

# Power Relay G7L-PV

## Two-pole Power Relay That Is Ideal for Inverters in Photovoltaic Power Systems

- High switching capacity with contact rating of 30 A at 280 VAC (AC7a class).
- Power consumption reduced by lowering coil voltage after relay operation (low power consumption of approx. 320 mW at 37.5% reduced coil voltage).
- Ambient operating temperature of up to 85° C.
- Contact gap of 3.0 mm for safety.
- UL and VDE class F certification for coil insulation.



## Ordering Information

### PCB Terminals

Number of poles	Model	Rated coil voltage (V)	Minimum order (Relays)
2 poles	G7L-2A-P-PV	DC 12 or 24	20 Relays/tray

To order: Select the part number and add the desired coil voltage rating. (e.g., G7L-2A-P-PV DC24)

### Model Number Legend

**G7L-2A-P-PV-□**  
 1 2 3 4      1. Contact Configuration    2. Terminal Shape    3. Relay Application    4. Rated Coil Voltage  
 2A: DPST-NO                      P: PCB terminals                      PV: Photovoltaic power systems    12, 24 VDC

## Application Examples

### Grid Connection Control of Inverters for Photovoltaic Power Systems

Consult with your OMRON representative for any applications other than photovoltaic power systems.

## Specifications

### ■ Coil Ratings

Rated voltage (V)	Rated current (mA)	Coil resistance (Ω)	Must-operate voltage	Must-release voltage	Maximum permissible voltage	Power consumption
DC 12	191.7	63	75% max.	10% min.	110%	Approx. 2.3 W
DC 24	95.8	250				

- Note:**
1. The rated current and coil resistance were measured at a coil temperature of 23° C with tolerances of ± 15%.
  2. Performance characteristics are measured at a coil temperature of 23° C.
  3. The maximum permissible voltage is the maximum value of the fluctuation range for the Relay coil operating power supply and was measured at an ambient temperature of 23° C.

## ■ Contact Ratings

Model Item/Load	G7L-2A-P-PV	
	Resistive load	Inductive load ( $\cos\phi = 0.8$ )
Contact structure	Double break	
Contact material	Ag alloy	
Rated load	30 A at 280 VAC	
Rated carry current	30 A	
Maximum contact voltage	280 VAC	
Maximum contact current	30 A	

## ■ Characteristics

<b>Contact resistance (See note 2.)</b>		100 mΩ max.
<b>Operate time (See note 3.)</b>		30 ms max.
<b>Release time (See note 3.)</b>		30 ms max.
<b>Maximum operating frequency</b>	<b>Mechanical</b>	1,800 operations/h
	<b>Rated load</b>	360 operations/h
<b>Insulation resistance (See note 4.)</b>		1,000 MΩ min.
<b>Dielectric strength</b>	<b>Between coil and contacts</b>	4,000 VAC, 50/60 Hz for 1 min
	<b>Between contacts of the same polarity</b>	2,000 VAC, 50/60 Hz for 1 min
	<b>Between contacts of different polarity</b>	2,000 VAC, 50/60 Hz for 1 min
<b>Impulse withstand voltage (See note 5.)</b>		10,000 V between coil and contacts
<b>Vibration resistance</b>	<b>Destruction</b>	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)
	<b>Malfunction</b>	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)
<b>Shock resistance</b>	<b>Destruction</b>	1,000 m/s <sup>2</sup>
	<b>Malfunction</b>	100 m/s <sup>2</sup>
<b>Endurance</b>	<b>Mechanical</b>	1,000,000 operations min. (at 1,800 operations/h)
	<b>Electrical (See note 6.)</b>	30,000 operations min. (at 360 operations/h under rated load, ON for 1 s and OFF for 9 s)
<b>Ambient operating temperature</b>		-25 to 85° C (with no icing or condensation)
<b>Ambient operating humidity</b>		5% to 85%
<b>Failure rate (P level)(reference value) (See note 7.)</b>		100 mA at 5 VDC
<b>Weight</b>		Approx. 100 g

Note: 1. The values given above are initial values.

2. Measurement conditions: 1 A at 5 VDC using the voltage drop method.

3. Measurement conditions: At rated operating voltage, not including contact bounce.  
Ambient temperature: 23° C

4. Measurement conditions: The insulation resistance was measured with a 500-VDC megohmmeter at the same places as those used for measuring the dielectric strength.

5. JEC-212 (1981) Standard Impulse Wave Type (1.2 × 50 μs).

6. Ambient temperature: 23° C

7. This value was measured at a switching frequency of 60 operations per minute.

## ■ Approved Standards

UL Approval UL508,   
(File No. E41643)

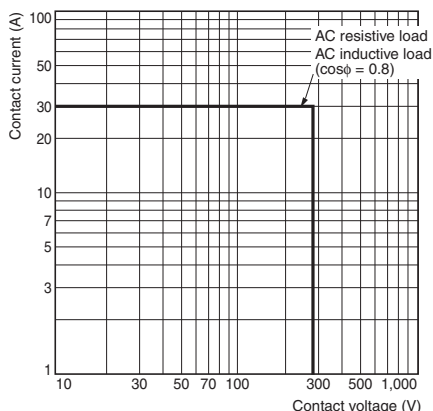
Model	Coil	Contact ratings	Number of test operations
G7L-2A-P-PV	12 VDC or 24 VDC	30 A 280 VAC (0.8 PF) 65° C	30,000 operations

EN/IEC and VDE Approval   
(Approval No. 1530)

Model	Coil	Contact ratings	Number of test operations
G7L-2A-P-PV	12 VDC or 24 VDC	30 A 280 VAC ( $\cos\phi=0.8$ ) 85° C	30,000 operations

# Engineering Data

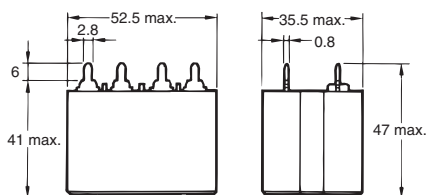
## Maximum Switching Power



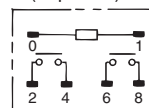
## Dimensions

Unit: mm

### G7L-2A-P-PV

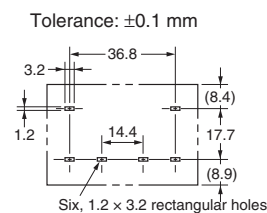


Terminal Arrangement/Internal Connections (Top View)



(The coil has no polarity.)  
Note: The G7L-PV terminals are shown from the top.

PCB Mounting Holes



## Safety Precautions

Be sure to read the precautions common to all Power PCB Relays, contained in the Technical User's Guide, "Electromechanical Relays, Technical Information" for correct use.

### Precautions for Correct Use

#### Installation

- Install the Relays in locations that are as dry as possible and have as little dust, dirt, and harmful gas as possible.
- Using the a Relay under high temperature, high humidity, or harmful gas may deteriorate its performance characteristics due to condensation or corrosive materials, resulting in failure or burn damage to the Relay.
- The Relay weight approx. 100 g. Be sure that the PCB is strong enough to support it. We recommend dual-side through-hole PCBs to reduce solder cracking from heat stress.
- Install the Relay so that the surface with the markings faces up. (The coil terminals will be at the top and the contact terminals will be at the bottom.)

#### Micro Loads

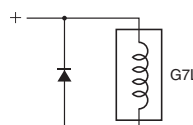
- The G7L-PV is a Power Relay that is suitable for grid connection switching applications for inverters in photovoltaic power systems. Do not use the G7L-PV to switch minute loads, such as signals.

#### Soldering PCB Terminals

- Do not perform automatic soldering. Always solder the terminals manually.
- The G7L-PV is not sealed. Do not wash the G7L-PV with water or detergent.

#### Coil Voltage Reduction (Holding Voltage) after Relay Operation

- If the coil voltage is reduced to the holding voltage after Relay operation, first apply the rated voltage to the coil for at least 100 ms.
- A voltage of at least 37.5% of the rated voltage is required for the coil holding voltage. Do not allow voltage fluctuations to cause the coil holding voltage to fall below this level.
- If you use the Relay at the holding voltage, install a diode in parallel with the coil. The G7L-PV has no coil polarity. Connect the diode so that the polarity is the opposite of the applied coil voltage.



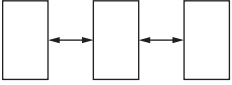
Diode Selection

- Dielectric strength =  $V_{RM} \times \text{Rated voltage} \times 2$
- Forward current =  $I_F \geq \text{Rated current}$

**PCB Mounting Interval (at Rated Coil Voltage)**

- If you mount more than one G7L-PV, maintain the mounting intervals that are given in the following figures.
- If the Relays are used with the coil voltage at the holding voltage (37.5%) at an ambient temperature of 85° C, side-by-side mounting (0 mm) is possible.

Relay Mounting Direction

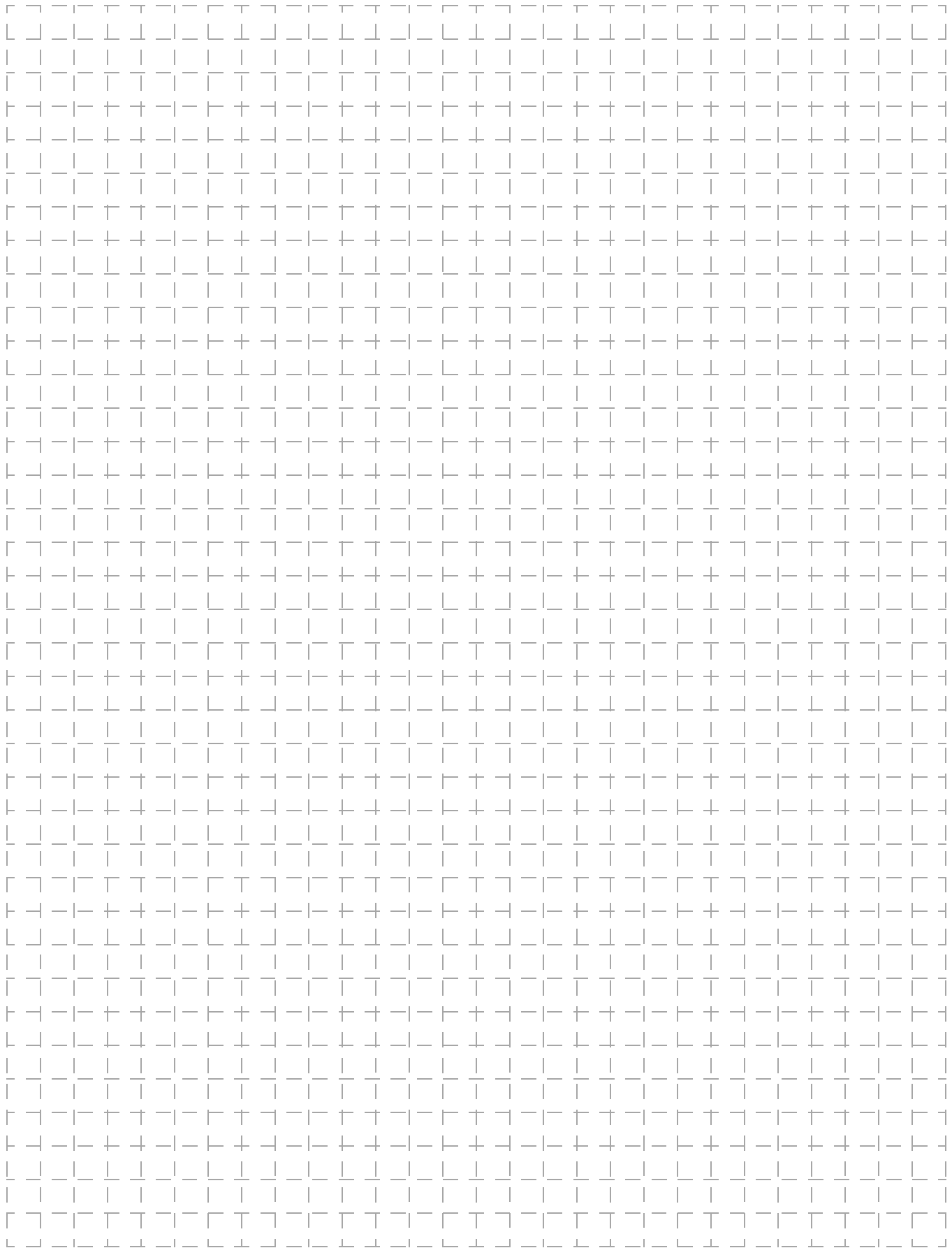


Ambient operating temperature of 85° C: 30 mm min.  
 Ambient operating temperature of 70° C: 0 mm min.

Relay Mounting Direction



Ambient operating temperature of 85° C: 40 mm min.  
 Ambient operating temperature of 70° C: 0 mm min.



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**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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Specifications subject to change without notice

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