Purdue evGrandPrix Collegiate
Vehicle Systems Declaration 2022-23

Version: RevA (released March 2023)

Overview:

The Collegiate Division of evGrand Prix allows for the testing of many different technologies. It is Purdue's responsibility to be aware of the innovations and systems that will enter the race. This form allows teams to outline and declare the high-level systems & components of their kart. evGrand Prix staff will review it prior to the race to determine the safety of the kart and to help ensure the team's success. This form will also be used prior to Technical Inspection and Design Review as well.

School	
Team or Club Name	
Crew Chief	

Kart #		

Anything marked confidential will be kept from the public and from other teams.

	SYSTEM	ANSWERS FROM TEAM	DESIGN COMMENTS	CONFIDENTIAL?
MOTOR & CONTROLLER	**MOTOR**			
	Motor Type (Brushed, BLDC, AC Induction, etc):			
	Brand/Manufacturer & Model:			
	Operating Voltage Range:			
	Max RPM:			
	Max Continuous Power:			
	Weight:			
	CONTROLLER			
	Brand & Model:			
	Max Operating Voltage:			
	Max Current:			
	Using Regenerative Braking?			
BATTERY PACK	**BATTERY CELLS**			
	Brand/Manufacturer & Model:			
	Cell Form Factor (circle one): Cylindrical Prismatic Pouch			
	Nominal Voltage of Individual Cell:			
	Max / Min Voltage of Individual Cell:			
	Amp-Hour Capacity of Individual Cell:			
	Physical Dimensions of Cell or Module:			
	Cell Chemistry (circle one):	i) Lithium Ion - Nickel Manganese Cobalt Oxide - LiNiMnCoO2 (NMC) ii) Lithium Ion - Nickel Cobalt Aluminum Oxide - LiNiCoAlO2 (NCA) iii) Lithium Ion - Manganese Oxide - LiMn2O4 (LMO) iv) Lithium Ion - Cobalt Oxide - LiCoO2 (LCO) v) Lithium Iron Phosphate - LiFeP04 (LFP) vi) Lithium Titanate - Li2TiO3 (LTO) vii) Lithium Polymer (LiPo) viii) Other: _____	

BATTERY PACK

SYSTEM	ANSWERS FROM TEAM	DESIGN COMMENTS	CONFIDENTIAL?
PACK CONFIGURATION			
Series Cells:			
Parallel Cells:			
Nominal Voltage of Pack:			
Min / Max Pack Voltage of Pack:			
Amp-Hour Capacity of Pack:			
Total kWh of Pack:			
CURRENT & POWER			
(Fill in the 8 blank spaces)	**Individual Cell**	**Pack**	
Continuous	_____Amps _____ kW	. _____Amps _____ kW	
Peak	_____Amps _____ kW	. _____Amps _____ kW	
PACK ASSEMBLY			
What Vendor Was Used to Buy the Pack, Modules, or Cells? (Please list the website, if applicable):			
What Did You Purchase? (circle one)	Battery Pack (turnkey, off-the-shelf)	Battery Modules (aka bricks, blocks, or elements)	Battery Cells (i.e. 18650s)
Who Did the Final Assembly of the Pack?			
Have You Tested Your Pack at 14kW peak power yet?			
What Considerations Did You Make in Regards to Mechanical Assembly and the Enclosure? How Did You Optimize Safety in the Design?			
What Considerations Did You Make in Regards to Heat Dissipation? How Did You Optimize Cooling? (This applies to the Motor & Controller as well)			

	SYSTEM	ANSWERS FROM TEAM	DESIGN COMMENTS	CONFIDENTIAL?
BATTERY MANAGEMENT	**BATTERY MANAGEMENT**			
	Brand & Model of BMS Used:			
	Safety Features (circle all that apply)	i) pack over/under voltage ii) Individual cell over/under voltage iii) Pack over current iv) Pack short circuit v) Temperature over/under vi) Cell balancing vii) Other: _____		
	Number of Thermistor Temperature Sensors Installed in Pack:			
	Current Sensor: (Hall or Shunt?)			
	What happens if your BMS measures - for example - a cell under its minimum voltage threshold during use? What does your BMS do? How does your kart shut off & isolate the battery pack?			
	Are you prepared to show technical inspectors the live BMS data? This includes invidual cell voltages and real-time temperature readings of your battery pack. This will likely involve having your comptuer ready with the BMS programmmer and software.			
	Do you have a Limp Mode functionality or any other real-time current-limiting functionality?			
	Are your BMS safety features active during charging?			
	Can your BMS shut off charging to the pack if it sees a critical issue? (Many teams overlook this safety functionality but it is very important)			