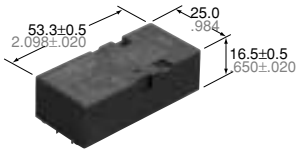
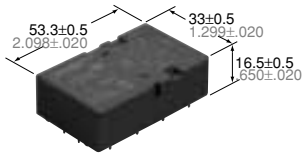
Panasonic
ideas for life

POLARIZED, MONOSTABLE SAFETY RELAY

SF RELAYS
Double contact



2 Form A 2 Form B



4 Form A 4 Form B

mm inch

FEATURES

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

• Forced operation contacts (2 Form A 2 Form B)
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.

• 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.

• Separated chamber structure (2 Form A 2 Form B, 4 Form A 4 Form B)
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.

• High breakdown voltage 2,500 Vrms between contacts and coil

• 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.

• Complies with safety standards
Standard products are UL, CSA, TÜV and SEV certified. Comform to European standards. TÜV certified (945/EL, 178/88). Complies with SUVA European standard.

SPECIFICATIONS

Contact

		2 Form A 2 Form B	4 Form A 4 Form B
Contact arrangement			
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		30 mΩ	
Contact material		Gold-flashed silver alloy	
Rating (resistive)	Nominal switching capacity	6 A 250 V AC, 6 A 30 V DC	
	Max. switching power	1,500 VA, 180 W	
	Max. switching voltage	440 V AC, 30 V DC	
	Max. carrying current	6 A	
Expected life (min. operations)	Mechanical (at 180 cpm)	10^7	
	Electrical (at 20 cpm)	10^5	

Coil

Nominal operating power	500 mW

Remarks
* Specifications will vary with foreign standards certification ratings.
*1 Measurement at same location as "Initial breakdown voltage" section
*2 Detection current: 10mA
*3 Excluding contact bounce time
*4 Half-wave pulse of sine wave: 11ms; detection time: 10µs
*5 Half-wave pulse of sine wave: 6ms
*6 Detection time: 10µs
*7 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

Characteristics (at 20°C 68°F)

			2 Form A 2 Form B	4 Form A 4 Form B
Contact arrangement				
Max. operating speed			180 cpm (at nominal voltage)	
Initial insulation resistance*1			Min. 1,000 MΩ at 500 V DC	
Initial breakdown voltage*2	Between open contacts		1,300 Vrms	
	Between contact sets		2,500 Vrms	
	Between contact and coil		2,500 Vrms	
Operate time*3 (at nominal voltage)			Max. 30 ms	
Release time (without diode)*3 (at nominal voltage)			Max. 15 ms	
Temperature rise (at nominal voltage) (at 20°C)			Max. 45°C with nominal coil voltage and at 6 A carry current	
Shock resistance	Functional*4		Min. 294 m/s² {30 G}	
	Destructive*5		Min. 980 m/s² {100 G}	
Vibration resistance	Functional*6		10 to 55 Hz at double amplitude of 2 mm	
	Destructive		10 to 55 Hz at double amplitude of 2 mm	
Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature)		Ambient temp.	–40°C to +70°C –40°F to +158°F	
		Humidity	5 to 85% R.H.	
Unit weight			Approx. 38 g 1.34 oz	Approx. 47 g 1.66 oz

ORDERING INFORMATION

Ex. SF [2] [D] — [DC 5 V]

Contact arrangement	Coil voltage
2: 2 Form A 2 Form B 4: 4 Form A 4 Form B	DC 5, 12, 24, 48, 60 V

UL/CSA, TÜV, SEV approved type is standard

TYPICAL APPLICATIONS

- **Industrial equipment such as presses and machine tools**

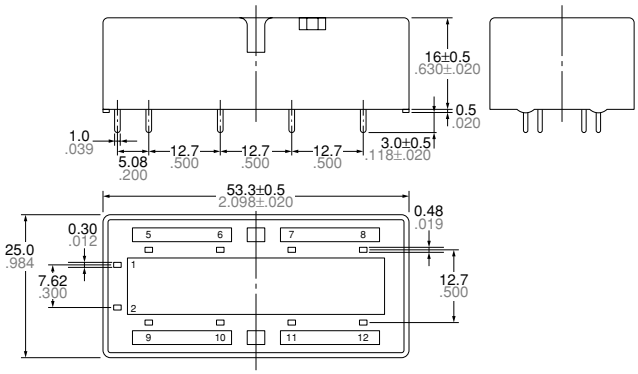
TYPES AND COIL DATA (at 20°C 68°F)

Contact arrangement	Part No.	Nominal voltage, V DC	Pick-up voltage, VDC (max.)	Drop-out voltage, V DC (min.)	Coil resistance Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
2 Form A 2 Form B	SF2D-DC5V	5	3.75	0.5	50	100	500	6
	SF2D-DC12V	12	9	1.2	288	41.7	500	14.4
	SF2D-DC24V	24	18	2.4	1.152	20.8	500	28.8
	SF2D-DC48V	48	36	4.8	4.608	10.4	500	57.6
	SF2D-DC60V	60	45	6.0	7.200	8.3	500	72
4 Form A 4 Form B	SF4D-DC5V	5	3.75	0.75	50	100	500	6
	SF4D-DC12V	12	9	1.8	288	41.7	500	14.4
	SF4D-DC24V	24	18	3.6	1.152	20.8	500	28.8
	SF4D-DC48V	48	36	7.2	4.608	10.4	500	57.6
	SF4D-DC60V	60	45	9.0	7.200	8.3	500	72

DIMENSIONS

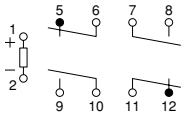
mm inch

1. 2 Form A 2 Form B

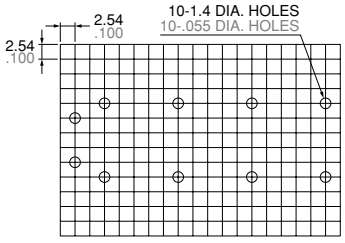


General tolerance: ±0.3 ±.012

Schematic (Bottom view)

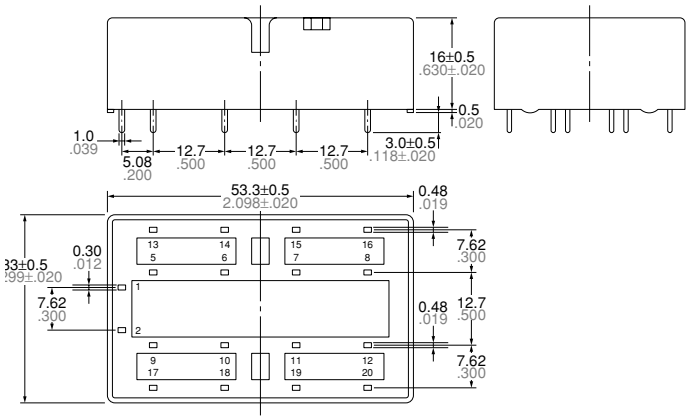


PC board pattern (Bottom view)



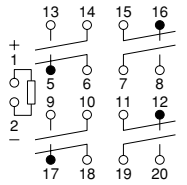
Tolerance: ±0.1 ±.004

2. 4 Form A 4 Form B

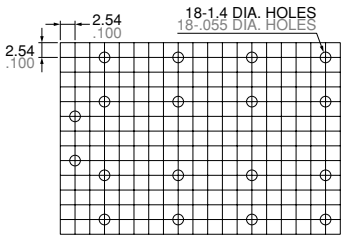


General tolerance: ±0.3 ±.012

Schematic (Bottom view)



PC board pattern (Bottom view)



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