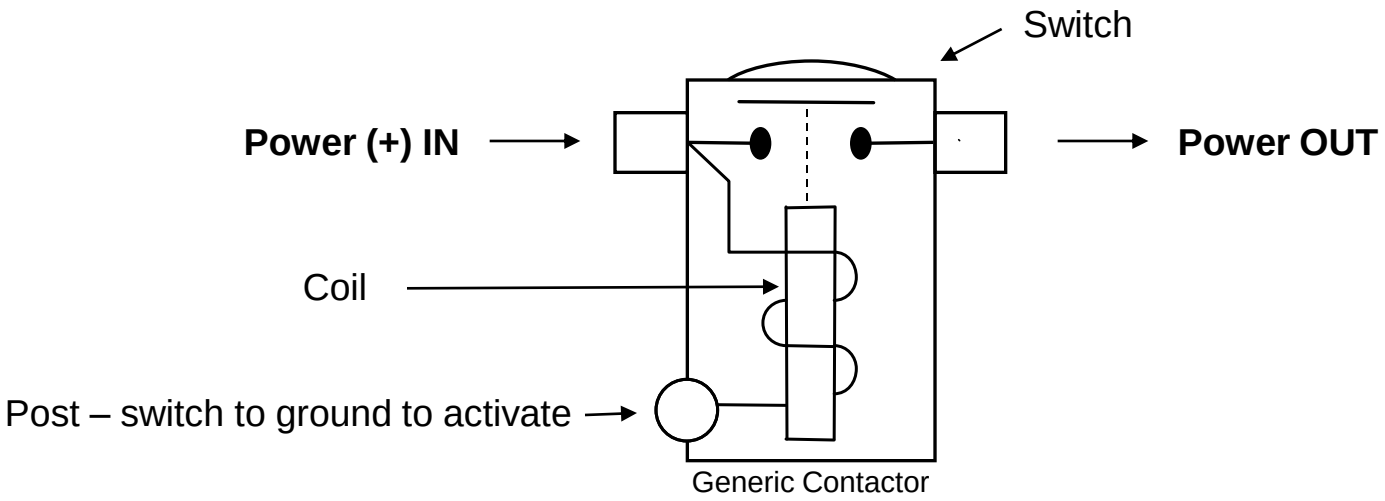
Vertical Power

Contactor Wiring

Rev F

What is a Contactor?

- Contactors are relays designed for high-current applications.
- A relay includes:
  - A coil (solenoid), when energized, that creates a magnetic field
  - A switch that is closed by the magnetic field generated by the coil.

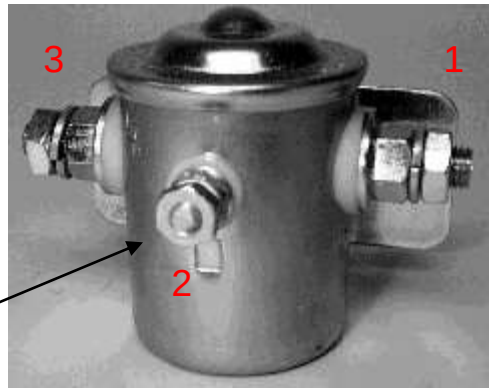


- Diodes <u>should always</u> be installed externally to reduce voltage spikes.

Vertical Power

Battery Contactor

Power IN from battery →



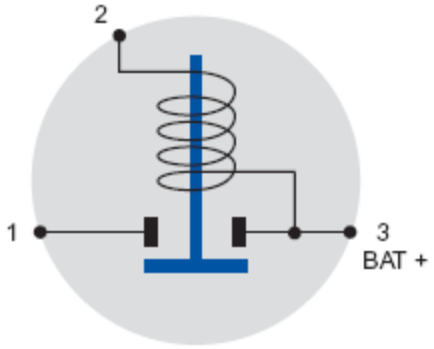
→ **Power OUT to Control Unit or main bus**

If you wire this side to the battery the contactor will not work.

Wire to VP-100/200 Control Unit J5 Pin 5 or to Master Switch. When this post is <u>grounded</u> the contactor is closed.

Battery contactor (aka master relay, master contactor, master solenoid) is a “Continuous Duty” relay meaning it can be turned on indefinitely. This relay will become warm during normal operations.

This contactor draws just under 1A at 14v.

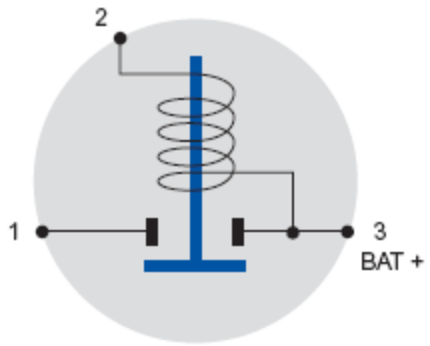


Vertical Power

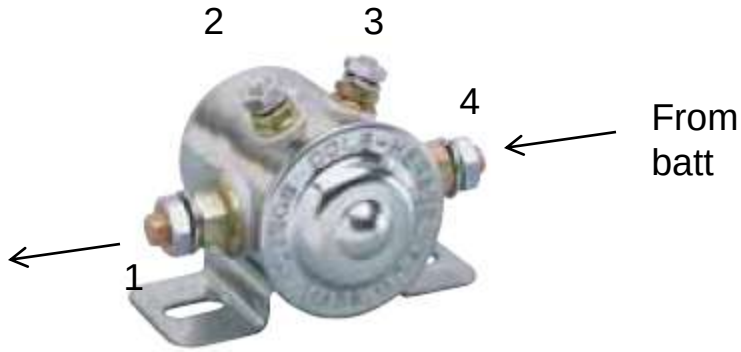
Types of Battery Contactors

Single Post

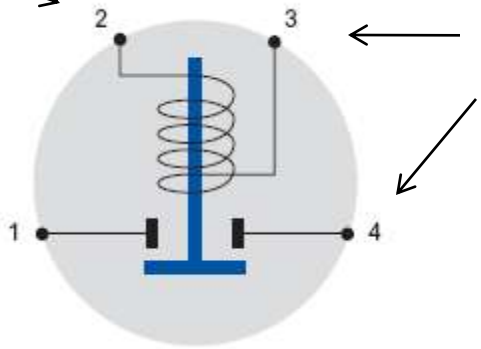
Ground this post to engage



Two Post



Ground this post to engage

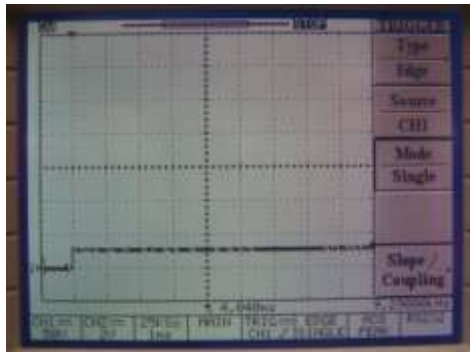


Connect posts 3 and 4 with short 18 ga wire. It is then electrically same as single-post contactor

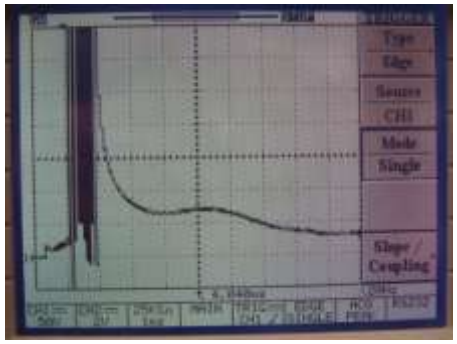
Vertical Power

Diodes on Battery Contactor

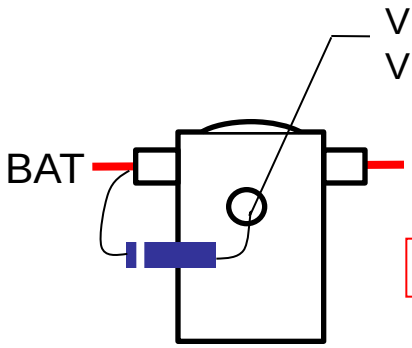
Why? Extends life of contactor by minimizing arcing across internal contacts. See o-scope pictures:



With diode



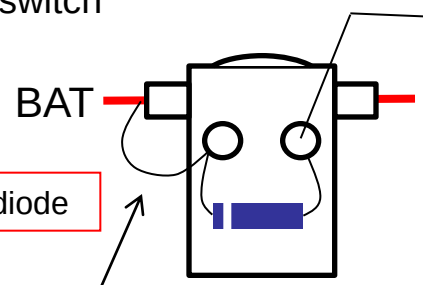
Without diode



One Post

Note direction of diode

18 ga jumper wire



Two Post

Use diodes on all contactors:
- Master
- Starter
- Hydraulic pump
- Air conditioning

Diode: Use SB560-E3/51 from Digi-key. Included with wiring harness kit.

Vertical Power

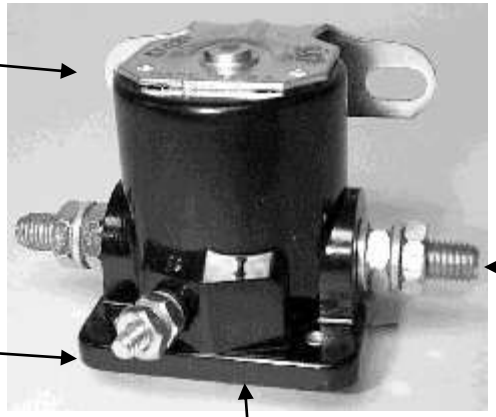
Starter Contactor

This is a common type of contactor, sold by Van's Aircraft and others.

Coil gets ground from mounting bracket.

Power

"S" Terminal
Positive power from Control Unit or starter button activates coil (closes contactor).



Power

Some contactors do not have a post here.

Coil gets ground from mounting bracket.

"S" Terminal
Positive power from Control Unit or starter button activates coil (closes contactor).

"I" Terminal
Bus voltage is on this post when the contactor is closed.

Starter contactor (aka starter relay) is an "Intermittent Duty" relay meaning it is designed to be turned on only for short periods of time. This contactor draws about 4A at 14v.

Starter Contactor

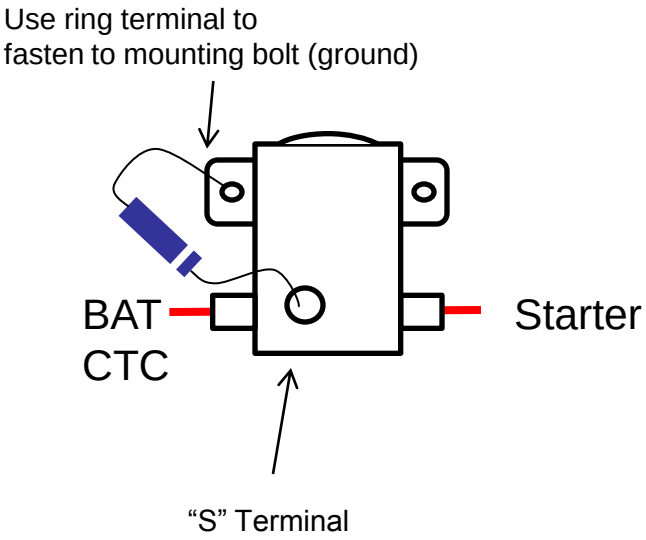
This contactor is sold by
B&C Specialty Products.

Image from B&C Specialty Products web site.

Starter contactor (aka starter relay) is an “Intermittent Duty” relay meaning it is designed to be turned on only for short periods of time. This contactor draws about 4A at 14v.

Vertical Power

Diode on Starter Contactor



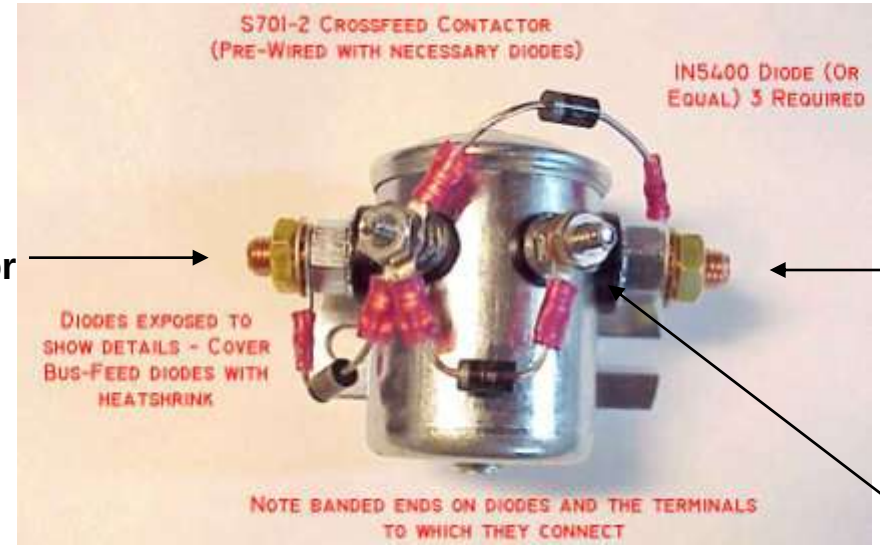
Not required on VP-100/200, but can be installed if desired. Required on VP-50 and traditional wiring.

Vertical Power

Cross-Tie Contactor

For VP-200 Config 4 only

From Bus A Batt Contactor



From Bus B Batt Contactor

Image from B&C Specialty Products web site.

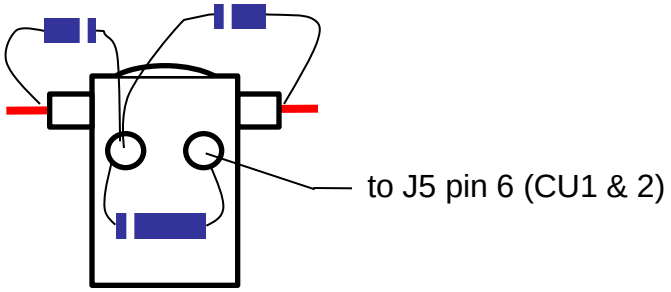
Wire J3 Pin 6 on Control Units, or Cross-tie switch to this post. Ground to activate coil (close contactor).

Cross-tie contactor (aka x-tie contactor, bus-tie contactor) is a “Continuous Duty” relay meaning it can be turned on indefinitely. This relay is normally used in a dual bus configuration to tie both busses together in the case of an alternator failure. This relay will become warm during normal operations.

Vertical Power

Diodes on X-Tie Contactor

For VP-200 Config 4 only

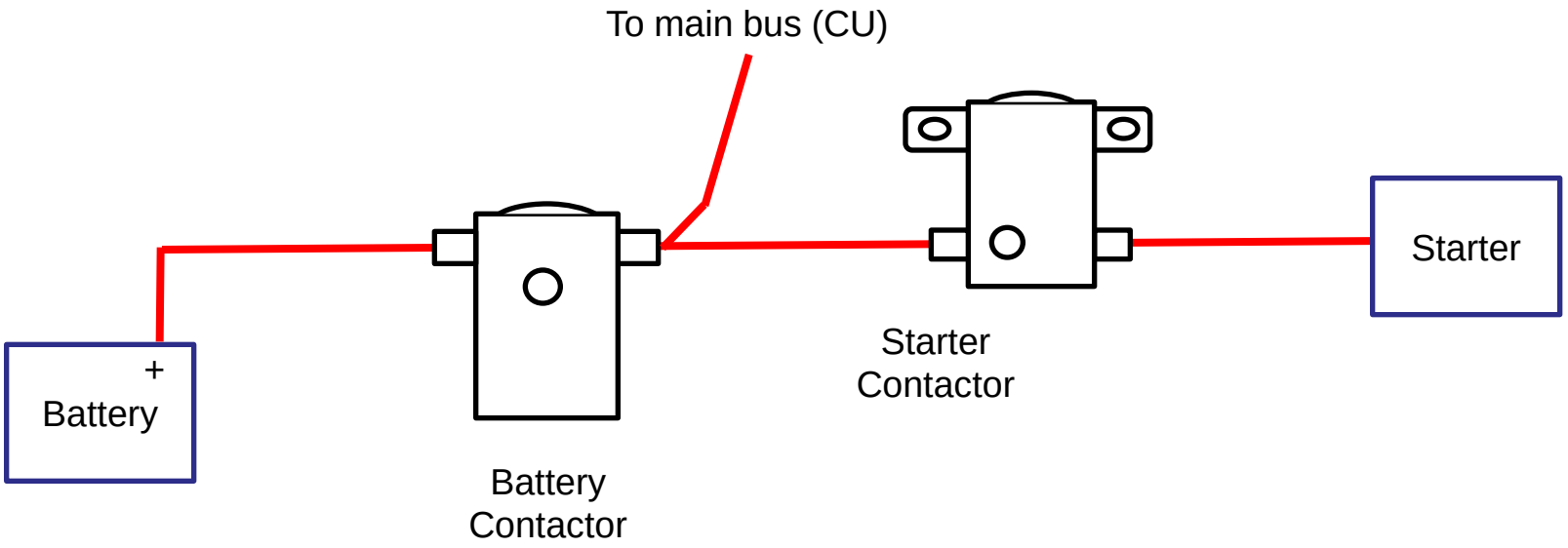


X-tie ctc
(Config 4 only)

Note direction of diodes

Vertical Power

Contactor Wiring Overview



Vertical Power