



# LEONI 4

The premium class in neonatal ventilation.

# Groundbreaking technology in neonatology. For a safe start in life.

The LEONI 4 ventilator is a device for invasive and non-invasive ventilation in intensive care.

LEONI 4 can be used for the ventilation of premature infants, newborns, term infants and children with a body weight of up to 30 kg.



## Basic data LEONI 4

Classification in accordance with Regulation (EU) 2017/745	Class IIb	<b>Ambient conditions during operation</b>	
IP classification	IPX1	Temperature	-10 – 45°C
CE	0197	Air pressure	600 – 1060hPa
Dimensions (WxHxD)	40 cm x 50 cm x 40 cm (incl. display)	Relative humidity	10% – 90%, non-condensing
Weight	17.2 kg with one permanently installed battery, each additional battery (up to two additional batteries) 0.65 kg*	<b>Ports</b>	
<b>Display</b>		Serial port	2 x RS232
Display	15.6" capacitive color touch display	Ethernet	2 x RJ45
Display resolution	Full HD 1920 x 1080 px Display is removable and can be attached to round tube or standard side rail with optional holder*	Universal Serial Bus	3 x USB
<b>Electrical data</b>		Digital Multimedia Interface	1x HDMI
Power supply	100 – 240 VAC, 50/60 Hz	Sensor interfaces	4 (Flow, etCO <sub>2</sub> , SpO <sub>2</sub> , NN)
Mains-independent operation - internal battery - with two additional batteries*	2h conventional, 1h HFOV 6h conventional, 3h HFOV	<b>High frequency oscillation ventilation</b>	
Power consumption - in standby - Max.	31 W 250 W	Principle	Integrated double membranes with positive and negative amplitudes
Protection class	1 according to DIN EN 60601-1	Setting range - Oscillation - Medium pressure - Frequency	5 – 100mbar 0 – 40mbar 5 – 20Hz
<b>Gas connections</b>		Ratio range	1:1 to 1:3
Compressed air	2.0 – 6.5 bar; medical compressed air	Recruitment function	yes
Oxygen	2.0 – 6.5 bar; medical oxygen; concentration 93% – 100%	<b>Gas mixer</b>	
O <sub>2</sub> sensor	Fuel cell; paramagnetic*	Flow principle	Constant flow, VIVE (variable inspiratory and variable expiratory flow)
		Gas mixture	Proportional valve mixer
		Inspiratory O <sub>2</sub> concentration	21% – 100%
		Oxygen shower	22% – 100%; adjustable from 30 – 120 sec.

\*paid option

## Ventilation modes, monitoring, parameters

### Invasive ventilation modes

Systematic code according to DIN ISO 19223

IPPV / IMV (CMV-PC)	Intermittent Positive Pressure Ventilation
IMV (IMV-PC)	Intermittent Mandatory Ventilation
IPPV / IMV + VT Limit	Intermittent Positive Pressure Ventilation / Intermittent Mandatory Ventilation with tidal volume limitation
S-IPPV (SIMV-PC)	Synchronized Intermittent Positive Pressure Ventilation
S-IPPV + VT limit	Synchronized Intermittent Positive Pressure Ventilation with tidal volume limitation
S-IPPV + VTG	Synchronized Intermittent Positive Pressure Ventilation with tidal volume guarantee
S-IPPV + VT limit / VTG	Synchronized Intermittent Positive Pressure Ventilation with tidal volume limitation / tidal volume guarantee
SIMV (SIMV-PC/ES)	Synchronized Intermittent Mandatory Ventilation
SIMV + Psupport	Synchronized Intermittent Mandatory Ventilation with Pressure Support
SIMV + VT limit	Synchronized Intermittent Mandatory Ventilation with tidal volume limitation
SIMV + VTG	Synchronized Intermittent Mandatory Ventilation with tidal volume guarantee
SIMV + Psupport + VTG / VT Limit	Psupport + VTG / VT Limit are freely configurable
PSV - SIMV (SIMV-PC/PS/ES)	Pressure Support Ventilation (PSV) in connection with SIMV
PSV- SIPPV (SIMV-PC/PS)	Pressure Support Ventilation (PSV) in connection with SIPPV
PSV-SIMV + Psupport + VT limit / VTG	Psupport + VTG / VT Limit are freely configurable
PSV-SIPPV + VT limit / VTG	VTG / VT Limit are freely configurable
CPAP (CPAP)	Continuous Positive Airway Pressure
HFO (HFOV)	High Frequency Oscillation can be combined with Tidal Volume Guarantee, I:E Ratio, Recruitment Maneuver

### Non-invasive ventilation modes

Systematic code according to DIN ISO 19223

nCPAP (CPAP)	Nasal Continuous Positive Airway Pressure
S-nCPAP* (CPAP)	Synchronized Nasal Continuous Positive Airway Pressure (with abdominal sensor)
nIPPV (CMV-PC)	Nasal Intermittent Positive Pressure Ventilation
S-nIPPV* (SIMV-PC)	Synchronized Nasal Intermittent Positive Pressure Ventilation (with abdominal sensor)
nHFO (HFOV)	Nasal High Frequency Oscillation
HiFlow LM*	HFOT High Flow Oxygen Therapy

\*paid option

All invasive and non-invasive ventilation modes can be combined with the optional pulse oximetry-controlled ventilation CLAC (Closed Loop Automatic Oxygen Control).

### Parameters

Inspiratory Peak pressure	4 – 60 mbar
PEEP / CPAP	0 – 30 mbar
Frequency	2 - 200 1/min
Inspiration time	0.1 – 2 sec.
Expiration time	0.2 – 30 sec.
Inspiratory flow	2 – 32 l/min
Expiration flow	2 – 10 l/min
HiFlow	2 – 60 l/min

### Monitoring

Ventilation charts	Pressure, flow, volume, etCO <sub>2</sub> *, Abdomen*, plethysmogram (optional with CLAC),
Ventilation loops	Flow/pressure, volume/pressure, flow/volume, etCO <sub>2</sub> /volume
Pulmonary function	Compliance, dynamic compliance, C20/C - stress index, resistance, DCO <sub>2</sub>
O <sub>2</sub> measurement	21% – 100%
Alarms	Plain text message in three large alarm windows incl. help text
Trend	Display of numerical values and curves Resolution 2 sec.
Logbook function	40,000 events; transfer to USB medium possible
Screenshot function	10,000 images internal memory; Transfer to USB medium possible
CLAC	Closed loop automatic oxygen control*
etCO <sub>2</sub> measurement	Main stream measurement*
NIV trigger	Abdominal sensor*
Screen saver	Yes
Compact Display – Additional Display	Yes
Battery indicator	Yes, in mains operation State of charge in % in battery operation; remaining running time in minutes adapted to the mode
Body surface area calculation	Yes



## LEONI 4

Developed with over 30 years of expertise and experience in the ventilation of the most sensitive lungs and the tiniest people, LEONI 4 assures the technological safety that always has to be state-of-the-art in neonatology.

And it goes one step further towards the future: with an agile system that keeps operation intuitive, configuration need-based and training requirements to a minimum.

Together with Instant View Technology, enabling speedy detection of measurement deviations, LEONI 4 defines new standards in the safe ventilation of preterm babies.



CE 0197

Made in  
Germany

Löwenstein Medical  
Arzbacher Straße 80  
56130 Bad Ems, Germany  
T. +49 2603 9600-0  
F. +49 2603 9600-50  
info@loewensteinmedical.com  
loewensteinmedical.com



 With people in mind

