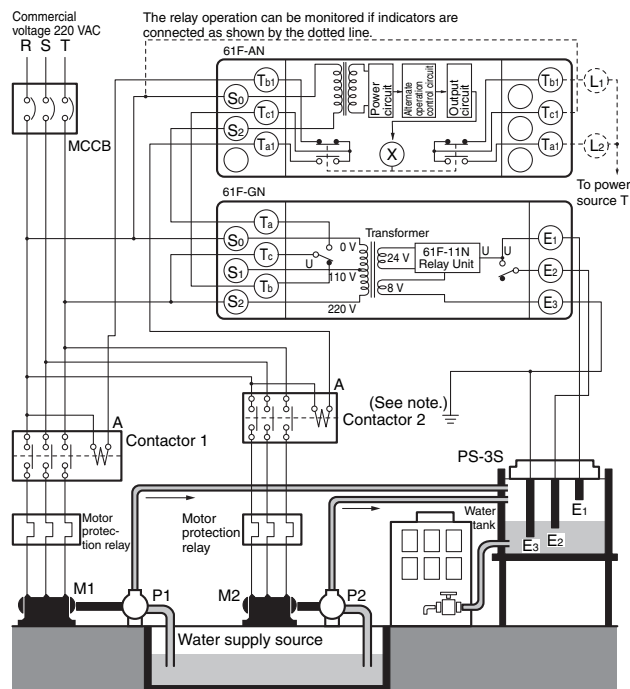
61F-AN



**Dimensions:**  
page 17

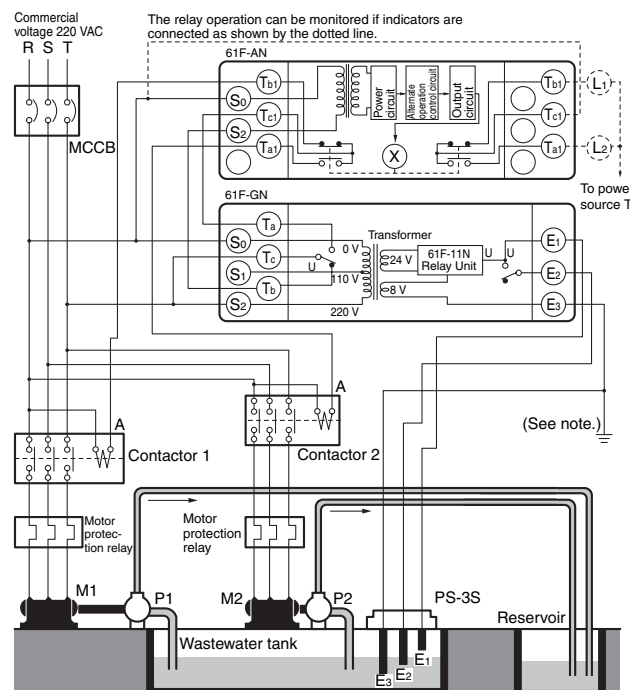
## Combining with the 61F-GN

## Water Supply



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

## Drainage

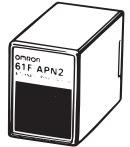


**Note:** Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

## Combining with the 61F-G

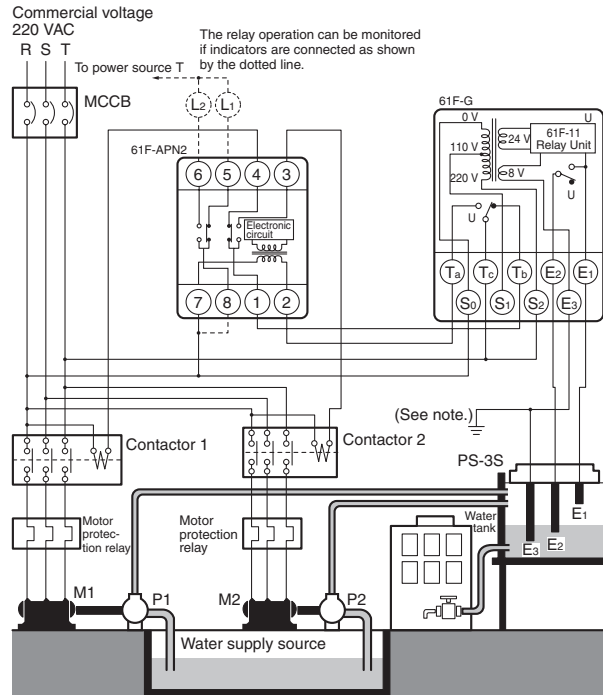
61F-APN2

Dimensions:  
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### Combining with the 61F-G

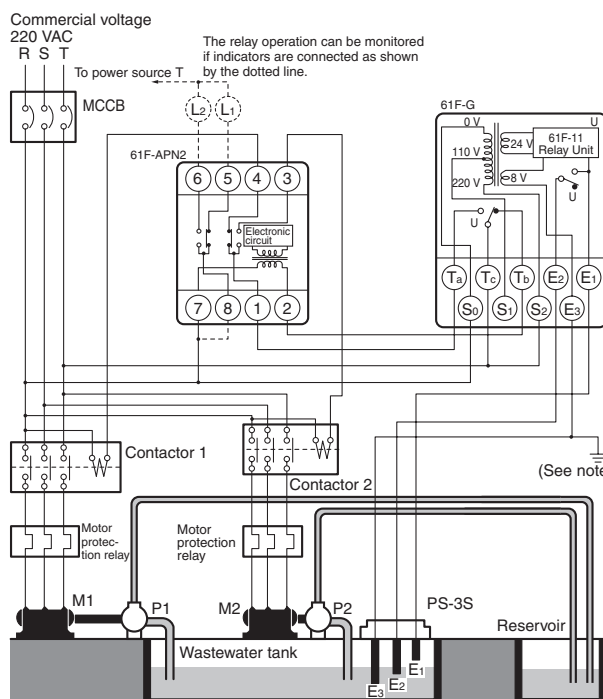
#### Water Supply



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-G1N

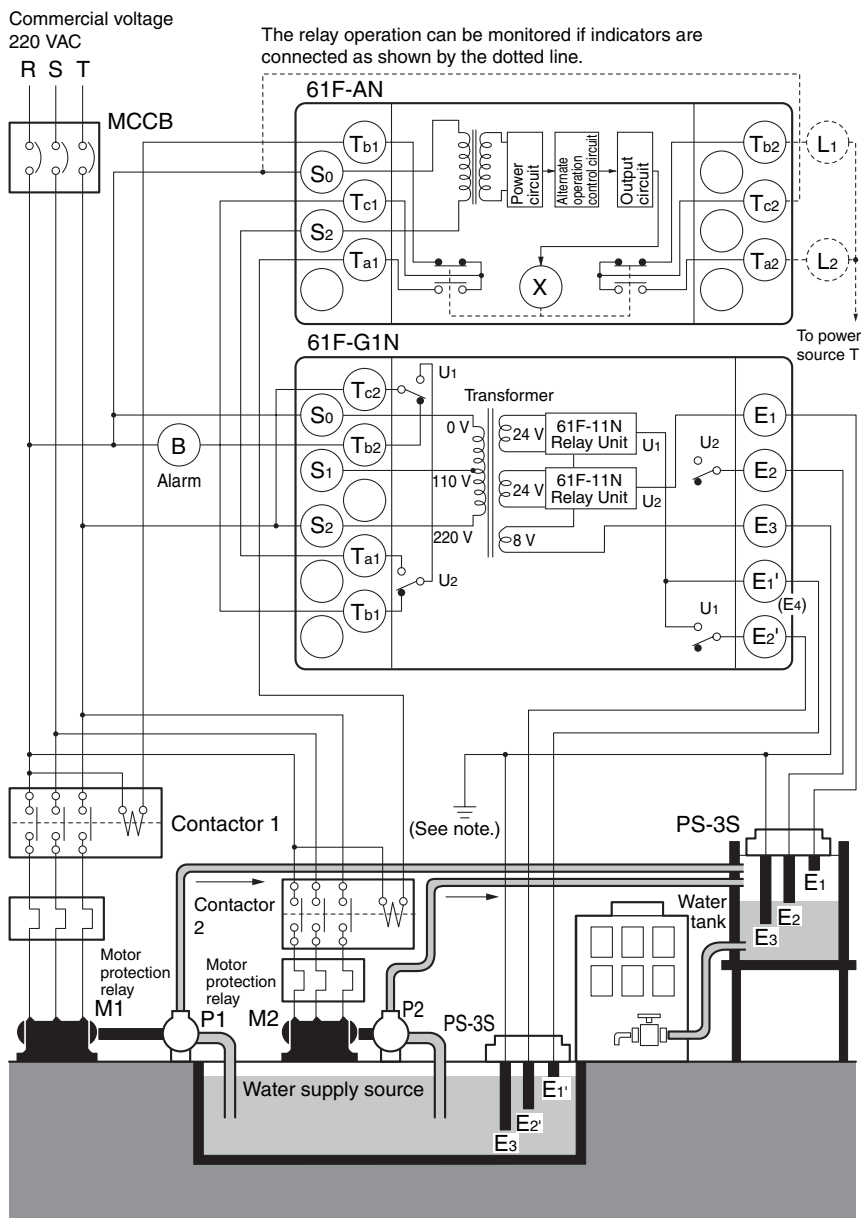
**61F-AN**

**Dimensions:**  
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### Combining with the 61F-G1N

## Water Supply



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

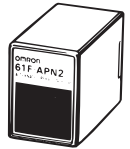
## Drainage

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-G1

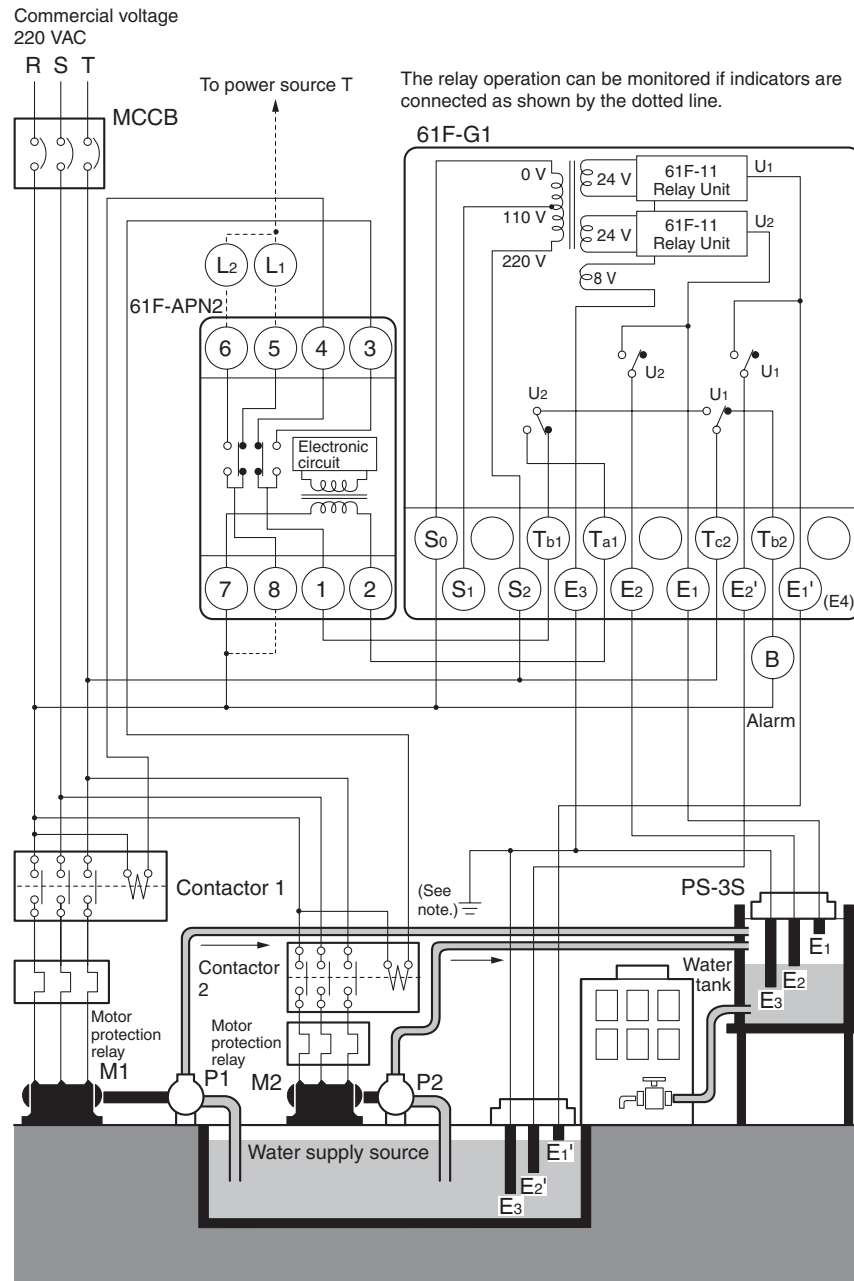
61F-APN2

Dimensions:  
page 17



### Combining with the 61F-G1

#### Water Supply



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

#### Water Drainage

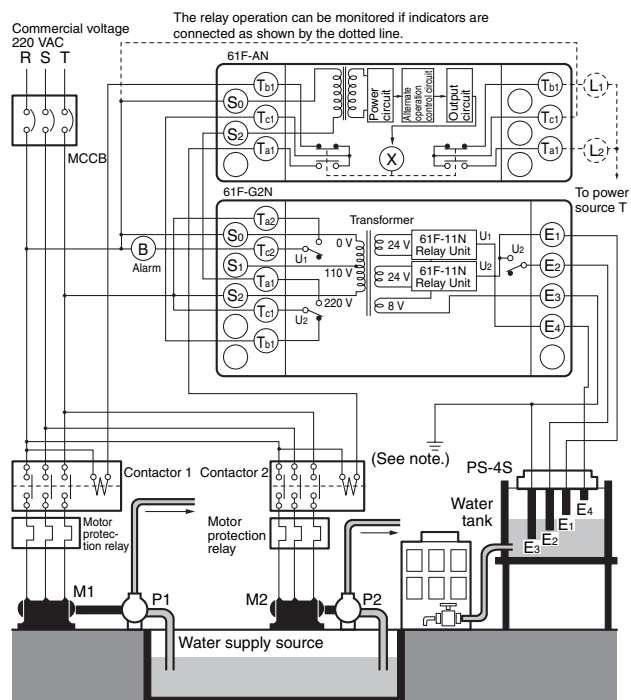
The 61F-G1N is to be used only for supplying water and cannot be used for alternate operation for controlling drainage.



**Dimensions:**  
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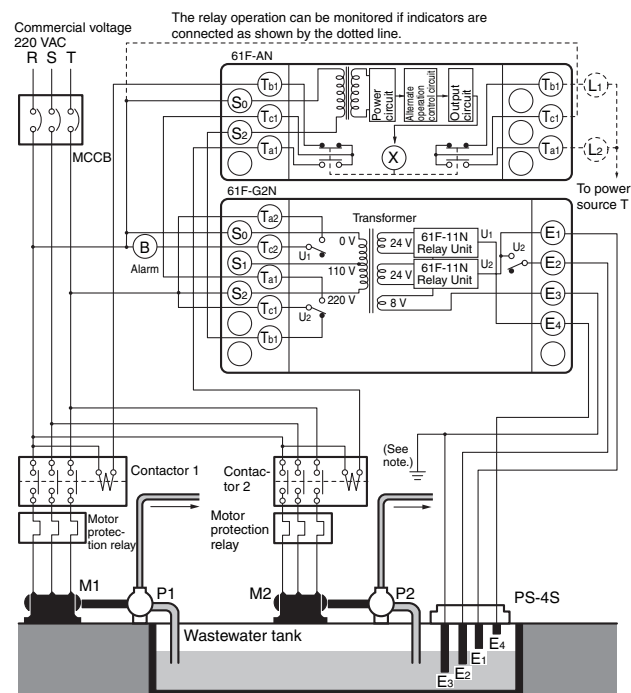
### Combining with the 61F-G2N

## Water Supply



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

## Drainage



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



## Combining with the 61F-G2

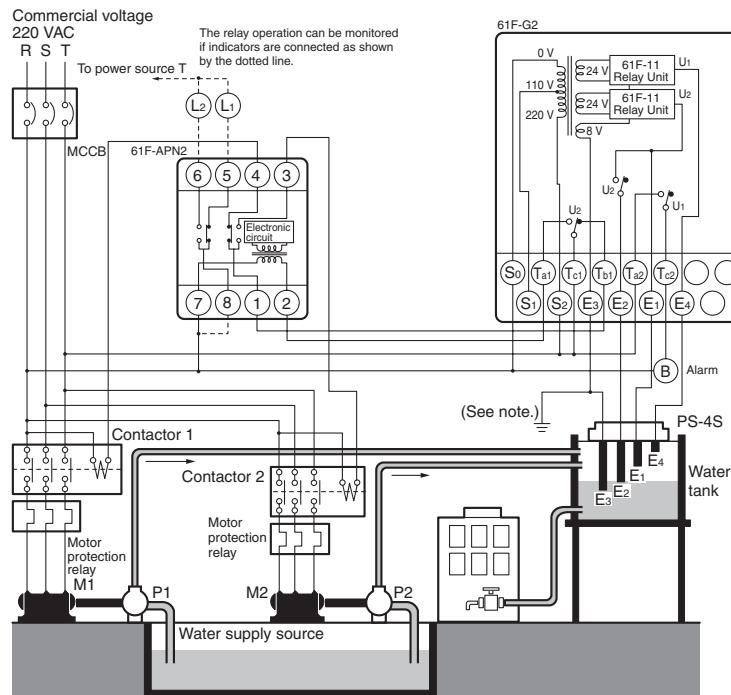
61F-APN2

**Dimensions:**  
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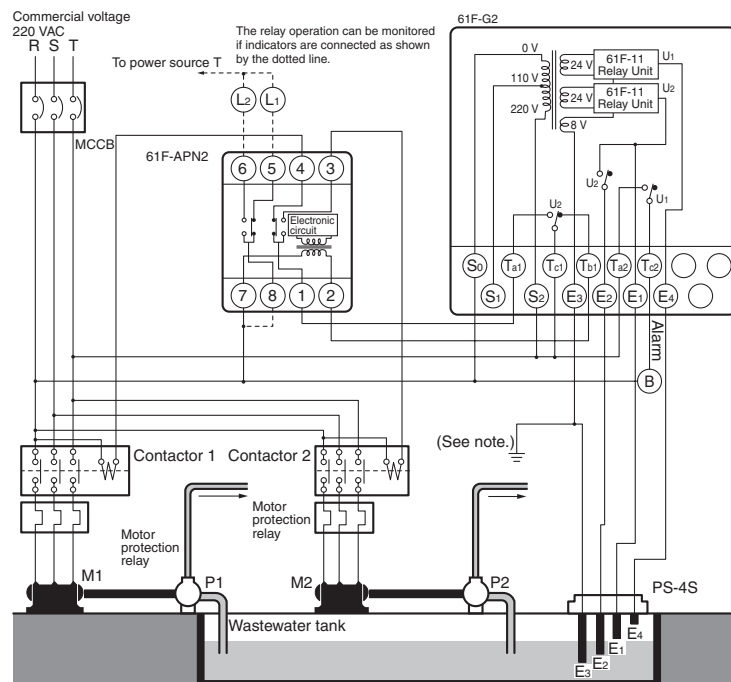
### Combining with the 61F-G2

## Water Supply



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

## Drainage

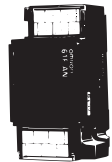


**Note:** Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

## Combining with the 61F-G3N

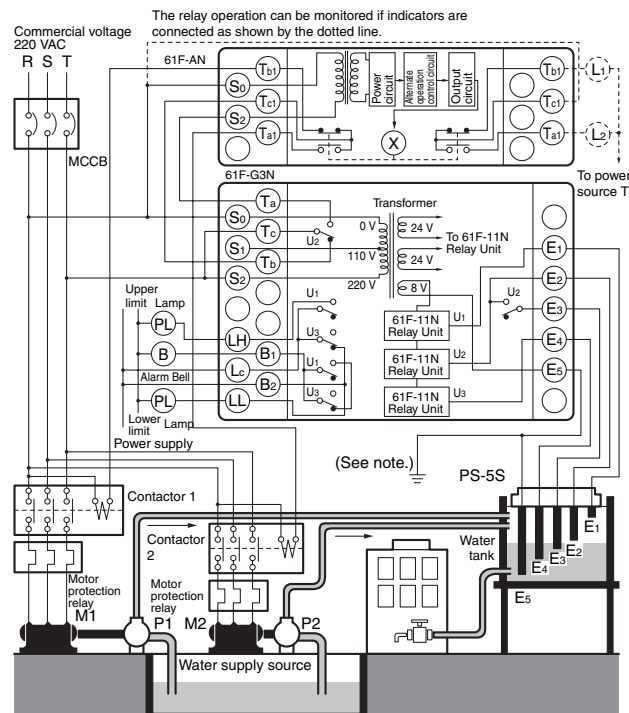
61F-AN

Dimensions:  
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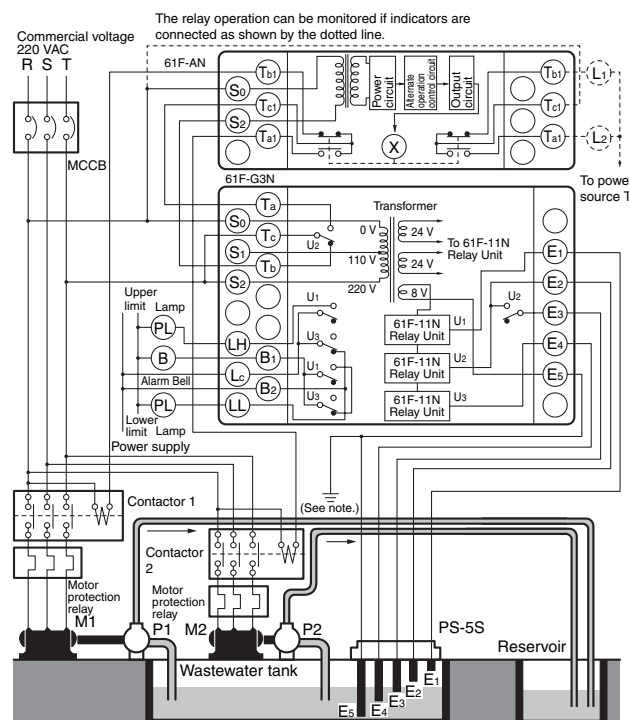
### Combining with the 61F-G3N

#### Water Supply



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

#### Drainage

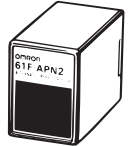


**Note:** Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

## Combining with the 61F-G3

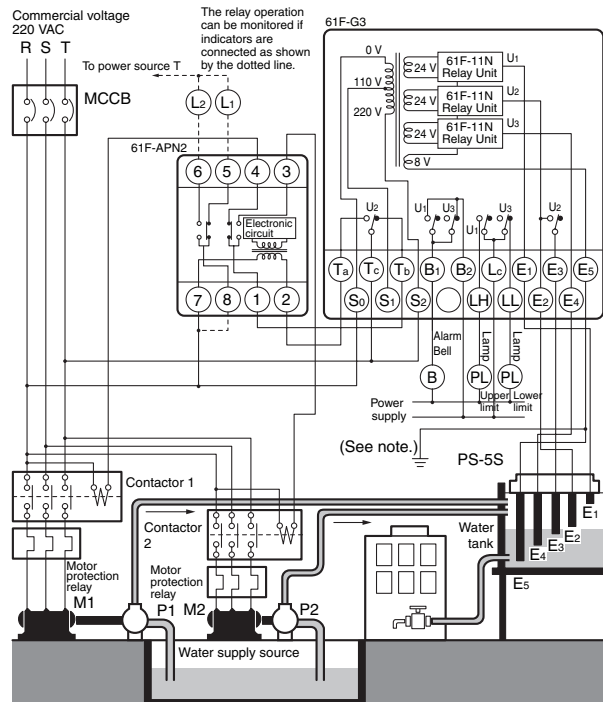
61F-APN2

Dimensions:  
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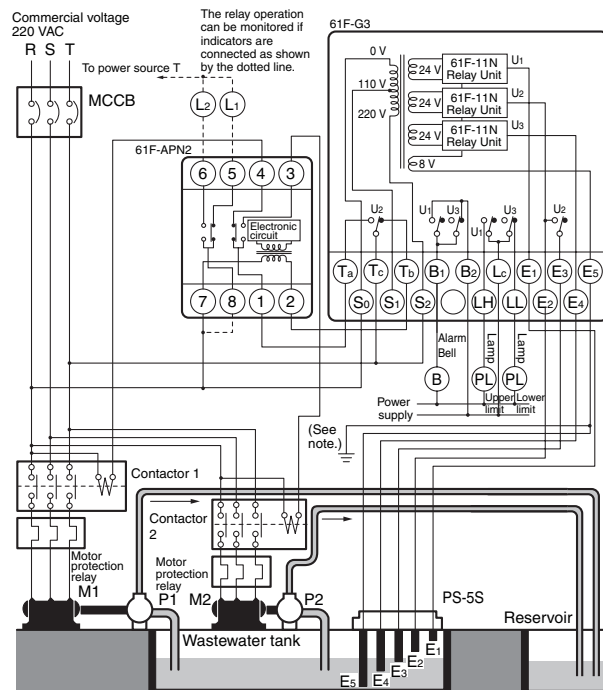
### Combining with the 61F-G3

#### Water Supply



**Note:** Be sure to ground the common Electrode E3 (the longest Electrode).

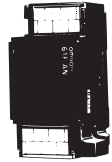
#### Drainage



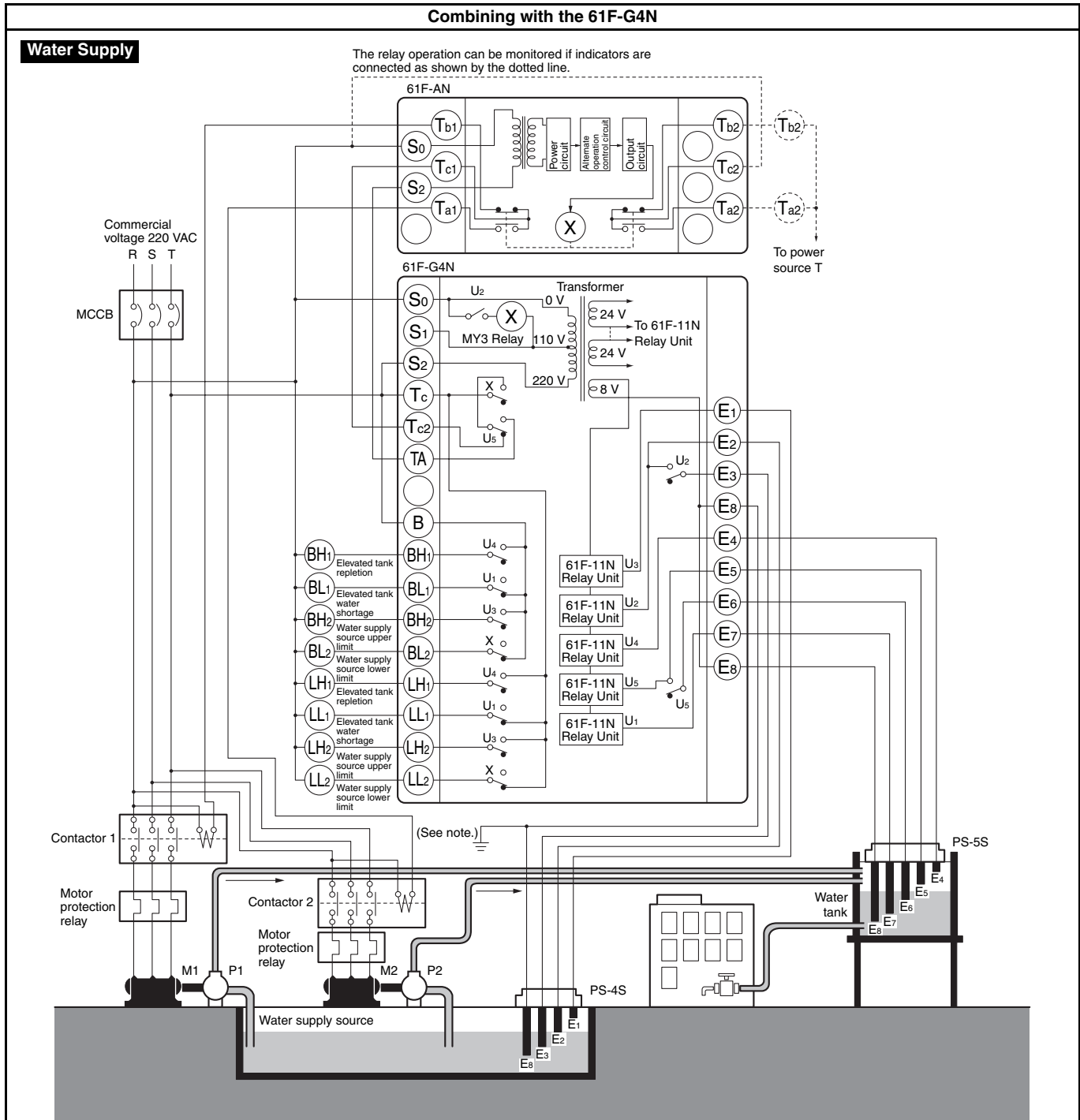
**Note:** Be sure to ground the common Electrode E3 (the longest Electrode).

## Combining with the 61F-G4N

## Alternate Operation Relay 61F-AN



Dimensions:  
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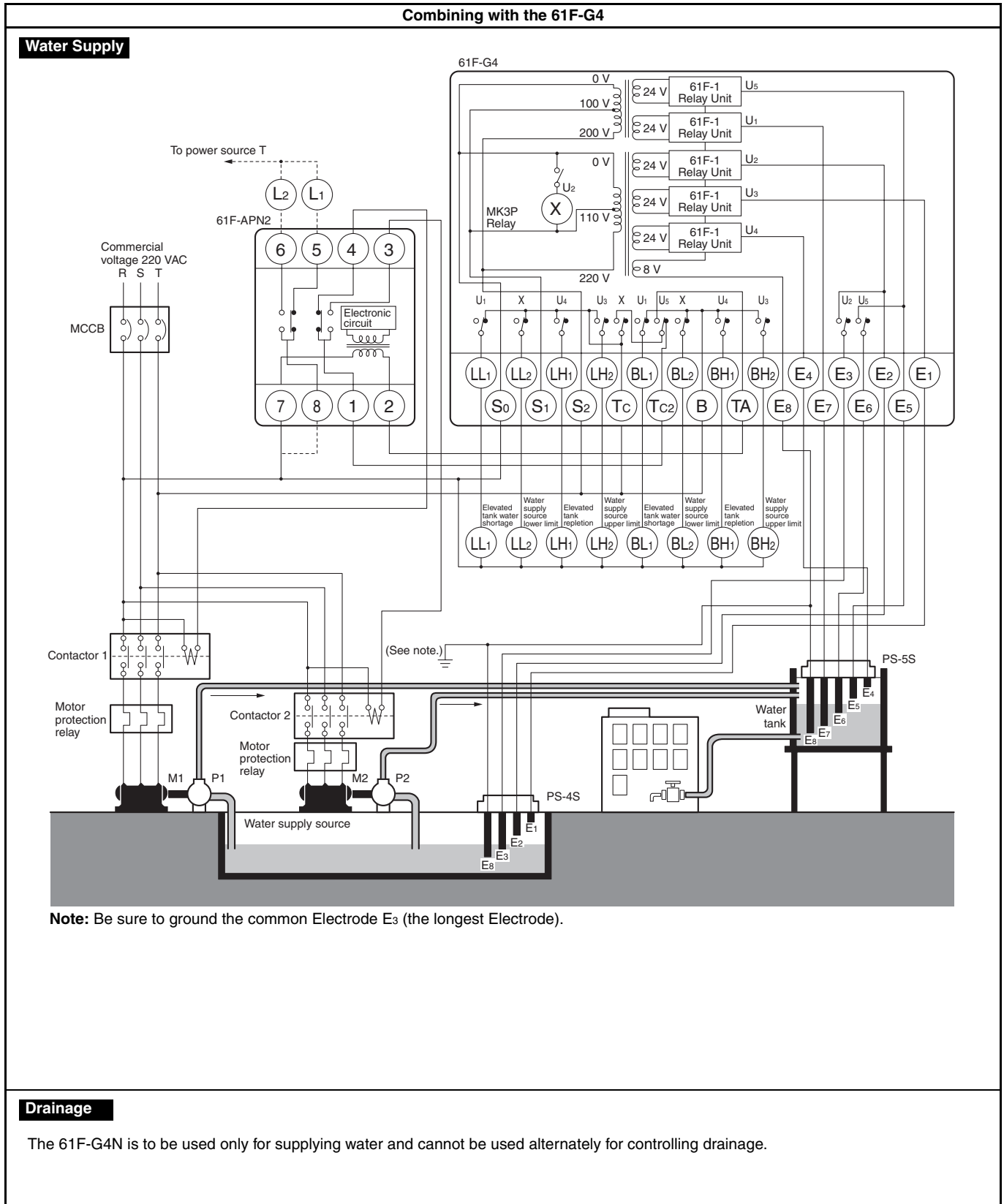
## Drainage

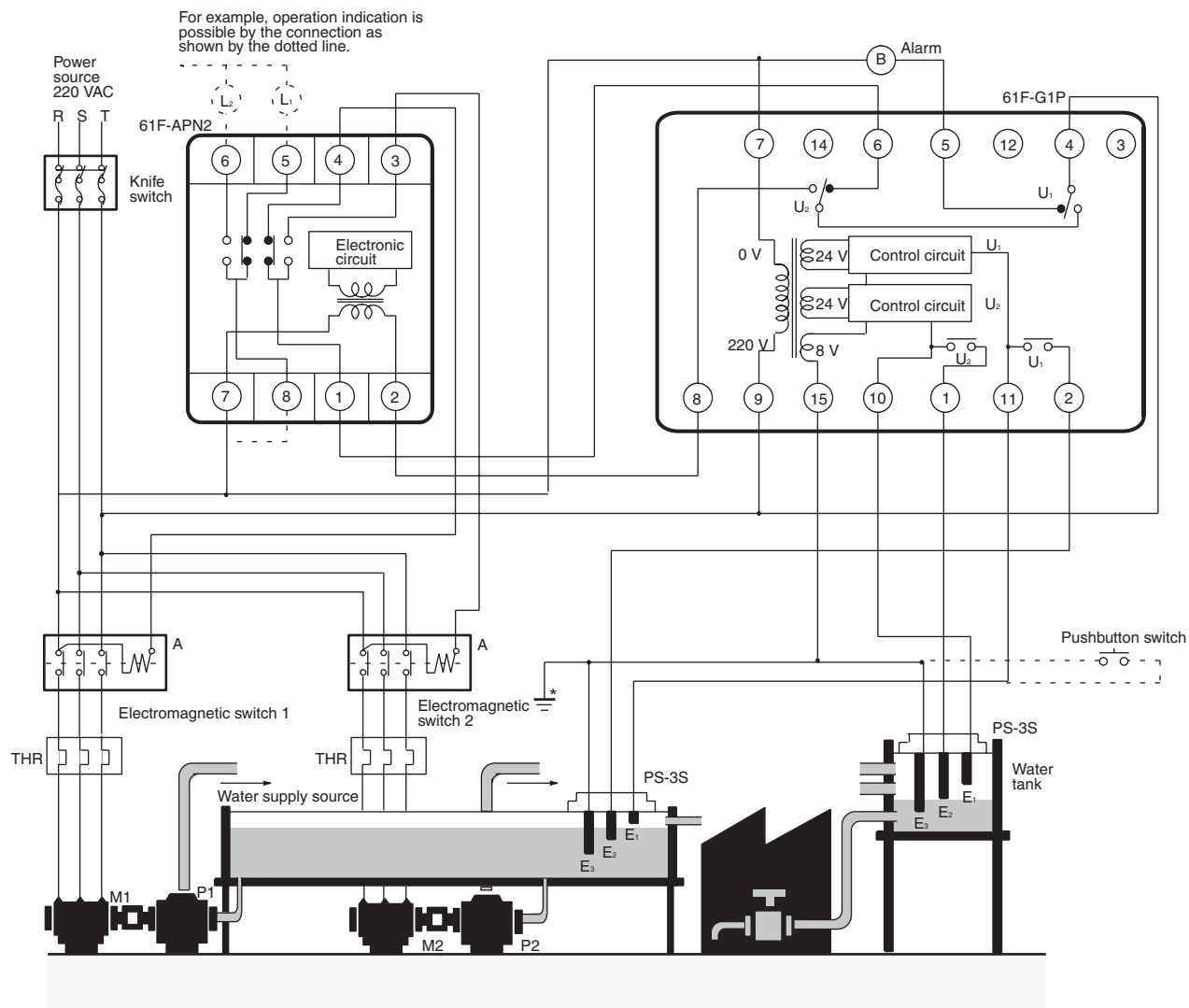
The 61F-G4N is to be used only for supplying water and cannot be used alternately for controlling drainage.

## Combining with the 61F-G4

## Alternate Operation Relay 61F-APN2

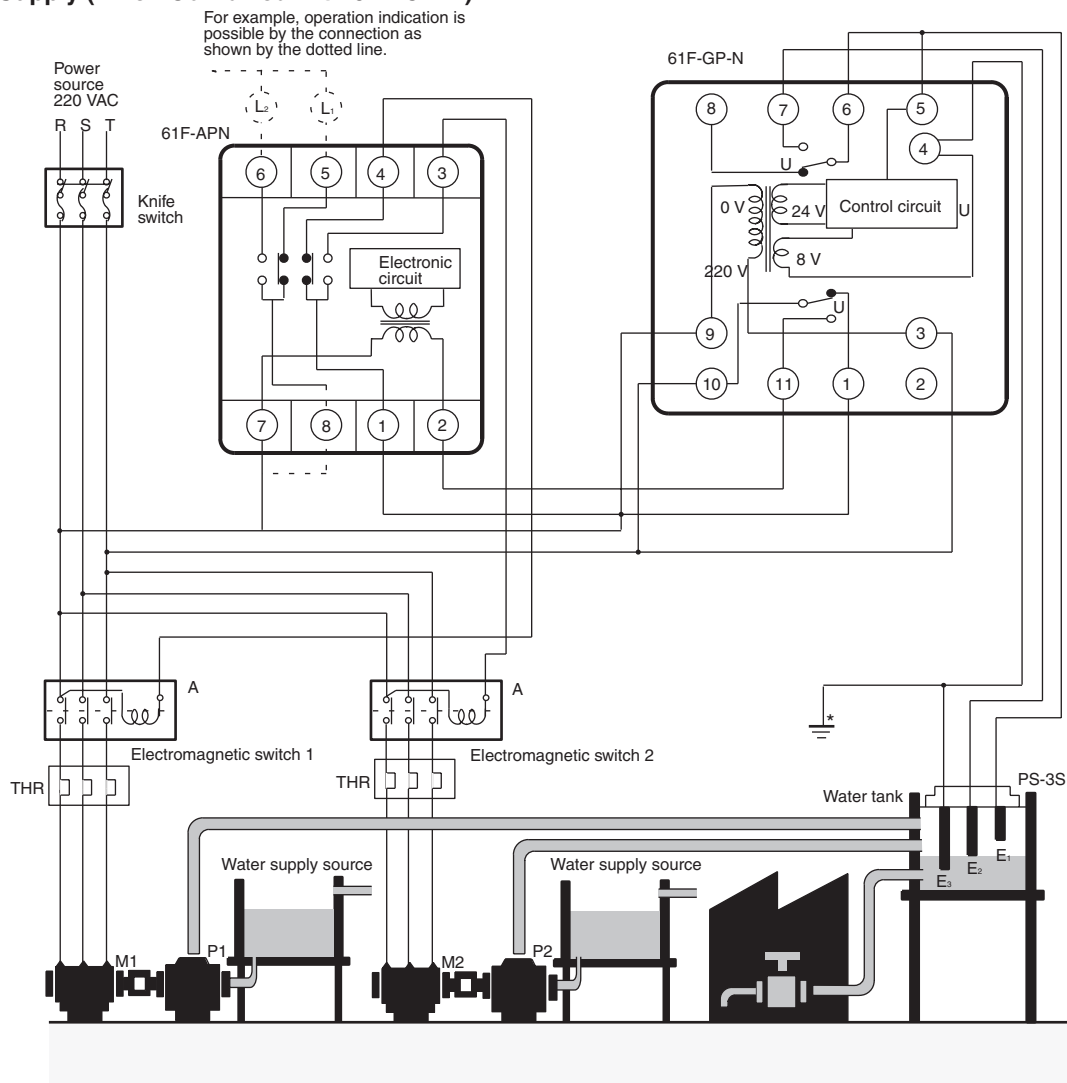
Dimensions:  
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**At 220 VAC****Water Supply (When Combined with 61F-G1P)**

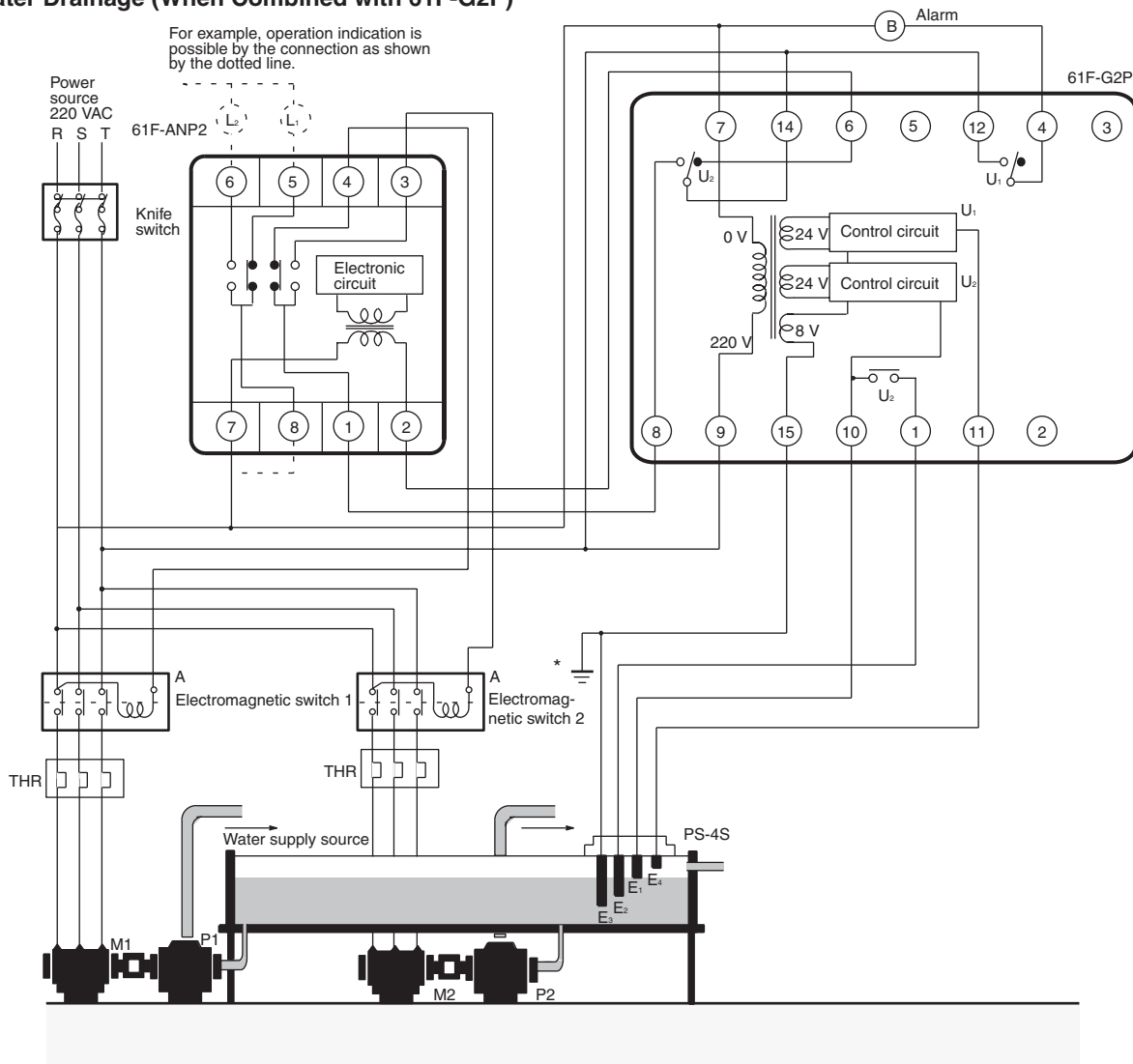
\*Be sure to ground terminal 15.

# Water Supply (When Combined with 61F-GP-N)



\*Be sure to ground terminal 4.

## Water Drainage (When Combined with 61F-G2P)



\*Be sure to ground terminal 15.





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