

MORPHEUS ND

HYBRID - Touch Screen

Anaesthesia machine

code: MND.SE-T

Rev. 10 01/08/2022



GENERAL DESCRIPTION

The Morpheus_ND HYBRID anaesthesia unit is completed with:

- electronic gas mixing system (integrated in the Touch Screen)
- electronic lung ventilator with 15" TFT colour Touch Screen display
- valves group: open, semi-closed, closed, heated, with soda lime absorber of 1,5 Kg. capacity
- SIARETEX rapid connection device, Selectatec compatible for mounting 2 vaporizers (1 in the front; 1 "parked positioned" in the back)
- gas supply group
- gas analysis system (optional)
- trolley (optional)

Intended use

The Morpheus ND HYBRID anaesthesia unit with lung ventilator, with 15" TFT colour Touch Screen display can be used on adult, children and newborn patients.

The operating principle we have called "HYBRID" is unique because two systems coexist simultaneously: the main system consists of a special new age silent technology turbine that allows operation without the need of gas and a second oxygen emergency system that intervenes in case of anomaly of the main system

The microprocessor automatically chooses which system to use, giving priority to the turbine as it permits to reduce the gas consumption (very important in places where the compressed air is not available). The user shouldn't intervene as the system is completely automatic.

This new age technology turbine is extremely silent (<29dB) also during its operation, and thanks to the exclusive cooling system, it guarantees a life of more than 20,000 hours. In case of failure of one of the 2 systems, the other one is available. It's like having an emergency ventilator.

In addition, the Morpheus ND incorporates the Protocolock safety device that allows to identify any error in the connection of gases that could be fatal for the patient.

The Morpheus ND HYBRID is suitable for administration of Oxygen - Air - Nitrous Oxide / Xenon - Halothane - Enflurane - Isoflurane - Sevoflurane - Desflurane mixtures.

STANDARDS



The anaesthesia unit complies with the essential requirements and it is realized according to the references of the Annex II of 93/42/EEC Medical Devices Directive.

Class and type according to EN 60601-1 Class I Type B

National classification of medical devices Z1203010101

Class according to 93/42 EEC Directive Class IIb, Rule 9, Type: Active according to MDD 93/42 EEC Annex IX

Electromagnetic compatibility (EMC) Conform to the requirements of the EN 60601-1-2 and following updating's

Norms EN 60601-1 :2006/A1 :2013; EN 60601-1-2 :2015; EN 60601-2-13:2006/A1:2007; EC 60601-1-6:2010/AMD1:2013; EN 60601-1-8:2007 / A11:2017; EN 62304:2006/ AC: 2008; EN ISO 14971:2012; EN ISO 4135:2001; DIR. 2011/65/CE; D.Lgs 49/2014

File number reference 2164224

Unique Device Identification (UDI) number 0 80 3373726 0 1 9 7

Basic-UDI-DI

ENVIRONMENTAL CONDITIONS

Operating

- Relative humidity: 30 - 95% non-condensing
- Temperature: from +10 to +40°C

Storage

- Relative humidity: < 95%
- Temperature: from -25 to +70°C

STRUCTURE

Dimensions (W x D x H) 55 x 51 x 42,5 (W x D x H) cm

Lung ventilator Light aluminium alloy and plastic moulds

Weight 25 kg (without accessories)

Optional Support for 2 (two) vaporizers on horizontal guide On horizontal guide: SIARETEX rapid connection device, Selectatec compatible for 2 vaporizers

Trolley (optional)

- Pivoting antistatic wheels, diameter 100 mm (2 with brakes)
- No. 1 full extension drawers
- Worktop: 60 x 34 cm (W x D)
- No. 2 vertical cylinders supports, on the back side (for cylinders up to 5 litres capacity) and round rubber pads
- Auxiliary power supply sockets: No. 1 220 Vac Schuko socket (max 6 A).

Dimensions (trolley) 75,5 x 73,5 x 92,5 (W x D x H) cm (w/o optional vital signs Patient Monitor)

Trolley weight 37 kg (without accessories)

TECHNICAL DATA

Electric power supply 100 - 240Vac / 50 - 60Hz

Power 200 VA max.

Internal battery NiMh 4,5 Ah 12Vdc

Internal battery operation Around 120 minutes operation

Battery re-charging time About 10 hours

External electric connections	<ul style="list-style-type: none"> ▪ RS232 for serial connection of Gas Analyzer ▪ USB 1 (connector for CPU programming) ▪ USB 2 (connector for transfer patient data, events, trends)
Shelf lighting	12Vdc by led
Illuminated auxiliary flow meter	Calibrated, illuminated

ELECTRONIC GAS MIXING SYSTEM

	<ul style="list-style-type: none"> ▪ It has the function to regulate the capacity and the concentration of gas mixture (Air, O₂, N₂O) by displaying them on the right side of the TFT monitor (15") colors monitor and deliver it to the anaesthetic gas vaporizer. ▪ It allows to select the mixture to be delivered (Air - O₂, or N₂O - O₂) and the oxygen enrichment for delivered mixture in case of emergency. The anaesthesia module includes a device which guarantees a minimum concentration of 25% of oxygen with all mixtures set different from air / oxygen (MIX-LIFE device) ▪ PROTOLOCK system. The exclusive SIARE safety device that analyzes the coherence of the gases connected to the machine when the machine is switched on, warning the operator in case of incorrect connections, thus avoiding possible fatal accidents to the patient ▪ Through the three pressure gauges on the front panel it allows the continuous control of medical gas feeding pressure coming from the gas pipelines system or from the cylinders. ▪ The flowmeter is electronically controlled with double coupled valves to always guarantee correct delivery even in the event of a fault. An electronic flow meter continuously monitors the correct supply of gases ▪ The electronic flowmeter box provides the option on demand to use an alternative anaesthetic gas in spite of N₂O: the Xenon (Xe).
AUTO TEST	When the electronic flow meter is switched on automatically, various control tests are performed.
Fresh gases flow	<ul style="list-style-type: none"> ▪ From 0.5 to 12.5 L / min with oxygen and air. ▪ From 0.5 to 12.5 L / min with oxygen and nitrous oxide (Minimum flow of oxygen 0.2 l / min). ▪ Resolution: 0.1 L / min.
Oxygen concentration	<ul style="list-style-type: none"> ▪ From 25% to 100% with mixtures of nitrous oxide and oxygen ▪ From 21% to 100% with mixtures of air and oxygen ▪ Resolution: 1%
Medical gas supply	<p>OXYGEN</p> <ul style="list-style-type: none"> ▪ Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) ▪ Minimum flow required 90 L / min <hr/> <p>NITROUS OXIDE</p> <ul style="list-style-type: none"> ▪ Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) ▪ Max. required flow 9 L/min. <hr/> <p>MEDICAL COMPRESSED AIR</p> <ul style="list-style-type: none"> ▪ Pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) ▪ Max. required flow 15 L/min.

Safety devices	<ul style="list-style-type: none"> ▪ AGAINST THE ADMINISTRATION OF HYPOXIC MIXTURES MIX-LIFE: it always guarantees a minimum concentration of 25 % oxygen on mixtures which includes nitrous oxide. ▪ IN CASE OF WRONG MEDICAL GASES CONNECTIONS Acoustic and visual alarm (Protolock) ▪ IN CASE OF LACK OR LOW OXYGEN PRESSURE CUT-OFF: audible alarm with immediate cut-off of nitrous oxide delivery. ▪ AGAINST OVERPRESSURE IN FLOWMETER BOX: pressure sensor for the protection of the flowmeter components ▪ IN CASE OF LACK OR COMPRESSED AIR LOW PRESSURE: all the devices (gas feeding) supplied by compressed air are automatically supplied by oxygen. ▪ AGAINST THE SIMULTANEOUS DELIVERY OF AIR AND N2O: <ul style="list-style-type: none"> ▪ Selection by only one icon on the touch screen. ▪ ALARM fan lock
Gauges	No. 3 on front panel (O ₂ - N ₂ O - AIR), scale 0 - 6 bar
Control for activation of exit of fresh gas for manual ventilations.	<ul style="list-style-type: none"> ▪ MANUAL mode setting (MAN) from Touch Screen and ventilator keyboard with automatic deviation of fresh gas to the manual system of anaesthesia unit valves group, or to a "TO and FRO" circuit with visual indicator. ▪ AUTOMATIC deactivation of manual ventilation systems directly by ventilator control.
O₂ emergency by-pass	By apposite membrane key on the front shelf, and touch screen: max flow 30 L/min.
IN gas sockets on gas supply group	<ul style="list-style-type: none"> ▪ No. 3 sockets for distribution system (O₂ - N₂O - AIR) ▪ No. 2 sockets for cylinder (O₂ - N₂O) - Optional
OUT gas sockets on gas supply group	<ul style="list-style-type: none"> ▪ No. 1 sockets for O₂ ▪ No. 1 sockets O₂ - AIR for active scavenger feeding (Optional) ▪ No. 1 fresh gas connector for external use for ex. TO AND FRO (selectable by apposite membrane key on the front shelf - AUX).
Other	<ul style="list-style-type: none"> ▪ Socket for recycle of exhaust monitor gas ▪ Connection for anaesthetic gas scavenging (optional device: active type, or passive type)
Patient connections	Male conic connectors 22 mm / Female of 15 mm (according to EN ISO 5356-1:2015 norm)
<i>Overall circuit specifications – Resistance (Pressure / Flow)</i>	Adult patient circuit I. D. 22 mm, <ul style="list-style-type: none"> ▪ flow of 30 l / min, pressure 0.35 cm H₂O; ▪ flow of 15 l / min, pressure 0.14 cm H₂O; ▪ flow of 2.5 l / min, pressure 0.01 cm H₂O.
<i>Overall Circuit Specifications -Compliance</i>	Adult patient circuit I. D. 22 mm: 0.56 ml/cm H ₂ O

BREATHING SYSTEM

- Compact system with automatic connections, easy dismountable and autoclavable.
- It allows the ventilation in modality: real open circuit, semi-closed circuit, closed circuit at low flows.
- The system also allows the spontaneous and manual ventilation in case of anaesthesia unit breakdown or machine off.
- Top special CO₂ absorber canister of 1,5 Kg with rapid connection: this allows canister replacement also during interventions (the canister is autoclavable and reusable).
- The recycling system is a selective type; hence the soda lime and fresh gas consumption are reduced to the minimum.
- The heated valves group reduces the condensation and heats the fresh gas.
- The transition from one ventilation modality to another is completely controlled by the ventilator without any user's action on valves group.

Inspiratory and expiratory pressure / flow ¹

- 30 l / min if the anesthetic breathing system is intended for adult patients; pressure: 2.0 cm H₂O inspiratory and 3.8 cm H₂O expiratory
- 15 l/min if the anesthetic breathing system is intended for pediatric patients; pressure: 1.2 cm H₂O inspiratory and 2.3 cm H₂O expiratory
- 2,5 l/min if the anesthetic breathing system is intended for newborn patients; pressure: 0.5 cm H₂O inspiratory and 1.1 cm H₂O expiratory

LUNG VENTILATOR FUNCTIONAL FEATURES

User's interface	15" TFT high resolution colour display with membrane keyboard and encoder
Operation principle	<ul style="list-style-type: none"> ▪ Time cycled at constant volume ▪ Pressure cycled ▪ Microprocessor controlled flow ▪ Spontaneous breath with integrated valve
Gas	<ul style="list-style-type: none"> ▪ Medical compressed Air or Oxygen supply with pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) ▪ Low pressure compressor drives independent from the gas supply system (in this case it's necessary a pneumatic Oxygen supply only for the delivery of fresh gases max 14 l/min). ▪ Oxygen (in case of compressor failure) with pressure included between 280 kPa and 600 kPa (2.8 - 6 bar).
Pressure automatic compensation	Automatic compensation of atmospheric pressure on measured pressure: present
Dead space compensation	Automatic compensation of mechanical and patient circuit dead space
Leak % visualization	Present
Visualization of the oxygen consumption calculation	Present

¹ at a fresh gas flow rate of 12.5 l / min (maximum fresh gas inlet flow)

SELF TEST	<ul style="list-style-type: none"> ▪ Primary test: at anaesthesia unit's start-up, a control test of low-pressure compressor operation, medical gas supply presence, INSP. and EXP. flow sensors operation, patient circuit leakage check, pressure sensor back-up battery state, oxygen cell state, correct medical gases connections (Protolock), integrity of audible alarm is automatically performed. This test takes around 15 seconds ▪ Tests on demand: the anaesthesia unit has a tests on demand which is activated by the user in the ventilator menu. This subtest permits to verify the dead space and losses or to perform the oxygen cell calibration.
Respiratory parameters default setting	Present (Neonatal, Paediatric, Adult)
Ventilation modalities	APCV, APCV-TV, PSV, PSV-TV, VC/VAC, VC/VAC BABY (integrated NEONATAL ventilation mode), V-SIMV (Volumetric +PS; SPONT), P-SIMV (Pressometric +PS; SPONT). SIGH, Apnea BACK-UP (NIV PSV, NIV PSV-TV), MAN (Manual).
Breathing rate VC/VAC	<ul style="list-style-type: none"> ▪ From 4 to 50 bpm (Adults) ▪ From 4 to 100 bpm (Pediatric) ▪ From 4 to 150 bpm (Neonatal)
Inspiratory Time / Expiratory Time (maximum, minimum)	<ul style="list-style-type: none"> ▪ Ti min = 0.036 sec (minimum inspiratory time) ▪ Ti max = 12 sec (maximum inspiratory time) ▪ Te min = 0.08 sec (minimum expiratory time) ▪ Te max = 13.6 sec (maximum expiratory time)
Breathing rate V-SIMV e P-SIMV	<ul style="list-style-type: none"> ▪ From 1 to 30 bpm (Adults) ▪ From 1 to 45 bpm (Pediatric) ▪ From 1 to 60 bpm (Neonatal)
SIMV Inspiratory time	<ul style="list-style-type: none"> ▪ From 0.2 to 5.0 sec. (Adults) ▪ From 0.2 to 5.0 sec. (Pediatric) ▪ From 0.2 to 2.2 sec. (Neonatal)
Tidal volume	<ul style="list-style-type: none"> ▪ From 100 to 1500 ml (Adult) ▪ From 50 to 400 ml (Paediatric) ▪ From 2 to 100 ml (Neonatal)
I:E ratio	From 1:10 to 4:1 (Adults, Pediatric, Neonatal)
Inspiratory pause	From 0 to 60 % of the inspiratory time
Inspiratory pressure limit	Pinsp: from 2 to 80 cmH2O (in function of low and high pressure alarm set)
Inspiratory ramp Slope	1 to 8 (acceleration slope) - (8 max. acceleration) (in operative modes by pressure only)
PEEP	From OFF, 1 to 30 cmH2O
<i>PEEP adjustment</i>	Microprocessor controlled valve
O₂ concentration	Adjustable from 21 to 100% with electronic integrated mixer.
Trigger detective method	Through sensor (Pressure or Flow)
<i>Pressure trigger (I)</i>	Pressure adjustable from OFF; -1 to -20 cmH2O under PEEP level (step of 1 cmH2O)
<i>Flow trigger (I)</i>	Flow adjustable from OFF; 0.3 to 15 L/min <ul style="list-style-type: none"> ▪ from 0.3 to 1 L/min (step of 0.1 L/min) ▪ from 1 L/min to 2 L/min (step of 0.5 L/min) ▪ from 2 L/min to 15 L/min (step of 1 L/min)
<i>Trigger E</i>	From 5 to 90 % of the inspiratory flow peak
Exp. Valve control	Electrovalve response time of Exp. valve: 4 msec.
Inspiratory flow (FLOW)	190 l/min

Flow-by	Automatic
PS (pressure support)	From 5 to 78 cmH ₂ O (PSV, V-SIMV, P-SIMV)- Adults, Pediatric, Neonatal
SIGH in VC/VAC modality	<ul style="list-style-type: none"> ▪ Interval: 40 ÷ 500 bpm (step 1 bpm) ▪ Amplitude: OFF, 1 ÷ 100% of set Tidal Volume (step 10%)
Functions	<ul style="list-style-type: none"> ▪ MENU function (SETUP – PATIENT DATA) ▪ Alarms Limits ▪ Graphics visualization (Auto-Range) ▪ INSP Block - EXP Block (max 20 sec.) ▪ MAN control (manual ventilation)
Expandability	Software upgradeable

USER INTERFACE

Touch screen monitor	Module with TFT LED display with touch screen
<i>Dimensions</i> 15"	
<i>Displaying area</i> 30,5 x 22,8 mm	
Display keyboard	<p>Touch screen controls + keyboard and encoder knob for rapid access to the operative functions</p> <ul style="list-style-type: none"> ▪ selection, set up and confirmation of physiological breathing parameters ▪ selection and direct activation of functions
Displaying and settings	<ul style="list-style-type: none"> ▪ Operative Mode setting ▪ AUT, MAN e Stand-by mode Setting ▪ Display of signals and alarm messages, screen lock ▪ Setting and monitoring of physiological breathing parameters ▪ MENU function for setting operation parameters ▪ Graph function for display of curves, LOOPS, respiratory parameters, gas parameters ▪ Alarm Limits setting function ▪ Enabling of particular operational functions ▪ Display, clock, date and time, power, battery charger ▪ Visualization of software version
Calibration Programs	<ul style="list-style-type: none"> ▪ Self Test ▪ Turbine Characterization ▪ Expiratory Flow Sensor Calibration ▪ VTEc ▪ ScreenShoot Enable
MENU function - SETUP	<ul style="list-style-type: none"> ▪ Display (Brightness, Energy Saving, Sound Volume, Touch Audio) ▪ Date & Time ▪ Language ▪ Units ▪ Default (Default parameters: Erase Trend data, Erase Events data, Erase Patient data, Setting & Ventilation Default) ▪ Other (NIV Enable, Power Failure, Apnea Time N₂O / Xe, PASSWORD change, Data saving on USB) ▪ Gas Sensor (IRMA/ISA) ▪ Supplementary Tests (Leak test, O₂ Sensor Calibration)
MENU function - PATIENT DATA	The PATIENT DATA can be set or deleted
Alarm Limits	PAW (cmH ₂ O), PEEP (cmH ₂ O), V _{te} (ml), VM (L/min), O ₂ (%), RR (bpm)
Displayed graphics	<ul style="list-style-type: none"> ▪ CURVES: Pressure (PAW) - Flow - Volume (V_{te}) - Gas ▪ LOOPS: Pressure / Volume - Flow / Volume - Pressure/Flow - Lung ventilation icon ▪ MEASURES: Respiratory parameters, Gas ▪ Events ▪ Trends

<i>Events</i>	Memory storage up to 2000 machine events including the alarms.
<i>Trends</i>	Storage capacity (72 h) of all measured parameters Foreseen Trends: Rate, PAW, PEEP, Vm, Vte.
Physiological breathing parameters setting	I:E, Pause (%), PEEP, P _{insp} , P _{Max} , P _{min} (cmH ₂ O), P _S (cmH ₂ O), FR, FR _{simv} (bpm), SIGH (Sigh. Amp. (%) - Sigh. Int. (b)), Slope, T _i , T _i Max (s), Tr. E (%), Tr. I (L/min - cmH ₂ O), V _{te} , V _{ti} (ml), BACK-UP parameters.
<i>Range of measured parameters</i>	<ul style="list-style-type: none"> ▪ Respiratory rate (range: 0 ÷ 200 bpm) ▪ Rate accuracy ± 1 Bpm ▪ I:E ratio (range 1:99 ÷ 99:1) ▪ % of FiO₂ - EiCO₂ (range: 0% ÷ 100%) ▪ O₂ accuracy ± (2.5% + 2.5% of the reading) ▪ O₂ from 21% to 90% in less than 80 seconds ▪ Tidal Volume: V_{te}, V_{ti} (range: 0 ÷ 1500 ml) ▪ Minute Volume (range: 0 ÷ 40 l/min) ▪ Expired Volume Accuracy ± (15% + 4ml) for volumes > 50ml ▪ Expired Volume Accuracy ± (15% or ± 15ml) whichever is greater for volumes ≤ 50ml ▪ PAW: peak, mean, plateau, PEEP (range -20 ÷ 80 cmH₂O) ▪ Pressure accuracy ± (2 cmH₂O + 4% of the reading). ▪ Inspiratory Peak Flow: F_i (range: 1 ÷ 190 l/min) ▪ Expiratory Peak Flow: F_e (range: 1 ÷ 150 l/min) ▪ T_{insp.}, T_{exp}, T_{pause} (range 0.036 ÷ 13.6 sec) ▪ Time accuracy ± 0.2 seconds ▪ Static and Dynamic compliance (range: 1 ÷ 100 ml/cmH₂O) ▪ Resistance (range: 0 ÷ 200 cmH₂O/l/s) ▪ Leak (l/min)
<i>Displayed parameters</i>	PAW (cmH ₂ O), FR (bpm), I:E, PEEP (cmH ₂ O), O ₂ (% - l/min), V _{te} (ml), VM (L/min), FiCO ₂ (%), EiCO ₂ (%) MAP (cmH ₂ O), P _{plateau} (cmH ₂ O), F _i , F _e (L/min), T _i , T _{pause} , T _e (sec.), R _i (cmH ₂ O/l/s), C _s , C _d (ml/cmH ₂ O), Leak (%), O ₂ (L/min)
<i>Additional displayed parameters (optional)</i>	RR SPONT, TV SPONT, MV SPONT, RSBI, TE, WOB, AUTOPEEP
<i>Gas parameters displayed</i>	CO ₂ , O ₂ , N ₂ O, Ag ₁ , Ag ₂ , MAC
Flow sensor	Magnetic disturbance (patented), multi-usage type
<i>Calibration</i>	Automatic (started by the operator)
<i>Maintenance</i>	By steam or chemical disinfection
Oxymeter	Electronic (value displayed in breathing parameters)
<i>Calibration</i>	Automatic (started by the Operator)
Safety	<ul style="list-style-type: none"> ▪ Electronic and mechanical limit of airways pressure ▪ Self-diagnosis system
ALARMS	
Alarm types	<ul style="list-style-type: none"> ▪ By MENU: with limits set by the operator ▪ By DEFAULT: the operator cannot set them up
Alarm default setting	Present (Neonatal, Paediatric, Adult)

Alarm priority High

Alarms with limits set up by the operator

Airways pressure High – Low

PEEP High – Low

Expired tidal volume High – Low

Expired minute volume High – Low

FiO2 concentration High – Low

Respiratory rate High – Low

Electric power supply Alarm occurs in case of failure of external power supply

Apnea time Low Rate (function of Apnea BACK-UP)

System alarms

Level (charge) Battery at 50%

Level (charge) Battery at 25%

Battery level (low) 10 Minutes

Disconnected battery Yes / No

Battery over temperature Indication of exceeding the temperature limits inside the battery

Battery charger disconnected Indication of failure in the battery charge

Turbine fault Signals in case of a blower fault condition

Turbine over temperature Indication of exceeding the temperature limits inside the turbine

Turbine over current Indication of exceeding the current limits inside the turbine

Circuit disconnected Indication of patient circuit disconnected

Gas feeding: O2 Low (< 2,7 bar)

Gas feeding: Air Low (< 2,7 bar)

CAN BUS error Electronic boards CAN connection wrong

Maintenance To be performed when the warning appears

Flowmeter alarms

- Lack or low O2 pressure with consequent cut-off of N2O delivery
- Lack or low N2O pressure
- Lack or low Xe pressure
- Lack or low AIR pressure
- Fresh gas occlusion
- Wrong fresh gases connection (PROTOCOLK)

Gas Analyzer

Gas Analyzer Sampling line obstruction

Sampling line absent

Adaptor replacement

Adaptor absent

O2 socket failure
Error O2 Sensor
Accuracy not specified
Error
Sigh absence
O2 Sensor replacement
O2 Calibration required
Low FiO2 , Low EtO2 , Low - High EtCO2 , Low - High FiCO2 , Low - High FiN2O , Low - High EtN2O , Low - FiAg1 , Low - EtAg1 , Low - High FiAg2 , Low - High EtAg2 , Mixed Agents MAC < 3 , Mixed Agents MAC >= 3

SELF-TEST alarms-Verification

Turbine	The correct functioning of the low pressure compressor is tested
Oxygen Inlet	Verification oxygen pressure
CAN module 3	Verification BUS CAN turbine operation
INSP. Flow sensor	Verification of flow sensor operation
EXP. Flow sensor	Verification of flow sensor operation
Electrovalve	The correct functioning of electro-valve is tested
Patient circuit	Verification of patient circuit
Battery	Checking on battery power
Oxygen sensor	Cell condition
Protolock O2	Verification and Oxygen presence
Protolock Air	Verification and Air presence
Acoustic alarm	Verification by the user of acoustic signal emission, the confirmation of the test is made by silencing of that alarm

GAS ANALYSIS (OPTIONAL)

Gas analysis	Integrated software for analysis of CO2, O2, N2O, AG automatic identification, MAC.
Mainstream device	<ul style="list-style-type: none"> ▪ IRMA AX+ (CO2, N2O, primary and secondary agents, HAL, ISO, ENF, SEV, DES). ▪ IRMA CO2 (CO2)
Sidestream device	<ul style="list-style-type: none"> ▪ ISA AX+ (CO2, N2O, Agents) ▪ ISA CO2 (CO2) ▪ ISA OR+ (CO2, N2O, Agents, O2)

ACCESSORIES

Supplied Accessories

- User's Manual
 - O2 supply hose
 - N2O supply hose
 - Air supply hose
 - Top Special CO2 absorber canister
 - O2 cell
 - Patient Circuit
 - Manual ventilation KIT
 - Electric power supply cable
 - Scavenging connector 22M-30M
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SIARE applies the UNI EN ISO 13485:2016 Quality System and the 93/42/EEC.

SIARE ENGINEERING INTERNATIONAL GROUP s.r.l.

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