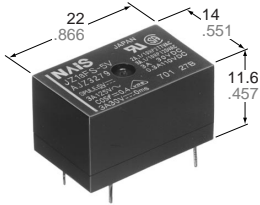


# NAIS

## SMALL SIZED POWER RELAY

# JZ-RELAYS



mm inch

### FEATURES

- Small sized flat type: 22×14×11.6 mm .866×.551×.457 inch
- High dielectric withstanding: 10,000 V surge in  $\mu\text{s}$  between coil and contact
- High electrical noise immunity
- High sensitivity type available
- VDE, TÜV, SEMKO also approved

### 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 m $\Omega$			
Rating (resistive)	Nominal switching capacity	5 A 125 V AC 5 A 30 V DC	3 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, 1,250 VA
	Max. switching voltage	250 V AC, 110 V DC (0.3 A)		
	Max. switching current	5 A	3 A	8 A
Expected life (min. operations)	Mechanical (at 180 cpm)	5 × 10 <sup>6</sup>		
	Electrical (at 20 cpm)	10 <sup>5</sup> (at nominal operating capacity)	2 × 10 <sup>5</sup> (3 A 125 V AC) 10 <sup>5</sup> (3 A 30 V DC)	10 <sup>5</sup> (at nominal operating capacity) 5 × 10 <sup>4</sup> (8 A 125 V AC) 10 <sup>5</sup> (5 A 30 V DC)

#### Coil (at 20°C 68°F)

Standard type	Nominal operating power	400 mW
High sensitivity type	Nominal operating power	200 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 Wave is standard shock voltage of  $\pm 1.2 \times 50\mu\text{s}$  according to JEC-212-1981
- \*4 Excluding contact bounce time
- \*5 Half-wave pulse of sine wave: 11ms; detection time: 10 $\mu\text{s}$
- \*6 Half-wave pulse of sine wave: 6ms
- \*7 Detection time: 10 $\mu\text{s}$
- \*8 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 24).

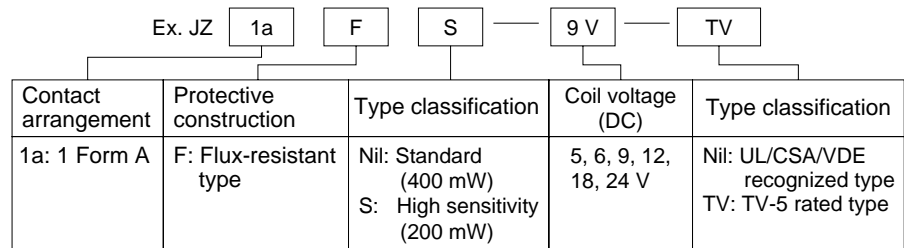
#### Characteristics

(at 25°C 77°F, 50% Relative humidity)

Max. operating speed		20 cpm
Initial insulation resistance*1		Min. 100 M $\Omega$ at 500 V DC
Initial breakdown voltage*2	Between open contacts	750 Vrms for 1 min.
	Between contacts and coil	2,000 Vrms for 1 min.
Surge voltage between contact and coil*3		Min. 10,000 V
Operate time*4 (at nominal voltage)		Approx. 4 ms
Release time*4 (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*5	Min. 98 m/s <sup>2</sup> {10 G}
	Destructive*6	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional*7	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*8 (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

### TYPICAL APPLICATIONS ORDERING INFORMATION

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



Note: Standard packing Carton: 100 pcs. Case: 500 pcs.  
UL/CSA, TV-5 (only for TV type) approved type is standard.

# TYPES AND COIL DATA (at 20°C 68°F)

## 1) Standard type

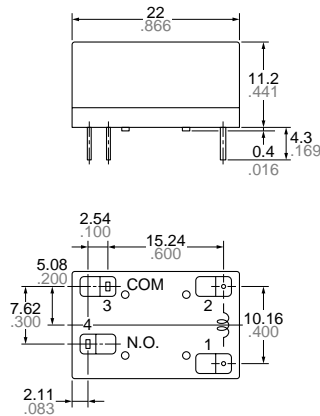
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, at 70°C, V DC
JZ1aF-5V	5	3.5	0.25	62.5	80	400	5.5
JZ1aF-6V	6	4.2	0.3	90	67	400	6.6
JZ1aF-9V	9	6.3	0.45	202	45	400	9.9
JZ1aF-12V	12	8.4	0.6	360	33	400	13.2
JZ1aF-18V	18	12.6	0.9	810	22	400	19.8
JZ1aF-24V	24	16.8	1.2	1,440	17	400	26.4

## 2) High sensitivity type

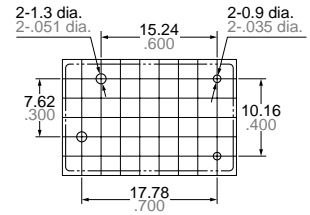
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, at 70°C, V DC
JZ1aFS-5V	5	4	0.25	125	40	200	6.5
JZ1aFS-6V	6	4.8	0.3	180	33	200	7.8
JZ1aFS-9V	9	7.2	0.45	405	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

mm inch



### PC board pattern (Copper-side view)



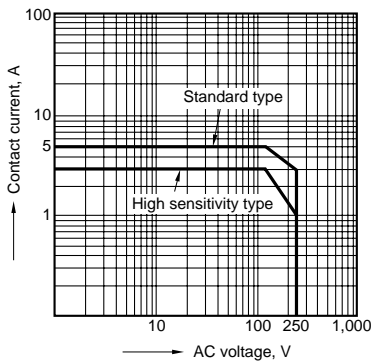
Tolerance: ±0.1±.004

General tolerance: ±0.3 ± .012

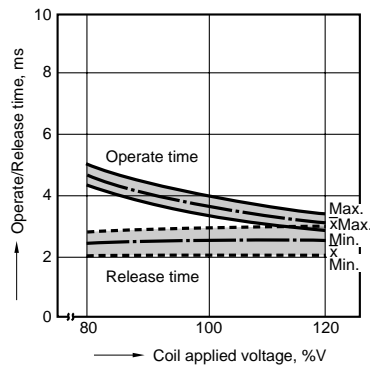
## REFERENCE DATA

### • Not TV-5 rated type

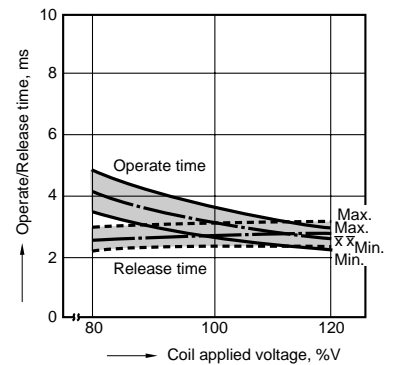
1. Max. switching power (AC resistive load)



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

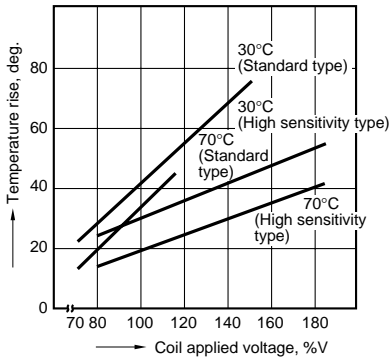


2.-(2) Operate/Release time (High sensitivity type)



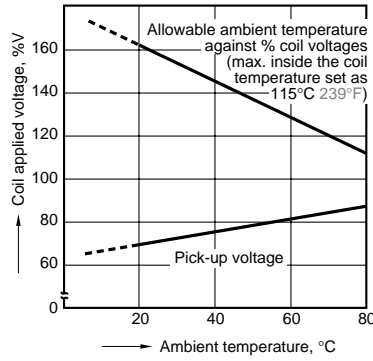
3. Coil temperature rise

Point measured: Coil inside  
Contact current: 3 A



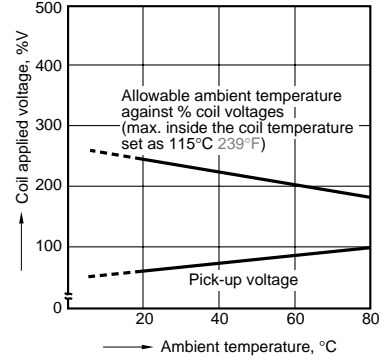
4.-(1) Ambient temperature vs. coil applied voltage (Standard type)

Contact current: 1 A



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

Contact current: 1 A

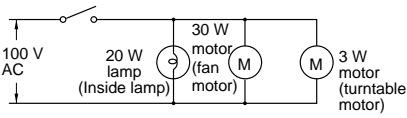


5. Electrical life (load test: fan motor, turntable motor and inside lamp of microwave oven)

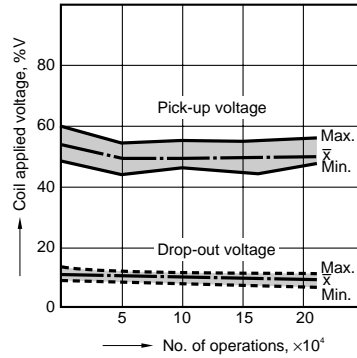
Tested sample: JZ1aFS-24V, 6 pcs.  
Load: 100 V AC 0.5 A; Rush current: 2.5 A  
Operation frequency: 4 times/min.

(ON:OFF = 3s:12s)  
With coil diode protection  
Ambient temperature: 70°C 158°F

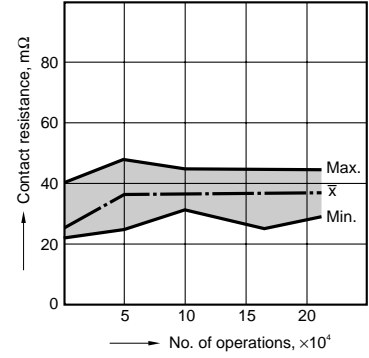
Circuit



Change of pick-up and drop-out voltage



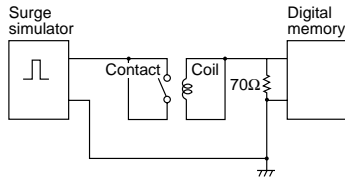
Change of contact resistance



6. Noise resistance

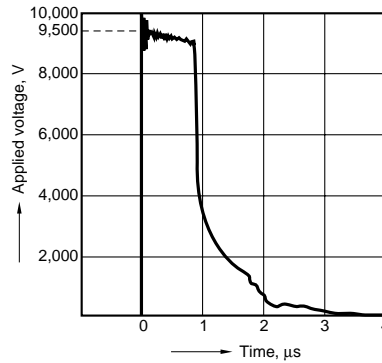
Tested sample: JZ1aFS-24V

Circuit



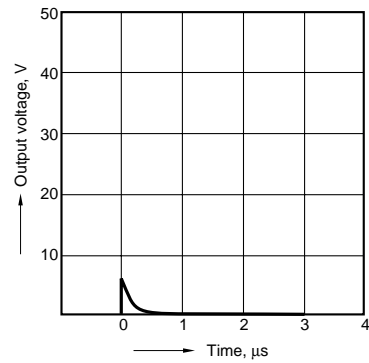
Noise wave form

(Applied voltage wave form to the contact)



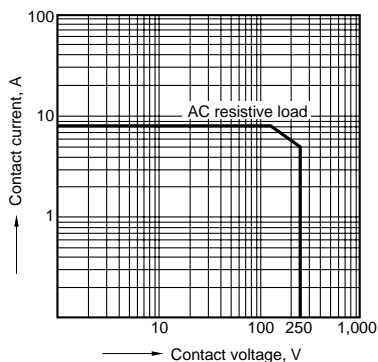
Output wave form

(Output wave form on the coil side)



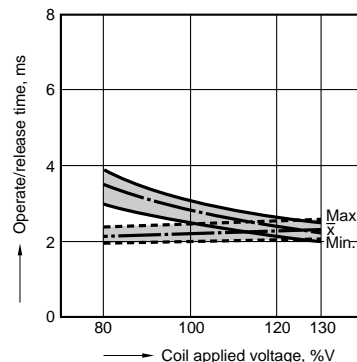
•TV-5 rated type

1. Max. switching power



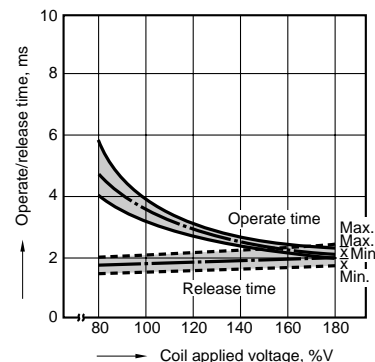
2-(1). Operate/Release time (Standard type)

Sample: JZ1aF-12V-TV



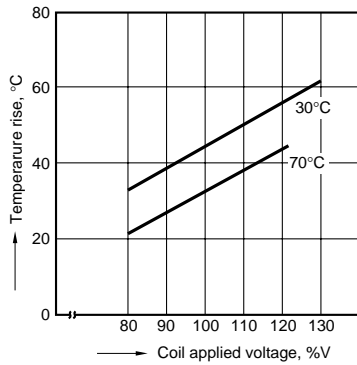
2-(2). Operate/Release time (High sensitivity type)

Sample: JZ1aFS-12V-TV



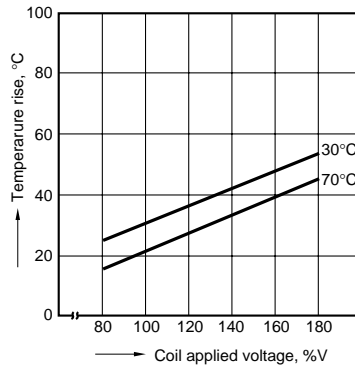
3-(1). Coil temperature rise (Standard type)

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



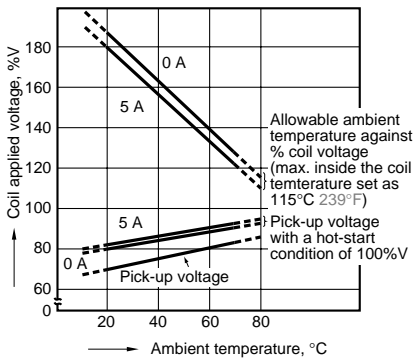
3-(2). Coil temperature rise (High sensitivity type)

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



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

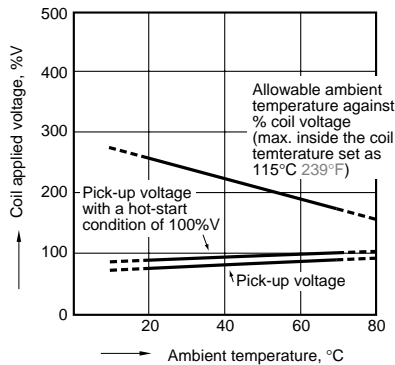
Sample: JZ1aF-12V-TV



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

Sample: JZ1aFS-12V-TV

Contact current: 5 A

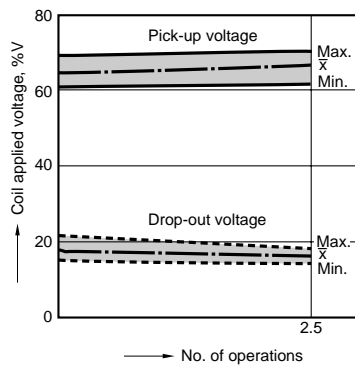


5-(1). Electrical life test (TV-5)

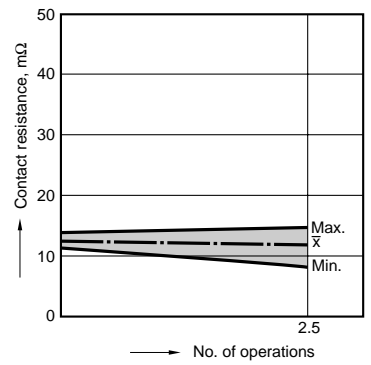
Tested sample: JZ1aF-12V-TV, 6 pcs.  
UL Lamp load test

	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



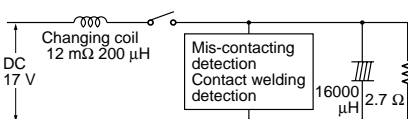
5-(2). Electrical life test (Condenser load)

Tested sample: JZ1aF-12V-TV, 6 pcs.  
Load: DC 17 V 6.4 A, Inrush max. 139 A  
Operating speed: 20 cpm

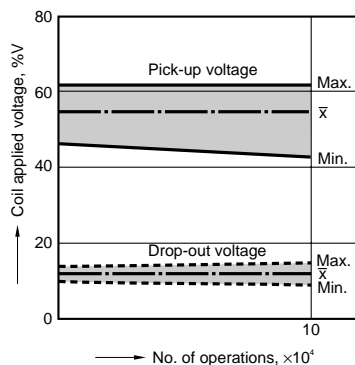
(ON:OFF = 1 s:2 s)

Ambient temperature: 27°C 81°F

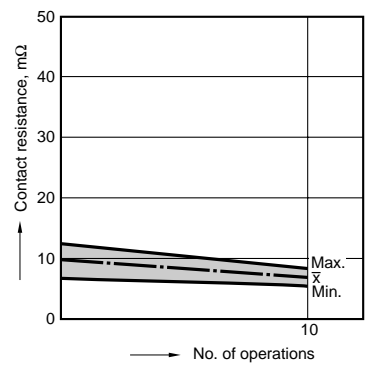
Circuit:



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

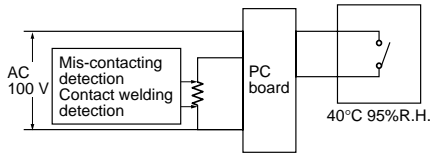
Inrush: 100 A max.; Steady: 5.0 A

Operating speed: 20 cpm

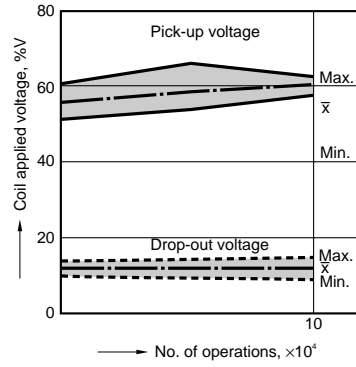
(ON:OFF = 1 s:2 s)

Ambient temperature: 40°C 104°F95% R.H.

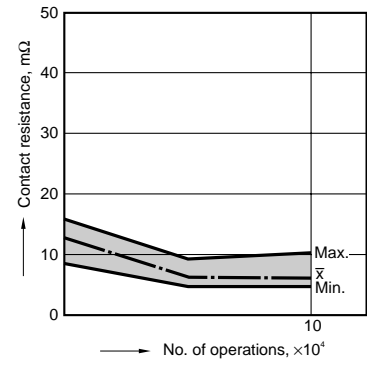
Circuit:



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



## Change of contact resistance



**For Cautions for Use, see Relay Technical Information (Page 11 to 39).**