Floatless Level Switch (Compact Type)  
61F-G\(\square\)N

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.

Model Number Structure

Model Number Legend

<table>
<thead>
<tr>
<th>Model Number Structure</th>
<th>61F-G(\square)N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Controller Application</td>
<td>G: Automatic water supply and drainage</td>
</tr>
<tr>
<td></td>
<td>G1: Automatic water supply with idling prevention or water shortage alarm</td>
</tr>
<tr>
<td></td>
<td>G2: Automatic water supply and drainage with abnormal water increase alarm</td>
</tr>
<tr>
<td></td>
<td>G3: Automatic water supply and drainage with full tank and water shortage alarm</td>
</tr>
<tr>
<td></td>
<td>G4: Automatic water supply with water level indicator for water supply tank and water receiving tank and prevention of idling due to water shortage</td>
</tr>
<tr>
<td></td>
<td>I: Liquid level indication and alarm (no two-wire models)</td>
</tr>
<tr>
<td>2. Type</td>
<td>Blank: General-purpose</td>
</tr>
<tr>
<td></td>
<td>L: Long-distance (for 2 km)</td>
</tr>
<tr>
<td></td>
<td>L 4KM: Long-distance (for 4 km)</td>
</tr>
<tr>
<td></td>
<td>H: High-sensitivity</td>
</tr>
<tr>
<td></td>
<td>D: Low-sensitivity</td>
</tr>
<tr>
<td></td>
<td>R: Two-wire</td>
</tr>
</tbody>
</table>

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.
## Ordering Information

<table>
<thead>
<tr>
<th>Classification by control purpose</th>
<th>Classification by application</th>
<th>Set contents</th>
<th>General-purpose</th>
<th>Long-distance (between Controller and Electrodes) (See note 2.)</th>
<th>High-sensitivity (for high specific resistance)</th>
<th>Low-sensitivity (for low specific resistance)</th>
<th>Two wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GN Models</td>
<td>◆: Automatic water supply and drainage control, ▲: Automatic water supply control</td>
<td>61F-GN Base x 1 61F-11 Units x 1</td>
<td>61F-GN</td>
<td>61F-GNL</td>
<td>61F-GNH</td>
<td>61F-GND</td>
<td>61F-GNR</td>
</tr>
<tr>
<td>G1N Models</td>
<td>▲ w/pump idling prevention</td>
<td>61F-G1N Base x 1 61F-11 Units x 2</td>
<td>61F-G1N</td>
<td>61F-G1NL</td>
<td>61F-G1NH</td>
<td>61F-G1ND</td>
<td>61F-G1NR</td>
</tr>
<tr>
<td></td>
<td>▲ w/alarm for abnormally low level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2N Models</td>
<td>▲ w/alarm for abnormally high level</td>
<td>61F-G2N Base x 1 61F-11 Units x 2</td>
<td>61F-G2N</td>
<td>61F-G2NL</td>
<td>61F-G2NH</td>
<td>61F-G2ND</td>
<td>61F-G2NR</td>
</tr>
<tr>
<td>G3N Models</td>
<td>▲ w/alarm for abnormally high and low levels</td>
<td>61F-G3N Base x 1 61F-11 Units x 3</td>
<td>61F-G3N</td>
<td>61F-G3NL</td>
<td>61F-G3NH</td>
<td>61F-G3ND</td>
<td>61F-G3NR</td>
</tr>
<tr>
<td>G4N Models</td>
<td>▲ w/level display of water source and tank</td>
<td>61F-G4N Base x 1 61F-11 Units x 5 MY3 Relay x 1</td>
<td>61F-G4N</td>
<td>61F-G4NL</td>
<td>61F-G4NH</td>
<td>61F-G4ND</td>
<td>61F-G4NR</td>
</tr>
<tr>
<td>IN Models</td>
<td>Level indication with alarm</td>
<td>61F-IN Base x 1 61F-11 Units x 2</td>
<td>61F-IN</td>
<td>61F-INL</td>
<td>61F-INH</td>
<td>61F-IND</td>
<td>61F-INR</td>
</tr>
<tr>
<td>Relay unit</td>
<td></td>
<td>61F-11 Units x 1</td>
<td>61F-11N</td>
<td>61F-11NL</td>
<td>61F-11NH</td>
<td>61F-11ND</td>
<td>61F-11NR</td>
</tr>
</tbody>
</table>

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

Example: 61F-GN[110/220 VAC] Desired supply voltage

If you order the 61F-GN, one 61F-11 Relay Unit is included in the set.
## Specifications

### Standard Models

<table>
<thead>
<tr>
<th>Items</th>
<th>Type</th>
<th>General-purpose Controllers 61F- G N</th>
<th>Long-distance Controllers 61F- NL 2KM (2 km)</th>
<th>High-sensitivity Controllers 61F- G NH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling materials and operating conditions</td>
<td>For control of ordinary purified water and wastewater</td>
<td>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.</td>
<td>For control of liquids with high specific resistance, such as distilled water</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>100/200, 110/220 or 120/240 VAC, 50/60 Hz (both supported on same model)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable voltage fluctuation range</td>
<td>85% to 110% of rated voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-electrode voltage</td>
<td>8 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-electrode current</td>
<td>Approx. 1 mA AC max.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-electrode operation resistance (recommended values)</td>
<td>0 to approx. 4 kΩ</td>
<td>0 to 1.8 kΩ (for 2 km)</td>
<td>0 to 0.7 kΩ (for 4 km)</td>
<td>Approx. 10 kΩ to 40 kΩ (See note 4.)</td>
</tr>
<tr>
<td>Inter-electrode release resistance (recommended values)</td>
<td>Approx. 15 kΩ to →Ω</td>
<td>4 kΩ to →Ω (for 2 km)</td>
<td>2.5 kΩ to →Ω (for 4 km)</td>
<td>Approx. 100 kΩ to →Ω</td>
</tr>
<tr>
<td>Cable length (See note 2.)</td>
<td>1 km max.</td>
<td>2 km max.</td>
<td>4 km max.</td>
<td>50 m max.</td>
</tr>
<tr>
<td>Output</td>
<td>3 A, 200 VAC (Resistive load)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient operating temperature</td>
<td>−10 to 55°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient operating humidity</td>
<td>45% to 85%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance (See note 3.)</td>
<td>100 MΩ min. (at 500 VDC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dielectric strength (See note 3.)</td>
<td>2,000 VAC, 50/60 Hz for 1 min.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life expectancy</td>
<td>Electrical: 250,000 operations min. Mechanical: 10,000,000 operations min.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>GN models: 315 g; G1N, G2N, IN models: 410 g; G3N models: 625g; G4N models: 870 g</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Internal Circuit Diagrams

- **Example: 61F-GN**
- **Example: 61F-GNL**
- **Example: 61F-GNH**

**Note:**

1. The [□] 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 kΩ or less, however, this may cause reset failures.
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)

<table>
<thead>
<tr>
<th>Controller Type</th>
<th>61F-11ND</th>
<th>61F-11NL (2 km)</th>
<th>61F-11NL (4 km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General-purpose Controller</td>
<td>61F-11N</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Long-distance Controllers</td>
<td>61F-11NL (2 km)</td>
<td>61F-11NL (4 km)</td>
<td>Provided</td>
</tr>
<tr>
<td>High-sensitivity Controllers</td>
<td>61F-11NH</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Low-sensitivity Controller</td>
<td>61F-11ND</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Two-wire Controller</td>
<td>61F-11NR</td>
<td>Not provided</td>
<td>---</td>
</tr>
</tbody>
</table>

#### Terminal Arrangement

The Relay Unit Circuit

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.

### Note:
1. The □ 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 kΩ or less, however, this may cause reset failures.
**Connections**

Automatic Water Supply Control

- Connect contactor coil terminal to Tb.
- Connect to power supply terminals.
  - S0-S1: 110 VAC
  - S0-S2: 220 VAC

**Principles of Operation**

The pump stops (U indicator ON) when the water level reaches E1, and starts (U indicator OFF) when the water level drops below E2.

**Note:**
1. Be sure to ground the common Electrode E3 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.
Automatic Drainage Control

**Connections**

- Connect the contactor coil terminal to Ta.
- Connect to power supply terminals.
  - S0-S1: 110 VAC
  - S0-S2: 220 VAC

![Connection Diagram]

**Principles of Operation**

- The pump starts (U indicator ON) when the water level reaches E1 and stops (U indicator OFF) when the water level drops below E2.

**Relay Unit Layout**

- Connect the contactor coil terminal to Ta.
- Connect to power supply terminals.
  - S0-S1: 110 VAC
  - S0-S2: 220 VAC

![Connection Diagram]

**Note:**
1. Be sure to ground the common Electrode E3 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.
Automatic Water Supply Control with Pump Idling Prevention

Connections

- Connect to power supply terminals.
  - S0-S1: 110 VAC
  - S0-S2: 220 VAC
- Insert a pushbutton switch (NO contact) between E1' and E3 as shown by the dotted line.
- Do not press the pushbutton switch if the pump stops (U1 indicator OFF) during normal operation after an alarm is given for a low water level (e.g., the water level does not reach E1').

Test Operation/ Recovering from Power Interruptions

If the water supply source level has not yet reached E1' 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 E1' and E3.

Note: 1. Be sure to ground the common Electrode E3 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.

Principles of Operation

- The pump starts (U1 indicator OFF) when the water level drops below E2 and stops (U2 indicator ON) when water level reaches E1.
- The pump is forced to stop when the water supply source level drops below E2' (U1 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

Connections
- Connect to power supply terminals. 
  S0-S1: 110 VAC  
  S0-S2: 220 VAC
- Insert a pushbutton switch (NO contact) between E3 and E4.
- If the pump stops upon releasing the pushbutton switch, keep pressing the pushbutton switch.
- Connect the E2 electrode for the water shortage alarm to the E1' terminal.

Test Operation/ Recovering from Power Interruptions
If the water level has not yet reached E4 when starting the pump or after recovering from a power interruption, press the pushbutton switch to start the pump by short-circuiting E3 and E4 (U1 indicator ON).

Note: 1. Be sure to ground the common Electrode E4 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.

Principles of Operation
- The pump stops (U2 indicator ON) when the water level reaches E1 and starts (U2 indicator OFF) when water level drops below E2.
- If the water level drops below E4 for any reason, an alarm is given (U1 indicator OFF).

Relay Unit Layout
Automatic Water Supply with Abnormal Water Increase Alarm

Connections

- Connect power supply terminal S2 to terminal Tb1.
- Connect to power supply terminals.
  - S0-S1: 110 VAC
  - S0-S2: 220 VAC

Note: 1. Be sure to ground the common Electrode E3 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.

Principles of Operation

- The pump starts (U1 indicator OFF) when the water level reaches E2 and stops (U2 indicator ON) when the water level rises above E1.
- If the water level reaches E4 for any reason, an alarm is given (U1 indicator ON).

Relay Unit Layout

Water supply source

Water tank

Reservoir

Pump OFF

Pump ON

(See note 1.)

Dimensions page 16
Automatic Drainage Control with Abnormal Water Increase Alarm

**Connections**
- Connect power supply S2 to terminal Ta1.
- Connect to power supply terminals. S0-S1: 110 VAC
  S0-S2: 220 VAC

Note: 1. Be sure to ground the common Electrode E5 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.

**Principles of Operation**
- The pump starts (U1 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 (U1 indicator ON).

**Relay Unit Layout**
Automatic Water Supply Control with Full Tank and Water Shortage Alarm

Compact Model 61F-G3N

Dimensions

Connections

- Connect contactor coil terminal to Tb.
- Connect to power supply terminals.
  S0-S1: 110 VAC
  S0-S2: 220 VAC

Principles of Operation

- The pump starts (U1 indicator ON) when the water level reaches E2 and stops (U2 indicator OFF) when the water level drops below E2.
- If the water level rises to E1 for any reason, the upper-limit indicator turns ON and an alarm is given (U1 indicator ON). If the water level drops below E1 for any reason, the lower-limit indicator turns ON and an alarm is given (U3 indicator OFF).

Note: 1. Be sure to ground the common Electrode E5 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.
Automatic Drainage Control with Full Tank and Water Shortage Alarm

Compact Model 61F-G3N

**Connections**
- Connect contactor coil terminal to Ta.
- Connect to power supply terminals.
  - S0-S1: 110 VAC
  - S0-S2: 220 VAC

**Note:**
1. Be sure to ground the common Electrode E5 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.

**Principles of Operation**
- The pump starts (U1 indicator ON) when the water level reaches E2 and stops (U2 indicator OFF) when the water level reaches E3.
- If the water level rises to E1 for any reason, the upper-limit indicator turns ON and an alarm is given (U1 indicator ON). If the water level drops below E4 for any reason, the lower-limit indicator turns ON and an alarm is given (U3 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

Connections
- Connect to power supply terminals. S1, S2: 110 VAC, S3, S4: 220 VAC
- Insert a pushbutton switch (NO contact) between E2 and E8 as shown by the dotted line.
- Do not press the pushbutton switch if the pump stops during normal operation after an alarm is given for low water level (i.e., the water level has not reached E3).

Test Operation / Recovering from Power Interruptions
When starting the pump and after recovering from a power interruption, if the water source level has not yet reached E2 (U2 indicator OFF), press the pushbutton switch to start the pump by momentarily short-circuiting E2 and E8.

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 E3 (U2 indicator OFF).
- 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 E3 self-holding circuit from failing.
Liquid Level Indication and Alarm

Connections
- Connect to power supply terminals.
  S0-S1: 110 VAC
  S0-S2: 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 E2, the alarm turns OFF and the intermediate indicator turns ON (U2 indicator ON).
- When the water level rises to E1, the upper-limit indicator turns ON and an alarm is given (U1 indicator ON).

Note: 1. Be sure to ground the common Electrode E3 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.
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. Two-wire Electrode Holders have an in-built resistor of 6.8 kΩ 1W.

Automatic Water Supply and Drainage Control

Connections

Note: 1. Be sure to ground the common Electrode E3 (the longest Electrode).
2. The above wiring diagram is for a rated voltage of 110/220 VAC.
   - Connect contactor coil terminal to Tb. (Do not connect Tb.)
   - Connect to power supply terminals.
   - The two-wire models require only two cables for the connection between 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.

Principles of Operation

The pump stops (U indicator ON) when the water level reaches E1 and starts (U indicator OFF) when water level drops below E2.

Compact Model

Dimensions page 16
Dimensions

Note: All units are in millimeters unless otherwise indicated.

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

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.*
Read and understand this catalog.
Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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Suitability of Use.
Omrón Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer’s application or use of the Product. At Buyer’s request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer’s application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.
Omrón Companies shall not be responsible for the user’s programming of a programmable Product, or any consequence thereof.

Performance Data.
Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron’s test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron’s Warranty and Limitations of Liability.

Change in Specifications.
Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron’s representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.
Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.