

## Compact, Space-saving Plug-in Type Ideal for Pump Panels or Building into Equipment.

- Large switching capacity: 5 A at 220 VAC (resistive load).
- Easy to handle with DIN rail mounting.
- Replace for maintenance without rewiring the socket.



 Refer to *Safety Precautions for Floatless Level Controllers*.

61F-G□P□ (110 VAC) in this catalog have been discontinued at the end of March 2018.

## Model Number Legend

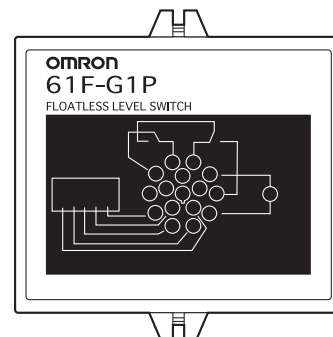
61F-□P□  
1 2

### 1. Control Applications

- G1: Automatic water supply with idling prevention or water shortage alarm  
G2: Automatic water supply and drainage with abnormal water increase alarm  
I: Liquid level indication and alarm

### 2. Type

- Blank: General-purpose  
L 2KM: Long-distance (for 2 km)  
L 4KM: Long-distance (for 4 km)  
H: High-sensitivity  
D: Low-sensitivity



## Ordering Information

| Type      | General-purpose | Long-distance (for 2 km) | Long-distance (for 4 km) |
|-----------|-----------------|--------------------------|--------------------------|
|           | Model           | Model                    | Model                    |
| G1 models | 61F-G1P *       | 61F-G1PL 2K              | 61F-G1PL 4KM *           |

| Type      | High-sensitivity | Low-sensitivity |
|-----------|------------------|-----------------|
|           | Model            | Model           |
| G1 models | 61F-G1PH *       | 61F-G1PD *      |

| Type      | General-purpose | Long-distance (for 2 km) | Long-distance (for 4 km) |
|-----------|-----------------|--------------------------|--------------------------|
|           | Model           | Model                    | Model                    |
| G2 models | 61F-G2P *       | 61F-G2PL 2KM *           | 61F-G2PL 4KM *           |

| Type      | High-sensitivity | Low-sensitivity |
|-----------|------------------|-----------------|
|           | Model            | Model           |
| G2 models | 61F-G2PH *       | 61F-G2PD *      |

| Type     | General-purpose | Long-distance (for 2 km) | Long-distance (for 4 km) |
|----------|-----------------|--------------------------|--------------------------|
|          | Model           | Model                    | Model                    |
| I models | 61F-IP *        | 61F-IPL 2KM *            | 61F-IPL 4KM *            |

| Type     | High-sensitivity | Low-sensitivity |
|----------|------------------|-----------------|
|          | Model            | Model           |
| I models | 61F-IPH *        | 61F-IPD *       |

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

Example: 61F-G1P [110VAC]

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

\* 61F-G□P□ (110 VAC) in this catalog have been discontinued at the end of March 2018.

## ■ Plug-in Models

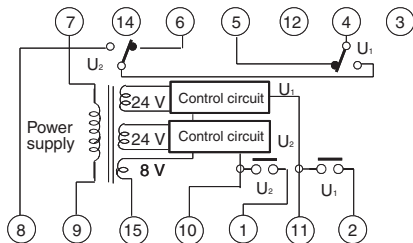
### Specifications

| Item                                           | General-purpose Controller<br>61F-G1P<br>61F-G2P<br>61F-IP                        | Long-distance Controllers<br>61F-G1PL<br>61F-G2PL<br>61F-IPL<br>(see note 2)                                                                                                                    | High-sensitivity Controllers<br>61F-G1PH<br>61F-G2PH<br>61F-IPH<br>(see note 1, see note 6) | Low-sensitivity Controller<br>61F-G1PD<br>61F-G2PD<br>61F-IPD                                                          |
|------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Controlling materials and operating conditions | For control of ordinary purified water or sewage water                            | For control of ordinary purified water in cases where the distance between sewage pumps and water tanks or between receiver tanks and supply tanks is long or where remote control is required. | For control of liquids with high specific resistance such as distilled water                | For control of liquids with low specific resistance such as salt water, sewage water, acid chemicals, alkali chemicals |
| Supply voltage                                 | 100, 200, 220 VAC; 50/60 Hz                                                       |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Operating voltage range                        | 85% to 110% of rated voltage                                                      |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Interelectrode voltage                         | 8 VAC                                                                             |                                                                                                                                                                                                 | 24 VAC                                                                                      | 8 VAC                                                                                                                  |
| Interelectrode current                         | Approx. 1 mA AC max.                                                              |                                                                                                                                                                                                 | Approx. 0.4 mA AC max.                                                                      | Approx. 1.2 mA AC max.                                                                                                 |
| Power consumption                              | Approx. 6.4 VA max.                                                               |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Interelectrode operate resistance              | 0 to approx. 4 kΩ                                                                 | 0 to 1.8 kΩ (for 2 km)<br>0 to 0.7 kΩ (for 4 km)                                                                                                                                                | Approx. 15 kΩ to approx. 70 kΩ<br>(see note 5)                                              | 0 to approx. 1.8 kΩ                                                                                                    |
| Interelectrode release resistance              | Approx. 15 k to ∞ Ω                                                               | 4 k to ∞ Ω (for 2 km)<br>2.5 k to ∞ Ω (for 4 km)                                                                                                                                                | Approx. 300 k to ∞ Ω                                                                        | Approx. 5 k to ∞ Ω                                                                                                     |
| Response time                                  | Operate: 80 ms max.<br>Release: 160 ms max.                                       |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Cable length (see note 3)                      | 1 km max.                                                                         | 2 km max.<br>4 km max.                                                                                                                                                                          | 50 m max.                                                                                   | 1 km max.                                                                                                              |
| Control output                                 | 2 A, 200 VAC (Inductive load: $\cos\phi = 0.4$ )<br>5 A, 200 VAC (Resistive load) |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Ambient temperature                            | Operating: -10 to 55°C                                                            |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Ambient humidity                               | Operating: 45% to 85% RH                                                          |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Insulation resistance (see note 4)             | 100 MΩ min. (at 500 VDC)                                                          |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Dielectric strength (see note 4)               | 2000 VAC, 50/60 Hz for 1 min.                                                     |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Life expectancy                                | Electrical: 500,000 operations min.<br>Mechanical: 5,000,000 operations min.      |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |
| Weight                                         | Approx. 495 g                                                                     |                                                                                                                                                                                                 |                                                                                             |                                                                                                                        |

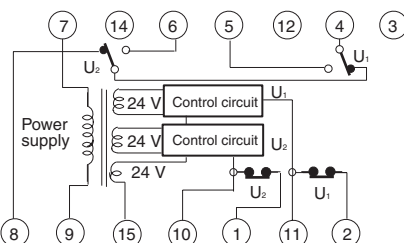
- Note:**
1. The relay in the 61F-G1H/-G2H/-IPH de-energizes when there is water present across the Electrodes, whereas the relay in the 61F-GP-N8HY energizes when there is water present across the Electrodes.
  2. Models are available for 2 km and 4 km.
  3. The length when using completely-insulated, 600-V, 3-conductor (0.75 mm<sup>2</sup>) cabtire cables. Usable cable lengths will become shorter as the cable diameter or number of conductors becomes larger. For details, refer to *Safety Precautions for Floatless Level Controllers*.
  4. The insulation resistance and dielectric strength indicate 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*.
  5. Possible to use with 15 kΩ or less, however, this may cause reset failure.
  6. High-sensitivity Controllers use advanced operation.  
When the power supply voltage is applied, if there are some liquids between the electrodes (ground and operation electrodes), the internal relay will not operate.  
When the power supply voltage is applied, if there are no liquids between the electrodes (ground and operation electrodes), the internal relay will operate.

## Internal Circuit Diagrams

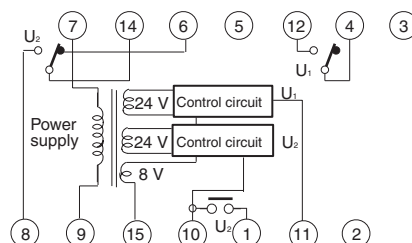
61F-G1P/-G1PL/-G1PD



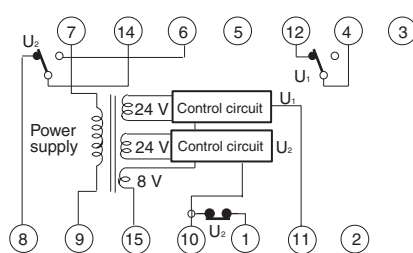
61F-G1PH



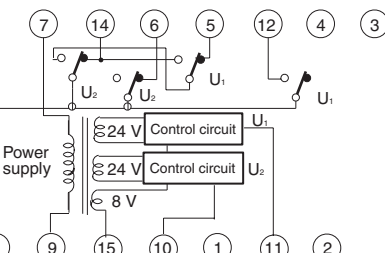
61F-G2P/-G2PL/-G2PD



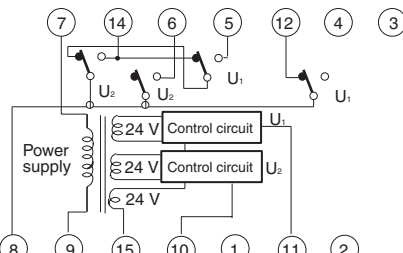
61F-G2PH



61F-IP/-IPL/-IPD



61F-IPH



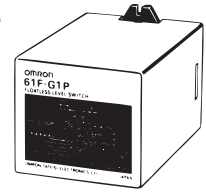
**Note:** The 61F-G□PH High-sensitivity Controller uses advanced operation. The internal relay will operate on the NO contact side when power is supplied and then will operate according to the liquid level.

## Connections

### Automatic Water Supply Control with Pump Idling Prevention and Abnormal Water Shortage Alarm

Plug-in Type  
61F-G1P

Dimensions:  
Page 7



| Automatic Water Supply Control with Pump Idling Prevention                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Automatic Water Supply Control with Abnormal Water Shortage Alarm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Connections</b></p> <p><b>Note:</b> Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).</p> <ul style="list-style-type: none"> <li>Insert a pushbutton switch between terminals 11 and 15 as shown by the dotted lines.</li> <li>Do not press the pushbutton if the low-water alarm sounds and the pump stops during normal operation (water below E<sub>2</sub>).</li> </ul> <p><b>Test Operation/Recovering from Power Interruptions</b></p> <p>If the supply water level is below E<sub>1</sub>' when starting operation or when recovering from a power interruption, press the pushbutton to momentarily close the circuit to start the pump.</p> | <p><b>Connections</b></p> <p><b>Note:</b> Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).</p> <p><b>Connection Sockets</b><br/>14PFA (Front-connecting)<br/>PL15 (Rear-connecting)</p> <ul style="list-style-type: none"> <li>Insert a pushbutton switch between terminals 11 and 15 as shown by the dotted lines.</li> <li>If the pump stops when the pushbutton switch is released, press it again.</li> </ul> <p><b>Test Operation/Recovering from Power Interruptions</b></p> <p>If the supply water level is below E<sub>4</sub> when starting operation or when recovering from a power interruption, press the pushbutton to momentarily close the circuit to start the pump.</p> |
| <p><b>Principles of Operation</b></p> <ul style="list-style-type: none"> <li>The pump starts when the water level in the tank drops below E<sub>2</sub> and stops when the water level reaches E<sub>1</sub>.</li> <li>When the level of water supply source drops below E<sub>2</sub>', the pump stops. Pumping idling is prevented and the alarm sounds.</li> </ul>                                                                                                                                                                                                                                                                                                                  | <p><b>Principles of Operation</b></p> <ul style="list-style-type: none"> <li>The pump stops when the water level reaches E<sub>1</sub> and starts when the water level in the tank drops below E<sub>2</sub>.</li> <li>If the water level drops below E<sub>4</sub> for any reason, the pump stops and the alarm sounds.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |

# Automatic Water Supply and Drainage Control with Abnormal Water Increase Alarm

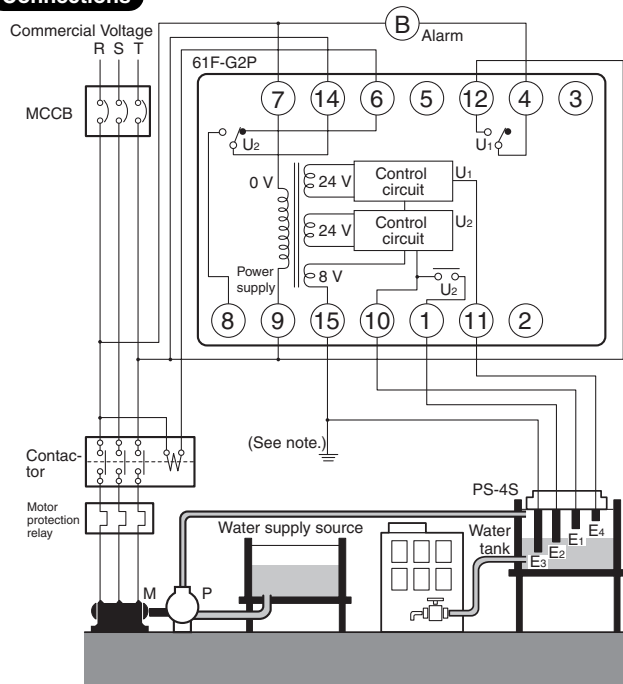
Plug-in Type  
61F-G2P

Dimensions:  
Page 7



## Automatic Water Supply with Abnormal Water Increase Alarm

### Connections



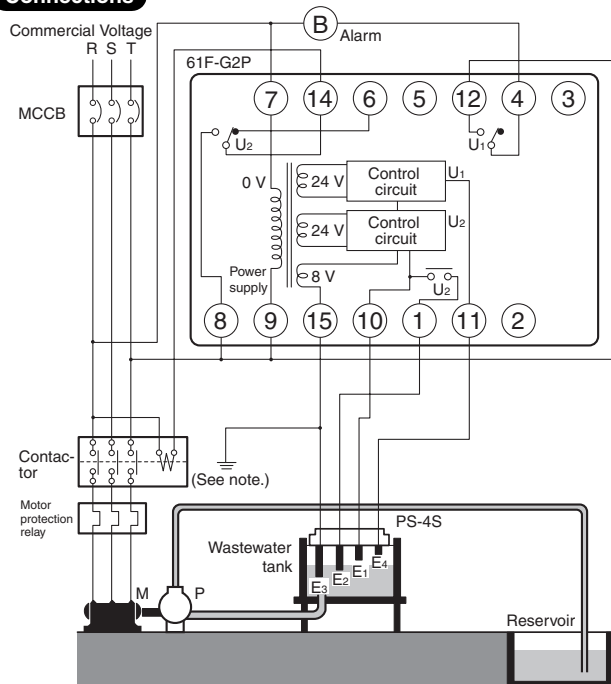
**Note:** Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

**Connection Sockets**  
14PFA (Front-connecting)  
PL15 (Rear-connecting)

- Connect terminal 14 to power supply terminal 9. (Terminal 8 is not connected.)
- The power supply depends on the specifications of the model.

## Automatic Drainage Control with Abnormal Water Increase Alarm

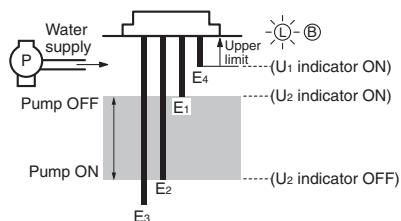
### Connections



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

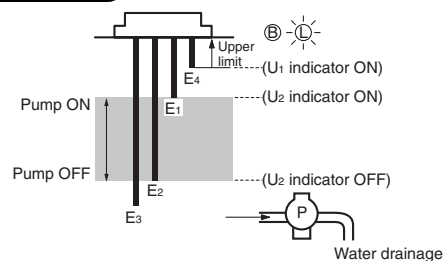
**Connection Sockets**  
14PFA (Front-connecting)  
PL15 (Rear-connecting)

- Connect terminal 8 to power supply terminal 9.



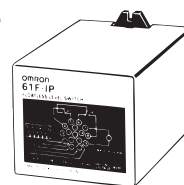
- The pump starts when the water level drops below E<sub>2</sub> and stops when the water level reaches E<sub>1</sub>.
- If the water level drops below E<sub>4</sub> for any reason, the pump stops and the alarm sounds.

### Principles of Operation



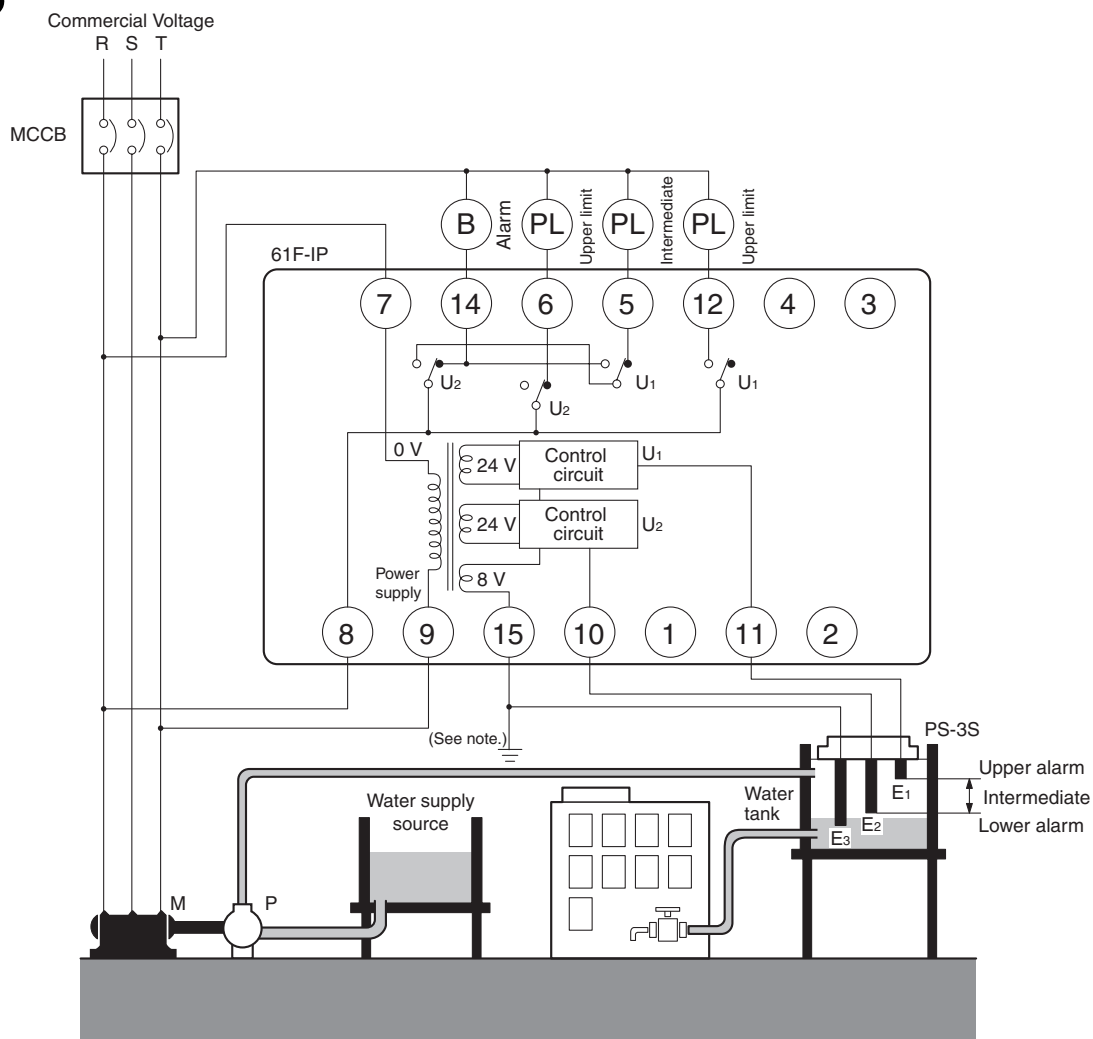
- The pump starts when the water level reaches E<sub>1</sub> and stops when the water level drops below E<sub>2</sub>.
- If the water level drops below E<sub>4</sub> for any reason, the pump stops and the alarm sounds.

## Liquid Level Indication and Alarm

Plug-in Type  
61F-IPDimensions:  
Page 7

## Liquid Level Indication and Alarm

## Connections

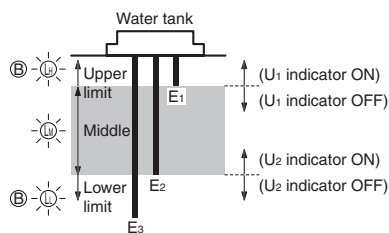


Note: Be sure to ground the common Electrode E<sub>3</sub> (the longest Electrode).

Connection Sockets  
14PFA (Front-connecting)  
PL15 (Rear-connecting)

## Principles of Operation

- When the water level drops E<sub>2</sub>, the lower-limit indicator turns ON and the alarm sounds.
- When the water level reaches E<sub>2</sub>, the indicator turns OFF and the intermediate indicator turns ON.
- When the water level rises to E<sub>1</sub>, the upper-limit indicator turns ON and the alarm sounds.



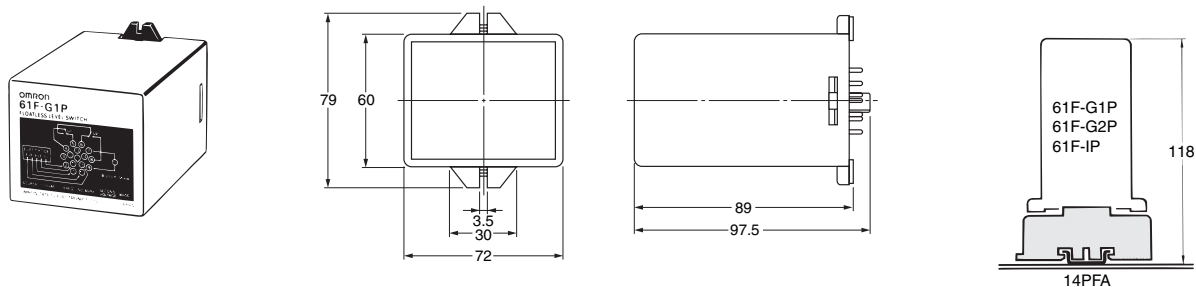
## Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

61F-G1P, -G1PL, -G1PH, -G1PD

61F-G2P, -G2PL, -G2PH, -G2PD

61F-IP, -IPL, -IPH, -IPD



## ■ 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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