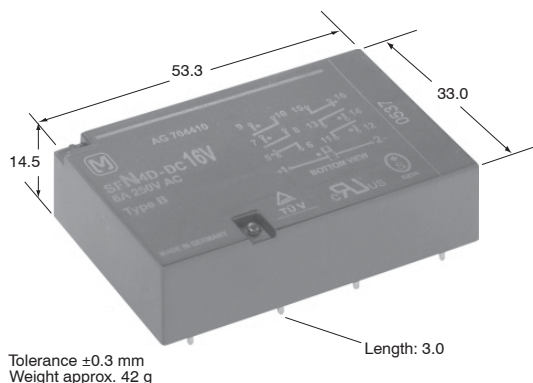


**Panasonic**  
ideas for life

**LOW PROFILE  
SAFETY RELAY  
WITH FORCIBLY GUIDED  
CONTACTS**

**SFN4D  
RELAY**



### Features

- Relay complies with EN 50205, Type B
- Polarized magnet system with snap action function
- Extremely small total power loss
  - Nominal coil power consumption of 390mW
  - Double contacts with low contact resistance, e.g.  $[(6A)^2 \times 2.5m\Omega] \times 4NO = 360mW$
- Relay height, 14.5mm
- Reinforced insulation according to EN 50178
  - between coil-contacts and contacts-contacts
  - rated voltage of the circuits 230 / 400V or 277 / 480Vrms
  - rated impulse voltage of 6kV → clearance ≥ 5.5 mm
  - pollution degree 2 → creepage distance ≥ 5.5mm

## SPECIFICATIONS

### Contact

Contact configuration (a = normally open / NO, b = normally closed / NC)	4a2b
Contact material	AgSnO <sub>2</sub> , with Au flash
Contact resistance (initial at 6V DC, 1A)	≤30mΩ
Typical contact resistance	2.5mΩ
Max. switching capacity	6A/8A* <sup>1</sup> 250V AC
Max. switching voltage	500V AC / DC
Min. switching voltage / min. switching current	Reference 10V / 10mA
Pick-up / drop-out / bounce time (approx. values at U <sub>nominal</sub> )	23 / 6* <sup>2</sup> / 2ms
Mechanical life	10 <sup>7</sup> ops

### Coil

Operate / release and holding at 20°C (% of U <sub>nominal</sub> )* <sup>3</sup>	75% / 25% min. 48%
Pick-up/nominal power consumption	219-236 / 390-420mW

### Characteristics

Max. switching frequency (without load)	5Hz
Permissible ambient temperature at nominal power consumption* <sup>3</sup>	-25°C to 92°C
Upper temperature limit	105°C
Test voltage: open contact / contact-contact / contact-coil	2500 / 4000 / 5000V <sub>rms</sub>
Insulation resistance at 500V DC (initial)	10 <sup>9</sup> Ω
Shock resistance (11ms) NO/NC* <sup>4</sup>	20 / 15G
Vibration resistance 10 – 200 Hz (10 – 55 Hz, amplitude 2 mm)* <sup>4</sup>	10G
Degree of protection	RT III* <sup>5</sup>
Unit weight	42g

#### Important: Relay characteristics may be influenced by:

- strong external magnetic fields
- magnetic conductive materials near the relay
- narrow top-to-top mounting (printed surface to printed surface)

\*1 See "ELECTRICAL LIFE (Reference Data)\*<sup>1</sup>" on page 2.

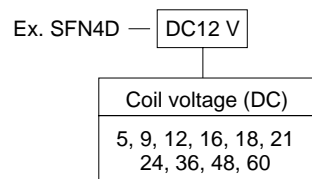
\*2 Without diode

\*3 See also "REFERENCE DATA" on page 3.

\*4 Contact interruption <10μs

\*5 According to EN 61810-1: 2004, table 2

## ORDERING INFORMATION



Notes: 1) Standard packing; Tube: 10 pcs. Case 100 pcs.  
2) Other coil voltage available upon request

# SFN4D

## COIL DATA (at 20°C)

Part number	Coil nominal voltage V DC	Operate voltage*1 V DC	Release voltage*1 V DC	Coil resistance $\Omega$ ( $\pm 10\%$ , 20°C)
SFN4D-DC5V	5	3.75	1.25	64.1
SFN4D-DC9V	9	6.75	2.25	207.7
SFN4D-DC12V	12	9.00	3.00	369.2
SFN4D-DC16V	16	12.00	4.00	656.4
SFN4D-DC18V	18	13.5	4.50	830.8
SFN4D-DC21V	21	15.75	5.25	1130.8
SFN4D-DC24V	24	18.00	6.00	1476.9
SFN4D-DC36V	36	27.00	9.00	3085.7
SFN4D-DC48V	48	36.00	12.00	5485.7
SFN4D-DC60V	60	45.00	15.00	8571.4

\*1 Operate and release voltage at different temperatures, see "REFERENCE DATA" on page 3, coil voltage characteristics.

## SWITCHING CAPABILITY

- Making / breaking capacities according to EN 60947-5-1: 2000, table 4 / 5; AC15: 6A 230V AC / DC13: 6A 24V DC
- Endurance / overload test according to UL 508 16 edition, sections 42 / 43; 6A 250V AC / 6A 24V DC; B300 / R300; File E120782

## ELECTRICAL LIFE (Reference Data)\*1

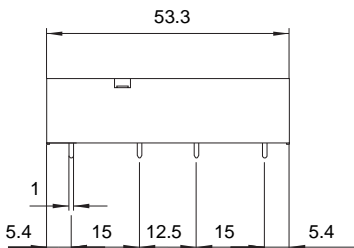
Voltage	Current (A)	Load type	Frequency	Duty cycle	No. of contacts	No. of ops.
230V AC	8	AC 1	0.25Hz	25%	4	85,000
230V AC	6	AC 1	0.25Hz	25%	4	200,000
230V AC	2.5	AC 1	0.25Hz	25%	4	1,500,000
230V AC	60 / 6	AC 15	0.20Hz	20%	3	40,000
24V DC	6	DC 1	0.25Hz	25%	4	2,000,000
250V DC	0.27	DC 13	0.10Hz	10%	4	>1,000,000*2

\*1 Test conditions: Room temperature, breathing hole closed, dielectric strength according to EN61810-1:2004.

\*2 Has to be confirmed

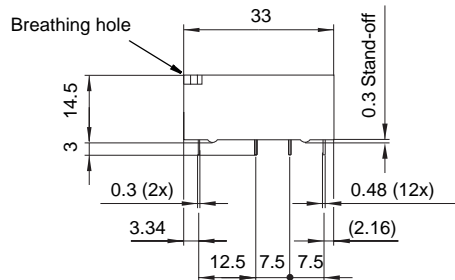
## DIMENSIONS

### Outer dimensions

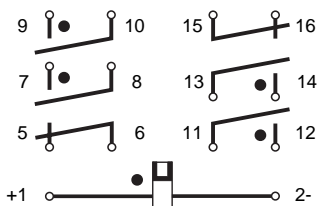


General tolerance:  $\pm 0.3$

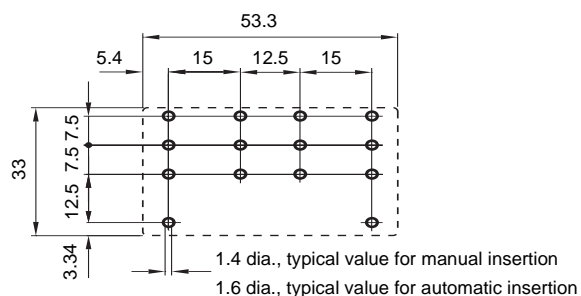
Projection mode:



### Schematic (Bottom view)

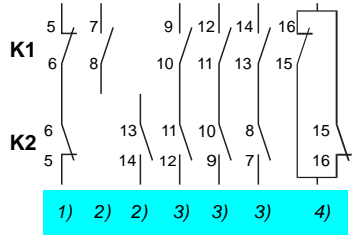
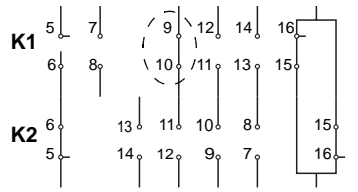
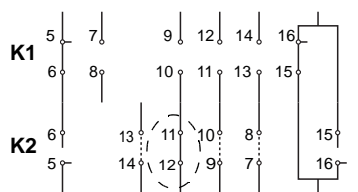
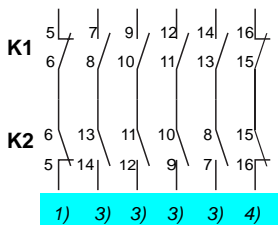
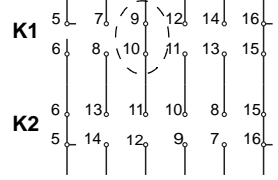
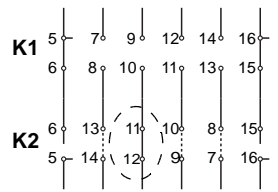
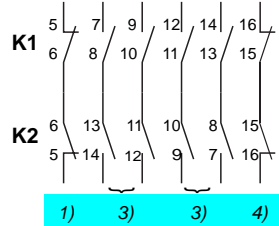
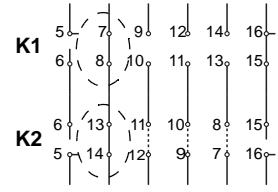


### PC board pattern (Bottom view)



Failure modes, application examples

1) Feedback loop, 2) Self-holding circuit, 3) Safety circuit, 4) Auxilliary contacts

<p>1. Self-holding circuit, three safety circuits</p> 	<p>One contact welded, e.g. NO 9-10 of K1.</p>	<p>Condition of contacts at deenergized coil</p> 
	<p>One contact welded, e.g. NO 12-11 of K2.</p>	<p>Condition of contacts at deenergized coil</p> 
<p>2.1. Four safety circuits</p>  <p>(see wiring example, p. 8)</p>	<p>One contact welded, e.g. NO 9-10 of K1.</p>	<p>Condition of contacts at deenergized coil</p> 
	<p>One contact welded, e.g. NO 12-11 of K2.</p>	<p>Condition of contacts at deenergized coil</p> 
<p>2.2. Two safety circuits</p>  <p>(see wiring example, p. 8)</p>	<p>Both contacts of one path are welded, e.g. NO 7-8 and NO 14-13.</p> <p>A safety circuit needs two paths in this failure mode. The contacts 9-10, 12-11, and 14-13 of K1 interrupt the load.</p>	<p>Condition of contacts at deenergized coil</p> 
	<p>Both contacts of one path are welded, e.g. NO 9-10 and NO 12-11.</p> <p>A safety circuit needs two paths in this failure mode. The contacts 7-8, 12-11, and 14-13 of K1 interrupt the load.</p>	<p>Condition of contacts at deenergized coil</p> 