LÖWENSTEIN
medical

INTENSIVE CARE VENTILATION

elisa 300, 500, 600, 800, 800VIT

Intensive care ventilation. Simple, effective and lung protective.

elisa 300
elisa 500
elisa 600
elisa 800
elisa 800 VIT

Contents

elisa - because individuality matters in intensive care ventilation.

The elisa product family has a common denominator: Simplicity at the highest technological standard.

Simple application creates safety for medical staff and patients.

To be a technological pioneer means two things to SALVIA: natural, gentle ventilation and a sustainable outlook. The elisa product family is based on this principle of sustainability. Upgrades create smooth transitions between the models, while software updates guarantee our products' long service life at the highest technological level.

Innovative. Intuitive. Sustainable.
The elisa family.

DESIGN AWARD 2015

reddot award 2015

INDUSTRIE PREIS 2015 BEST OF

GERMAN DESIGN AWARD SPECIAL 2017

elisa - because individuality matters in intensive care ventilation.

elisa 800^{VIT}

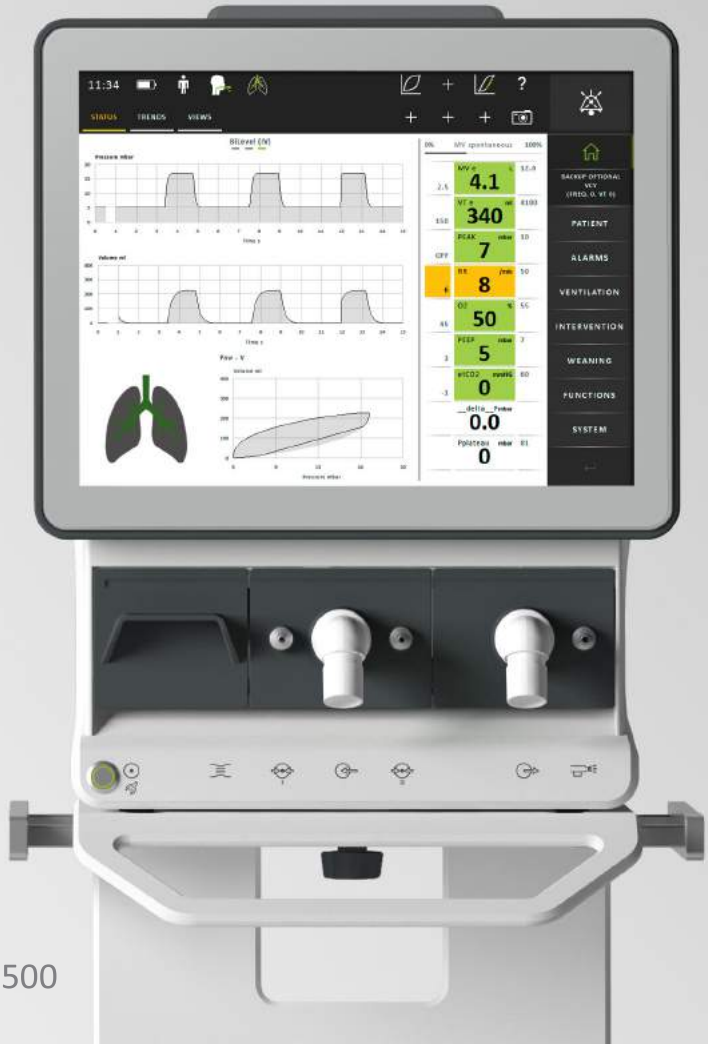
elisa 600 | 800 | 800^{VIT}

The premium range in intensive care ventilation

The platform concept enables situation-based configuration. The flexible system architecture allows for integrating future requirements as well as medical and technical developments.

The devices offer a full bandwidth of diagnostic and therapeutic tools for innovative and intuitive ventilation, from common clinical standards to our ventilator-integrated impedance tomography (VIT), which remains unique in the world.

elisa - because individuality matters in intensive care ventilation.



elisa 500

elisa 300 | 500

The new compact range in intensive care ventilation with the latest turbine technology

The turbine technology enables maximum peak inspiratory flows of up to 300 l/min and higher ventilation pressures. At the same time, noise emissions and maintenance costs have been significantly reduced.

Daily requirements in intensive care ventilation are complex and wide-ranging. A comprehensive functional platform, state-of-the-art technology, flexible device configuration and intuitive operation support you in your daily routine work and in critical ventilation situations:

- in the ICU, the intermediate care unit, the emergency department or during in-hospital transports
- with ARDS, COPD or in prolonged weaning, in high-flow oxygen therapy, invasive or non-invasive ventilation
- in modern ventilation modes, oesophageal pressure measurement with mesh nebulizer, loops, PEEPfinder® or weaning tools

Instant View Technology

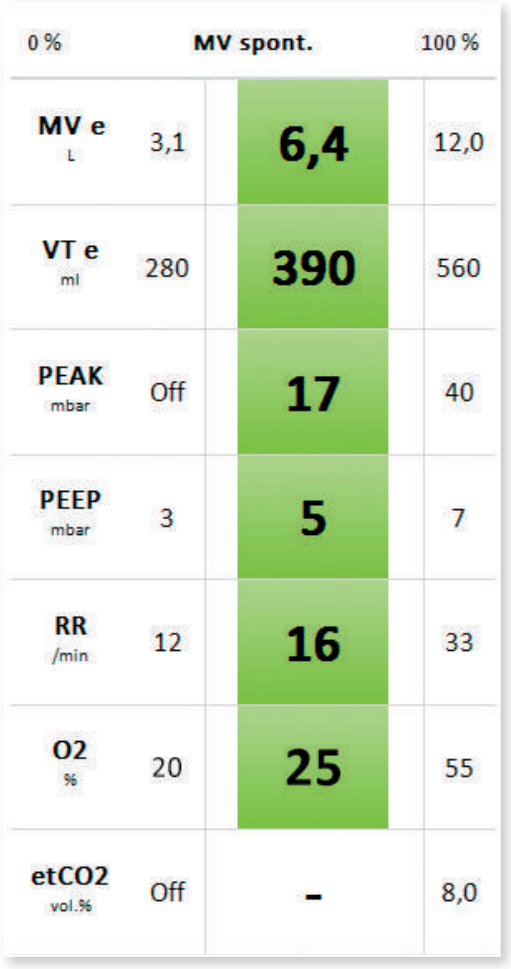
in control at all times

Don't miss the wood for the trees – instantly assess the current ventilation situation and identify developing problems.

Time is a scarce resource in everyday clinical practice. Increasing workloads, critical situations as well as normal routine place high demands on medical personnel. The cumbersome operation of complicated devices causes additional stress and creates sources of error. That calls for innovative technology which offers a clear overview of the required information in a structured format. Simply smart!

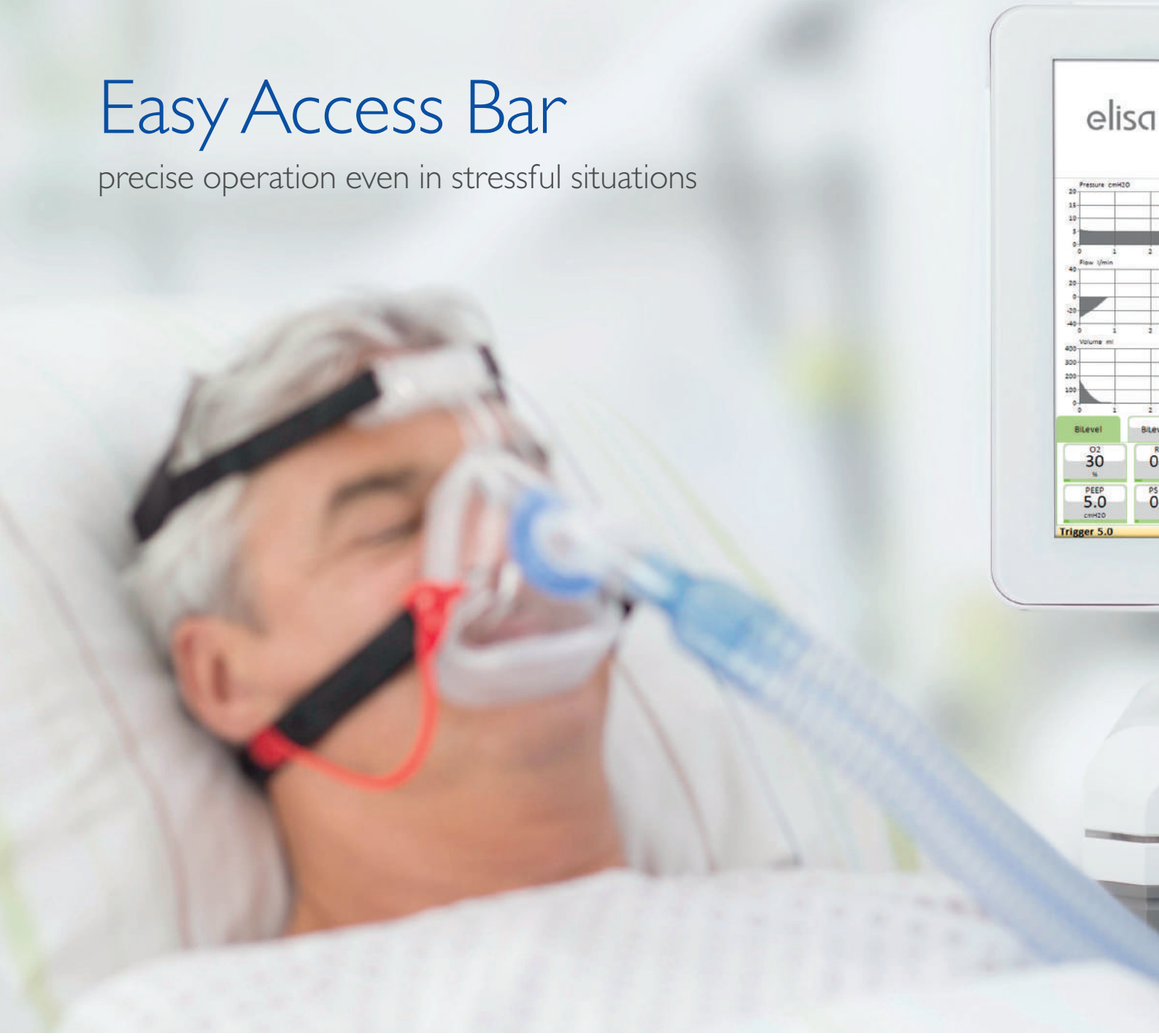
Instant View Technology

The Instant View Technology gives you an intuitive grasp of the patient's situation. Trends and necessary interventions are immediately evident. Deviations are clearly obvious without the need to read individual measuring values.



Easy Access Bar

precise operation even in stressful situations



New answers are needed for intelligent operation – the Easy Access Bar enables fast response.

Easy Access Bar

The Easy Access Bar of the intensive care ventilator family elisa 300 to 800^{VIT} lets you choose the required settings with precision and ease, even in stressful situations. The touchscreen operation provides intuitively understandable, unmistakable feedback on the selected setting. Since all numerical values and setting parameters are consistently arranged in the same location, operating the devices becomes an easy routine that does not fail in critical situations.

The absence of conventional rotary knobs makes operation easy and verifiable. The fully disinfectable surface enables hygienic operation at minimal cost.

A clean affair

a simple way to prevent nosocomial pneumonia

The device's numerous individual functions and architecture support compliance with suitable infection prevention measures.

Pneumonia is the most common nosocomial infection occurring in ventilation patients. It leads to extended hospital stays and increases lethality by up to 30%.

The elisa series features a number of functions to support the necessary measures for reducing nosocomial infections. The design of the modern intensive care ventilators eliminates hygienic problem zones such as dirt-collecting corners or rotary knobs and allows for easy cleaning and disinfection. The Valve Bar comprises all elements that can be directly or indirectly contaminated via the respiratory tract and makes it easy to quickly replace all patient-side connections to effectively prevent cross-contamination.

The materials used guarantee continued functionality, even under the most severe conditions such as mechanical strain and repeated autoclaving.

The configurable hygiene function supports the implementation of internal hospital hygiene standards without the need for complex RFID technology or the purchase of expensive special tube systems. It comprises all potentially critical parts such as nebulizers, HME filters, tube extensions, and suction systems.

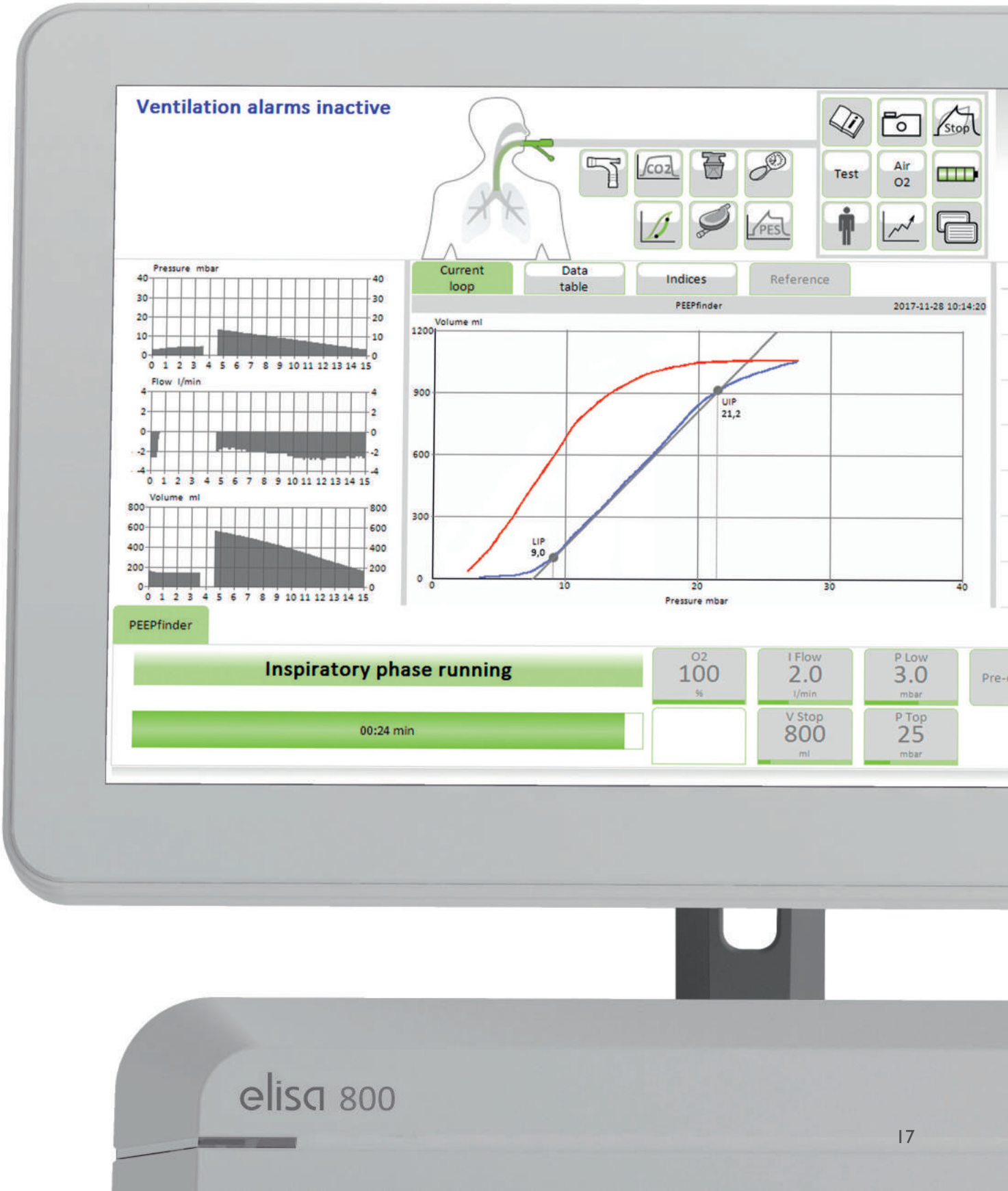
PEEPfinder®

gold standard bedside lung diagnostics

The PEEPfinder® makes the determination of the optimal PEEP range as easy as setting the respiratory rate.

It is considered an established fact that the cyclic collapse and reopening of lung areas in patients with ALI significantly damages the pulmonary tissue and that alveolar cycling of lung areas in particular represents an independent risk factor for higher mortality.

The PEEPfinder® can be used to optimise the settings of the ventilator, thus supporting lung-protective ventilation. The manoeuvre is performed in a secure window and can be combined with a preoxygenation function. The expanded, quasi-static PV tool supports the user's assessment of stress and strain. Intelligent algorithms and extensive safety features make it easier to determine the elastic properties of the lungs. A number of evaluation options are available for this purpose. Graphic evaluation support for detecting inflection points, stress indices, and storage of up to 10 reference loops facilitate the straightforward implementation of lung-protective ventilation.


Ventilation alarms inactive
Stop
Test
Air
O2
CO2
PES
Pressure mbar
Flow l/min
Volume ml
Current loop
Data table
Indices
Reference
PEEPfinder
2017-11-28 10:14:20
Volume ml
UIP
21,2
LIP
9,0
Pressure mbar
PEEPfinder
Inspiratory phase running
00:24 min
O2
100
%
I Flow
2.0
l/min
P Low
3.0
mbar
V Stop
800
ml
P Top
25
mbar
elisa 800


Monitor
Patient

Volatile sedation meets intensive care ventilation

optimised ventilation with bespoke sedation

The use of volatile anaesthetics enables daily awakening trials, timely neurological assessment, and avoiding benzodiazepine hangover.

Daily awakening trials, propofol infusion syndrome, timely neurological assessment of ventilated, intensive care patients or reducing brief reactive psychosis – there are many reasons for the use of volatile anaesthetics in the context of intensive care treatment.

Salvia medical has responded to this challenge and has entered new territory with the successful application of the new DIN EN ISO 80601-2-13 standard, "Particular requirements for basic safety and essential performance of an anaesthetic workstation." This goes far beyond the scope of safe intensive care ventilator operation and the effects of anaesthetic gases on the materials of such devices. Rather, the new anaesthetic delivery function compensates the inspiratory and expiratory resistances of the Anaesthetic Conserving Device System® and thereby avoids extending the mean expiration time, reduces the risk of trapping, and guarantees the accuracy of volume measurement.

Cuffscout®

simple cuff management to reduce VAP risk

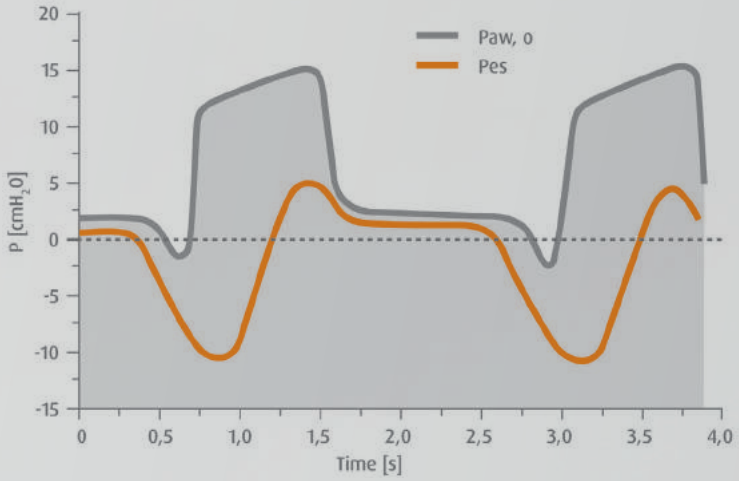
The continuous monitoring and control of the blocked cuff is one of the measures to reduce the VAP risk of mechanically ventilated patients in the intensive care unit.

Intermittent cuff control with a pressure gauge, which is frequently applied in current practice, is not fully adequate to counteract this risk. For this reason, we have equipped our best-selling products with the new Cuffscout® function. It maintains and monitors the cuff pressure specified by the user. In addition, our devices immediately recognise defective cuffs and leaks and feature a cough detection algorithm to further simplify the individual cuff adjustment.


BiLevel
Stop
Test
Air O2
Max
Apnoea ventilation
BiLevel
Rate 10, P insp 12
0 %
MV spont.
100 %
MV e 2,5 3,6 12,0
VT e 150 270 Off
PEAK Off 17 27
PEEP 3 5 7
RR 6 13 50
O2 25 31 35
etCO2 Off - 60
Alarms
Ventilation
O2 Flush
Weaning-analyzer
P0.1
Hold
More functions
Enter
Cuff pressure mbar
5.7
Curve on
Curve off
Max. block on
Max. block off
Auto
Static
Cuff const.
25
mbar
On

Transpulmonary Monitoring

more than just detection of stress and strain



Even in difficult clinical ventilation situations, the measurement of oesophageal or transpulmonary pressure allows lung-protective ventilation to be adjusted.

Alveolar overdistension and cyclic alveolar collapse are the primary causes of ventilation-associated lung injury. This is characterised by alveolar permeability dysfunction with oedema, alveolar haemorrhage, hyaline alveolar membrane formation, loss of surfactant function, and alveolar collapse. The lung damage caused by alveolar overdistension is produced by high pressure values. These are reflected in the transpulmonary pressure (difference between airway pressure and pleural pressure). Although inspiratory alveolar overdistension and expiratory collapse cause lung damage through shear forces, the limits of conventional lung protection can also be considerably exceeded with maximum plateau pressures of 30 mbar without the lung being overdistended. The transpulmonary pressure measurement allows lung-protective ventilation to be adjusted without additional damage to the lung particularly in patients who require a large proportion of the ventilation pressure to extend the "stiff" lung (obesity, elevated intraabdominal pressure, etc.).

Tools to assist the weaning process

there are no simple answers when weaning fails

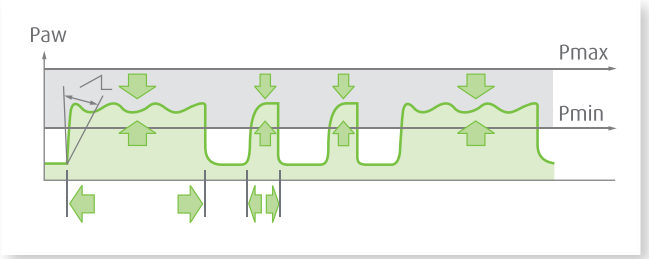
In the majority of ventilated patients, ventilator weaning is quick and can be successfully achieved by simple strategies. However, there is a steady rise in the number of ventilated patients that cannot be weaned off the ventilator or where the weaning process is very prolonged.

40 % of all ventilated patients undergo difficult or prolonged ventilator weaning, which takes up almost 50 % of intensive care time. Often, these are patients with severe respiratory dysfunction, where comorbidity makes the weaning process more difficult. The necessary weaning strategy is complex, demanding and allows no simple answers. In addition to special modes for simple weaning, there are numerous tools and indices available for continuously assessing the weaning process and for the standardised assessment of weaning and extubation readiness.

Weaning modes

The right choice of ventilation type has high significance in the weaning concept and influences the duration and success of weaning. In addition to the whole range of conventional ventilation modes, elisa 600 and 800 also have two special ventilation types for efficient weaning of standard ventilation patients. Spontaneous breathing activity, necessary ventilation pressure for mandatory and spontaneous breathing activities, trapping risk, and lung parameters are continuously recorded, assessed and used to adjust the ventilation parameters.

Adaptive Lung Protection Ventilation (ALPV®) takes lung protective protection rules into account and guarantees the necessary CO_2 elimination. ALPV® can be maintained throughout the entire period of ventilation without changing the ventilation mode or adjusting the ventilation parameters.



Adaptive Lung Protection Ventilation continuously adapts to the weaning situation.

Weaninganalyzer®

A huge challenge in weaning is to establish the right time for weaning readiness and extubation. The fact that up to 16 % of extubations are unplanned as so-called self-extubations with subsequent ventilation no longer being required in about 50 % of these patients illustrates the importance of the right time for planned extubation.

The Weaninganalyzer® contains protocols for daily standardised determination of weaning readiness (“ready to wean”) and extubation readiness (“ready to extubate”). By monitoring clinical situations and assessing measurement values, daily SAT or SBT tests can be performed more easily, thus helping to reduce complications, reintubation rates, days in intensive care and treatment costs.

Fastwean®

Fastwean® allows measurement values relevant to weaning to be assessed at a glance. Whether RSBI, occlusion pressure measurement P0.1 or Negative Inspiratory Force – the measurement values are continuously displayed and assessed using a ‘traffic lights’ display.

Fastwean				
RSBI	-	98	110	
P0.1	-3,0	2,9	-	mbar
MIP	20,0	24	-	mbar
Vt sp.	300	318	550	ml
F sp.	11	18	30	/min
etCO2	31	41	45	mmHg
SP02	-	-	-	%

Fastwean® supports differentiated assessment in the weaning process.

Ventilator-integrated tomography (VIT®)

the imaging navigation system for intensive care ventilation

Electrical impedance tomography (EIT) for the first time offers a bedside method for reliable non-invasive determination of the regional lung function without radiation exposure.

The real-time images as well as the EIT-based special lung function parameters support clinicians with the regular evaluation of the variable pulmonary status in order to adjust the ventilation to individual patient needs.

In the elisa 800^{VIT}, Salvia medical combines both functions: Intensive care ventilation and EIT.
Assessment and monitoring of ventilation, stretch, regional compliance, regional tidal volume and size of available lung volume (functional lung size) can be performed continuously and easily, and the results applied to ventilation strategies.

The EIT, in turn, supports the implementation of lung-protective ventilation, therapeutic positioning, and weaning.

Powerful computers, innovative textiles and modern algorithms have all contributed to electrical impedance tomography graduating from the pure science stage to being part of clinical routine. Sensor densities that were too low, complicated assessment strategies, and pressure sores caused by sensor belts are now a thing of the past.
Changes in the dependent and non-dependent lung regions can be located at a glance, and ventilation settings can be adjusted under direct visual control.


BiLevel
Backup ventilation
BiLevel
Rate 10, P insp 12
Test
Air O2
Stop
Ventilation
Stretch
Regional Cmpl.
Regional Vt
Silent Spaces
0 %
MV spontan
100 %
MV e
L
Off
2,4
Off
VT e
ml
Off
215
Off
PEAK
mbar
Off
16
40
4
6
8
Alarms
Ventilation
O2 Flush
Weaning-analyzer
P0.1
Hold
O2
%
Enter
% non-dependent
9
68
23
functional lung size %
dependent %

Options & choices

our modular system at a glance

Highflow O_2

High-flow oxygen therapy (HFOT) is considered a supplement to non-invasive ventilation or is used in cases where conventional oxygen therapy does not provide adequate oxygenation. It involves offering a continuous flow with individually adjusted oxygen supply via a special nasal cannula.

CPR

CPR mode

Special emergency mode for ventilation in resuscitation situations.

ALPV

ALPV®

The ALPV mode combines the previous advantages of hybrid closed-loop ventilation with the current requirements of lung-protective ventilation. The pressure-controlled ventilation with volume guarantee (comparable to dynamic BiLevel) is combined with pressure-supported spontaneous breathing with volume guarantee (dynamic PSV) in such a way that a tidal volume of 6 ml/kg of ideal body weight results as the target value for mandatory and pressure-supported spontaneous breathing. At the same time, the device continuously monitors potential air trapping and offsets it as necessary. ALPV® is used as a weaning mode and generalist mode.

PAPS

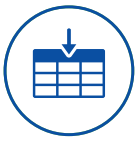
PAPS® Proportional Adaptive Pressure Support

In contrast to the fixed pressure support with PSV, a spontaneously breathing patient receives proportional pressure support with PAPS. The effective pressure support is based selectively on the respective increased elastic and restrictive resistance values. A special algorithm determines the current work of breathing based on elevated flow and stretch resistance in every breath and regulates the selective pressure support for compensation.

LOOP

Loop package

Up to six selectable loops form the basis of differentiated assessment and derivation of treatment decisions. At the same time, up to 10 reference loops can be saved and displayed to compare with the current ventilation situation for diagnosis.



Scientific Data Tool

The Scientific Data Tool offers a solution for scientific data collections. All ventilation data and EIT measuring values can be recorded breath by breath. Our external software compiles the EIT and ventilation data, associated with the individual breaths, and converts it to an Excel table.

Transport option

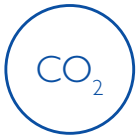
A bracket for attaching the unit to the bed and a kit for accommodating the compressed air and oxygen bottles make it easier to transport the intensive care ventilator with the patient bed within the hospital.

PEEPfinder®

Thanks to state-of-the-art sensor technology and its high-resolution sampling rate, the PEEPfinder® features algorithms for the reliable determination of inflection points to establish the necessary PEEP and ventilation range. The intuitive display allows a verifiable review of measuring values, transparent PEEP settings, and the assessment of stress indices as well as static compliance.

Mesh nebulizer

Targeted nebulizing of medications with ultrasound represents the current gold standard. Modern ultrasound technology does not interfere with ventilation therapy, can be refilled during ongoing operation, and is virtually noiseless. The synchronization of our technology with the patient's inspiration significantly reduces the drug consumption while maintaining the same efficacy. The integrated solution enables the direct operation via the intensive care ventilator without the need to rely on additional external devices.



Optional CO_2

Mainstream or side stream sensors complete the close monitoring of ventilation patients in routine clinical and emergency situations. Measuring values can be displayed numerically, as a curve or as a loop.

Weaninganalyzer®

The Weaninganalyzer® accurately displays the patient's weaning process and offers a reliable forecast for initiating the weaning process and extubation readiness based on daily trials and real-time data.

Mains-independent power supply

Additional batteries and an external charger allow off-grid operation for a period of at least four hours.

Automatic patient detection APD

As an additional safety function, users can activate the automatic patient detection (APD) feature on the configuration level to make it available. This prevents inadvertent switching to the standby function or turning the ventilator off as long as a patient is connected.

Hygiene function

To reduce the risk of nosocomial (hospital-acquired) infection, the ventilator's hygiene management function monitors the timely replacement of accessories that are in direct contact with the patient (tubing system, valve bar, suction system, HME filter, and nebulizer head). Monitoring and display follow the respective department requirements without the need for complex RFID chips or expensive breathing circuits.

WOBOV® Work Of Breathing Optimized Ventilation

WOBOV is a generalist mode that takes promoting spontaneous breathing, sufficient minute ventilation, an energetically optimal breathing pattern and compliance with specific lung protection rules into account. It continuously calculates the energetically optimal breathing pattern and adjusts the ventilation control (modified Otis formula) accordingly. If the ventilation is still insufficient, WOBOV gradually steps up mechanical support or the algorithm compensates the deficit up to the specified minute volume as needed.

PESO
Oesophageal pressure monitoring

Bedside monitoring of oesophageal pressure with a modified gastric tube reflects the changes in pleural pressure under ventilation.

The resulting measuring values enable PEEP optimisation, avoidance of alveolar over-inflation with development of barotrauma, identification of patient-ventilator asynchrony, assessment of respiratory muscle effort, and measurement of intrinsic PEEP with spontaneous breathing.

Hardware Options	elisa 300	elisa 500	elisa 600	elisa 800	elisa 800^{VIT}
CO_2 interface (without sensor)	✓	✓	✓	✓	✓
CO_2 sensor: Mainstream measurement	+	+	+	+	+
CO_2 sensor: Sidestream measurement	+	+	+	+	+
Mesh nebulizer interface	+	✓	+	✓	✓
Weaning indicator: MIP	+	+	✓	✓	✓
Additional low-pressure feed for oxygen	+	+	–	–	–
PDMS interface: Salvia 1.3	+	✓	+	✓	✓
PDMS interface: Philips	+	+	+	+	+
Video port	+	✓	+	✓	✓
Cuffscout®	+	✓	+	✓	✓
Oesophageal pressure monitoring	+	✓	+	✓	✓
Expanded neonatal mode (including flow sensor close to patient)	–	+	+	+	+
Multi-gas sensor (CO_2, Iso, Sevo)	–	–	+	+	+
21.5" screen	–	–	+	+	+
Second 18.5" screen	–	–	+	+	+
Replacement battery for another 120 minutes	+	+	+	+	+

✓ integrated + optional – not available

Software Options	elisa 300	elisa 500	elisa 600	elisa 800	elisa 800 VIT
Base Package 'Ventilation Modes'	✓	✓	✓	✓	✓
Expanded Package 'Ventilation Modes' (ALPV, CPR, PC-APRV)	+	✓	✓	✓	✓
Mode: WOBOV®	+	✓	✓	✓	✓
Mode: PAPS®	+	✓	+	✓	✓
HFOT	+	✓	✓	✓	✓
Neonatal Mode	✓	✓	✓	✓	✓
PEEPfinder®	✓	–	–	–	–
Expanded PEEPfinder® (with automatic display of inflection points & recruitability)	+	✓	✓	✓	✓
Weaninganalyzer® (SAT & SBT)	–	+	✓	✓	✓
Lung Protection Navigator	–	+	+	+	+
Loop Package including reference loops	+	✓	✓	✓	✓
Ventilator-Integrated Impedance Tomography	–	–	–	+	✓

✓ integrated + optional – not available

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