



INSPIRE - 100

An Emergency Ventilator

TekMedika Pvt. Ltd.

(12) United States Patent
Nanda et al.

(10) Patent No.: US 12,465,716 B2
(45) Date of Patent: Nov. 11, 2025

INSPIRE-100 is a patent-pending ventilator design tailored for adult patients, providing comprehensive ventilatory support from initiation to weaning.

It features a user-friendly Human-Machine Interface with a clear front panel and advanced remote monitoring capabilities accessible via laptops, desktops, tablets, or mobile devices.

This device is particularly suited for facilities without access to compressed gas or oxygen pipelines and is built to withstand challenging environmental conditions.

INSPIRE-100 supports four commonly used ventilation modes: CMV, ACV, SIMV, and PSV. It offers a full range of breath parameters across all modes, ensuring complete assistance for patient-initiated breathing.



Unmatched Affordability



Unmatched Remote Monitoring via WiFi



Unmatched Ease-of-use



Works without Compressed Air Pipeline



Works with Oxygen Cylinder or Concentrator



Field Upgradeable



Complete Set of mainstream Parameters

Intended Use

Adult Patients only



Acute Respiratory Distress Syndrome (ARDS)



Chronic Obstructive Pulmonary Disease (COPD)



Obese Hypoventilation Symptoms (OHS)



Cheyne-Stokes breathing (CSR/CSA)



Neuromuscular Diseases



Pneumonia



Asthma



Drug Overdose



Snake Bites

Technical Specs

| Mode | Description |
|-------------|---------------------------------------|
| CMV | Continuous Mandatory |
| ACV | Synchronized Assist Control |
| SIMV | Synchronized Intermittent Mandatory |
| PSV (BiPAP) | Pressure Supported (BiPAP equivalent) |

| Volume Control Parameter | Range |
|-----------------------------------|-----------|
| Tidal Volume (ml) | 200 - 600 |
| Respiration Rate (bpm) | 10 - 30 |
| I:E Ratio | 1:1 - 1:3 |
| PEEP (cmH ₂ O) | 4 - 15 |
| FiO ₂ (System Managed) | External |

| Pressure Support Parameter | Range |
|---------------------------------------|---------|
| Support Pressure (cmH ₂ O) | 5 - 20 |
| Flow Trigger Termination (%) | 10 - 60 |

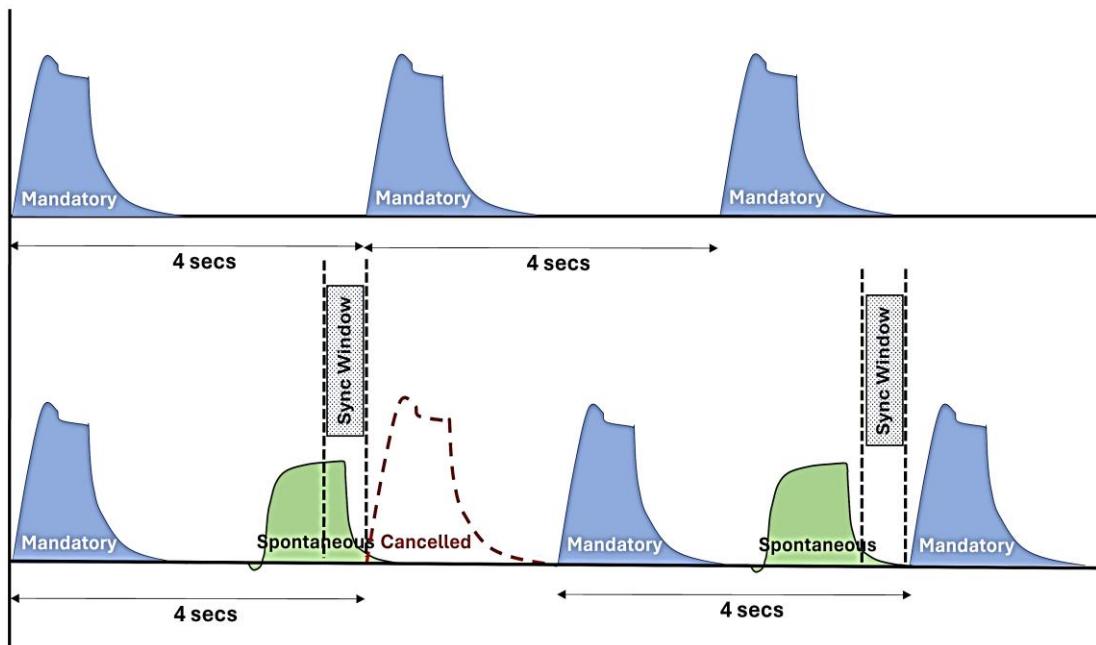
| Full Set of ALARMS | |
|-------------------------|--------------------|
| Max Pressure | Pressure Leak |
| Pressure Loss | Airway Blockage |
| Cough / Hiccups | System Temperature |
| Inconsistent Parameters | Extreme Parameters |
| Replace BVM | BVM Size |
| and many more ... | |

Power Consumption 120W

Breath Synchronization for Patient Comfort

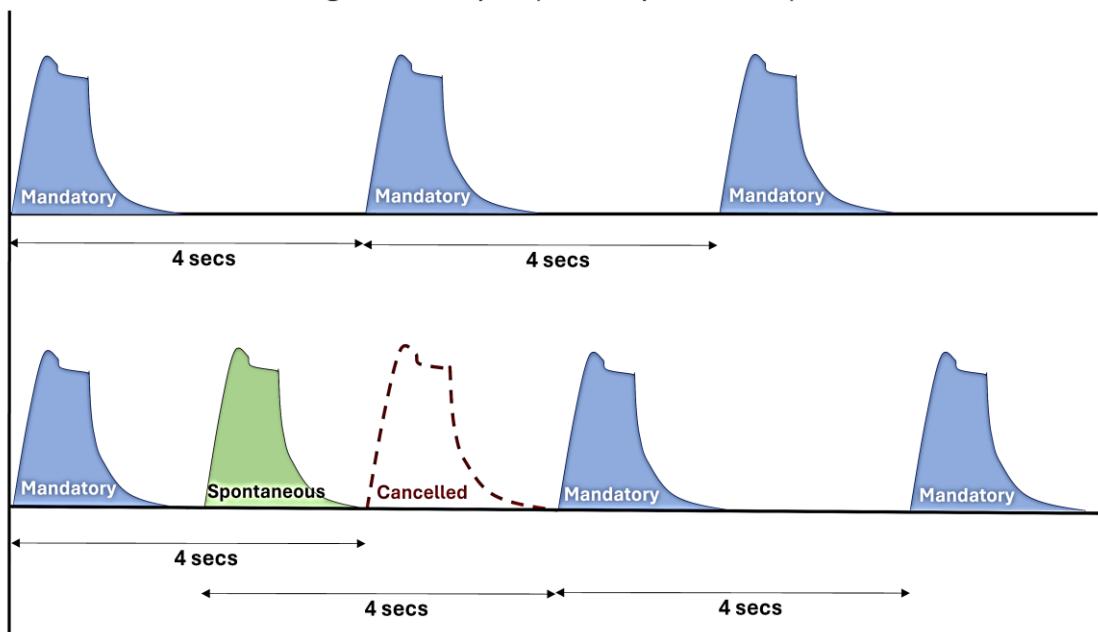
Breath Synchronization in SIMV Mode

e.g. RR=15 bpm (4 secs per breath)



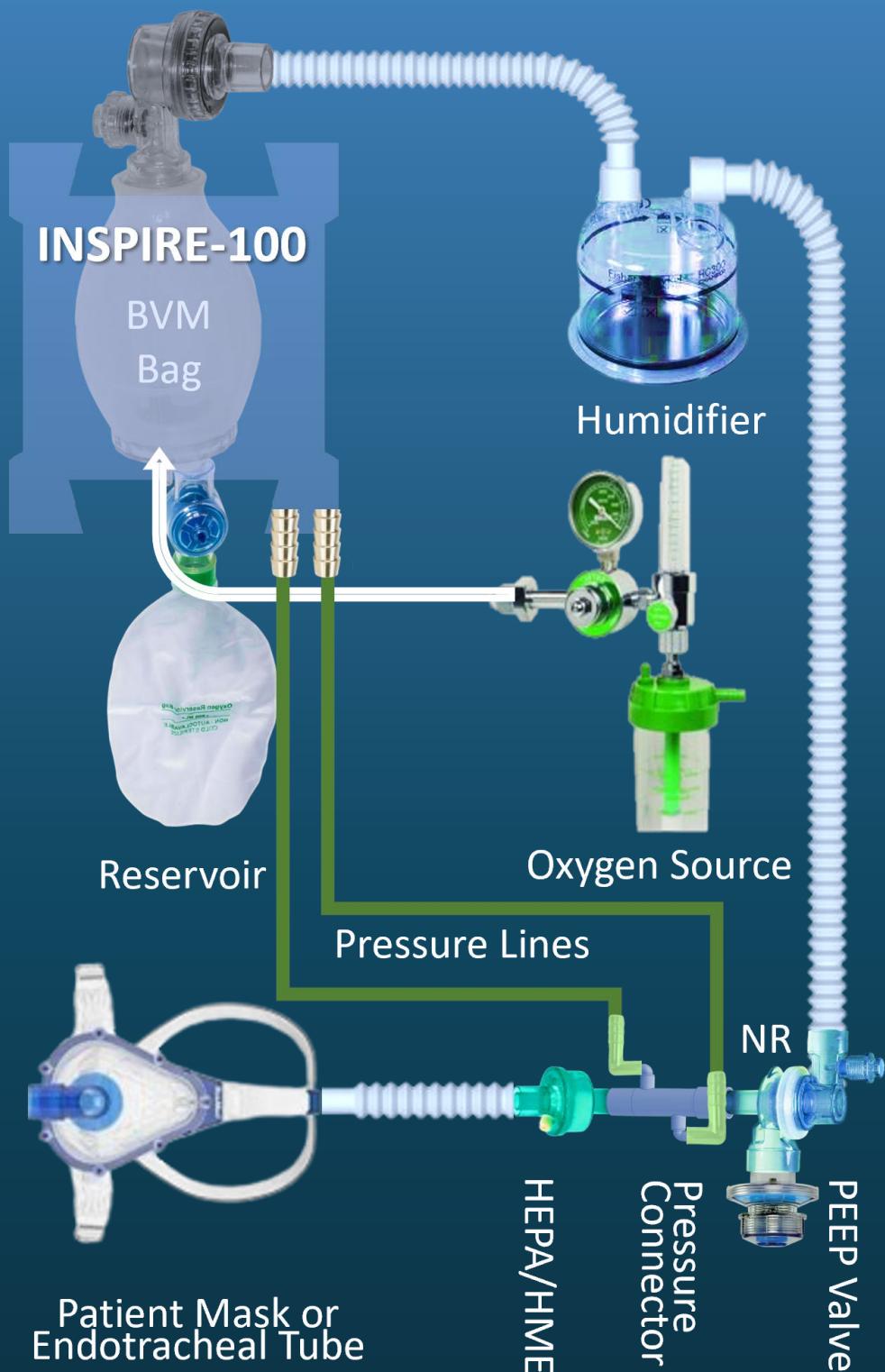
Breath Synchronization in ACV Mode

e.g. RR=15 bpm (4 secs per breath)

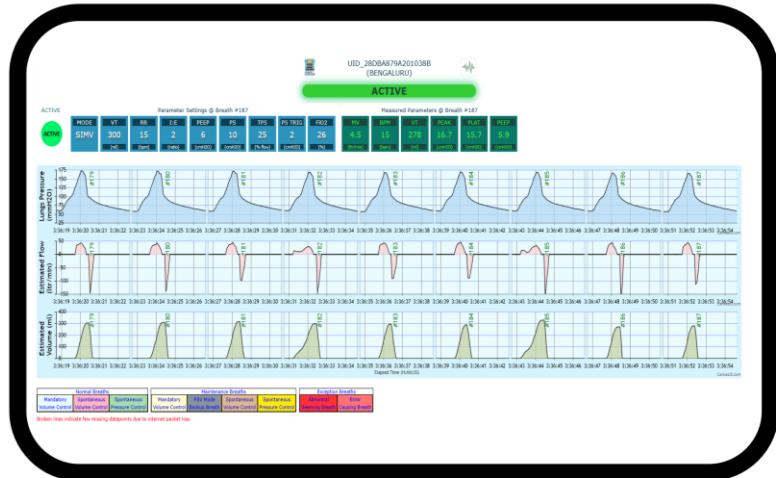


Breathing Circuit

Simple, Off-the shelf, Single-limbed and compatible with Standard Accessories



Remote Monitoring



Accessible on Laptops & Mobile devices



Search & Range Selection



Snapshots View



Waveforms View



Charts View



Statistics View



Recording and Playback



Multi-system Display

Powerful Search for Combination of Events

Demo Long [09-05-2024 17:40:26]

MATCH CRITERIA
 $((\text{MODE_SETTING} == \text{"SIMV"}) \text{ AND } (\text{BREATH_TYPE} == \text{"MANDATORY"}) \text{ AND } ((\text{TIDAL_VOLUME} < 250) \text{ OR } (\text{PEAK_PRESSURE} > 30)))$

AND

- MODE_SETTING EQ SIMV

AND

- BREATH_TYPE EQ MANDATORY

AND

- TIDAL_VOLUME LT 250 ml

OR

- PEAK_PRESSURE GT 30 cmH2O

CLEAR **EXPORT** **IMPORT** **SEARCH**

SEARCH RESULTS in Breath number range [1, 128]

| Range | Matching Breaths | | | Parameter Values | | | |
|--------------------------|------------------|------------|----------|------------------|-------------|--------------|---------------|
| Select | Number | Date | Time | MODE_SETTING | BREATH_TYPE | TIDAL_VOLUME | PEAK_PRESSURE |
| <input type="checkbox"/> | 9 | 09-05-2024 | 17:40:56 | SIMV | MANDATORY | 229 | 37 |
| <input type="checkbox"/> | 10 | 09-05-2024 | 17:41:00 | SIMV | MANDATORY | 252 | 34 |
| <input type="checkbox"/> | 11 | 09-05-2024 | 17:41:04 | SIMV | MANDATORY | 278 | 36 |
| <input type="checkbox"/> | 43 | 09-05-2024 | 17:43:31 | SIMV | MANDATORY | 216 | 10 |
| <input type="checkbox"/> | 44 | 09-05-2024 | 17:43:35 | SIMV | MANDATORY | 216 | 10 |
| <input type="checkbox"/> | 46 | 09-05-2024 | 17:43:43 | SIMV | MANDATORY | 205 | 22 |
| <input type="checkbox"/> | 47 | 09-05-2024 | 17:43:47 | SIMV | MANDATORY | 227 | 24 |
| <input type="checkbox"/> | 48 | 09-05-2024 | 17:43:51 | SIMV | MANDATORY | 234 | 23 |

8 Matches: End of Search

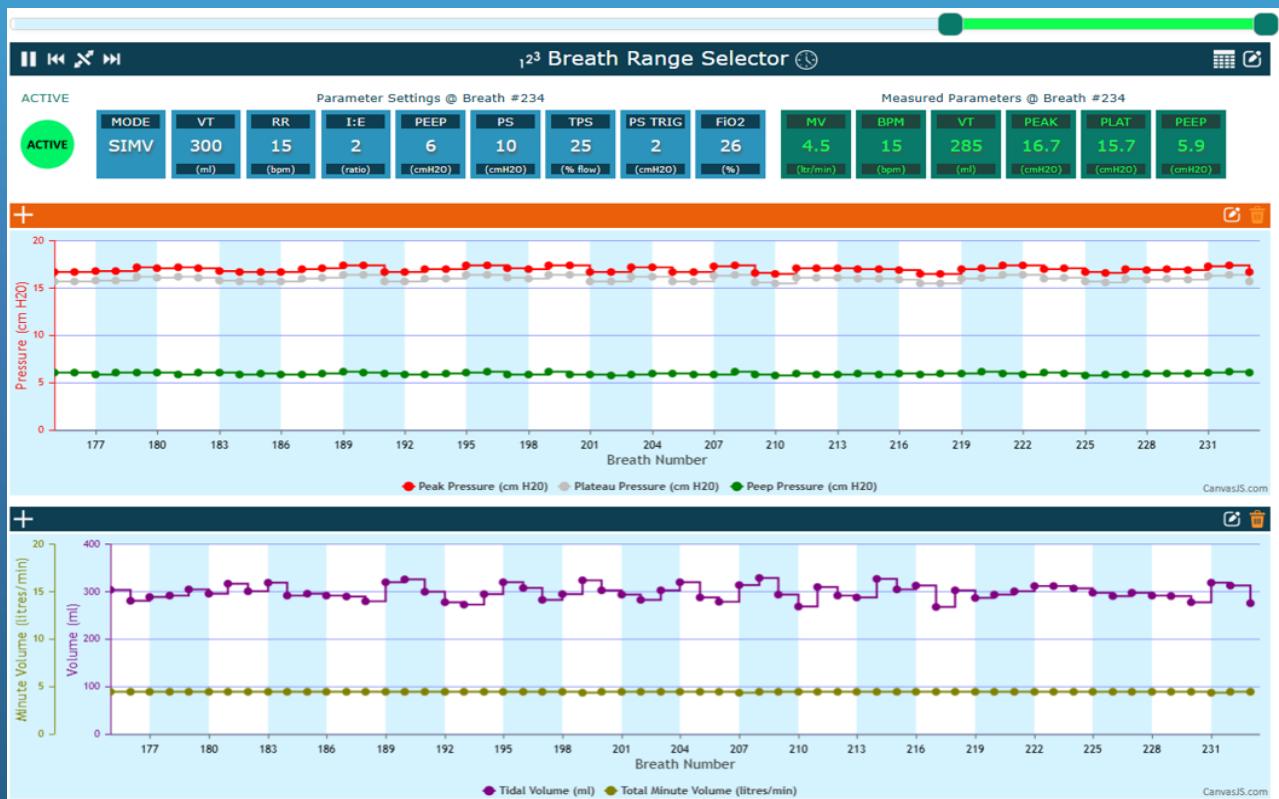
Range Selector to Navigate Any View Back and Forth in Time

1²3 Breath Range Selector

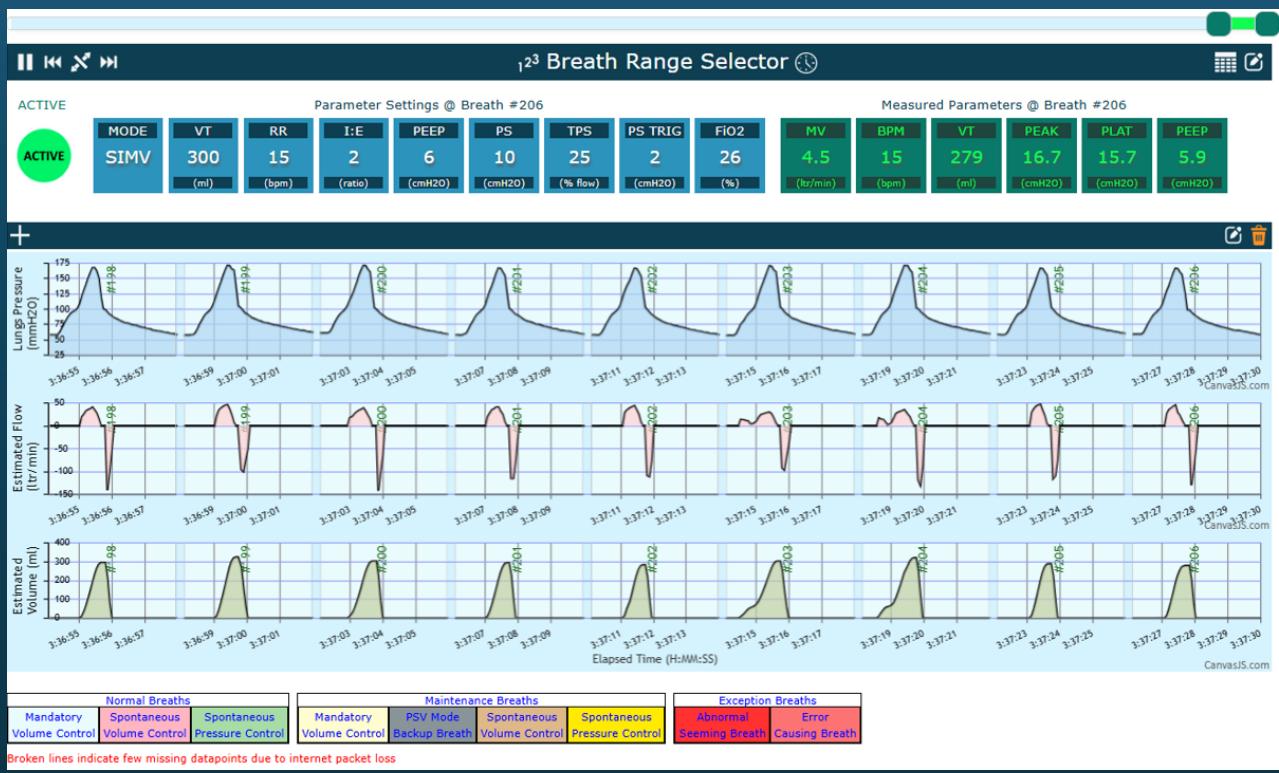
Selected Breath Range

| | Breath Number | Breath Start Time | | |
|-------------|---------------|-------------------|-------------|----------|
| | | Day | Date | Time |
| From | 520 | Fri | 26-Apr-2024 | 12:20:05 |
| Upto | 579 | Fri | 26-Apr-2024 | 12:22:58 |
| SPAN | 60 | 00:02:53 | | |

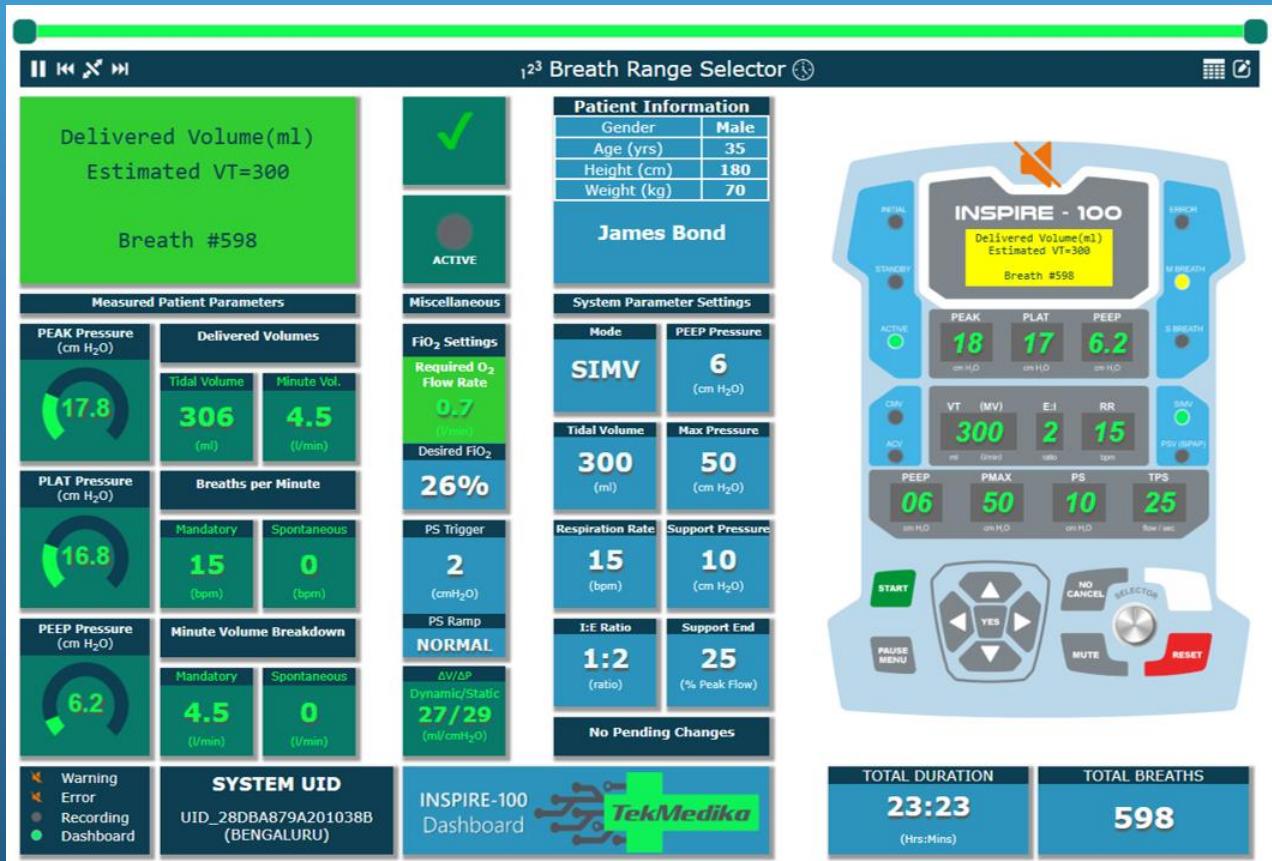
Charts for All Parameters



Pressure & Flow Waveforms



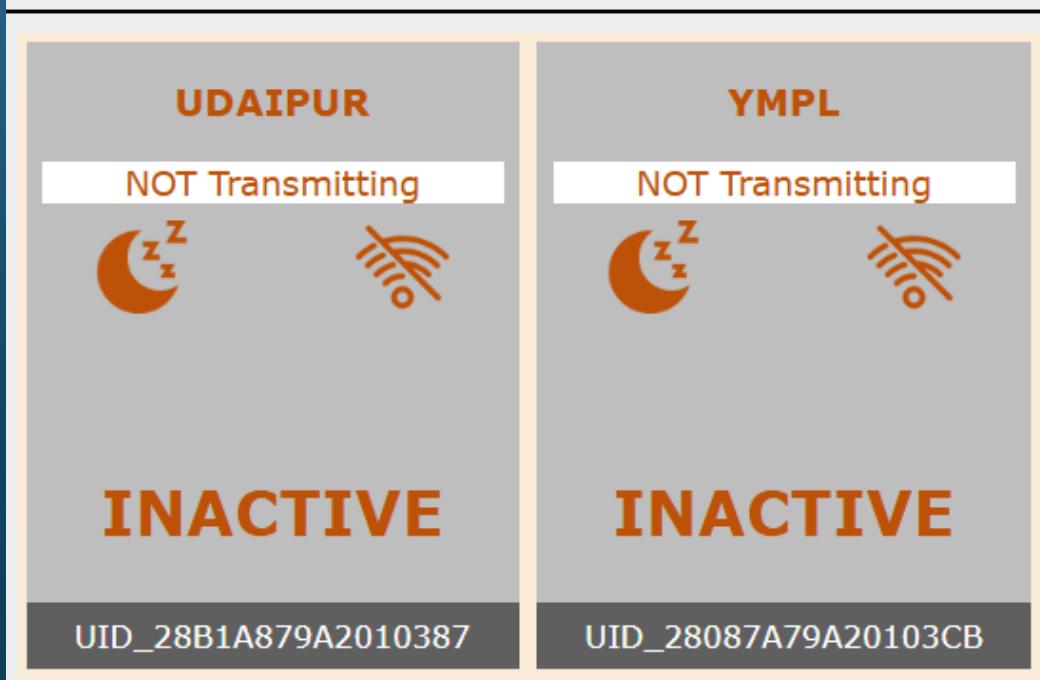
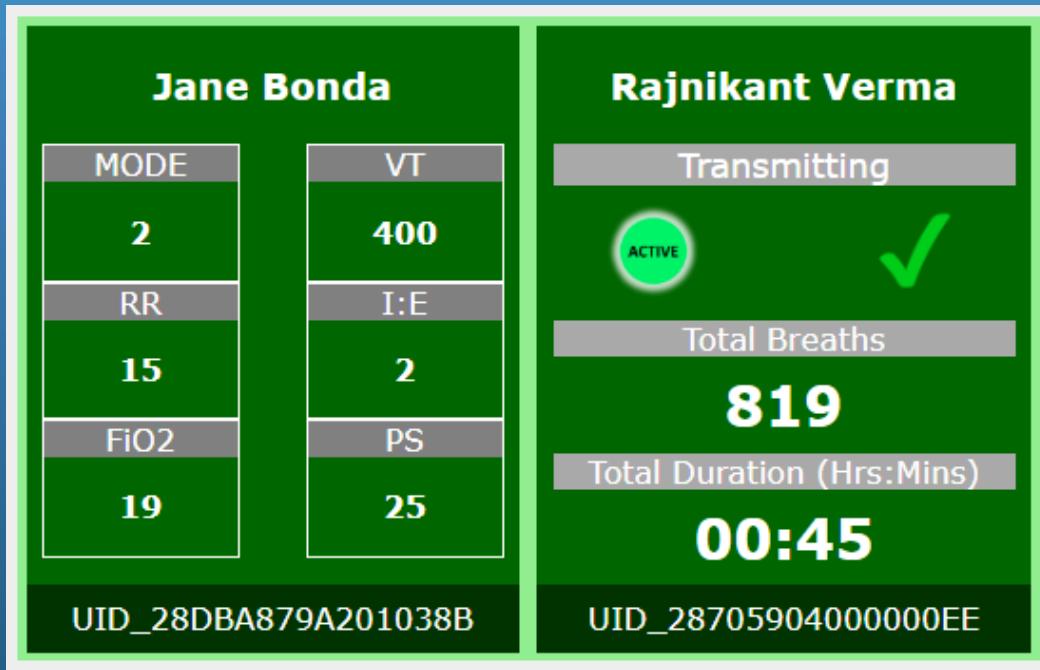
Snapshots for each Breath



Detailed Statistics

| Parameters Measured | | | | Static Information | | | | | | | | | |
|--|-----------------------|------------------------------------|------|--------------------|--------------------------------|------------------------|--------|----|----|----|----|-------------|----------|
| Parameter | Units | Min | Max | Avg | Patient Name: | James Bond | | | | | | | |
| Peak Pressure | cmH ₂ O | 15.9 | 18.1 | 17.0 | Gender: | Male Age: 35yr | | | | | | | |
| Plateau Pressure | cmH ₂ O | 14.9 | 17.1 | 16.0 | Weight: | 70kg Height: 180cm | | | | | | | |
| PEEP Pressure | cmH ₂ O | 5.2 | 6.6 | 5.9 | System Location: | Ooru | | | | | | | |
| Tidal Volume Delivered | ml | 248 | 344 | 298.6 | Location Altitude: | 3000 ft | | | | | | | |
| Total Minute Volume | litres/min | 4.1 | 4.5 | 4.5 | Location Atmospheric Pressure: | 926 cmH ₂ O | | | | | | | |
| Mandatory Minute Volume | litres/min | 4.1 | 4.5 | 4.5 | Location Atmospheric Oxygen: | 19% | | | | | | | |
| Spontaneous Minute Volume | litres/min | 0 | 0 | 0.0 | | | | | | | | | |
| Mandatory BPM | bpm | 14 | 15 | 15.0 | Parameter Settings Used | | | | | | | | |
| Spontaneous BPM | bpm | 0 | 0 | 0.0 | Parameter | Units | Values | | | | | | |
| FIO ₂ | % | 26 | 26 | 26.0 | Ventilation Mode | mode | SIMV | | | | | | |
| Static ΔV/ΔP | ml/cmH ₂ O | 26 | 34 | 29.9 | Tidal Volume | ml | 300 | | | | | | |
| Dynamic ΔV/ΔP | ml/cmH ₂ O | 23 | 31 | 27.2 | Minute Volume | l/min | 6 | | | | | | |
| System Temperature | degC | 30 | 33 | 31.9 | Respiration Rate | bpm | 15 | | | | | | |
| Miscellaneous Information | | | | | | | | | | | | | |
| Information | Value | Parameter Settings Used | | | | | | | | | | | |
| Number of Breaths | 120 | | | | | | | | | | | | |
| Number of Mandatory Breaths | 120 | | | | | | | | | | | | |
| Number of Spontaneous Breaths | 0 | | | | | | | | | | | | |
| Number of Maintenance Breaths | 0 | | | | | | | | | | | | |
| Number of CMV Spontaneous Breaths | 0 | | | | | | | | | | | | |
| Number of PSV Backup Breaths | 0 | | | | | | | | | | | | |
| Number of Missing Breath Times (Packet loss) | 0 | | | | | | | | | | | | |
| Number of Missing Breath Waveforms (Packet loss) | 1 | | | | | | | | | | | | |
| Number of WiFi Disconnects | 0 | Sequence of Parameter Combinations | | | | | | | | | | | |
| Number of Notifications | 0 | Parameter Combination | | | | | | | | | | | |
| Number of Warnings | 1 | Starting From | | | | | | | | | | | |
| Number of Errors | 0 | SIMV | 300 | 15 | 1:2 | 6 | 50 | 10 | 25 | 26 | 73 | 28-Dec-2025 | 13:17:40 |

Multi-system Monitoring For Nurses Station



A summary state of all systems can be displayed on one screen. Each system is shown as a tile.



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