

Zisline T100 Ventilator



The Intensive Care Ventilator Zisline T100 is designed for controlled and assisted artificial ventilation of adults, children and neonates, including extremely low birth weight neonates from 500 g, who are dependent on mechanical ventilation.

Areas of application

- in anesthesiology, resuscitation and intensive care units, as well as during patient transport, in inpatient healthcare facilities, in field and mobile emergency hospitals;
- outside the medical organizations in providing emergency or urgent medical care;
- in a transport during medical evacuation by air ambulance;
- in a transport during medical evacuation by land, water and other ambulances.

Ventilation parameters

Tidal volume: 2–3000 ml
Rate of breathing: 1–150 bpm
Inspiration time: 0.2–15 s
Inspiratory pressure: 0–100 cmH₂O
Flow trigger: 0.1–20 lpm
Pressure trigger: 0.5–20 cmH₂O
Positive end-expiratory pressure: 0–50 cmH₂O

Trends

Saving and viewing of trends of the main monitoring parameters during 360 hours.

Weight:

6.5 kg with one battery.
7 kg with two batteries.

Universal bracket VESA

Wall bracket for carrying frame.
Fastening of the carrying frame to the wall or rail with a quick-lock mechanism.

Operation of the device is guaranteed from any sources of oxygen: low or high pressure O₂

Central O₂ pipeline, cylinders, oxygen concentrator.

Comfortable ergonomic carrying bag

10” touch screen LCD display

The protection class of the device is IP34, allowing to use T100 in the field.

Proximal flow sensor for neonates

Mainstream CO₂ sensor

Shockproof elastic bumpers

8 hours of battery life / hot swap battery

Power failure operation ensures a high level of patient safety. Rechargeable battery provides up to 8 hours of continuous ventilation. Battery replacement without interrupting ventilation (hot swap).

Ventilation modes

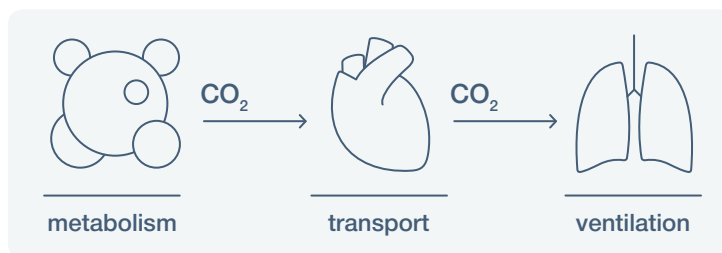
Mandatory ventilation: CMV VCV, CMV PCV, PCV VG.
Synchronized intermittent mandatory ventilation: SIMV VC, SIMV PC, SIMV DC.
Spontaneous breathing: CPAP, BiSTEP, APRV, NIV.
Adaptive ventilation: iSV.
Neonatal ventilation: nCPAP, nIMV.
High flow oxygen therapy: HF_O₂.

MIS / PDMS data transfer according to ISO 11073

SpO₂ sensor



Volumetric Capnometry



End-expiratory CO₂ partial pressure monitoring allows for the most physiological and safe ventilation of the patient.

Additional VCO₂ capabilities: allows assessment of alveolar ventilation; tracks changes in physiological dead space during artificial ventilation.

Intelligent Support Ventilation iSV Mode

The mode of intellectual adaptive ventilation provides the target volume of minute ventilation at any level of patient's spontaneous respiratory activity. iSV mode automatically adjusts the support pressure level in each respiratory cycle.

Advantages

- automatically adjusts the I:E ratio in real time in accordance with the respiratory mechanics of the patient;
- automatically calculates the static and dynamic limits of safe ventilation for V_T, RB and I:E, ensures strict compliance of ventilation parameters with specified limits.

The mode is optimal for rapidly changing respiratory needs of the patient, e.g. during weaning from the ventilator.

The adaptive ventilation mode does not exclude the participation of a doctor in the adjustment of the ventilation parameters, but significantly simplifies his work and minimizes the optimization time of the ventilation parameters.

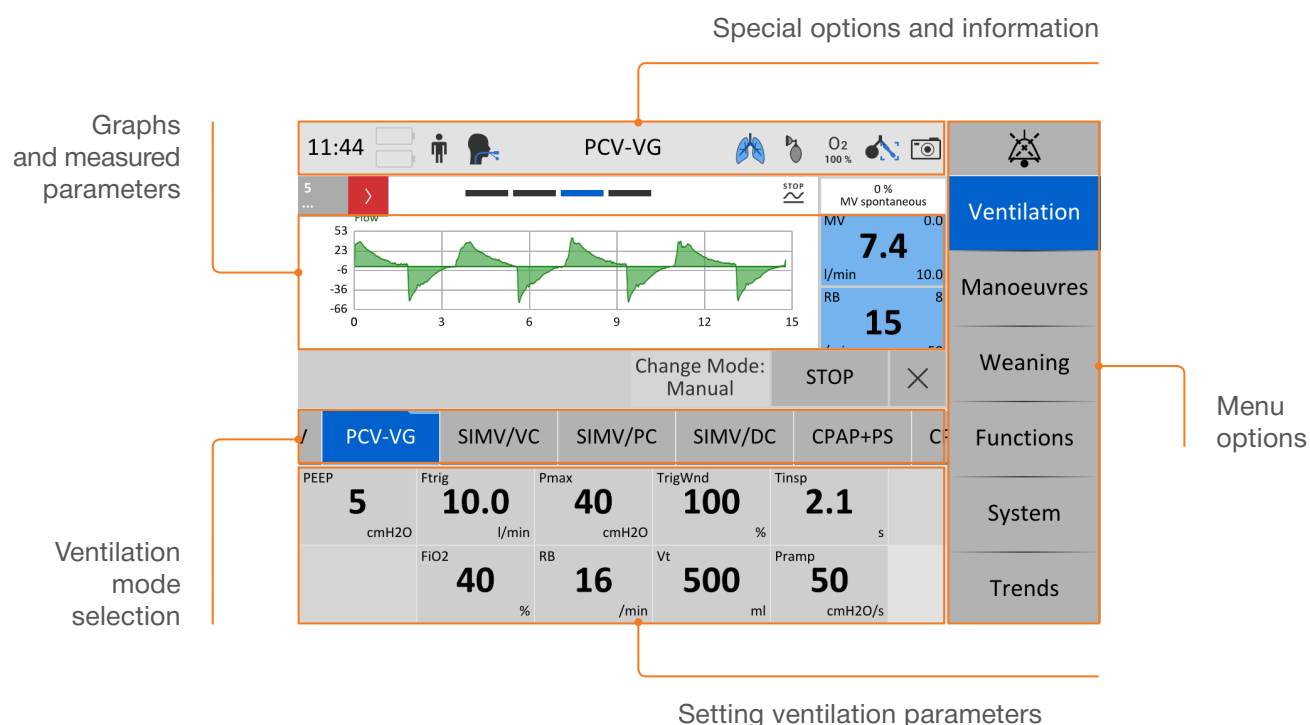
High Flow Oxygen Therapy

High flow oxygen therapy HF_O₂ mode is designed to ventilate spontaneously breathing patients using a nasal cannula. In this mode, the patient receives a continuous flow of heated and humidified gas mixture with a preset oxygen concentration.

Advanced Respiratory Monitoring and Weaning Functions

- Transpulmonary pressure.
- Stress index SI.
- RSBI.
- P_O.1.
- Up to 5 loops configurable.

User Interface Configurable and Easy to Use



Mainstream CO₂ Sensor

- Proprietary original capnometry technology.
- No calibration required by reference gases.
- Response time less 30 ms.
- Reusable autoclavable adapters.
- For all patient types.

This ensures stable continuous measurement of the concentration and partial pressure of carbon dioxide in breathing gas.



Proximal Flow Sensor

- For neonates only.
- Digital and precise.
- Small tidal volume from 1 ml.
- Reusable autoclavable or disposable.
- No sensor calibration required.

This allows to deliver extremely precise breathing gas volumes and to respond to any breathing attempts of the smallest patients.



Distal Flow Sensor

- Autoclavable.
- Integrated into exhalation valve.
- Easy to maintain and clean.



Technical Specification

Patient categories	Adults with a tidal volume of 200–3000 ml Children with a tidal volume of 20–400 ml Neonatal with a tidal volume of 2–200 ml (option with proximal flow sensor)			
Ventilator settings	Adults		Children	Neonatal
Ventilation modes	Volume-controlled ventilation modes			
	CMV VCV	+	+	+
	SIMV VC	+	+	+
	Pressure-controlled ventilation modes			
	CMV PCV	+	+	+
	BiSTEP	+	+	
	SIMV PC	+	+	+
	APRV	+	+	
	Spontaneous ventilation modes			
	CPAP+PS (PSV)	+	+	+
	CPAP+VS	+	+	+
	NIV	+	+	
	Hybrid ventilation modes			
	PCV VG	+	+	+
	SIMV DC	+	+	+
	Closed loop / adaptive modes			
	iSV	+	+	
Nasal applications (NC)	HF_O ₂	up to 80 lpm		up to 30 lpm
	nCPAP			+
	niMV			+
Ventilation rate (rate)	Adults	1–60 bpm		
	Children	1–120 bpm		
	Neonatal	5–150 bpm		
Inspiratory time (T _{insp})	Adults	0.2–15 s		
	Children / neonatal	0.2–3 s		
Tidal volume (V _T)	Adults with a tidal volume of 200–3000 ml Children with a tidal volume of 20–400 ml Neonatal with a tidal volume of 2–200 ml (option with proximal flow sensor)			
Inspiratory flow (Flow _{insp})	0–260 lpm			
PS Endflow (ETS)	5–80%			
Inspiratory pressure (P _{insp})	Adults: 0–100 cmH ₂ O Children / neonatal: 0–60 cmH ₂ O			
PEEP	OFF, 0.5–50 cmH ₂ O			
Pressure support (PS)	Adults: 0–80 cmH ₂ O Children / neonatal: 0–60 cmH ₂ O			
P _{ramp} (rate of the pressure rise)	5–200 cmH ₂ O/s			
O ₂ concentration	21–100%			
Flow trigger	OFF Adults: 1.0–20 lpm Children: 0.5–10 lpm Neonatal: 0.1–10 lpm			
Pressure trigger	OFF, 0.5–20 cmH ₂ O			
Tube compensation	Tube, tracheostomy tube, inspiration, expiration Degree of compensation: 0–100% Tube diameter: 2.0–10.0 mm			
Automatic Byflow	5–8 lpm			

Device functions	Tube compensation Adjustment of the alarm volume Display brightness: day/night mode, configurable night screen Permanent indication of lung compliance and resistance Tabular trend (including storage function) Graphical trend Up to 5 loops Screenshot function PDMS/monitoring
Additional functions	O ₂ flush Pneumatic nebulizer Mainstream capnometry, volumetric capnometry Pulse oximetry
Maneuvers	Recruitment maneuver Sigh (inspiratory and expiratory) Manual breath

Weaning functions

Fastwean (recommended measurements)	RSBI Occlusion measurement P0.1 V _{spont} R _B R _B _{spont}
Fastprotect (recommended measurements)	ΔP P _{plat}
WOB (work of breathing) measurements	W _{spont} W _{vent}

Available measurements

Airway pressure	PIP	0.1–100 cmH ₂ O	
	P _{plat}	0–99 cmH ₂ O	
	PEEP	0–99 cmH ₂ O	
	P _m	0.1–100 cmH ₂ O	
Rate measurement	Respiratory rate RB: 0.1–200 1/min		
	Spontaneous respiratory rate RB _{spont} : 0.1–200 1/min		
O ₂ measurement	21–100%		
CO ₂ measurement (option)	Mainstream		
	EtCO ₂	1–15% (1–115 mmHg)	Concentration (partial pressure) of CO ₂ in the exhaled mixture
	FICO ₂	0–255 mmHg	CO ₂ partial pressure in the inhaled mixture
Volumetric capnography Measurements (option)	V _d	Functional dead space volume	
	MV _{alv}	Minute alveolar ventilation	
	V _{alv}	Alveolar ventilation	
	VCO ₂	Measured volume of the eliminated, ml CO ₂ /min	
SpO ₂ measurement	PR (pulse)	30–240 beats/min	
	SpO ₂	0–100%	
Volume measurement	MV	All	0.1–30 lpm
	MV _{spont}	All	0.1–30 lpm
	V _{insp}	All	1–4000 ml
	V _{exp}	All	1–4000 ml
	V _{spont}	All	1–4000 ml
	Leak	All	0–75% 0.1–200 lpm
Cardiac output according to Fick (optional)	CO	Children Adults	0.2–1 lpm 1–15 lpm
Inspiratory: expiratory ratio	I:E	0.0–99.9	
Static compliance / resistance	C _{st} / R _{st}	C: 0.1–99.9 ml/cmH ₂ O R: 0.1–200 cmH ₂ O·s/L	
Dynamic compliance / resistance	C / R (LSF)	C: 0.1–99.9 ml/cmH ₂ O R: 0.1–200 cmH ₂ O·s/L	
Chest compliance	C _{cw}	0.1–99.9 ml/cmH ₂ O	
Auxiliary external pressure (optional)	P _{aux}	–30–100 cmH ₂ O	
Transpulmonary pressure	P _{tp}	–30–100 cmH ₂ O	
Transpulmonary pressure at the moment of peak inspiratory pressure	P _{tpi}	–30–100 cmH ₂ O	
Transpulmonary pressure at the end of expiration	P _{tpo}	–30–100 cmH ₂ O	
Rapid shallow breathing index	RSBI	0–999	
Curve presentation	Pressure, Flow, Volume, PCO ₂ , VCO ₂ , SpO ₂ , iSV, P _{tp} , P _{aux} , nCPAP		
Graphical trend	Up to 360 hours		

Electrical supply

Mains power	AC 100–240 V, 50/60 Hz DC 11–30 V
Power consumption	300 VA maximum
Internal power supply	Rechargeable Li-Ion battery (one or two). Automatic switch-over when mains supply fails. Replacement possible during operation. Operating time of up to 8 h with each fully charged battery

Gas supply

Oxygen supply (O ₂)	Pressure range: 150 to 600 kPa (22 to 87 PSI)
Air supply (AIR)	From turbine, noise level 46 dB(A)
Maximum inspiratory flow	Up to 260 lpm, up to 200 lpm with 100% oxygen

Dimensions and weight

Width x depth x height:	350 x 170 x 300 mm
Weight, net:	6.5 kg with one battery 7.0 kg with two batteries

Control unit

Screen type	4:3 LCD display, tilt angle of 35°
Screen diagonal	10.1"
Input system	Touch screen (capacitive multi-touch)

Configurable measurements

Basic values	
Peak inspiratory pressure	PIP
Mean pressure for the respiratory cycle	P _m
Positive end-expiratory pressure	PEEP
Residual pressure level in lungs	AutoPEEP
Minute volume	MV
Minute volume of spontaneous breaths	MV _{spont}
Expiratory volume	V _{exp}
Inspiratory volume	V _{insp}
Rate of breathing	RB
Inspiratory:expiratory ratio	I:E
Fractional concentration of inspired oxygen	FiO ₂
Frequency of spontaneous breaths	RB _{spont}
Leakage flow from the breathing circuit	Leak
Static compliance / resistance	C _{st} / R _{st}
Dynamic compliance / resistance	C / R (LSF)
Chest compliance	C _{cw}
Concentration (partial pressure) of CO ₂ in the exhaled mixture (optional)	EtCO ₂
CO ₂ partial pressure in the inhaled mixture (optional)	FICO ₂
Oxygen saturation of arterial blood hemoglobin (optional)	SpO ₂
Plateau pressure	P _{plat}
Peak inspiratory flow	FlowPeak
Elimination of CO ₂ per minute (optional)	VCO ₂
Minute alveolar ventilation (optional)	MV _{alv}
Alveolar ventilation (optional)	V _{alv}
Functional dead space (optional)	V _d
Cardiac output according to Fick (optional)	CO
Auxiliary external pressure (optional)	P _{aux}
Transpulmonary pressure (optional)	P _{tp}
Transpulmonary pressure at the moment of peak inspiratory pressure (optional)	P _{tpi}
Transpulmonary pressure at the end of expiration (optional)	P _{tpo}

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