ZERO EMISSION VEHICLES AUSTRALIA

http://www.zeva.com.au

Automatic Precharger

Two-stage soft start / inrush protection for your motor controller

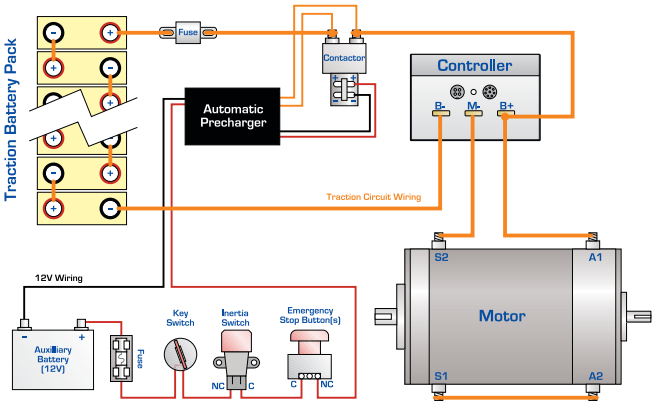
INTRODUCTION

Motor controllers for electric vehicles typically have a large internal capacitor bank with very low ESR (Equivalent Series Resistance). As such they require inrush protection when first powering up to prevent a large current spike which can damage components – most commonly, welding contactors shut or blowing fuses.

The ZEVA Automatic Precharger is designed to offer a 2-stage soft start for motor controllers, limiting inrush current while the internal capacitors charge up before automatically closing the main contactor when precharging is complete.

WIRING

The diagram below shows how the automatic precharger may be intergrated in a typical EV traction circuit:



The device has 6 wires to connect:

- **Red/black input:** Connect to your ignition key-switched 12V supply, ideally via ~5A fuse.
- **2x Orange HV:** Connect these to the contactor's HV terminals. They are non-polarised (connect either way around).
- **Red/black output:** Connect these to the contactor's coil. The precharger has internal contactor coil spike suppression (no external diodes required).

TECH NOTE ABOUT PRECHARGING

Prechargers only work correctly if there are no continuous loads on the output side of the main contactor. Your main contactor should *only* be switching power to the motor controller. Other loads such as DC/DC, chargers, etc should be wired in before the main contactor. If you do not wish to have these in circuit permanently, a second contactor is recommended (typically these do not require precharge).

This device is not simply a staged timer, but determines precharge completion from a low voltage drop across the main contactor, which is the safest way to avoid current spikes when the contactor closes. However if there are permanent loads downstream from the main contactor it may continue trying to precharge indefinitely, which can result in damage to the internal resistors and/or relay. (But fortunately, replacing blown precharge resistors or relays is far less expensive than contactors, controllers or power fuses!)

SPECIFICATIONS

- Power supply: 6-18VDC (12V nominal, 5A max)
- Available for 12-160V or 160-320V traction circuits
- Precharge resistance: 50Ω (LV) or 200Ω (HV)
- Internal coil spike suppression
- Dimensions: 72x44x30mm

TECHNICAL SUPPORT

If you have any queries not covered by this manual, feel free to contact us via our website: **www.zeva.com.au**

Products are covered against manufacturing faults for a period of 12 months from date of purchase. If you believe your device may be faulty, please contact us for RMA information.

ZEVA is a 100% carbon neutral business. All products proudly designed and manufactured in Australia.