



## T9A series

### Low Cost 30 Amp PC Board or Panel Mount Relay

File E22575

File LR15734

#### Features

- Up to 30 amp switching in SPST and 20 amp in SPDT arrangements.
- Immersion cleanable<sup>(6)</sup>, plastic sealed case available.
- Meets UL 873 and UL 508 spacing – 1/8" through air, 1/4" over surface.
- Load connections made via 1/4" Q. C. terminals and safety wells accept insulated female Q. C. terminals (mounting codes 2 & 5).
- UL Class F insulation system standard.
- Well suited for various industrial, commercial and residential applications.

#### Contact Ratings @ 25°C with relay properly vented. Remove vent nib after soldering and cleaning.

**Arrangements:** 1 Form A (SPST-NO), and 1 Form C (SPDT).

**Material:** Silver-cadmium oxide.

**Mechanical Life:** 10 million operations, typical.

**Minimum Contact Load:** 1A @ 5VDC or 12VAC.

**Initial Contact Resistance:** 75 milliohms, max., @ min. rated current (switched).

#### Typical Electrical Load & Life - 1 Watt Coil

| Contact Arrangement | Contact Load     | Type of Load       | Operations |
|---------------------|------------------|--------------------|------------|
| 1                   | 30A @ 240VAC     | UL General Purpose | 100,000    |
|                     | 25A @ 240VAC     | Resistive Heater   | 100,000    |
| 5                   | 20A/10A @ 240VAC | UL General Purpose | 100,000    |
|                     | 20A/10A @ 240VAC | UL Resistive       | 100,000    |
|                     | 20A/10A @ 28VDC  | Resistive          | 100,000    |

#### Typical Electrical Load & Life - 900mW Coil

| Contact Arrangement | Contact Load | Type of Load  | Operations |
|---------------------|--------------|---------------|------------|
| 1                   | 120VAC       | 50 LRA/16 FLA | 100,000    |
|                     | 120VAC       | 30 LRA/11 FLA | 200,000    |

#### UL 508/873 & CSA Contact Ratings - 1 Watt Coil

| Voltage | Load Type        | N.O. Contact | N.C. Contact |
|---------|------------------|--------------|--------------|
| 277VAC  | Tungsten *       | 5.4A         | -            |
| 277VAC  | Ballast          | 10A          | 3A           |
| 240VAC  | Motor            | 2 HP         | 1/2 HP       |
| 240VAC  | Resistive *      | 30A          | 20A          |
| 240VAC  | General Purpose† | 30A          | 15A          |
| 240VAC  | LRA/FLA **††     | 80A/30A      | 30A/12A      |
| 240VAC  | Pilot Duty *     | 470VA        | 275VA        |
| 125VAC  | Motor            | 1 HP         | 1/4 HP       |
| 120VAC  | LRA/FLA          | 98A/22A      | -            |
| 120VAC  | Tungsten *       | 8.3A         | -            |
| 120VAC  | Pilot Duty       | 470VA        | -            |
| 28VDC   | Resistive        | 20A          | 10A          |

\* Rated 6,000 operations.

\*\* Higher UL & CSA ratings available.

† For Form C application, derate current to 20A (N.O.), 10A (N.C.).

†† For Form C application, derate current to 67%.

**Note:** Consult factory for other 900mW version contact ratings.

#### Initial Dielectric Strength

**Between Open Contacts:** 1,500V rms.

**Between Contacts and Coil:** 2,500V rms.

6 kV surge using 1.2µs/50µs Impulse Wave or  
.5µs – 100kHz Ring Wave

#### Initial Insulation Resistance

**Between Mutually Insulated Elements:** 10<sup>9</sup> ohms, min., @ 500VDC,  
25°C and 50% R.H.

#### Coil Data @ 25°C

**Voltage:** 5 to 110VDC.

**Nominal Coil Power:** 1.0W, (approx.) and 900mW (approx.) versions.

**Maximum Coil Power:** 2.8 Watt.

**Maximum Coil Temperature<sup>(5)</sup>:** Class F: 140°C.

**Duty Cycle:** Continuous.

#### Coil Data - 1 Watt

| Nominal Voltage | DC Resistance ± 10% (Ohms) | Nominal Current (mA) | Nominal Voltage | DC Resistance ± 10% (Ohms) | Nominal Current (mA) |
|-----------------|----------------------------|----------------------|-----------------|----------------------------|----------------------|
| 5               | 25                         | 200                  | 18              | 324                        | 56                   |
| 6               | 36                         | 167                  | 22              | 484                        | 45                   |
| 9               | 81                         | 111                  | 24              | 576                        | 42                   |
| 12              | 144                        | 83                   | 48              | 2,304                      | 21                   |
| 15              | 225                        | 67                   | 110             | 12,100                     | 9                    |

#### Coil Data - 900mW

| Nominal Voltage | DC Resistance ± 10% (Ohms) | Nominal Current (mA) | Nominal Voltage | DC Resistance ± 10% (Ohms) | Nominal Current (mA) |
|-----------------|----------------------------|----------------------|-----------------|----------------------------|----------------------|
| 5               | 27                         | 185                  | 22              | 545                        | 40                   |
| 6               | 40                         | 150                  | 24              | 660                        | 36                   |
| 9               | 97                         | 93                   | 28              | 890                        | 31                   |
| 12              | 155                        | 77                   | 36              | 1,450                      | 25                   |
| 15              | 256                        | 59                   | 48              | 2,560                      | 19                   |
| 18              | 380                        | 47                   | 110             | 13,450                     | 8                    |
| 20              | 450                        | 44                   |                 |                            |                      |

#### Operate Data @ 25°C

**Must Operate Voltage:** 75% of nominal voltage or less.

**Must Release Voltage:** 10% of nominal voltage or more.

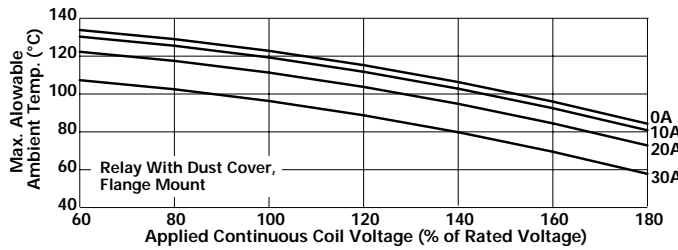
**Operate Time (Including Bounce)§:** 15 ms, max.

**Release Time (Including Bounce)§:** 15 ms, max.

§ At or From Nominal Coil Voltage

## Ambient Temperature vs. Coil Voltage - 1 Watt Coil

Data below are average values and should be verified in application. Tests were conducted within a 2' ( .6 m) cube (still air); at nominal coil power @ 25°C; with normally open contact loaded; and with 4' (1.22 m) long, #10 AWG load wires. P.C. board relays were mounted to a 30A, single side P.C. board (6).



## Environmental Data

**Storage Temperature Range:** -55°C to 130°C.  
**Operating Temperature Range<sup>(1)</sup>:** -55°C to +85°C.  
**Vibration, Operational:** 0.065" (1.65mm) max. excursions from 10-55 Hz. with no contact opening >100µs.  
**Shock, Operational:** 10g for 11 ms with no contact opening >100µs.  
**Shock, Mechanical:** 100g.

## Mechanical Data

**Termination:** Printed circuit and quick connect terminals (4).  
**Enclosures (all have 94V-0 flammability rating):**  
**T9AP:** Unsealed, plastic dust cover.  
**T9AS:** Immersion cleanable, sealed plastic case (2 & 3).  
**T9AV:** Vented, flux-tight, plastic cover.  
**Weight: Q.C. version:** 1.2 oz. (33g) approx. (mounting code 2 & 5).  
**Sealed Model T9AS:** 0.9 oz. (26g) approx. (mounting code 1).

## Notes

- (1) Operating ambient temperature must consider "Must Operate Voltage Change Over Temperature," Contact Temperature Rise, Coil Temperature Rise (If coil is not allowed to cool) and Maximum Coil Temperature. Specification ambient considers 20A load with coil cooled to ambient.
- (2) Sealed relay terminals should not be bent.
- (3) Remove knock-off nib after cleaning process for optimum life of sealed relays.
- (4) Maximum soldering temperature is 500°F for 4 seconds.
- (5) Class F coils are UL systems approved for maximum coil temperature of 140°C, by change of resistance method.
- (6) See application note 13C265 for proper relay mounting, termination, cleaning and PC board conductor width. Coil rise test performed with 30A PC board to maintain 20°C maximum rise @ 30A.

## Ordering Information

Typical Part Number ▶ **T9A S 5 D 2 2 -12**

### 1. Basic Series:

T9A = Low cost, printed circuit board/panel power relay.

### 2. Enclosure:

P = Unsealed, plastic dust cover (mounting code 5).  
 S = Immersion cleanable, knock off nib, sealed plastic case (mounting codes 1 & 2).  
 V = Vented, flux-tight (mounting code 1).

### 3. Contact Arrangement:

1 = 1 Form A (SPST-NO). 5 = 1 Form C (SPDT).

### 4. Coil Input:

D = DC voltage (1 Watt) L = DC voltage (900mW)

### 5. Mounting & Termination:

1 = Printed circuit board mounting; PC terminals for coil & contacts (a).  
 2 = Printed circuit board mounting; PC terminals for coil & contacts, and .250" (6.35mm) quick connects for contacts (b).  
 5 = Flanged mounting; .187" (4.75mm) quick connects for coil and .250" (6.35mm) quick connects for contacts (c).

### 6. Contact Material:

2 = Silver-cadmium oxide.

### 7. Coil Voltage:

|          |            |            |            |            |              |
|----------|------------|------------|------------|------------|--------------|
| 5 = 5VDC | 9 = 9VDC   | 15 = 15VDC | 20 = 20VDC | 24 = 24VDC | 48 = 48VDC   |
| 6 = 6VDC | 12 = 12VDC | 18 = 18VDC | 22 = 22VDC | 36 = 36VDC | 110 = 110VDC |

a) Only available with enclosure code "S" & "V". b) Only available with enclosure code "S". c) Only available with enclosure code "P".

## Stock Items – The following items are normally maintained in stock for immediate delivery.

|             |              |              |              |              |             |
|-------------|--------------|--------------|--------------|--------------|-------------|
| T9AP1D52-12 | T9AS1D12-110 | T9AS1D22-110 | T9AS1L12-24  | T9AS5D12-5   | T9AS5L12-12 |
| T9AP1D52-24 | T9AS1D12-12  | T9AS1D22-12  | T9AS5D12-110 | T9AS5D22-110 | T9AS5L12-24 |
| T9AP1D52-48 | T9AS1D12-18  | T9AS1D22-24  | T9AS5D12-12  | T9AS5D22-12  |             |
| T9AP5D52-12 | T9AS1D12-24  | T9AS1D22-48  | T9AS5D12-18  | T9AS5D22-24  |             |
| T9AP5D52-24 | T9AS1D12-48  | T9AS1D22-5   | T9AS5D12-24  | T9AS5D22-48  |             |
| T9AP5D52-48 | T9AS1D12-5   | T9AS1L12-12  | T9AS5D12-48  | T9AS5D22-5   |             |

Outline Dimensions

T9AS – Mounting & Termination Code 2



T9AP – Mounting & Termination Code 5



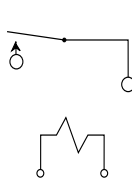
Note: Recommended mounting screw torque is 4.0-5.0 lbs.in when #6 screw is used.

T9AS/V – Mounting & Termination Code 1

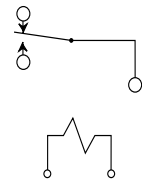


Wiring Diagrams (Bottom Views)

1 Form A



1 Form C



PC Board Layouts (Bottom Views)

T9AP/S – Mounting & Termination Code 2



T9AS/V – Mounting & Termination Code 1



DIN Mount Adapter - 9T91A001



Note: Fits 35mm din track  
Includes: 2 Din clips  
2 Screws  
Must be ordered in multiples of 50



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