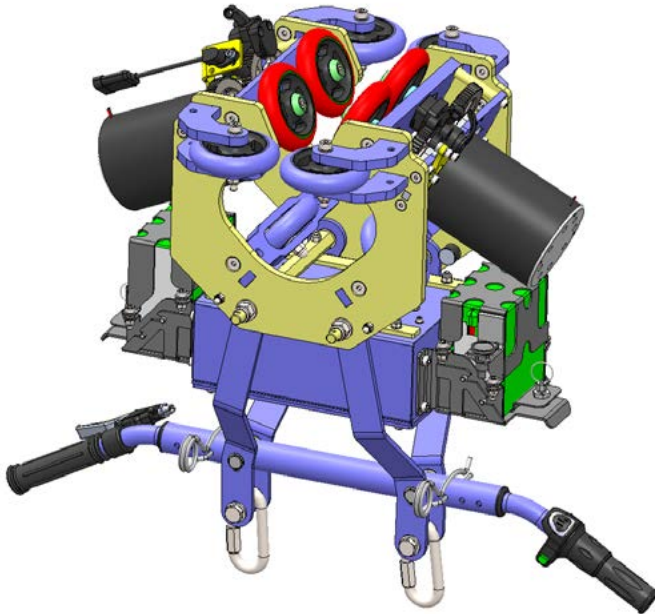


ROLLGLIDER

Electric Trolley



1 Description

The Rollglider electric trolley is designed to be used on Rollglider lines with little inclination and less speed. The electric trolley allows for a Rollglider line design that offers a smooth chill ride rather than a thrill boosting experience at high speed and acceleration. The user has a certain amount of control over the speed through a set of steering handles that are similar to the ones on a motorcycle with gas and brake on them. The electric trolley can run at a speed of up to 3m/s (approx. 11 km/h) by itself but it would accelerate up to 35 km/h on the inclined sections of the line, driven by the gravity. The electric trolley is designed to allow multiple riders on one Rollglider line at the same time. The participants should be launched within a 20 second delay from one another which allows for a maximum capacity of up to 180 ppl/hour for a single Rollglider line.

2 How it works

The electrical trolley is driven by two brushed DC-motors with a power of 1kW at 36V voltage powered by two Li-Ion polymeric batteries.

The nominal rotations of the engine - 3k RPM are transferred to 4 wheels that perform the movement by a reduction drive. The actuating gear wheel has an rotation cycles and rotation direction encoder that gathers data for the movement. A special controller constantly keeps track of the data from the encoder and executes the different operational modes: "Forward movement", "Backward movement" and "Off".

3 “Forward movement” mode

When pressing the ‘Gas’ handle both motors start a forward movement mode. The ‘gas’ signal from the steering handle controls the speed until it reaches 10 km/h. After that the Rollglider trolley use inertia and gravity to continue the movement (the motors are turned off and do not interfere with the movement). In case the linear speed exceeds 35km/h the motors start a braking mechanism and limit the speed at a maximum of 35 km/h.

4 “Off” mode

The trolley moves with inertia. The motors are turned off and do not interfere with the movement.

5 “Backward movement” mode

When pressing the ‘Gas’ handle both motors start a forward movement mode. The ‘gas’ signal from the steering handle controls the speed. When the ‘gas’ handle is fully released the trolley moves at its current velocity driven by inertia, the motors are turned off and do not interfere with the movement. When the brake is invoked the motors start a braking (recuperative) mode. The braking system works proportionally to the amount of pressure applied to the brake handle.

There is an electric board with 3-position switch for the three modes and another switch to turn the system on and off. Only authorized staff members can access the board.

The braking mode is being activated by the brake handle. The braking strength depends on the amount of pressure applied to the handle. What is essential about the braking mode is that when the brake handle is pressed up to half-way down, the braking mechanism is recuperative; when the pressure is more than 50% - it's active. The braking mechanism is mandatorily activated when the rotation cycles measured by the encoders exceed 1850 RPM which indicates that the velocity of the trolley has reached 35 km/h.

The system has active feedback management that controls the speed and momentum (current) in both forward and braking mode. A Hall effect sensor indicates the type of signal that is coming from the steering handles. The velocity is set by the 'gas' handle and the 'brake' handle sets the braking degree. A light indicator is switched on every time the brake handle is being pressed as well as every time the braking mechanism is being activated when the trolley reaches speed of 35 km/h.