

The AeroBreath™ \$100 Ventilator Project

SIMPLE

Objectives

Focus on therapeutic and/or recovery phase care and emergency assistance.

Provide meaningful ventilation capability.

Use only process and materials suitable for rapid deployment.

Keep it simple. Two lanes: S = Manual Operation, and E = Motorized.

Substantiation

Evaluate and compare to a commercial unit (Philips Respironics PLV-102).

Review by Pulmonary / ICU Specialists

Compliance with U.S. FDA Emergency Use Authorization (EUA)

Capability (for E Lane except where noted)

Type	Volume Control Ventilator
Tidal Volume	300-750 mL, 50 mL Graduation, Manually Selectable
Breaths per Minute (BPM)	10-20
Manual Pressure Control with Safety Relief	0 - 60 cm H ₂ O
Exhalation Valve Control	Yes
Manometer	Ambu, or Equiv.
PEEP	Ambu PEEP Valve, or Equiv.
Patient Circuit	22 mm

Materials

Framework	Injection Molded Plastic and PVC Pipe
Bellows	Flexible Duct (Silicone, Polypropylene, etc)
Diaphragms	Injection Molded Plastic
Check Valve Housings	Injection Molded Plastic
Check Valve Diaphragms	Silicone Rubber
Control	Simple Two-Speed Motor Control
Mechanism	Aluminum Torque Arm and Injection Molded Connecting Rod
Power	Low Voltage DC Motor (12W) (E Lane) or Hand Crank (S Lane)

Deployability

Use of low tech, available parts and materials.

Coordination of compatible and available motors through AeroBreath™ Project website.

Scalability

Production Rate	Fast Build
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Critical Dependencies

Motors	Can Substitute Other Motors, Hand Crank or Alternative 40 in. lbs. Torque Source
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Cost

Materials	\$100 to \$250
Labor (one-off)	8 Man-Hours
Labor (production estimate)	1 Man-Hour