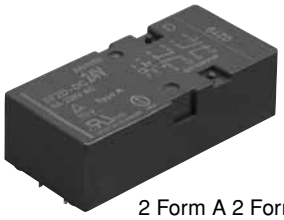
Panasonic
ideas for life

Flat type safety relays (double contact)

SF RELAYS
Double contact type



2 Form A 2 Form B

4 Form A 4 Form B

RoHS compliant

FEATURES

1. High contact reliability
High contact reliability is achieved through the use of a double contact.

2. Forced operation contacts
N.O. and N.C. side contacts are connected through a card so that one interacts with the other in movement. In case of a contact welding, the other keeps a min. 0.5mm .020inch contact gap.

3. Independent operation contacts (4 Form A 4 Form B)
There are 4 points of forced operation contacts.
Each pair of contacts is free from the main armature and is independent from each other. So if a N.O. pair of contacts are welded, the other 3 N.O. contacts are not effected (operate properly) That enables to plan a circuit to detect welding or go back to the beginning condition.

4. Separated chamber structure
N.O. and N.C. side contacts are put in each own space surrounded with a card and a body-separater. That prevents short circuit between contacts, which is caused by their springs welding or damaged.

5. High breakdown voltage
High breakdown voltage 2,500 Vrms between contacts and coil.

6. High sensitivity
Realizes thin shape and high sensitivity (500 mW nominal operating power) by utilizing high-efficiency polarized magnetic circuit with 4-gap balanced armature.

7. Complies with safety standards
Standard products are UL, CSA, TÜV and SEV certified. Conform to European standards. TÜV certified. Complies with SUVA European standard.

TYPICAL APPLICATIONS

1. Industrial equipment such as presses and machine tools
2. Elevators and other kinds of hoisting mechanisms, conveyor equipment.

ORDERING INFORMATION

SF [ ] **D** - [ ]

Contact arrangement
2: 2 Form A 2 Form B
4: 4 Form A 4 Form B

Nominal coil voltage
DC 5, 12, 24, 48, 60V

Note: Certified by UL, CSA, TÜV and SEV

TYPES

Contact arrangement	Nominal coil voltage	Part No.
2 Form A 2 Form B	5V DC	SF2D-DC5V
	12V DC	SF2D-DC12V
	24V DC	SF2D-DC24V
	48V DC	SF2D-DC48V
	60V DC	SF2D-DC60V
4 Form A 4 Form B	5V DC	SF4D-DC5V
	12V DC	SF4D-DC12V
	24V DC	SF4D-DC24V
	48V DC	SF4D-DC48V
	60V DC	SF4D-DC60V

Standard packing: Carton: 20 pcs.; Case: 200 pcs.

RATING

1. Coil data

Contact arrangement	Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal coil current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power (at 20°C 68°F)	Max. applied voltage (at 20°C 68°F)
2 Form A 2 Form B	5V DC	75%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	100mA	50Ω	500mW	120%V of nominal voltage
	12V DC			41.7mA	288Ω		
	24V DC			20.8mA	1,152Ω		
	48V DC			10.4mA	4,608Ω		
	60V DC			8.3mA	7,200Ω		
4 Form A 4 Form B	5V DC	75%V or less of nominal voltage (Initial)	15%V or more of nominal voltage (Initial)	100mA	50Ω	500mW	
	12V DC			41.7mA	288Ω		
	24V DC			20.8mA	1,152Ω		
	48V DC			10.4mA	4,608Ω		
	60V DC			8.3mA	7,200Ω		

2. Specifications

Characteristics	Item		Specifications	
Contact	Arrangement		2 Form A 2 Form B	4 Form A 4 Form B
	Contact resistance (Initial)		Max. 30 mΩ (By voltage drop 6 V DC 1A)	
	Contact material		Au-flashed $AgSnO_2$ type	
Rating	Nominal switching capacity (resistive load)		6A 250V AC, 6A 30V DC	
	Max. switching power (resistive load)		1,500VA 180W	
	Max. switching voltage		440V AC, 30V DC	
	Max. switching current		6A	
	Nominal operating power		500mW	
	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	1,300 Vrms for 1min. (Detection current: 10mA)	
		Between contact sets	2,500 Vrms for 1min. (Detection current: 10mA)	
		Between contact and coil	2,500 Vrms for 1min. (Detection current: 10mA)	
	Temperature rise (coil) (at 20° 68°F)		Max. 45°C 113°F (By resistive method, nominal voltage applied to the coil; contact carrying current: 6A)	
	Operate time		Max. 30ms (Nominal voltage applied to the coil, excluding contact bounce time.)	
	Release time		Max. 15ms (Nominal voltage applied to the coil, excluding contact bounce time.) (without diode)	
Mechanical characteristics	Shock resistance	Functional	Min. 294 m/s² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs)	
		Destructive	Min. 980 m/s² (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 2 mm	
Expected life	Mechanical		Min. 10^7 (at 180 times/min.)	
	Electrical		Min. 10^5 (at 20 times/min.)	
Conditions	Conditions for operation, transport and storage*2		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		180 times/min.	
Unit weight			Approx. 38g 1.34oz	Approx. 47g 1.66oz

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. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.