

TRIGO

the compact electronic anaesthesia unit
for the induction



By extending its product range with the small electronic wall-mounted anaesthesia unit **TRIGO** EKG completes its compact class of anaesthesia units. With the performance of a bigger mobile anaesthesia machine the **TRIGO** finds its place as wall mount device in the induction. Besides the electronic gas mixer and the Multimode-Anaesthesia-Ventilator including different ventilation parameters also various optional monitoring functions can be integrated (O₂, CO₂, anaesthetic agents, N₂O). These are displayed numerically or graphically and adjusted either by touch or by a conventional wheel. As a modern wall mount device with the installation depth of a bookshelf ("shelf unit") the **TRIGO** offers more freedom of movement in the induction room.

Functions:

- 6,4" colour touch-screen TFT-LCD with central rotary button
- dialogue handling at the screen
- self-test and control of the single components in the standby mode
- automatic leakage test
- electronic control of the adjusted gas dosage
- electronic supervision of the pressure gas supply with display and alarm function for lower deviation in pressure
- compensation of variations in pressure supply
- detection of the system compliance
- dynamic compliance compensation
- wide adjustment range from 200 ml to 11 litres
- precise resolution and display of the scale in 20 ml steps
- automatic switchover of the scale at higher flow values
- automatic fresh gas dosing for low flow operation
- low-pressure-technology from 2 bar pressure
- display of the measured values as curves and numeric values
- configurable basic adjustments, specific for each ventilation mode
- default parameters can be defined
- integrated monitor for volume, pressure, O₂, anaesthetic agents, N₂O, CO₂
- electronic PEEP
- for neonatal, paediatric and adult application
- error state and service information logging
- best optic and acoustic visualising of the alarms
- single vaporizer holding for different vaporizers (Halothane, Enflurane, Isoflurane, Sevoflurane, Desflurane)
- compact circle system, CO₂-absorber canister is exchangeable during operation without any leakage
- RS232 interface for connection to electronic anaesthesia documentation and clinical IT-network

Security system:

- electronic O₂-deficiency detection
- electronic N₂O-blockage
- O₂-emergency dosage (min. 4 L/min O₂ flow in case of total failure)
- emergency dosage for gas supply failure: failure AIR: 100% O₂, failure N₂O: 100% O₂, failure O₂: 100% AIR
- automatic check for correct covering of the single gas supply channels every time the device is switched on
- operation is guaranteed for at least 30 minutes at power supply failure by an internal rechargeable battery

Ventilation parameters:

- CMV (volume controlled ventilation)
- PCV (pressure controlled ventilation)
- MAN./SPONT. (manual, spontaneous), spontaneous ventilation with apnea control
- SIMV (synchronous intermittent mandatory ventilation)
- MMV (mandatory minute ventilation)
- ASB (pressure support ventilation)

Technical Specifications:

Ventilation parameters:

CMV-Mode:

Tidal volume: 20 - 1500 ml
Frequency: 6 - 60 min⁻¹
I:E-ratio: 2:1-1:4 at Ti 0,3 – 10 s
Pressure limitation P_{MAX}: (PEEP +5) to 80 hPa

PCV-Mode:

Inspiratory flow: 10 - 80 L
Frequency: 6 - 60 min⁻¹
I:E-ratio: 2:1-1:4 at Ti 0,3 – 10 s
Pressure limitation P_{MAX}: (PEEP +5) to 80 hPa

SIMV-Mode (Option):

Tidal volume: 20 - 1500 ml
Frequency: 4 - 60 min⁻¹
I:E-ratio: 2:1-1:4 at Ti 0,3 – 10 s
Pressure limitation P_{MAX}: (PEEP +5) to 80 hPa
Flow trigger: 3 L/min

MMV-Mode (Option):

in preparation
Frequency: 4 - 60 min⁻¹
I:E-ratio: 2:1-1:4 at Ti 0,3 – 10 s
Pressure limitation P_{MAX}: (PEEP +5) to 80 hPa
Flow trigger: 3 L/min

ASB-Mode (Option):

in preparation

Neonatal-Mode (Option):

in preparation
Tidal volume: 5 - 350 ml
Frequency: 15 - 150 min⁻¹

for all ventilation modes:

PEEP (integrated): 0 - 20 hPa
Inspiratory pause: 0 - 50 % Ti

General Data:

Gas supply: AIR, O₂, N₂O
Flow: min. 11 l/min
Fresh gas: O₂/AIR or O₂/N₂O
flow (standby): 0 l/min
flow (operation): 0.2 - 11 l/min
resolution: 0.1 l/min
accuracy: ± 10 % rel.
O₂-concentration: 25 - 100 %
resolution: 1 Vol%
accuracy: ± 10 % rel.
O₂-Flush: min. 35 l/min
Driving gas: compressed air or oxygen
pressure: 2 - 10 bar
flow: max. 180 l/min
consumption: approx. equal to the respective minute volume
Patient system: „bellows in bottle“ upright
Display: coloured, TFT-LCD 6,4"
Power supply: internal: accumulator 12V, 3,2 Ah (tightly installed)
external: 100-240V, 50/60Hz
Power consumption: approx. 60 VA
Operating temperature: 15 - 35 °C
Dimensions: 485x300x320 mm (L x B x H)
Weight: 29 kg

Monitoring:

Pressure measurement:

Measuring range: -10 - 90 hPa
Accuracy: ± 4% or ± 1hPa
Resolution: 1 hPa

Volume measurement:

Measures: tidal volume, minute volume, frequency
Tidal volume: 0 - 2000 ml
Accuracy: ± 8%
Minute volume: 0 - 99 l/min
Accuracy: ± 8%
Frequency: 3 - 150 min⁻¹
Accuracy: ± 1 min⁻¹
Resolution: 1 min⁻¹

Anaesthetic agent measurement (option):

with/without automatic agent identification

Anaesthetic agents: Halothane, Enflurane, Isoflurane, Sevoflurane, Desflurane
Measuring ranges: HAL, ISO: 0 - 8.5 Vol%,
ENF, SEV: 0 - 10 Vol%,
DES: 0 - 22 Vol%
Accuracy: ± (0.15 Vol% + 15% rel.)
Resolution: 0.1 Vol%
MAC calculation: minimum alveolar concentration

N₂O-measurement (option):

Measuring range: 0 - 100 Vol%
Accuracy: ± (2 Vol% + 8% rel.)
Resolution: 1 Vol%

CO₂-measurement (option):

Measuring range: 0 - 10 Vol%
Accuracy: ± 0.5 Vol% or ± 12% rel.
Resolution: 0.1 Vol%

Oxygen measurement Galvanic Cell (option):

Measuring principle: Galvanic Cell
Measuring range: 0 - 100 Vol%
Accuracy: ± 1 Vol% or ± 2% rel.
Resolution: 1 Vol%
T₉₀: approx. 14 seconds
Sensor life time: approx. 1-4 years, depending on the measured oxygen concentration

Oxygen measurement paramagnetic (option):

Measuring principle: paramagnetic
Measuring range: 0 - 100 Vol%
Accuracy: ± 1 Vol% or ± 2% rel.
Resolution: 1 Vol%
T₉₀: 500 ms
Note: only available with gas bench for anaesthetic agents and/or CO₂

Alarms:

For all measurements lower and upper alarm limits are adjustable (inspiratory and expiratory values for anaesthetic agents, N₂O, CO₂, paramagnetic O₂-measurement, inspiratory value only for O₂-measurement by galvanic cell).

Above listed data are subject of change without further notice.