G7L-PV

PCB Power Relay

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 voltage applied to coil after rated voltage is applied (low power consumption of approx. 320 mW when voltage applied to coil is reduced to 37.5%.).
- 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.

■Model Number Legend

G7L-2A-P-PV
1 2 3

1. Contact Configuration
2A: DPST-NO

2. Terminal Shape
P: PCB terminals

3. Relay Application
PV: Photovoltaic power systems

■Ordering Information

●PCB Terminals

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

Note 1. When ordering, add the rated coil voltage to the model number.
Example: G7L-2A-P-PV DC12
Rated coil voltage
However, the notation of the coil voltage on the product case as well as on the packing will be marked as □□ VDC.

■Application Examples

●Grid Connection Control of Inverters for Photovoltaic Power Systems

■Ratings

●Coil

Rated voltage (V)	Rated current (mA)	Coil resistance (Ω)	Must-operate voltage	Must-release voltage	Maximum permissible voltage	Power consumption
			Percentage of rated voltage			
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%.
Note 2. Performance characteristics are measured at a coil temperature of 23°C.
Note 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.

●Contacts

Item \ Model / Load	G7L-2A-P-PV	
	Resistive load	Inductive load (cosϕ = 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	

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■Characteristics

Contact resistance (See note 2.)		100 mΩ max.
Operate time (See note 3.)		30 ms max.
Release time (See note 3.)		30 ms max.
Maximum operating frequency	Mechanical	1,800 operations/h
	Rated load	360 operations/h
Insulation resistance (See note 4.)		1,000 MΩ min.
Dielectric strength	Between coil and contacts	4,000 VAC, 50/60 Hz for 1 min
	Between contacts of the same polarity	2,000 VAC, 50/60 Hz for 1 min
	Between contacts of different polarity	2,000 VAC, 50/60 Hz for 1 min
Impulse withstand voltage (See note 5.)		10,000 V between coil and contacts
Vibration resistance	Destruction	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)
	Malfunction	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)
Shock resistance	Destruction	1,000 m/s²
	Malfunction	100 m/s²
Endurance	Mechanical	1,000,000 operations min. (at 1,800 operations/h)
	Electrical (See note 6.)	30,000 operations min. (at 360 operations/h under rated load, ON for 1 s and OFF for 9 s)
Ambient operating temperature		−25 to 85°C (with no icing or condensation)
Ambient operating humidity		5% to 85%
Failure rate (P level)(reference value) (See note 7.)		100 mA at 5 VDC
Weight		Approx. 100 g

Note 1. The values given above are initial values.
Note 2. Measurement conditions: 1 A at 5 VDC using the voltage drop method.
Note 3. Measurement conditions: At rated operating voltage, not including contact bounce.
Ambient temperature: 23°C
Note 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.
Note 5. JEC-212 (1981) Standard Impulse Wave Type (1.2 × 50 μs).
Note 6. Ambient temperature: 23°C
Note 7. This value was measured at a switching frequency of 60 operations per minute.

■Approved Standards

UL Recognized UL508, (File No. E41643)

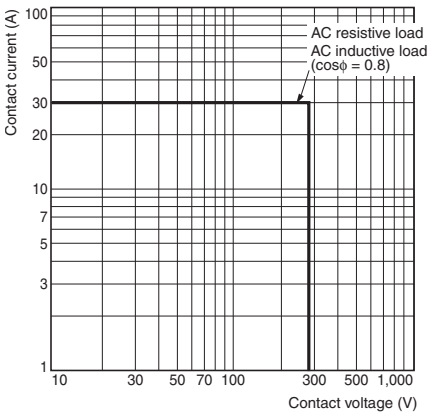
Model	Coil	Contact ratings	Number of test operations
G7L-2A-P-PV	12 VDC or 24 VDC	30 A 280 VAC (0.8 PF) 65°C	30,000 operations

EN/IEC and VDE Certified (Certificate No. 1530)

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

■Engineering Data

●Maximum Switching Power

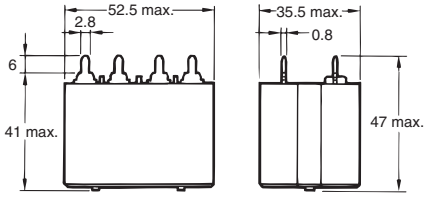


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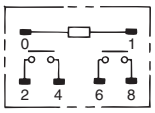
■Dimensions (Unit: mm)

G7L-2A-P-PV



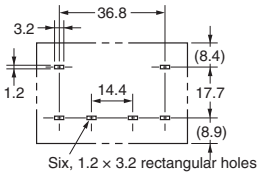


Terminal Arrangement/Internal Connections
(Bottom View)



(The coil has no polarity.)

PCB Mounting Holes
(Bottom View)
Tolerance: ±0.1 mm



■Precautions

- **Refer to *Safety Precautions for All PCB Relays* for general precautions.**

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

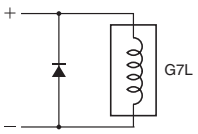
- The G7L-PV is a Power Relay that is suitable for grid connection switching applications for inverters in photovoltaic power systems. Do not use the G7L-PV to switch minute loads, such as signals.

●Soldering PCB Terminals

- Do not perform automatic soldering. Always solder the terminals manually.
- Solder with the following conditions: Soldering iron temperature (max.) 380°C, Soldering time within 10 seconds.
- 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.



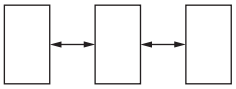
Diode Selection

- Dielectric strength = VRM × Rated voltage × 2
- Forward current = IF ≥ 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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