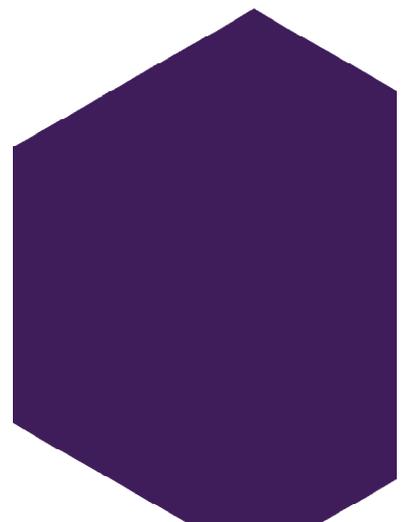
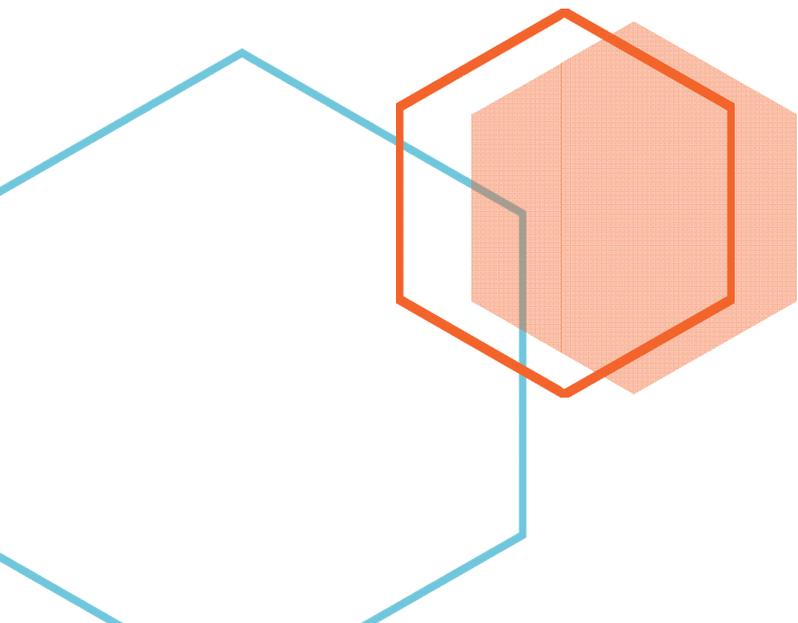


Non-Invasive CPAP type Ventilator

PREPARED BY MSME TECHNOLOGY CENTRE -
KOLKATA

COVID – 19 viruses may cause lung complications like pneumonia and in the most severe cases it causes ARDS. The pneumonia that is caused by COVID – 19 fills the Air Sacs in the lungs with fluid, limiting their Oxygen intake ability. In this scenario most patients are provided with non-invasive type pressure ventilation. Continuous Positive Airway Pressure is the most basic level of support that may be provided.





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Background

In the present scenario the entire world is going through mayhem, since the beginning of this calendar year, caused by an invisible antagonist. A foe to whom we all are susceptible. COVID-19, the disease caused by the new corona virus, may cause lung complications such as pneumonia, and in the most severe cases, Acute Respiratory Distress Syndrome, or ARDS. The pneumonia that is caused by COVID-19 tends to take hold of both lungs. Air sacs in the lungs fill with fluid, limiting their ability of oxygen intake and causing shortness of breath, cough and other symptoms.

In this present scenario, most patients, who are provided with noninvasive ventilation, are provided support with pressure ventilation, with **Continuous Positive Airway Pressure (CPAP)**, which is the most basic level of support. **CPAP** may be especially useful in patients with congestive heart failure.

The product developed by CTC - Kolkata has a special feature that is, our product is totally IOT Based and also it can be operated through Android Devices as per doctor and patient convenience.

Overview

Continuous positive airway pressure (CPAP) is a form of positive airway pressure (PAP) ventilation in which a constant level of pressure above atmospheric pressure is continuously applied to the upper airway.

Highlights

Most patients, who are provided with noninvasive ventilation, are provided support with pressure ventilation, with (CPAP), which is the most basic level of support. CPAP may be especially useful in patients with congestive heart failure.

The Non – Invasive CPAP Type Ventilator developed by CTC - Kolkata has a special feature that is, our product is totally IOT Based and it can be operated and controlled through Android Devices as per doctor and patient convenience.



The application of positive pressure may be intended to prevent upper airway collapse, or to reduce the work of breathing in conditions such as acute decompensate heart failure. CPAP improves survival and decreases the need for steroid treatment for lungs. In resource-limited settings CPAP improves respiratory rate and survival chances with primary pulmonary disease. Researchers have found that nurses can initiate and manage care with once or twice daily physician rounds.^[2]

In March 2020 the USFDA suggested that CPAP devices may be used to support patients affected by Covid-19;^[3] however, they recommended additional filtration as non-invasive ventilation may increase the risk of infectious transmission.

Operating Principle

Non-invasive ventilation (NIV) is the delivery of Oxygen in atmospheric air plus pure Oxygen at 37°C 98% RH mixed together for ventilation support via a face mask and therefore eliminating the need of an endotracheal airway. NIV works by creating a positive airway pressure - the pressure outside the lungs being greater than the pressure inside of the lungs. CPAP is the most basic level of support and provides constant fixed positive pressure throughout inspiration and expiration, causing the airways to remain open and reduce the work of breathing. It also helps to keep the chest and lungs expanded by increasing the functional residual capacity (the amount of air remaining in the lungs after expiration) by maintaining PEEP (Pressure 0~2.0KPa) after a normal (tidal) expiration.

Technical Parameters

- Ventilation Wave
- Tidal Volume :650ml
- Breath Frequency :12 BPM
- I : E Ratio : 1:2
- Breathless Time : 0.5 Sec
- Inspiration Plateau : 6 m bar
- PEEP : 7 m bar
- Trigger Sensitivity : Pressure Triggering
- Oxygen Concentration : 21%
- PSV Pressure : 5 m bar
- Monitor Wave and parameters : Monitor Wave p-t, V-t
Tidal volume, Breath Frequency, I:E ratio, PEEP, P peak, MV, Oxygen

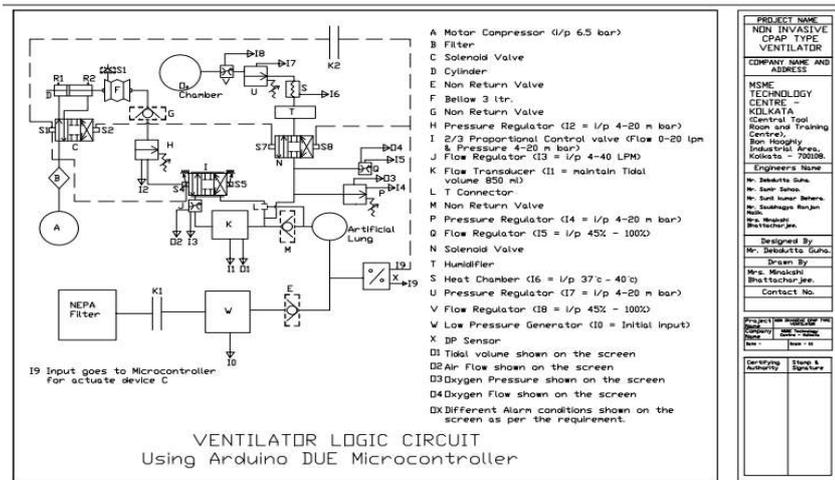


Concentration, P mean

Alarm Parameters & Alarm Settings

- Tidal volume upper limit
- Tidal Volume Lower limit
- Breath Frequency Upper limit
- Breath Frequency Lower limit
- Peak pressure upper Limit
- Peak pressure lower Limit
- PEEP upper limit
- PEEP lower limit
- Oxygen concentration upper limit
- Oxygen concentration lower limit
- MV upper limit
- MV lower limit
- Apnea alarm and Setting

Schematic Diagram



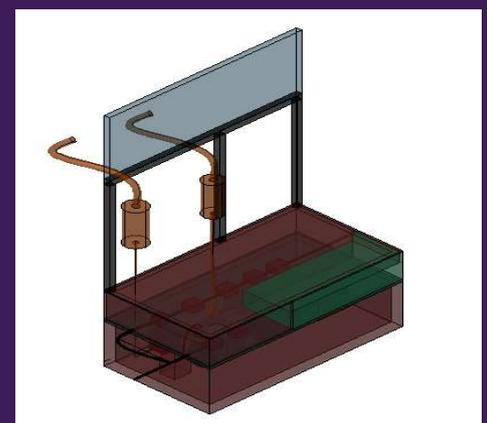
Product Diagram



Wave Form Diagram



3-D Base Model of CPAP Type Ventilator



3-D Final Covered Model of CPAP Type Ventilator

List of Testing Labs

The Product parameters have been sent for approval to the following NABL accredited laboratories:-

- TUV Rheinland (India) Pvt. Ltd. Bangalore
- Swen Konformity, Vishal Nagar, Pimple Nilakh, Pune
- Tarang Labs Product Qualification and Compliance Planet, Bangalore



Tendering Process

Scope of Work

The institute seeks for selection of MSMEs/Startups with Udyog Aadhar/ companies for technology transfer for mass production, sales and marketing of “Non-Invasive CPAP Type Ventilator”. The technology will be transferred to the competent firm for the commercial production, sales and marketing of the developed Non-Invasive CPAP Type Ventilator and an agreement shall be signed between MSME TECHNOLOGY CENTRE, KOLKATA & the competent firm.

The competent firm selected as Transfer Of Technology partner shall be responsible for:

- Production of the CPAP Type Ventilator based on the documents provided by MSME TECHNOLOGY CENTRE, KOLKATA.
- Marketing, selling and installation of the product.
- Provide customer support/warranty after the products sold.
- Have facilities for Assembly and testing of the system.

- Provide production documents to the TOT partner
- Facilitate testing of one unit produced by the TOT partner
- MSME TECHNOLOGY CENTRE, KOLKATA will provide the Controller with circuit.
- If testing unit cannot be transported, MSME TECHNOLOGY CENTRE, KOLKATA can facilitate the testing with the help online platforms.

Documentation

The ToT Partner is expected to prepare detailed documents for production in consultation with MSME TECHNOLOGY CENTRE, KOLKATA, however the final production documentation is entirely the responsibility of TOT partner.

Prototype Model





General Terms and Conditions of Eoi

MSME TECHNOLOGY CENTRE, KOLKATA invites “Expression of Interest” (EOI) in the format given in Annexure-1. The industries will be shortlisted based on the information furnished in Annexure – I and assessment by the committee.

- This invitation of EOI will be open till 20th of July, 2020. Expression of Interest submitted before the specified end date will be evaluated within stipulated time.
- A competent committee will scrutinize the applications for follow-up action. The applicants may be called for a presentation regarding their strengths and business proposal.
- The minimum turnover of the organization in last three years and strengths/capabilities as one of the eligibility criteria for short listing of the applicants.
- Participation in this EOI does not guarantee any association with MSME TECHNOLOGY CENTRE, KOLKATA unless notified by MSME TECHNOLOGY CENTRE, KOLKATA in writing.
- The technology is offered on a non exclusive basis. One agency may be shortlisted per state, if they agree to the terms and conditions as specified in the agreement. The agreement will be sent to the shortlisted agencies.
- The shortlisted competent firm will have to enter into an agreement with MSME TECHNOLOGY CENTRE, KOLKATA after which production can be started.
- There will be a onetime technology transfer fee of Rs. 1, 50,000.00 (INR Rupee One Lakh & Fifty Thousand Only), which needs to be paid by the TOT Partner during signing of agreement. There will be royalty charges which shall be paid by the selected partner to MSME TECHNOLOGY CENTRE, KOLKATA, based on the production of the units. The Royalty charges plus applicable taxes will be Rs. 25,000.00 per unit manufactured to be paid to MSME TECHNOLOGY CENTRE, KOLKATA.
- The submission of the EOI shall include all such documents that are specific herein to prove the authenticity of their offer and any claim made therein. The burden of proving such claims shall lie with the bidder.
- All cost and expenses associated with submission of EOI shall be borne by the bidder while submitting the EOI and MSME TECHNOLOGY CENTRE, KOLKATA shall have no liability, in any manner in this regard, or if it decides to terminate the process of short listing for any reason whatsoever.
- MSME TECHNOLOGY CENTRE, KOLKATA reserves the right of rejecting any offer without assigning reasons.



Non-Invasive CPAP type Ventilator



- There is neither a business guarantee nor any commitment for funding support from MSME TECHNOLOGY CENTRE, KOLKATA to the shortlisted/selected/engaged firm.

Who Can Apply

MSMEs/Startups with Udyog Aadhar/ companies willing to take up production, manufacturing, marketing, sales and support of Non-Invasive CPAP Type Ventilator.

Out-Come of the Tendering Process

Ramaesis Realty Pvt Ltd (RRPL). Emerged out as winner of the EoI process. RRPL, a privately held company incorporated in the year 2010, With around 20000 sq.ft of production area in 2 workshops in West Bengal at Nodakhali & Panagarh, RRPL has catered to different State Government projects as well as Corporate And Individual Clients.

