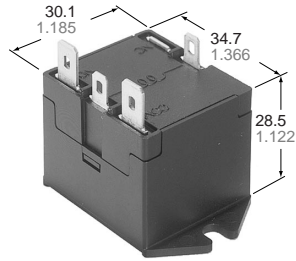


TMP type



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

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	
UL/CSA rating		10 A 250 V AC, 15 A 125 V AC, 1 HP 125, 250 V AC	
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.

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

*6 Half-wave pulse of sine wave: 11ms; detection time: 10μs

*7 Half-wave pulse of sine wave: 6ms

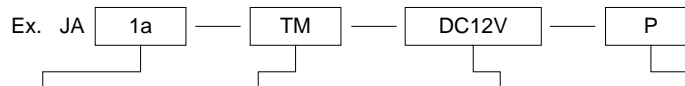
*8 Detection time: 10μs

*9 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 49)

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	—	233	217	1.4 AV	1.3 AV	6.6 V DC
				117	108	1.4 AV	1.3 AV	
12	9.6	3.6	—	58	54	1.4 AV	1.3 AV	13.2
24	19.2	7.2	—	12	11	1.4 AV	1.3 AV	26.4
115	92	34.5	—					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)

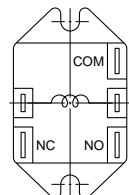
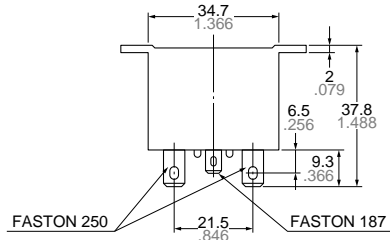
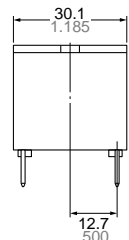
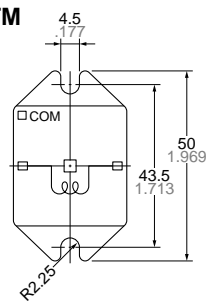
2. TV-Rated Series

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

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

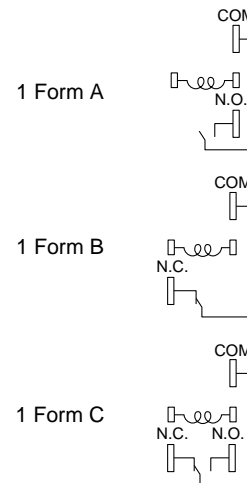
DIMENSIONS

TM



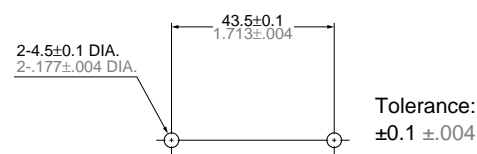
Schematic (Bottom view)

mm inch



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

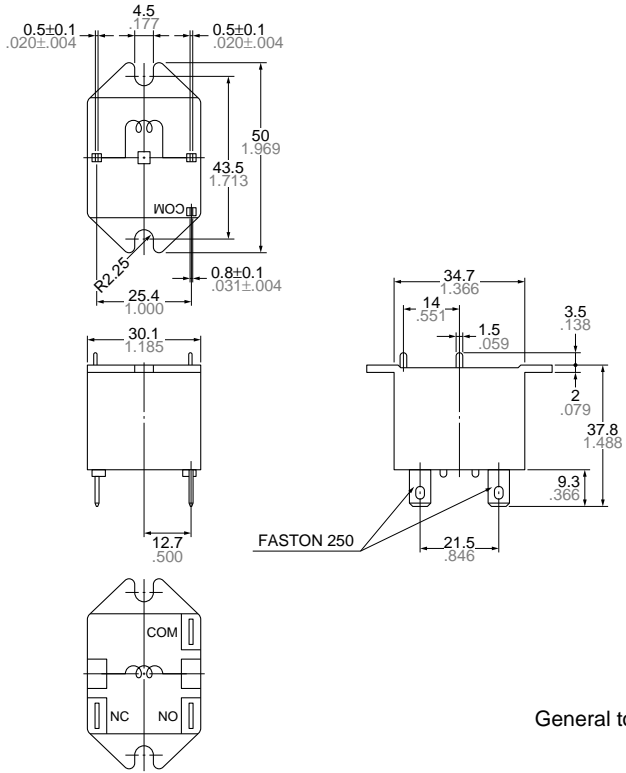
Mounting hole location



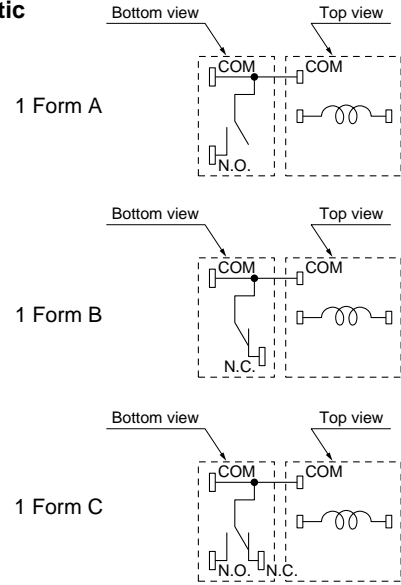
Remarks

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

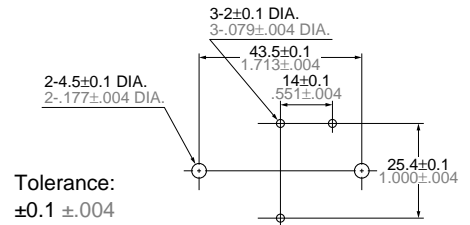


Schematic



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

Mounting hole location



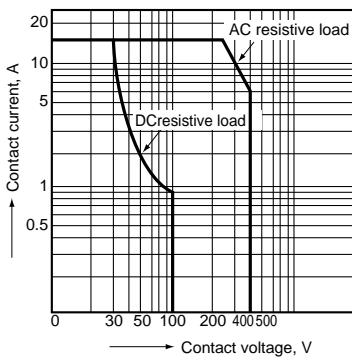
General tolerance: $\pm 0.3 \pm .012$

Remarks

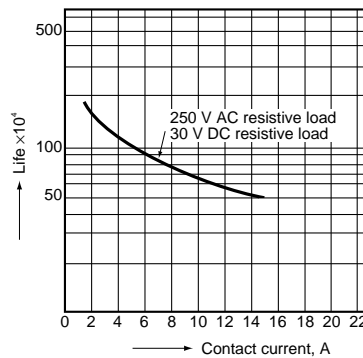
Above dimensions are for 1 Form C type.
For 1 Form A type, NC terminal is removed
For 1 Form B type, NO terminal is removed.

REFERENCE DATA

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

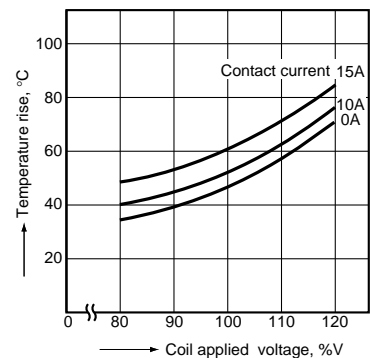


2. Life curve (Common for 1a, 1b, and 1C)



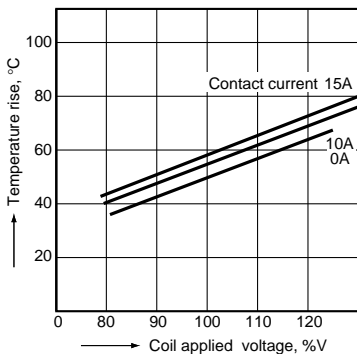
3.-(1) Coil temperature rise (1a-AC type)

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

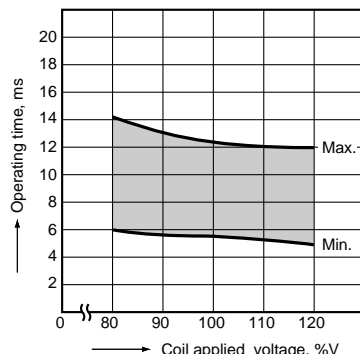


3.-(2) Coil temperature rise (1a-DC type)

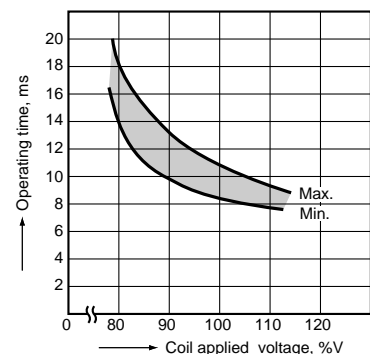
Point measured: Inside the coil
Ambient temperature: 25°C 77°F



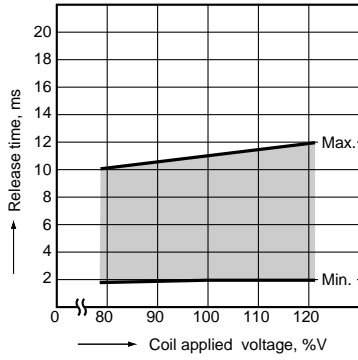
4.-(1) Operate time (1a-AC type)



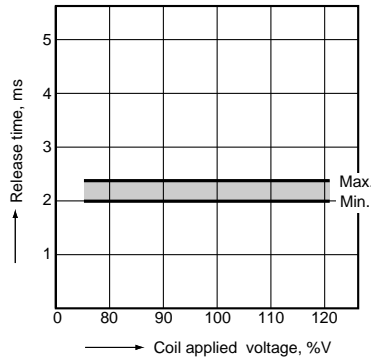
4.-(2) Operate time (1a-DC type)



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

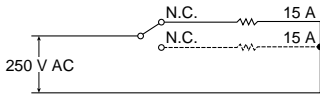


5.-(2) Release time (1a-DC type)



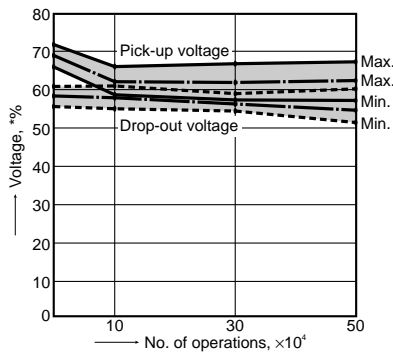
6.-(1) Electrical life (15 A 250 V AC resistive)

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



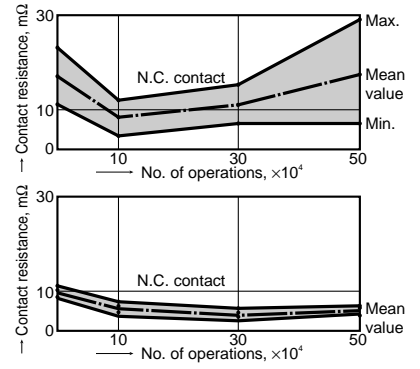
TEST RESULT:

1. Pick-up and drop-out voltage



* This shows percent rate against nominal coil voltage.

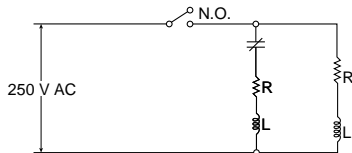
2. Contact resistance



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

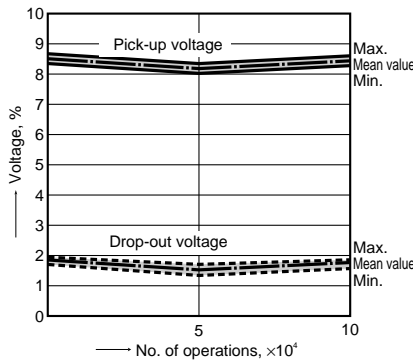
6.-(2) Electrical life (15 A 250 V AC Motor simulated load)

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:

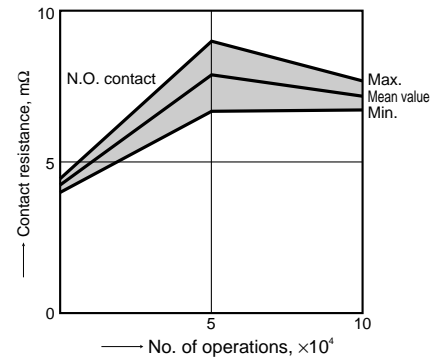


TEST RESULT:

1. Pick-up and drop-out voltage



2. Contact resistance



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