

## Specifications

### Ratings

#### Coil Ratings

Rated voltage	Rated current		Coil resistance	Must operate voltage	Must release voltage	Max. voltage	Power consumption
	50 Hz	60 Hz					
AC	6 V	443 mA	385 mA	3.1 Ω	80% max. of rated voltage	110% of rated voltage	Approx. 2.3 VA at 60 Hz Approx. 2.7 VA at 50 Hz
	12 V	221 mA	193 mA	13.7 Ω			
	24 V	110 mA	96.3 mA	48.4 Ω			
	100 V	26.6 mA	23.1 mA	760 Ω			
	110 V	24.2 mA	21.0 mA	932 Ω			
	200 V	13.3 mA	11.6 mA	3,160 Ω			
	220 V	12.1 mA	10.5 mA	3,550 Ω			
	230 V	10.0 mA	11.5 mA	4,250 Ω			
	240 V	11.0 mA	9.6 mA	4,480 Ω			
DC	6 V	224 mA		26.7 Ω	15% min. of rated voltage	Approx. 1.4 W	
	12 V	112 mA		107 Ω			
	24 V	55.8 mA		430 Ω			
	48 V	28.1 mA		1,710 Ω			
	100 V	13.5 mA		7,390 Ω			
	110 V	12.3 mA		8,960 Ω			
	125 V	10.8 mA		11,576 Ω			

- Note:**
1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15%/–20% for AC rated current and ±15% for DC coil resistance.
  2. Performance characteristic data are measured at a coil temperature of 23°C.
  3. The maximum voltage is one that is applicable instantaneously to the Relay coil at 23°C and not continuously.
  4. For DC-operated Relays with the LED indicator built-in, add an LED current of approx. 5 mA to the rated current.

#### Contact Ratings


Load	Resistive load ( $\cos\phi = 1$ )	Inductive load ( $\cos\phi = 0.4$ )
Contact mechanism	Single	
Contact material	AgSnIn	
Rated load	NO	7 A, 250 VAC
	NC	
Rated carry current	10 A	
Max. switching voltage	250 VAC, 250 VDC	
Max. switching current	10 A	
Max. switching power	NO	2,500 VA/300 W
	NC	1,250 VA/150 W

## Characteristics


<b>Contact resistance</b>	100 mΩ max.
<b>Operate time</b>	AC: 20 ms max. DC: 30 ms max.
<b>Release time</b>	20 ms max. (40 ms max. for built-in Diode Relays)
<b>Max. operating frequency</b>	Mechanical: 18,000 operations/h Electrical: 1,800 operations/h (under rated load)
<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	2,500 VAC 50/60 Hz for 1 min between coil and contacts 1,000 VAC 50/60 Hz for 1 min between contacts of same polarity and terminals of the same polarity 2,500 VAC 50/60 Hz for 1 min between current-carrying parts, non-current-carrying parts, and opposite polarity
<b>Insulation method</b>	Basic insulation
<b>Impulse withstand voltage</b>	4.5 kV between coil and contacts (with 1.2 × 50 μs impulse wave) 3.0 kV between contacts of different polarity (with 1.2 × 50 μs impulse wave)
<b>Pollution degree</b>	3
<b>Rated insulation voltage</b>	250 V
<b>Vibration resistance</b>	Destruction: 10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 0.5-mm single amplitude (1.0-mm double amplitude)
<b>Shock resistance</b>	Destruction: 1,000 m/s <sup>2</sup> (approx. 100 G) Malfunction: 100 m/s <sup>2</sup> (approx. 10 G)
<b>Endurance</b>	Mechanical: 5,000,000 operations min. (at 18,000 operations/h under rated load) Electrical: 100,000 operations h. (at 1,800 operations/h under rated load)
<b>Failure rate P level (reference value)</b>	10 mA at 1 VDC
<b>Ambient temperature</b>	Operating: -40 to 60°C (with no icing or condensation)
<b>Ambient humidity</b>	Operating: 5% to 85%
<b>Weight</b>	Approx. 90 g

**Note:** 1. The values given above are initial values.  
2. P level:  $\lambda_{60} = 0.1 \times 10^{-6}$ /operation  
3. Ambient temperature of models with LED indicator is -25 to 60°C.

## Approved Standards

**UL508 (File No. E41515)** 

Coil ratings	Contact ratings	Operations
6 to 110 VDC 6 to 240 VAC	N.O. contact 10 A, 250 V AC 50/60 Hz (Resistive) 10 A, 30 V DC (Resistive) 7 A, 250 V AC 50/60 Hz (General Use)	100,000
	N.C. contact 10 A, 250 V AC 50/60 Hz (Resistive) 10 A, 30 V DC (Resistive) 7 A, 250 V AC 50/60 Hz (General Use)	100,000

**CSA Standard: CSA C22.2 No. 14 (File No. LR35535)** 

Coil ratings	Number of Poles	Contact ratings	Operations
6 to 125 VDC 6 to 240 VAC	2	10 A, 250 V AC (Resistive) 10 A, 30 V DC (Resistive) 7 A, 250 V AC (General Use)	100,000
	3	10 A, 250 V AC (Resistive) Same Polarity 10 A, 30 V DC (Resistive) Same Polarity 7 A, 250 V AC (General Use) Same Polarity	100,000

**IEC Standard/TÜV Certification: IEC61810-1**  
(Certification No. R50104853) 

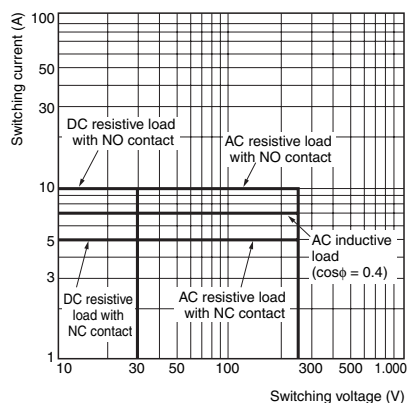
Coil ratings	Contact ratings	Operations
6, 12, 24, 48, 100, 110 VDC 6, 12, 24, 100, 110, 200, 220, 240 VAC	N.O. contact 10 A, 250 V AC 50/60 Hz (Resistive) 10 A, 30 V DC (Resistive) 7 A, 250 V AC 50/60 Hz (General Use)	100,000
	N.C. contact 5 A, 250 V AC 50/60 Hz (Resistive) 5 A, 30 V DC (Resistive) 7 A, 250 V AC 50/60 Hz (General Use)	100,000

**Note:** When Relays are mounted on the PF083A-E or PF113A-E, the maximum carrying current is 9 A.

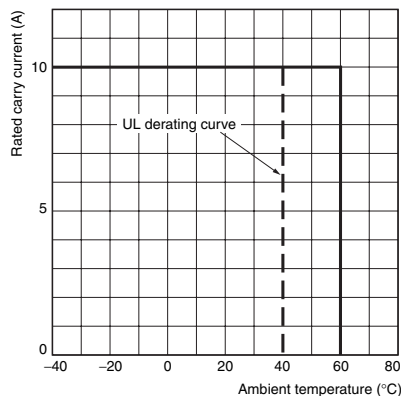
## Engineering Data

### Reference Data

#### Maximum Switching Power



#### Rated Carry Current vs. Ambient Rated Temperature



**Note:** The lower limit of the ambient operating temperature for models with built-in operation indicators is -25°C.