LÖWENSTEIN
medical

INTENSIVE CARE VENTILATION

elisa 300, 500, 600, 800, 800VIT

HOSPITAL HOMECARE DIAGNOSTICS

Intensive care ventilation. Simple, effective and lung protective.

Contents

The elisa principle – agile system design for individualised ventilation therapy

In theory, things couldn't be simpler - air has to go in and out.

Clinical practice, in contrast, consists of a wide range of requirements for modes, setting parameters, diagnostic options, and therapeutic manoeuvres. As a result, ventilators quickly become overly complex, subject to compromise or require intensive training. The agile system architecture of the elisa family implements the respective hospital standard to reduce operator errors and work time.

Whether customised rounds view, resuscitation mode or Fastwean support – the user interface can be perfectly configured to suit your needs.

Innovative. Intuitive. Sustainable.
The elisa family.

DESIGN AWARD 2015

reddot award 2015

INDUSTRIE PREIS 2015 BEST OF

GERMAN DESIGN AWARD SPECIAL 2017

elisa. The future of intensive care ventilation.

elisa 600 | 800 | 800VIT

The premium range in intensive care ventilation

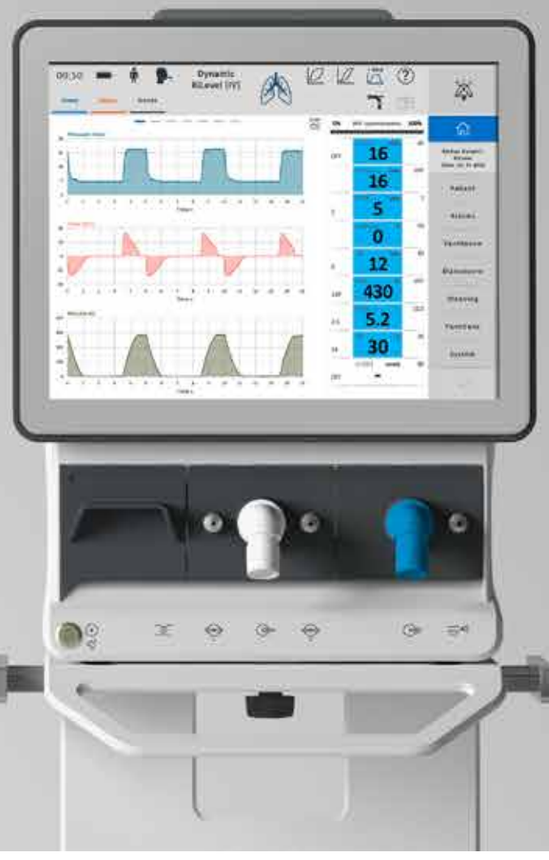
The platform concept enables situation-based configuration. The flexible system architecture allows for integrating future requirements as well as medical and technical developments.

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 300 | elisa 500

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

elisa 300



elisa 500

elisa 300 combines compact-class advantages with the performance characteristics of a modern universal ventilator for invasive and non-invasive ventilation therapy.

The innovative user interface and the comprehensive device configuration options are the basis for versatile application options in intensive care, intermediate care, emergency rooms or during in-hospital transport. The 12.1-inch display with a stunning colour performance is the key operating element to guarantee simple operation. Numerous functions provide support with daily routine tasks.

With a peak flow of up to 300 litres per minute, the high-performance, noise-optimised turbine guarantees sufficient flow capacities.

The compact-class device elisa 500 features top-shelf performance characteristics, while offering a full therapeutic range of clinical ventilation options in turbine-driven devices. The agile system architecture of the elisa family, along with extensive configuration options and a stunning colour performance of the 15.1-inch display, create the basis for versatile application options, ranging from the weaning unit to maximum-level intensive care.

As a modern universal ventilator for invasive and non-invasive applications, even the basic version of elisa 500 features the new special sensors, transpulmonary pressure measurement and the Cuffscout®.

Instant View Technology

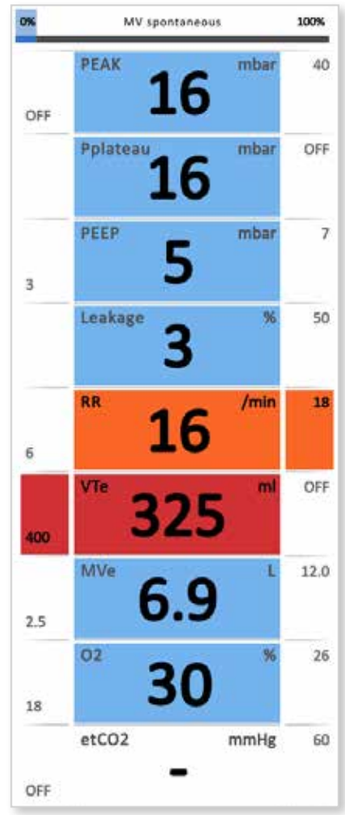
in control at all times

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.

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.

Löwenstein 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®

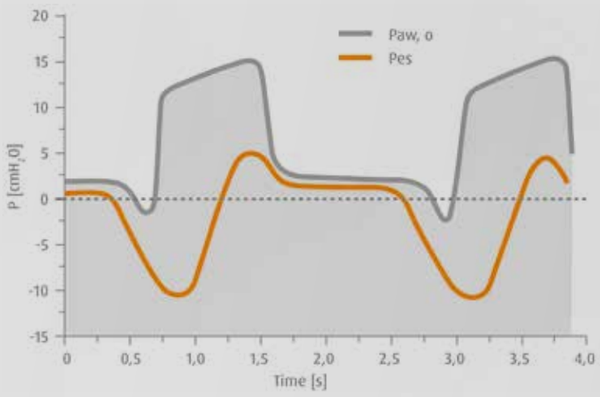
simple cuff management to reduce VAP risk

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.

Chest 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.

Adapting the ventilation therapy based on oesophageal pressure values is a simple, less invasive and valid method, which only requires the placement of an oesophageal catheter. The associated transpulmonary pressure measurement reflects the extent of mechanical stress on the alveoli in every breath and therefore enables the continuous assessment of the necessary PEEP, including with spontaneous breathing.

In the difficult weaning process, bedside monitoring of respiratory muscle activity in real time based on oesophageal pressure allows for assessing the level of synchronisation between the patient's respiratory efforts and the device insufflation time, which in turn makes it feasible to individually adapt the ventilation parameters (e.g. optimised insufflation time, pressure support or PEEP).

At the same time, the respiratory effort is quantified by measuring the work of breathing WOB. Based on these values, the level of muscle effort can be individualized to assist the patient under ventilation.

Tools to assist the weaning process

there are no simple answers when weaning fails

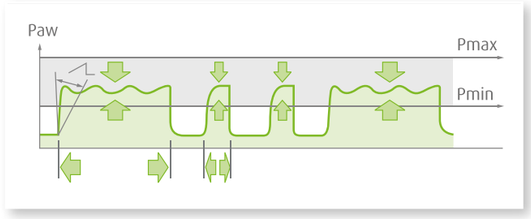
In the majority of ventilated patients, ventilator weaning is quick and can be successfully achieved by simple strategies. However, there is a steady rise in the number of ventilated patients that cannot be weaned off the ventilator or where the weaning process is very prolonged.

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 P.01 or Negative Inspiratory Force – the measurement values are continuously displayed and assessed using a ‘traffic lights’ display.

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}, Löwenstein 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.

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.

CO_2

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.

APD

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

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

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.

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Stand: 11/2018

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