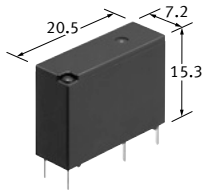
Power relays (Over 2 A)

LD-P RELAYS

Slim (7.2 mm), 1 Form A 5 A, Power relay

Protective construction：Sealed



(Unit：mm)

FEATURES

- **Rated switching capacity: 5 A 277 V AC**
- **Ambient temperature: -40 to +85°C**
- **Excellent heat resistance and tracking performance**
  EN60695 (GWT2-11, GWFI2-12, GWIT2-13) data available (for VDE)
  (Please consult us for details.)
- **Compact size: 7.2 mm(W) X 20.5 mm(L) X 15.3 mm(H)**

TYPICAL APPLICATIONS

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

ORDERING INFORMATION (PART NO.)

ALDP 1 ☐ ☐ ☐

- Contact arrangement
  1：1 Form A
- Coil insulation class
  Nil：Class E insulation
  F：Class F insulation
- Rated coil voltage (DC)

Part No.	05	06	09	12	18	24
Rated coil voltage	5	6	9	12	18	24

- Packing style
  Nil：Tube
  W：Carton

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

TYPES

Contact arrangement	Rated coil voltage	Part No. *		Standard packing	
		Class E insulation	Class F insulation	Inner carton	Outer carton
1 Form A	5 V DC	ALDP105W	ALDP1F05W	Carton: 100 pcs Tube: 50 pcs	Carton: 500 pcs Tube: 1,000 pcs
	6 V DC	ALDP106W	ALDP1F06W		
	9 V DC	ALDP109W	ALDP1F09W		
	12 V DC	ALDP112W	ALDP1F12W		
	18 V DC	ALDP118W	ALDP1F18W		
	24 V DC	ALDP124W	ALDP1F24W		

* Tube packing types available. When ordering, please remove suffix “W”.

RATING

■Coil data

- Operating characteristics such as 'Operate voltage' and 'Release voltage' are influenced by mounting conditions, ambient temperature, etc.
  Therefore, please use the relay within ±5% of rated coil voltage.
- 'Initial' means the condition of products at the time of delivery.

Rated coil voltage	Operate voltage*1 (at 20°C)	Release voltage*1 (at 20°C)	Rated operating current (±10%, at 20°C)	Coil resistance (±10%, at 20°C)	Rated operating power	Max. allowable voltage*2 (at 20°C)
5 V DC	Max. 75% V of rated coil voltage (Initial)	Min. 5% V of rated coil voltage (Initial)	40 mA	125 Ω	200 mW	180% V of rated coil voltage
6 V DC			33.3 mA	180 Ω		
9 V DC			22.2 mA	405 Ω		
12 V DC			16.7 mA	720 Ω		
18 V DC			11.1 mA	1,620 Ω		
24 V DC			8.3 mA	2,880 Ω		

*1. square, pulse drive
*2. Maximum allowable voltage is the maximum voltage which can satisfy the coil temperature rise value. Please refer to "Max. applied voltage and temperature rise" in GUIDELINES FOR USAGE.

■Specifications

Item		Specifications
Contact data	Contact arrangement	1 Form A
	Contact resistance (initial)	Max. 100 mΩ (by voltage drop 6 V DC 1 A)
	Contact material	AgNi type
	Contact rating (resistive)	5 A 277 V AC, 3 A 30 V DC
	Max. switching power (resistive)	1,385 VA, 90 W
	Max. switching voltage	277 V AC, 30 V DC
	Max. switching current	5 A (AC), 3 A (DC)
	Min. switching load (reference value)*1	100 mA 5 V DC
Insulation resistance (initial)		Min. 1,000 MΩ (at 500 V DC, Measured portion is the same as the case of dielectric strength.)
Dielectric strength (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 withstand voltage (initial)*2	Between contact and coil	10,000 V
Time characteristics (initial)	Operate time	Max.10 ms at rated coil voltage (at 20°C, without bounce)
	Release time	Max.10 ms at rated coil voltage (at 20°C, without bounce, with diode)
Shock resistance	Functional	300 m/s^2 (half-sine shock pulse: 11 ms, detection time: 10 μs)
	Destructive	1,000 m/s^2 (half-sine shock pulse: 6 ms)
Vibration resistance	Functional	10 to 55 Hz (at double amplitude of 1.5 mm, detection time: 10 μs)
	Destructive	10 to 55 Hz (at double amplitude of: 1.5 mm)
Expected life	Mechanical life	Min. 5×10^6 (at 180 times/min.)
Conditions	Conditions for usage, transport and storage*3	Ambient temperature: -40 to +85°C, Humidity: 5 to 85% RH (Avoid icing and condensation)
Unit weight		Approx. 4 g

*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 ±1.2×50 μs according to JEC-212-1981
*3. For ambient temperature, please read "GUIDELINES FOR RELAY USAGE".

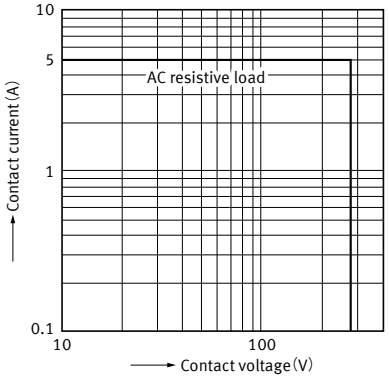
■Expected electrical life

Conditions: Resistive load, at 20°C, switching frequency 20 times/min

Type	Switching capacity	Number of operations
1 Form A	5 A 125 V AC	Min. 2 x 10^5
	5 A 250 V AC	Min. 10^5
	3 A 30 V DC	Min. 10^5

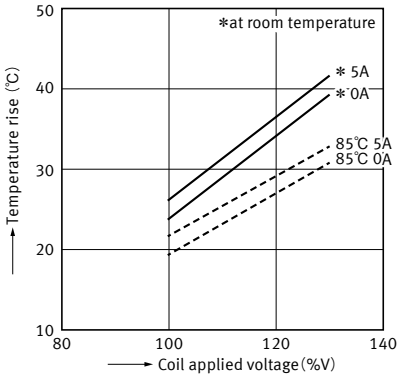
REFERENCE DATA

1.Max. switching capacity



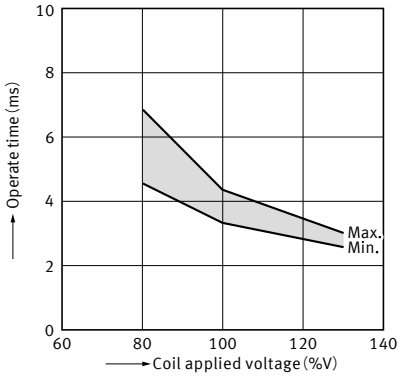
2.Coil temperature characteristics (Average)

Tested sample：ALDP112, 6 pcs.
Measured portion：Coil inside
Contact current：0A, 5A



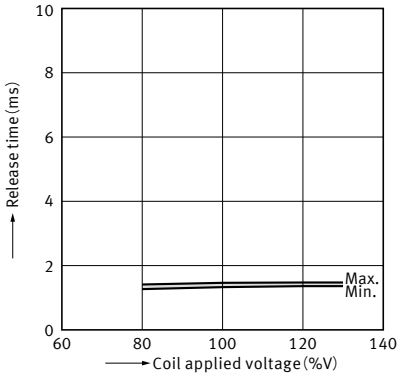
3-1.Operate time

Tested sample：ALDP112, 30 pcs.



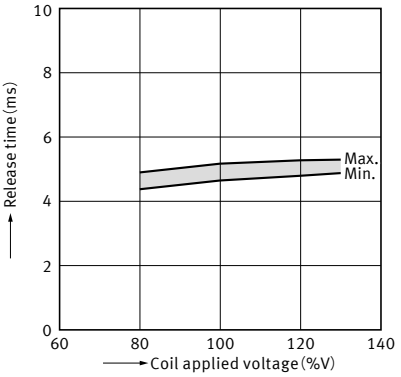
3-2.Release time (without diode)

Tested sample：ALDP112, 30 pcs.



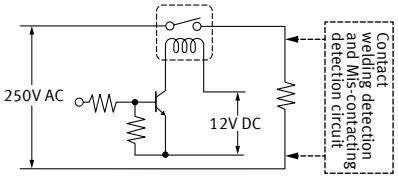
3-3.Release time (with diode)

Tested sample：ALDP112, 30 pcs.

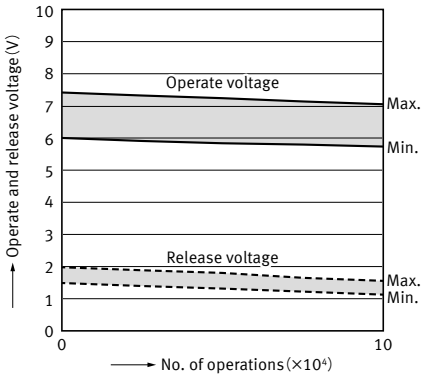


4.Electrical life test (5A 250 V AC Resistive load)

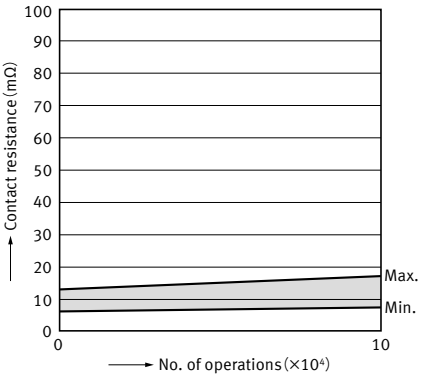
Tested sample：ALDP112, 6 pcs.
Operation frequency：20 times/min.
(ON：OFF=1.5s：1.5s)
Ambient temperature：20℃
Circuit：



Change of operate and release voltage



Change of contact resistance

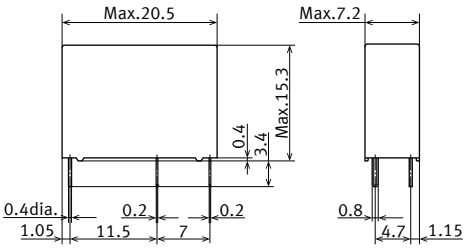


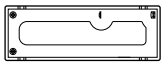
DIMENSIONS

CAD The CAD data of the products with a "CAD" mark can be downloaded from our Website. Unit: mm

CAD

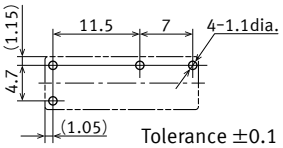
External dimensions





General tolerance
Less than 1mm : ±0.1
Min. 1mm less than 3mm : ±0.2
Min. 3mm : ±0.3

Recommended PC board pattern (BOTTOM VIEW)



Schematic (BOTTOM VIEW)

SAFETY STANDARDS

■UL/C-UL (Recognized)

File No.	Contact rating	Operations	Ambient temperature
E43028	6 A 277 V AC	5×10^4	–
	5 A 277 V AC Resistive	10^5	85°C
	5 A 277 V AC Resistive (Class F only)	5×10^4	105°C
	5 A 30 V DC Resistive	10^5	–
	3 A 277 V AC General Use	12×10^4	85°C
	Pilot Duty C 300	10^5	85°C
	Pilot Duty 0.65 A 277 V AC (Inrush 6.5 A)	10^5	85°C

*Pilot Duty is in accordance with the conditions of UL508.

■VDE (Certified)

File No.	Contact rating	Operations	Ambient temperature
40014384	5 A 250 V AC (cosφ = 1.0)	10^5	85°C
	5 A 250 V AC (cosφ = 1.0) (Class F only)	5×10^4	105°C
	5 A 30 V DC (0 ms)	10^4	25°C

■CSA (Certified)

CSA standard certified by C-UL

■CQC (Certified)

File No.	Contact rating	Ambient temperature
CQC10002048611	5 A 250 V AC	85°C

Note: Excluding Class F insulation

INSULATION CHARACTERISTICS (IEC61810-1)

Item	Characteristics	
Clearance/Creepage distance (IEC61810-1)	Min. 5.5 mm/5.5 mm	
Category of protection (IEC61810-1)	RT III	
Tracking resistance (IEC60112)	PTI 175	
Insulation material group	III a	
Over voltage category	III	
Rated voltage	250 V	
Pollution degree	3	2
Type of insulation (Between contact and coil)	Basic insulation	Reinforced insulation
Type of insulation (Between open contacts)	Micro disconnection	

Note: EN/IEC VDE Certified.