

# AZEV140

## 40 AMP POWER RELAY

### FEATURES

- 40 Amp nominal switching capability
- Isolated NC signal contact for welding monitoring
- Withstands up to 1850 A short circuit current
- Wide contact gap of  $\geq 2.25$  mm
- Dielectric strength 4 kV<sub>RMS</sub>
- UL / CUR: E365652
- TÜV: B 088793 0016
- CQC: CQC20002276475



### CONTACTS

|   |   |
|---|---|
| <b>Arrangement</b><br>load contact<br>signal contact  | SPST-NO (1 Form A)<br>SPST-NC (1 Form B) coupled to load contact  |
| <b>Ratings (max.)</b><br>load contact<br>switched power<br>switched current<br>switched voltage<br><br>signal contact<br>switched current<br>minimum load | (resistive load)<br><br>22000 VA<br>50 A<br>440 VAC<br><br>10 mA at 12 VDC<br>10 mA, 5 VDC, 50mW  |
| <b>Approved ratings</b><br>load contact<br><br><br>signal contact   | (UL/CUR/TÜV/CQC)<br>40 A at 440 VAC, resistive, 85°C, 30k cycles<br>32 A at 440 VAC, resistive, 85°C, 50k cycles<br>50 A at 440 VAC, resistive, 85°C, 6k cycles<br>20 A make, 50 A carry, 20 A break at 440 VAC, resistive, 85°C, 50k cycles<br><br>10 mA at 12 VDC, 85°C, 50k cycles |
| <b>Contact material</b><br>load contact<br>signal contact   | AgSnO <sub>2</sub> (silver tin oxide)<br>AgNi + Au (silver nickel, gold plated)   |
| <b>Contact gap</b><br>load contact  | $\geq 2.25$ mm  |
| <b>Contact resistance</b><br>load contact<br>initial<br>typical   | $\leq 50$ m $\Omega$<br>$< 3$ m $\Omega$  |

### COIL

|  |  |
|--|--|
| <b>Nominal coil DC voltages</b>                                    | 5, 9, 12, 24, 48                           |
| <b>Dropout voltage</b>   | $> 5\%$ of nominal coil voltage            |
| <b>Holding voltage</b>   | $> 35\%$ of nominal coil voltage           |
| <b>Coil power</b><br>nominal<br>holding power<br>at pickup voltage | (at 23 °C)<br>2.1 W<br>258 mW<br>1.2 W     |
| <b>Temperature rise</b>  | 70 K (126°F) at nominal coil voltage, 85°C |
| <b>Insulation system</b>   | class F, max. temperature 155°C (311°F)    |

### GENERAL DATA

|   |  |
|---|--|
| <b>Life Expectancy</b><br>mechanical<br>electrical  | (minimum operations)<br>1 x 10 <sup>5</sup><br>see UL/CUR/TÜV/CQC ratings  |
| <b>Operate Time</b>   | 30 ms (max.) at nominal coil voltage   |
| <b>Release Time</b>   | 10 ms (max.) at nominal coil voltage, without coil suppression   |
| <b>Dielectric Strength</b><br>open load contacts<br>coil to load contacts<br>open signal contacts<br>coil to signal contacts<br>signal to load contacts | (at sea level for 1 min.)<br>2500 V <sub>RMS</sub><br>4000 V <sub>RMS</sub><br>500 V <sub>RMS</sub><br>500 V <sub>RMS</sub><br>4000 V <sub>RMS</sub>                         |
| <b>Pulse current capability</b>   | $\geq 1.50$ kA, $\geq 6.0$ kA <sup>2</sup> s<br>(based on requirements of IEC 62752)<br>$\geq 1.85$ kA, $\geq 4.5$ kA <sup>2</sup> s<br>(based on requirements of IEC 62955) |
| <b>Surge voltage</b><br>open load contacts<br>coil to load contacts<br>signal to load contacts  | 6 kV<br>6 kV<br>6 kV   |
| <b>Insulation Resistance</b>  | 1000 M $\Omega$ (min.) at 23°C, 500 VDC, 50% RH  |
| <b>Temperature Range</b><br>operating   | (at nominal coil voltage)<br>-40°C (-40°F) to 85°C (185°F)   |
| <b>Vibration resistance</b>   | 0.062" (1.5 mm) DA at 10–55 Hz   |
| <b>Enclosure</b><br>protection category<br>material group<br>flammability   | P.B.T. polyester<br>RT II, flux proof<br>Illa<br>UL94 V-0  |
| <b>Terminals</b>  | Tinned copper alloy, P. C.   |
| <b>Soldering</b><br>preheating<br>soldering   | (referring IEC 61760-1 wave soldering)<br>120°C (248°F) / $\leq 120$ s<br>260 $\pm 5$ °C (500 $\pm 9$ °F) / $\leq 10$ s  |
| <b>Dimensions</b><br>length<br>width<br>height  | 35.0 mm (1.38")<br>16.0 mm (0.63")<br>28.0 mm (1.10")  |
| <b>Weight</b>   | 35 grams (approx.)   |
| <b>Compliance</b>   | UL 508, IEC 61810-1, GB/T 21711.1-2008<br>RoHS, REACH<br>designed to meet requirements of IEC 62752 and IEC 62955  |
| <b>Agency Approvals</b><br>UL / CUR<br>TÜV<br>CQC   | E365652<br>B 088793 0016<br>CQC20002276475   |
| <b>Packing unit in pcs</b>  | 50 per plastic tray<br>400 per carton box  |

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## COIL VOLTAGE SPECIFICATIONS

| Nominal Coil VDC | Must Operate VDC | Min. Holding VDC | Max. Coil VDC | Resistance Ohm $\pm 10\%$ |
|------------------|------------------|------------------|---------------|---------------------------|
| 5                | 3.75             | 1.75             | 6.0           | 11.8                      |
| 9                | 6.75             | 3.15             | 10.8          | 38.4                      |
| 12               | 9.0              | 4.2              | 14.4          | 68.5                      |
| 24               | 18.0             | 8.4              | 28.8          | 274                       |
| 48               | 36.0             | 16.8             | 57.6          | 1096                      |

Test conditions: 23°C (73°F), upright position, terminals downward.

## ORDERING DATA

AZEV140-1AE  -  D

Nominal coil voltage  
see coil voltage specifications table

Signal contact

nil: without signal contact

1BG: equipped with 1 Form B signal contact

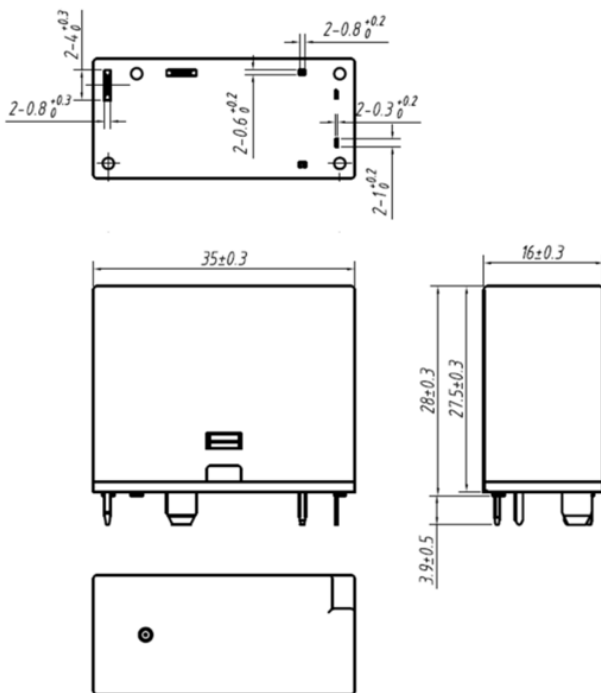
### Example ordering data

AZEV140-1AE-24D Without signal contact, 24VDC coil

AZEV140-1AE1BG-12D With 1 Form B signal contact, 12VDC coil

## MECHANICAL DATA

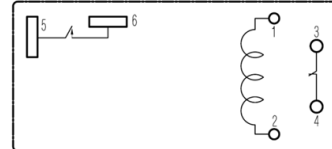
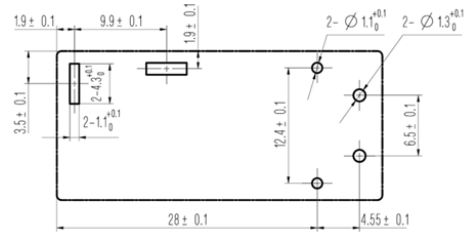
Dimensions in mm. Pin dimensions given without tin coating.



CAD data in attachment of the datasheet.

## PC BOARD LAYOUT / WIRING DIAGRAMS

Layout and footprint recommendation. Viewed towards terminals.  
Dimensions in mm.



## IEC 62752 / IEC 62955 Short Circuit Withstand

Compliance with IEC 62752, IEC 62955 or similar standards for short circuit withstand is a function of both relay design and PCB layout. ZETTLER's relay design and applications engineering teams have developed an application note that contains important design suggestions to optimize the performance of the relay with respect to its short circuit current withstand capability.

In addition, as the overall performance depends on multiple factors such as part arrangement and trace routing, compliance cannot be generically guaranteed by ZETTLER. We strongly encourage customers to conduct their own short circuit tests in accordance with IEC 62752, IEC 62955 or similar standards in the context of their individual application design.

## NOTES

- All values at reference temperature of 23°C (73°F) unless stated otherwise.
- Relay may pull in with less than "Must Operate" value.
- "Maximum Coil Voltage" is the maximum voltage the coil can endure for a short period of time.
- Coil suppression circuits such as diodes, etc. in parallel to the coil will lengthen the release time. We recommend to use coil suppression circuits with a reverse breakdown voltage of around 3 times the nominal coil voltage to achieve a fast release time.
- For applications requiring long term high current carrying, we recommend to reduce the coil energization to around half of the nominal coil voltage as holding voltage.
- For the gold plated signal contact a minimum load of 10mA/5V/50mW is recommended.
- Provide sufficient PCB cross section at Form A load terminals as a heat spreader to dissipate power loss from contact resistance.
- Relay adjustment may be affected if excessive shock is applied to the relay or if undue pressure is exerted on the relay case. Dropped relays must not be used anymore.
- 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.
- RTII (flux proof) relays must not be washed, immersion cleaned or conformal coated.
- During storage, transport and usage, ensure a dry, non-condensing and non-icing environment.
- Substances containing silicone or phosphorus must be avoided in the vicinity to the relay as these will shorten its service life.
- Avoid corrosive gases near the relay. Contact corrosion will lead to malfunction.
- Specifications 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.

## ZETTLER GROUP

Building on a foundation of more than a century of expertise in German precision engineering, ZETTLER Group is a world-class enterprise, engaged in the design, manufacturing, sales and distribution of electronic components. Our industry leadership is based on a unique combination of engineering competence and global scale.

For more information on other ZETTLER Group companies, please visit [zettler-group.com](http://zettler-group.com). For support on this product or other ZETTLER relays, please visit one of the group sites below.

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