



**Load for solar inverter,
Compact size,
1 Form A 22A/33A
power relays**

LF-G RELAYS (ALFG)



RoHS compliant

Protective construction: Flux-resistant type

FEATURES

1. High capacity

High capacity control possible at 22A/33A (High capacity type) 250V AC rating in compact size (L: 15.7 × W: 30.1 × H: 23.3 mm L: .618 × W: 1.185 × H: .917 inch)

2. Contact gap: 1.5 mm .059 inch and 1.8 mm*** .071 inch

Compliant with European photovoltaic standard (IEC62109* and VDE0126**).

* Safety standard of PV power inverter
** German safety standard of PV power inverter
*** Due to addition of altitude stipulation (2,000 m 6,561.68 ft or more) to IEC62109.

EN61810-1 certified: 2.5 kV surge breakdown voltage (between contacts)

3. Long insulation distance

Creepage distance between contact and coil terminal: Min. 9.5 mm .354 inch
Clearance distance between contact and coil terminal: Min. 6.5 mm .256 inch
Surge breakdown voltage: 6 kV

4. Coil holding voltage contributes to saving energy of equipment

The coil holding voltage can be reduced up to 35%V of the nominal coil voltage (Ambient temperature: 20°C 68°F).
Power consumption at the lowest coil holding voltage: 170 mW equivalent

*Coil holding voltage is the coil voltage after 100 ms from the applied nominal coil voltage.

*When the ambient temperature during use is 85°C 185°F, make the coil holding voltage between 45% and 80%V of the nominal coil voltage.

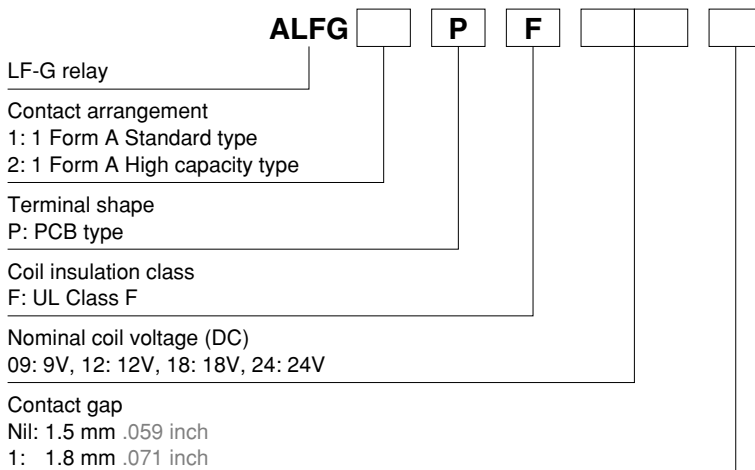
5. Conforms to various safety standards

UL/C-UL and VDE approved

TYPICAL APPLICATIONS

1. Photovoltaic power generation systems (Solar inverter)
2. Uninterruptible Power Supplies (UPS)
3. Home appliances
4. Office equipment

ORDERING INFORMATION



Note: Certified by UL/C-UL and VDE

TYPES

| Contact arrangement | Nominal coil voltage | Part No. | | | |
|---------------------|----------------------|-----------------------------------|--------------------|-----------------------------------|--------------------|
| | | Contact Gap 1.5 mm .059 inch type | | Contact Gap 1.8 mm .071 inch type | |
| | | Standard type | High capacity type | Standard type | High capacity type |
| 1 Form A | 9V DC | ALFG1PF09 | ALFG2PF09 | ALFG1PF091 | ALFG2PF091 |
| | 12V DC | ALFG1PF12 | ALFG2PF12 | ALFG1PF121 | ALFG2PF121 |
| | 18V DC | ALFG1PF18 | ALFG2PF18 | ALFG1PF181 | ALFG2PF181 |
| | 24V DC | ALFG1PF24 | ALFG2PF24 | ALFG1PF241 | ALFG2PF241 |

Standard packing: Carton: 50 pcs.; Case: 200 pcs.

RATING

1. Coil data

| Nominal coil voltage | Pick-up voltage (at 20°C 68°F) (Initial) | Drop-out voltage (at 20°C 68°F) (Initial) | Nominal operating current [±10%] (at 20°C 68°F) | Coil resistance [±10%] (at 20°C 68°F) | Nominal operating power | Max. applied voltage (at 20°C 68°F) |
|----------------------|--|---|---|---------------------------------------|-------------------------|-------------------------------------|
| 9V DC | 70%V or less of nominal voltage | 10%V or more of nominal voltage | 155mA | 58Ω | 1,400mW | 120%V of nominal voltage |
| 12V DC | | | 117mA | 103Ω | | |
| 18V DC | | | 78mA | 230Ω | | |
| 24V DC | | | 59mA | 410Ω | | |

2. Specifications

| Characteristics | Item | Specifications | | |
|---------------------------------------|---|--|---|---|
| | | Standard type | | High capacity type |
| | | Contact Gap 1.5 mm .059 inch type Contact Gap 1.8 mm .071 inch type | Contact Gap 1.5 mm .059 inch type | Contact Gap 1.8 mm .071 inch type |
| Contact | Arrangement | 1 Form A | | |
| | Contact resistance (Initial) | Max. 100 mΩ (By voltage drop 6 V DC 1A) | | |
| | Contact material | AgSnO ₂ type | | |
| Rating | Nominal switching capacity | 22A 250V AC | 31A 250V AC | 33A 250V AC |
| | Max. switching power | 5,500VA | 7,750VA | 8,250VA |
| | Max. switching voltage | 250V AC | | |
| | Max. switching current | 22A (AC) | 31A (AC) | 33A (AC) |
| | Nominal operating power | 1,400mW | | |
| | Min. switching capacity (Reference value)*1 | 100mA 5V DC | | |
| Electrical characteristics | Insulation resistance (Initial) | Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section. | | |
| | Breakdown voltage (Initial) | Between open contacts | 2,500 Vrms for 1 min. (Detection current: 10 mA) | |
| | | Between contact and coil | 4,000 Vrms for 1 min. (Detection current: 10 mA) | |
| | Surge breakdown voltage*2 (Between contact and coil) (Initial) | 6,000 V | | |
| | Coil holding voltage*3 | 35 to 120%V (contact carrying current: 22A, at 20°C 68°F) 45 to 80%V (contact carrying current: 22A, at 85°C 185°F) | 35 to 120%V (contact carrying current: 31A, at 20°C 68°F) 45 to 80%V (contact carrying current: 31A, at 85°C 185°F) | 35 to 120%V (contact carrying current: 33A, at 20°C 68°F) 45 to 80%V (contact carrying current: 33A, at 85°C 185°F) |
| | Operate time (at 20°C 68°F) (Initial) | Max. 20 ms (at nominal coil voltage excluding contact bounce time.) | | |
| Release time (at 20°C 68°F) (Initial) | Max. 10 ms (at nominal coil voltage excluding contact bounce time, without diode) | | | |
| Mechanical characteristics | Shock resistance | Functional | Min. 100 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.) | |
| | | Destructive | Min. 1,000 m/s ² (Half-wave pulse of sine wave: 6 ms.) | |
| | Vibration resistance | Functional | 10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10μs.) | |
| | | Destructive | 10 to 55 Hz at double amplitude of 1.5 mm | |
| Expected life | Mechanical | Contact Gap 1.5 mm .059 inch type: Min. 10 ⁶ (at 180 times/min.) Contact Gap 1.8 mm .071 inch type: Min. 5×10 ⁵ (at 180 times/min.) | | |
| | Electrical | Resistive load | 22A 250V AC, Min. 3×10 ⁴ (at 20 times/min.) | — |
| | | Inductive load | Destructive: 22A 250V AC (cosφ = 0.8), Min. 3×10 ⁴ (on:off = 0.1s:10s) Over load: 35A 250V AC (cosφ = 0.8), Min. 50 (on:off = 0.1s:10s) | Destructive: 31A 250V AC (cosφ = 0.8), Min. 3×10 ⁴ (on:off = 0.1s:10s) Over load: 47A 250V AC (cosφ = 0.8), Min. 50 (on:off = 0.1s:10s) |
| Conditions | Conditions for operation, transport and storage*4 | Ambient temperature: -40°C to +60°C -40°F to +140°F (When nominal coil voltage applied) -40°C to +85°C -40°F to +185°F (Coil holding voltage is when 45 to 80%V of nominal coil voltage is applied.) Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) Air pressure: 86 to 106 kPa | | |
| Unit weight | Approx. 23 g .81 oz | | | |

Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

*3. Coil holding voltage is the coil voltage after 100 ms from the applied nominal coil voltage.

*4. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.