



TekMedika Pvt. Ltd.

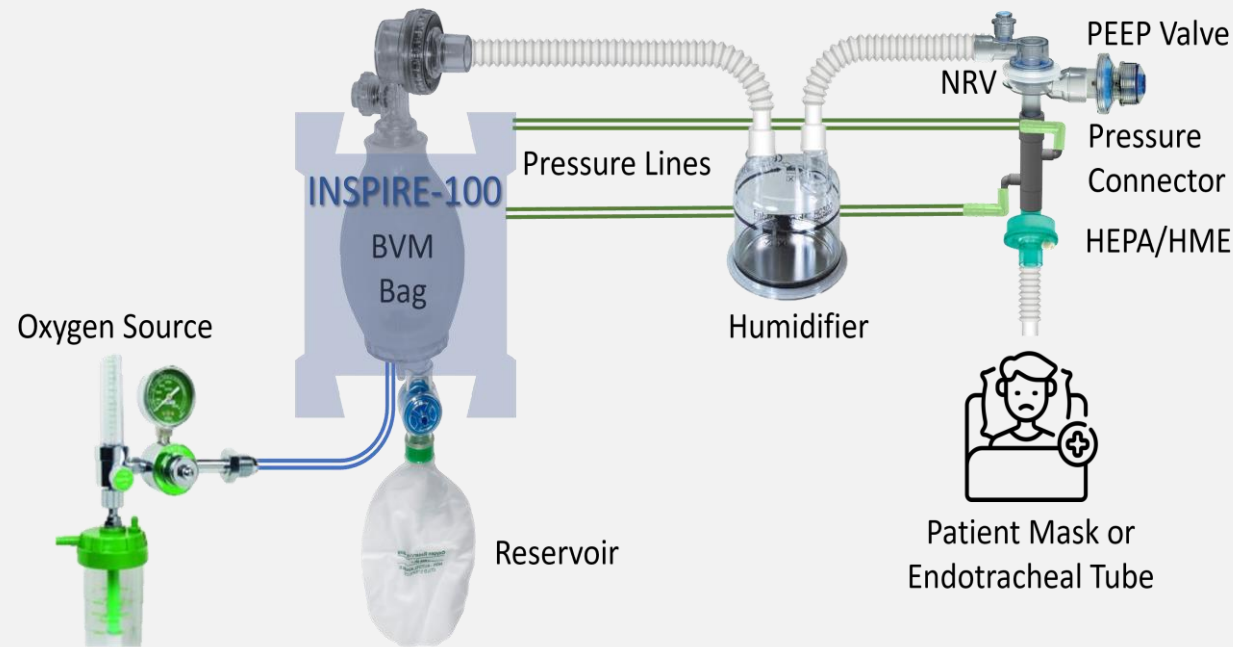
## INSPIRE-100



***A Streamlined Emergency  
Respiration Assist Device***

# Product Overview

## Breathing Circuit



## Salient Features

*Exceptionally Budget Friendly*

*Elaborate Remote Monitoring Capabilities*

*Easy-to-use  
Easy-to-train  
Rugged & Robust*

*No Need for Compressed air or Piped O<sub>2</sub>*

*Complete Set of Most-used Respiration Parameters*

*Power Consumption 100W*

## Patient Comfort

*Mandatory Breaths synchronized with Patient-initiated Breaths*

*No breath stacking*

$$Q \propto \sqrt{\frac{(P_{G1} - P_{G2})}{(P_{G1} + P_{G2}) + 2 \cdot P_{atmosphere}}}$$

An important and necessary simplification is that  $P_{G1}$  and  $P_{G2}$  encountered in our system are of the order of tens of cmH<sub>2</sub>O while  $P_{atmosphere}$  is of the order of a thousand cmH<sub>2</sub>O of pressure. At sea level,  $P_{atmosphere}$  is approximately 1000 cmH<sub>2</sub>O. Even at an altitude of 15,000 feet,  $P_{atmosphere}$  is approximately 600 cmH<sub>2</sub>O. On the other hand, the  $P_{G1}$  and  $P_{G2}$  in the system range from 1 cmH<sub>2</sub>O to 60 cmH<sub>2</sub>O.

Thus the  $(P_{G1} + P_{G2})$  term is negligible compared to  $(2 \cdot P_{atmosphere})$ , even more so since it is preceded by a square root. The flow equation can be simplified to the one below.

$$Q \propto \sqrt{\frac{(P_{G1} - P_{G2})}{P_{atmosphere}}}$$

Recalling Equation 2 from the theory section above, this equation can be recast as below given that the characteristics and pressure tap location are the same for every system.

$$Q = C \cdot \sqrt{\frac{(P_{G1} - P_{G2})}{P_{atmosphere}}}$$

At a given geographical location,  $P_{atmosphere}$  is also a constant. So, the above equation further reduces to the one below.

$$Q = \left( \frac{C}{\sqrt{P_{atmosphere}}} \right) \cdot \sqrt{(P_{G1} - P_{G2})}$$

The equation needs further simplification to ease the computation burden of the square root computation for an inexpensive micro-controller. The constraints are as below.

## Commonly used Ventilation Modes

|             |   |
|-------------|---|
| <b>CMV</b>  | Continuous Mandatory Ventilation                |
| <b>ACV</b>  | Synchronized Assist Control Ventilation         |
| <b>SIMV</b> | Synchronized Intermittent Mandatory Ventilation |
| <b>PSV</b>  | Pressure Support Ventilation                    |

## Full Set of Alarm Alerts

|                               |                        |                         |
|-------------------------------|------------------------|-------------------------|
| Max Pressure                  | Pressure Leak          | Pressure Loss           |
| Airway Blockage               | Coughing<br>Hiccupping | Inconsistent Parameters |
| Extreme Parameter Combination | System Temperature     | And many more ...       |

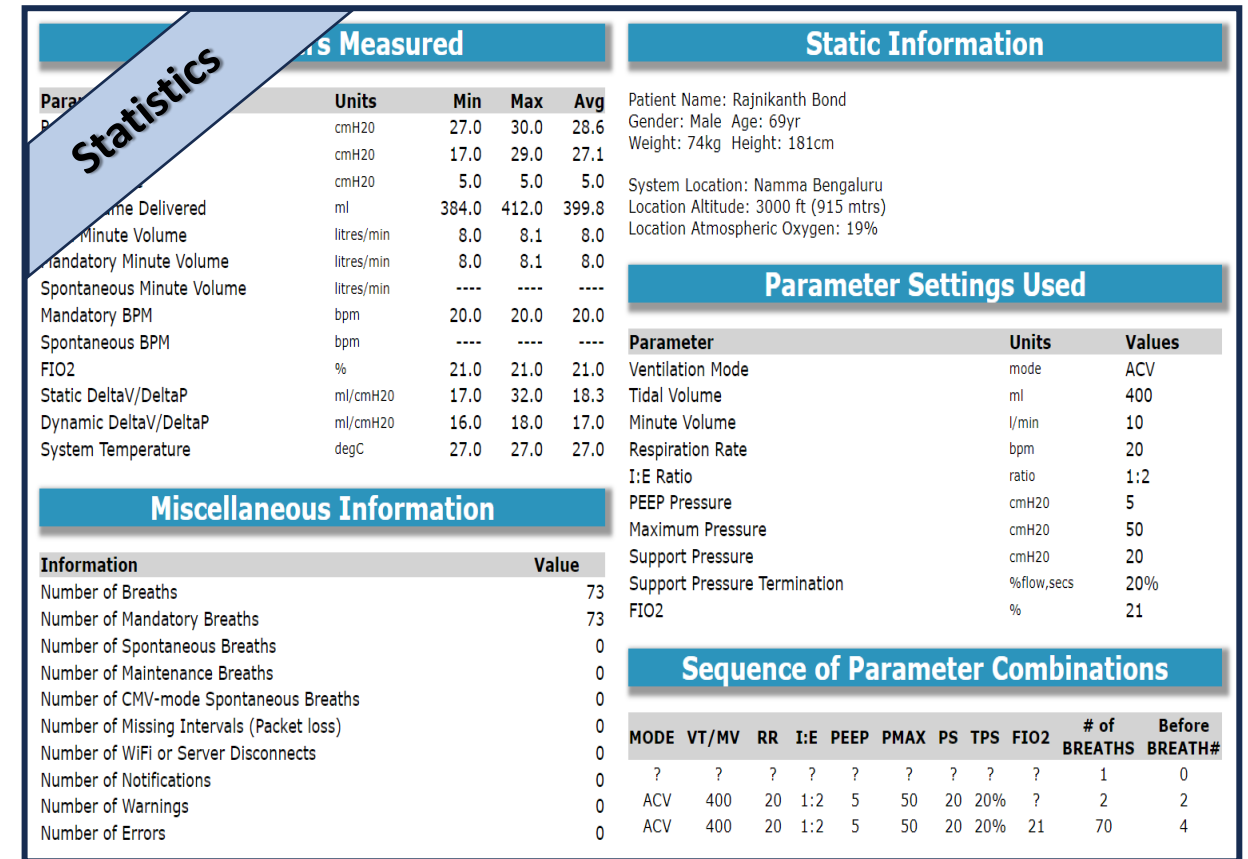
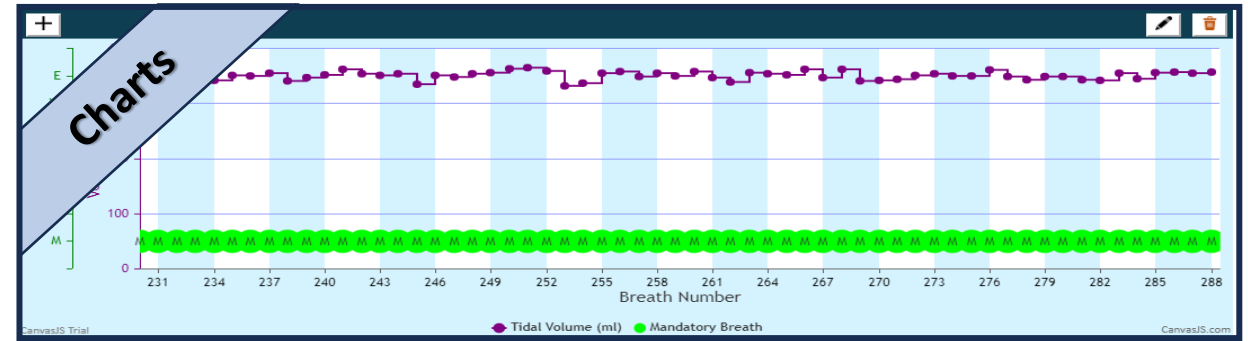
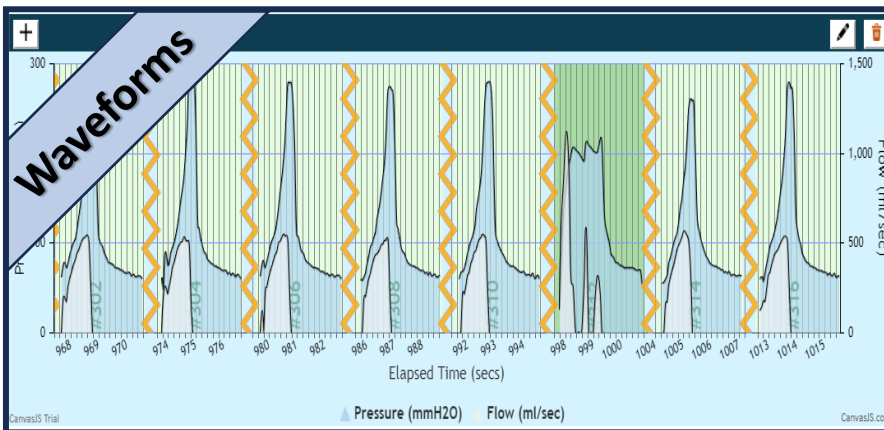
## Volume Controlled Breaths

|  |   |   |
|--|---|---|
| <b>Tidal Volume</b><br>200 - 600 ml      | <b>Respiratory Rate</b><br>10 - 30 bpm            | <b>I:E Ratio</b><br>1:1   1:2   1:3                                       |
| <b>PEEP</b><br>4 - 15 cmH <sub>2</sub> O | <b>Max Pressure</b><br>15 - 60 cmH <sub>2</sub> O | <b>FiO<sub>2</sub> Support</b><br>System Managed<br>Externally Controlled |

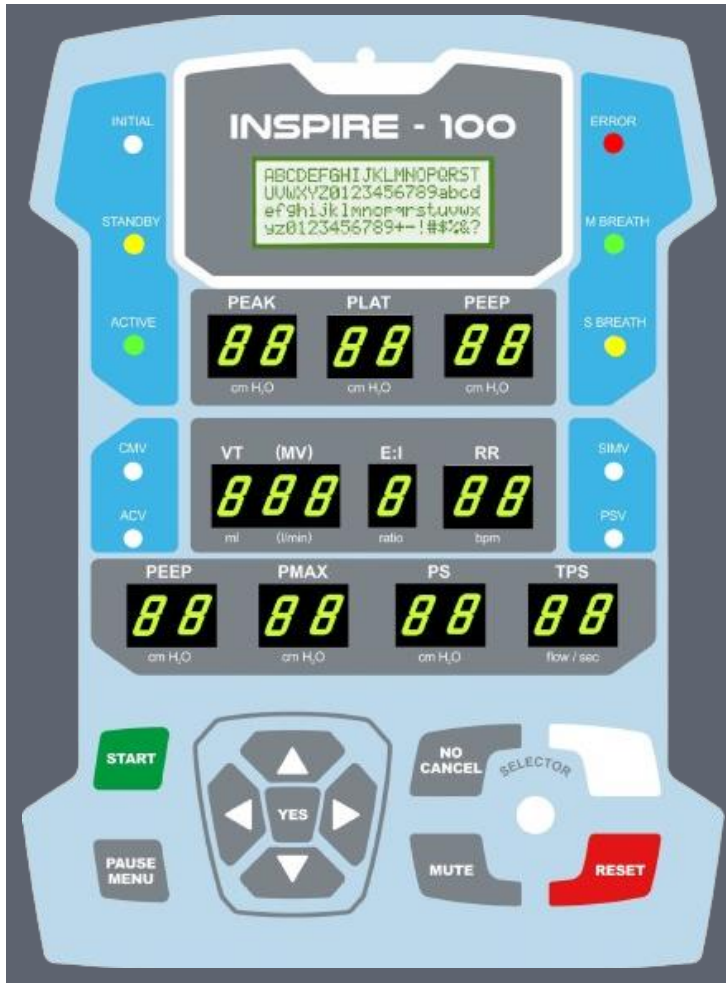
## Pressure Supported Breaths

|                                     |                                  |
|-------------------------------------|----------------------------------|
| <b>Support Pressure</b>             | 5 - 35 cmH <sub>2</sub> O        |
| <b>Support Pressure Termination</b> | Flow Triggered<br>Time Triggered |

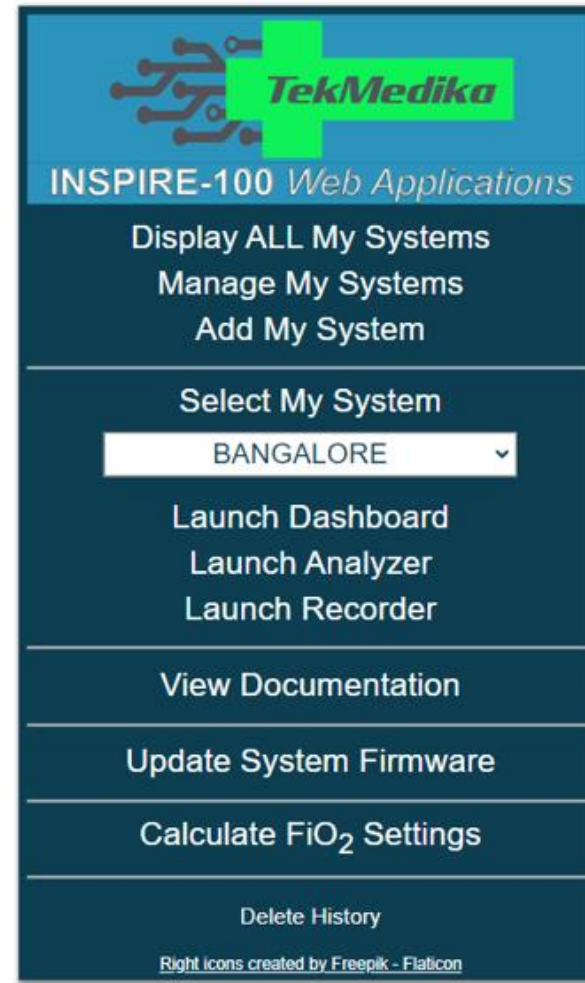
# Elaborate Remote Monitoring



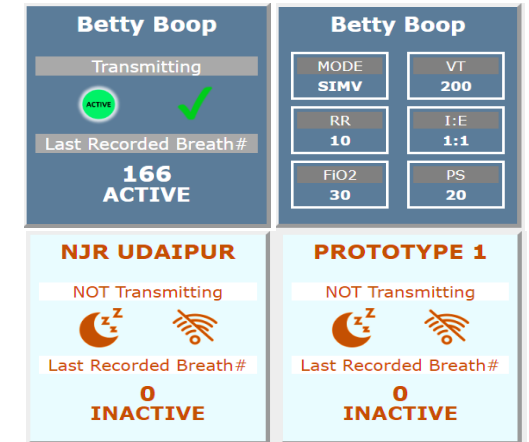
## Menu-driven, Tactile, Intuitive and Easy-to-read Control Panel



## Live Dashboard Recording and Analyzer



## Multi-system Dashboard for Nurses' Station



## Field Upgradeable

