RENSSELAER MOTORSPORT

RM27 HV Power Supply Briefing

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Goal

- Use fancy HVPS without injury

Powertrain

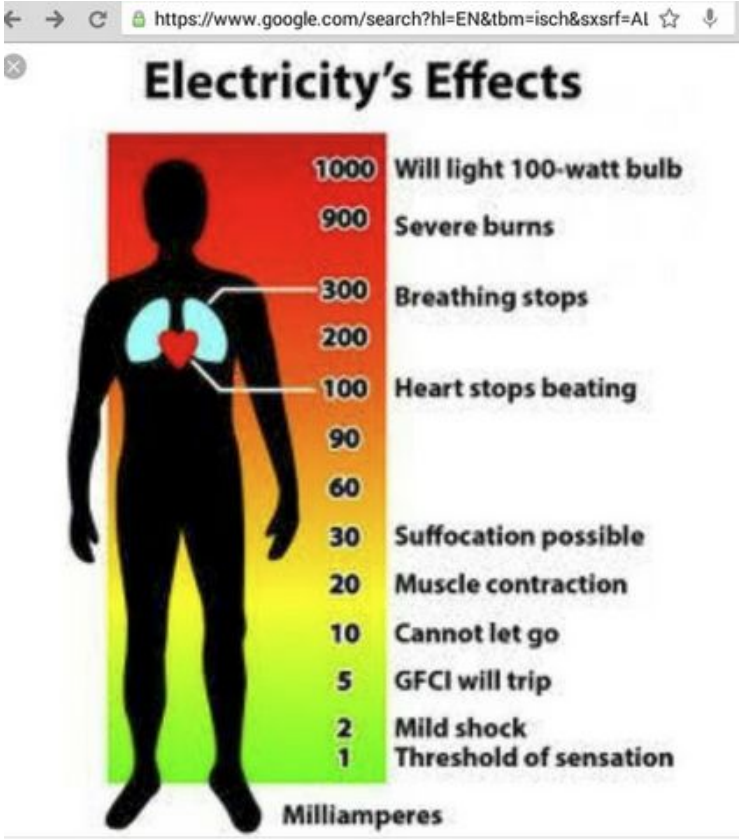
- In addition to being connected to 400V, the motor is heavy and moving (and EXPENSIVE)
  - **The entire motor casing spins FAST**
- Even if the motor has stopped moving:
  - Ensure power is cut off from the tractive system
  - **Motor will be hot**
- The ESC handles many volts and amps
  - **ESC will be hot**
- If handling **motor or ESC**, contact **ESO**

HVPS

Autoranging System DC Power Supply, 750 V, 60 A, 15000 W, 208 VAC

US$ 20,844

BODILY EFFECT	MEN/WOMEN	DIRECT CURRENT (DC)
Slight sensation felt at hand(s)		
	Men	1.0 mA
	Women	0.6 mA
Threshold of pain		
	Men	5.2 mA
	Women	3.5 mA
Painful, but voluntary muscle control maintained		
	Men	62 mA
	Women	41 mA
Painful, unable to let go of wires		
	Men	76 mA
	Women	60 mA
Sever pain, difficulty breathing		
	Men	90 mA
	Women	60 mA
Possible heart fibrillation after 3 seconds		
	Men and Women	



High voltage

TABLE 1-I. Probable effects of shock.

Current values (milliamperes)		Effects
AC 25 Hz to 400 Hz	DC	
0 to 1	0-4	Perception
1 to 4	4-15	Surprise
4 to 21	15-80	Reflex action
21 to 40	80-160	Muscular inhibition
40 to 100	160-300	Respiratory block
Over 100	Over 300	Usually fatal

- >50V = dead
- Do not touch the HVPS unless Sean tells you to
- Do not approach the setup when HVPS is on unless told to
- Will announce verbally when HV work is being conducted and when it is over
- Treat the person with HV equipment on like they are actively welding
- If you touch it, you will have **1.5A (1500mA)** across your heart at HV
- If you touch it, you will not be able to move, and will be “glued” to it (15mA)
  - Electrical beating stick!
- Touch recently energized things with back of your hand (inverter, etc.)
- Keep one hand in your back pocket if not wearing HV gloves near HVPS

Questions?

- Please familiarize yourself with the Shop Safety Manual
  - Has EHS & faculty advisor approved guidelines on electrical work and safety

- If any questions arise while working, please ask in-person or on slack