### Floatless Level Switch (Compact Type)

## 61F-G□N

CSM\_61F-G\_N\_DS\_E\_3\_5

## Improved Design for a More Lightweight Construction and Reduced Standby Power Consumption.

- Standby power reduced to 85% or less of previous models. (Applicable to 61F-GN.)
- Weighs only 85% or less of previous models. (Applicable to 61F-G3N/-G4N.)
- Easy identification of operating status with LED operation indicator.
- Increased reliability of internal relay (micro load: 5 VDC, 1 mA) to enable PLC input.
- Electrode terminals and other wiring terminals are separated for easy wiring.
- Select from three mounting methods: JEM, DIN rail mounting, or screw mounting.

Note: LED operation indicator is provided on Controllers manufactured in August 1999 or later.



Refer to Safety Precautions for Floatless Level
Controllers.



61F-G□N (120/240 VAC) in this catalog have been discontinued at the end of March 2018.

### **Model Number Structure**

### ■ Model Number Legend



### 1. Controller Application

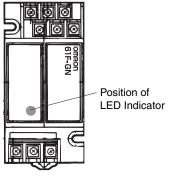
- G: Automatic water supply and drainage
- G1: Automatic water supply with idling prevention or water shortage alarm
- G2: Automatic water supply and drainage with abnormal water increase alarm
- G3: Automatic water supply and drainage with full tank and water shortage alarm
- G4: Automatic water supply with water level indicator for water supply tank and water receiving tank and prevention of idling due to water shortage
- I: Liquid level indication and alarm (no two-wire models)

#### 2. Type

Blank: General-purpose L 2KM: Long-distance (for 2 km)

L 4KM: Long-distance (for 4 km)

H: High-sensitivityD: Low-sensitivityR: Two-wire



Note: LED indicator is provided on Controllers manufactured in August 1999 or later. It is not mounted on the case surface. It can be seen through the case.

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### **Ordering Information**

Classification by application by control purpose			General- purpose	Long-distance (between Controller and Electrodes) (See note 2.)	High- sensitivity (for high specific resistance)	Low- sensitivity (for low specific resistance)	Two wire	
Controller	GN Models	•	61F-GN Base x 1 61F-11□ Units x 1	61F-GN *	61F-GNL *	61F-GNH *	61F-GND *	61F-GNR *
	G1N Models	▲ w/pump idling prevention	61F-G1N Base x 1 61F-11□ Units x 2	61F-G1N *	61F-G1NL *	61F-G1NH *	61F-G1ND *	61F-G1NR *
		▲ w/alarm for abnormally low level						
	G2N Models	♦ w/alarm for abnormally high level	61F-G2N Base x 1 61F-11□ Units x 2	61F-G2N *	61F-G2NL *	61F-G2NH *	61F-G2ND *	61F-G2NR *
	G3N Models	♦ w/alarm for abnormally high and low levels	61F-G3N Base x 1 61F-11□ Units x 3	61F-G3N *	61F-G3NL *	61F-G3NH *	61F-G3ND *	61F-G3NR *
	G4N Models		61F-G4N Base x 1 61F-11□ Units x 5 MY3 Relay x 1	61F-G4N *	61F-G4NL *	61F-G4NH *	61F-G4ND *	61F-G4NR *
	IN Models	Level indication with alarm	61F-IN Base x 1 61F-11□ Units x 2	61F-IN *	61F-INL *	61F-INH *	61F-IND *	61F-INR
Relay unit	• -	•	61F-11□ Units x 1	61F-11N	61F-11NL	61F-11NH	61F-11ND	61F-11NR

- Note: 1. ◆: Automatic water supply and drainage control, ▲: Automatic water supply control
  - 2. Subclassified into 2 km and 4 km models according to the model of relay unit used. Specify 2 km or 4 km when ordering.
  - When ordering, specify the desired operating voltage at the end of the model number.
     Example: 61F-GN[110/220 VAC]
     Desired supply voltage
  - 4. Contact your OMRON representative for products with voltages other than those listed above.
  - 5. If you order with a standard model number, the corresponding Relay Units are also delivered as part of a set. If you order the 61F-GN, one 61F-11 Relay Unit is included in the set.

 $\pmb{*}$  61F-G $\square$ N (120/240 VAC) in this catalog have been discontinued at the end of March 2018.

### **Specifications**

### **Standard Models**

Type Items	General-purpose Controllers 61F-□N	Long-distance 61F-□NL 2KM (2 km) Controllers 61F-□NL 4KM (4 km)	High-sensitivity Controllers 61F-□NH		
Controlling materials and operating conditions  For control of ordinary purified water and wastewater		For control of ordinary purified water and wastewater. Particularly in cases where the distance between the pumps and water tanks or between supply and receiver tanks are far apart or where remote control is required.	For control of liquids with high specific resistance, such as distilled water		
Rated voltage	100/200, 110/220 or 120/240 VAC, 50/60 Hz (both supported on same model)				
Allowable voltage fluctuation range	85% to 110% of rated voltage				
Inter-electrode voltage	8 VAC				
Inter-electrode current	Approx. 1 mA AC max.				
Power consumption	GN□: 3 VA max., G1N□, G2N□, IN□: 4 VA max., G3N□: 5.5 VA max., G4N□: 8.5 VA max.				
Inter-electrode operation resistance (recommended values)	0 to approx. 4 kΩ	0 to 1.8 k $\Omega$ (for 2 km) 0 to 0.7 k $\Omega$ (for 4 km)	Approx. 10 k $\Omega$ to 40 k $\Omega$ (See note 4.)		
Inter-electrode release resistance (recommended values)	Approx. 15 k to $\infty\Omega$	4 k to $\infty\Omega$ (for 2 km) 2.5 k to $\infty\Omega$ (for 4 km)	Approx. 100 k to $\infty\Omega$		
Cable length (See note 2.)	1 km max.	2 km max. 4 km max.	50 m max.		
Output	3 A, 200 VAC (Resistive load)				
Ambient operating temperature	−10 to 55°C				
Ambient operating humidity	45% to 85%				
Insulation resistance (See note 3.)	100 MΩ min. (at 500 VDC)				
Dielectric strength (See note 3.)	2,000 VAC, 50/60 Hz for 1 min.				
Life expectancy	Electrical: 250,000 operations min.  Mechanical: 10,000,000 operations min.				
Weight	GN models: 315 g; G1N, G2N, IN models: 410 g; G3N models: 625g; G4N models: 8				
Internal Circuit Diagrams	Example: 61F-GN	Example: 61F-GNL	Example: 61F-GNH		
	S2 Tb S1 Tc S0 Ta  O V Transformer  100 V S S2 V S1 F11N U Relay Unit U S20 V S SV  E3 E2 E1	S2 TD TC TO TA  O V Transformer 100 V 3 24V 61F-11N Relay Unit 200 V 0 8 V E3 E2 E3	S2 Tb Tc S0 Ta Tc		

**Note: 1.** The  $\square$  in the model name represents G, G1, G2, G3, G4, or I.

- 2. The length when using completely insulated, 600-V, 3-core (0.75 mm²) cabtire cables. Usable cable lengths will become shorter as the cable diameter or number of cores becomes larger due to increased floating capacity. For details, refer to Safety Precautions for Floatless Level Controllers.
- 3. The insulation resistance and dielectric strength are the values between power terminals and Electrode terminals, between power terminals and contact terminals, and between Electrode terminals and contact terminals. For details, refer to Safety Precautions for Floatless Level Controllers.
- 4. Application is possible with 10 k $\Omega$  or less, however, this may cause reset failures.

Туре	Low-sensitivity Controller 61F-□ND	Two-wire Controller 61F-□NR			
Items  Controlling materials and operating conditions	For control of liquids with low specific resistance, such as salt water, wastewater, acid chemicals, or alkaline chemicals	For control of ordinary purified water or wastewater. Used with a Two-wire Electrode Holder (incorporating a resistor of 6.8 kΩ)			
Rated voltage	100/200, 110/220 or 120/240 VAC, 50/60 H	Iz (supported by the same model)			
Allowable Voltage Fluctuation	85% to 110% of rated voltage				
Inter-electrode voltage	8 VAC				
Inter-electrode current	Approx. 1 mA AC max.				
Power consumption	GN□: 3 VA max., G1N□, G2N□, IN□: 4 VA max., G3N□: 5.5 VA max., G4N□: 8.5 VA max.				
Inter-electrode operation resistance (recommended values)	0 to approx. 1.8 kΩ	Approx. 0 to 1.1 kΩ			
Inter-electrode release resistance (recommended values)	Approx. 5 k to $\infty \Omega$	Approx. 15 k to $\infty \Omega$			
Cable length (See note 2.)	1 km max.	800 m max.			
Output	3 A, 200 VAC (Resistive load)				
Ambient operating temperature	−10 to 55°C				
Ambient operating humidity	45% to 85%				
Insulation resistance (See note 3.)	100 MΩ min. (at 500 VDC)				
Dielectric strength (See note 3.)	2,000 VAC, 50/60 Hz for 1 min.				
Life expectancy	Electrical: 250,000 operations min. Mechanical: 10,000,000 operations min.				
Weight	GN models: 315 g; G1N, G2N, IN models: G4N models: 870 g	410 g; G3N models: 625g;			
Internal Circuit Diagrams	Example: 61F-GND  S2  TB  OV Transformer  100 V 3  E3V  D4V  Relay Unit  U  CE3  E2  E2  E3  E2  E1	Example: 61F-GNR  \$2 Tb Tc So Ta  OV Transformer 100V 38 24V Relay Unit Relay Unit Es			

**Note: 1.** The  $\square$  in the model name represents G, G1, G2, G3, G4, or I.

- 2. The length when using completely insulated, 600-V, 3-core (0.75 mm²) cabtire cables. Usable cable lengths will become shorter as the cable diameter or number of cores becomes larger due to increased floating capacity. For details, refer to Safety Precautions for Floatless Level Controllers.
- 3. The insulation resistance and dielectric strength are the values between power terminals and Electrode terminals, between power terminals and contact terminals, and between Electrode terminals and contact terminals. For details, refer to Safety Precautions for Floatless Level Controllers.
- 4. Application is possible with 10  $k\Omega$  or less, however, this may cause reset failures.

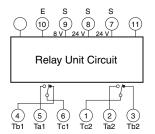
### **■** Relay Unit

The Relay Unit can be replaced without removing the wires for maintenance inspections. It can also be replaced with other Relay Units.

# Compatibility with General Purpose Model (61F-11N)

General- purpose Controller	61F-11N	
Long- distance Controllers	61F-11NL (for 2 km) 61F-11NL (for 4 km)	Provided
High- sensitivity Controllers	61F-11NH	
Low- sensitivity Controller	61F-11ND	
Two-wire Controller	61F-11NR	Not provided

### **Terminal Arrangement**



### **Ordering Example**

If you order the components listed above, the corresponding Relay Unit will be supplied with the Controller.

Example: If a 61F-GN Controller is ordered, a 61F-11N Relay Unit will also be included.

### **■** Connections

### **Automatic Water Supply Control**

### **Compact Model** 61F-GN

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### **Automatic Water Supply Control** Connections • Connect contactor coil terminal to Tb. • Connect to power supply terminals. So-S1: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC 220-VAC power supply R S T 61F-GN мссв Ta Εı 24 V $S_0$ 61F-11N Тc $E_2$ S<sub>1</sub> U Тb 68 V S<sub>2</sub> Ез Transformer (See note 1.) PS-3S Motor protection Stop Εı relay tank Start F2 Water supply source Eз Note: 1. Be sure to ground the common Electrode $E_3$ (the longest Electrode). 2. The above wiring diagram is for a rated voltage of 110/220 VAC. **Principles of Operation** The pump stops (U indicator ON) **Relay Unit Layout** when the water level reaches E1 and starts (U indicator OFF) when the water level drops below E2. -(U indicator ON) Pump OFF Pump ON (U indicator OFF)

### **Automatic Drainage Control**

### Compact Model 61F-GN

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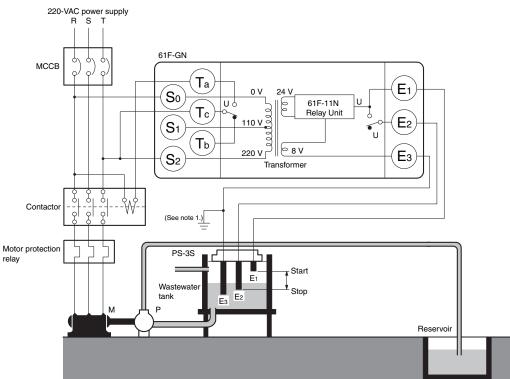
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#### **Automatic Drainage Control**

### Connections

- Connect the contactor coil terminal to Ta.
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC

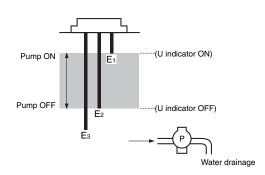


Note: 1. Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### **Principles of Operation**

 The pump starts (U indicator ON) when the water level reaches E<sub>1</sub> and stops (U indicator OFF) when the water level drops below E<sub>2</sub>.





### Automatic Water Supply Control with Pump Idling Prevention

### Compact Model 61F-G1N

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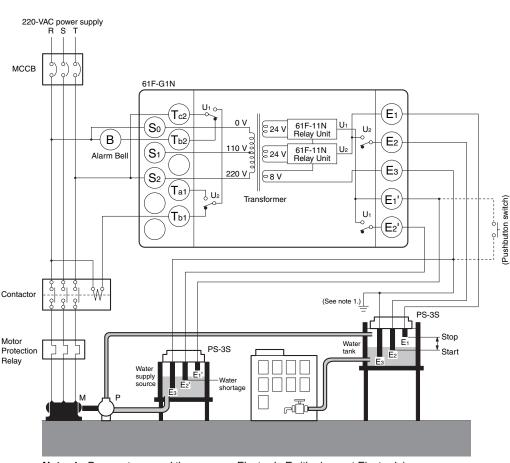
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#### Connections

- Connect to power supply terminals.
- S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC
- Insert a pushbutton switch (NO contact) between E<sub>1</sub>' and E<sub>3</sub> as shown by the dotted line.
- Do not press the pushbutton switch if the pump stops (U<sub>1</sub> indicator OFF) during normal operation after an alarm is given for a low water level (e.g., the water level does not reach E<sub>2</sub>').

#### Test Operation/ Recovering from Power Interruptions

If the water supply source level has not yet reached E<sub>1</sub>' when starting the pump or after recovering from a power interruption, press the pushbutton switch to start the pump (U1 indicator ON) by momentarily short-circuiting E<sub>1</sub>' and E<sub>3</sub>.



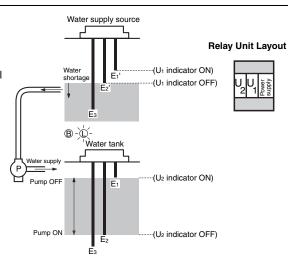
**Automatic Water Supply Control with Pump Idling Prevention** 

Note: 1. Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

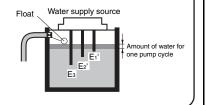
### **Principles of Operation**

- The pump starts (U<sub>2</sub> indicator OFF) when the water level drops below E<sub>2</sub> and stops (U<sub>2</sub> indicator ON) when water level reaches E<sub>1</sub>.
- The pump is forced to stop when the water supply source level drops below E<sub>2</sub>' (U<sub>1</sub> indicator OFF) to prevent the pump from idling and gives an alarm.



### Note

Length of Electrode E1'
 When installing the Controller in locations where there is a possibility of momentary power interrupts or blackouts, the length of E1' should be made so that the amount of water corresponding to one pump cycle does not expose the Electrodes. This will prevent the E2' self-holding circuit from failing.



### Automatic Water Supply Control with Abnormal Water Shortage Alarm

### Compact Model 61F-G1N

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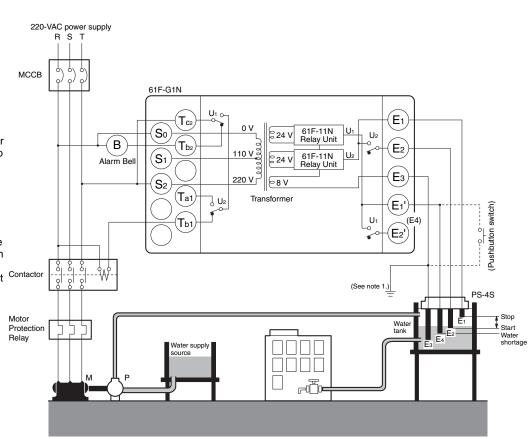


### Connections

- Connect to power supply terminals.
- S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC
- Insert a pushbutton switch (NO contact) between E<sub>3</sub> and E<sub>4</sub>.
- If the pump stops upon releasing the pushbutton switch, keep pressing the pushbutton switch.
- Connect the E<sub>4</sub> electrode for the water shortage alarm to the E<sub>1</sub>' terminal.

#### Test Operation/ Recovering from Power Interruptions

If the water level has not yet reached  $E_4$  when starting the pump or after recovering from a power interruption, press the pushbutton switch to start the pump by short-circuiting  $E_3$  and  $E_4$  ( $U_1$  indicator ON).



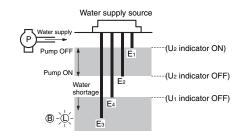
**Automatic Water Supply Control with Abnormal Water Shortage Alarm** 

Note: 1. Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### **Principles of Operation**

- The pump stops (U<sub>2</sub> indicator ON) when the water level reaches E<sub>1</sub> and starts (U<sub>2</sub> indicator OFF) when water level drops below E<sub>2</sub>.
- If the water level drops below E<sub>4</sub> for any reason, an alarm is given (U<sub>1</sub> indicator OFF).





### Automatic Water Supply with Abnormal Water Increase Alarm

### Compact Model 61F-G2N

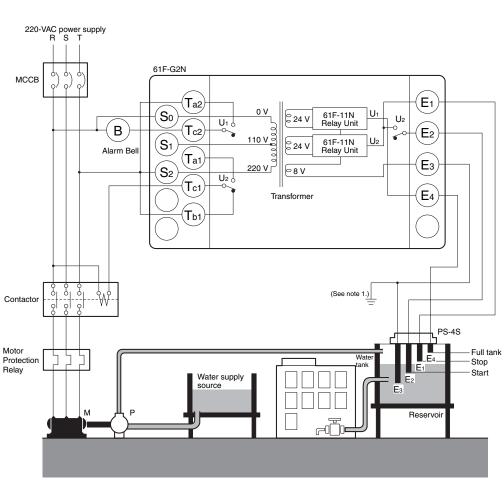
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### Connections

- Connect power supply terminal S<sub>2</sub> to terminal Tb<sub>1</sub>.
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC



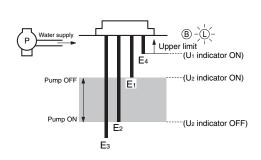
**Automatic Water Supply with Abnormal Water Increase Alarm** 

Note: 1. Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### **Principles of Operation**

- The pump starts (U<sub>2</sub> indicator OFF) when the water level reaches E<sub>2</sub> and stops (U<sub>2</sub> indicator ON) when the water level rises above E<sub>1</sub>.
- If the water level reaches E<sub>4</sub> for any reason, an alarm is given (U<sub>1</sub> indicator ON).





### **Automatic Drainage Control with Abnormal Water Increase Alarm**

### **Compact Model** 61F-G2N

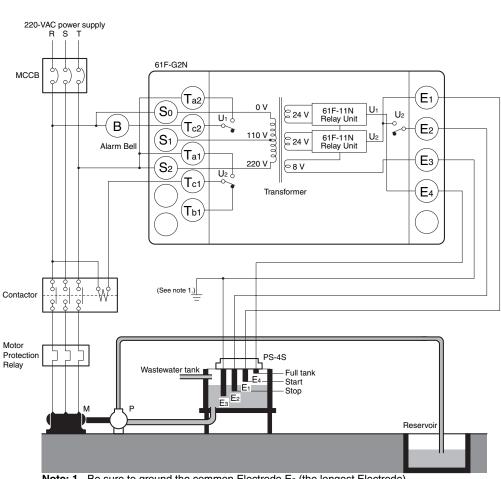
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#### Connections

- Connect power supply S2 to terminal Ta<sub>1</sub>.
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC



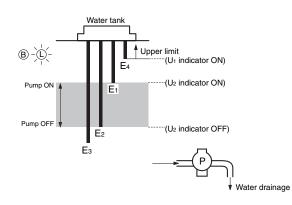
**Automatic Drainage Control with Abnormal Water Increase Alarm** 

Note: 1. Be sure to ground the common Electrode E<sub>5</sub> (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### **Principles of Operation**

- The pump starts (U2 indicator ON) when the water level reaches E1 and stops (U2 indicator OFF) when the water level drops below E2.
- If the water level reaches E4 for any reason, an alarm is given (U  $_{1}$ indicator ON).





### **Automatic Water Supply Control with Full Tank and Water Shortage Alarm**

### Compact Model 61F-G3N

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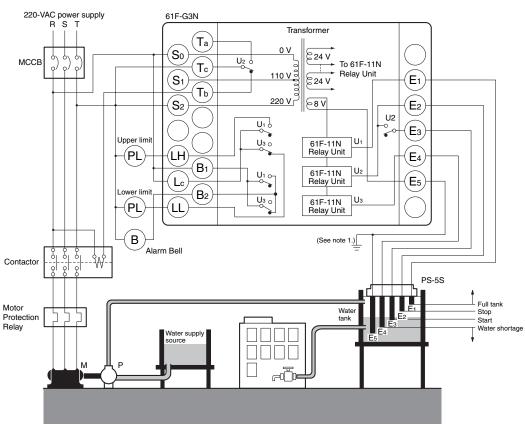


#### Automatic Water Supply Control with Full Tank and Water Shortage Alarm

#### Connections

- Connect contactor coil terminal to Tb.
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC

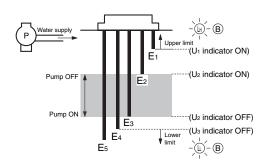


**Note: 1.** Be sure to ground the common Electrode E<sub>5</sub> (the longest Electrode).

#### 2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### Principles of Operation

- The pump starts (U<sub>2</sub> indicator ON) when the water level reaches E<sub>2</sub> and stops (U<sub>2</sub> indicator OFF) when the water level drops below E<sub>3</sub>.
- If the water level rises to E<sub>1</sub> for any reason, the upper-limit indicator turns ON and an alarm is given (U<sub>1</sub> indicator ON). If the water level drops below E<sub>4</sub> for any reason, the lower-limit indicator turns ON and an alarm is given (U<sub>3</sub> indicator OFF).





### Automatic Drainage Control with Full Tank and Water Shortage Alarm

Compact Model 61F-G3N

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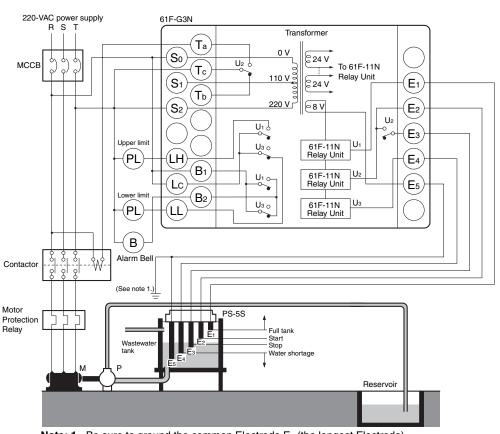


#### Automatic Drainage Control with Full Tank and Water Shortage Alarm

#### Connections

- Connect contactor coil terminal to Ta.
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC

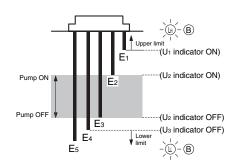


**Note: 1.** Be sure to ground the common Electrode  $E_5$  (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### **Principles of Operation**

- The pump starts (U<sub>2</sub> indicator ON) when the water level reaches E<sub>2</sub> and stops (U<sub>2</sub> indicator OFF) when the water level reaches E<sub>3</sub>.
- If the water level rises to E<sub>1</sub> for any reason, the upper-limit indicator turns ON and an alarm is given (U<sub>1</sub> indicator ON). If the water level drops below E<sub>4</sub> for any reason, the lower-limit indicator turns ON and an alarm is given (U<sub>3</sub> indicator OFF).

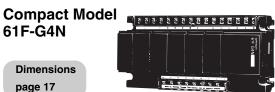




**Water Source Level Indication with** Prevention of Pump Idling Due to Water **Shortage, and Automatic Water Supply** Control with Indication of Water Level in **Elevated Tank** 

### 61F-G4N

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Water Source Level Indication with Prevention of Pump Idling Due to Water Shortage, and Automatic Water Supply Control with Indication of Water Level in Elevated Tank Connections 220-VAC power supply 61F-G4N RS Transformer Connect to power supply So terminals. 24 V  $(\mathbf{X})$ 110 V So-S1: 110 VAC To 61F-11N Ú۱۶  $(S_1)$ MCCB MY3 Relay Relay Unit So-S2: 220 VAC 24 V  $S_2$  Insert a pushbutton switch X (NO contact) between E2 | 68 V T<sub>c</sub> 220 V and E<sub>8</sub> as shown by the (E1) U5 0 T<sub>c2</sub> dotted line. (E2) Do not press the (TA) pushbutton switch if the (E<sub>3</sub>) pump stops during normal (E8) operation after an alarm is (Pushbutton switch) B given for low water level (E4) (i.e., the water level has not U4 0-(BH<sub>1</sub>) reached E<sub>3</sub>). 61F-11N U<sub>3</sub> Relay Unit (E5) (BL<sub>1</sub>) Elevated  $(BL_1)$ Test Operation/ 61F-11N Relay Unit  $(E_6)$ tank water shortage
Water supply source upper limit Recovering from U3 0-(BH<sub>2</sub>) **Power Interruptions** (E<sub>7</sub> χο 61F-11N U4 (BL<sub>2</sub>) (BL<sub>2</sub>) Water supply source lower limit Relay Unit When starting the pump and (E8) U<sub>4</sub> o after recovering from a power (LH<sub>1</sub>) 61F-11N Us Relay Unit Elevated tank repletion interruption, if the water U<sub>1</sub> o **●**U<sub>5</sub>  $(LL_1)$  $(LL_1)$ source level has not yet 61F-11N U1 Relay Unit U₃ oreached E2 (U2 indicator (LH2) Water supply source upper limit OFF), press the pushbutton switch to start the pump by (LL2) (LL<sub>2</sub>) Contactor momentarily short-circuiting E2 and E8. (See note 1.) PS-5S Motor Protection Relay Full tank Stop PS-4S Start ♣ Upper limit shortage ON\_ -OFF Lower limit مصّ

### Note: 1. Be sure to ground the common Electrode E8 (the longest Electrode).

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

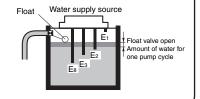
**Relay Unit Layout** 

### Principles of Operation

- Insert four Electrodes in the water supply source and five Electrodes in the elevated water tank.
- The lower-limit indicator for the water supply source remains ON while the water source level is below E<sub>3</sub> (U<sub>2</sub> indicator
- When the water level rises to E2, the lower-limit indicator turns OFF (U2 indicator ON) and the pump is ready for operation.
- When the water level reaches E1, the upper-limit indicator turns ON (U3 indicator ON).
- The water-shortage indicator for the elevated tank remains ON while the water level in the elevated tank is below E7. The indicator turns OFF (U1 indicator ON) when the water level rises to E7.
- The pump stops (U₅ indicator ON) when the water level reaches E₅ and starts (U₅ indicator OFF) when the water level drops below E6.
- If the water level reaches E4 for any reason, the tank repletion indicator for the elevated tank turns ON (U4 indicator ON).

#### **Precaution**

• Length of Electrode E2 When installing the Controller in locations where there is a possibility of momentary power interruptions or blackouts, the length of E2 should be made so that the amount of water corresponding to one pump cycle does not expose the Electrodes. This will prevent the E<sub>3</sub> self-holding circuit from failing.



### **Liquid Level Indication and Alarm**

### **Compact Model** 61F-IN

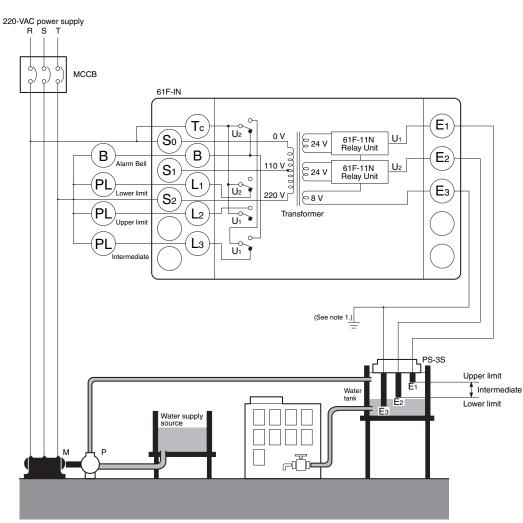
Dimensions page 16



### Connections

Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 110 VAC S<sub>0</sub>-S<sub>2</sub>: 220 VAC



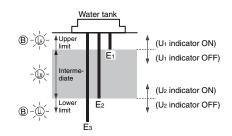
Note: 1. Be sure to ground the common Electrode E3 (the longest Electrode).

**Liquid Level Indication and Alarm** 

2. The above wiring diagram is for a rated voltage of 110/220 VAC.

### **Principles of Operation**

- When the water level drops below E2, the lower-limit indicator turns ON and an alarm is given (U2 indicator OFF).
- When the water level reaches E<sub>2</sub>, the alarm turns OFF and the intermediate indicator turns ON (U<sub>2</sub> indicator ON).
- When the water level rises to E<sub>1</sub>, the upperlimit indicator turns ON and an alarm is given (U<sub>1</sub> indicator ON).





### **■** Two-wire Connection

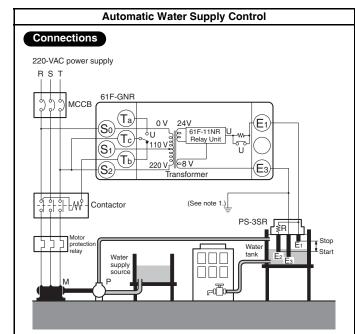
The wiring between the 61F Controller and the Electrodes can be reduced by removing the self-hold circuit. This arrangement is called a two-wire connection. Three Electrodes are still required. Both the 61F Controller (including the Relay Unit) and Electrode Holder must be two-wire models.

Connections

Two-wire Electrode Holders have an in-built resistor of 6.8 kΩ 1W.

### Automatic Water Supply and Drainage Control



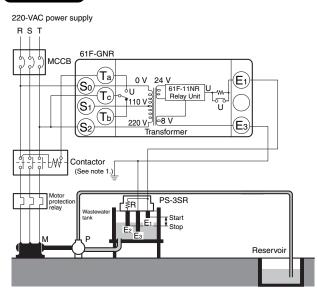


- Note: 1. Be sure to ground the common Electrode  $E_3$  (the longest Electrode).
  - The above wiring diagram is for a rated voltage of 110/ 220 VAC.
- Connect contactor coil terminal to Tb.
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 100 VAC S<sub>0</sub>-S<sub>2</sub>: 200 VAC

- The two-wire models require only two cables for the connection between the 61F-GNR and the Electrode Holder, but still requires three Electrodes.
- A Two-wire Electrode Holder must be used. (It has an inbuilt resistance R.)
- The Relay Unit must also be for two-wire models.

### Automatic Drainage Control

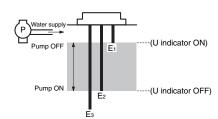


- Note: 1. Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).
  - The above wiring diagram is for a rated voltage of 110/ 220 VAC.
- Connect contactor coil terminal to Ta. (Do not connect Tb.)
- Connect to power supply terminals.

S<sub>0</sub>-S<sub>1</sub>: 100 VAC S<sub>0</sub>-S<sub>2</sub>: 200 VAC

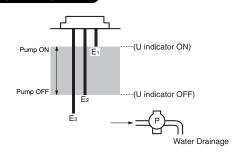
- The two-wire models require only two cables for the connection between 61F-GNR and the Electrode Holder, but still needs three Electrodes.
- A Two-wire Electrode Holder must be used. (It has an inbuilt resistance R.)
- The Relay Unit must also be for two-wire models.

#### **Principles of Operation**



The pump stops (U indicator ON) when the water level reaches E<sub>1</sub> and starts (U indicator OFF) when water level drops below E<sub>2</sub>.

### Principles of Operation



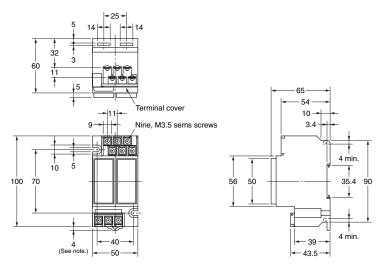
The pump starts (U indicator ON) when the water level reaches  $E_1$  and stops (U indicator OFF) when the water level drops below  $E_2$ .

### **Dimensions**

Note: All units are in millimeters unless otherwise indicated.

61F-GN, -GNL, -GNH, -GND, -GNR

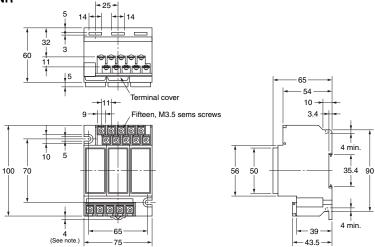




Note: Dimensions are with the DIN rail mounting (sliding) bracket attached.

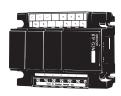
61F-G1N, -G1NL, -G1NH, -G1ND, -G1NR 61F-G2N, -G2NL, -G2NH, -G2ND, G2NR 61F-IN, - NL, -INH, -IND

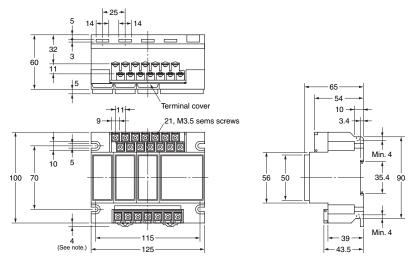




Note: Dimensions are with the DIN rail mounting (sliding) bracket attached.

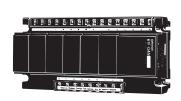
### 61F-G3N, -G3NL, -G3NH, -G3ND, -G3NR, -G3N-NGD

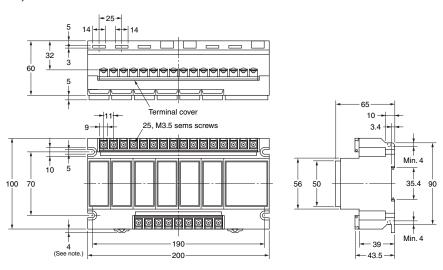




Note: Dimensions are with the DIN rail mounting (sliding) bracket attached.

### 61F-G4N, - G4NL, -G4NH, -G4ND, -G4NR, -G4N-KYD





Note: Dimensions are with the DIN rail mounting (sliding) bracket attached.

### **■** Safety Precautions

Refer to Safety Precautions for All Level Controllers.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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