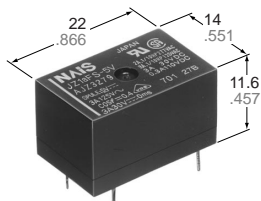


# NAIS

## SMALL SIZED POWER RELAY

# JZ-RELAYS



mm inch

**UL File No.: E43028**  
**CSA File No.: LR26550**

- **Small sized flat type: 22 × 14 × 11.6 mm .866 × .551 × .457 inch**
- **High dielectric withstanding: 10,000 V surge in μs between coil and contact**
- **High electrical noise immunity**
- **High sensitivity type available**

## SPECIFICATIONS

### Contact

Type	Standard type	High sensitivity type	Standard TV-5 type	TV-5 High sensitivity type		
Arrangement	1 Form A					
Contact material	Silver alloy					
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100 mΩ					
Rating (resistive)	Nominal switching capacity	5 A 125 V AC 5 A 30 V DC	5 A 125 V AC 3 A 30 V DC	8 A 125 V AC 5 A 30 V DC		
	Max. switching power	150 W, 750 VA	90 W, 500 VA	150 W, 1,000 VA		
	Max. switching voltage	250 V AC, 110 V DC (0.3 A)				
	Max. switching current	5 A	3 A	8 A		
UL/CSA rating	5A 125 V AC 3 A 277 V AC 1/10 HP 125, 277 V AC 5 A 30 V DC 0.3 A 110 V DC	3 A 125 V AC 2 a 277 V AC 1/10 HP 125, 277 V AC 3 A 30 V DC 0.3 A 110 V DC	8 A 125 V AC 5 A 277 V AC 1/6 HP 125, 277 V AC 5 A 30 V DC 0.3 A 110 V DC TV-5			
	VDE rating	5 A 125 V ~ (cosφ = 0.4) 5 A 30 V ...	3 A 125 V ~ (cosφ = 0.4) 3 A 30 V ...	5 A 125 V ~ (cosφ = 0.4) 5 A 30 V ...	—	
	Expected life (min. operations)	Mechanical (at 180 cpm)	5 × 10 <sup>6</sup>			
		Electrical (at 20 cpm)	10 <sup>5</sup> (5 A 125 V AC) 2×10 <sup>5</sup> (3 A 125 V AC)	2 × 10 <sup>5</sup> (at nominal operating capacity)	10 <sup>5</sup> (at nominal operating capacity)	10 <sup>5</sup> (at nominal operating capacity)

### Coil (at 20°C 68°F)

Standard type	Minimum operating power	196 mW
	Nominal operating power	400 mW
High sensitivity type	Minimum operating power	128 mW
	Nominal operating power	200 mW

### Characteristics (at 25°C 77°F, 50% Relative humidity)

Max. operating speed	20 cpm	
Initial insulation resistance	Min. 100 MΩ at 500 V DC	
Initial breakdown voltage*1	Between open contacts	750 Vrms for 1 min.
	Between contacts and coil	2,000 Vrms for 1 min.
Surge voltage between contact and coil*2	Min. 10,000 V	
Operate time*3 (at nominal voltage)	Approx. 4 ms	
Release time*3 (without diode) (at nominal voltage)	Approx. 2 ms	
Temperature rise (ambient temperature at 70°C)	Max. 45°C at max. switching current	
Shock resistance	Functional*4	Min. 98 m/s <sup>2</sup> {10 G}
	Destructive*5	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional*6	98 m/s <sup>2</sup> {10 G}, 10 to 55 Hz at double amplitude of 1.6 mm
	Destructive	117.6 m/s <sup>2</sup> {12 G}, 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. 7 g .25 oz	

### Remarks

- \*1 Detection current: 10mA
- \*2 Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981
- \*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 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 49)

## TYPICAL APPLICATIONS

- Microwave oven (fan, inside lamp)
- Machineries which need electrical noise resistance and surge resistance, (Ex. hot-water heater)

## ORDERING INFORMATION

Contact arrangement	Protective construction	Type classification	Coil voltage (DC)	Type classification
1a: 1 Form A	F: Flux-resistant type	Nil: Standard (400 mW) S: High sensitivity (200 mW)	5, 6, 9, 12, 18, 24 V	Nil: UL/CSA/VDE recognized type TV: TV-5 rated type

Note: Standard packing Carton: 50 pcs. Case: 500 pcs.

**TYPES AND COIL DATA** (at 20°C 68°F)

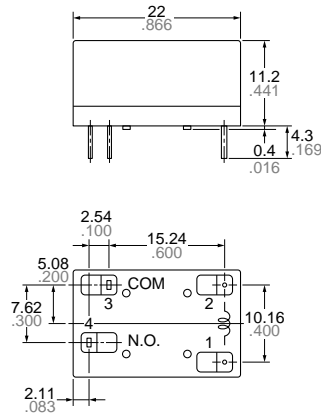
1) Standard type

Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, at 70°C, V DC
JZ1aF-5V	5	3.5	0.25	62.5	80	400	6
JZ1aF-6V	6	4.2	0.3	90	67	400	7.2
JZ1aF-9V	9	6.3	0.45	202	45	400	10.8
JZ1aF-12V	12	8.4	0.6	360	33	400	14.4
JZ1aF-18V	18	12.6	0.9	810	22	400	21.6
JZ1aF-24V	24	16.8	1.2	1,440	17	400	28.8

2) High sensitivity type

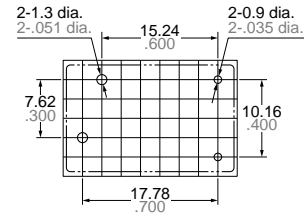
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, at 70°C, V DC
JZ1aFS-5V	5	4	0.25	125	40	200	6.5
JZ1aFS-6V	6	4.8	0.3	180	33	200	7.8
JZ1aFS-9V	9	7.2	0.45	404	22	200	11.7
JZ1aFS-12V	12	9.6	0.6	720	17	200	15.6
JZ1aFS-18V	18	14.4	0.9	1,620	11	200	23.4
JZ1aFS-24V	24	19.2	1.2	2,880	8.3	200	31.2

**DIMENSIONS**



General tolerance:  $\pm 0.3 \pm 0.012$

PC board pattern (Copper-side view) mm inch

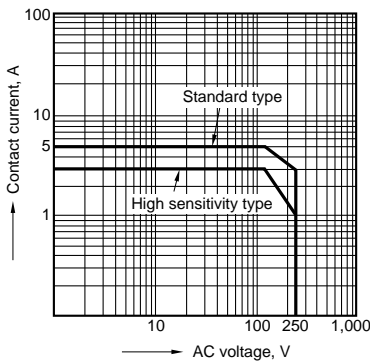


Tolerance:  $\pm 0.1 \pm 0.004$

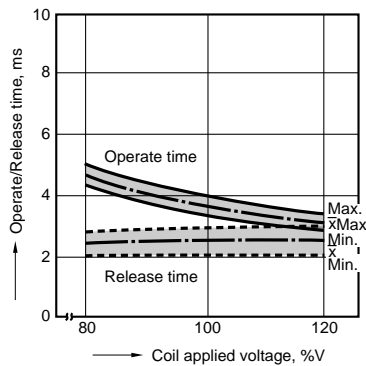
**REFERENCE DATA**

■ Not TV-5 rated type

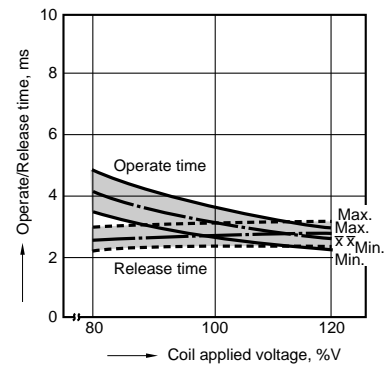
1. Max. switching power (AC resistive load)



2.-(1) Operate/Release time (Standard type)

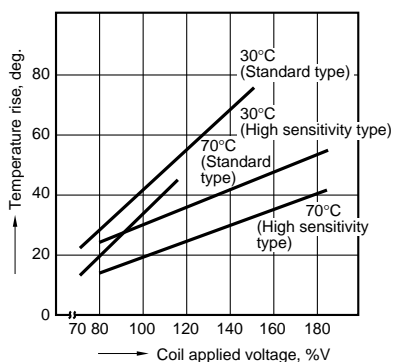


2.-(2) Operate/Release time (High sensitivity type)



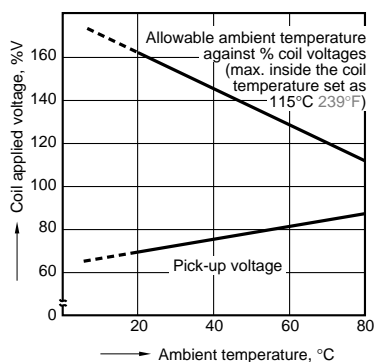
3. Coil temperature rise

Point measured: Coil inside  
Contact current: 3 A



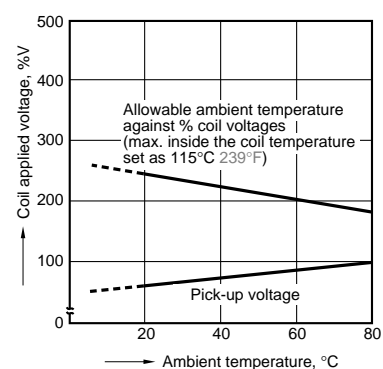
4.-(1) Ambient temperature vs. coil applied voltage (Standard type)

Contact current: 1 A



4.-(2) Ambient temperature vs. coil applied voltage (High sensitivity type)

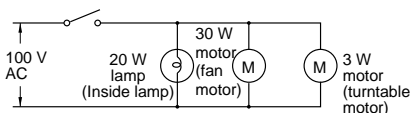
Contact current: 1 A



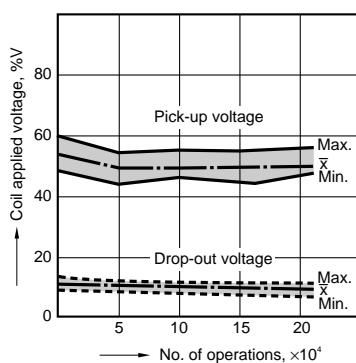
5. Electrical life (load test: fan motor, turntable motor and inside lamp of microwave oven)

Tested sample: JZ1aFS-24V, 6 pcs.  
Load: 100 V AC 0.5 A; Rush current: 2.5 A  
Operation frequency: 4 times/min.  
(ON:OFF = 3s:12s)  
With coil diode protection  
Ambient temperature: 70°C 158°F

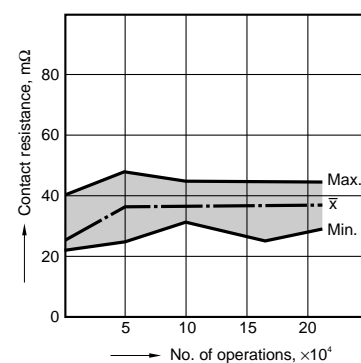
Circuit



Change of pick-up and drop-out voltage

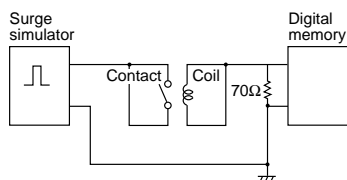


Change of contact resistance

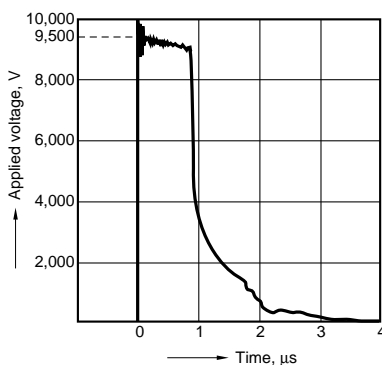


6. Noise resistance

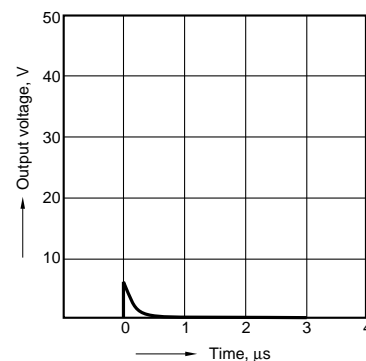
Tested sample: JZ1aFS-24V  
Circuit



Noise wave form (Applied voltage wave form to the contact)

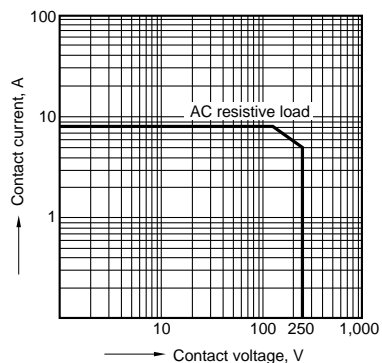


Output wave form (Output wave form on the coil side)



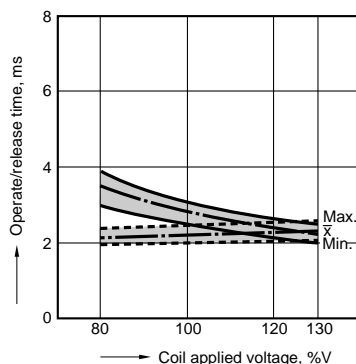
TV-5 rated type

1. Max. switching power



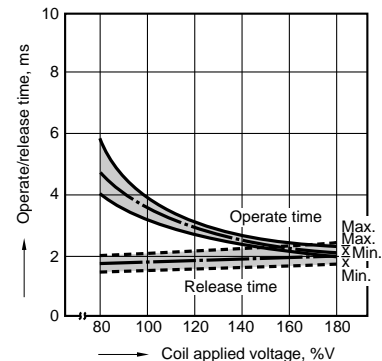
2-(1). Operate/Release time (Standard type)

Sample: JZ1aF-12V-TV



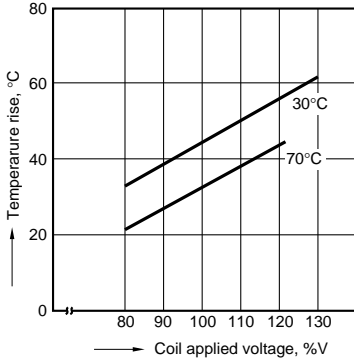
2-(2). Operate/Release time (High sensitivity type)

Sample: JZ1aFS-12V-TV



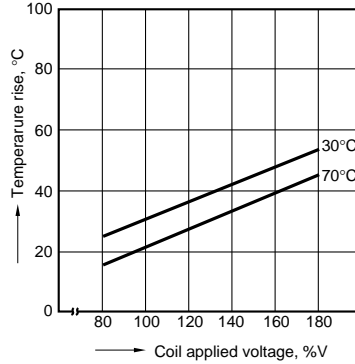
### 3-(1). Coil temperature rise (Standard type)

Sample: JZ1aF-12V-TV  
 Point measured: Coil inside  
 Contact current: 8 A



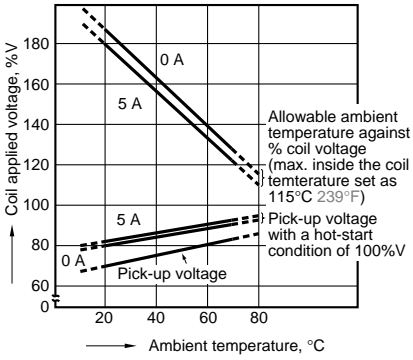
### 3-(2). Coil temperature rise (High sensitivity type)

Sample: JZ1aFS-12V-TV  
 Point measured: Coil inside  
 Contact current: 5 A



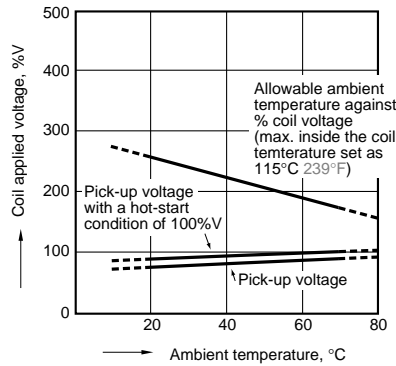
### 4-(1). Ambient temperature vs. coil applied voltage (Standard type)

Sample: JZ1aF-12V-TV



### 4-(2). Ambient temperature vs. coil applied voltage (High sensitivity type)

Sample: JZ1aFS-12V-TV  
 Contact current: 5 A

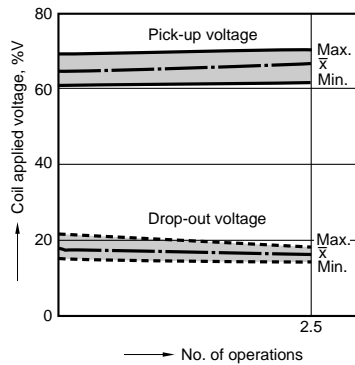


### 5-(1). Electrical life test (TV-5)

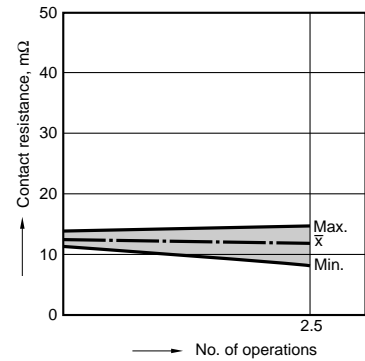
Tested sample: JZ1aF-12V-TV, 6 pcs.  
 UL Lamp load test

	Overload	Endurance
Voltage	AC 120 V	AC 120 V
Switching frequency	60 Hz	60 Hz
Current	Inrush: 111 A; Steady: 7.5 A	Inrush: 78 A; Steady: 5.0 A
Operating speed	10 cpm (ON:OFF = 1s:5s)	10 cpm (ON:OFF = 1s:5s)
No. of operations	50 ope.	25,000 ope.

### Change of pick-up and drop-out voltage

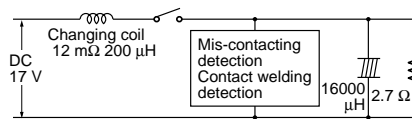


### Change of contact resistance

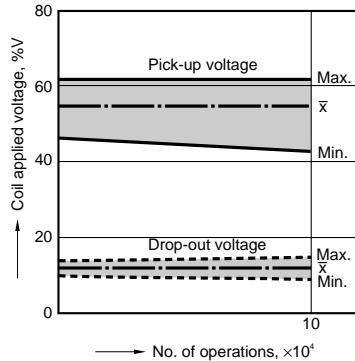


### 5-(2). Electrical life test (Condenser load)

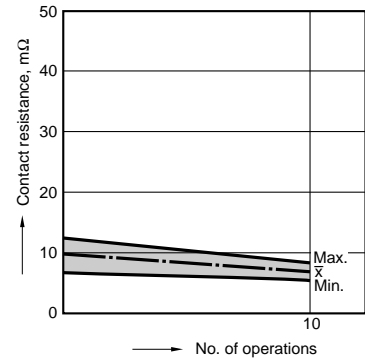
Tested sample: JZ1aF-12V-TV, 6 pcs.  
 Load: DC 17 V 6.4 A, Inrush max. 139 A  
 Operating speed: 20 cpm  
 (ON:OFF = 1 s:2 s)  
 Ambient temperature: 27°C 81°F  
 Circuit:



### Change of pick-up and drop-out voltage



### Change of contact resistance



5-(3). Electrical life test (TV power source)

Tested sample: JZ1aF-12V-TV, 10 pcs.

Load: AC 100 V TV power source

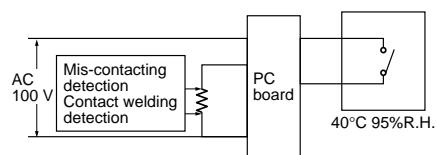
Inrush: 100 A max.; Steady: 5.0 A

Operating speed: 20 cpm

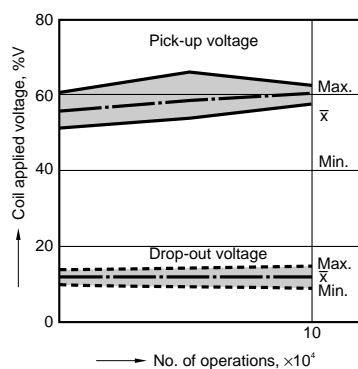
(ON:OFF = 1 s:2 s)

Ambient temperature: 40°C 104°F 95% R.H.

Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance

