

## LYRA x2 Top notch performance of Non-Invasive and Invasive Ventilation

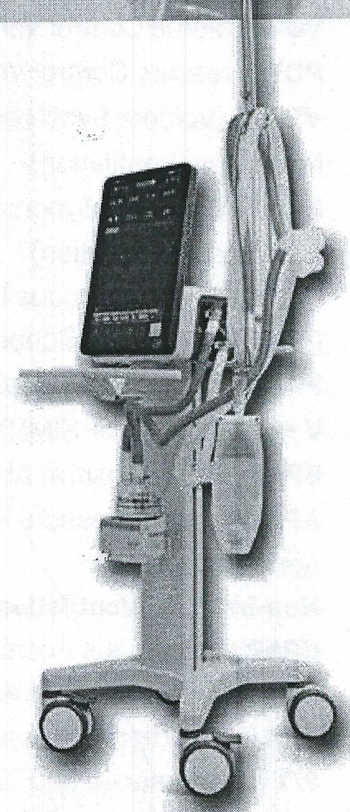
LYRA x2 is a premium non-invasive turbine driven ventilator with no compromise on the performance in invasive ventilation.

User can easily switch between NIV- and IV-modes by UI operation only.

Comprehensive parameter monitoring describes the full scenario of patient's status to the care giver.

In a busy ICU it is imperative to give the desired mechanical ventilation to the patient.

An 18.5 inch vertical layout touchscreen display makes operating of the ventilator smooth & easy.



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# LYRA x2

## Technical Specifications

### Physical Specification

Dimensions: 327 mm x 310 mm x 493 mm

(L x W x H): 664 mm x 600 mm x 1520 mm  
(with trolley)

Weight: Approximately 12.0 kg, Approximately  
33.0 kg (with trolley)

### Screen

Display Size: 18.3 Color active matrix TFT touch

Display Resolution (H) x (V): 1080 x 1980 pixels

Brightness: Adjustable

### Ventilation Specifications

Patient Type: Adult, Pediatric, Neonate

#### Invasive Ventilation Modes:

**VCV** (Volume Control Ventilation)

**PCV** (Pressure Control Ventilation)

**VSIMV** (Volume Synchronized Intermittent  
Mandatory Ventilation)

**PSIMV** (Pressure Synchronized Intermittent  
Mandatory Ventilation)

**CPAP/PSV** (Continuous Positive Airway  
Pressure/Pressure Support Ventilation)

**PRVC** (Pressure Regulated Volume Control)

**V + SIMV** (PRVC + SIMV)

**BPAP** (Bilevel Positive Airway Pressure)

**APRV** (Airway Pressure Release Ventilation)  
Apnea Ventilation

#### Non-invasive Ventilation Modes:

**CPAP** (Continuous Positive Airway Pressure)

**PCV** (Pressure Control Ventilator)

**PPS** (Proportional Pressure Support)

**S/T** (Spontaneous and Timed)

**VS** (Volume Support)

#### Controlled Parameters

O<sub>2</sub> %: 21-100% (increments of 1%)

VT (Tidal Volume): Adult: 100-2000 mL  
(increments of 10 mL) / Pediatric: 20-300 mL /  
Neonate: 2-300 mL (increments of 1 mL)

f (Ventilation frequency): 1-80 bpm /  
Neonate: 1-150 bpm (increments of 1 bpm)

fSIMV (Ventilation frequency in SIMV mode):  
1-80 bpm / Neonate: 1-150 bpm (increments  
of 1 bpm)

I:E range: 4:1-1:10 (increments of 0.5)

T<sub>insp</sub> (Inspiratory time): 0.20-10 s (increments  
of 0.05 s)

T<sub>slope</sub> (Time of Pressure Rising): Thigh 0-2.00  
s (increments of 0.05 s)

T<sub>low</sub>: 0.2-30 s (increments of 0.1 s)

T<sub>pause</sub>: 0.2-30 s (increments of 0.1 s)

ΔP<sub>insp</sub>: 5%-60 cm H<sub>2</sub>O (increments of 1 cm  
H<sub>2</sub>O), Off

ΔP<sub>supp</sub>: 0-60 cm H<sub>2</sub>O (increments of 1 cm  
H<sub>2</sub>O)

Phigh: 0-60 cm H<sub>2</sub>O (increments of 1 cm H<sub>2</sub>O)

Plow: 0-45 cm H<sub>2</sub>O (increments of 1 cm H<sub>2</sub>O)

PEEP: 1-45 cm H<sub>2</sub>O  
(increments of 1 cm H<sub>2</sub>O), Off

Flow trigger: 0.5-15 L/min  
(increments of 0.1 L/min)

Pressure trigger: -10 to -0.5 cm H<sub>2</sub>O  
(increments of 0.5 cm H<sub>2</sub>O)

Exp% (Expiration termination level): 10-85%  
(increments of 5%), Auto

CPAP: 4-25 cm H<sub>2</sub>O (increments of 1 cm H<sub>2</sub>O)

EPAP: 4-25 cm H<sub>2</sub>O (increments of 1 cm H<sub>2</sub>O)

IPAP: 4-20 cm H<sub>2</sub>O (increments of 1 cm H<sub>2</sub>O)

Rise time: 1-5 (increments of 1)

Ramp time: 0-45 min (increments of 5 min), Off

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Min P (VS minimum IPAP): 5-30 cm H<sub>2</sub>O  
 (increments of 1 cm H<sub>2</sub>O)  
 Max P (VS maximum IPAP): 6-40 cm H<sub>2</sub>O  
 (increments of 1 cm H<sub>2</sub>O)  
 Max P (PPV maximum pressure limit):  
 5-40 cm H<sub>2</sub>O (increments of 1 cm H<sub>2</sub>O)  
 Max V (PPV maximum volume limit):  
 200-3500 mL (increments of 5 ml)  
 Max E: 0-100 cm H<sub>2</sub>O/L  
 (increments of 1 cm H<sub>2</sub>O/L)  
 Max R: 0-50 cm H<sub>2</sub>O/L  
 (increments of 1 cm H<sub>2</sub>O/L)  
 PPV%: 0%-100% (increments of 1%)

**Apnea Ventilation**

Vtvapnea: Adult: 100-2000 mL  
 (increments of 10 mL) / Pediatric: 20-300 mL /  
 Neonate: 2-300 mL (increments of 1 mL)  
 ΔPapnea: 5-60 cm H<sub>2</sub>O  
 (increments of 1 cm H<sub>2</sub>O)  
 Fapnea: 1-80 bpm (increments of 1 bpm)  
 Apnea Tinsp: 0.20-10 s (increments of 0.05 s)

**Sigh**

Sigh Switch: On, Off  
 Interval: 20 s-180 min (increments of 1 s  
 from 20 to 59 s, increments of 1 min from  
 1 to 180 min)  
 Cycles Sigh: 1-20 (increments of 1)  
 Δint.PEEP: 1-45 cm H<sub>2</sub>O  
 (increments of 1 cm H<sub>2</sub>O), Off

**Synchronized Tube Resistance Compliance**

Tube Type: ET Tube, Trach Tube, Disable STRC  
 Tube I.D.: Adult: 5.0-12.0 mm (increments of  
 0.5 mm) / Pediatric: 2.5-8.0 mm (increments of  
 0.5 mm)  
 Compensate: 0-100% (increments of 1%)  
 Expiration Compliance Switch: On, Off

**Monitored parameters**

Numeric:

Paw	Oxygen concentration	WOB
Ppeak	VTe spn	RSBI
Pplat	VTe/IBW	NIF
Pmean	f	PO.1
PEEP	ftotal	PEEPi
Insp Flow	fmand	PIP
Exp Flow	fspn	EPAP
MV	Re	Pt.Trig
MV leak	Ri	Pt.leak
MV spn	Cdyn	Tot.leak
Vte	Cstat	Continuous Flow (O <sub>2</sub> Therapy)
VTi	Rcexp	

Real time Graphics:

Pressure-time waveforms: Paw-Volume Loop  
 Flow-time waveforms: Flow-time Loop  
 Volume-time waveforms: Paw-Flow Loop



# LYRA x2

## Technical Specifications

### Control Accuracy

O<sub>2</sub> %:  $\pm(3 \text{ vol. \%} + 1\% \text{ of setting})$   
TV:  $\pm(10 \text{ mL} + 10\% \text{ of setting})$  (BTPS)  
T<sub>insp</sub>:  $\pm 0.1 \text{ s}$  or  $\pm 10\%$  of setting,  
whichever is greater  
I: E: 2:1 to 1:4:  $\pm 10\%$  of setting, other range:  
 $\pm 15\%$  of setting  
f:  $\pm 1 \text{ bpm}$   
fSIMV:  $\pm 1 \text{ bpm}$   
T<sub>slope</sub>:  $\pm(0.2 \text{ s} + 20\% \text{ of setting})$   
PEEP:  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
 $\Delta P_{\text{insp}}$ :  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
 $\Delta P_{\text{supp}}$ :  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
P<sub>high</sub>:  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
P<sub>low</sub>:  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
T<sub>high</sub>:  $\pm 0.2 \text{ s}$  or  $\pm 10\%$  of setting,  
whichever is greater  
T<sub>low</sub>:  $\pm 0.2 \text{ s}$  or  $\pm 10\%$  of setting,  
whichever is greater  
Pressure Trigger:  $\pm(1.0 \text{ cm H}_2\text{O} + 10\% \text{ of setting})$   
Flow Trigger:  $\pm(1.0 \text{ L/min} + 10\% \text{ of setting})$   
 $\Delta \text{int. PEEP}$ :  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
Exp%:  $\pm 10\%$   
CPAP:  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
EPAP:  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
IPAP:  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
Rise time: -  
Ramp time:  $\pm 1 \text{ s}$   
Min P (VS minimum IPAP):  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
Max P (VS maximum IPAP):  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
Max P (PPV maximum pressure limit):  
 $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$

Max V (PPV maximum volume limit):  $\pm 15\%$  of setting  
Max E: -  
Max R: -  
Fapnea:  $\pm 1 \text{ bpm}$   
 $\Delta P_{\text{apnea}}$ :  $\pm(2.0 \text{ cm H}_2\text{O} + 5\% \text{ of setting})$   
T<sub>vapnea</sub>:  $\pm(10 \text{ mL} + 10\% \text{ of setting})$  (BTPS)  
Apnea T<sub>insp</sub>:  $\pm 0.1 \text{ s}$  or  $\pm 10\%$  of setting,  
whichever is greater

### Monitoring Accuracy

Airway pressure (P<sub>peak</sub>, P<sub>plat</sub>, P<sub>mean</sub>, PEEP, PAP, EPAP):  $\pm(2 \text{ cm H}_2\text{O} + 4\% \text{ of the actual reading})$   
Tidal Volume (T<sub>vi</sub>, T<sub>ve</sub>, T<sub>ve/IBW</sub>, T<sub>ve spn</sub>):  
0 ml - 100 ml:  $\pm(10 \text{ ml} + 3\% \text{ of the actual reading})$  (BTPS) / 100 ml - 4000 ml:  
 $\pm(3 \text{ ml} + 10\% \text{ of the actual reading})$  (BTPS)  
Minute Volume (MV, MV<sub>spn</sub>, MV<sub>leak</sub>):  $\pm 0.3 \text{ L/min}$   
or  $\pm 8\%$  of the actual reading, whichever is greater (BTPS)  
Frequency (f<sub>total</sub>, f<sub>mand</sub>, f<sub>spn</sub>):  $\pm 5\%$  of reading  
or  $\pm 1 \text{ bpm}$ , whichever is greater  
Inspired Oxygen (FiO<sub>2</sub>):  $\pm(2.5 \text{ vol. \%} + 2.5\% \text{ of the actual reading})$   
Resistance: 0 to 50:  $\pm 10 \text{ cm H}_2\text{O/L/s}$  Other range: 50% of the actual reading  
Compliance: 25% of the actual reading or  $\pm 10 \text{ ml/cm H}_2\text{O}$ , whichever is greater  
RSBI: 0 to 999 1/(min\*L):  $\pm(3 \text{ 1/(min*L)} + 15\% \text{ of the actual reading})$   
WOB: -  
NIF:  $\pm(2 \text{ cm H}_2\text{O} + 4\% \text{ of the actual reading})$   
P0.1:  $\pm(2 \text{ cm H}_2\text{O} + 4\% \text{ of the actual reading})$   
PEEPi: -  
Rcexp: -

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### Alarm settings

Tidal Volume: High / Low  
Minute Volume: High / Low  
Airway pressure: High / Low  
Frequency: High / Low  
Inspired Oxygen (FiO2): High / Low  
etCO2: High / Low  
Apnea alarm time: 5-60 s

### Trend

Type: Tabular, Graphic  
Length: 72 hours  
Content: Monitor Parameters,  
Setting Parameters (Setting Ventilation mode  
and Parameters)

### O<sub>2</sub> Therapy

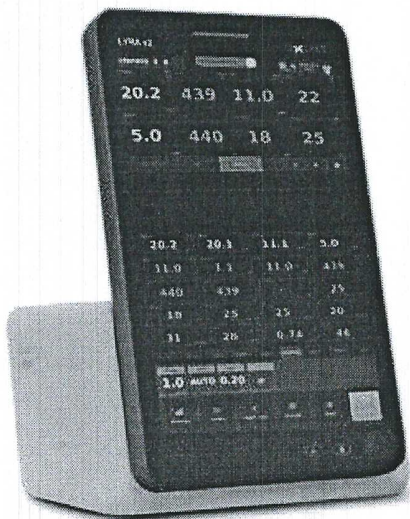
Controlled Parameters  
O<sub>2</sub> %: 21-100% (increments of 1%)  
Flow: 4-60 L/min  
Controlled Accuracy  
O<sub>2</sub> %:  $\pm(3 \text{ vol.} \% + 1\% \text{ of setting})$   
Flow:  $\pm(2 \text{ L/min} + 10\% \text{ of setting})$  (BTPS)

### Environmental specifications

Temperature: 5-40°C (operating); -20 to 60 °C  
(storage and transport, O<sub>2</sub> sensor: -20 to 50 °C)  
Relative Humidity: 10-95% (operating); 10-95%  
(storage and transport)  
Barometric Pressure: 62-106 kPa (operating);  
50-106 kPa (storage and transport)

### Power Battery Backup

External AC power supply  
Input voltage: 100-240 V  
Input frequency: 50/60 Hz  
Input current: 2.5 A Max  
Fuse: T2.5 AH/250 V  
Internal battery  
Number of batteries: One or Two (Optional)  
Battery type: Build-in Lithium-ion battery,  
11.25 VDC, 6400 mAh  
Battery run time: 3 hours (Powered by one  
new fully-charged battery in standard working  
condition) / 6 hours (Powered by two new  
fully-charged battery in standard working  
condition)



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# LYRA x2

## Technical Specifications

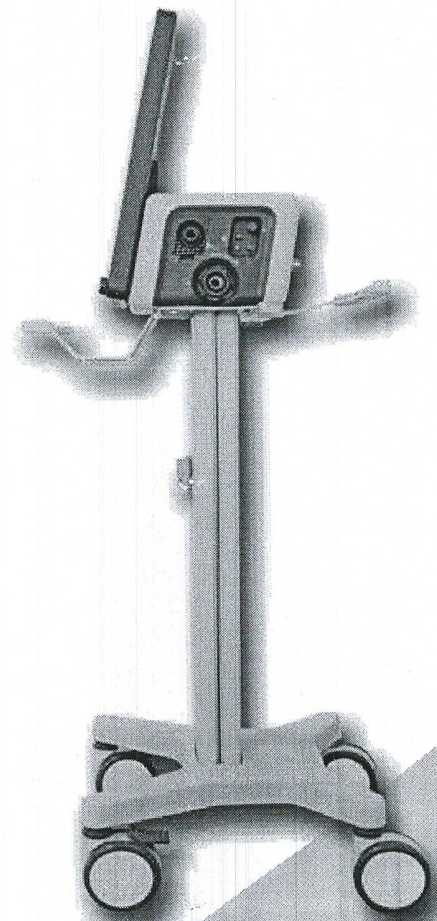
### Others

Communication interface: RS-232, Ethernet,  
USB port, CO2 analyzer connector

Gas supply: O<sub>2</sub>

(HPO) Oxygen connector: NIST (DISS optional)

Gas supply pressure: 280-600 kPa



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