Medu
SVERIGE

LÖWENSTEIN
medical

elisa

Intensive care ventilation – Simple. Effective. Lung-protective.

With people in mind

Intensive care ventilation – Simple. Effective. Lung-protective.

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elisa 46
As agile as life itself.

The elisa Code

Agile system enables personalised ventilation therapy.

In theory, it's quite simple - air has to go in and air has to come out.

In everyday clinical practice, however, the requirements in terms of modes, settings/parameters, diagnostic options and therapeutic manoeuvres are vastly different.
This can very quickly make a ventilator too complex, too compromised or too intense in terms of training.
The agile system architecture of the elisa series facilitates the implementation of respective facility standards, reducing operator errors and training requirements.

Be it rounds overviews, resuscitation mode or automatic SBT tests – the user interface can be configured to meet your requirements.

Innovative. Intuitive. Sustainable.
The elisa series.

DESIGN AWARD 2015

reddot award 2015

INDUSTRIE PREIS 2015 BEST OF

GERMAN DESIGN AWARD SPECIAL 2017

elisa 600 | elisa 800

The Premium class in intensive care ventilation.

elisa – because intensive care ventilation must be personalised.

The platform concept enables customised configuration. The flexible system architecture facilitates the integration of future requirements as well as medical and technical developments.

The complete range of diagnostic and therapeutic tools for individualised and intuitive ventilation is available here: From common clinical standards to our ventilator-integrated impedance tomography (VIT) with the new elisa VIT module.

elisa 300 | elisa 500

The new compact class in intensive care ventilation with state-of-the-art turbine technology.

DESIGN AWARD 2018

elisa 300

elisa 300 combines the advantages of the compact class with the performance features of a modern universal ventilator. Invasive and non--invasive ventilation therapy, as well as high-flow O_2 therapy, are both mandatory and optional.

Combined with its comprehensive configurability, the innovative user interface forms the basis for the wide range of possible applications in the intensive care unit, intermediate care unit, emergency room or during intra-hospital transport.

The brilliant 12.1-inch screen is the central control element and guarantees simplest operation. A wide range of support functions assist users in their daily routine tasks.

With a high peak flow, a powerful, noise-optimised turbine guarantees more than sufficient flow reserves.

elisa 500

With elisa 500, the compact class does not have to forego the performance features of the higher class and the entire therapeutic range of clinical respiratory medicine is also available for turbine devices.

The innovative user interface of the elisa series, combined with comprehensive configurability and a brilliant 15-inch colour screen, forms the basis for the wide range of possible applications, from the weaning unit to maximum care in the intensive care unit.

The modern elisa 500 universal ventilator for invasive and non-invasive ventilation already has special sensors, transpulmonary pressure measurement and the Cuffscout integrated in its basic version.

Instant View Technology

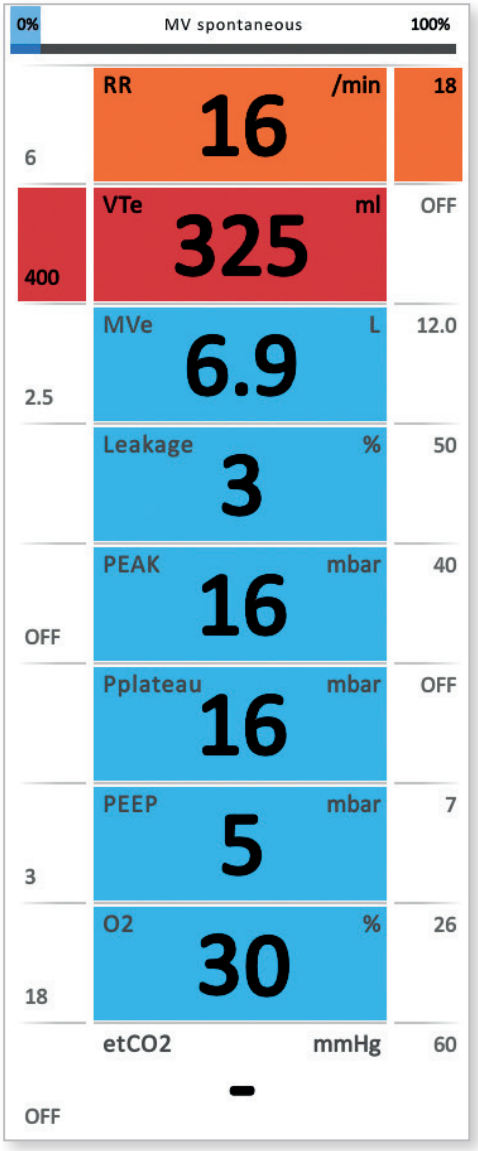
Maintaining an overview at all times.

Seeing the wood for the trees – the current respiratory situation can be viewed at a glance to identify any developing problems.

Time is a scarce commodity in day-to-day care. An ever increasing amount of intense work, critical situations, but also normal routine place high demands on medical staff. The cumbersome operation of complicated devices creates additional stress and sources of error. This is where innovative technology comes in and presents the required information in comprehensive manner and provides a clear overview at all times. Simply smart!

Instant View Technology

Instant View Technology allows you to intuitively grasp the patient's situation. Trends and necessary interventions can be recognised immediately. Deviations are visible at a glance, even without having to read the individual values.



Easy Access Bar

Precise operation, even in the most stressful situations.

Smart operation needs new answers – the Easy Access Bar enables quick intervention.

Easy Access Bar

The Easy Access Bar of the elisa 300 to elisa 800 series of intensive care ventilators allows for accurate and easy adjustment of the desired settings, even in stressful situations. Touchscreen operation provides intuitive and unmistakable feedback on the set value. As all numerical values and parameters are always arranged in the same place, operation becomes an easy routine and remains error-resistant even in critical situations.

The absence of conventional knobs makes operation simple and easy to understand. The fully disinfectable surface means hygienic use with minimum effort.

A clean affair.

Simple prevention of nosocomial pneumonia.

The variety of individual functions and the device architecture supports compliance with suitable infection prevention measures.

Pneumonia is the leading cause of all nosocomial infections in ventilated patients, leading to prolonged hospitalisation and an increase in mortality of up to 30%.

A wide range of functions in the elisa series support the necessary measures to reduce nosocomial infections. The architecture of the modern intensive ventilators already makes hygienic problem areas such as dirty corners or rotary knobs obsolete and allows easy cleaning and disinfection. The valve bar includes all elements that can be contaminated directly or indirectly via the respiratory tract and allows for a rapid exchange of all patient-side connections. This effectively prevents cross-contamination.

A 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 includes all potentially critical parts such as nebulisers, HME filters, tube extensions and suction systems.

PEEPfinder

Bedside pulmonary diagnostics in accordance with the gold standard.

With the PEEPfinder, determining the optimum PEEP range is as easy as setting the respiratory rate.

It is considered certain that atelectasis and reopening of lung zones in patients with ALI causes considerable damage to the lung tissue and, in particular, that alveolar cycling of lung zones represents an independent risk factor for higher mortality.

The PEEPfinder can be used to optimise the ventilator settings and therefore supports lung-protective ventilation. The manoeuvre is performed in a safe window and can be combined with a pre-oxygenation function.

The extended quasi-static PV tool supports the user in assessing stress and strain. Intelligent algorithms and extensive safety functions make it easy to determine the elastic properties of the lungs. Extensive evaluation options are available for this purpose. Graphical evaluation support for detecting the inflection points, recording stress indices and up to 10 storage options for the reference loops facilitate the simple implementation of lung-protective ventilation.

16


15:01
Dynamic BiLevel (IV)
Home
Status
Trends
PEEPfinder
2018-09-26
15:05:04
Volume ml
1000
750
500
250
0
PMC
7,8
LIP
12,6
0
10
20
30
40
Pressure mbar
The next PEEPfinder cannot be started before the expiry of the 60-second lockout time after the last manoeuvre.
Insp. Hold
Exp. Hold
Manual Breath
Sigh
Recruitment
O2
100
%
I Flow
2.0
l/min
P Low
3.0
mbar
Recr. time
2
s
V Stop
800
ml
P Top
25
mbar
elisa 800


Monitor
Patient

Volatile sedation meets intensive care ventilation.

Ventilation optimised by adapted sedation.

The use of volatile anaesthetics opens the door to daily wake-up tests, prompt neurological assessment and avoidance of excessive benzodiazepine.

Daily wake-up attempts, propofol-related infusion syndrome, prompt neurological assessment of the ventilated patient or reduction of transit syndrome – there are many motivations for the use of volatile anaesthetics in intensive care therapy.

To meet these challenges, we implemented a comprehensive strategy for "Safety, including key performance characteristics, for anaesthesia work-stations".

This does not just regard the safe operation of intensive care ventilators and the effects of anaesthetic gases on the materials of the intensive care ventilator. The anaesthetic function compensates for the in- and expiratory resistances of the Anaesthetic Conserving Device System (Sedaconda), therefore avoiding the prolongation of the mean expiratory time, reducing the risk of trapping and ensuring the accuracy of volume measurement.

Optional anaesthetic gases can be accurately measured and monitored directly with the elisa in combination with the LEOLYZER multi-gas sensor.

Cuffscout

Simple cuff management to reduce the risk of VAP.

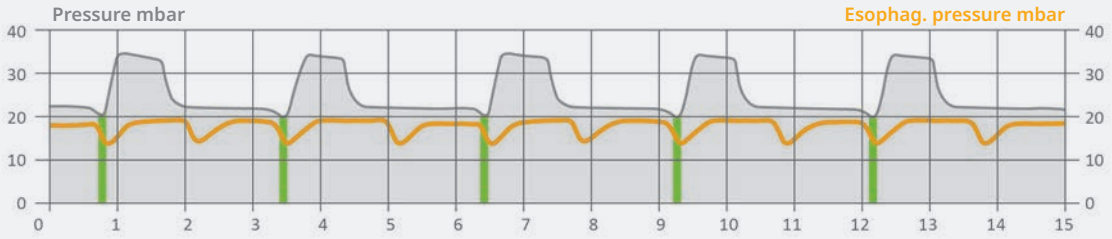
One of the measures to reduce the risk of VAP in ventilated patients in the intensive care unit is continuous monitoring and control of the blocked cuff.

As the previously and frequently used method of intermittent cuff control using a manometer is insufficient for counteracting this risk, we have equipped our successful products with the new "Cuffscout" function. The cuff pressure specified by the user is maintained and monitored. Our devices also immediately recognise defective cuffs and leaks and feature a cough detection algorithm. This further simplifies customised cuff adjustment.


Dynamic BiLevel (IV)
I-HOLD
PES
P01
STOP
0%
MV spontaneous
100%
PEAK
mbar
23
Pplateau
mbar
22
PEEP
mbar
5
Leakage
%
0
RR
/min
12
VTe
ml
OFF
40
7
3
50
50
6
Time s
Backup Dynamic BiLevel (Rate 10, Vt 400)
Patient
Alarms
Ventilation
Manoeuvre
Weaning
Functions
System
AnaConDa
Cuffscout
ASR
Peso
O2 Flush
Hygiene
On
Auto
Static
Cuff const.
25
mbar
Max. block on
Max. block off

Transpulmonary monitoring

More than just detecting stress and strain.



The measurement of oesophageal and transpulmonary pressures allows adapted ventilation even in difficult clinical ventilation situations.

The adaptation of ventilation therapy based on the measurement of oesophageal pressure is a simple, less invasive and valid method that only requires the placement of a modified gastric tube. Transpulmonary pressure measurement based on this can measure the extent of mechanical stress on the alveoli on a breath-by-breath basis and allows continuous assessment of the necessary PEEP, even during spontaneous breathing.

During the difficult weaning process, bedside monitoring of respiratory muscle activity in real time using oesophageal pressure allows the synchronisation degree between the patient's inspiratory efforts and the insufflation time of the ventilator to be assessed and the ventilation parameters to be individually adjusted (e.g. optimisation of insufflation time or pressure support, or the PEEP or the Pressure Time Product PTP).

At the same time, measuring the work of breathing (WOB) permits quantifying the respiratory effort and therefore adapting the degree of muscle relief to the patient during ventilation.

Weaning process support tools.

There are no simple answers for weaning failure.

The vast majority of patients can be weaned off the ventilator quickly and with simple strategies. However, the number of ventilated patients who cannot be weaned off the ventilator, or can only be weaned off very slowly, is constantly increasing.

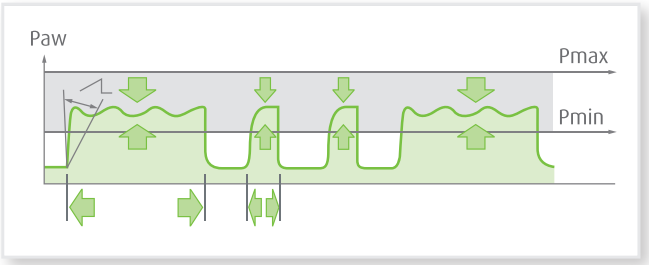
40% of all ventilated patients undergo difficult or prolonged weaning, which requires almost 50% of the time spent on intensive therapy.

This often involves patients with severe respiratory dysfunction, where comorbidity often has a complicating effect on the weaning process. The necessary weaning strategy is complex, demanding and does not allow for simple answers. In addition to special modes for simple weaning, extensive tools and indices are available for continuous assessment of the weaning process and for standardised assessment of weaning and extubation readiness.

Weaning modes

Choosing the right form of ventilation is very important in the weaning concept and has an influence on weaning duration and success. In addition to the broad range of traditional ventilation modes, elisa 600 and 800 also feature two special ventilation modes for efficient weaning of patients undergoing standard ventilation. Spontaneous breathing activity, the necessary ventilation pressure for mandatory and spontaneous breathing activities, the risk of trapping and the lung parameters are continuously recorded, evaluated and used to adjust the ventilation parameters.

Adaptive Lung Protection Ventilation (ALPV) takes lung protection rules into account and ensures the necessary CO_2 elimination. ALPV can be maintained for the entire ventilation time without changing the ventilation mode or adjusting the ventilation parameters.



Adaptive Lung Protection Ventilation continuously adapts to the weaning situation.

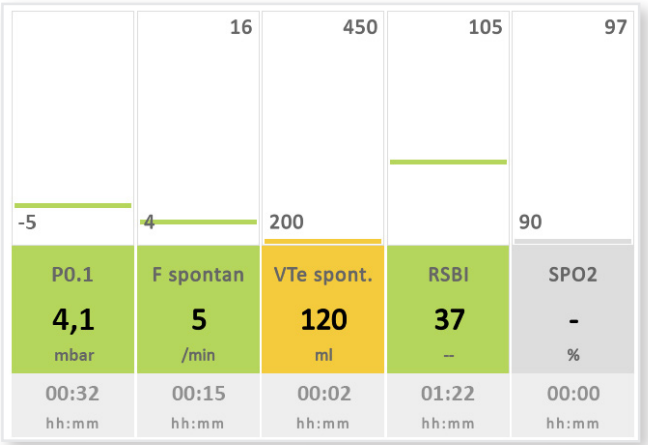
Weaninganalyzer

A major challenge in weaning is determining the right time for weaning readiness and extubation. The fact that up to 16% of extubations are unplanned, so-called self-extubations, and that ventilation is no longer required in around 50% of these patients, emphasises the importance of adequate timing for planned extubation.

The Weaninganalyzer comprises standardised test procedures for daily determination of readiness to wean (SAT: "ready to wean") and extubate (SBT: "ready to extubate"). By querying clinical situations and evaluating metrics, daily SAT or SBT tests can be realised more easily, helping to reduce complications, re-intubation rates, ICU days and treatment costs.

Fastwean

Fastwean enables the evaluation of weaning-related values at a glance. Whether RSBI, occlusion pressure measurement P.01 or Negative Inspiratory Force – the measured values are continuously displayed and evaluated using a traffic light display.



Fastwean supports differentiated assessment during the weaning process.

Ventilator-Integrated Tomography (VIT)

The imaging navigation system for intensive care ventilation.

Electrical impedance tomography (EIT) is a bedside method that can be used to reliably determine regional lung function non-invasively and without radiation exposure.

The real-time images, as well as the EIT-based special lung function parameters, support the clinician in the regular evaluation of the changing lung situation and the adaptation of ventilation to the individual needs of the patient.

By expanding the elisa 800 with the elisa VIT module, we have combined both functions: intensive care ventilation and EIT.

Ventilation, stretch, regional compliance, regional tidal volume and the extent of the available lung volume (functional lung size) can be easily and continuously assessed, monitored and used as the basis for a ventilation strategy.

EIT therefore supports the implementation of lung-protective ventilation, therapeutic positioning and weaning.

The trigger asynchrony tool allows automatic detection of asynchronies between the patient and the ventilator. The type of synchronisation error is also detected (e.g. double trigger, reverse trigger, stacking).

Powerful computers, innovative sensors and modern algorithms have contributed to the fact that electrical impedance tomography has left the purely scientific stage and arrived in everyday clinical practice. Insufficient sensor density, complicated assessment strategies and cross-contamination caused by sensor belts are now a thing of the past.

Changes in the dependent and non-dependent lung zones can be localised at a glance and ventilator settings can be adjusted under visual control.

NEW!
VIT in neonatology

VCO_2 - Efficiency of ventilation therapy.

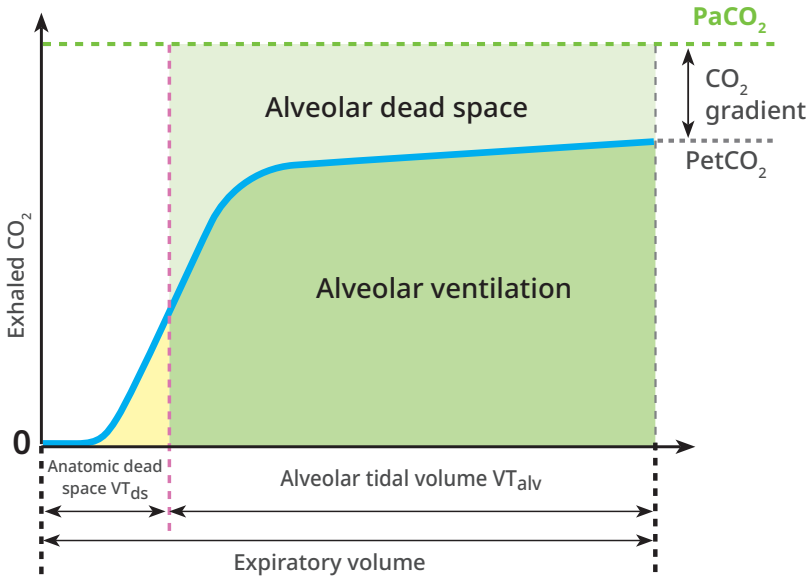
VCO_2 determination on a breath-by-breath basis, non-invasively and at the bedside.

In the age of lung-protective forms of ventilation, the ratio of dead space to tidal volume can be optimised through targeted measures in order to increase ventilation efficiency.

Capnography as a graphical representation of the expiratory CO_2 concentration is an essential component of monitoring the ventilated patient at the bedside. Capnography visualises CO_2 kinetics in a non-invasive way and in real time. In daily routine, it is mainly used to identify correct intubation and to adjust the minute ventilation volume to be applied. However, capnography can provide much more extensive and clinically valuable additional information, especially in its form of volumetric capnography, which has not yet been widely used in clinical terms.

This includes monitoring and optimising ventilation, assessing gas exchange and determining the anatomical and alveolar dead space on a breath-by-breath basis.

This provides the treatment team with clinical parameters for decision-making at the bedside that could previously only be obtained using more complex, invasive, non-automated procedures.




18:09
BiLevel (IV)
Home
Status
Trends
Pressure mbar
Time s
Flow l/min
Time s
Volume ml
Time s
VTds
VDalv
VTalv
ml
90
100
310
VTe ml
500
VTds ml
VDalv ml
VTalv ml
elisa 800

LEOCLAC

Automatically regulated oxygen therapy – the amount of oxygen makes the difference.

High concentrations of O_2 can trigger undesired events. The spectrum ranges from inflammatory reactions of the respiratory tract, resorption atelectasis and seizures to increased hospital mortality.

During high-flow O_2 therapy and ventilation, oxygen saturation should be closely monitored and the inspiratory oxygen concentration should be continuously adjusted to the individual therapy range.

Based on integrated pulse oximetry, Leoclac permits continuous adjustment of the inspiratory oxygen concentration to the set therapy range. As it can be combined with invasive or non-invasive ventilation and HFOT, Leoclac continuously evaluates the quality of the pulse wave and detects possible artefacts.

Various sizes and models of SpO_2 sensors are available for Leoclac. Heart rate, O_2 saturation and pleth curve can be monitored independent of Leoclac. An intelligent graphic facilitates the simple assessment of FiO_2 control.


10:42
BiLevel (IV)
Home
Status
Trends
SPO2
O2
0%
MV spontaneous
100%
RR
12
VTe
650
MVe
8,1
PEAK
19
Pplateau
19
PEEP
5
Leakage
0
O2
30
etCO2
Backup BiLevel
(Rate 10, P Insp 12)
Patient
Alarms
Ventilation
Manoeuvres
Weaning
Functions
System

HIGH-FLOW O_2

As therapy standard.

High-flow O_2 therapy represents an important link between invasive and non-invasive ventilation (NIV), as well as low-flow oxygen therapy.

As a non-invasive procedure, high-flow O_2 therapy is not only characterised by its simple application and minimal restrictions for the patient, but also by its high level of acceptance, even in delirious or restless patients.

A comparatively high flow of warmed, humidified inspiratory gas is applied via a nasal cannula. Depending on the indication and location, the inspiratory gas is air, an air-oxygen mixture or pure oxygen. Accordingly, the effects of this therapy can be seen in CO_2 leaching from the anatomical dead space with a reduction in the work of breathing, in the increase in expiratory lung volume and, if necessary, in a constantly high inspiratory oxygen concentration. Due to the system architecture of the elisa series, the breathing circuit does not need to be changed when switching between HFOT and non-invasive or invasive ventilation.

Neonatology

Non-invasive procedures for our tiniest patients.

The physiology and pathophysiology of premature infants and neonates differ, not least due to the respective degree of maturity, which is also reflected in the respiratory challenges. Non-invasive procedures for respiratory support using nasal prongs and nasal masks have become increasingly established and close the significant gap between oxygen therapy and traditional invasive ventilation.

nCPAP

The standard procedure for supporting lung ventilation and preventing alveolar collapse is nasal CPAP. Variable flow control, low invasiveness and ease of use are convincing in everyday clinical practice.

nBiLevel

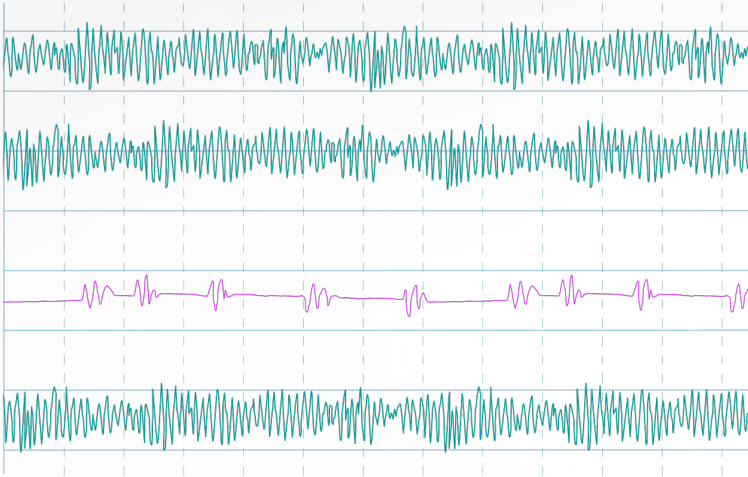
This mode is available especially for bridging apnoea situations or as a therapy method for apnoea-bradycardia syndromes. As a further development of the familiar NIPPV therapy, nBiLevel allows pressure-controlled non-invasive ventilation via prongs or mask.

nHFOT

High-flow O_2 therapy (HFOT) is also firmly established in neonatal ventilation management after extubation. Specifically adapted for neonates, a flow of actively heated and humidified inspiratory gas with an appropriate oxygen concentration, applied via prongs or nasal mask, ensures successful weaning.

LEOBRAIN

Guideline-compliant sedation even in difficult situations.



Apart from patient-related factors, overly deep sedation is considered to be the main trigger for acute states of confusion and attention-deficit disorders.

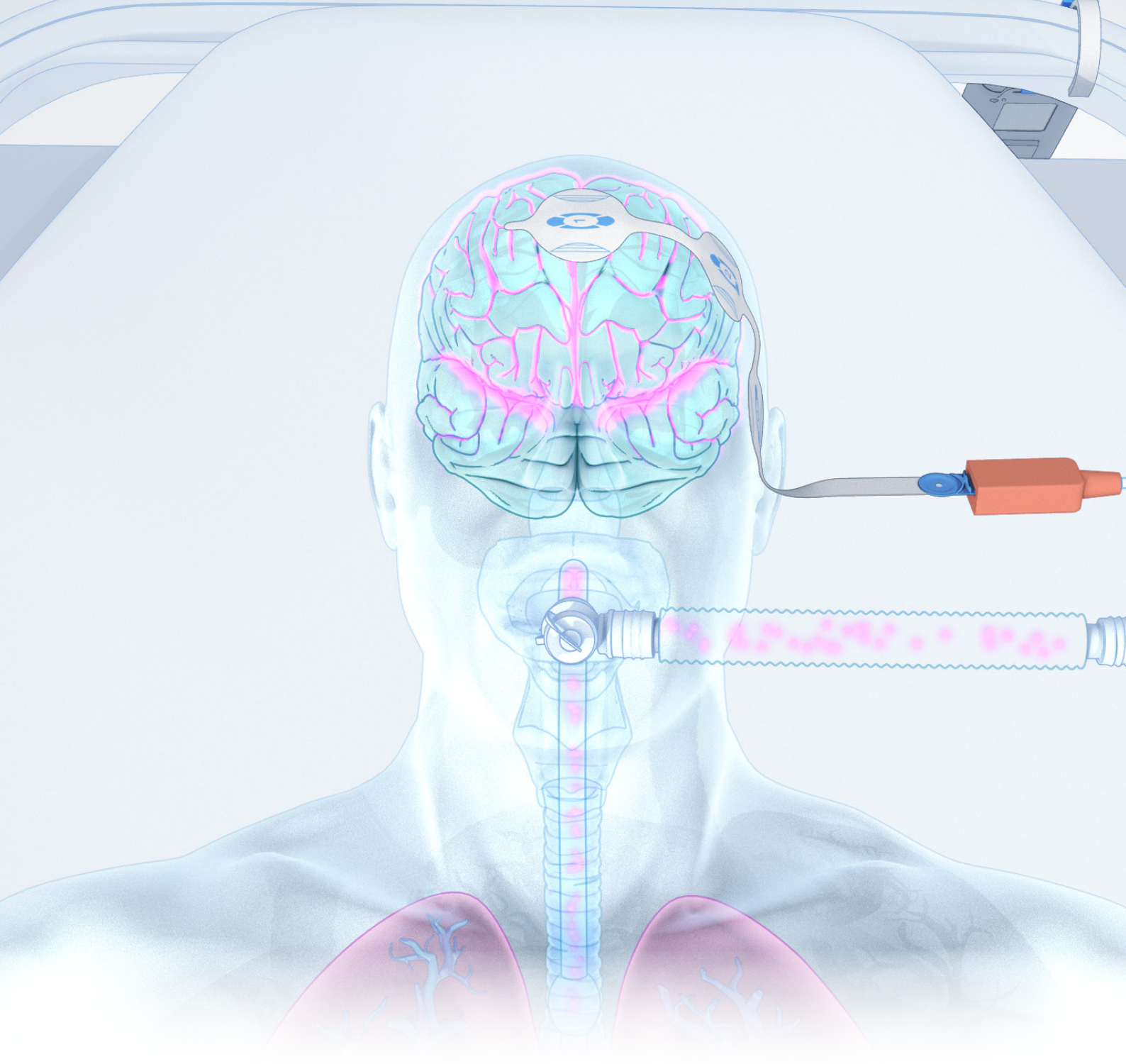
This so-called delirium is an expression of brain dysfunction and is described in 30% to 80% of all intensive care patients.

The effects of delirium on recovery and treatment outcome are considerable.

The pneumonia rate, ventilation time and stay in the intensive care unit are often prolonged.

The respective degree of analgesia and sedation should be standardised at least once per shift by assessing the reaction to verbal and tactile stimuli.

Deep sedation is often sought in the course of controlled hypothermia following resuscitation, in the therapeutic prone position or in the case of intracranial pressure issues. In these situations, the guidelines recommend EEG-supported monitoring procedures to continuously monitor the depth of sedation and to avoid over-sedation.



Löwenstein's LEOBRAIN allows simple, bedside monitoring of the depth of sedation.

By adding the LEOBRAIN module to the elisa ventilators, EEG-supported sedation monitoring is possible at any time directly via the ventilator without the need for additional monitors and is therefore an integral component of your ventilation monitoring.

Find out more about LEOBRAIN in our video.

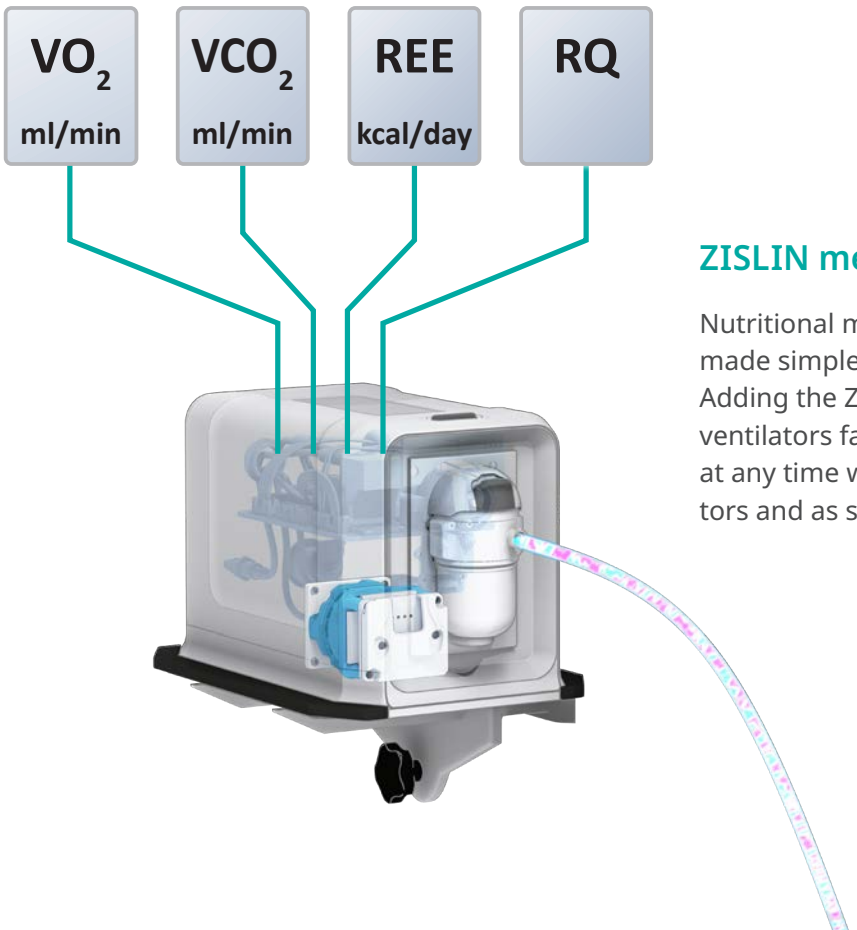
LEOMETRY

When nutritional status influences ventilation.

The nutrition-related risk of critically ill patients is determined by their nutritional status at the time of admission to the intensive care unit and the current severity of their illness. Up to 75% of all intensive care patients suffer from non-specific malnutrition or protein-energy malnutrition. This increases the mortality rate of this patient group.

In the context of medical nutrition of ventilated patients, the international and national guidelines recommend indirect calorimetry to determine the resting energy expenditure and therefore the caloric target.

The resting energy expenditure of critically ill patients is not constant, but fluctuates greatly depending on the patient, the phase of illness or pathophysiology and the severity of their illness. This is where mathematical formulas quickly reach their limits.



ZISLIN metabolic module

Nutritional monitoring of ventilated patients is made simple with Löwenstein's LEOMETRY. Adding the ZISLIN metabolic module to the elisa ventilators facilitates indirect bedside calorimetry at any time without the need for additional monitors and as simply as end-tidal capnometry.

Find out more about
LEOMETRY in our video.

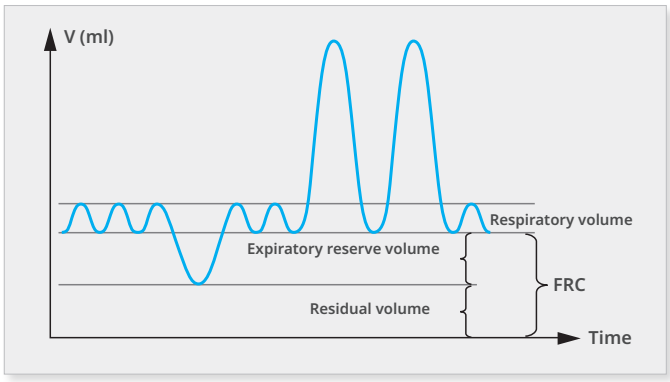
Functional residual capacity (FRC)

Bedside, non-invasive, module-based.

The functional residual capacity (FRC) reflects the volume that remains in the lungs after a normal exhalation. In acute respiratory insufficiencies, FRC is often reduced due to the development of atelectasis. In addition, ventilation with a low PEEP, especially in the case of obesity, upper abdominal and thoracic surgery, or due to an increased occlusion volume, can greatly reduce FRC.

By combining the elisa ventilators with the ZISLIN module, functional residual capacity can be determined bedside without a great deal of technical effort. This combination can detect the development of atelectasis and the recruitment of atelectatic lung zones and is therefore a way of implementing lung-protective ventilation.

In addition to traditional FRC measurement, a decremental PEEP manoeuvre is also available.
In the balancing act between end-expiratory alveolar collapse and end-inspiratory overdistension, FRC-PEEP can be used to determine the individually required PEEP.



PAPS

Proportional Adaptive Pressure Support (PAPS)

Improve synchronisation and reduce work of breathing.

To this day, experts are still debating whether the majority of the breathing pattern in traditional PSV pressure support is determined by the patients themselves or whether, in the worst case, patients only have to trigger the set trigger criterion. The advancement of proportional pressure support allows the breathing pattern to be controlled by the patient.

In contrast to traditional pressure-supported ventilation, PAPS provides dynamic pressure support proportional to the patient's inspiratory effort. The ventilated patient can be selectively relieved of the increased work of breathing caused by the pathological parts of the resistance and elastance of the respiratory system.

This allows patients to adapt their ventilation to their changing needs by modulating the tidal volume. The result is better synchronisation between patient and ventilator, less work of breathing and therefore increased ventilator comfort.

The cyclical, non-invasive determination of the work of breathing allows simple adjustment and supports diaphragm-protective ventilation. This paved the way for automatic and continuous adjustment of proportional pressure support to the clinical situation and significantly simplified the setting for the user.

Options & Opportunities

Our modular system at a glance.

System functions

Independent power supply

Additional rechargeable batteries and an external charger allow independent operation for at least four hours.

High-flow O_2

High-flow oxygen therapy (HFOT) is used as a supplement to non-invasive ventilation or when conventional oxygen therapy cannot provide sufficient oxygenation. A special nasal cannula is used to provide a continuous flow with a customised oxygen supply.

Automatic patient detection APD

As an additional safety function, automatic patient detection (APD) can be activated at configuration level and is therefore available to the user. This prevents accidental switching to the standby function or switching off the ventilator while a patient is connected.

Hygiene function

To reduce nosocomial infections, the hygiene management function monitors the replacement intervals for accessories that are used in direct contact with the patient (breathing circuit, valve bar, suction system, HME filter and nebuliser head). Monitoring and display are based on the respective departmental specifications and require neither complex RFID chips nor expensive special tube sets.

Weaninganalyzer

The Weaninganalyzer permits accurate assessment of the weaning process and reliable prognosis for the initiation of the weaning process and extubation capability based on daily trials and real-time data.

Options

Nasal CPAP / Nasal BiLevel

With the nBiLevel and nCPAP, non-invasive respiratory support procedures are available for premature babies, neonates and children.
Warmed and moistened air with or without additional oxygen is applied via special nasal cannulas (prongs), which are placed at the entrance to the nostrils. The set flow builds up a continuous positive airway pressure. The mandatory breaths of the nasal BiLevel also support ventilation.

Mesh nebuliser

Targeted nebulisation of medication using ultrasound is the current gold standard. Modern ultrasound technology does not affect the ventilation therapy, can be replenished during operation and is virtually noiseless. By synchronising with the patient's inhalation, our technology's consumption of medication is significantly lower with the same effectiveness. The integrated solution allows direct operation via the intensive ventilator and eliminates the need for additional external devices.

LEOMETRY

Leometry measures the respiratory gas exchange to estimate the energy metabolism. As the energy produced is equal to the energy consumed, the energy metabolism can be visualised in real time by measuring O_2 consumption and CO_2 production as part of indirect calorimetry.
Based on the breath-by-breath measurement of oxygen consumption (VO_2) and carbon dioxide production (VCO_2), the resting energy requirement is determined in accordance with Weir's modified formula.

CO_2 option

Main or sidestream flow sensors complete close monitoring of ventilated patients in both routine and in emergency situations. The measured values can be displayed numerically, as a curve or as a loop.

EIT with elisa VIT module

Continuous bedside monitoring based on electrical impedance tomography (EIT) facilitates continuous assessment of the effects of ventilation on lung function.
This non-invasive and radiation-free imaging procedure is based on the reconstruction of the impedance distribution in the human thorax. Transthoracic imaging resulting from tension measurements on the surface of the thorax allows the assessment of inhomogeneous lungs, continuous adaptation of ventilator settings, optimisation of therapeutic positioning and detection of trigger asynchronies.

LEOCLAC

Permanently adapting the inspired oxygen concentration to the patient requirements is of particular importance in ventilation medicine. To prevent conditions of hypoxia as well as hyperoxia, the user is normally guided by non-invasive pulse oximetry data and spot-check measurements of the gas exchange by blood gas analysis.
The LEOCLAC function supports clinical users in their routine. When the user specifies a defined frame, the special LEOCLAC algorithm automatically regulates the inspiratory oxygen concentration based on the SpO_2 measurement performed by the elisa.

Volumetric capnography

Volumetric capnography primarily measures the kinetics of carbon dioxide elimination. A volumetric capnogram contains extensive physiological information about metabolic production, transport via the bloodstream and the elimination of CO_2 in the lungs. VCap is also the tool for measuring dead space, as it permits detailed analysis of each tidal volume's functional components, providing useful clinical information on the efficiency of pulmonary gas exchange.

Volumetric oximetry

Oxygen consumption ($\dot{V}O_2$) is an indicator of metabolism and can be used to assess the severity of a disease process or the success of the therapeutic measures. The difference between the inspiratory and expiratory oxygen concentration provides information on the oxygen consumption. Based on breath-by-breath measurements with the ZISLIN metabolic module, oxygen uptake can be continuously determined and its progression graphically displayed.

PESO

Oesophageal pressure monitoring

Bedside measurement of oesophageal pressure using a modified gastric tube reflects the changes in pleural pressure under ventilation.
The resulting measured values allow PEEP optimisation, the avoidance of alveolar overinflation with the development of barotrauma, unmasking of patient-ventilator asynchrony, estimation of respiratory muscle effort and measurement of intrinsic PEEP during spontaneous breathing.

Manoeuvres

PEEPfinder

Thanks to state-of-the-art sensor technology and a high-resolution sampling rate, the PEEPfinder features algorithms to reliably determine the inflection points and therefore the necessary PEEP and ventilation range. Easy-to-understand visualisation facilitates checking the measured values in comprehensible manner, a transparent PEEP setting and the assessment of stress indices and static compliance.

FRC

FRC measurement during ventilation enables bedside determination of the functional residual capacity (FRC) of the lungs, i.e. the volume of air that remains in the lungs after normal exhalation.
FRC determination provides important information about lung function, statements about the PEEP setting and the recruitability of the lungs, as well as the realisation of lung-protective ventilation.

Special modes

ALPV

The ALPV mode combines the previous advantages of hybrid closed-loop ventilation with the current requirements of lung-protective ventilation. Pressure-controlled ventilation with guaranteed volume (comparable to dynamic BiLevel) is combined with pressure-supported spontaneous breathing with guaranteed volume (dynamic PSV) such, that the target value for mandatory and pressure-supported spontaneous breathing is a tidal volume of 6 ml/kg ideal BW. At the same time, any trapped air is continuously monitored and equalised if necessary. ALPV is used as a weaning mode and generalised mode.

BiLevel NRV

As a consistent advancement of the BiLevel strategy with an upward ramp, this NRV modification results in a lower rate of pressure increase and a slower pressure drop from the upper to the lower PEEP level. BiLevel-NRV (Near Relaxation Ventilation) is based on the idea that in NRV mode, there is less difference between actual lung volume and pressure-specific relaxation volume in the respiratory system than in any currently available mode. With this form of ventilation there are no more plateaus, only ramps. The entire time of the inspiratory pressure level now corresponds to an upward ramp, while the entire time of the lower pressure level represents a downward ramp.
The intention is to reduce high peak flows, to avoid unsuccessful respiratory efforts during pressure changes and to reduce dynamic overinflation.

WOBOV Work Of Breathing Optimised 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. In this mode, the breathing pattern associated with the highest energy efficiency is continuously calculated and the ventilation control (modified Otis equation) adapted accordingly. If ventilation is still insufficient, WOBOV will gradually increase ventilator support again, i.e., the algorithm will compensate the deficit up to the pre-set minute ventilation when necessary.

CPR mode

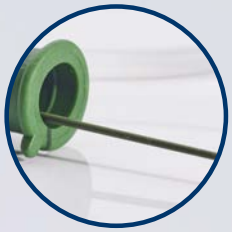
Special emergency mode for ventilation under resuscitation conditions.

PAPS Proportional Adaptive Pressure Support

Contrary to the fixed pressure support in the PSV mode, the spontaneously breathing patient receives proportional pressure support in the PAPS mode. The effective pressure support in this mode adapts to the elevated elastic and restrictive resistances. A special breath-by-breath determines the work of breathing due to higher flow and airway resistances and adapts the pressure support required for compensation.

PesoCath

Lung-protective through continuous peso measurements with PesoCath.



Wire-in-wire system

Easy retraction of the insertion wire thanks to a wire-in-wire solution and special coating.

Oesophageal balloon

The special oesophageal balloon enables outstanding response behaviour for sudden pressure changes and is designed for the dynamic requirements of transpulmonary pressure measurement.

Ventilator interface

Connection for oesophageal and transpulmonary pressure monitoring or position-dependent for gastric pressure.

Simply safe in emergencies

Direct channel for emergency suction, auscultation and drainage of gastric juice.

Enteral nutrition latest standard

Direct connection to the new standard for connectors in accordance with DIN EN ISO 80369 with practical sealing crown.

elisa

As agile as life itself.

Options	elisa 300	elisa 500	elisa 600	elisa 800
Transpulmonary pressure monitoring	–	✓	+	✓
Cuffscout: Cuff monitoring & adjustment	–	✓	+	✓
IAP: Intraabdominal pressure monitoring	–	✓	+	✓
LEOCAP: CO_2 mainstream sensor	+	+	+	+
LEOSTREAM: Sidestream sensor	+	+	+	+
LEOLYZER: Multi-gas sensor	+	+	+	+
LEOBRAIN: Depth-of-sedation measurement module	+	+	+	+
ZISLIN metabolic module	+	+	+	+
SpO_2 sensor	+	+	+	+
Sedaconda	+	+	+	+
Nursecall	+	+	+	+
elisa VIT Module	–	–	+(*)	+

✓ integrated + optional – not available * in preparation

Licenses	elisa 300	elisa 500	elisa 600	elisa 800
LEOCLAC	+	+	+	+
LEOMETRY	+	+	+	+
BiLevel NRV	+	+	+	+
FRC manoeuvres	+	+	+	+
Non-invasive respiratory support for neonates (nBiLevel, nCPAP)	+	+	+	+

Interfaces				
Number of PDMS interfaces	2	2	–	–
Number of universal BF interfaces for external accessories or PDMS	2	4	2	2
Mesh nebuliser	–	–	+	✓
USB	2	2	2	✓
HDMI or DVI (for service purposes)	1	1	1	1
RJ 45	1	1	2(+)(*)	2(+)
Up to 5 additional interfaces via elisa@megs	+	+	+	+

✓ integrated + optional – not available * in preparation

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