Panasonic
ideas for life

1a 5A slim power relay

# LD-P RELAYS (ALDP)

RoHS compliant

## FEATURES

**1. Nominal switching capacity:**
**5A 277V AC**
**2. Ambient temperature:**
**–40°C to +85°C –40°F to +185°F**
**3. Excellent heat resistance and tracking performance**
EN60695 (GWT2-11, GWFI2-12, GWIT2-13) data available
(Please consult us for details.)
**4. Slim type: 20.3 (L) × 7.0 (W) × 15 (H) mm .799 (L) × .276 (W) × .591 (H) inch**

## TYPICAL APPLICATIONS

- **Boilers**
- **Air conditioner**
- **Refrigerator**
- **Hot water units**
- **Microwave ovens**
- **Fan heaters**

## ORDERING INFORMATION

**ALDP** [1] [ ] [W]

LD-P relay

Contact arrangement
1: 1 Form A

Nominal coil voltage (DC)
05: 5V, 06: 6V, 09: 9V, 12: 12V, 18: 18V, 24: 24V

Packing style
W: Carton packing

Note: Certified by UL/C-UL and VDE

## TYPES

| Contact arrangement | Nominal coil voltage | Part No. |
|---|---|---|
| 1 Form A | 5V DC | ALDP105W |
| | 6V DC | ALDP106W |
| | 9V DC | ALDP109W |
| | 12V DC | ALDP112W |
| | 18V DC | ALDP118W |
| | 24V DC | ALDP124W |

Packing quantity: Carton 100 pieces, Case 500 pieces
Note: The "W" at the end of the part number only appears on the inner and outer packaging. It does not appear on the relay itself.
Please consult with our sales office on a tube packing type.

## RATING

### 1. Coil data

| Nominal coil voltage | Pick-up voltage (at 20°C 68°F) | Drop-out voltage (at 20°C 68°F) | 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) |
|---|---|---|---|---|---|---|
| 5V DC | 75%V or less of nominal voltage (Initial) | 5%V or more of nominal voltage (Initial) | 40.0mA | 125Ω | 200mW | 130%V of nominal voltage |
| 6V DC | | | 33.3mA | 180Ω | | |
| 9V DC | | | 22.2mA | 405Ω | | |
| 12V DC | | | 16.7mA | 720Ω | | |
| 18V DC | | | 11.1mA | 1,620Ω | | |
| 24V DC | | | 8.3mA | 2,880Ω | | |

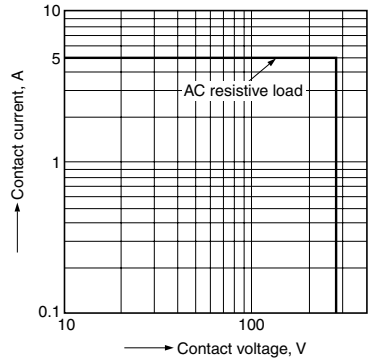
## 2. Specifications

| Characteristics | Item | | Specifications |
|---|---|---|---|
| Contact | Arrangement | | 1 Form A |
| | Contact resistance (Initial) | | Max. 100 mΩ (By voltage drop 6 V DC 1A) |
| | Contact material | | AgNi type |
| Rating | Nominal switching capacity (resistive load) | | 5A 277V AC |
| | Max. switching power (resistive load) | | 1,385VA |
| | Max. switching voltage | | 277V AC |
| | Max. switching current | | 5A |
| | 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 | 750 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) | | 10,000 V |
| | Temperature rise (coil) | | Max. 30°C 86°F (By resistive method, nominal coil voltage applied to the coil; contact carrying current: 5A, at 85°C 185°F) |
| | Operate time (at nominal voltage) (at 20°C 68°F) | | Max. 10 ms (excluding contact bounce time.) |
| | Release time (at nominal voltage) (at 20°C 68°F) | | Max. 10 ms (excluding contact bounce time) (With diode) |
| Mechanical characteristics | Shock resistance | Functional | 300 m/s² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.) |
| | | Destructive | 1,000 m/s² (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 (at 180 times/min.) | | Min. $5\times10^6$ |
| | Electrical (at 20 times/min.) | | Min. $2\times10^5$ (5A 125V AC at rated load), Min. $10^5$ (5A 250V AC at rated load) |
| Conditions | Conditions for operation, transport and storage*3 | | Ambient temperature: –40°C to +85°C –40°F to +185°F; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) |
| | Max. operating speed (at nominal switching capacity) | | 20 times/min. |
| Unit weight | | | Approx. 4 g .14 oz |

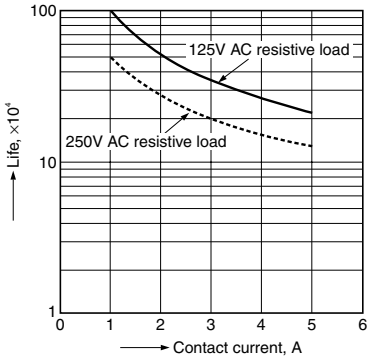
Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981
*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

# REFERENCE DATA

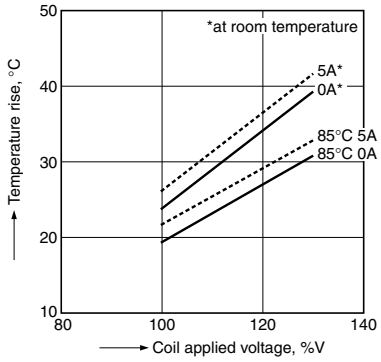
1. Max. switching power



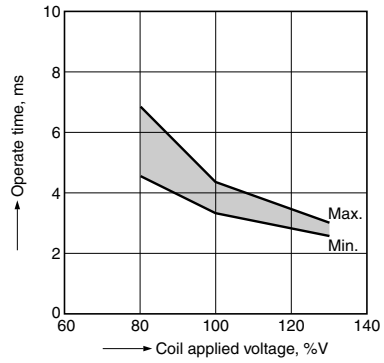

2. Life curve



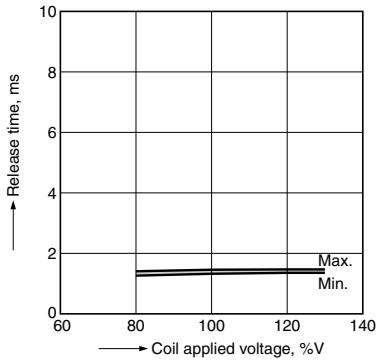

3. Coil temperature rise
Sample: ALDP112, 6 pcs.
Point measured: inside the coil
Contact current: 0 A, 5 A



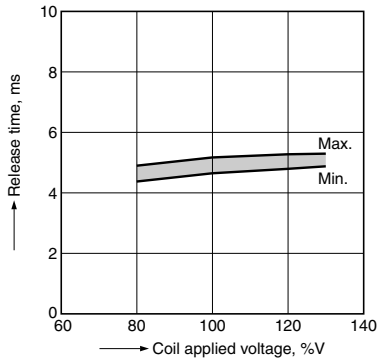

4-(1). Operate time
Sample: ALDP112, 30 pcs.




4-(2). Release time (without diode)
Sample: ALDP112, 30 pcs.



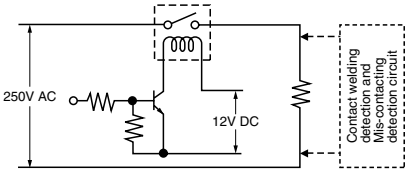

4-(3). Release time (with diode)
Sample: ALDP112, 30 pcs.



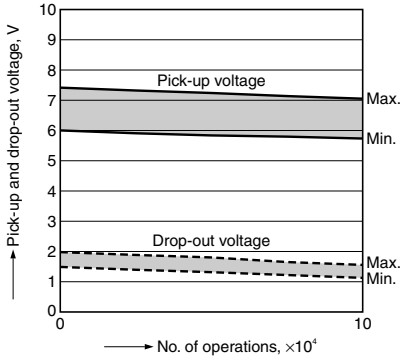
# LD-P (ALDP)

5. Electrical life test
(5A 250V AC Resistive load)
Sample: ALDP112, 6 pcs.
Operation frequency: 20 times/min.
(ON:OFF = 1.5s:1.5s)

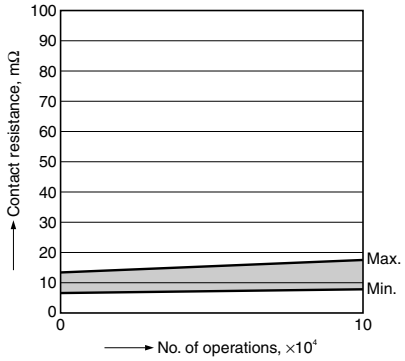
Circuit:




Change of pick-up and drop-out voltage




Change of contact resistance

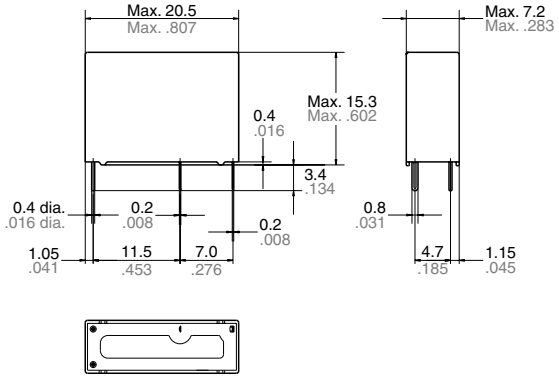



## DIMENSIONS (mm inch)

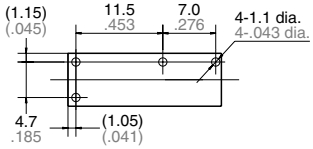
The CAD data of the products with a **CAD Data** mark can be downloaded from: http://industrial.panasonic.com/ac/e/

**CAD Data**

External dimensions

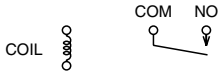



PC board pattern (Bottom view)




Tolerance: ±0.1 ±.004

Schematic (Bottom view)




| Dimension: | General tolerance |
|---|---|
| Less than 1mm .039inch: | ±0.1 ±.004 |
| Min. 1mm .039inch less than 3mm .118 inch: | ±0.2 ±.008 |
| Min. 3mm .118 inch: | ±0.3 ±.012 |

## SAFETY STANDARDS

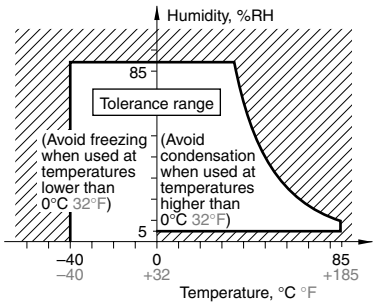
| Certification authority | |
|---|---|
| UL/C-UL | 5A 277V AC 85°C 185°F<br>5A 30V DC |
| VDE | 5A 250V AC cos$\phi$ = 1.0 85°C 185°F<br>5A 30V DC 0ms |

## NOTES

**■ Usage, transport and storage conditions**

1) Temperature:
–40 to +85°C –40 to +185°F
2) Humidity: 5 to 85% RH
(Avoid freezing and condensation.)
The humidity range varies with the temperature. Use within the range indicated in the graph below.
3) Atmospheric pressure: 86 to 106 kPa

Temperature and humidity range for usage, transport, and storage




**■ Certification**

1) This relay is UL/C-UL certified.
UL/C-UL standards:
5 A 277 V AC 85°C 185°F
5 A 30 V DC
2) This relay is certified by VDE.
VDE standards:
5 A 250 V AC cos$\phi$ = 1.0 85°C 185°F
5 A 30 V DC 0ms
3) UL/C-UL and VDE certified ratings are displayed on the packaging box.
(On the relay, only the certification marks are shown and not the certified ratings. Please refer to the product specification diagrams to see what is stamped.)

**■ Part number display**

The "W" at the end of the part number only appears on the inner and outer packaging. It does not appear on the relay itself.

**■ Creepage distance and clearances between contact and coil: Min. 6 mm .236 inch**