

## 1a 5A slim power relay

## LD-P RELAYS (ALDP)



Protective construction: Sealed type

### 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, GWF12-12, 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

**5. High insulation resistance:**

• Creepage distance and clearances

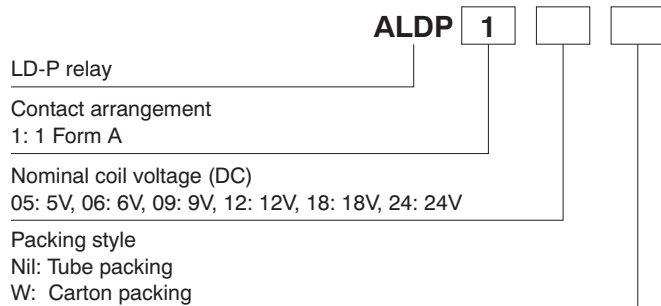
between contact and coil: Min. 6 mm .236 inch (In compliance with IEC65)

• Surge withstand voltage between contact and coil: 10,000 V or more.

### TYPICAL APPLICATIONS

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

### ORDERING INFORMATION



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

Notes:

\*1 Tube packing: Tube 50 pieces, Case: 1,000 pieces  
 Carton packing: Carton 100 pieces, Case 500 pieces

\*2 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.

# LD-P (ALDP)

## 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 [ $\pm 10\%$ ] (at 20°C 68°F)	Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)	Nominal operating power	Max. allowable 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	125 $\Omega$	200mW	130%V of nominal voltage
6V DC			33.3mA	180 $\Omega$		
9V DC			22.2mA	405 $\Omega$		
12V DC			16.7mA	720 $\Omega$		
18V DC			11.1mA	1,620 $\Omega$		
24V DC			8.3mA	2,880 $\Omega$		

### 2. Specifications

Characteristics	Item	Specifications	
Contact	Arrangement	1 Form A	
	Contact resistance (Initial)	Max. 100 m $\Omega$ (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. 1,000M $\Omega$ (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)	10,000 V (initial)	
	Temperature rise	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	Min. 300 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10 $\mu$ s.)
		Destructive	Min. 1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10 $\mu$ s.)
		Destructive	10 to 55 Hz at double amplitude of 1.5 mm
Expected life	Mechanical (at 180 cpm)	Min. 5 $\times 10^6$	
	Electrical (at 20 cpm)	Min. 2 $\times 10^5$ (5A 125V AC at rated load), Min. 10 <sup>5</sup> (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:

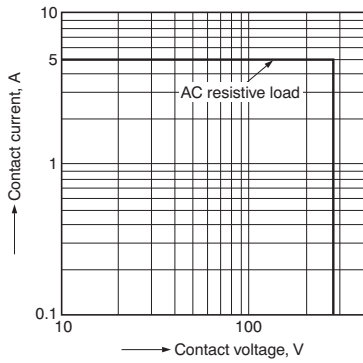
\*1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

\*2 Wave is standard shock voltage of  $\pm 1.2 \times 50\mu$ s according to JEC-212-1981

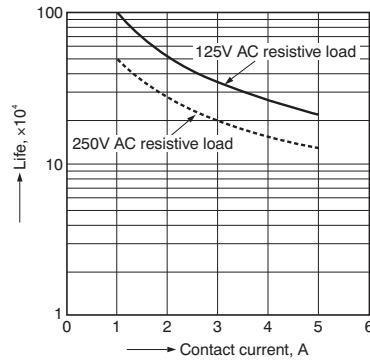
\*3 The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to "6. Usage, Storage and Transport Conditions" in [AMBIENT ENVIRONMENT](#) section in [Relay Technical Information](#).

REFERENCE DATA

1. Max. switching power

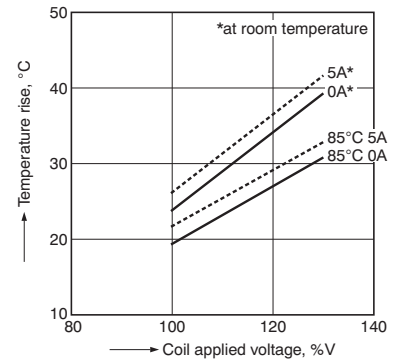


2. Life curve



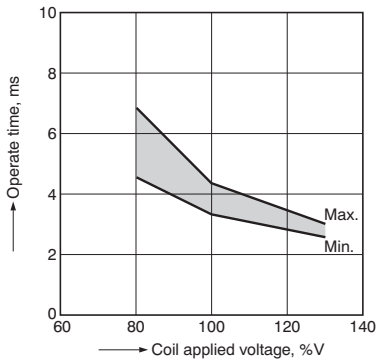
3. Coil temperature rise

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



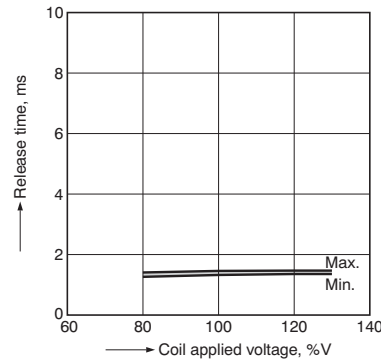
4-(1). Operate time

Sample: ALDP112, 30 pcs.



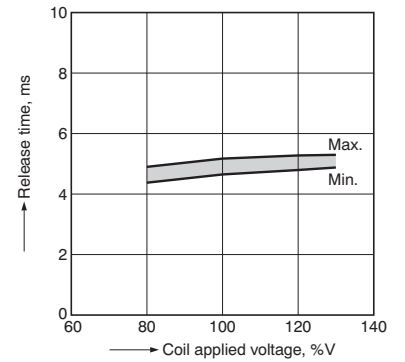
4-(2). Release time (without diode)

Sample: ALDP112, 30 pcs.



4-(3). Release time (with diode)

Sample: ALDP112, 30 pcs.

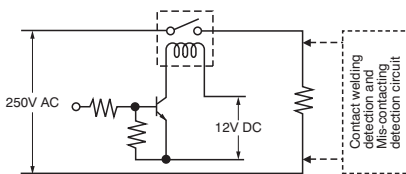


5. Electrical life test

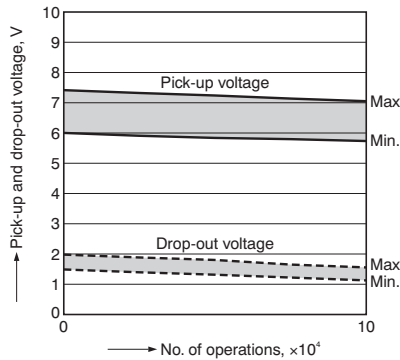
(5A 250V AC Resistive load)

Sample: ALDP112, 6 pcs.  
Operation frequency: 20 times/min.  
(ON:OFF = 1.5s:1.5s)

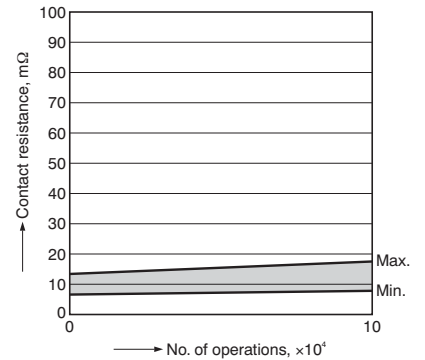
Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance

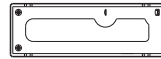
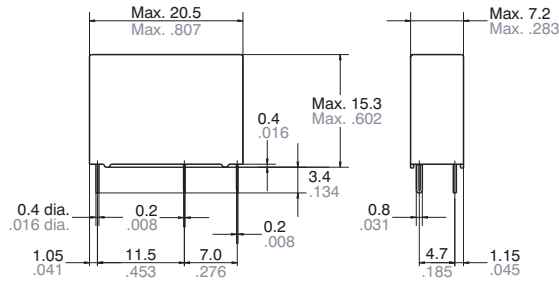


# LD-P (ALDP)

## DIMENSIONS (mm inch)

Download [CAD Data](#) from our Web site.

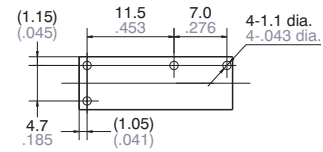
### CAD Data



**Dimension:**  
 Max. 1mm .039 inch:  $\pm 0.1 \pm .004$   
 1 to 3mm .039 to .118 inch:  $\pm 0.2 \pm .008$   
 Min. 3mm .118 inch:  $\pm 0.3 \pm .012$

### General tolerance

### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm .004$

### Schematic (Bottom view)



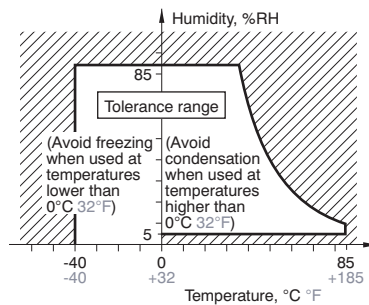
## SAFETY STANDARDS

Certification authority	
UL, C-UL	5A 277V AC 85°C 5A 30V DC
VDE	5A 250V AC $\cos\phi = 1.0$ 85°C 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 and C-UL certified.  
UL and 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. 6mm .236 inch**

For Cautions for Use, see [Relay Technical Information](#).