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ALDP105 ALDP124 ALDP112 ALDP118

EN
This Datasheet is presented by the manufacturer

DE
Dieses Datenblatt wird vom Hersteller bereitgestellt

FR
Cette fiche technique est présentée par le fabricant

Panasonic
ideas for life

1 Form A 5A
Slim size (7 mm)
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, 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

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

ALDP [1] [ ] [ ]

LD-P relay

Contact arrangement
1: 1 Form A

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

Packing style
Nil: Tube packing
W: Carton packing

Note: UL, C-UL and VDE approved type is standard.

TYPES

Contact arrangement	Nominal coil voltage	Part No.
1 Form A	5V DC	ALDP105
	6V DC	ALDP106
	9V DC	ALDP109
	12V DC	ALDP112
	18V DC	ALDP118
	24V DC	ALDP124

Packing quantity: inner 100 pieces, outer 500 pieces

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. 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	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		

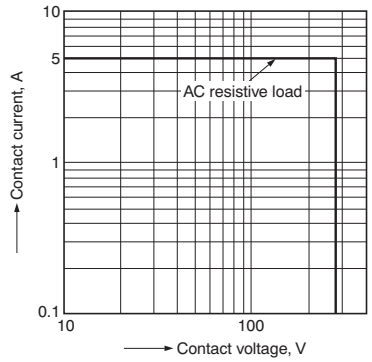
2. Specifications

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)		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/s² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)
		Destructive	Min. 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 cpm)		Min. 5×10^6
	Electrical (at 20 cpm)		Min. 2×10^5 (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 cpm
Unit weight			Approx. 4 g .14 oz

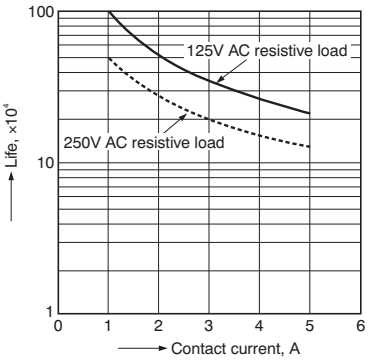
Notes:
*1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*2 Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981
*3 The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to “6. Usage, Storage and Transport Conditions“ in AMBIENT ENVIRONMENT section in Relay Technical Information.

REFERENCE DATA

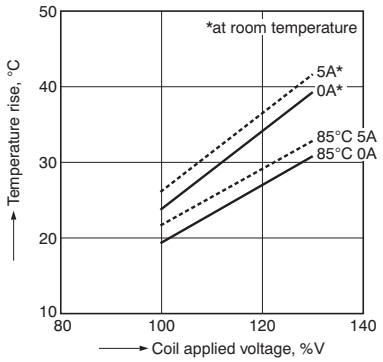
1. Max. switching power



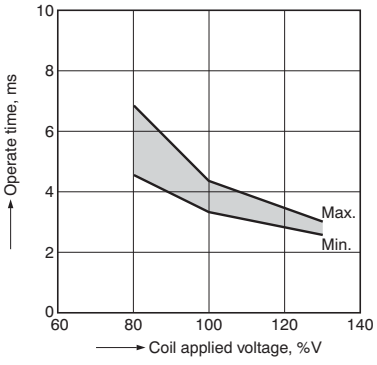
2. Life curve



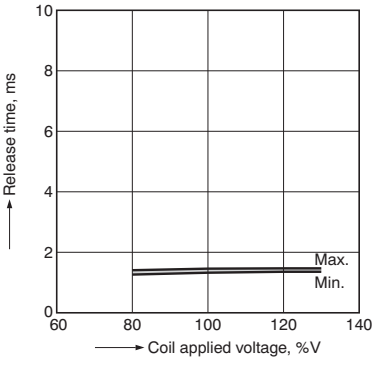
3. Coil temperature rise
Sample: ALDP112, 6 pcs.
Point measured: inside the coil
Contact current: 0 A, 5 A



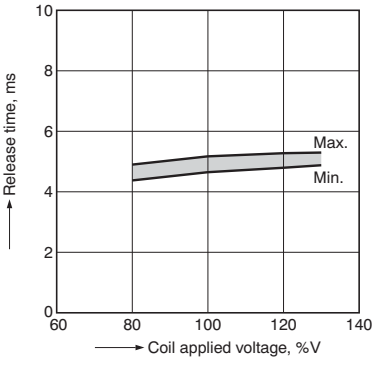
4-(1). Operate time
Sample: ALDP112, 30 pcs.



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

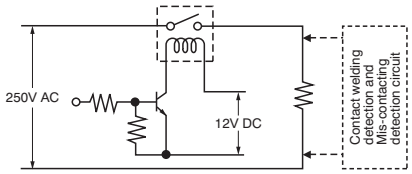


4-(3). Release time (with diode)
Sample: ALDP112, 30 pcs.

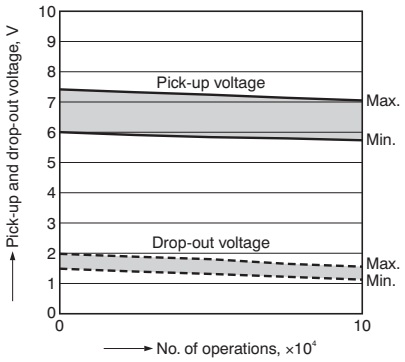


5. Electrical life test
(5A 250V AC Resistive load)
Sample: ALDP112, 6 pcs.
Operation frequency: 20 times/min.
(ON:OFF = 1.5s:1.5s)

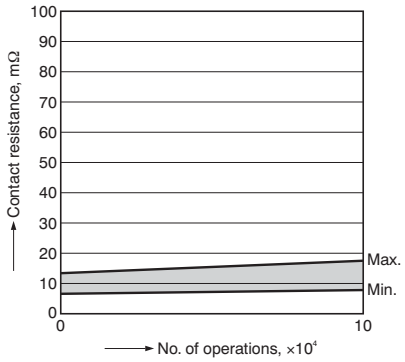
Circuit:



Change of pick-up and drop-out voltage



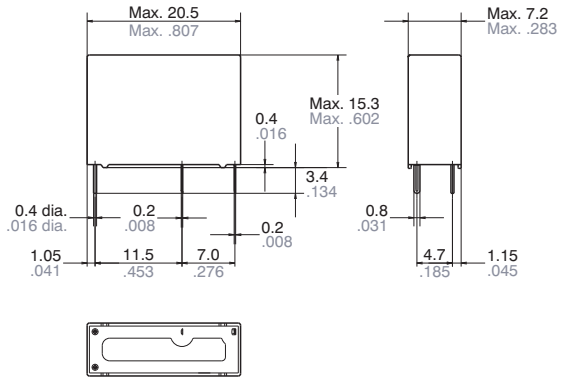
Change of contact resistance



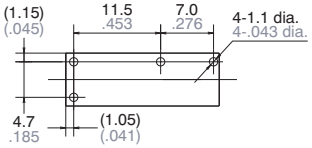
DIMENSIONS (mm inch)

Download CAD Data from our Web site.

CAD Data

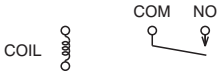


PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

Schematic (Bottom view)



Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

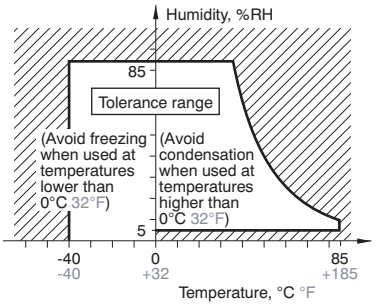
SAFETY STANDARDS

Certification authority	
UL, C-UL	5A 277V AC 70°C 5A 30V DC
VDE	5A 250V AC cosϕ = 1.0 70°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



4) Condensation
Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.
5) Freezing
Condensation or other moisture may freeze on the relay when the temperatures is lower than 0°C 32°F. This causes problems such as sticking of movable parts or operational time lags.
6) Low temperature, low humidity environments
The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

■ Solder and cleaning conditions

1) Please obey the following conditions when soldering automatically.
(1) Preheating: Within 120°C 248°F (solder surface terminal portion) and within 120 seconds
(2) Soldering iron: 260°C±5°C 500°F±41°F (solder temperature) and within 6 seconds (soldering time)
2) Do not use ultrasonic cleaning.
This will adversely affect the relay characteristics. Also, it is recommended that alcoholic solvents be used.

■ Certification

1) This relay is UL and C-UL certified.
UL and C-UL standards:
5 A 277 V AC 70°C
5 A 30 V DC
2) This relay is certified by VDE.
VDE standards:
5 A 250 V AC cosϕ = 1.0 70°C
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.

■ Others

1) To ensure good operation, please keep the voltage on the coil ends to ±5% (at 20°C 68°F) of the rated coil operation voltage. Also, please be aware that the pick-up voltage and drop-out voltage may change depending on the temperature and conditions of use.
2) Keep the ripple rate of the nominal coil voltage below 5%.
3) The cycle lifetime is defined under the standard test condition specified in the JIS C 5442 standard (temperature 15 to 35°C 59 to 95°F, humidity 25 to 75%R.H.). Check this with the real device as it is affected by coil driving circuit, load type, activation frequency, activation phase, ambient conditions and other factors.
Also, be especially careful of loads such as those listed below.
(1) When used for AC load-operating and the operating phase is synchronous.
Rocking and fusing can easily occur due to contact shifting.
(2) Highly frequent load-operating
When highly frequent opening and closing of the relay is performed with a load that causes arcs at the contacts, nitrogen and oxygen in the air is fused by the arc energy and HNO_3 is formed. This can corrode metal materials.
Three countermeasures for these are listed here.
• Incorporate an arc-extinguishing circuit.
• Lower the operating frequency
• Lower the ambient humidity
4) Minimum switching capacity is a guideline as to the lowest possible level at which it will be possible for a low level load to allow switching. 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.
5) Heat, smoke, and even a fire may occur if the relay is used in conditions outside of the allowable ranges for the coil ratings, contact ratings, operating cycle lifetime, and other specifications. Therefore, do not use the relay if these ratings are exceeded.
6) If the relay has been dropped, the appearance and characteristics should always be checked before use.
7) Incorrect wiring may cause unexpected events or the generation of heat or flames.
8) Creepage distance and clearances between contact and coil: Min. 6 mm

For Cautions for Use, see Relay Technical Information.

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