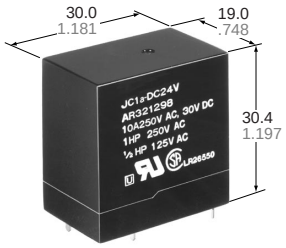
NAiS

COMPACT POWER RELAYS

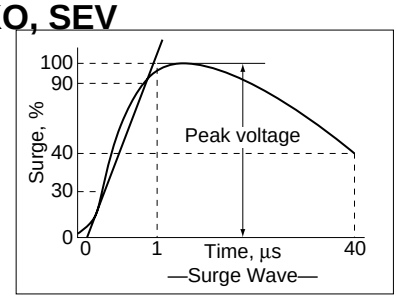
# JC-RELAYS




mm inch

## UL File No.: E43028, CSA File No.: LR26550
## VDE File No.: VDE-REG.-Nr. 894, SEMKO, SEV

- **High inrush current capability**
  - **1 Form A: 163 A inrush (TV-8)**
  - **2 Form A: 111 A inrush (TV-5)**
- **High dielectric withstanding for transient protection:**
  - **JC can withstand 10,000 V surge in μs between coil and contact.**
- **Electrical life:**
  - **1 Form A: $10^5$ ope. at 10 A 250 V AC resistive load**
  - **2 Form A, 1 Form A 1 Form B: $10^5$ ope. at 5 A 250 V AC resistive load**




# SPECIFICATIONS

### Contact

| | | | | |
|---|---|---|---|---|
| Arrangement | | | 1 Form A | 2 Form A, 1 Form A 1 Form B |
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) | | | 30 mΩ | |
| Contact material | | | Silver alloy | |
| Contact force, min. | | | 30 g (N.C. contact of 1a1b: 20 g) | |
| Rating (resistive load) | Maximum switching power | | 2,500 VA | 1,250 VA |
| | Maximum switching voltage | | 250 V AC | 250 V AC |
| | Max. switching current | | 10 A | 5 A |
| UL/CSA rating | | | 10 A 250 V AC, 1/2 HP 125 V AC 10 A 30 V DC, 1 HP 250 V AC | 5 A 250 V AC, 1/4 HP 125 V AC 5 A 30 V DC, 1/2 HP 250 V AC |
| VDE rating | | | 10 A 250 V AC (cosφ = 1.0) 7.5 A 250 V AC (cosφ = 0.4) 10 A 30 V DC | 5 A 250 V AC (cosφ = 1.0) 3 A 250 V AC (cosφ = 0.4) 5 A 30 V DC |
| Expected life (min. operation) | Mechanical | | $5\times10^6$ | |
| | Electrical (resistive) | 10 A 250 V AC | $10^5$ | — |
| | | 5A 250 V AC | — | $10^5$ |

### Coil

| | | |
|---|---|---|
| Minimum operating power | 576 mW | 640 mW |
| Nominal operating power | 900 mW | 1,000 mW |

**Remarks**

*1 Measurement of same location as “Intial 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 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 49)

### Characteristics

| | | |
|---|---|---|
| Maximum operating speed | | 20 cpm. |
| Initial insulation resistance*1 | | Min. 100 MΩ at 500 V DC |
| Initial breakdown voltage*2 | Between open contacts | 2,000 V rms for 1 min. (N.C. contact of 1a1b: 1,000 Vrms) |
| | Between contacts sets | 2,000 Vrms for 1 min. |
| | Between contacts and coil | 4,000 Vrms for 1 min. |
| Operate time*3 (at nominal voltage) | | Approx. 15 ms |
| Release time(without diode)*3 (at nominal voltage) | | Approx. 5 ms (1a1b:Approx. 10 ms) |
| Temperature rise (at nominal voltage) | | Max. 55°C |
| Shock resistance | Functional*4 | {20 G} |
| | Destructive*5 | {100 G} |
| Vibration resistance | Functional*6 | {10 G}, 10 to 55 Hz at double amplitude of 1.6 mm [1a1b type at double amplitude: 1.0 mm, 58.8 m/s² {6 G}] |
| | Destructive | {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. | –50°C to +60°C –58°F to +140°F |
| Unit weight | | Approx. 31 g 1.09 oz |

# TYPICAL APPLICATIONS

Automatic garage door openers
Microwave ovens
Dryers
Vending machines
Copiers
Air conditioners
Stereo equipment
TV sets

# ORDERING INFORMATION

Ex. JC [1a] [ ] — [TM] — [DC12V]

| Contact arrangement | Classification | Mounting classification | Coil voltage |
|---|---|---|---|
| 1a: 1 Form A<br>2a: 2 Form A<br>1a1b: 1 Form A 1 Form B | Nil: Standard type | Nil: PC board terminal<br>S: Plug-in terminal<br>TM: Top mounting | DC 6, 12, 24, 48 V |

(Notes) 1. TV rated types available 1 Form A: TV 8; 2 Form A: TV-5; 1 Form A, 1 Form B: TV-3.
2. For UL/CSA or VDE recognized types, add suffix UL/CSA/VDE.
3. Standard packing Carton: 50 pcs.; Case: 200 pcs.

# ADDITIONAL SERIES

Following up-graded contact rating types recognized by UL and CSA are available.

| Contact arrangement \ Additional letter | F (JC1aF, JC2aF, JC1a1bF) |
|---|---|
| 1 Form A | 15 A 250 V AC, 1 HP 125 V AC<br>15 A 30 V DC, 1 HP 250 V AC |
| 2 Form A | 10 A 250 V AC, 1/3 HP 125 V AC<br>10 A 30 V DC, 1/2 HP 250 V AC |
| 1 Form A 1 Form B | 5 A 250 V AC, 1/3 HP 125 V AC<br>5 A 30 V DC, 1/2 HP 250 V AC |

# COIL DATA at 20°C 68°F

| Contact arrangement | 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, W | Maximum allowable voltage, V DC (at 60°C) |
|---|---|---|---|---|---|---|---|
| 1 Form A | 6 | 4.8 | 0.6 | 40 | 150 | 0.9 | 6.6 |
| | 12 | 9.6 | 1.2 | 160 | 75 | 0.9 | 13.2 |
| | 24 | 19.2 | 2.4 | 640 | 37.5 | 0.9 | 26.4 |
| | 48 | 38.4 | 4.8 | 2,560 | 18.8 | 0.9 | 52.8 |
| 2 Form A<br>1 Form A 1 Form B | 6 | 4.8 | 0.6 | 36 | 166.6 | 1.0 | 6.6 |
| | 12 | 9.6 | 1.2 | 144 | 83.3 | 1.0 | 13.2 |
| | 24 | 19.2 | 2.4 | 576 | 41.6 | 1.0 | 26.4 |
| | 48 | 38.4 | 4.8 | 2,304 | 20.8 | 1.0 | 52.8 |

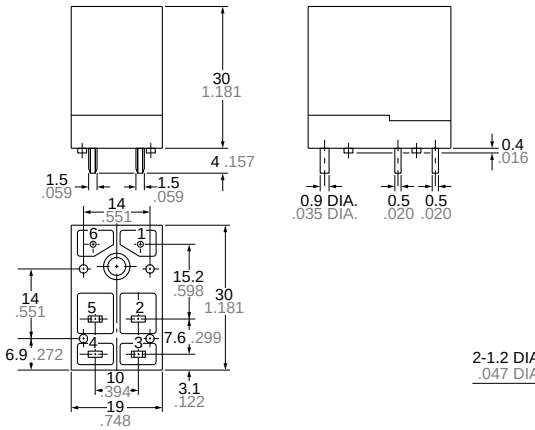
**Note:** Coil resestance varies ±10% for less than 1,000 Ω and ±15% for more than 1,000 W.
For each ±1°C change in ambient temperature. coil resistance varies ±0.4%.

# DIMENSIONS

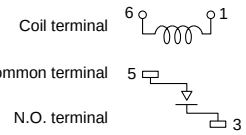
mm inch

**PC board type**

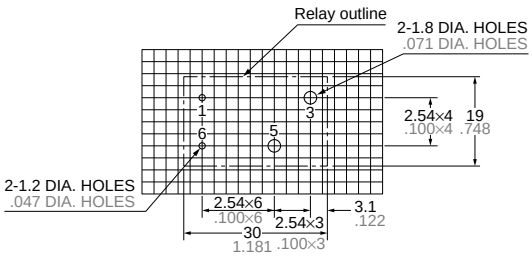
**JC1a**




**Schematic**

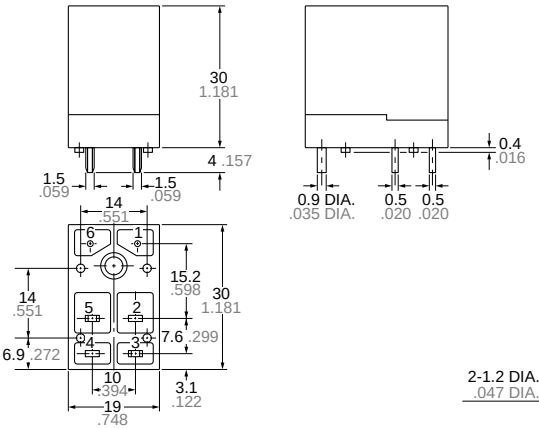



**PC board pattern** (Copper-side view)

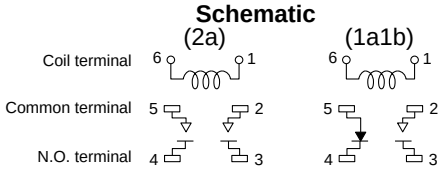



**PC board type**

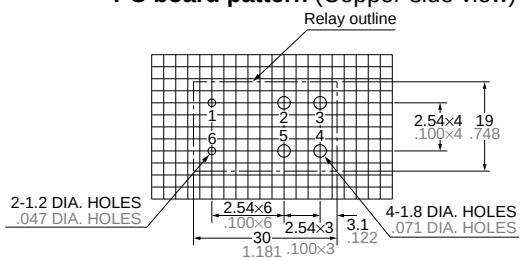
**JC2a, JC1a1b**




**Schematic**




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

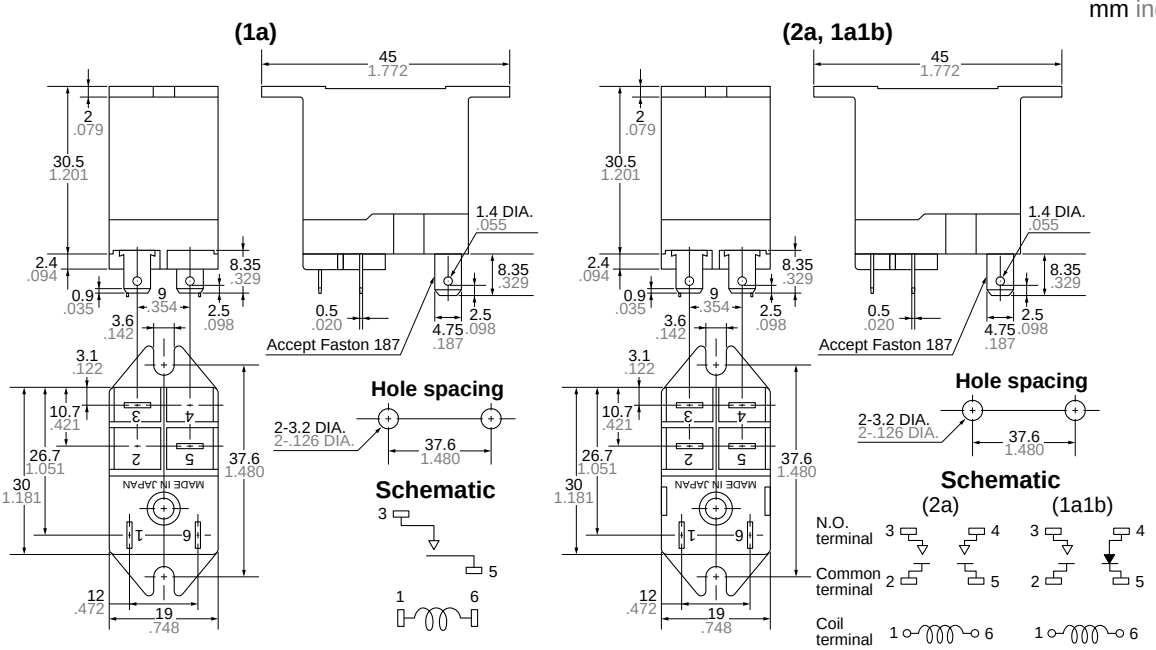



General tolerance: ±0.3 ±.012

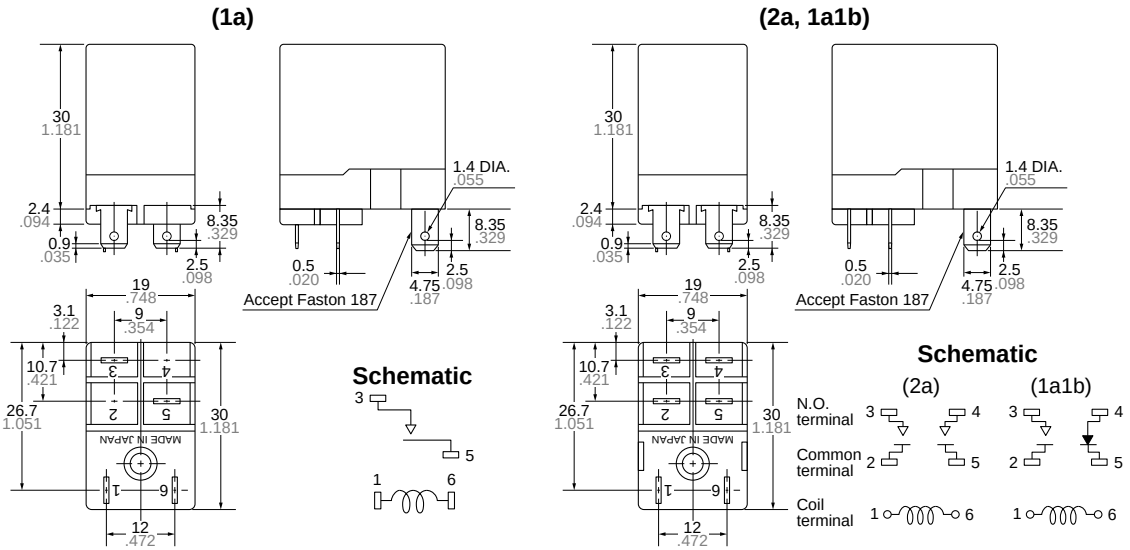
Tolerance: ±0.1 ±.004

## Top mount type

mm inch




## Plug-in type

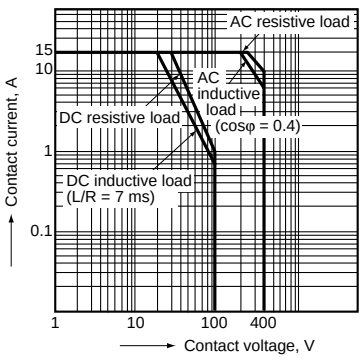




General tolerance: ±0.3 ±.012

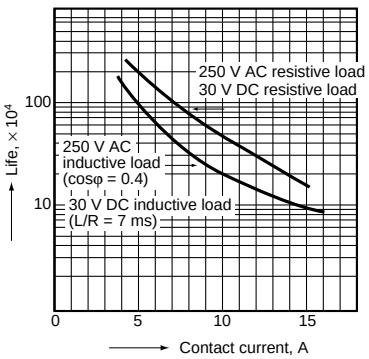
# REFERENCE DATA

### JC1a type

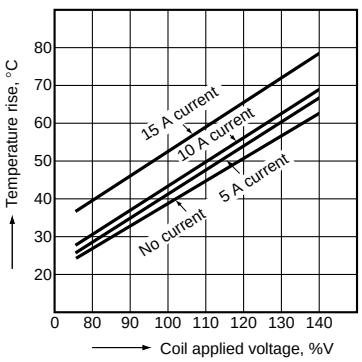
1. Maximum value for switching capacity



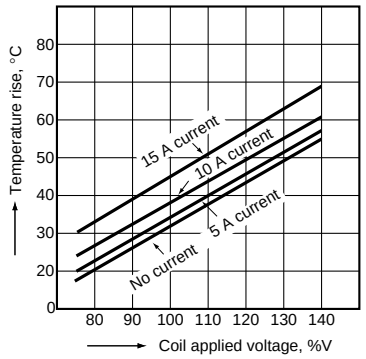

2. Life curve



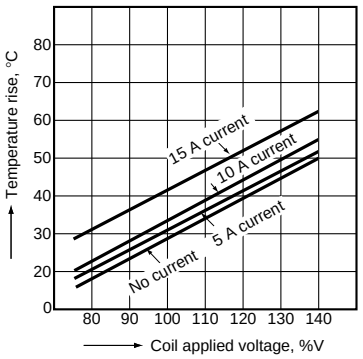

3.-(1) Coil temperature rise
Point measured: Inside the coil
Ambient temperature: 26°C 79°F



3.-(2) Coil temperature rise
Point measured: Inside the coil
Ambient temperature: 40°C 104°F

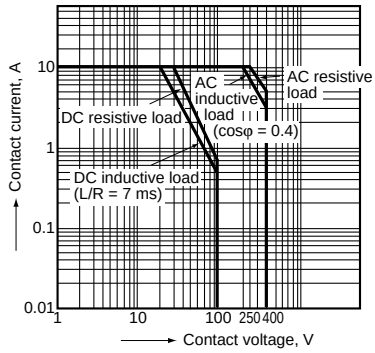



3.-(3) Coil temperature rise
Point measured: Inside the coil
Ambient temperature: 60°C 140°F

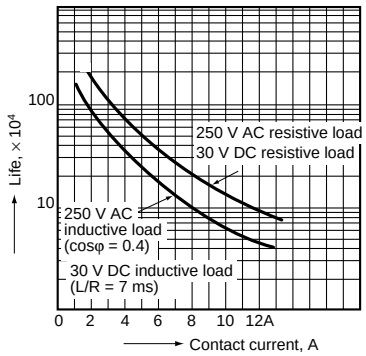



**JC2a type**

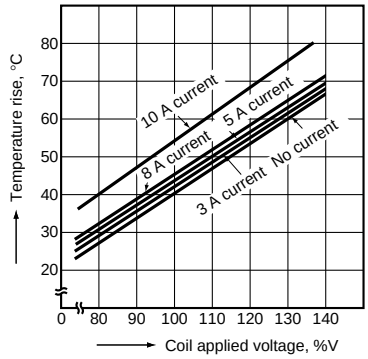
1. Maximum value for switching capacity



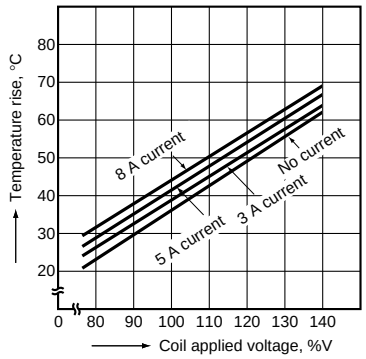

2. Life curve



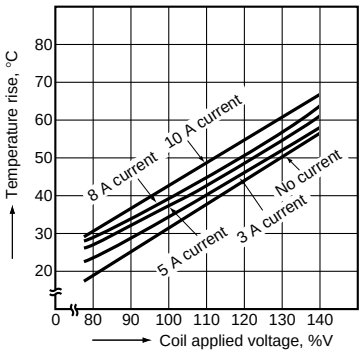

3.-(1) Coil temperature rise
Point measured: Inside the coil
Ambient temperature: 26°C 79°F




3.-(2) Coil temperature rise
Point measured: Inside the coil
Ambient temperature: 40°C 104°F




3.-(3) Coil temperature rise
Point measured: Inside the coil
Ambient temperature: 60°C 140°F



# ACCESSORIES

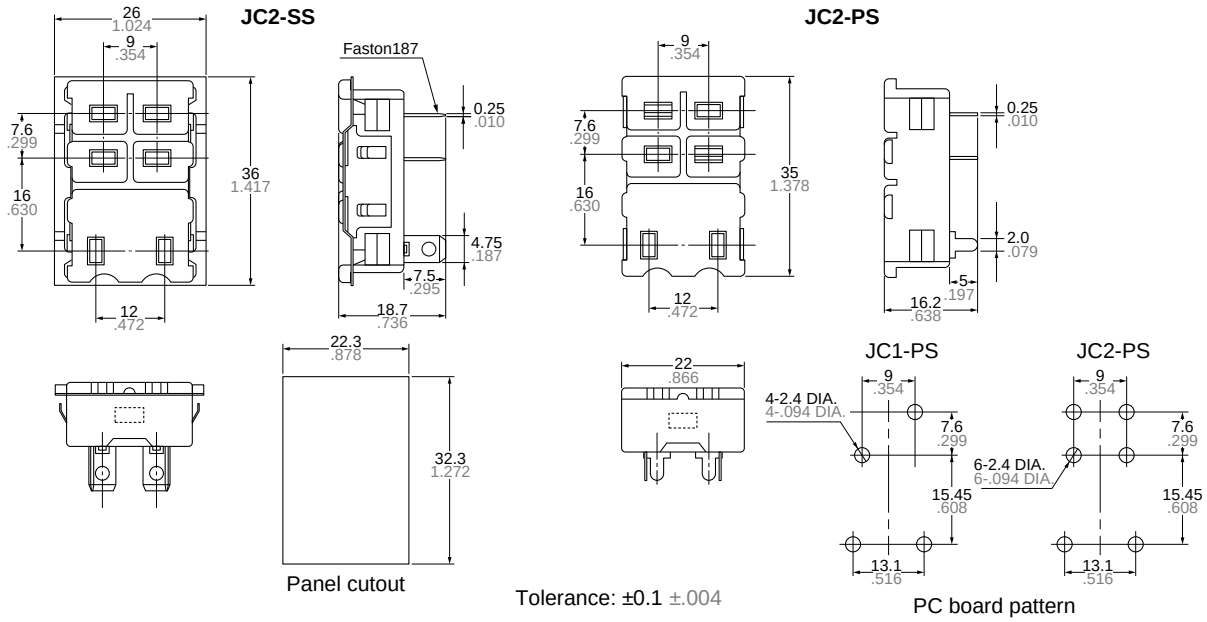
**JC1-SS**

**JC2-SS**

**JC1-PS**

**JC2-PS**

mm inch




Tolerance: ±0.1 ±.004

(Note)
Outward dimensions and chassis cutout dimensions for JC1-SS and JC1-PS are same as those of JC2-SS and JC2-PS respectively.

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# COMPACT POWER RELAYS FOR HIGH DC-LOADS

# JC-RELAY
(Special Type)


## Data sheet addition for JC-Relay

- **Integrated arc-blowing magnet for high DC-loads [H73-type]**
- **High switching capacity: 20A / 60V DC**
- **Clearance and creepage distance contact / coil: 8 mm**
- **Two contacts connected in series ensures even higher life expectancy**

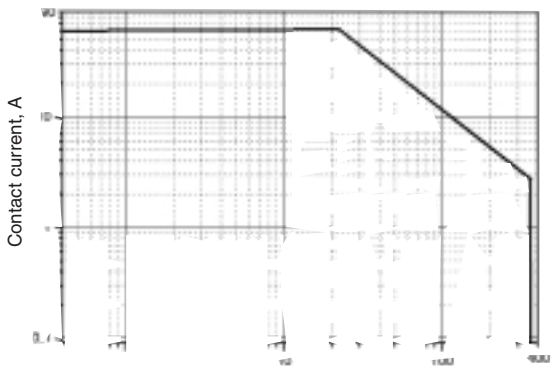
## APPLICATIONS:

Switching of DC-loads in devices such as
- Control of Industrial DC-motors
- Emergency power-off for DC loads

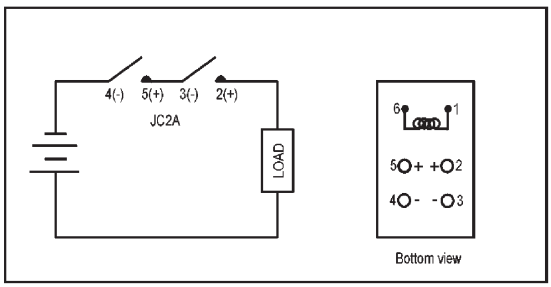
| | | | |
|---|---|---|---|
| **Arrangement** | | **2 Form A** | |
| **Contact material** | | **AgCdO, AgNi** | |
| **Contact connection** | | one contact | two contacts in series |
| **Rating (resistive) load** | 250VDC / 5A | $1 \times 10^4$ ops. | $2 \times 10^4$ ops. |
| | 250VDC / 4A | $3 \times 10^4$ ops. | $4 \times 10^4$ ops. |
| **Special loads test data (min. operations at 20°C)** | 220VDC / 1,6A; L/R = 14.6ms (1s On, 4s Off) | $2 \times 10^4$ | $3 \times 10^4$ |
| | 220VDC / 1A; L/R = 17.4ms (1s On, 4s Off) | $2 \times 10^4$ | $3 \times 10^4$ |
| | 60VDC / 20A; resistive load (30s On, 30s Off) | $1 \times 10^4$ | $2 \times 10^4$ |

Mechanical, endurance and coil data according to JC-datasheet

## Load limit curve for connection in series




## Connection diagram




**Attention:** For the Blow-out effect, the polarity must be defined as: (+) at contacts: 2, 5
(-) at contacts: 3, 4

## ORDERING AND TYPE INFORMATION (values at 20°C)

| Type | Nominal voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Nominal operating power, W | Coil resistance, Ω (±10%) |
|---|---|---|---|---|---|
| JC2aF-DC5V-Y1-H73 | 5 | 4.0 | 0.5 | 1 | 25 |
| JC2aF-DC6V-Y1-H73 | 6 | 4.8 | 0.6 | 1 | 36 |
| JC2aF-DC12V-Y1-H73 | 12 | 9.6 | 1.2 | 1 | 144 |
| JC2aF-DC24V-Y1-H73 | 24 | 19.2 | 2.4 | 1 | 576 |



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