

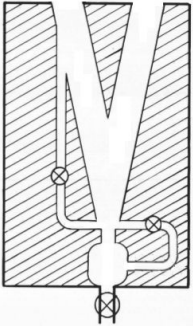
Tech. & Team

Resubmission:

ARMEE Vent

Inspired by 1960s designs and modified for positive PEEP

Device Diagram:



Core Team:

EMS Medical Director,
Medical Device Engineer,
Manufacturing Expert,
CFD Scientist,
Project Manager

Mission Alignment

Device is **rugged**, solid-state, has no moving parts, and is roughly the size/weight of a deck of cards - making it suitable for any kit. It is **pneumatic** (air-powered) and runs on low-pressure air or O₂. This is a **Pressure-Controlled** device which also allows patient-triggered breathing, suitable for invasive or non-invasive ventilation. It can be customized to target any of the following: positive PEEP (5-20), PIP (15-35), I:E ratio (1:1 to 1:3), RR (0-60), TV (50-1000), for large or small patients with healthy lungs or damaged ones. The device is **modular**, fitting standard hospital tubing, and can operate standalone or with a suite of alarms/sensors/emergency valves, optionally included.

Regulatory

Originally based on 1965 US Army ventilator research, which was **tested on dogs and humans successfully**, we have modified the designs and are underway with our own clinical testing. The design is very simple, easily cleaned or disposed-of, and runs indefinitely given a consistent flow of air. It can be easily swapped for a BVM, or fitted with (optional) additional safety precautions which give it full alarm and sensor functionality. Aside from an input flow rate of 20-30 lpm (which version 2 will fix), the device meets the UK's **RMVS** ventilator standards, and we expect it to pass EUA regulations once the final product is packaged.

Technical Viability

We use well-researched fluid dynamics science (**fluid amplifiers**) to build a suite of devices with pressure profiles built-in to the geometry of the devices to offer a range of **PIP/PEEP/I:E** ratio combos which can be targeted for different patient sizes and lung-health levels. While an unusual way to solve the problem, patients infrequently have their prescriptions changed in an emergency/pandemic situation, so simply swapping device models to match at those times is sufficient - and we offer the ability for more fine-grained adjustments via changing Input Flow as well. Multiple doctors endorse this approach already, and will be given rigorous data charts to guide applicability of the device.

Speed

A single **CNC machine** could immediately begin producing hundreds of units per day at sub-\$30 ppu. **Injection Molding**: thousands per day, sub-\$5. **3D printing**: around 10 per day, sub-\$5 ppu - useful for forward-deployment or on-demand production. Overall: **10k could be made in one day** with 20-30 CNC machines with no lead-in time. That said, we recommend a sub-5-minute quality test per device, and we warn that the optional alarms/sensors may not match production speed. These are easier to source or create out of existing materials though, and may not be needed for every patient. We have several interested manufacturing partners.