BaxterOSV – Electronics | 2020

Final Report

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Objectives

Given the risk COVID-19 poses to under-developed countries, especially the lack of medical equipment and infrastructure needed for ventilators, the Baxter Open Source Ventilator (BaxterOSV) was designed to work in under-developed countries with limited access to medical supply chains

BaxterOSV utilizes off-the-shelf components and design that creates its own pressure to ventilate patients and does not need expensive hospital infrastructure

BaxterOSV also performed more consistently between breaths when compared to industry products

Proof of Concept

BaxterOSV went through 3 iterations before completing a design that was fully functional

At each stage the ventilator was tested by a ventilator technician to confirm it's performance and test the user experience



V2 of BaxterOSV being tested on a test dummy

Approach

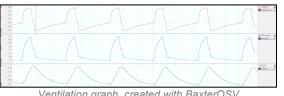
The key design features of our ventilator were:

- Safety using an Open Source Ventilator you need to be confident in safety. The worst failure in our ventilator is one additional breath
- Manufacturing Speed in a crisis time is of the essence. By using "satellite manufacturing" we were able to shift manufacturing to end users to ramp up production in high-need areas much faster
- Versatile Construction using off-the-shelf components means that parts can easily be replaced in other countries if they break or are not available/compatible. For example, our back-pressure regulator was replaced with SCUBA regulator on v2 when the US supply chain was low on regulators

Results

The BaxterOSV was chosen as one of the Top 7 finalists in the CoVent-19 Challenge

Our final design was able to reliably perform at a range of different settings. It is ready for further testing and manufacturing if needed



Ventilation graph, created with BaxterOSV



V3 of BaxterOSV