

Three-pole Relays

Rated voltage		Rated current		Coil resistance	Coil inductance (reference value)		Must operate voltage	Must release voltage	Max. voltage	Power consum. (approx)
		50 Hz	60 Hz		Arm. OFF	Arm. ON				
AC	6 V	310 mA	270 mA	6.7 Ω	0.03 H	0.05 H	80% max.	30% min.	110%	1.6 to 2.0 VA (60 Hz)
	12 V	159 mA	134 mA	24 Ω	0.12 H	0.21 H				
	24 V	80 mA	67 mA	100 Ω	0.44 H	0.79 H				
	50 V	38 mA	33 mA	410 Ω	2.24 H	3.87 H				
	100/110 V	14.1/16 mA	12.4/13.7 mA	2,300 Ω	10.5 H	18.5 H				
	200/220 V	9.0/10.0 mA	7.7/8.5 mA	8,650 Ω	34.8 H	59.5 H				
DC	6 V	234 mA		25.7 Ω	0.11 H	0.21 H	80% max.	10% min.	110%	1.4 W
	12 V	112 mA		107 Ω	0.45 H	0.98 H				
	24 V	58.6 mA		410 Ω	1.89 H	3.87 H				
	48 V	28.2 mA		1,700 Ω	8.53 H	13.9 H				
	100/110 V	12.7/13 mA		8,500 Ω	29.6 H	54.3 H				

Note: See notes under next table.

Four-pole Relays

Rated voltage		Rated current		Coil resistance	Coil inductance (reference value)		Must operate voltage	Must release voltage	Max. voltage	Power consum. (approx)
		50 Hz	60 Hz		Arm. OFF	Arm. ON				
AC	6 V	386 mA	330 mA	5 Ω	0.02 H	0.04 H	80% max.	30% min.	110%	1.95 to 2.5 VA (60 Hz)
	12 V	199 mA	170 mA	20 Ω	0.10 H	0.17 H				
	24 V	93.6 mA	80 mA	78 Ω	0.38 H	0.67 H				
	50 V	46.8 mA	40 mA	350 Ω	1.74 H	2.88 H				
	100/110 V	22.5/25.5 mA	19/21.8 mA	1,600 Ω	10.5 H	17.3 H				
	200/220 V	11.5/13.1 mA	9.8/11.2 mA	6,700 Ω	33.1 H	57.9 H				
DC	6 V	240 mA		25 Ω	0.09 H	0.21 H	80% max.	10% min.	110%	1.5 W
	12 V	120 mA		100 Ω	0.39 H	0.84 H				
	24 V	69 mA		350 Ω	1.41 H	2.91 H				
	48 V	30 mA		1,600 Ω	6.39 H	13.6 H				
	100/110 V	15/15.9 mA		6,900 Ω	32 H	63.7 H				

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15%/–20% for rated currents and ±15% for DC coil resistance.

2. Performance characteristic data are measured at a coil temperatures of 23°C.

3. AC coil resistance and impedance are provided as reference values (at 60 Hz).

4. Power consumption drop was measured for the above data. When driving transistors, check leakage current and connect a bleeder resistor if required.

■ Contact Ratings

Relay	Single contact				Bifurcated contacts	
	1-pole		2-, 3- or 4-pole		2-pole	
Load	Resistive load ($\cos\phi = 1$)	Inductive load ($\cos\phi=0.4$, L/R=7 ms)	Resistive load ($\cos\phi = 1$)	Inductive load ($\cos\phi=0.4$, L/R=7 ms)	Resistive load ($\cos\phi = 1$)	Inductive load ($\cos\phi=0.4$, L/R=7 ms)
Rated load	110 VAC 15 A 24 VDC 15 A	110 VAC 10 A 24 VDC 7 A	110 VAC 10 A 24 VDC 10 A	110 VAC 7.5 A 24 VDC 5 A	110 VAC 5A 24 VDC 5 A	110 VAC 4 A 24 VDC 4A
Rated carry current	15 A		10 A		7 A	
Max. switching voltage	250 VAC 125 VDC		250 VAC 125 VDC		250 VAC 125 VDC	
Max. switching current	15 A		10 A		7 A	
Max. switching power	1,700 VA 360 W	1,100 VA 170 W	1,100 VA 240 W	825 VA 120 W	550 VA 120 W	440 VA 100 W
Failure rate (reference value)*	100 mA, 5 VDC		100 mA, 5 VDC		10 mA, 5 VDC	

*Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$ /operation, reference value

■ Characteristics

Item	All except Relays with bifurcated contacts	Relays with bifurcated contacts
Contact resistance	50 mΩ max.	
Operate time	25 ms max.	
Release time	25 ms max.	
Max. operating frequency	Mechanical: 18,000 operations/hr Electrical: 1,800 operations/hr (under rated load)	
Insulation resistance	100 MΩ min. (at 500 VDC)	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity 2,000 VAC, 50/60 Hz for 1 min between contacts of different polarity	
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.5 mm single amplitude (1.0 mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 0.5 mm single amplitude (1.0 mm double amplitude)	
Shock resistance	Destruction: 1,000 m/s ² Malfunction: 200 m/s ²	
Endurance	Mechanical: AC: 50,000,000 operations min. (at 18,000 operations/hr) DC: 1,00,000,000 operations min. (at 18,000 operations/hr) Electrical: Single-, three-, and four-pole: 200,000 operations min. (at 1,800 operations/hr under rated load) Double-pole: 500,000 operations min. (at 1,800 operations/hr under rated load)	
Ambient temperature*	Operating: Single- and double-pole standard, bifurcated-contact Relays: -25°C to 55°C (with no icing) (-25°C to 70°C if carry current is 4 A or less) All other Relays: -25°C to 40°C (with no icing) (-25°C to 55°C if carry current is 4 A or less)	
Ambient humidity	Operating: 5% to 85%	
Weight	Single- and double-pole: approx. 40 g, three-pole: approx. 50 g, four-pole: approx. 70 g	

Note: 1. The values given above are initial values.

2. The upper limit of 40°C for some Relays is because of the relationship between diode junction temperature and the element used.