

EV250-1A & 1B 400 Amps CZONKA-II EVX Make & Break Load Switching

Product Facts

- Hydrogen dielectric for power switching high current loads
- 400 A carry, 2,500 A interrupt @ 320 Vdc
- Suited for circuit protection, control, battery switching, and main power safety disconnect
- Versatile power, voltage, and current operating range: 28-1800 Vdc tested
- Low-cost compact version for volume production applications. Requires external coil economizer (PWM or lower hold voltage)
- "Hammer effect" mechanism breaks light contact welds
- "Super-sealed" environment chamber uniquely protects ALL moving parts
- Can operate in harsh environments
- Moving contact rotates to provide fresh contact surface for low contact resistance and low power consumption
- Sealed control connector. Mating connector with flying leads Part Number 2005 available, see page 7-95
- Logic control enabled by external economizer Part Number 9913
- High temperature (135°C) model with 10 inch flying leads available (-4A — Call TE for sales drawing)
- Bi-directional power switching
- Fast operate and release time



Product Specifications

Contact Arrangement — SPST-NO

Contact Form — X

Continuous Current Carry, Max. — 400 A; 6.5 Minutes — 500 A

Break Current @ 320 Vdc — 2,500 A

Contact Resistance, Max. — 0.0003 ohm

Contact Resistance, Typ. — 0.0001 — 0.0002 ohm

Dielectric at Sea Level (Leakage < 1mA) — 2,200 Vrms

Shock, 11ms, 1/2 Sine (Peak), Operating — 30 g

Vibration, Sinusoidal (80-2000 Hz, Peak) — 20 g

Operating Ambient Temperature Range — -40°C to +85°C

Load Life — See chart on next page

Operate Time, @ 25°C —

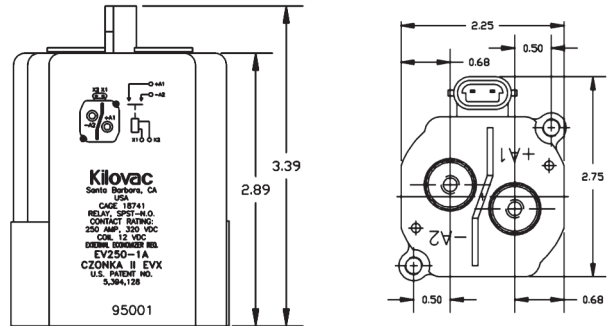
Close (Includes Bounce), Typ. — 30 ms

Bounce (After Close Only), Max. — 5 ms

Open (Includes Arcing), Max. — 15 ms

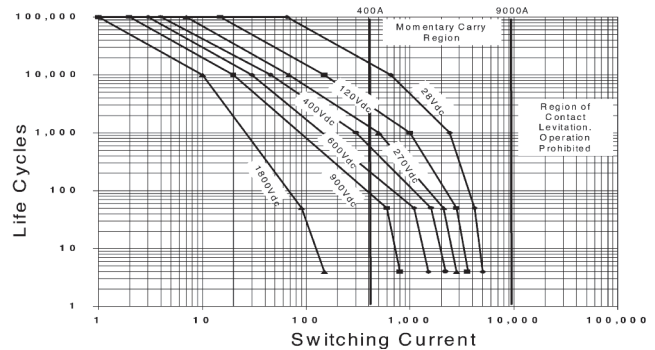
Insulation Resistance @ 500 Vdc, Min. — 100 mohm

Weight, Nominal — 1.54 lb (0.7 kg)



Note: Dimensions in inches. Multiply values by 25.4 for dimensions in mm.

Contact Ratings*



*For circuit conditions and actual data refer to the EV250 hot switch study. Since each application is unique, user is encouraged to verify rating in actual application.

Coil Data***

	EV250-1A	EV250-1B
Voltage, Nominal*	12 Vdc	24 Vdc
Pickup (Close), Max.	8.3 Vdc	16.6 Vdc
Continuous Hold, Max./Min.**	5.1/3.8 Vdc	10.2/7.6 Vdc
Dropout (Open), Min.	0.88 - 3.3 Vdc	2.4 - 6.6 Vdc
Coil Resistance @ 25°C, ±10%	3 Ω	12 Ω
Coil Energy, Max.	0.2 J	0.2 J
Coil Clamping	3 x nom.	3 x nom.

*Do not apply continuously. Requires external coil economizer. Other special coil voltages available upon request.

**At maximum continuous current and maximum ambient temperature. Hold voltage must be maintained within the limits specified to keep contacts closed and to prevent coil overheating.

***Do not use a free wheeling diode or capacitor across the coil.

Ordering Information

Sample Part Number ►

EV250-1 A

Series: _____

Coil Voltage: _____

A = 12 Vdc, Nominal

B = 24 Vdc, Nominal

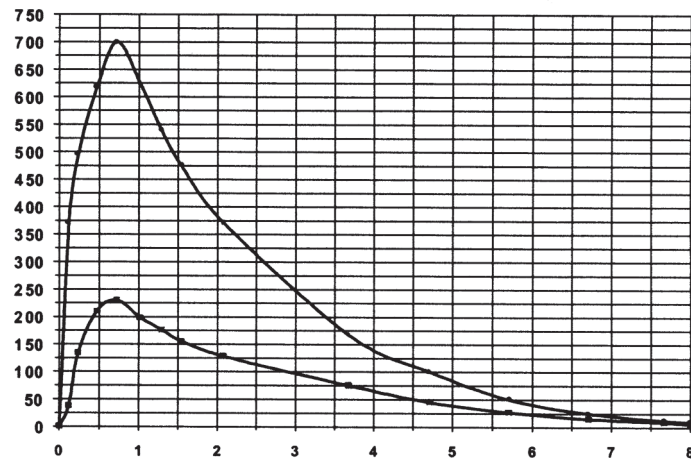
For detailed specifications and recommendations, refer to the EV250-1A & B sales drawings.

For factory-direct application assistance, dial 800-253-4560, ext. 2055, or 805-220-2055.

EV250-1A & 1B 400 Amps CZONKA-II EVX Make & Break Load Switching (Continued)

Current vs Time

CONTACTS CLOSED INTO 70% AND 90% CAPACITOR PRE CHARGE



Life Ratings and Qualification Test Plan

Test #	Normal Operations		Abnormal Operations	
	1	2	3	4
Current	Reference Graph and Test Circuit Diagram (Sht. 8)		-250 A	2500 A
Voltage			320 V	320 V
Load Type	Capacitive	Capacitive	Resistive	Resistive
% Pre Charge	90%	70%	NA	N/A
Switch Mode	Make Only	Make Only	Make/Break	Break Only
Sequence				
1	10K cycles	10 cycles	2	2
2	10K	10	2	—
3	10K	10	2	—
4	10K	10	2	2
5	10K	10	2	—
Etc.	Continue Cycling to Relay Failure			

The testing objective is to verify proper relay function for a given number of consecutive and cumulative cycles under both normal and abnormal conditions in a variety of load switching applications. The life rating of 40K cycles minimum was calculated with 95% Weibull reliability.

Electrical Data (Over Temperature Range — Max. Terminal Temp. = 200°C)

Make/Break Life for Capacitive & Resistive Loads at 320 Vdc ^{1,2} —

@ 90% Capacitive Pre-Charge —
50,000 cycles

@ 70% Capacitive Pre-Charge —
50 cycles

@ -250 A (2 Consecutive, Reverse
Polarity) ¹ — 10 cycles

@ 3300 A (Break only,
2 Consecutive) ¹ — 4 cycles

Mechanical Life — 100,000 cycles

Notes:

1 Resistive load includes inductance
L = 25 µH. Load @ 2500 A tested
@ 200 µH.

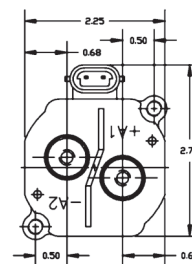
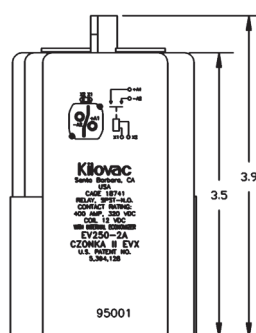
2 Conductor: 2 each of copper
54 mm² (AWG 0) required for
> 250 A carry. 1 Copper (AWG 0)
conductor recommended for
≤ 250 A

For factory-direct application assistance,
dial 800-253-4560, ext. 2055, or
805-220-2055.

EV250-2A & 2B 400 Amps CZONKA II EVX Make & Break Load Switching

Product Facts

- Hydrogen dielectric for power switching high current loads
- 400 A carry, 2,500 A interrupt @ 320 Vdc
- Suited for circuit protection, control, battery switching, and main power safety disconnect
- Versatile power, voltage, and current operating range: 28-1800 Vdc tested
- Internal coil economizer provides:
 - 4W typical hold power independent of temperature & voltage range
 - EMI spectrum tested and approved
 - Built-in coil suppression
- "Hammer effect" mechanism breaks light contact welds
- Hermetically "Super-sealed" environment chamber uniquely protects ALL moving parts
- Can operate in harsh environments
- Moving contact rotates to provide fresh contact surface for low contact resistance and low power consumption
- Sealed control connector. Mating connector with flying leads Part Number 2005 available
- Special versions available:
 - Economical (-8A/B) for light duty power switching (without arc blowout magnets)
 - 10 inch flying leads model (-7A)

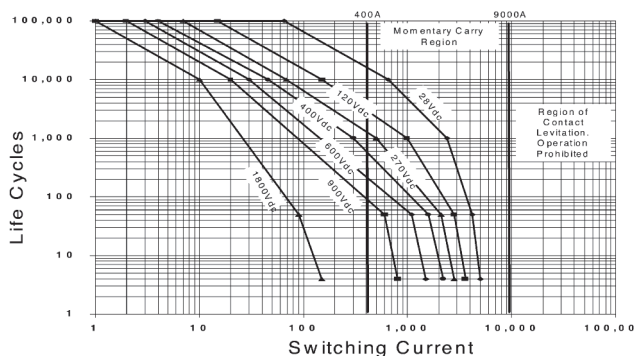


Note: Dimensions in inches. Multiply values by 25.4 for dimensions in mm.

Product Specifications

Contact Arrangement — SPST-NO
Contact Form — X
Continuous Current Carry, Max. — 400 A; 6.5 Minutes — 500 A
Break Current @ 320 Vdc — 2,500 A
Contact Resistance, Max. — 0.0003 ohm
Contact Resistance, Typ. — 0.0001 – 0.0002 ohm
Dielectric at Sea Level (Leakage < 1mA) — 2,200 Vrms
Shock, 11ms, 1/2 Sine (Peak), Operating — 30 g
Vibration, Sinusoidal (80-2000 Hz, Peak) — 20 g
Operating Ambient Temperature Range — -40°C to +85°C
Load Life — See chart on next page
Operate Time, @ 25°C — 18 ms
Close (Includes Bounce), Typ. — 18 ms
Bounce (After Close Only), Max. — 5 ms
Release Time (Includes Arcing), Max. — 15 ms
Insulation Resistance @ 500 Vdc, Min. — 100 mohm
Weight, Nominal — 1.76 lb (0.8 kg)

Contact Ratings*



*For circuit conditions and actual data refer to the EV250 hot switch study. Since each application is unique, user is encouraged to verify rating in actual application.

Coil Data**

	EV250-2A	EV250-2B
Voltage, Nominal*	12 Vdc	24 Vdc
Pickup (Close), Max.	9 Vdc	18 Vdc
Hold, Min.	7 Vdc	14 Vdc
Dropout (Open), Min.	5 Vdc	10 Vdc
Current (@ VsNom / 25°C)		
Inrush	2.8 A	1.8 A
Holding, Standby	0.34 A	0.11 A
Inrush Time, Max.	200 ms	200 ms

*Other special coil voltages available upon request.

**Do not use a free wheeling diode or capacitor across the coil. Built in suppression limits back EMF to zero volts.

Ordering Information

Sample Part Number ►

EV250 -2 A

Series: _____

Model: _____

2 = With Blowout Magnets
 8 = Without Blowout Magnets
 7 = 10" Flying Leads (12 V, with Magnets Only)

Coil Voltage: _____

A = 12 Vdc, Nominal

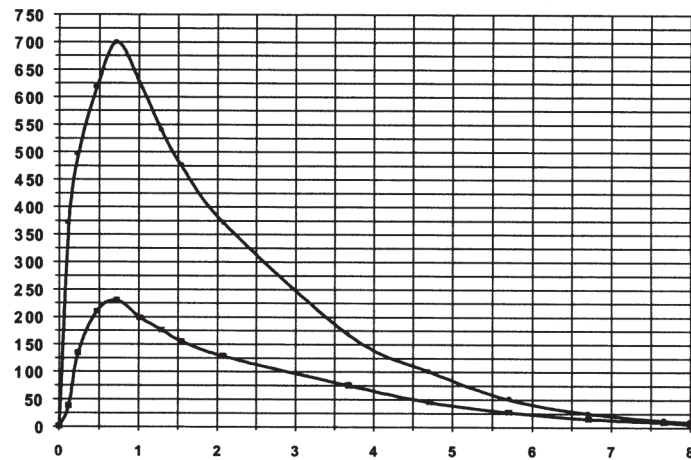
B = 24 Vdc, Nominal

For detailed specifications and recommendations, refer to the EV250-2A & B or 7A sales drawings.

For factory-direct application assistance, dial 800-253-4560, ext. 2055, or 805-220-2055.

EV250-2A & 2B 400 Amps CZONKA II EVX Make & Break Load Switching (Continued)

CONTACTS CLOSED INTO 70% AND 90% CAPACITOR PRE CHARGE



Life Ratings and Qualification Test Plan

Test #	Normal Operations		Abnormal Operations	
	1	2	3	4
Current	Reference Graph and Test Circuit Diagram (Sht. 8)		250 A	2500 A
Voltage			320 V	320 V
Load Type	Capacitive	Capacitive	Resistive	Resistive
% Pre Charge	90%	70%	NA	N/A
Switch Mode	Make Only	Make Only	Make/Break	Break Only
Sequence				
1	10K cycles	10 cycles	2	2
2	10K	10	2	—
3	10K	10	2	—
4	10K	10	2	2
5	10K	10	2	—
Etc.	Continue Cycling to Relay Failure			

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Notes:

1 Resistive load includes inductance
L = 25 µH. Load @ 2500 A tested
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54 mm² (AWG 0) required for
> 250 A carry. 1 Copper (AWG 0)
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