



Technology Transfer of Centrifugal Blower based Critical Care Ventilator- 'VaU'

Interest Exploration Note

VSSC/ISRO has developed an ICU grade positive pressure mechanical ventilator titled 'VaU', (*abbreviation of Ventilation assist Unit*), which can assist or replace the spontaneous breathing in patients under respiratory distress.

VaU is based on a centrifugal blower which draws in filtered ambient air, compresses it and delivers it to the patient to achieve ventilation and can therefore operate without a compressed pneumatic source. Provision is also given in the ventilator to connect a high pressure oxygen source, from which oxygen is metered automatically, to achieve the desired oxygen concentration (FiO_2) in the inspiratory flow. Microcontroller based control module in the ventilator acquires signals from an array of sensors and commands the electro-pneumatic components to effect closed loop control.

VaU also comes with an intuitive Human Machine Interface (HMI) System running on a medical grade touch screen PC, which allows the operator to set and monitor various ventilation parameters in real time. A power supply unit, which can operate with 230VAC or an internal battery pack, is used to power the electro-pneumatic components, controller, and the HMI system of the ventilator. VaU has been configured to operate in a variety of patient/ventilator triggered invasive and non-invasive ventilation modes and has provisions to detect fault conditions and raise alarms through the HMI system to alert the operator.



Specifications

S.No.	Parameter	Specification
1.	Description	Centrifugal Blower based Positive Pressure Mechanical Ventilator suitable for ICU applications.
2.	Operation Modes	VC,VC-AC, VC-SIMV, PC,PC-AC,, PC-SIMV, PSV, PRVC, CPAP, BiPAP
3.	Inspiration flow rate	Upto 200 LPM
4.	Tidal Volume	0 to 2000 ml
5.	FiO ₂ Control	21 to 100 % (from regulated O ₂ source of pressure 2 bar)
6.	Inspiratory Pressure	0 to 60 cm H ₂ O (Relief setting at 80 mbar)
7.	PEEP Pressure	5-30 cm H ₂ O
8.	Respiratory Rate	0 to 60 (with settable I:E ratio)
9.	Net Weight	20 Kg
10.	Mech. Interfaces	<ul style="list-style-type: none"> • ISO 5356 - 22 mm OD connectors for double limb breathing circuit. • ISO 18082 – NIST connector for oxygen supply.
11.	Additional Capabilities	<ul style="list-style-type: none"> • Inbuilt Touch Screen HMI for operation and monitoring • Pressure/Flow trigger options to detect patient inspiration effort • Proximal flow/Pressure Measurement & Control. • FiO₂ control using 2 bar high pressure O₂ source. • Detection of fault conditions and alarm generation.
12.	Dimensions in mm	350*250*200 (without display) 350*250*450 (with display)

The proto type developed at VSSC/ISRO has undergone in-house test & evaluation and meets the specifications given above. The responsibility of obtaining mandatory certification from approving agencies of government of India before clinical usage vests with the industry.

ISRO intends to transfer the technology of VaU Ventilator to PSUs/Industries/Start-ups having good track record in manufacture of critical medical/electronic equipment manufacturing.

Interested industries / entrepreneurs are requested to submit their **expression of interest along with details as per attached annexure** in the email address provided below for the purpose of evaluation. Shortlisted industries will be contacted over the email address provided, along with the details.

Last date for application: **5 pm on June 15, 2021.**

The Eol applications and all communications are to be send to vauventilator@gmail.com

Response form for ToT of "VaU" Ventilator

1. Name of the Firm
2. Nationality of the firm
3. Address of the Registered Office
4. Start-up or established firm (Include registration number)
5. Nature of present business
6. Details of medical equipment manufactured earlier
7. Financial Background
8. Manpower available for realisation of product (Electronics, Mechanical)
9. Plan for realisation of the product
10. Infrastructure available for realisation of the equipment (Electronics & Mechanical Fabrication)
11. Test and evaluation plan
12. Marketing plan
13. Email Address
14. Contact Person Name
15. Contact Person Phone Number

I declare that the information submitted above is true to the best of my knowledge and the information will be used by ISRO for shortlisting the industry for the purpose of technology transfer. I understand that if any information furnished here is found to be wrong/fabricated, it will lead to forfeiture of the technology transfer and any future association of my industry with ISRO.

PREPARED AND SUBMITTED BY

(AUTHORISED SIGNATORY WITH SEAL)

To

The Head
Technology Transfer & Industry Coordination Division
Vikram Sarabhai Space Centre
Indian Space Research Organisation
Thiruvananthapuram
