



EVA_{NEO}

VERSATILE VENTILATION
SOLUTION FOR YOUR NICU

STATE-OF-THE-ART VENTILATION AND SENSOR TECHNOLOGY

EVA_{NEO} is a compact intensive care ventilator for children and preterm infants (adult option available). Ventilation can be performed in both pressure and volume controlled modes. Basic ventilation modes can be combined with additional options, such as PRVC, PSV and tube compensation ensuring optimal patient support. With its internal, extremely quiet turbine and rechargeable battery range of up to eight hours, EVA_{NEO} is literally independent of gas and power supplies.

In developing EVA_{NEO}, priority was given to immediate operational readiness. After a short self-test, EVA_{NEO} is ready for operation without any complex calibration processes. The suitable ventilation scenario can be selected with the push of a single button. Thanks to the intuitive operational concept, it is easily adjustable to the patient's individual needs.



NON-INVASIVE VENTILATION IN COMBINATION WITH ABDOMINAL RESPIRATION SENSOR

NIV in preterm infants does not allow a flow sensor close to the air way opening.

To synchronize respiration with the ventilator, the abdominal motion can be detected using an

abdominal respiration sensor (<30 ms trigger signal), allowing lung protective ventilation strategies using EVA_{NEO}.

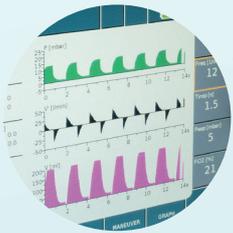
THESE FEATURES MAKE EVA_{NEO} UNIQUE.



+ Heated electronic flow sensor



+ Turbine driven with internal and external battery backup



+ Large 12.1" color touch screen



+ Simple, intuitive operation



+ Abdominal respiration sensor for synchronized non-invasive ventilation and apnea detection



INVASIVE VENTILATION WITH PROXIMAL FLOW SENSOR

The EVA_{NEO} ventilator is intended to be used for invasive and non-invasive ventilation whereas invasive ventilation is usually applied in intensive care setting or operating room. Non-invasive ventilation is used for spontaneous breathing patients where EVA_{NEO} is being connected via mask or helmet to the patient. The EVA_{NEO} can be used either for short-term or long-term ventilation or respiratory support in ICU and NICU settings. EVA_{NEO} offers a variety of different breathing maneuvers as well as the increasingly important high flow therapy. Additionally it offers the expiratory CO₂-Measurement as sidestream or mainstream technology.

Another important factor: thanks to the integrated MASIMO® technology, all Rainbow parameters are available such as Pulse, SpO₂, SpHb, PVI and SpCO.

Electronic flow sensor

The new connectivity with an electronic flow sensor allows more accuracy of flow and volume measurement in all patient groups. The electronic flow sensor is available as single use or multiple use sensor. It is easy to clean and allows flow measurement without any calibration.

Inner-clinical transport

In a clinical environment, EVA_{NEO}'s optimized functionality and multiple ventilation options allow best possible treatment. Due to its lightweight construction, internal turbine and battery backup inner-clinical transport on trolley is as easy as you expect. EVA_{NEO} offers the complete variety of ventilation modes. In neonatal ventilation EVA_{NEO} convinces with its gentle ventilation, and, if necessary for seriously ill adult patients (optional), EVA_{NEO} offers a more robust and stronger ventilation to guarantee the highest safety to the patient.

TECHNICAL DATA

General

| | |
|----------------|---|
| Patient group | Adults, children, premature/newborn infants |
| Classification | II b, according to 93/42 EEC |
| Dimensions | 410 x 283 x 383 mm (WxHxD) |
| Weight | 10.0 kg (without exchangeable battery) 10.6 kg (with exchangeable battery) |

Power supply

| | |
|-------------------|--|
| Mains | 100-240 V AC, 50-60 Hz |
| Power input | max. 150 W |
| Power consumption | 1.667 - 0.625 A |
| Battery | 25.2 V DC, 3.12 Ah, approx. 4 h (8 h incl. exchangeable battery) |
| Charging time | approx. 4.5 h (internal), approx. 6 h (exchangeable battery) |
| Connection | 100 - 240 V AC, \pm 10% |

Gas supply

| | |
|---------------------|---|
| AIR | integrated turbine, Peak Flow > 230 l/min. Leakage Comp. > 50 l/min. |
| O ₂ /HPO | 2.7 - 6 bar + 0.5 bar, HPO/LPO mode, oxygen 93 compatible |
| O ₂ /LPO | 0 - 1.5 bar / 0.5 - 5 l/min. |
| Protection class | IP 21 |
| UMDNS code | 17-429 |
| GMDN code | 42411 |

Operation modes

Invasive and non-invasive ventilation

Ventilation modes

| | |
|---|---|
| Volume controlled | VC-CMV, VC-S-IMV |
| Pressure controlled (invasive/non-invasive) | PC-CMV, nPC-CMV, PC-ACV, nPC-ACV, PC-ACV+, nPC-ACV+, PC-S-IMV, nPC-S-IMV, DUOPAP, nDUOPAP, CPAP, nCPAP, CPAP B/U, High Flow O ₂ Therapy |
| Ventilation options | PSV, PRVC, ETT compensation |
| Maneuvers | Inspiration hold, SpHb, Aerosol, Preoxygenation, P0.1 |
| Fast track control keys | Adults, Children, Premature/Newborn infants |

Ventilation settings

| | |
|--|--|
| P _{insp} | 1 ... 95 mbar (EVA), 1 ... 55 mbar (EVA _{NEO}) |
| P _{high} (DUOPAP) | 1 ... 95 mbar (EVA), 1 ... 55 mbar (EVA _{NEO}) |
| PEEP | 0 ... 35 mbar |
| Δ P _{supp} | 1 ... 55 mbar |
| Inspiration time | 0.15 ... 30 sec. (NEO-Mode) 0.2 ... 30 sec. (Ped./Adult-Mode) |
| Expiration time | 0.15 ... 30 sec. (NEO-Mode) 0.2 ... 30 sec. (Ped./Adult-Mode) |
| Breathing rate | 1 ... 200 bpm. (NEO-Mode) 1 ... 150 bpm. (Ped./Adult-Mode) |
| I:E | 1:200 ... 200:1 (Neo-Mode) 1:150 ... 150:1 (Ped./Adult-Mode) |
| Trigger flow | 0.2 ... 15 l/m |
| Trigger external (EVA _{NEO}) | 0.2 ... 15 Arb |
| Expiratory trigger | 5 ... 70% |
| Ramp up time | 0.06 ... 30 sec. |
| FiO ₂ | 21 ... 100% |
| Apnea time | 4 ... 60 sec. |
| Tidal volume (VCV) | 50 ... 2,000 ml |

Ventilation settings

| | |
|--------------------------------|---|
| Tidal volume (PRVC) | 2 ... 2,000 ml |
| High Flow O ₂ | 2 ... 60 l/min. |
| Preoxygenation | |
| FiO ₂ Concentration | 21 ... 100% absolute, 1 ... 79% relative |
| Preoxygen. time | 10 ... 180 sec. |
| Nebulizer outlet | |
| Pressure outlet | 1.5 bar |
| Nebulizer flow | approx. 5 l/min. (at 5 bar oxygen inlet pressure) |
| Nebulization | 100% O ₂ concentration |
| Nebulization time | 5 ... 30 min. |
| Tube compensation | |
| \emptyset | 2 ... 12 mm |
| Compensation | 0 - 100% |
| Alarms (selection) | PAW high/low, occlusion, MV high/low, apnea, f high, PEEP high/low, leakage, VT high/low, VT not reached, technical alarms, Gas alarms Optional: CO ₂ alarms, MASIMO alarms |

Measured values display

| | |
|-----------------------|--|
| LOOPS | V(P), V'(V), V'(P) |
| Trend display | up to 28 trends selectable |
| Trend duration | 1h, 6h, 12h, 24h, 72h |
| Curve display | P(t), V(t), V'(t), optional: CO ₂ (t), pletysmography |
| Parameter display | Pplat, Ppeak, Pmean, PEEP, VT _e , VT _{espon} , Vtleak, MVe, MV _{espon} , f _{total} , f _{spon} , T _{insp} , T _{exp} , V' _{max} , V' _{min} , I:E, resistance (R), compliance (C), RSB, FiO ₂ /O ₂ Optional: EtCO ₂ , SpO ₂ , pulse, PI, PVI, Spmet, SpHB, SpCO, SpOC |
| Pressure | |
| P _{Peak} | -20 ... 99 mbar |
| P _{Plat} | -20 ... 99 mbar |
| P _{Mean} | -20 ... 99 mbar |
| PEEP | -20 ... 99 mbar |
| Volume | |
| Exp. tidal volume | 0 ... 3,000 ml |
| Insp. tidal volume | 0 ... 3,000 ml |
| Exp. tidal volume | 0 ... 3,000 ml (V _{tspont} .) |
| Leakage volume | 0 ... 1,000 ml (V _{tleak}) |
| Minute volume | 0 ... 999 l/min (M _{ve}) |
| Minute volume | 0 ... 999 l/min (M _{vspon}) |
| Flow | |
| Insp. Flow | -200 ... 200 l/min |
| Exp. Flow | -200 ... 200 l/min |
| Time | |
| T _{insp} | 0 ... 60 sec. |
| T _{exp} | 0 ... 60 sec. |
| Breathing rate | |
| (f _{total}) | 0 ... 300 l/min |
| Breathing rate | |
| (f _{spon}) | 0 ... 300 l/min |
| I:E ratio | 1:200 ... 200:1 (Neo-Mode) 1:150 ... 150:1 (Ped./Adult-Mode) |
| Apnea | 0 ... 60 sec. |

TECHNICAL DATA

Measured value display

Diagnostics

Resistance (R) 0 ... 1,000 mbar l/sec.

Compliance (C) 0 ... 650 ml/mbar

Rapid shallow breathing index

(RSB) 0 ... 9,999 l/min x l

Time constant 0 ... 20 sec.

Pressure time product (PTP)

0 ... 999 mbar x sec.

FiO₂ 0 ... 100%

O₂ 21 ... 100%

EtCO₂

Vol% 0 ... 90

mmHg 0 ... 12

kPa 0 ... 999

MASIMO® parameters (optional)

Pulse 0 ... 240 bpm

PVI 0 ... 100%

PI 0.02 ... 20%

SpMet 0 ... 99,9%

SpCO 0 ... 99%

SpOC 0 ... 35 ml/dl

SpHb g/dl

Display

12.1" TFT color touch screen, resolution 1024 x 768, antireflecting

Interface SD, Ethernet, RS232, nurse call

Sensors

Flow/Volume Flow sensor single-use for newborns, infants and adults
Flow sensor reusable for newborns (PNT B) and adults (PNT D)
Electronic flowsensor for newborns and adults (reusable/disposable)

FIO₂ El. chem. oxygen cell (EVA, EVA_{NEO})

Optional CO₂ measurement (main or sidestream method), Masimo rainbow® SET (SpO₂, pulse, PI, PVI, SpHb, Spmet, SpCO, SPOC)

Standards (extract)

60601-1, 60601-1-2, DIN EN ISO: 14971,
80601-2-12, ISO 10651-3:1997



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