TekMedika

INSPIRE - 100

An Emergency Ventilator

TekMedika Pvt. Ltd.

(12) **United States Patent**
Nanda et al.

(10) **Patent No.: US 12,465,716 B2**
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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 (cmH2O)	4 - 15
FiO2 (System Managed)	External

Pressure Support Parameter	Range
Support Pressure (cmH2O)	5 - 20
Flow Trigger Termination (%)	10 - 60

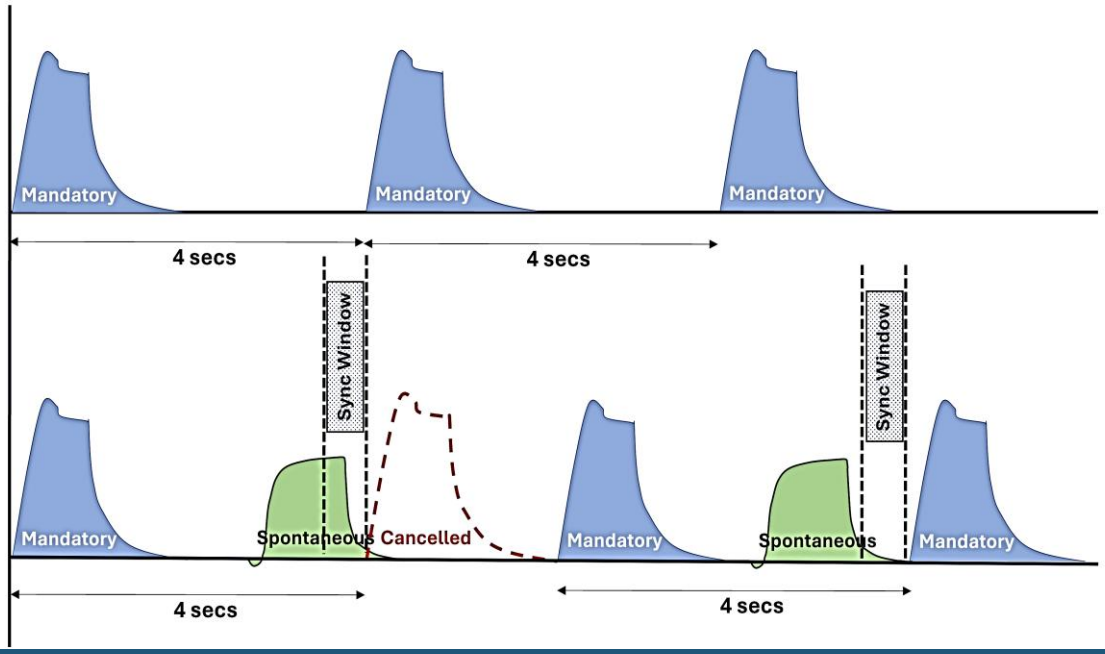
Full Set of ALARMS	
Max Pressure	Pressure Leak
Pressure Loss	Airway Blockage
Cough / Hiccups	System Temperature
Inconsistent Parameters	Extreme Parameters
Replace BVM	BVM Size
and many more ...	

Power Consumption 120W

Breath Synchronization for Patient Comfort

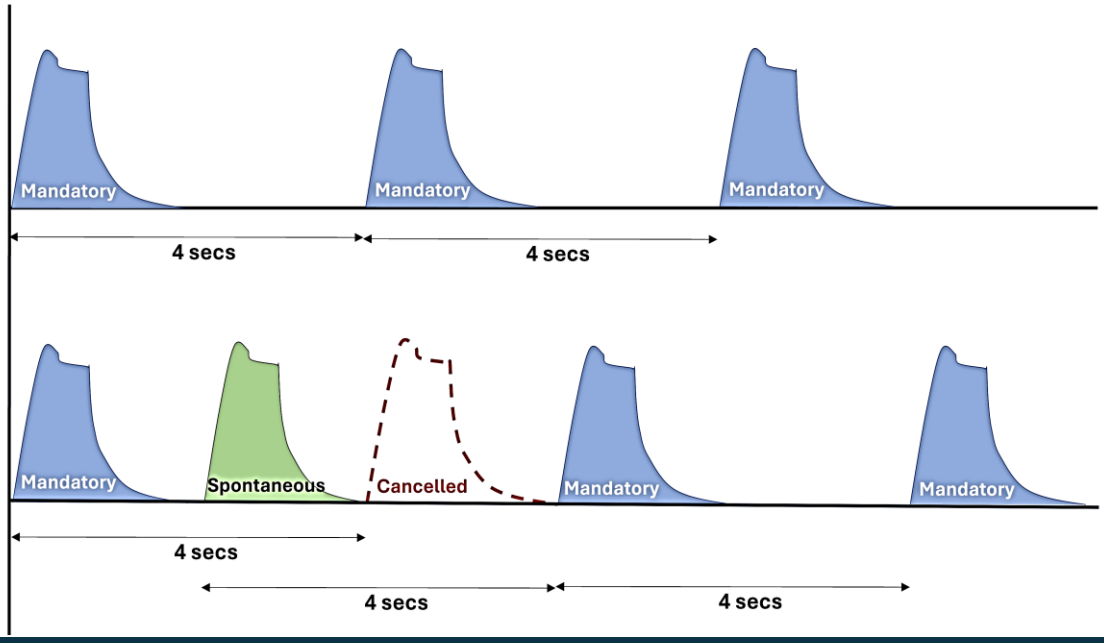
Breath Synchronization in SIMV Mode

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



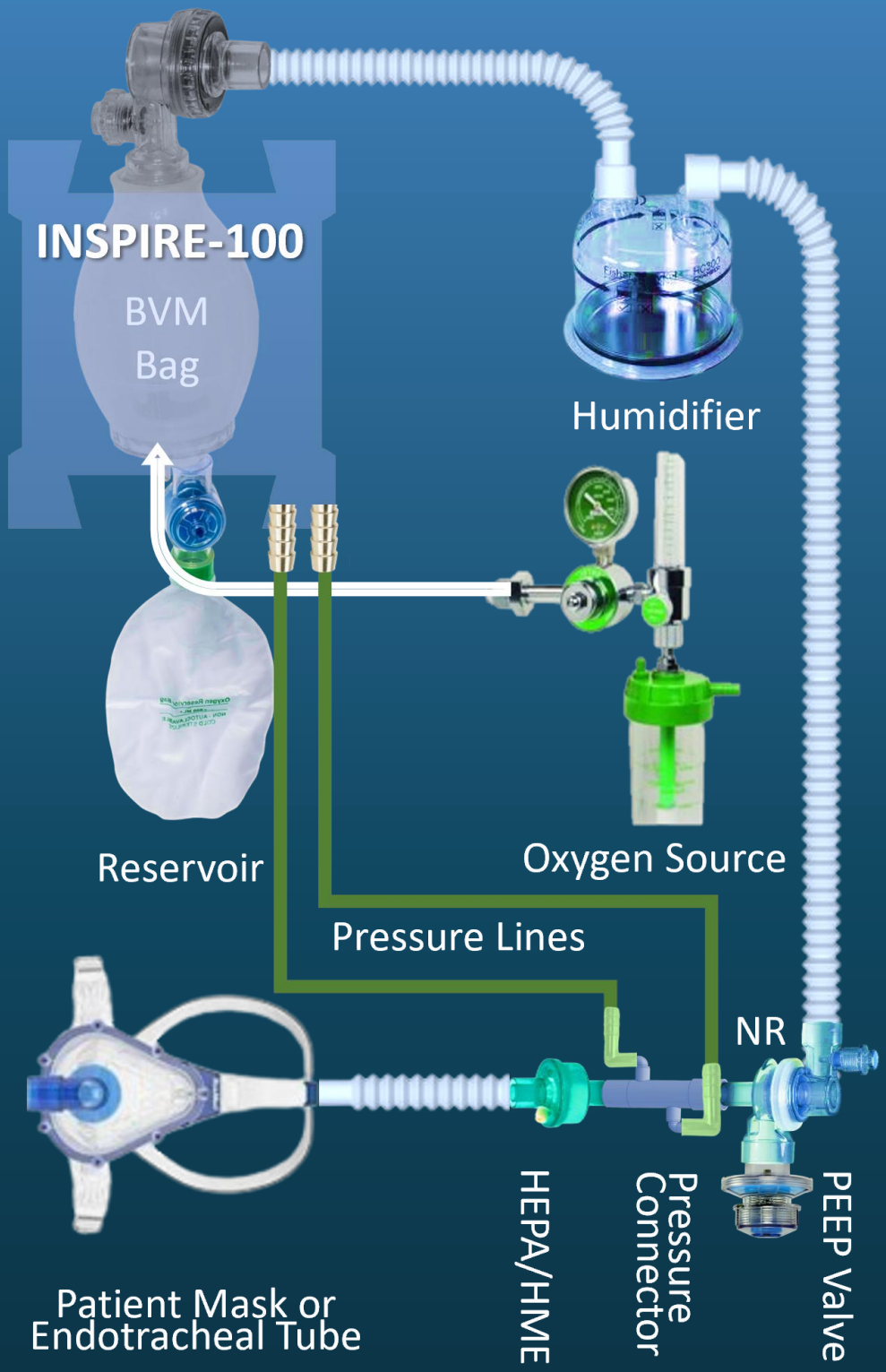
Breath Synchronization in ACV Mode

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

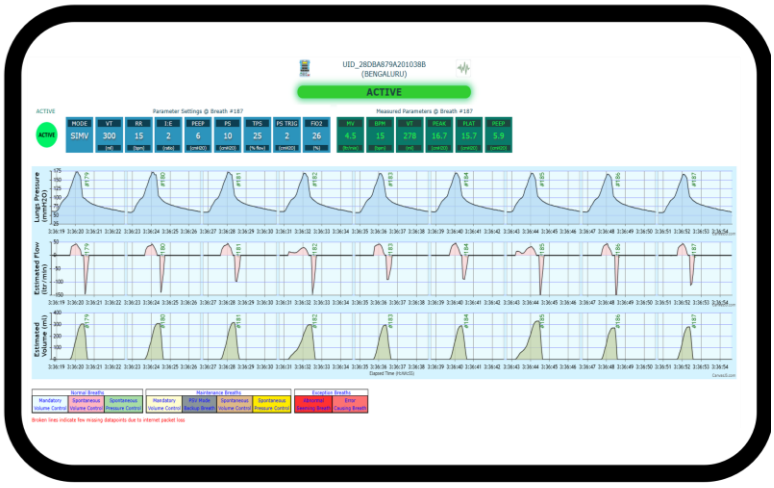


Breathing Circuit

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

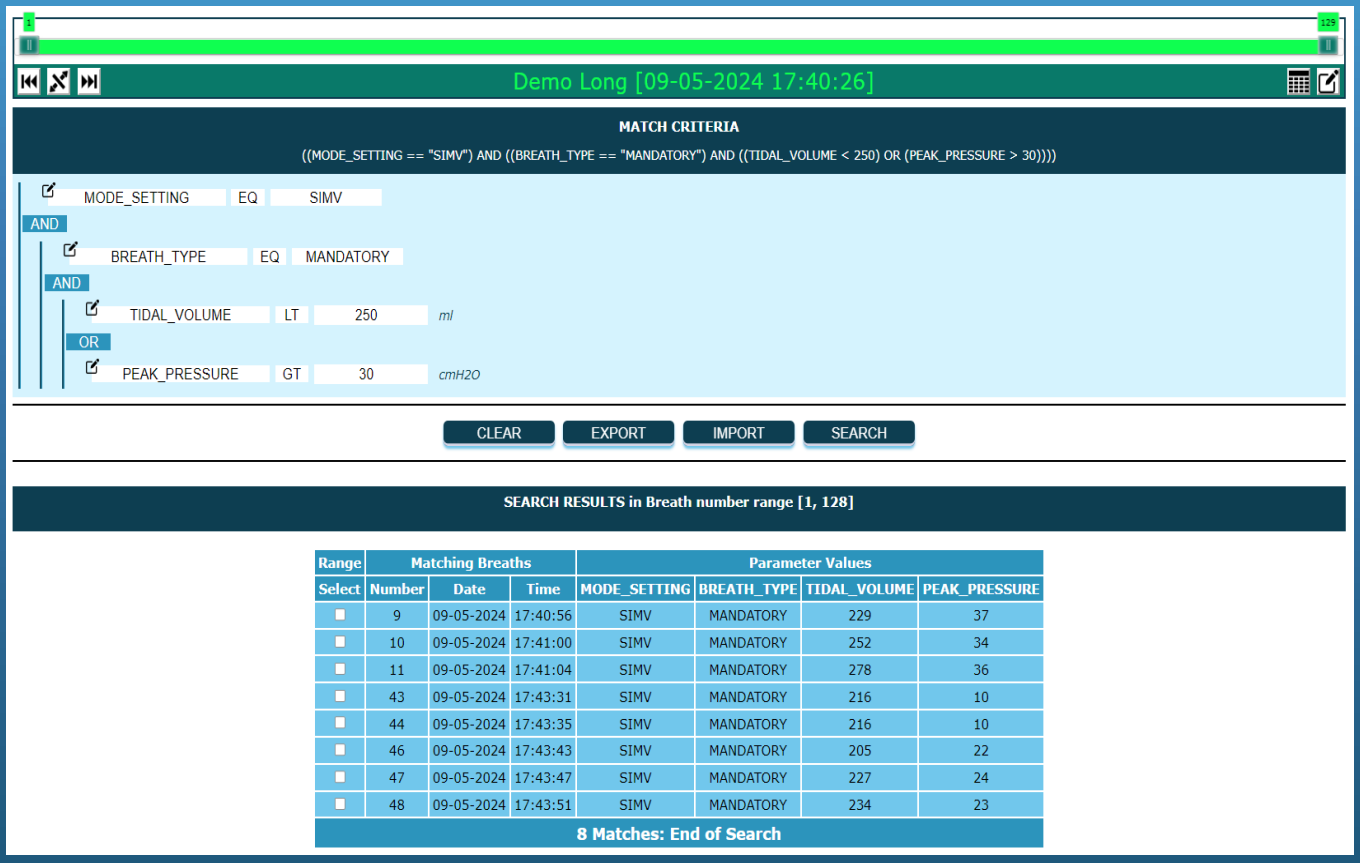


Remote Monitoring



- 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



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

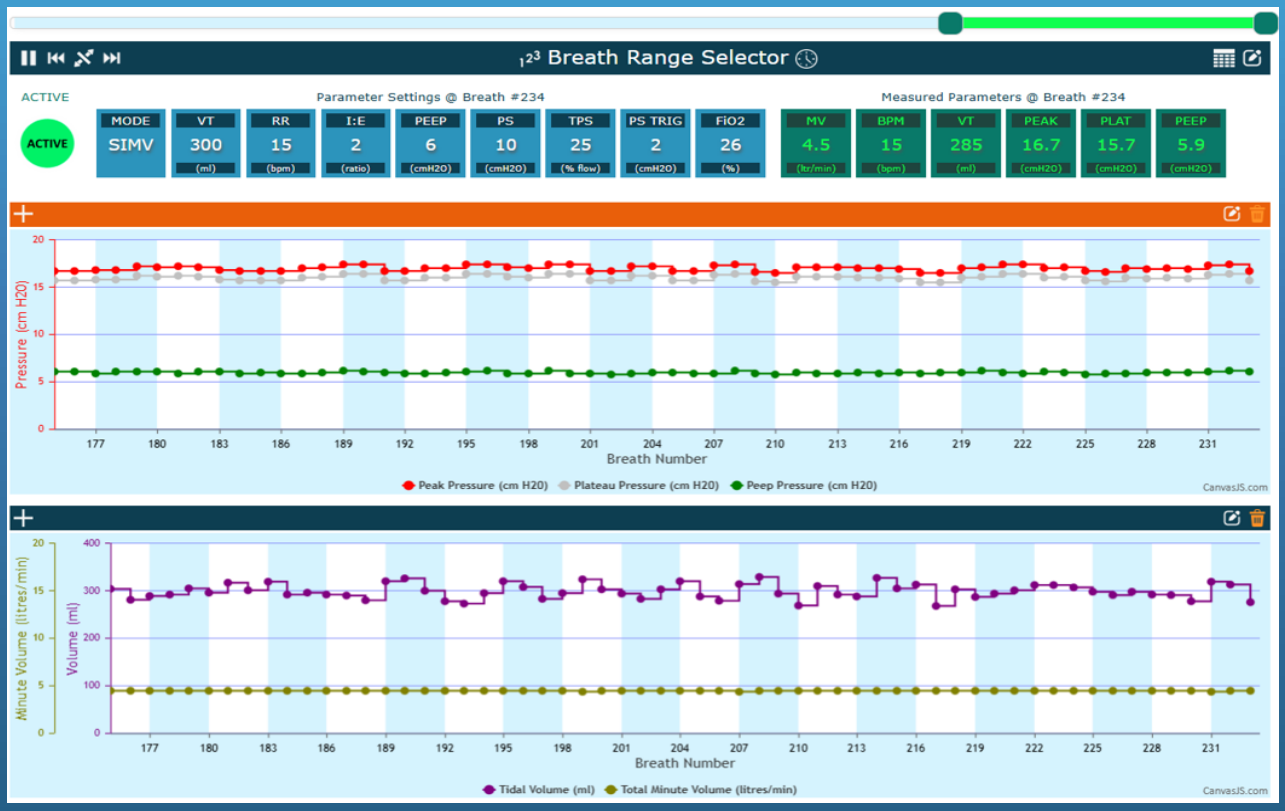
8 Matches: End of Search

Range Selector to Navigate Any View Back and Forth in Time

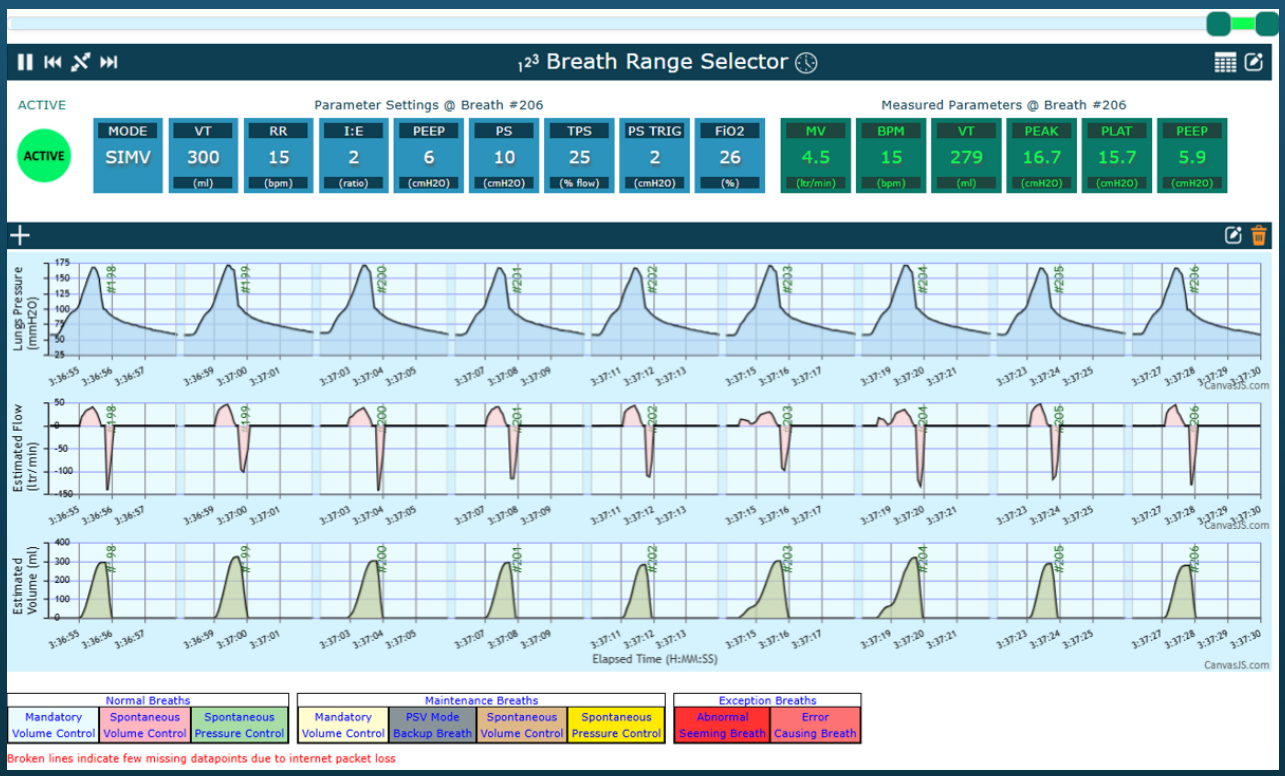
Selected Breath Range

	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		

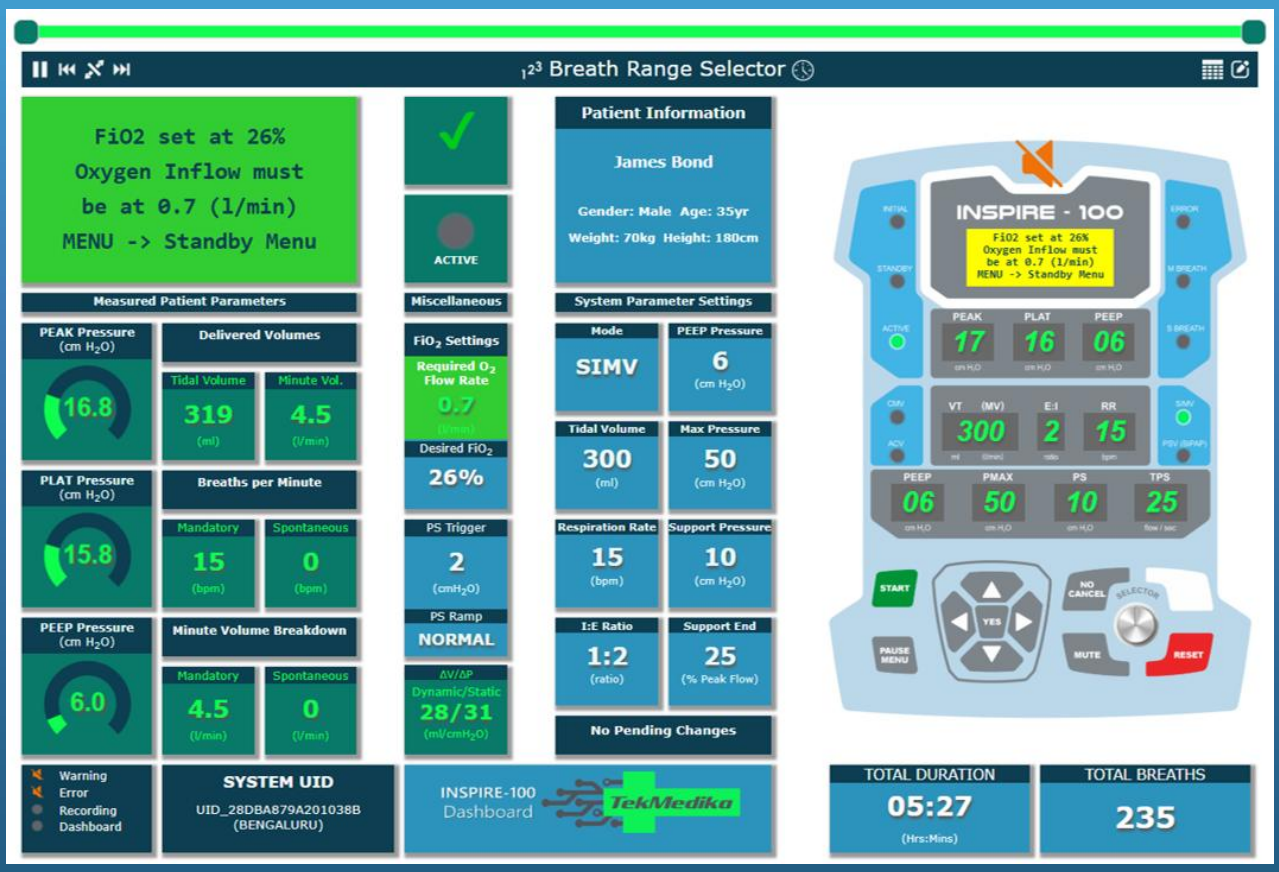
Charts for All Parameters



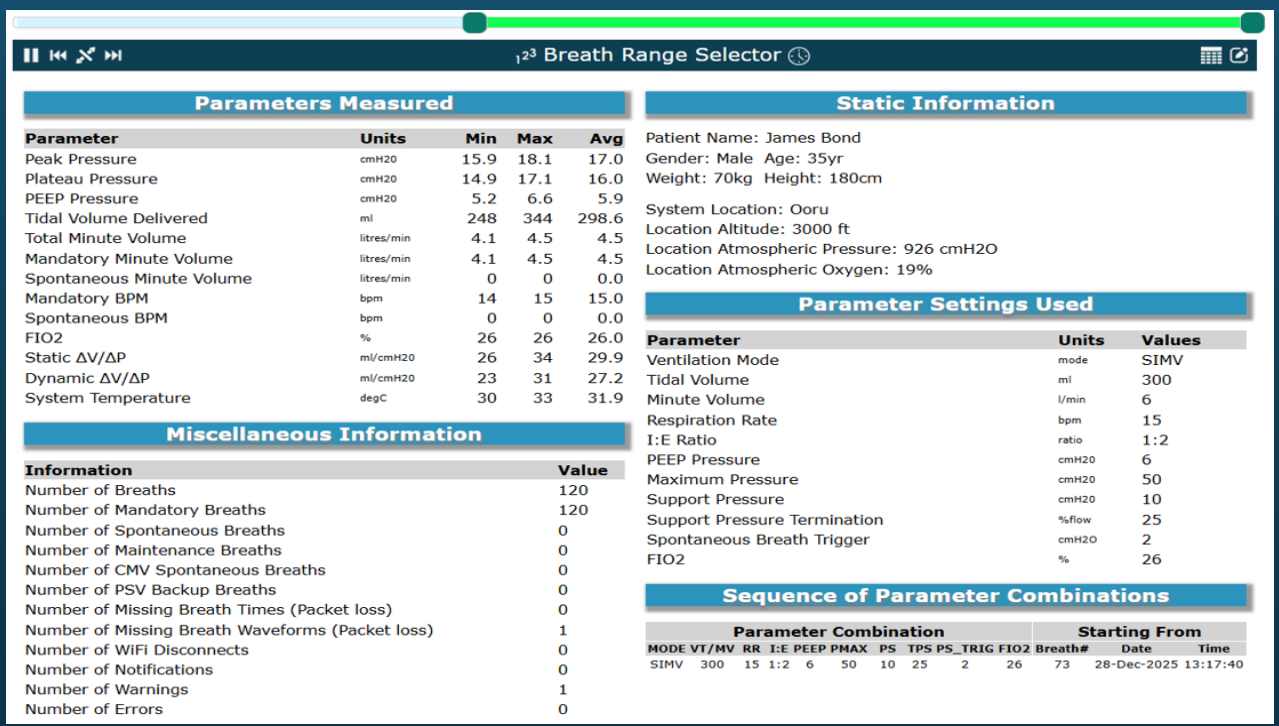
Pressure & Flow Waveforms



Snapshots for each Breath



Detailed Statistics



Breath Range Selector

Parameters Measured

Parameter	Units	Min	Max	Avg
Peak Pressure	cmH20	15.9	18.1	17.0
Plateau Pressure	cmH20	14.9	17.1	16.0
PEEP Pressure	cmH20	5.2	6.6	5.9
Tidal Volume Delivered	ml	248	344	298.6
Total Minute Volume	litres/min	4.1	4.5	4.5
Mandatory Minute Volume	litres/min	4.1	4.5	4.5
Spontaneous Minute Volume	litres/min	0	0	0.0
Mandatory BPM	bpm	14	15	15.0
Spontaneous BPM	bpm	0	0	0.0
FIO2	%	26	26	26.0
Static ΔV/ΔP	ml/cmH20	26	34	29.9
Dynamic ΔV/ΔP	ml/cmH20	23	31	27.2
System Temperature	degC	30	33	31.9

Miscellaneous Information

Information	Value
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
Number of Notifications	0
Number of Warnings	1
Number of Errors	0

Static Information

Patient Name: James Bond
Gender: Male Age: 35yr
Weight: 70kg Height: 180cm

System Location: Ooru
Location Altitude: 3000 ft
Location Atmospheric Pressure: 926 cmH2O
Location Atmospheric Oxygen: 19%

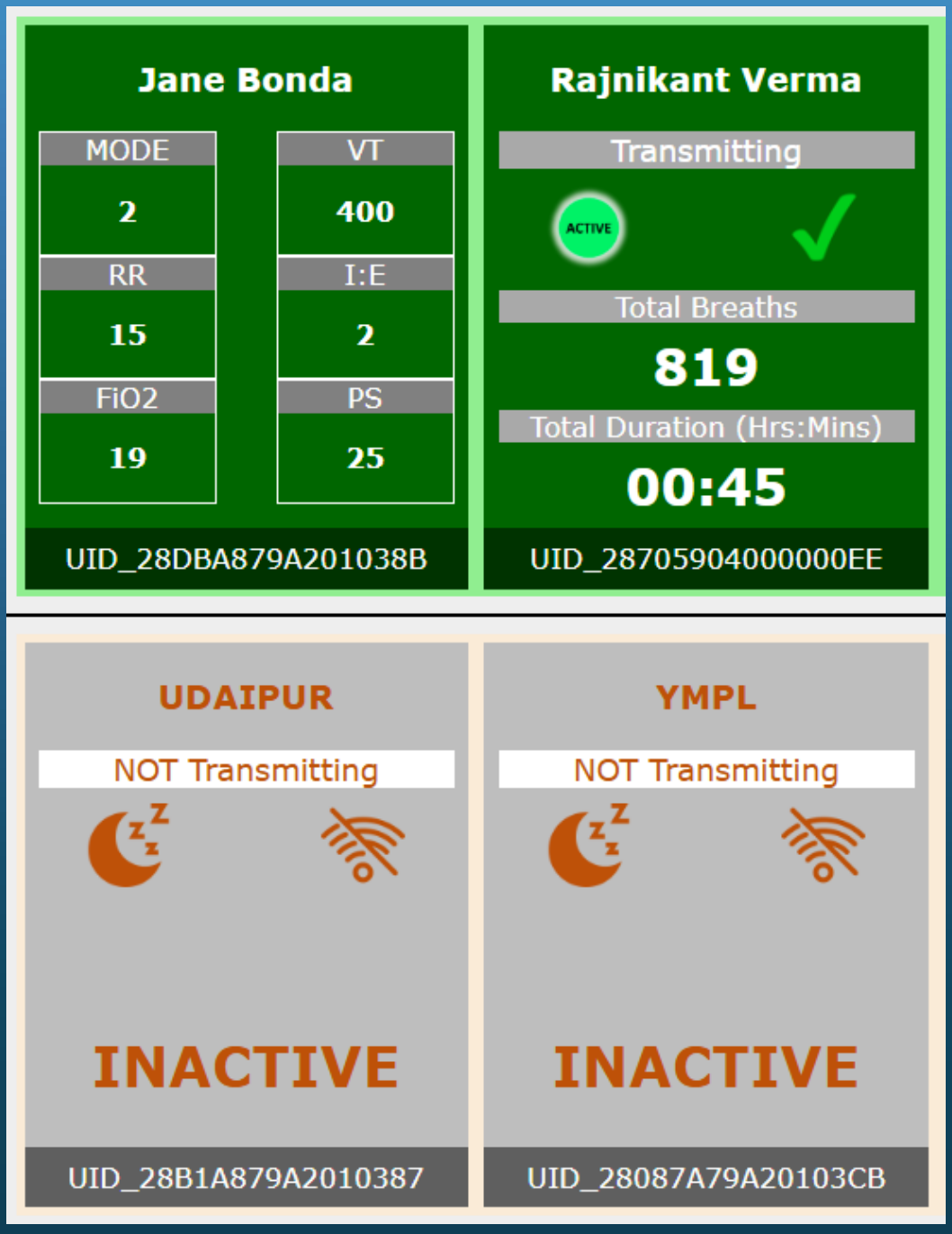
Parameter Settings Used

Parameter	Units	Values
Ventilation Mode	mode	SIMV
Tidal Volume	ml	300
Minute Volume	l/min	6
Respiration Rate	bpm	15
I:E Ratio	ratio	1:2
PEEP Pressure	cmH20	6
Maximum Pressure	cmH20	50
Support Pressure	cmH20	10
Support Pressure Termination	%flow	25
Spontaneous Breath Trigger	cmH2O	2
FIO2	%	26

Sequence of Parameter Combinations

Parameter Combination										Starting From		
MODE	VT/MV	RR	I:E	PEEP	PMAX	PS	TPS	PS_TRIG	FIO2	Breath#	Date	Time
SIMV	300	15	1:2	6	50	10	25	2	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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