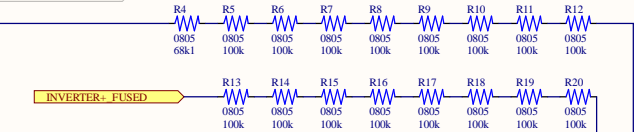


## Precharge - TS

This circuit checks for the voltage difference across the positive AIR, after precharge has been enabled. It will then power the coil of a relay powers the positive AIR coil, closing it.

0805 resistors are rated to 1.8W and 150V working voltage



### Voltage Divider Falstad Sim

Voltage Divider:  
 $10k / (10k + 250k + 499k) = 10/759$   
 $10k / (10k + 100k + 250k + 470k) = 10/830$   
 $(10/815k) / (10/747) = 0.9145$   
 Precharge Percent = 91.66%

TODO: Add 100k trim pot to BATT+ resistor chain, with target precharge percent set at 50k trim pot value. Allows fine tuning to account for resistor value error.

GND\_HV is INVERTER-

470k resistor allows hysteresis between turn-on and turn-off.

Hysteresis Simulation

100W, 1000 VDC Switching Rated  
 7 kV DC Isolation Voltage Rating

BATT+ needs to be galvanically disconnected from the comparator circuit if we are not precharging. Otherwise we are bridging the AIR's galvanic isolation when we don't want to.

## Precharge Enable Relay

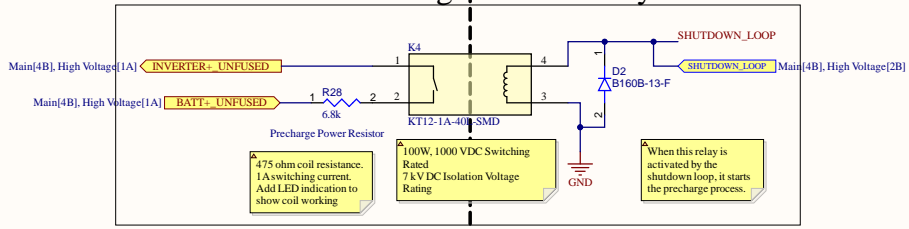
## Ready to Move Control

Voltage Reference:  
 Max:  $5V * (4.4k / 5.4k) = 0.96V$   
 Min:  $5V * (14.4k / 15.4k) = 0.33V$   
 TSAL turn-on voltage:  
 $60V * (747k / 757k) = 0.793V$   
 $50V * (10k / 10k + 499k + 250k) = 0.396V$

Reference voltage is adjustable via trim pot. Formula H-E required 30V for TSAL to turn on, while FSAE requires 60V

100k resistor allows hysteresis between turn-on and turn-off.

Hysteresis Simulation




475 ohm coil resistance. 1A switching current. Add LED indication to show coil working

100W, 1000 VDC Switching Rated  
 7 kV DC Isolation Voltage Rating

When this relay is activated by the shutdown loop, it starts the precharge process.

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	SHEET SIZE	TITLE	PART NUMBER	REVISION
	ANSI B	Accumulator High Voltage PCB	EL00016	AB
		LAST UPDATE	3/5/2025 8:05:18 PM	