**Open Source Ventilator**

**PEEP (Positive End Expiratory Pressure) Module**

V1.0; Sem Lampotang, March 17, 2020; Department of Anesthesiology, Center for Safety, Simulation & Advanced Learning Technologies, University of Florida, Gainesville, Florida, USA

Reports from our clinical colleagues treating COVID19 patients indicate that PEEP is needed. A patient usually exhales to atmospheric pressure during positive pressure ventilation. Positive pressure means pressure above atmospheric pressure. Simply put, a PEEP valve stops the flow of exhaled gas when the pressure at the end of expiration is at the desired positive pressure.

|  |  |  |  |
| --- | --- | --- | --- |
| **Physical Input**  | **Data/Control Input** | **Physical Output**  | **Status**  |
| **Design A (water column)** Gas exhaled by the patient coming from the exhalation valve  | Close the PEEP valve when pressure drops below PEEP Place the end of a 22 mm hose x cm below a translucent plastic cylinder of water with cm markings on the side of the cylinder  | Gas exhaled by the patient as long as pressure is above the PEEP level The depth x in cm of the hose end below the water should be the PEEP level in cm H2ODesign and build/3D print the PEEP column and verify it is accurate within ±1 cm H2O  | Not claimed; No one working on it yet |
|  |  |  |  |
| **Design B (Spring-loaded valve)** Gas exhaled by the patient coming from the exhalation valve  | Inlet port to PEEP valve is 22 mm corrugated hose Close the PEEP valve when pressure drops below PEEP  | Gas exhaled by the patient as long as pressure is above the PEEP level Discrete PEEP valves for each PEEP level based on spring tension or an adjustable spring tension for different PEEP levels Design and build/3D print the PEEP column and verify it is accurate within 1 cm H2O  | Not claimed; No one working on it yet |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |