

2c 15A, 4c 10A polarized power relays

Taking advantage of the 4-gap balanced armature mechanism, S relays have met a number of relay needs and earned a reputation for the characteristics that they provide. Building on the same structure, the SP relay was introduced as a highsensitivity power relay to provide nominal operating power of 300 mW and minimum operating power of 150 mW (single side stable and 2 coil latching types). Even so, with the nominal switching capacity for the 2 Form C at 15 A, and for the 4 Form C at 10 A, highcapacity switching is possible with small input. Moreover, taking full advantage of the excellence of the 4-gap balanced armature mechanism, we have realized a small. slim form factor that also has superior resistance to vibration and shock. This power relay is often chosen for NC machines and electrical power remote monitoring control panels, and for power supplies used in computers and other equipment. The SP also often provides power control for high-end business and industrial equipment.

SP RELAYS

FEATURES

1. Small, slim form factor Facilitating the form factor reduction of devices, the overall height of the relay package is less than half that of our HP relay.

2. High sensitivity

The high-efficiency polarized electromagnetic mechanism in conjunction with our exclusive spring alignment method achieves levels of sensitivity higher than relays that have been available up to now. For both the 2 Form C and 4 Form C single side stable and 2 coil latching types, the 150 mW minimum operating power level allows direct driving by transistor or chip controllers.

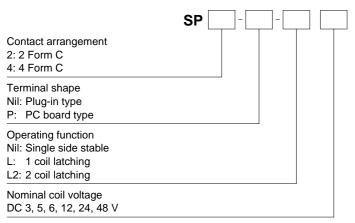
- **3. High reliability and long life** With a structure that ensures almost perfectly complete twin contact and minimal contact bounce, you get greater reliability than has so far been provided by power relays.
- 4. Latching types also available 1 coil latching and 2 coil latching types are available. In cases where it was formerly unavoidable to use plural relays for large power memory, you can now use a single SP relay.
- 5. Strong resistance to vibration and shock

Our balanced armature technology well withstands vibration and shocks. It provides strong resistance to vibration and shock.

6. Terminals and mounting boards are available.

RoHS compliant

ORDERING INFORMATION



Notes: 1. PC board type and 1 coil latching type are manufactured by lot upon receipt of order. 2. Certified by UL, CSA and TÜV

SP **TYPES**

0	Newsia et a situation a	Single side stable	2 coil latching		
Contact arrangement	Nominal coil voltage	Part No.	Part No.		
	3V DC	SP2-DC3V	SP2-L2-DC3V		
	5V DC	SP2-DC5V	SP2-L2-DC5V		
2 Form C	6V DC	SP2-DC6V	SP2-L2-DC6V		
2 FOITING	12V DC	SP2-DC12V	SP2-L2-DC12V		
	24V DC	SP2-DC24V	SP2-L2-DC24V		
	48V DC	SP2-DC48V	SP2-L2-DC48V		
	3V DC	SP4-DC3V	SP4-L2-DC3V		
	5V DC	SP4-DC5V	SP4-L2-DC5V		
4 Form C	6V DC	SP4-DC6V	SP4-L2-DC6V		
	12V DC	SP4-DC12V	SP4-L2-DC12V		
	24V DC	SP4-DC24V	SP4-L2-DC24V		
	48V DC	SP4-DC48V	SP4-L2-DC48V		

Standard packing (2 Form C): Carton: 20 pcs.; Case: 200 pcs. Standard packing (4 Form C): Carton: 10 pcs.; Case: 100 pcs. Note: PC board type and 1 coil latching type are manufactured by lot upon receipt of order.

* For terminal sockets and mounting boards sockets, see page 152 and 153.

RATING

1. Coil data

1) Single side stable

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
3V DC			100mA	30Ω		
5V DC			60.2mA	83Ω		
6V DC	70%V or less of	10%V or more of	50mA	120Ω	300mW	150%V of
12V DC	nominal voltage (Initial)	nominal voltage (Initial)	25mA	480Ω	3001100	nominal voltage
24V DC	((12.5mA	1,920Ω		
48V DC			6.2mA	7,700Ω		

2) 2 coil latching

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	cur	operating rent 20°C 68°F)		sistance 20°C 68°F)		operating wer	Max. applied voltage
-			Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
3V DC	70%V or less of nominal voltage (Initial)	70%V or less of nominal voltage (Initial)	100mA	100mA	30Ω	30Ω	300mW	300mW	150%V of nominal voltage
5V DC			60.2mA	60.2mA	83Ω	83Ω			
6V DC			50mA	50mA	120Ω	120Ω			
12V DC			25mA	25mA	480Ω	480Ω			
24V DC			12.5mA	12.5mA	1,920Ω	1,920Ω			
48V DC			6.2mA	6.2mA	7,680Ω	7,680Ω			

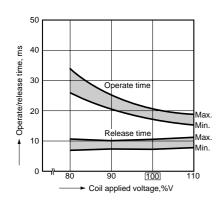
Characteristics		Item	Specifications			
	Initial contact pressure		2 Form C: Approx. 0.392 N (40 g 1.41 oz), 4 Form C: Approx. 0.196 N (20 g 0.71 oz)			
Contact	Arrangement		2 Form C, 4 Form C			
	Contact resistance (Initial)		Max. 30 mΩ (By voltage drop 6 V DC 1A)			
	Contact material		Stationary contact: Au flashed AgSnO2 type, Movable contact: AgSnO2 type			
	Nominal switching capacity (resistive load)		2 Form C: 15 A 250 V AC, 4 Form C: 10 A 250 V AC			
	Max. switching powe	r (resistive load)	2 Form C: 3,750 VA, 300 W, 4 Form C: 2,500 VA, 300 W			
	Max. switching voltage	je	2 Form C, 4 Form C: 250 V AC, 30 V DC (48V DC: Max. 2A)			
ating	Max. switching current	nt	2 Form C: 15 A (AC) 10 A (DC), 4 Form C: 10 A			
	Minimum operating p	ower	150mW (Single side stable, 2 coil latching)			
	Nominal operating po	ower	300mW (Single side stable, 2 coil latching)			
	Min. switching capac	ity (Reference value)*1	100 mA 5V DC			
	Insulation resistance (Initial) (25°C, 50% relative humidity)		Min. 1,000M Ω (at 500V DC) Measurement at same location as "Breakdown voltage" section.			
	Breakdown voltage (Initial)	Between open contacts	1,500 Vrms for 1 min. (Detection current: 10 mA)			
		Between contact and coil	3,000 Vrms for 1 min. (Detection current: 10 mA)			
lectrical		Between contact sets	3,000 Vrms for 1 min. (Detection current: 10 mA)			
haracteristics	Operate time [Set time] (at 20°C 68°F)		Max. 30 ms [Max. 30 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time.)			
	Release time [Reset time] (at 20°C 68°F)		Max. 20 ms [Max. 30 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode			
	Temperature rise (coil) (at 20°C 68°F)		Max. 40°C (By resistive method, nominal voltage applied to the coil; nominal switching capacity.)			
	Charle registeres	Functional	Min. 392 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10µs.)			
lechanical	Shock resistance	Destructive	Min. 980 m/s ² (Half-wave pulse of sine wave: 6 ms.)			
haracteristics		Functional	10 to 55 Hz at double amplitude of 3 mm (Detection time: 10µs.)			
	Vibration resistance	Destructive	10 to 55 Hz at double amplitude of 3 mm			
	Mechanical		Min. 5×107 (at 180 times/min.)			
Expected life	Electrical (resistive load)		2 Form C: Min. 10 ⁵ (15 A 250 V AC [at 20 times/min.]), Min. 10 ⁵ (10 A 30 V DC [at 20 times/min.]) 4 Form C: Min. 10 ⁵ (15 A 250 V AC [at 20 times/min.]), Min. 10 ⁵ (10 A 30 V DC [at 20 times/min.])			
Conditions	Conditions for operation, transport and storage*2		Ambient temperature: -50°C to +60°C -58°F to +140°F; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)			
	Max. operating speed	t de la constante de la consta	20 times/min. (at rated load)			
Jnit weight			2 Form C: 50 g 1.76 oz; 4 Form C: 65 g 2.29 oz			

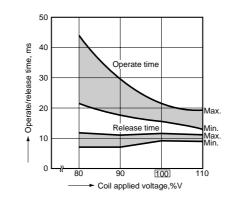
Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

*2. 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.

REFERENCE DATA

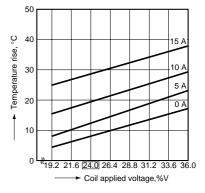
Operate and release time (Single side stable) SP2



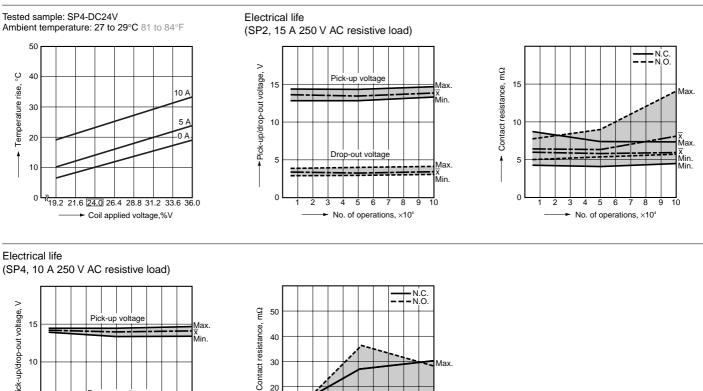


SP4

Coil temperature rise Tested sample: SP2-DC24V Ambient temperature: 20 to 22°C 68 to 72°F



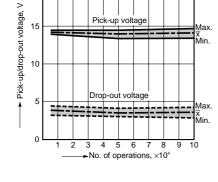




Max.

10

The CAD data of the products with a CAD Data mark can be downloaded from: http://industrial.panasonic.com/ac/e/



. Min

30

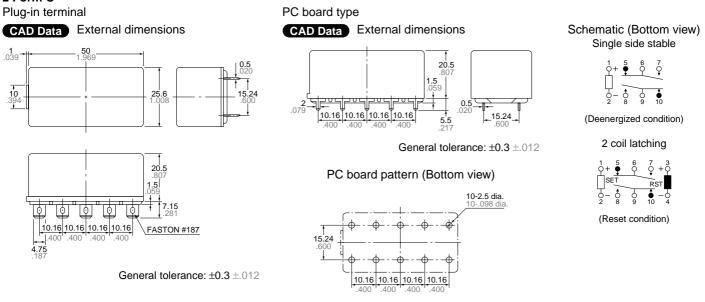
20

10

0

DIMENSIONS (mm inch)

2 Form C



5

No. of operations, ×10

8

Tolerance: ±0.1 ±.004

Diagram shows the "reset" position when terminals 3 and 4 are energized. Energize terminals 1 and 2 to transfer contacts.

4 Form C

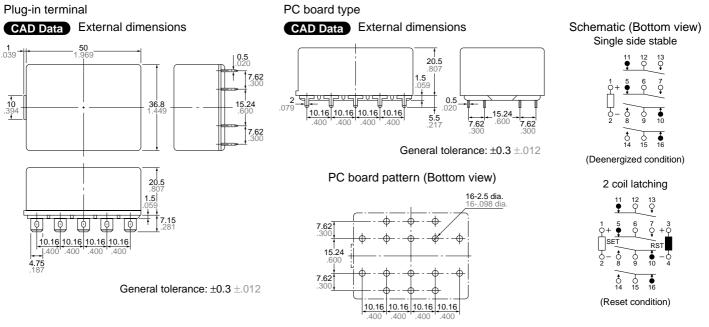


Diagram shows the "reset" position when terminals 3 and 4 are energized. Energize terminals 1 and 2 to transfer contacts.

SAFETY STANDARDS

Item		UL/C-UL (Recognized)		CSA (Certified)		TÜV (Certified)	
	File No.	Contact rating	File No.	Contact rating	File No.	Rating	
2 Form C	E43028	15A 250V AC ¹ / ₂ HP 125, 250V AC 10A 30V DC	LR26550 etc.	15A 250V AC 1/2HP 125, 250V AC 10A 30V DC	B 0303 13461 010	15A 250V AC (cos <i>φ</i> =1.0) 10A 30V DC	
4 Form C	E43028	10A 250V AC ¹ / ₃ HP 125, 250V AC 10A 30V DC	LR26550 etc.	10A 250V AC 1/3HP 125, 250V AC 10A 30V DC	B 0303 13461 010	10A 250V AC (cos <i>φ</i> =1.0) 10A 30V DC	

Tolerance: ±0.1 ±.004

For Cautions for Use.