DTU-Vent Version 2.0 for invasive ventilation, priced at less than 50 Million VND

Only two weeks after the announcement of their DTU-Vent version 1.0 noninvasive ventilator, the DTU research group continues to develop version 2.0, which expands the functionality to that of a professional medical ventilator and meets all the requirements for use in emergencies and the treatment of Covid-19 patients.

Manufacturers worldwide are no longer producing invasive and noninvasive ventilators separately. The DTU team is currently working on a new “2-in-1” design, integrating the functionality into one machine, in addition to adding a touchscreen, remote controls to reduce interaction with patients and ways of controlling multiple devices simultaneously.

DTU-Vent version 2.0, the "2-in-1" ventilator

Although the oxygen flow of the version 1.0 ventilator was only noninvasive, version 2.0 is designed to be used invasively, when severe cases need to breathe through an endotracheal tube.

The DTU-Vent version 2.0 provides full respiratory patient control invasively, or as a noninvasive ventilator providing oxygen to the lungs at a fixed frequency through a nasal or full face mask, responding quickly with large quantities of oxygen to stimulate breathing.

The operational features and the strengths of the first version are retained, including:

? A piston pump with highly stable and accurate air flow

? A design based on AMMI-Covid-19 requirements

? Pumping volumes adjusted with high accuracy

? Less power consumption than other piston-based ventilator products

? Design optimization independent of foreign international components

Dr. Le Hoang Sinh with the latest DTU-Vent

The DTU-Vent version 2.0 includes new advanced functionality including:

? Maximum tidal volume, increased from 450 ml 750 ml

? Maximum airflow speed, increased from 30 l/min to 120 l/min

? A positive end-expiratory pressure (PEEP) from 0 to 20 cmH2O, ensuring that lungs are not overloaded

? The fraction of oxygen (FiO2) can be adjusted from 21% to 100%, providing sufficient oxygen for patients with different severities

? The pump noise level has been reduced to 35 dB

? Air humidity and temperature have been stabilized

? Warning signals ensure optimal safety, using the ventilator in conjunction with application software, monitoring issues such as blood pressure, sufficient oxygen capacity and power failures

The DTU-Vent version 2.0 has a touch screen which remotely controls the ventilator using software installed on the ventilator or on a server. This new feature allows doctors and nurses to distance themselves from the patients while continuously monitoring their condition.

The DTU-Vent research team

The DTU-Vent version 2.0 provides ten different height settings for each patient, increasing efficiency and time-saving. Other adjustments include:

- Pressure control

- Volume control

- Instantaneous control of patient's vital indicators

The researchers understood the requirement for mobility in remote emergency situations or during power outages at the hospital. Their system is compact and comes with a back-up battery ensuring three hours of continuous operation.

The unique "Made in Vietnam" technology highlights the independent and intelligent design of the DTU-Vent and flexible, integrated software that meets all the requirements for a mass-produced "2 in 1" ventilator to combat the Covid-19 epidemic, all at a viable price of less than 50 million dong.

"With its new functionality, the DTU-Vent version 2.0 ably supports the treatment of Covid-19 patients," explained Dr. Le Hoang Sinh, head of the DTU-Vent team. *"In addition, the ventilator is designed with a new, more esthetic appearance and high operational stability. Our group is currently undergoing a thorough assessment and permit application process, in order to quickly begin large-scale production and provide medical facilities nationwide with a reasonably priced device."*

DTU Provost, Dr. Le Nguyen Bao, has been providing the necessary support to the research group and said: "One of DTU's prime strengths is currently in the fields of Electronics, Information Technology and Medicine. Our objective is to focus on a basic education linked with empirical research, based on resources available. This has greatly encouraged our staff, lecturers and students to come up with ideas and research projects to create highly practical products to serve our community, including the DTU-Vent. Other successful DTU medical products include:

- The 3D anatomical simulation application, including the entire human body and related medical systems, which won a first prize at the 2017 Vietnam Talent Awards

- The eCPR 3D simulator for use in community cardiopulmonary resuscitation training, which won the 2020 Sao Khue award.

"Implementing the DTU-Vent ventilator project will be very important in contributing Danang and the Vietnamese government a practical and inexpensive way to fight and push back Covid-19."

DTU

- Among Asia's 500 best universities ranked by the QS in 2020
- The second university in Vietnam to be ABET accredited
- The third of eight Vietnamese universities ranked by URAP
- Ranked 1,854th in the top 2,000 universities worldwide and third of the four Vietnamese universities in the CWUR ranking
- Second in Vietnam in the Nature Index ranking.

(Media Center)