# Software safety features FOC100

## Overcurrent protection

1. Lower the control current by 20% when the measured current becomes greater than the maximum battery current. This is to prevent the battery from going into overcurrent protection and shutting down.
2. Set the control current to 0 for 1 second when the measured current becomes greater than the controller maximum current. This is to protect the controller from damage due to overcurrent.

## Temperature protection

1. Progressively limit the control current when the microcontroller temperature rises. By limiting the control current further temperature rise should be limited. If the temperature rises above the maximum temperature the controller current is set to 0.
2. Motor temperature protection by measuring stator resistance while controlling the motor.

## Sensor input

1. Zero value recalibration during startup. By recalibrating the sensor zero value at startup self-riding issues can be prevented. To increase confidence the calibrated zero value is correct the calibration should be ignored when the sensor signal is unstable.
2. Sensor value range check. The sensor value should fall within a certain range. When the sensor value is out of range this could indicate a short to supply, short to ground, or not connected.
3. Sensor value threshold. When the sensor value is lower than the threshold value it is ignored. This check is to prevent unintended control of the motor by for instance resting your foot on the pedal.
4. Sensor value fluctuation check. When the sensor value is constant for too long something is wrong and the motor control should be stopped.