

# AZ2800 / AZ2850

## 40 AMP MINIATURE POWER RELAY

### FEATURES

- DPST-NO and DPDT configuration
- Meets 8 mm creepage
- 4 kV dielectric strength
- Epoxy sealed version available
- UL Class F insulation (155°C) standard
- PCB and QC terminals available
- VDE and UL/CUR approved



### CONTACTS

|                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Arrangement</b>                                                              | DPST-NO (2 Form A)<br>DPDT (2 Form C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Ratings (max.)</b><br>switched power<br>switched current<br>switched voltage | (Resistive load)<br>1200 W or 11080 VA<br>40 A (NO), 3 A (NC)<br>30 VDC* or 600 VAC<br><br>* Note: If switching voltage is greater than 30 VDC, special precautions must be taken. Please contact the factory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Rated Loads</b><br><b>UL/CUR</b>                                             | <b>NO contacts</b><br>40 A at 277 VAC, Resistive, 6k cycles [1][2]<br>30 A at 277 VAC, General Use, 100k cycles [1][2]<br>10 A at 600 VAC, General Use, 6k cycles [1]<br>1 HP at 120 VAC, 100k cycles [1][2]<br>2.5 HP at 240 VAC, 100k cycles [1][2]<br>8 FLA / 26 LRA at 600 VAC, 30k cycles [1]<br><b>NO contacts, DC coils only</b><br>25.3 FLA / 110 LRA at 240VAC, 30k cycles [1][2]<br><b>NC contacts</b><br>3 A at 277 VAC, General Use, 100k cycles [1][2]<br>2 A at 480 VAC, General Use, 6k cycles [1]<br>1 A at 600 VAC, General Use, 6k cycles [1]<br>3 FLA / 3 LRA at 240 VAC, 30k cycles [1]<br>2 FLA / 2 LRA at 480 VAC, 30k cycles [1]<br>1 FLA / 1 LRA at 600 VAC, 30k cycles [1] |
| <b>VDE</b><br>AZ2800 series<br>AZ2850 series                                    | <b>NO contacts</b><br>20 A at 250 VAC, Resistive, 50k cycles [2]<br>30 A at 250 VAC, Resistive, 50k cycles [2]<br><b>NC contacts</b><br>3 A at 250 VAC, Resistive, 50k cycles [2]<br><br>Notes:<br>• Versions with 12 VAC coils are not VDE approved.<br>• AgCdO contact versions are not VDE approved.<br>• RT III (wash tight) versions tested at VDE with the vent hole opened.                                                                                                                                                                                                                                                                                                                  |
| <b>Contact materials</b>                                                        | [1] AgCdO - silver cadmium oxide<br>[2] AgSnO <sub>2</sub> - silver tin oxide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Initial resistance</b>                                                       | < 50 mΩ (24 V, 1 A - voltage drop method)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### COIL

|                                                           |                                                                                                                       |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Nominal coil voltages</b>                              | see coil voltage specifications tables                                                                                |
| <b>Dropout</b><br>DC coil types<br>AC coil types          | ≥ 10% of nominal coil voltage<br>≥ 20% of nominal coil voltage                                                        |
| <b>Coil power</b><br>DC coil types<br>AC coil types       | typ. at 23°C (68°F) ambient temperature<br>1.7 W (nominal), 925 mW (at pickup)<br>4.0 VA (nominal) 2.6 VA (at pickup) |
| <b>Temperature Rise</b><br>DC coil types<br>AC coil types | at nominal coil voltage<br>48 K (86°F)<br>68 K (122°F)                                                                |
| <b>Max. temperature</b>                                   | 155°C (311°F) - Class F                                                                                               |

### GENERAL DATA

|                                                                                                |                                                                                                                               |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Life Expectancy</b><br>mechanical<br>electrical                                             | (minimum operations)<br>5 x 10 <sup>6</sup><br>1 x 10 <sup>5</sup> at 30 A, 277 VAC Resistive (NO)                            |
| <b>Operate Time</b><br>DC coil types                                                           | 15 ms (typ.), 25 ms (max. including bounce)<br>at nominal coil voltage                                                        |
| <b>Release Time</b><br>DC coil types                                                           | 10 ms (typ.), 25 ms (max. including bounce)<br>at nom. coil voltage, without coil suppression                                 |
| <b>Dielectric Strength</b><br>coil to contact<br>between open contacts<br>between contact sets | (at sea level for 1 min.)<br>4000 VAC<br>1500 VAC<br>2000 VAC                                                                 |
| <b>Surge voltage</b><br>coil to contact                                                        | 10 kV (at 1.2 x 50 μs)                                                                                                        |
| <b>Insulation Resistance</b>                                                                   | 1000 MΩ (min.) at 23°C, 500 VDC, 50% RH                                                                                       |
| <b>Temperature Range</b><br>operating<br>DC coil types<br>AC coil types<br>storage             | (at nominal coil voltage)<br>-40°C (-40°F) to 85°C (185°F)<br>-40°C (-40°F) to 65°C (149°F)<br>-40°C (-40°F) to 105°C (221°F) |
| <b>Vibration resistance</b>                                                                    | 1.65 mm (0.065") DA at 10–55 Hz                                                                                               |
| <b>Shock</b><br>operational<br>non-destructive                                                 | (11ms, 1/2 sine pulse)<br>10 g (no contact opening > 100μsec)<br>100 g                                                        |
| <b>Enclosure</b><br>type<br>material group                                                     | P.B.T. polyester<br>RT II (flux proof), RT III (wash tight)<br>IIla                                                           |
| <b>Terminals</b><br>AZ2800 series<br>AZ2850 series                                             | Quick connect tabs<br>Tinned copper alloy, P. C.                                                                              |
| <b>Soldering</b> (AZ2850 series)<br>preheating<br>soldering                                    | (referring IEC 61760-1 wave soldering)<br>120°C (248°F) / ≤ 120 s<br>260 ±5°C (500 ±9°F) / ≤ 2 x 5 s                          |
| <b>Cleaning</b> (AZ2850 series)<br>max. solvent temp.<br>max. immersion time                   | (wash tight versions only)<br>80°C (176°F)<br>30 seconds                                                                      |
| <b>Weight</b>                                                                                  | 86 grams (approx.)                                                                                                            |
| <b>Agency Approvals</b><br>VDE<br>UL / CUR                                                     | 40023442<br>E44211                                                                                                            |
| <b>Packing unit in pcs</b>                                                                     | 20 per tray / 100 per carton box                                                                                              |
| <b>Compliance</b>                                                                              | IEC 61810-1, UL508<br>RoHS (only for AgSnO <sub>2</sub> versions)                                                             |

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## COIL VOLTAGE SPECIFICATIONS

### DC coils

| Nominal Coil VDC | Must Operate VDC | Max. Voltage VDC | Nom. Current mA $\pm 10\%$ | Resistance Ohm $\pm 10\%$ |
|------------------|------------------|------------------|----------------------------|---------------------------|
| 5                | 3.8              | 8.0              | 326.7                      | 15.3                      |
| 6                | 4.5              | 9.6              | 272.0                      | 22                        |
| 12               | 9.0              | 19.2             | 140.0                      | 86                        |
| 24               | 18.0             | 38.4             | 68.5                       | 350                       |
| 48               | 36.0             | 76.8             | 34.5                       | 1390                      |
| 110              | 82.5             | 176.0            | 15.2                       | 7255                      |

### 50Hz AC coils

| Nominal Coil VAC | Must Operate VAC | Max. Voltage VAC | Nom. Current mA $\pm 10\%$ | DC Res. Ohm $\pm 10\%$ |
|------------------|------------------|------------------|----------------------------|------------------------|
| 12               | 9.6              | 15.6             | 340.0                      | 11.25                  |
| 24               | 19.2             | 26.4             | 166.0                      | 45                     |
| 120              | 96               | 132              | 33.3                       | 1125                   |
| 208              | 167              | 229              | 19.2                       | 3278                   |
| 220              | 176              | 242              | 18.2                       | 3800                   |
| 240              | 192              | 264              | 16.7                       | 4500                   |
| 277              | 222              | 305              | 14.4                       | 5960                   |

### 60Hz AC coils

| Nominal Coil VAC | Must Operate VAC | Max. Voltage VAC | Nom. Current mA $\pm 10\%$ | DC Res. Ohm $\pm 10\%$ |
|------------------|------------------|------------------|----------------------------|------------------------|
| 12               | 9.6              | 15.6             | 340.0                      | 9.5                    |
| 24               | 19.2             | 26.4             | 166.0                      | 35.7                   |
| 120              | 96               | 132              | 33.3                       | 830                    |
| 208              | 167              | 229              | 19.2                       | 2600                   |
| 220              | 176              | 242              | 18.2                       | 2870                   |
| 240              | 192              | 264              | 16.7                       | 3800                   |
| 277              | 222              | 305              | 14.4                       | 4700                   |

Note: All values at 23°C (73°F), upright position, terminals downward.

## ORDERING DATA

**AZ28**  -

**Coil terminal option (AZ2800 only)**  
 nil: .250 x .032 in [6.3 x 0.8 mm]  
 K: .187 x .020 in [4.8 x 0.5 mm]

**Sealing option**  
 nil: non sealed  
 E: wash tight version

**Coil type**  
 D: DC coil  
 A: 60 Hz AC coil  
 A5: 50 Hz AC coil

**Nominal coil voltage**  
 see coil voltage specifications tables

**Contact material**  
 nil: AgCdO - silver cadmium oxide (not VDE approved)  
 E: AgSnO<sub>2</sub> - silver tin oxide

**Contact arrangement**  
 2A: 2 Form A (DPST-NO)  
 2C: 2 Form C (DPDT)

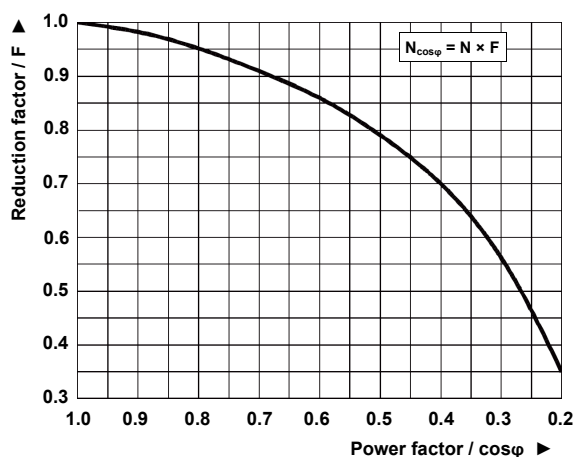
**Series**  
 00: Flange mount, QC terminals  
 50: PCB mount, solder terminals

### Example ordering data

- AZ2800-2AE-12D Flange mount, 2 Form A, silver-tin-oxide, 12 VDC nominal coil voltage, non sealed, .250 x .032 in [6.3 x 0.8 mm] coil terminals
- AZ2800-2A-120A Flange mount, 2 Form A, silver-cadmium-oxide, 120 VAC / 60 Hz nominal coil voltage, non sealed, .250 x .032 in [6.3 x 0.8 mm] coil terminals
- AZ2800-2AE-240A5K Flange mount, 2 Form A, silver-tin-oxide, 240 VAC / 50 Hz nominal coil voltage, non sealed, .187 x .020 in [4.8 x 0.5 mm] coil terminals
- AZ2850-2CE-24DE PCB mount, 2 Form C, silver-tin-oxide, 24 VDC nominal coil voltage, wash tight version

## INDUCTIVE LOADS LIFE REDUCTION

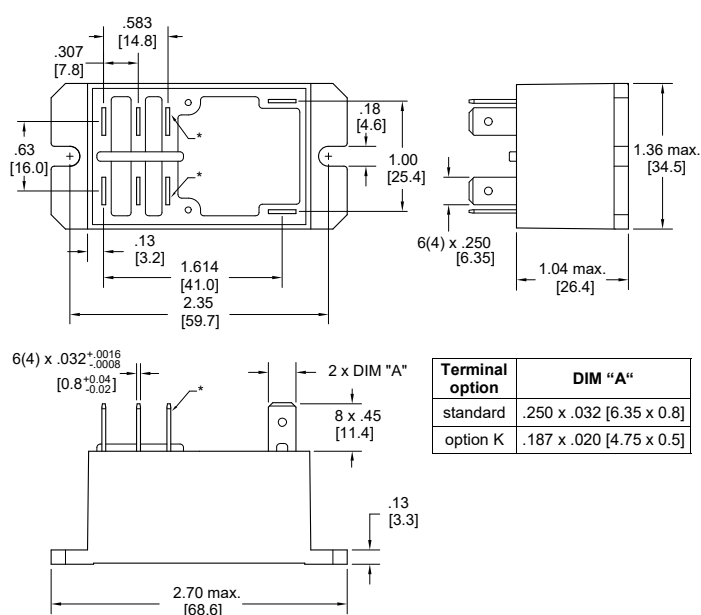
General curve of electrical life reduction factor at inductive AC load



## AZ2800 MECHANICAL DATA

Dimensions in inches with metric equivalents in parentheses.  
 Tolerance if not stated otherwise:  $\pm .010"$

\* Note: Only for 2 Form C (DPDT) versions



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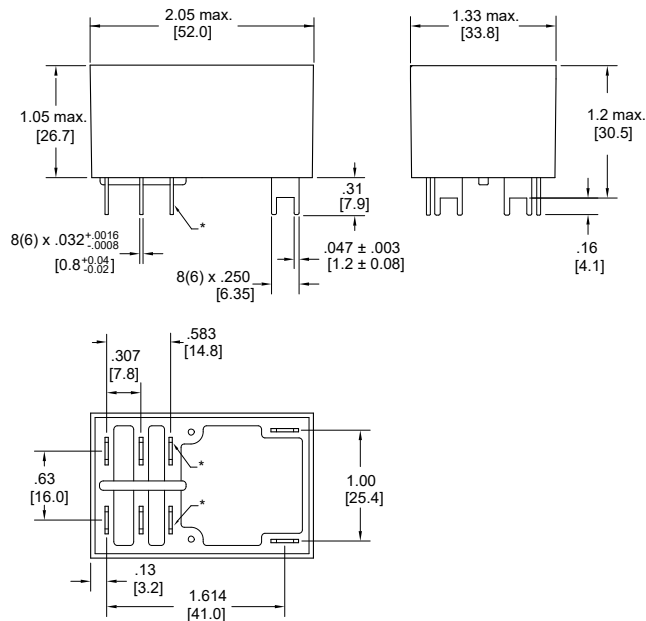
2023-02-14

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## AZ2850 MECHANICAL DATA

Dimensions in inches with metric equivalents in parentheses.  
Tolerance if not stated otherwise:  $\pm .010$ "

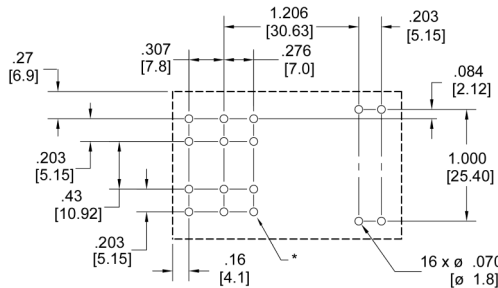
\* Note: Only for 2 Form C (DPDT) versions



## AZ2850 PCB FOOTPRINT

Recommendation for PC board layout of AZ2850. Viewed towards terminals.  
Dimensions in inches with metric equivalents in parentheses.

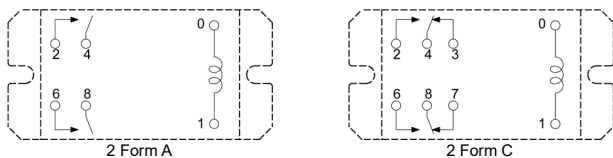
\* Note: Only for 2 Form C (DPDT) versions



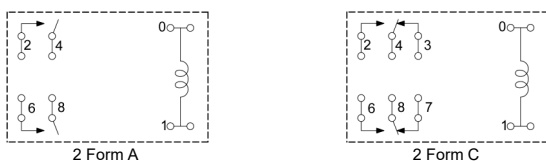
## WIRING DIAGRAMS

Viewed towards terminals

### AZ2800



### AZ2850



## NOTES

1. All values in this datasheet are at reference temperature of 23°C (73°F) unless stated otherwise.
2. The relay may pull in and operate with less than the specified *must operate* voltage value.
3. The coil's *must operate* voltage and the coil's *resistance* value depend on the temperature of the coil. The specified values are given for a coil temperature of 23°C and increase by approx. 0.39% per Kelvin of temperature rise.
4. Coil suppression circuits such as diodes, etc. in parallel to the coil will lengthen the release time.
5. Relays are electromechanical components that are sensitive to shock. The relay's adjustment can be affected if the relay is subjected to excessive shock or excessive pressure is applied to the relay case. Relays which have been dropped must no longer be used.
6. Substances containing silicone or phosphorus must be avoided in the vicinity to the relay. Outgassing from these substances can penetrate the relay and adhere on the contacts. Deposits of these substances may act as insulators and adversely affect the contact resistance. Silicone can be found e.g. in gaskets, lubricants or filling materials, phosphorus can be found e.g. as a flame retardant in plastics.
7. Prevent non-sealed relays from atmospheres subject to dust. Dust particles may enter the case and get stuck between the contacts, causing the contact circuits to fail.
8. Do not use these relays in environments with explosive or flammable gases. Electrical arcing at the contacts could ignite these gases and cause fire.
9. Avoid high frequency or ultrasonic vibrations on the relays as these can cause contact welding and misalignment or destruction of internal structures.
10. During operation, storage and transport, ambient temperature should be within the specified temperature range. Humidity should be in the range of 5% to 85% RH. Icing and condensation must be avoided. Relays stored for an extended period of time may show initially increased contact resistance values due to chemical effects such as oxidation.
11. For automated dual wave soldering process we recommend preheating with 120°C (248°F) for max. 120 seconds and a soldering temperature of 260  $\pm$  5°C (500  $\pm$  9°F) for max. 10 seconds soldering time (max. 5 seconds per wave). For manual soldering we recommend 350°C (662°F) max. temperature for max. 5 seconds. During the soldering process, no force may be exerted on the relay terminals.
12. Flux proof relays must not be washed, immersion cleaned or conformal coated as substances may enter the case and cause corrosion or seizure of mechanical parts.
13. For AZ2800 series flange mount types: Allow suitable slack in wiring and do not apply excessive force to the terminals. No washing or soldering allowed.
14. Versions equipped with silver cadmium oxide contacts (AgCdO) are not available within the region of the European Economic Area.
15. The datasheet and the component's specifications are subject to change without notice.

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## DISCLAIMER

This product specification is to be used in conjunction with the application notes which can be downloaded from the regional ZETTLER relay websites. The specification provides an overview of the most significant part features. Any individual applications and operating conditions are not taken into consideration. It is recommended to test the product under application conditions. Responsibility for the application remains with the customer. Proper operation and service life cannot be guaranteed if the part is operated outside the specified limits.

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