# AZEV678

### 40 AMP 2 POLES POWER RELAY WITH MONITORING

#### FEATURES

- 40 Amp /480 VAC switching capability
- Dual NO load contacts plus isolated NC monitor contact for welding monitoring
- Withstands up to 1.85kA short circuit current
- Electrical rating according to IEC61851-1: CC2/50k cycles
- Load contact gap: ≥3 mm
- Dielectric strength : 5 kV<sub>RMS</sub>, between contacts and coil
- UL class F insulation
- UL/CUR E365652
- TÜV B088793 0020
- CQC 22002356459

#### CONTACTS

Arrangement load contact monitor contact	2PST-NO(2 Form A) SPST-NC(1 Form B) coupled to load contacts			
Ratings (max.) Load contacts switched power switched current continuous current switched voltage monitor contact Max. switched current	(resistive load) 19200 VA 40 A 40 A 480VAC 100mA, 12VDC			
UL/CUR/TÜV/CQC Approval ratings load contact	40A at 480VAC, resistive, 85°C, 6k cycles 35A at 400VAC, resistive, 85°C, 50k cycles			
monitor contact Minimum load	10A make, 40A carry, 10A break, At 480VAC, 85°C, resistive, 50k cycles 10mA at 12VDC,85°C, 50k cycles 10mA, 5VDC Note: Approvals with open vent hole only.			
Contact material load contact monitor contact	AgSnO <sub>2</sub> AgNi (gold plated)			
Contact gap load contact monitor contact	≥3mm  ≥0.7mm			
Contact resistance initial	load contact: $\leq 10m\Omega$ (6VDC 20A) monitor contact: $\leq 100m\Omega$ (6VDC 1A)			
COIL				
Nominal coil DC voltages	6, 9, 12, 24, 48			
Dropout voltage	> 5% of nominal coil voltage			
Holding voltage *	$(35\% \sim 80\%)$ of nominal coil voltage (@23°C)			

Holding voltage	(40% ~65%) of nominal coil voltage (@25°)	
<b>Coil power</b> nominal holding power at pickup voltage	(at 23 °C) 2.6 W 416 mW 1463 mW	
Temperature Rise	70 K @ max. at holding voltage, 85°C	
Max. temperature	Class F insulation - 155°C (311°F)	

\* Notes1: To avoid overheating and burning, the voltage continuously applied to the coil must be the holding voltage, which shall be applied after 500ms from the applied nominal coil voltage.





### GENERAL DATA

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Life Expectancy mechanical electrical	(minimum operations) 1 x 10 <sup>5</sup> See approval ratings		
Operate Time	30 ms (max.) at nominal coil voltage		
Release Time	10 ms (max.) at nominal coil voltage, without coil suppression		
Dielectric Strength (Initial) between open load contacts between load contacts sets between coil and load contacts between load and monitor contacts between open monitor contacts between coil and monitor contacts	(at sea level for 1 min.) 3000 V <sub>RMS</sub> 3000 V <sub>RMS</sub> 5000 V <sub>RMS</sub> 5000 V <sub>RMS</sub> 1000 V <sub>RMS</sub> 1000 V <sub>RMS</sub>		
Short circuit capacity Based on requirements of EN/IEC 62955:2018	Test sequence E: [9.11.2.3 a)]: 250VAC,Ip=1.85kA,I <sup>2</sup> t =4.5kA <sup>2</sup> s (In≤32A, Inc=3kA) [9.11.2.2)]: 250VAC,Im=500A Test sequence F : [9.11.2.3 b)]: 250VAC,Im=500A [9.11.2.3 c)]: 250VAC,Ip=1.85kA,I <sup>2</sup> t =4.5kA <sup>2</sup> s (In≤32A, I∆c=3kA)		
Surge Voltage @1.2/50µs	10kV coil to load contacts 6kV between load contacts 8kV monitor contacts to load contacts		
Insulation Resistance	1000 MΩ (min.) at 23°C, 500 VDC, 50% RH		
Temperature Range operating	(at holding coil voltage) -40°C (-40°F) to 85°C (185°F)		
Vibration resistance	0.062" (1.5 mm) DA at 10–55 Hz		
Shock	10 g		
Enclosure protection category material group flammability	RT II, flux proof IIIa UL94 V-0		
Terminals	Tinned copper alloy, P. C.		
Soldering preheating soldering	(referring IEC 61760-1 wave soldering) 120°C (248°F) / ≤ 120 s 260 ±5°C (500 ±9°F) / ≤ 2x5s		
Dimensions length width height	36.5 mm (1.41") 33.8mm (1.33") 41.5 mm (1.63")		
Weight	85 grams (approx.)		
Compliance	RoHS, REACH		
Packing unit in pcs	10 per plastic tube/ 150 per carton box		

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#### **COIL VOLTAGE SPECIFICATIONS**

Nominal Coil VDC	Must Operate VDC <sub>2</sub> )	Min. Holding VDC 3)	Max. Cont. VDC 4)	Resistance Ohm ± 10%
6	4.5	2.4	6.6	13.9
9	6.7	3.6	9.9	31.2
12	9.0	4.8	13.2	55.4
24	18.0	9.6	26.4	221.5
48	36.0	19.2	52.8	886.2

Notes2:

1)All values at 23°C, upright position, terminals downward.

2)Relay may pull in with less than "Must Operate" value.

3)After 500ms rated voltage.

4)Continous time is less than 60 seconds

5)To avoid overheating at elevated ambient temperatures, operate the coil at holding voltage after applying the full nominal coil voltage for ≥500 milliseconds.

#### **ORDERING DATA**



Monitor contact Nil: without monitor contact 1B: equipped with 1 form B monitor contact

Note: For Ag plating contact (main load) , add P after date code.

#### Example ordering data

AZEV678-2AE1B-12D With monitor contact

#### NOTES

- 1. All values at 23°C (73°F) except special note.
- Provide sufficient PCB cross section as heat spreader on terminals. And too long current carrying circuit inside PCB board is not conducive to heat dissipation
- 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.
- Relay parameters 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.
- 5. For automated dual wave soldering process we recommend preheating with 120°C (248°F) for max. 120 seconds and a soldering temperature of 260 ±5°C (500 ±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.
- 6. Substances containing silicone or phosphorus must be avoided in the vicinity to the relay as these will shorten its service life.
- Relays must not be washed, immersion cleaned or conformal coated. A protective measure for relay is necessary while applying three proofing paint.
- 8. With gold plated contacts a minimum load of 10mA/5V/50mW is recommended.
- 9. Relay parameters will be affected while long-time heating by soldering iron or solder bath. Please following the soldering demand strictly.
- 10. Specifications subject to change without notice.



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#### **MECHANICAL DATA**

Dimensions in mm. Tolerance: ±0.3mm if not stated otherwise.

- Notes:1.Pin dimensions for reference only and given without tin coating. 2.Pins 11 and 12 are omitted in versions without 1 Form B monitor contact. 3.With sealed versions the vent hole is sealed by epoxy and the auxiliary vent hole
  - must be cut open to achieve the specified performance and service life. 33.8 ±0.5 36.5 ±0.5 ±0.5 23.05 Top side view ZETTLER 12 AZEV678-2AE1B-12D 1.5 x 0.4 NO 40A 480VAC 1.5 x 0.3 35A 400VAC 33.5 NC 10mA 12VDC Cac  $\sim$ DATECODE CHINA vent hole auxiliary vent hole

#### PC BOARD LAYOUT WIRING DIAGRAMS

Viewed towards terminals. Note: Pins 11 and 12 are omitted in versions



#### PC BOARD LAYOUT

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Dimensions in mm. Dimensions in mm. Viewed towards terminals. Note: Pins 11 and 12 are omitted in versions without 1 Form B monitor contact.



### AZEV678

#### 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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