AZ2280

MINIATURE POWER RELAY

FEATURES

- Up to 40 Amp switching capability (with DC coils)
- Quick-connect leads for contacts and coil
- 1 Form A, B and C contacts available
- Life expectancy to 10 million operations
- Options for DC and AC coils (CE compliant AC coils)
- Class F (155°C) insulation standard
- Available with an epoxy seal for automatic wave soldering and immersion cleaning
- Certified for use with A2L and A3 refrigerants (UL LZGH & NCKL)

CONTACTS

Arrangement	SPST-N.O. (1 Form A) SPST-N.C. (1 Form B) SPDT (1 Form C)
Ratings (max.) **1 Form A** switched power switched current switched voltage **1 Form B** switched power switched current switched voltage **1 Form C** switched power switched current switched voltage	(resistive load) 1120 W or 11080 VA 40 A 28 VDC* or 277 VAC 420 W or 4155 VA 40 A (Form A), 30 A (Form B) 28 VDC* or 277 VAC 840 W or 8310 VA (N.O.), 560 W or 5540 VA (N.C.) 30 A (N.O.), 20 A (N.C) 28 VDC* or 277 VAC * Note: If switching voltage is greater than 30 VDC, special precautions must be taken. Please contact the factory.
Contact materials	$AgSnO_2$ (silver tin oxide) AgCdO (silver cadmium oxide)
Contact resistance Initial typical	(load contact, voltage drop method) ≤ 50 mΩ ≤ 2 mΩ

COIL

Nominal coil DC voltages	see coil voltage specification tables
Dropout voltage	> 10% of nominal coil voltage - DC coils > 20% of nominal coil voltage - AC coils
Coil power DC coils nominal max. continuous at pickup voltage AC coils nominal max. continuous at pickup voltage	(at 23°C ambient temperature) 0.9 W (approx.) 1.7 W 500 mW (typ.) see coil voltage specification tables 2.7 VA 1.4 VA (typ.)
Temperature Rise	43 K (77°F) at nom. coil voltage, no load 70 K (126°F) at nom. coil voltage, 30 A load
Max. temperature	155°C (311°F) - class F coil wire

GENERAL DATA

Life Expectancy mechanical electrical	(minimum operations) 1 x 10^7 1 x 10^5 at 28 A 277 VAC resistive (N.O.)
Operate Time	15 ms (max.) at nominal DC coil voltage
Release Time	10 ms (max.) DC coil, w/o coil suppression
Dielectric Strength coil to load contacts between open contacts	(at sea level for 1 min.) 2500 V_{RMS} 1500 V_{RMS}
Insulation Resistance	1000 MΩ (min.) at 20°C, 500 VDC, 50% RH
Temperature Range operating DC coils AC coils Ignition-protected	(at nominal coil voltage) -55°C (-67°F) to 85°C (185°F) -55°C (-67°F) to 60°C (140°F) -55°C (-67°F) to 60°C (140°F)
Vibration resistance	0.062" (1.5 mm) DA at 10–55 Hz
Shock	10 g
Enclosure flammability	P.B.T. polyester UL94 V-0
Terminals	Quick Connects Note: Allow suitable slack on leads and do not subject terminals to excessive force.
Dimensions length width height	 50.2 mm (1.98") 27.5 mm (1.08") 27.8 mm (1.09")
Weight	36 grams (approx.)
Compliance	UL E44211 (NLDX2/8, LZGH2/8) UL E547441 (NCKL2/8) VDE 40049064 (IEC/EN 61810-1)
Packing unit in pcs	40 per plastic tray / 240 per carton box

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UL/CUR APPROVED CONTACT RATINGS

1 Form A	40 A at 277 VAC, General Use, 40°C, 6k cycles * [1] 40 A at 277 VAC, General Use, 30°C, 6k cycles * [2] 30 A at 277 VAC, General Use, 80°C, 6k cycles [1][2] 30 A at 28 VDC, Resistive, 80°C, 6k cycles [1] 30 A at 28 VDC, General Use, 80°C, 6k cycles [2] 24 A at 240 VAC, Resistive, 60°C, 100k cycles [2] 16.7 A at 240 VAC, Resistive, 105°C, 100k cycles * [2] 28 A at 277 VAC, General Use, 80°C, 100k cycles [1] 20 FLA / 60 LRA at 277 VAC, 80°C, 30k cycles [1] 2 HP at 250 VAC [1][2] 1 HP at 125 VAC [1][2]
1 Form B	15 A at 277 VAC, General Use, 80°C, 6k cycles [1][2] 10 A at 28 VDC, General Use, 80°C, 6k cycles [1][2] 10 FLA / 33 LRA at 277 VAC, 80°C, 30k cycles [1] ½ HP at 250VAC [1][2] ¼ HP at 125 VAC [1]
1 Form C (N.O.)	30 A at 277 VAC, General Use, 80°C, 6k cycles [1][2] 20 A at 277 VAC, General Use, 80°C, 6k cycles [1] 20 A at 28 VDC, Resistive, 80°C, 6k cycles [1] 20 A at 28 VDC, General Use, 80°C, 6k cycles [2] 20 FLA / 60 LRA at 277 VAC, 80°C, 30k cycles [1] 2 HP at 250 VAC [1][2] 1 HP at 125 VAC [1][2]
1 Form C (N.C.)	20 A at 277 VAC, General Use, 80°C, 6k cycles [1][2] 10 A at 28 VDC, Resistive, 80°C, 6k cycles [1] 10 A at 28 VDC, General Use, 80°C, 6k cycles [2] 10 FLA / 33 LRA at 277 VAC, 80°C, 30k cycles [1] ½ HP at 250 VAC [1][2] ¼ HP at 125 VAC [1][2]

[1] AgCdO (silver cadmium oxide) contacts - AZ2280 only

[2] $AgSnO_2$ (silver tin oxide) contacts - AZ2280 or AZ2280R

* For DC coil types only

VDE APPROVED CONTACT RATINGS

1 Form A	40 A at 250 VAC, Resistive, 6k cycles [2] 30 A at 250 VAC, Resistive, 30k cycles [1] 15 A at 250 VAC, Cos Phi = 0.4, 85°C, 100k cycles [1][2]
1 Form B	15 A at 250 VAC, Resistive, 30k cycles [1]
1 Form C (N.O.)	30 A at 277 VAC, Resistive, 30k cycles [1][2] 20 A at 277 VAC, Resistive, 85°C, 100k cycles [1]
1 Form C (N.C.)	15 A at 250 VAC, Resistive, 30k cycles [1] 10 A at 250 VAC, Resistive, 85°C, 100k cycles [2]

[1] AgCdO (silver cadmium oxide) contacts

[2] $AgSnO_2$ (silver tin oxide) contacts

Note: AC coil types and 18 VDC coil are not VDE approved

DC COIL VOLTAGE SPECIFICATIONS

Nominal Coil VDC	Must Operate VDC	Max. Continuous VDC	Resistance Ohm ± 10%
5	3.75	6.4	27
6	4.5	7.8	40
9	6.75	12.2	97
12	9.0	15.4	155
15	11.25	19.8	256
18	13.5	24.1	380
24	18.0	33.0	660
48	36.0	62.6	2560
110	82.5	146.6	13450

AC COIL VOLTAGE SPECIFICATIONS

Nominal Coil VAC	Must Operate VAC	Max. Continuous VAC	Nominal Coil Power VA
12	9.6	13.8	2.3
24	19.2	27.6	2.1
120	96	138	2.3
208	176	239	2.2
240	192	276	2.2/2.6
277	220	319	2.2

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

ORDERING DATA

AZ2280 -□□□□- □□D□□F

Coil terminal
nil: 0.187“ terminals
K: 0.110“ terminals

Sealing option
nil: non sealed
E: sealed version

Coil option
D: DC coil
A: AC coik

Nominal coil voltage
see coil voltage specifications table

Contact option
nil: Standard contacts
T: Extended life contacts

Contact material
nil: *silver cadmium oxide (AgCdO)
E: silver tin oxide ($AgSnO_2$)

Contact arrangement
1A: 1 Form A (SPST-N.O.)
1B: 1 Form B (SPST-N.C.)
1C: 1 Form C (SPDT)

Series
AZ2280: Standard version (NLDX2/8 and LZGH2/8)
AZ2280R: Ignition-protected version for A3 (NCKL2/8)

*Cadmium based contacts not available in all regions or with AZ2280R .

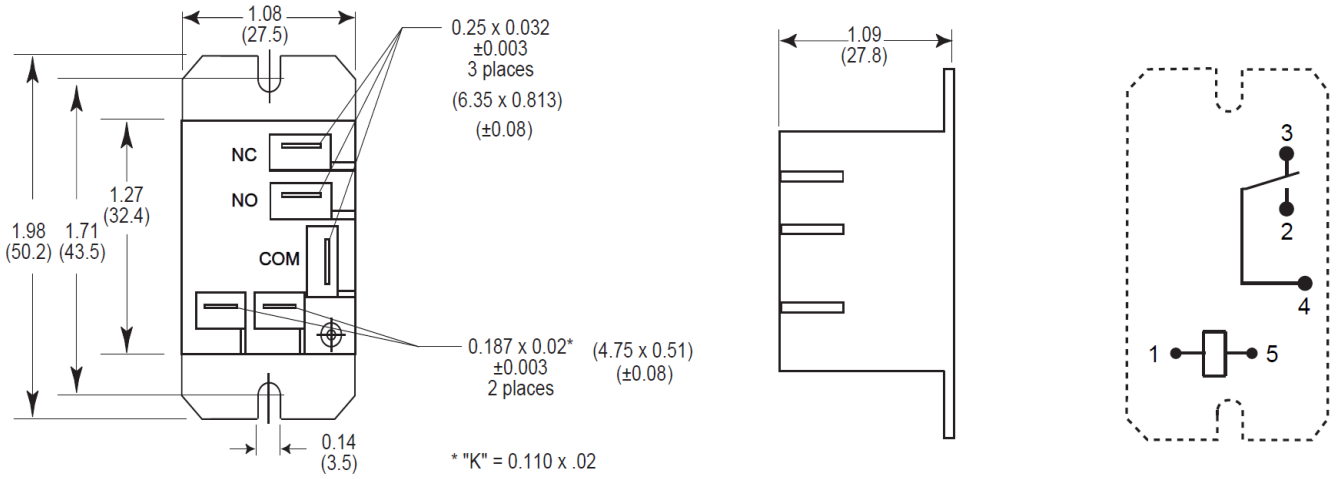
Example ordering data

AZ2280-1AT-9DKF	Standard AZ2280, form A, extended life cadmium oxide contacts, 9 VDC coil, 0.110“ coil terminals
AZ2280-1CE-120AF	Standard AZ2280, form C, silver tin oxide contacts, 120 VAC coil, sealed version
AZ2280R-1AE-12DEF	Ignition-protected version, form A, silver tin oxide contacts, 12 VDC coil, sealed

AZ2280

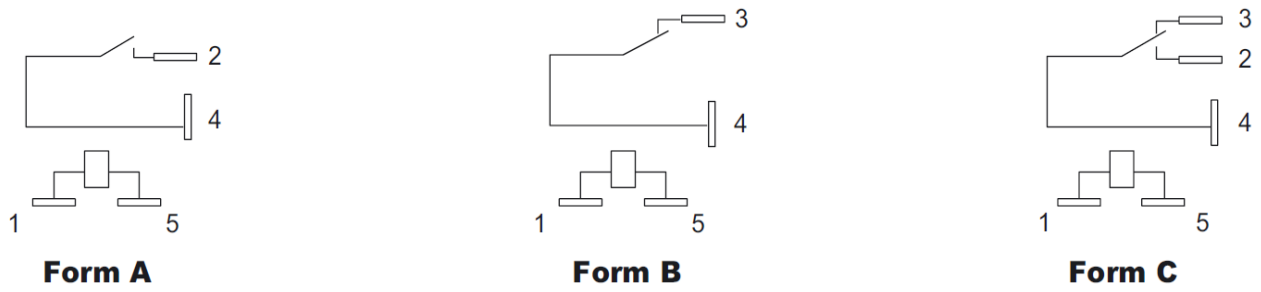
MECHANICAL DATA

Dimensions in inches with metric equivalents in parentheses. Tolerance: ±0.2mm (≤1mm) , ±0.3mm (1-5mm), ±0.4mm (>5mm)



WIRING DIAGRAMS

Viewed towards terminals



NOTES

General

1. All values in this datasheet are at reference temperature of 23°C (73°F) unless stated otherwise.
2. Evaluate the component's performance and operating conditions under the worst-case conditions of the actual application.
3. The datasheet and the component's specifications are subject to change without notice.
4. Customer special requirements to be reviewed by our company and identified in the form of a suffix number

Storage, handling, and environmental guidelines

1. 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.
2. Do not allow the relay to be used in an environment containing silicone, otherwise silicone inside the relay may cause the relay contact acceleration failure.
3. Prevent relays from atmospheres containing corrosive gases or liquid or solid, such as water vapor, H2S, SO2, NO2, Cl, P, dust and other harmful substances and elements. Corrosion of structures and contacts leads to malfunction and shortens the component's service life.
4. 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.
5. Do not use unsealed relays in environments with explosive or flammable gases. Electrical arcing at the contacts could ignite these gases and cause fire. Ignition-protected components for use in refrigeration and air-conditioning equipment are operated in unclassified locations and have not been investigated for use in hazardous (classified) locations or for explosive atmosphere applications.
6. Non-sealed relays (RTII) must not be washed, immersion cleaned or conformal coated as substances may enter the case and cause corrosion or seizure of mechanical parts.
7. Avoid high frequency or ultrasonic vibrations on the relays as these can cause contact welding and misalignment or destruction of internal structures.
8. During operation, storage and transport, ambient temperature should be within the specified operating 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.

Design guidelines

1. The relay may pull in and operate with less than the specified *must operate* voltage value.
2. The coil's *must operate* and *min. holding* voltages, the coil's *ohmic resistance* and the relay's *operate time* 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. This circumstance must be considered, especially during operation with high load currents and elevated ambient temperature.
3. At elevated ambient temperatures, after applying the rated nominal coil voltage for ≥ 200 milliseconds, the coil energization must be reduced to a suitable holding level in order to reduce thermal stress and to prevent the coil from overheating.
4. Coil suppression circuits such as diodes, etc. in parallel to the coil will lengthen the release time. We recommend using suppression circuits with a breakdown voltage of approx. 2 times the nominal coil voltage in order to achieve a quick release time.
5. When using PWM coil control, use a fast-switching recirculation diode in parallel with the coil to keep the coil current during pulse pauses. To achieve a quick release time when de-energizing the coil, the recirculation diode must be eliminated from the circuit to get a fast decay of coil current. As PWM frequency we recommend ≥ 15 kHz in order to avoid audible noise from magnetostriction. To reduce negative EMI effects, we recommend to apply the PWM to the coil's inner/center layer terminal and have the outer layer terminal connected to ground or the supply rail.
6. Contact resistance is a function of load current, dwell time and wear level of the contacts. Immediately after closing the contacts, or if tested with low current only, the contact resistance will show a relatively high value. A low level steady state contact resistance is reached at higher current after a certain time in thermal equilibrium.
7. The relay dissipates heat form power losses through its load terminals. Provide sufficient cross section (wire gauge) and so that they can act as heat spreader.
8. As with any contact mechanism, the relay's NC signal contact bounces when switching. For evaluation of its signal, suitable debouncing measures must be taken to get a reliable signal.

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

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SITES FOR ZETTLER RELAYS

NORTH AMERICA

American Zettler, Inc.
www.azettler.com
sales@azettler.com

EUROPE

Zettler Electronics, GmbH
www.zettlerelectronics.com
office@zettlerelectronics.com

Zettler Electronics, Poland
www.zettlerelectronics.pl
office@zettlerelectronics.pl

CHINA

Zettler Group, China
www.zettlercn.com
relay@zettlercn.com

ASIA PACIFIC

Zettler Electronics (HK) Ltd.
www.zettlerhk.com
sales@zettlerhk.com