

# Panasonic



**Compliant with European standards 1a1b 16A/10A/8A polarized power relays**

## DE RELAYS

### FEATURES

- 1. Conforms to European safety standards (VDE0700 and VDE0631)**  
 Insulating distance between coil and contacts:  
 Clearance Min. 8mm .315 inch  
 Creepage distance Min. 8mm .315 inch
- 2. Extensive product line-up**
- 3. Surge voltage between contact and coil 12 kV**
  - **Low operating power**  
 Nominal operating power at 200 mW (Single side stable, 2 coil latching)
- 4. Compact body saves space**  
 Size: 12.5(W) × 25.0(L) × 12.5(H) mm  
 .492(W) × .984(L) × .492(H) inch
- 5. UL/CSA, VDE approved**  
 16A contact rating possible for 1 Form A and 1 Form A 1 Form B.

### TYPICAL APPLICATIONS

- Temperature controller
- Automatic meter reading
- OA equipment
- FA equipment

### ORDERING INFORMATION

DE  -  -  V

Contact arrangement

- 1a: 1 Form A
- 2a: 2 Form A
- 1a1b: 1 Form A 1 Form B

Operating function

- Nil: Single side stable
- L: 1 coil latching
- L2: 2 coil latching

Coil voltage (V DC)

- 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48\* (\*single side stable only)

Note: UL/CSA, VDE approved type is standard.

# DE (ADE)

## TYPES

Contact arrangement	Nominal coil voltage	Single side stable type	1 coil latching type	2 coil latching type
		Part No.	Part No.	Part No.
1 Form A	1.5V DC	DE1A-1,5V	DE1A-L-1,5V	DE1A-L2-1,5V
	3V DC	DE1A-3V	DE1A-L-3V	DE1A-L2-3V
	4.5V DC	DE1A-4,5V	DE1A-L-4,5V	DE1A-L2-4,5V
	5V DC	DE1A-5V	DE1A-L-5V	DE1A-L2-5V
	6V DC	DE1A-6V	DE1A-L-6V	DE1A-L2-6V
	9V DC	DE1A-9V	DE1A-L-9V	DE1A-L2-9V
	12V DC	DE1A-12V	DE1A-L-12V	DE1A-L2-12V
	24V DC	DE1A-24V	DE1A-L-24V	DE1A-L2-24V
1 Form A 1 Form B	48V DC	DE1A-48V	—	—
	1.5V DC	DE1A1B-1,5V	DE1A1B-L-1,5V	DE1A1B-L2-1,5V
	3V DC	DE1A1B-3V	DE1A1B-L-3V	DE1A1B-L2-3V
	4.5V DC	DE1A1B-4,5V	DE1A1B-L-4,5V	DE1A1B-L2-4,5V
	5V DC	DE1A1B-5V	DE1A1B-L-5V	DE1A1B-L2-5V
	6V DC	DE1A1B-6V	DE1A1B-L-6V	DE1A1B-L2-6V
	9V DC	DE1A1B-9V	DE1A1B-L-9V	DE1A1B-L2-9V
	12V DC	DE1A1B-12V	DE1A1B-L-12V	DE1A1B-L2-12V
2 Form A	24V DC	DE1A1B-24V	DE1A1B-L-24V	DE1A1B-L2-24V
	48V DC	DE1A1B-48V	—	—
	1.5V DC	DE2A-1,5V	DE2A-L-1,5V	DE2A-L2-1,5V
	3V DC	DE2A-3V	DE2A-L-3V	DE2A-L2-3V
	4.5V DC	DE2A-4,5V	DE2A-L-4,5V	DE2A-L2-4,5V
	5V DC	DE2A-5V	DE2A-L-5V	DE2A-L2-5V
	6V DC	DE2A-6V	DE2A-L-6V	DE2A-L2-6V
	9V DC	DE2A-9V	DE2A-L-9V	DE2A-L2-9V
2 Form A	12V DC	DE2A-12V	DE2A-L-12V	DE2A-L2-12V
	24V DC	DE2A-24V	DE2A-L-24V	DE2A-L2-24V
	48V DC	DE2A-48V	—	—

Standard packing: Tube package: 20 pcs.; Case: 500 pcs.

## RATING

### 1. Coil data

#### 1) Single side stable type

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)
1.5V DC	70%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	132.7mA	11.3Ω	200mW	130%V of nominal voltage
3V DC			66.6mA	45Ω		
4.5V DC			44.5mA	101Ω		
5V DC			40mA	125Ω		
6V DC			33.3mA	180Ω		
9V DC			22.2mA	405Ω		
12V DC			16.6mA	720Ω		
24V DC			8.3mA	2,880Ω		
48V DC			4.2mA	11,520Ω		

#### 2) 1 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset 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)
1.5V DC	70%V or less of nominal voltage (Initial)	70%V or less of nominal voltage (Initial)	66.6mA	22.5Ω	100mW	130%V of nominal voltage
3V DC			33.3mA	90Ω		
4.5V DC			22.3mA	202Ω		
5V DC			20mA	250Ω		
6V DC			16.7mA	360Ω		
9V DC			11.1mA	812Ω		
12V DC			8.3mA	1,440Ω		
24V DC			4.2mA	5,760Ω		

## 3) 2 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset 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)
			Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
1.5V DC	70%V or less of nominal voltage (Initial)	70%V or less of nominal voltage (Initial)	66.6mA	66.6mA	11.3Ω	11.3Ω	200mW	200mW	130%V of nominal voltage
3V DC			66.6mA	66.6mA	45Ω	45Ω			
4.5V DC			44.5mA	44.5mA	101Ω	101Ω			
5V DC			40mA	40mA	125Ω	125Ω			
6V DC			33.3mA	33.3mA	180Ω	180Ω			
9V DC			22.2mA	22.2mA	405Ω	405Ω			
12V DC			16.6mA	16.6mA	720Ω	720Ω			
24V DC			8.3mA	8.3mA	2,880Ω	2,880Ω			

## 2. Specifications

Characteristics	Item	Specifications	
Contact	Arrangement	1 Form A      1 Form A 1 Form B      2 Form A	
	Contact resistance (Initial)	Max. 30 mΩ (By voltage drop 6 V DC 1A)	
	Contact material	AgSnO <sub>2</sub> type	
Rating	Nominal switching capacity (resistive load)	10A 250V AC, 10A 30V DC      8A 250V AC, 8A 30V DC	
	Max. switching power (resistive load)	2,500VA*4, 300W      2,000VA*4, 240W	
	Max. switching voltage	440V AC, 230V DC      440V AC, 230V DC	
	Max. switching current	10A (16A)*4      8A (16A)*4	
	Nominal operating power	Single side stable, 2 coil latching: 200mW; 1 coil latching: 100mW	
	Min. switching capacity*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	1,000 Vrms for 1 min. (Detection current: 10 mA)
		Between contact sets	—      4,000 Vrms for 1 min. (Detection current: 10 mA)
		Between contact and coil	5,000 Vrms for 1 min. (Detection current: 10 mA)
	Surge breakdown voltage*2 (Between contact and coil) (Initial)	12,000 V	
	Temperature rise (coil) (at 70°C 158°F)	Max. 50°C 122°F (By resistive method)	
	Operate time [Set time] (at 20°C 68°F)	Max. 10 ms (typ. 5ms) Max. 10 ms (typ. 4ms) (Nominal coil voltage applied to the coil, excluding contact bounce time.)	
Release time [Reset time] (at 20°C 68°F)	Max. 5 ms (typ. 2ms) Max. 10 ms (typ. 4ms) (Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode)		
Mechanical characteristics	Shock resistance	Functional	Min. 196 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)
		Destructive	Min. 980 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 2 mm (Detection time: 10μs.)
		Destructive	10 to 55 Hz at double amplitude of 3 mm
Expected life	Mechanical	Min. 10 <sup>7</sup> (at 300 times/min.)	
	Electrical	Min. 10 <sup>5</sup> (resistive load, at 20 times/min., at nominal switching capacity)	
	Electrical (16A/230V AC resistive)*4	25000      20000	
Conditions	Conditions for operation, transport and storage*3	Ambient temperature: -40°C to +70°C -40°F to +158°F; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	
	Max. operating speed	20 times/min. (at nominal switching capacity)	
Unit weight		Approx. 7 g .25 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

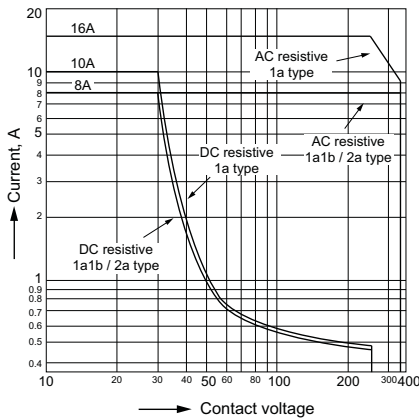
\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to "6. Usage, Storage and Transport Conditions" in [AMBIENT ENVIRONMENT](#) section in [Relay Technical Information](#).

\*4. 16A possible for one contact set only with max. 4000VA switching power.

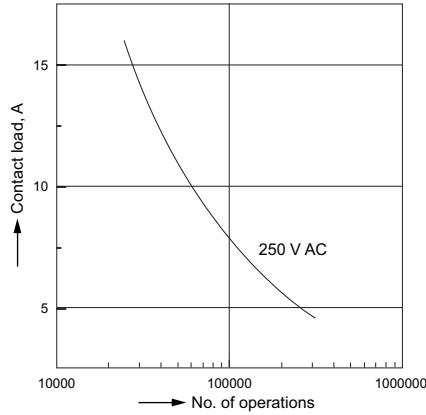
# DE (ADE)

## REFERENCE DATA

### 1. Max. switching power

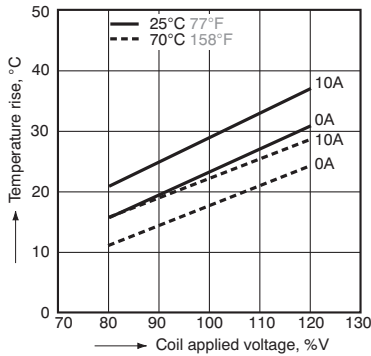


### 2. Life curve



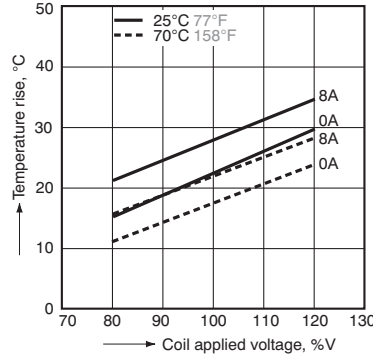
### 3.-(1) Coil temperature rise (1 Form A)

Tested sample: ADE109  
Quantity: n=6  
Ambient temperature: 25°C to 70°C 77°F to 158°F



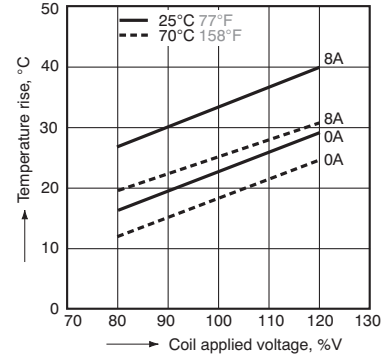
### 3.-(2) Coil temperature rise (1 Form A 1 Form B)

Tested sample: ADE309  
Quantity: n=6  
Ambient temperature: 25°C to 70°C 77°F to 158°F



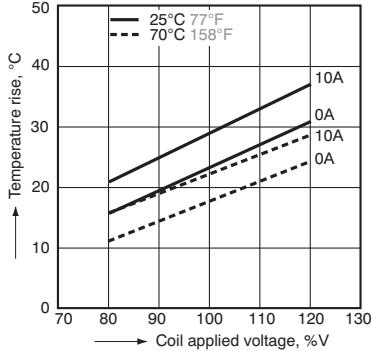
### 3.-(3) Coil temperature rise (2 Form A)

Tested sample: ADE209  
Quantity: n=6  
Ambient temperature: 25°C to 70°C 77°F to 158°F



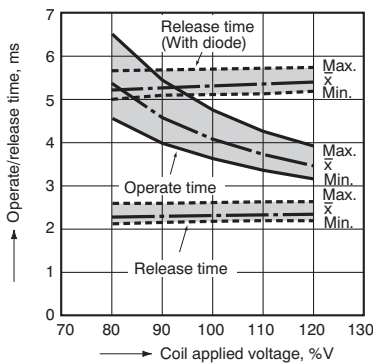
### 4-1. Operate/release time (1 Form A)

Tested sample: DE1a-5V  
Quantity: n=5



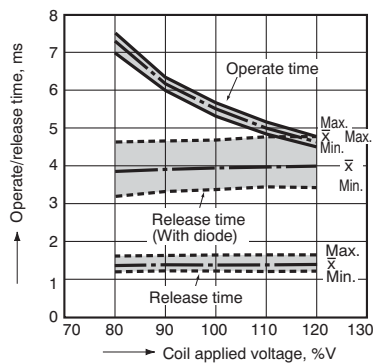
### 4-2. Operate/release time (1 Form A 1 Form B)

Tested sample: DE1a1b-5V, Quantity: n=5



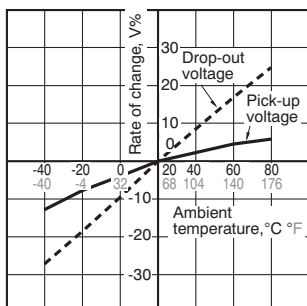
### 4-3. Operate/release time (2 Form A)

Tested sample: DE2a-5V, Quantity: n=5



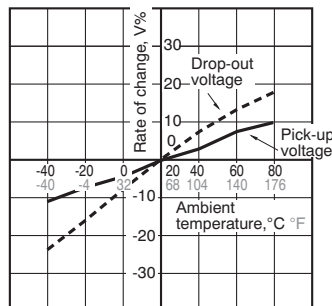
### 5-1. Ambient temperature characteristics (1 Form A)

Tested sample: DE1a-5V, Ambient temperature: -40°C to 80°C -40°F to 176°F, Quantity: n=6



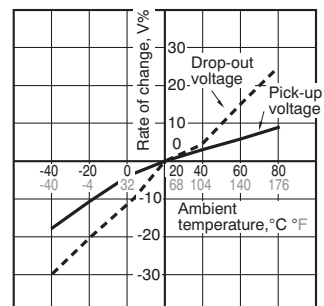
### 5-2. Ambient temperature characteristics (1 Form A 1 Form B)

Tested sample: DE1a1b-5V, Ambient temperature: -40°C to 80°C -40°F to 176°F, Quantity: n=6

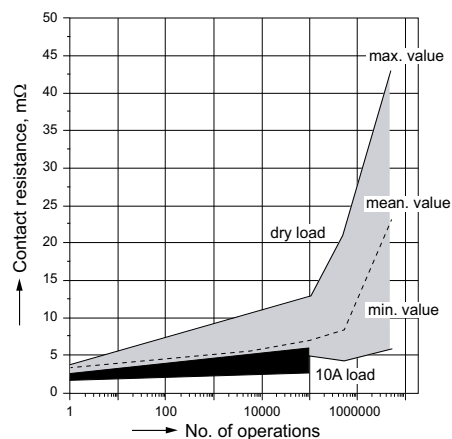


### 5-3. Ambient temperature characteristics (2 Form A)

Tested sample: DE2a-5V, Ambient temperature: -40°C to 80°C -40°F to 176°F, Quantity: n=6



6. Change of contact resistance



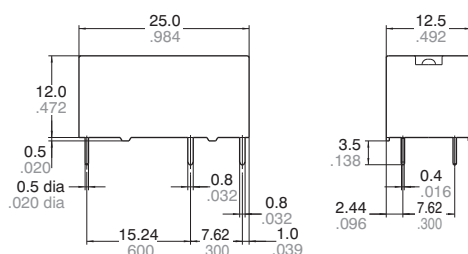
**DIMENSIONS** (mm inch)

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

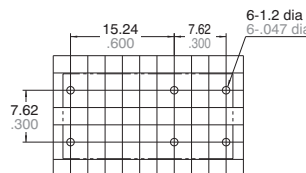
**CAD Data**



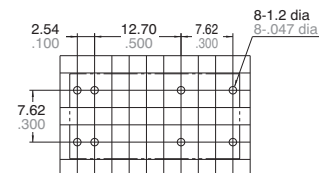
Single side stable  
1 coil latching type



Single side stable  
1 coil latching type

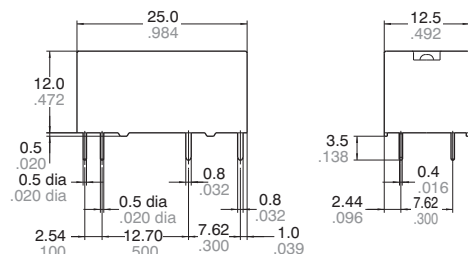


2 coil latching type



Tolerance :  $\pm 0.1 \pm .004$

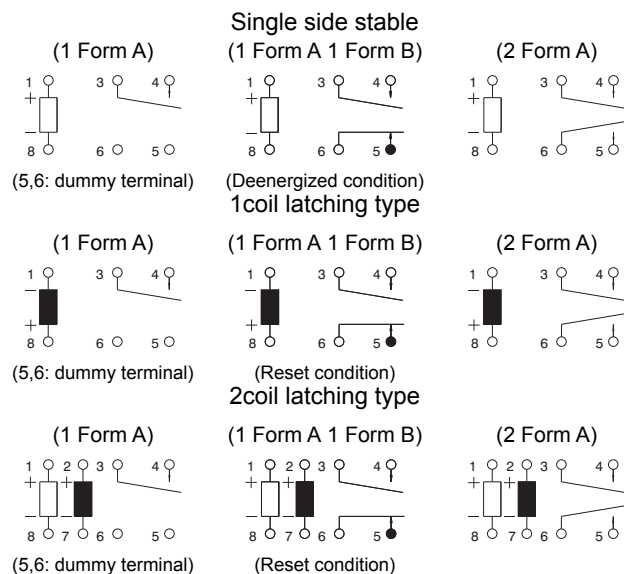
2 coil latching type



Tolerance:  $\pm 0.3 \pm .012$

PC board pattern (Bottom view)

Schematic (Bottom view)



**SAFETY STANDARDS**

Item	UL/C-UL (Recognized)		CSA (Certified)		VDE (Certified)	
	File No.	Contact rating	File No.	Contact rating	File No.	Contact rating
1 Form A	E120782	PILOT DUTY B300 R300	LR85932	PILOT DUTY B300 R300	115944	8A 250V AC (cosφ=1.0) 16A 250V AC (cosφ=1.0)
1 Form A 1 Form B	E120782	PILOT DUTY B300 R300	LR85932	PILOT DUTY B300 R300	115944	8A 250V AC (cosφ=1.0) 16A 250V AC (cosφ=1.0)
2 Form A	E120782	PILOT DUTY B300 R300	LR85932	PILOT DUTY B300 R300	115944	8A 250V AC (cosφ=1.0)

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