Project Apollo Project Overview

DIY Oxygen Concentrator Project

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Working copy available at: https://drive.google.com/drive/folders/1AWvZsK41v0T8z20f\_-QFAzTxI99lZbBv?ths=true

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Goal

The goal is to create extremely detailed DIY instructions for the creation of an Open Source Oxygen Concentrator. This should be concise and clear so it can be followed by those with little to no previous experience in building these types of systems.

The target price is less than $100 although this may be infeasible once development and prototypes are created.

Justification

- In the Helpful Engineering Round 1 Peer review this project was ranked 14th out of 26

proposals to make it to that stage. - It was ranked in the top 5 of the hardware projects. - It was ranked by Anaesthesiologists as “Hugely important” with a comment of “Lack of

O2 pipeline supply”

Assumptions

Note: Any assistance confirming or denying any assumptions would be appreciated as expert knowledge has not been available to date.

- Access to oxygen-rich air is critical to many medical facilities across the globe given that

we are running out of beds in many affected areas by COVID-19 [1], [2] - Additionally, according to the interviewed Seattle doc, 2⁄3 of hospitalized patients didn’t require much more care than o2 therapy, so any way to rapidly scale out concentrator production can probably take a large load off of hospitals. - There is no clear guideline on the percentage Oxygen and flow rate required. Target

Oxygen Concentration will be 93%. Acceptable range will be 70% to 100%. Target Oxygen Flow will be 5 litres per minute. The Acceptable range will be 1 to 20 litres per minute.

Project Timeline

- Project start date: March 12nd 2020 - Plan to complete build of prototype V1 by March 22nd. - Plan testing of prototype V1 from March 23rd to March 25th. - Community feedback in the week of March 26th to March 30th. - Publish schematics/instructions: April 4th. - Publish educational videos: April 11th.

Requirements

- Target Oxygen Concentration will be 93%. Acceptable range will be 70% to 100%. - Target Oxygen Flow will be 5 litres per minute. The Acceptable range will be 1 to 20

litres per minute. - Long-running (>1.5 years). - High dependability. - Simple design:

- Eliminate anything not strictly needed in the initial prototype. - Example: No built-in compressor. Instead it should work with a variety of external

compressors, some which can generate impurities such as oil mist or water vapors (common problems with all compressors) - Should be possible to construct from household or freely available materials. - Detail of suitable mechanism to ensure molecular sieve is not restricted from oil (from

compressor) to be provided. - Easy to maintain (i.e. easy to tear down, fix and replace drying silica beads or zeolite

beads etc.) - Should not require calibration or complex sensors.

Useful links

- Project GitHub: https://github.com/oxycon/ProjectApollo/projects - Project Google Drive:

https://drive.google.com/drive/folders/1AWvZsK41v0T8z20f\_-QFAzTxI99lZbBv?ths=true - Project Slack Channel: https://helpfulengineering.slack.com/archives/C0105E2T0UB

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