



Ministry of Defence



DRDO develops SpO₂ based Supplemental Oxygen Delivery System: A boon in current COVID-19 pandemic

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inDefence Research and Development Organisation (DRDO) has developed SpO₂ (Blood Oxygen Saturation) supplemental Oxygen Delivery System for soldiers posted at extreme high-altitude areas. Developed by Defence Bio-Engineering & Electro Medical Laboratory (DEBEL), Bengaluru of DRDO, the system delivers supplemental oxygen based on the SpO₂ levels and prevents the person from sinking in to a state of Hypoxia, which is fatal in most cases, if sets in. This automatic system can also prove to be a boon during the current Covid-19 situation.



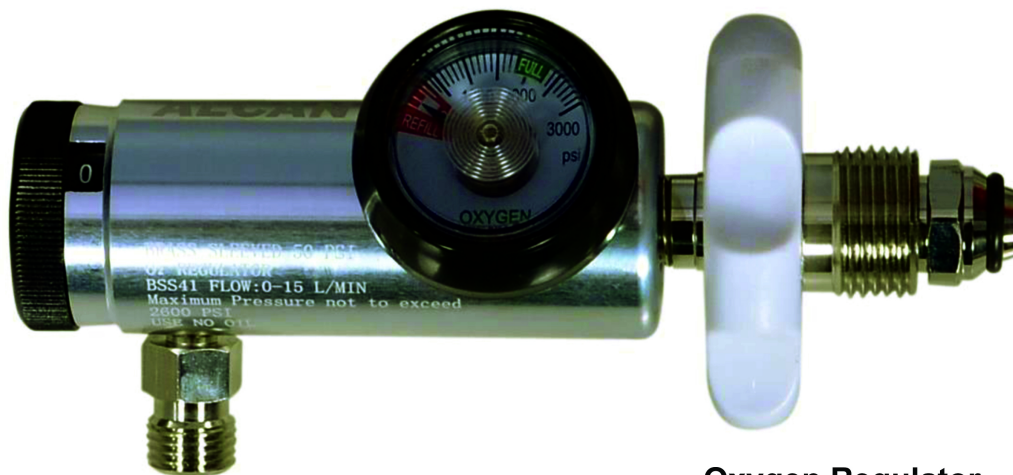
Medical Grade Cylinder Model No : ACE- 10L-152

Hypoxia is a state in which the amount of oxygen reaching the tissues is inadequate to fulfill all the energy requirements of the body. This is exactly the situation that gets replicated in a Covid patient due to the virus infection and has been a leading factor in the current crisis.





The electronic hardware of the system is designed for functioning at extreme altitudes featuring low barometric pressures, low temperatures and humidity. The software safety checks incorporated into the system are critical in ensuring the functional reliability of the system in field conditions.



Oxygen Regulator

The system reads SpO2 levels of the subject from a wrist-worn pulse oximeter module through wireless interface and controls a proportional solenoid valve to regulate the oxygen supply to the subject. The oxygen is delivered from a lightweight portable oxygen cylinder through nasal nares. The system is available in various sizes from one litre and one kg weight with 150 litres of oxygen supply to 10 litres & 10 kg weight with 1,500 litres of oxygen supply which can sustain for 750 minutes with a continuous flow of two liters per min (lpm).

Since the system is indigenously developed for operation in field conditions, it is unique with its dual qualities of being robust & cheap and is already in bulk production with the industry.

The system is a boon in the current pandemic as it can be used in the household for moderate Covid patients for Oxygen flow therapy with flow controlled at 2/5/7/10 lpm flow. The automatic usage has huge advantage in the household, as the oximeter would give an alarm for lower SpO2 value. It will automatically increase/decrease the O2 flow based on SpO2 setting which can be auto adjusted at 2, 5, 7, 10 lpm flow rate. The optimal O2 flow rate conserves the O2 resources/O2 management and greatly increases the endurance.



f With its availability and simple to use facility by a common person, the system shall greatly reduce the workload and exposure time of doctors and paramedics to monitor the SpO2 levels of the patient. The automated Calibrated Variable Flow Control for Low O2 levels (User pre-set, <90%, <80%) through a calibrated Flow Control Valve (PFCV) will facilitate in economising the oxygen supply (1-10 lpm with ± 0.5 lpm). A moderate Covid patient requires longtime moderate O2 supply 10Litre/150bar–10kg–1500 litres which can sustain up to 750 minutes.

in **Twitter** This automated, easy to use Oxygen Delivery System now available is a great boon particularly in these critical times when medical resources are stretched to their limits. Its proliferation would **WhatsApp** mitigate the crisis in management of such huge number of covid patients in many ways all across the country.

in **ABB/KA/DK/Savvy/ADA**

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