

## INVITATION TO TENDER

### Electric Powertrain Supply – Bambino and Cadet Karts from 2021

Motorsport UK has received the following questions and provides the answers below:

#### Questions

Technical requirements:

1. You mentioned 25KG and 30KG for Bambino and Cadet respectively for the weight of the power train, does this include the weight of the battery pack which are 15KG / 20KG?
2. Any stipulations on the positioning of certain components?

Motor:

1. Is the duty cycle to be the same as how existing bambino and cadet karts are run? This makes quite a big difference to the motor specification. A motor capable of 1hr 4-5kW continuous operation would be quite different to one that could deliver the normal session/race lengths of 8-10minutes.
2. Figures of 3KW and 5KW are peak numbers correct?
3. Maximum torque figures?

Battery:

1. Is the 60 minute running time continuous? Or does 60 minutes need to be delivered over the course of a day in multiple sessions like how the existing engines are used? Was the objective of this to eliminate a high charging demand after each session?
2. Is this two batteries on the kart or does it allow for a battery swap at 30minutes?
3. Is the 48V nominal voltage flexible as long as the pack maximum voltage does not go above 60V? One of the practices to garner more life out of the cells is to de-rate them to a lower state of charge so they are less stressed, we introduce extra cells to accommodate for this, but improve life span considerably which does mean the nominal voltage is slightly higher.

Controller:

1. The specification asks to demonstrate power and torque output parity, with a given tolerance. What is the given tolerance?

Charger:

1. What is the requested charging time?

Miscellaneous:

1. Regenerative Braking - Is this feature allowed?
  2. Are belt & chain-driven systems both considered? Any further guidance on the selection of chain/belt type?
  3. LCD displays for monitoring system voltage & battery pack state of charge, is this to be included in the prototype?
  4. System scrutineering - Any stipulations on this being made easy for diagnostics to be run for championships?
- 

**Answers**

Technical requirements:

1. Yes, maximum powertrain weight includes the battery pack.
2. No particular stipulations are made, however the complete powertrain must be compatible with existing Bambino or Cadet chassis as appropriate, with no – or limited – modifications. Any such limited modifications should be detailed in the proposal. It is expected that all components be contained within the main confines of the chassis-frame.

Motor:

1. Yes, the format of the event is envisaged to be similar to that of traditional IC-engined Bambino and Cadet classes, with sessions of equivalent lengths expected.
2. Yes.
3. No maximum torque figures are stipulated.

Battery:

1. As above, the 60 minute run-time will be delivered over the course of a day, similar to existing formats.
2. The maximum of two batteries can be utilised as the applicant sees fit to achieve the run-time requirement.

3. The 48V nominal is defined as a requirement of the tender. If a proposal is received that sits outside of this requirement, it may be considered at the discretion of Motorsport UK, but only subject to sufficient and clear technical justification.

Controller:

1. We will work with the successful applicant to define a suitable tolerance through development prior to full launch in 2021, using industry standards as a guideline.

Charger:

1. Not defined. The intention is that recharging during the course of a day's running at a race meeting will not be a requirement, therefore there is more emphasis on off-site or overnight charging.

Miscellaneous:

1. Proposals for such a feature are not called for at this time, however proposals based on non-speculative technologies may be submitted alongside any application.
2. Proposals for alternatives to traditional chain-driven systems may be submitted with reasoning.
3. Any such systems should be included for any demonstration of concept and must be proven by 01 August 2020.
4. Any proposals that may ease or improve the quality of scrutineering will be considered with interest.

Issued on: 14 November 2019