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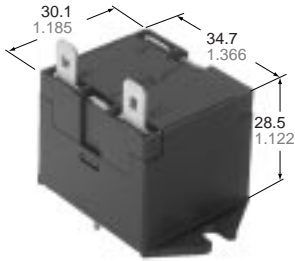
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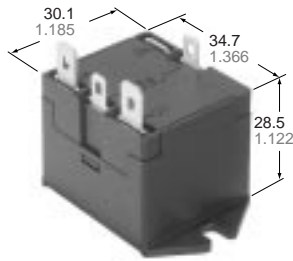
NAIS

1 HORSE-POWER COMPACT POWER RELAYS

JA-RELAYS



TMP type



TM type

mm inch

UL File No.: E43028

CSA File No.: LR26550

- High switching capacity — 55 A inrush, 15 A steady state inductive load (1 Form A)
- Particularly suitable for air conditioners, dish washers, microwave ovens, ranges, central cleaning systems, copiers, facsimiles, etc.
- Two types available
 “TM” type for direct chassis mounting
 “TMP” type for PC board mounting
- TV-rated types available
- TÜV also approved

SPECIFICATIONS

Contact

| | | | |
|---|------------------------------|--|-------------------|
| Arrangement | 1 Form A, 1 Form B, 1 Form C | | |
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) | 30 mΩ | | |
| Contact material | Silver alloy | | |
| Rating (resistive load) | Maximum switching power | 3,750 VA | |
| | Maximum switching voltage | 250 V AC | |
| | Max. switching current | 15A | |
| Expected life (min. operations) | Mechanical (at 180 cpm.) | 5×10 ⁶ | |
| | Electrical (at 20 cpm.) | 1 Form A (Inrush 55 A, Steady 15 A 250 VAC cosφ = 0.7) | 10 ⁵ |
| | | 1 Form B, 1 Form C (15 A 250 VAC, cosφ = 1) | 5×10 ⁵ |

Coil

| | | |
|-------------------------|---------|---------------------------------|
| Nominal operating power | DC type | 1.2 W |
| | AC type | 1.4 VA (50 Hz)/1.3 VA (60 Hz) |
| Minimum operating power | DC type | 0.77 W |
| | AC type | 0.90 VA (50 Hz)/0.84 VA (60 Hz) |

Remarks

- *1 Measurement at same location as “Initial breakdown voltage” section
- *2 Detection current: 10mA
- *3 Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981
- *4 Excluding contact bounce time
- *5 For the AC coil types, the operate/release time will differ depending on the phase.
- *6 Half-wave pulse of sine wave: 11ms; detection time: 10μs
- *7 Half-wave pulse of sine wave: 6ms
- *8 Detection time: 10μs
- *9 Refer to 6. Usage, transport and storage conditions NOTES (Page 8)

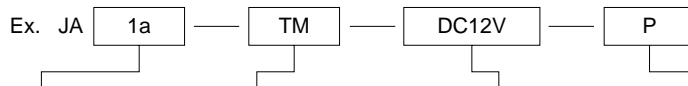
Characteristics

| | | |
|--|---------------------------|--|
| Maximum operating speed | 20 cpm. | |
| Initial insulation resistance*1 | Min. 100 MΩ at 500 V DC | |
| Initial break-down voltage*2 | Between open contacts | 1,500 Vrms |
| | Between contacts and coil | 2,000 Vrms |
| Surge voltage between contacts and coil*3 | Min. 5,000 V | |
| Operate time*4 (at 20°C) (at nominal voltage) | Approx. 10 ms*5 | |
| Release time(without diode)*4 (at 20°C) (at nominal voltage) | Approx. 2 ms*5 | |
| Temperature rise (at 50°C) (resistive) | Max. 70°C | |
| Shock resistance | Functional*6 | 98 m/s ² {10 G} |
| | Destructive*7 | 980 m/s ² {100 G} |
| Vibration resistance | Functional*8 | 88.2 m/s ² {9 G}, 10 to 55 Hz at double amplitude of 1.5 mm |
| | Destructive | 117.6 m/s ² {12 G}, 10 to 55 Hz at double amplitude of 2.0 mm |
| Conditions for operation, transport and storage*9 (Not freezing and condensing at low temperature) | Ambient temp. | -10°C to +50°C +14°F to +122°F |
| | Humidity | 5 to 85%R.H. |
| Unit weight | 44 g 1.55 oz | |

TYPICAL APPLICATIONS

Air conditioners, microwave ovens, load management equipment, copiers, process control equipment

ORDERING INFORMATION



| Contact arrangement | Mounting classification | Coil voltage | Classification |
|--|--|---------------------------------------|--|
| 1c: 1 Form C 1a: 1 Form A 1b: 1 Form B | TM: Solder Terminal TMP: Solder Terminal and PCB Terminal | DC 6, 12, 24 V AC 6, 12, 24, 115 V | Nil: Standard type P: Up-graded contact rating type (See next page) |

- (Notes) 1. For UL/CSA recognized types, add suffix UL/CSA.
 2. Standard packing Carton: 20 pcs.; Case: 200 pcs.

COIL DATA

DC Type at 20°C 68°F

| Nominal voltage | Pick-up voltage (max.) | Drop-out* voltage (min.) | Coil resistance, W (±10%) | Nominal operating current, mA (±10%) | Nominal operating power | Maximum allowable voltage (at 60°C) |
|-----------------|------------------------|--------------------------|---------------------------|--------------------------------------|-------------------------|-------------------------------------|
| 6 V DC | 4.8 V DC | 0.6 (0.3*) V DC | 30 | 200 | 1.2 W | 6.6 V DC |
| 12 | 9.6 | 1.2 (0.6*) | 120 | 100 | 1.2 | 13.2 |
| 24 | 19.2 | 2.4 (1.2*) | 480 | 50 | 1.2 | 26.4 |

AC Type at 20°C 68°F

| Nominal voltage | Pick-up voltage (max.) | Drop-out* voltage (min.) | Coil resistance, W (±10%) | Nominal operating current, mA (±10%) | | Nominal operating power | | Maximum allowable voltage (at 60°C) |
|-----------------|------------------------|--------------------------|---------------------------|--------------------------------------|-------|-------------------------|--------|-------------------------------------|
| | | | | 50 Hz | 60 Hz | 50 Hz | 60 Hz | |
| 6 V AC | 4.8 V AC | 1.8 V AC | — | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 6.6 V DC |
| | | | | 233 | 217 | 1.4 VA | 1.3 VA | |
| 12 | 9.6 | 3.6 | — | 117 | 108 | 1.4 VA | 1.3 VA | 13.2 |
| 24 | 19.2 | 7.2 | — | 58 | 54 | 1.4 VA | 1.3 VA | 26.4 |
| 115 | 92 | 34.5 | — | 12 | 11 | 1.4 VA | 1.3 VA | 126.5 |

* Drop-out voltage for 1 Form B type is 5% of nominal voltage.

NOTES

- The range of coil current for AC relay is ±15% (60 Hz). For DC relay it is ±10% at 20°C.
- The JA relay will operate in a range from 80% to 110% of the nominal coil voltage. It is however, recommended that the relay be used in the range of 85% to 110% of the nominal coil voltage, with the temporary voltage variation taken into consideration.
- When the operating voltage of AC relays drops below 80% of the nominal coil voltage. The relay will generate a considerable amount of heat which is not recommended for maximum efficiency.
- The coil resistance of DC types is the measured value of the coil at a temperature of 20°C (68°F). If the coil temperature changes by ±1°C. The measured value of the coil resistance should be increased or decreased by 0.4%.

ADDITIONAL SERIES

1. Following up-graded contact rating types recognized by UL are available. (For use in office appliances)

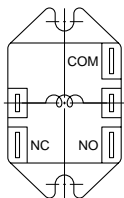
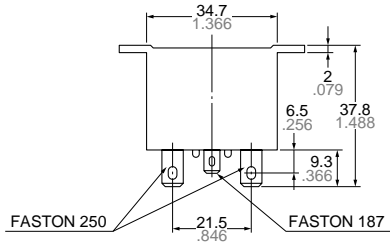
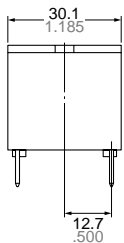
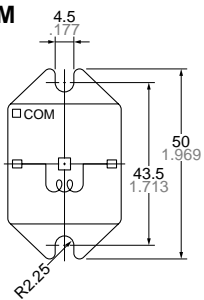
| Contact arrangement | Suffix | P (Ex. JA 1a-TM DC12V-P) |
|---------------------|--------|-----------------------------------|
| 1 Form C | | 25 A 250 V AC, 1 HP 125, 250 V AC |
| 1 Form A | | 25 A 250 V AC, 1 HP 125, 250 V AC |
| 1 Form B | | 25 A 250 V AC, 1 HP 125, 250 V AC |

2. TV-Rated Series

| Contact arrangement | Suffix | UL | CSA |
|---------------------|--------|------|------|
| | | TV | TV |
| 1 Form A | | TV-5 | TV-5 |

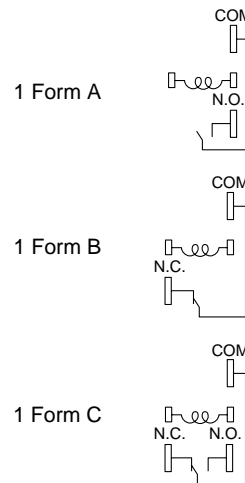
DIMENSIONS

TM



Schematic (Bottom view)

mm inch



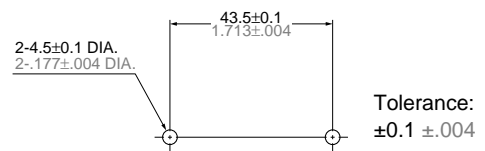
Terminals—.187" quick connect terminals for coil and .250" for contacts

Remarks

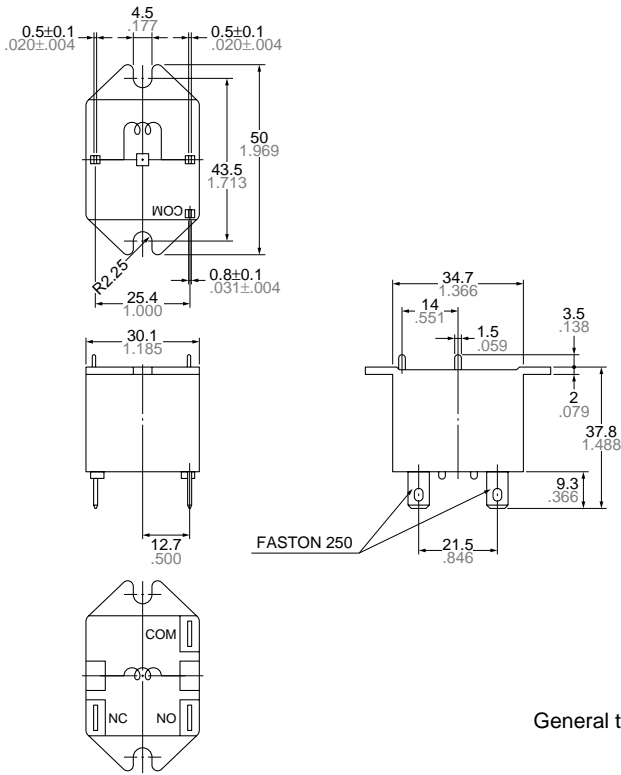
Above dimensions are for 1 Form C type.
For 1 Form A type, NC terminal is removed
For 1 Form B type, NO terminal is removed.

General tolerance: ±0.3 ±.012

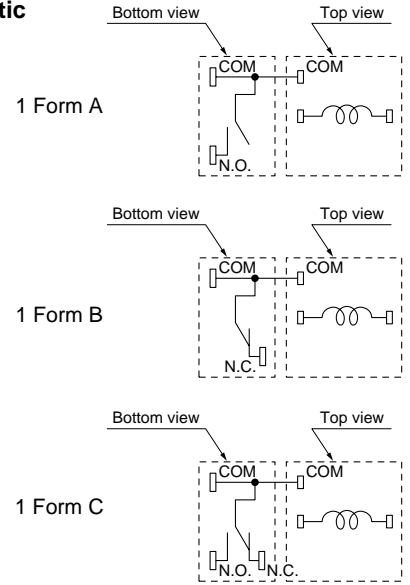
Mounting hole location



TMP

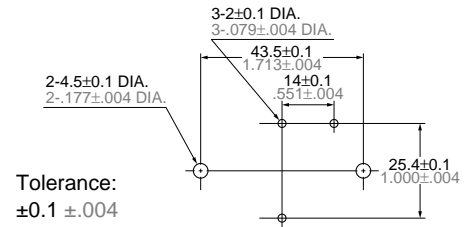


Schematic



Terminals—PC board terminals for coils and .250" quick connect terminals for contacts

Mounting hole location



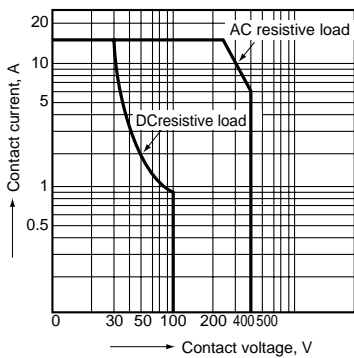
General tolerance: $\pm 0.3 \pm .012$

Remarks

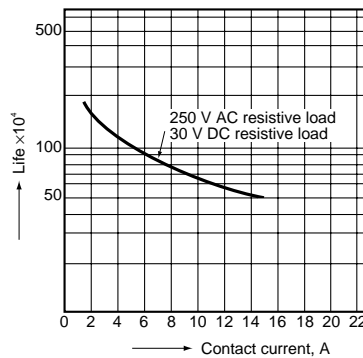
Above dimensions are for 1 Form C type.
 For 1 Form A type, NC terminal is removed
 For 1 Form B type, NO terminal is removed.

REFERENCE DATA

1. Maximum value for switching capacity (Common for 1a, 2b, and 1c)

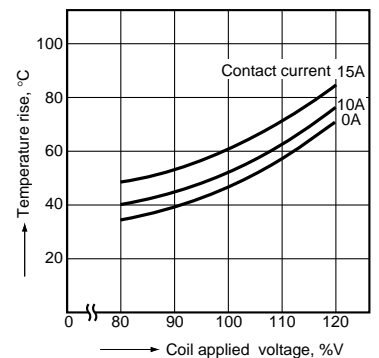


2. Life curve (Common for 1a, 1b, and 1c)



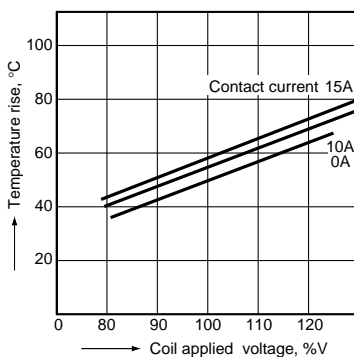
3.-(1) Coil temperature rise (1a-AC type)

Point measured: Inside the coil
 Ambient temperature: 25°C 77°F

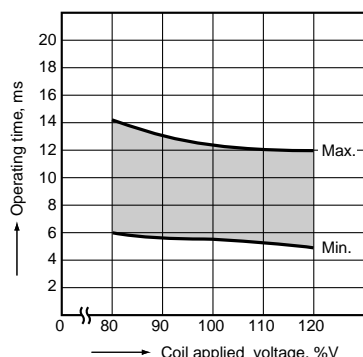


3.-(2) Coil temperature rise (1a-DC type)

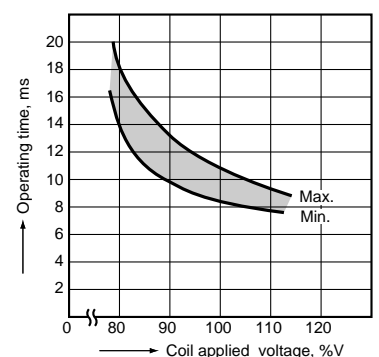
Point measured: Inside the coil
 Ambient temperature: 25°C 77°F



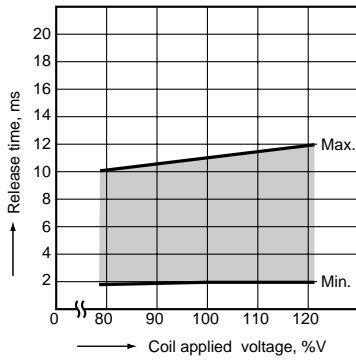
4.-(1) Operate time (1a-AC type)



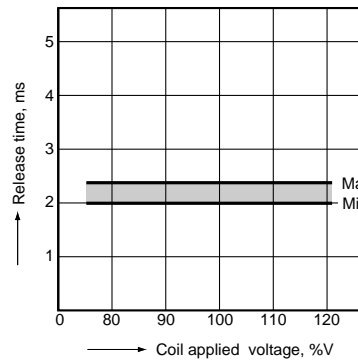
4.-(2) Operate time (1a-DC type)



5.-(1) Release time (1a-AC type)

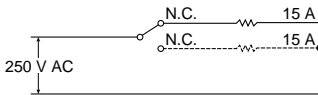


5.-(2) Release time (1a-DC type)



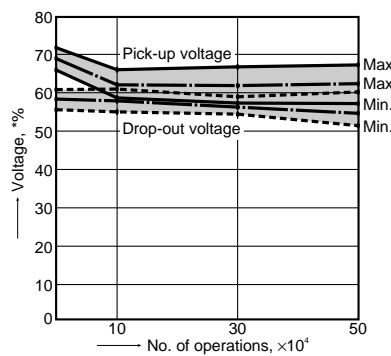
6.-(1) Electrical life (15 A 250 V AC resistive)

1. Tested sample: JA1c-TMP-AC115V
2. Load: 15 A 250 V AC resistive load
3. Cycle rate: 20 cpm.
4. Circuit:



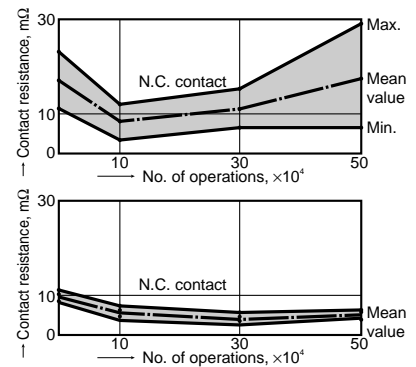
TEST RESULT:

1. Pick-up and drop-out voltage



* This shows percent rate against nominal coil voltage.

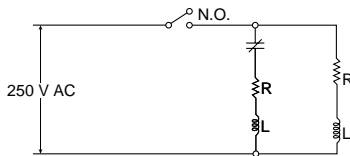
2. Contact resistance



3. No abnormality was observed in either insulation resistance or breakdown voltage.

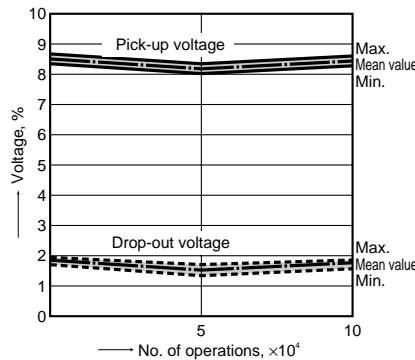
6.-(2) Electrical life (15 A 250 V AC Motor simulated load)

1. Tested sample: JA1a-TM-DC12V
2. Load: 250 V AC inductive load ($\cos\phi = 0.7$)
15 A steady and 55 A (0.3s*) inrush current
3. Cycle rate: 20 cpm.
4. Circuit:

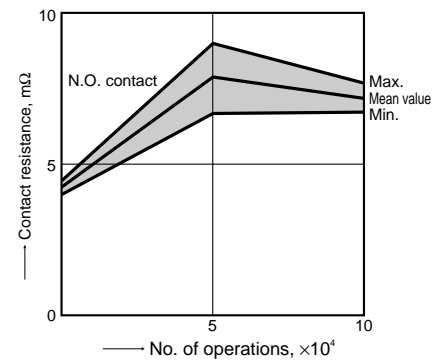


TEST RESULT:

1. Pick-up and drop-out voltage



2. Contact resistance



3. No abnormality was observed in either insulation resistance or breakdown voltage.

For Cautions for Use