PERSEO

workstation for gaseous anaesthesia

for adults, children and newborns

Code: OM 413 / 3 gas module – 3 rotameters

Code: OM 415 / 3 gas module – 5 rotameters

Rev: 8 (dd 20/06/2008)

In the illustration aside version with VM2000/S and closet circuit

DESTINATION OF USE

PERSEO is a workstation for gaseous anaesthesia and it can be used on adults, children and newborn patients.

PERSEO is suitable for administration of OXYGEN - AIR -NITROUS OXYDE - HALOTHANE - ENFLUORANE -ISOFLURANE - SEVOFLURANE - DESFLURANE - HALOCARBON 22 mixtures.

GENERAL DESCRIPTION

The PERSEO anaesthesia workstation is supplied with:

- Trolley
- Lung ventilator type:
    - VM2000
    - VM2000/S with built-in spirometer
- Mechanic gas mixing device O_2 / N_2O /AIR
- Double Interlock / Selectatec support for 2 vaporizers
- Bar for fixing accessories
- Gas distribution block
- TO and FRO " patient circuit for automatic / manual ventilation
- Breathing system:
    - open, heated
    - open, semi-closed, closed, heated, with CO2 absorber for manual/ automatic ventilation (soda absorber canister of 2.5 Kgs)
- Optional accessories

TECHNICAL DATA

Structure type	Trolley structure in light aluminium alloy, varnished steel and plastic moulds
Wheels	Antistatic wheels; diameter 100 mm (the two front ones with pedal brakes)
Dimensions (with ventilator)	683 x 630 x 1422 (W x D x H) mm
Weight (with ventilator)	About 63 Kg (without accessories)
Work shelf	Dimensions 240 x 250 (W x D) mm
Chest of 2 drawers	No. 1 dimensions 240 x 400 x 230 (W x D x H) mm
Bar for accessories	No. 2 at the sides (section: 30 x 10 mm)
Cylinder support	No. 2 vertical cylinders support, on the back side (up to 10,7 litres capacity cylinders) and lower rubber disk
Vertical bar for monitor and accessories	On the left side of the trolley, for the total height of the unit, allowing a rapid connection to accessories such as monitors, infusion pumps, etc…
Support for 2 vaporizers	On horizontal bar, Siaretex-plate for rapid change of 2 vaporizers, compatible with Selectatec
Environmental conditions	Temperature from 10 to 40°C
	Relative humidity from 10 to 90% non-condensing

MECHANIC GAS MIXING DEVICE

Generality	The anaesthesia module has the function to adjust the flow and the concentration of gas mixture (Air, O_2 and N_2O) as well as to deliver it to the anaesthetic gas vaporizer.
	The anaesthesia module allows to select the mixture to be delivered Air-O_2 or N_2O-O_2 and the O_2 enrichment to the delivered mixture in emergency situations; it includes a device which guarantees a minimum concentration of 25% oxygen in all gas supplying conditions (MIX - LIFE device).
	It allows selection of the fresh gas output to the valve group or to the auxiliary circuit (i.e.: TO and FRO).
	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.
Mixing device	Flowmeter box with 3 glass rotameters (Air, O_2 and N_2O).
Oxygen rotameter	Scale 0.2 - 12 l/min.
	Resolution: 0.1 l/min up to 1 l/min and 0.5 l/min up to 12 l/min
	Accuracy: $\pm$ 10% of the displayed value
	or $\pm$ 1% of end scale whichever is the worse case
Nitrous oxide rotameter	Scale 0.2 - 12 l/min.
	Resolution: 0.1 l/min up to1 l/min and 0.5 l/min up to 12 l/min
	Accuracy: $\pm$ 10% of the displayed value
	or $\pm$ 1% of end scale whichever is the worse case

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Air rotameter	Scale 0.2 - 12 l/min.
	Resolution: 0.1 l/min up to 1 l/min and 0.5 l/min up to 12 l/min
	Accuracy: $\pm$ 10% of the displayed value
	or $\pm$ 1% of end scale whichever is the worse case
Low flows oxygen rotameter (**provided with OM415 only**)	Scale 0.01 - 1 l/min.
	Resolution: 0.02 l/min up to 0.1 l/min and 0.05 l/min from 0.1 to 1 l/min
	Accuracy: $\pm$ 10% of the displayed value
	or $\pm$ 1% of end scale whichever is the worse case
Low flow nitrous oxide rotameter (**provided with OM415 only**)	Scale 0.02 - 1 l/min.
	Resolution: 0.02 l/min up to 0.1 l/min and 0.05 l/min to 0.1 a 1 l/min
	Accuracy: $\pm$ 10% of the displayed value
	or $\pm$ 1% of end scale whichever is the worse case
Medical gas supply	**OXYGEN** Gas pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) Max. required flow, 90 l/min. **NITROUS OXYDE** Gas pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) Max. required flow, 15 l/min. **MEDICAL COMPRESSED AIR** Gas pressure included between 280 kPa and 600 kPa (2,8 – 6 bar) Max. required flow, 90 l/min
Control manometers	Scale 0 - 10 bar (one for each gas) on the inlet pressure (on the front panel)
Gas inlets on valves group	No. 3 - supply inlets for hospital gas pipeline systems (O_2 - N_2O - Air)
	No. 2 - supply inlet for gas cylinder (O_2 - N_2O)
Fresh gas exit	No. 1 - directly in the valves group
	No. 1 - in the distribution gas block
Gas scavenger	Optional device (models: 300A – 200P)
Auxiliary outlets	No. 1 - oxygen outlet

SAFETY DEVICES

Against hypoxic mixtures	Min. O_2 concentration of 25% in the mixtures with N_2O (MIX-LIFE)
Against oxygen failure	Block of N_2O in the case of O_2 failure, with overpressure valve and acoustic alarm (CUT-OFF)
Against the overpressures in exit	Pre-calibrated discharge valve at 0.8 bar for the protection of the glass rotameters
	N_2O – AIR selector
Emergency O_2 / BY-PASS	By push button on the front panel

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BREATHING SYSTEM - Open

(code: G00205000)

General description	Compact system with automatic connections, easy dismountable and autoclavable.
Functionality	It allows the ventilation in the real open circuit.
	The circuit is heated to reduce condensation.
	All the internal and external connections are stainless steel.
	The group is completely autoclavable and it does not have disposable parts.

BREATHING SYSTEM - Closed

(code: G00155000)

General description	Compact system with automatic connections, easy dismountable and autoclavable.
Functionality	It allows the ventilation in the following modes: real open circuit, semi-closed circuit, closed circuit at low flows.
	The system also allows the spontaneous and manual ventilation also in case of machine breakdown or machine off.
	The CO_2 absorber canister has a rapid connection and this allows its replacement also during operation.
	The recycling system is a selective type, hence the soda lime and fresh gases consumption is reduced to the minimum.
	Reservoir bag adjustable support to facilitate the manual ventilation.
	The circuit is heated to reduce condensation and to heat the fresh gases.
	Switching from one modality to another is completely controlled by the ventilator without any user's action on breathing system.
	All internal and external connections are stainless steel.
	The group is completely autoclavable and it does not have disposable parts.

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LUNG VENTILATOR

VM2000/S - General Description

Fixing	On the upper part of the trolley by a quick connection device to the main structure
Type of Ventilation	IPPV
Control modality	Electronic by microprocessor The equipment is supplied with an electronic system which, at every start-up and for a few seconds, verifies all the hardware and software electronic parts for safety purposes. O_2 cell automatic calibration, leakage test and compliance calculation are on operator's request only.
Dead space compensation system	Automatic
Flow Generation	Digital System
Gas feeding	Medical Compressed Air or Oxygen with pressure included between 280 kPa and 600 kPa (2,8 – 6 bar)
Ventilation Modes	IPPV + AST / PCV / PSV / SPONT - SIMV / APNOEA BACK-UP / MANUAL (performed via breathing system or via manual external system for example, TO and FRO)
Measured Parameters	O_2 Concentration / PAW / PIP / MAP / PEEP / FLOW / MINUTE VOLUME / TIDAL VOLUME / RATE
Breathing rate	From 5 to 140 bpm
I:E Ratio	1:1 - 1:2 -1:3 - 1:4 - 2:1 - 3:1.
Inspiratory Pause	From 0 to 50% of the inspired time
SIMV Frequency	From 0 to 139 bpm
Tidal Volume	From 20 to 1500 ml
Minute Volume	From 1 to 30 litres
PEEP	0 - 20 cmH_2O
Inspiratory Flow	From 0 to 80 lit/min
Oxymeter	Built-in with display of O_2 concentration Min. resolution 1% . Automatic calibration procedure
Bronchomanometer	Electronic with led bar and display from -10 to 80 cmH2O

Trigger (sensibility)	Electronically adjustable continuously from -1 to -9 cm H2O under PEEP level
Safety	Airways pressure electronic and mechanic limit / Self-diagnosis system
User's Interface	LED Display / Back-enlightened LCD Display / LED bar Bronchomanometer / Other LED indicators / Control keys and knobs
Alarms	LOW/HIGH O_2 - HIGH / LOW AIRWAYS PRESSURE - APNOEA - POWER SUPPLY - LOW BATTERY - GAS SUPPLY - HIGH/LOW MINUTE VOLUME - HIGH/LOW TIDAL VOLUME - HIGH/LOW RATE

VM2000 - General Description

Fixing	On the upper part of the trolley by a quick connection device to the main structure
Type of Ventilation	IPPV
Control modality	Electronic by microprocessor The equipment is supplied with an electronic system which, at every start-up and for a few seconds, verifies all the hardware and software electronic parts for safety purposes. O_2 cell automatic calibration, on operator's request only.
Flow Generation	Digital System
Gas feeding	Medical Compressed Air or Oxygen with pressure included between 280 kPa and 600 kPa (2,8 – 6 bar)
Ventilation Modes	IPPV + AST / PCV / AST / SIMV - SPONT / APNOEA BACK-UP / MANUAL: (performed via breathing system or via manual external system for example, TO and FRO)
Measured Parameters	O_2 Concentration / PAW / PIP / PEEP
Measured Parameters **(optional)**	Only with the alphanumeric spirometer (cod. 713010/PER): FLOW / MINUTE VOLUME / TIDAL VOLUME / RATE
Breathing rate	From 5 to 120 bpm
I:E Ratio	1:1 - 1:2 -1:3 - 1:4 - 2:1 - 3:1.
SIMV Frequency	From 0 to 119 bpm
Tidal Volume	From 20 to 1500 ml
Minute Volume	From 1 – 30 l/min
PEEP	0 - 20 cmH$_2$O
Inspiratory Flow	From 0 to 80 lit/min

Oxymeter	Built-in with display of O_2 concentration
	Min. resolution 1% . Automatic calibration procedure
Bronchomanometer	Electronic with led bar and display from -10 to 80 cmH2O
Trigger (sensibility)	Electronically adjustable in continuous way from -1 to –9 cm H2O under PEEP level
Safety	Airways pressure electronic and mechanic limit / Self-diagnosis system
User's Interface	LED Display / LED bar Bronchomanometer / Other LED indicators / Control keys and knobs
Alarms	LOW/HIGH O_2 - HIGH / LOW AIRWAYS PRESSURE - APNOEA - POWER SUPPLY - LOW BATTERY - GAS SUPPLY
Alarms (**optional**)	Only with the alphanumeric spirometer (cod. 713010/PER): HIGH / LOW MINUTE VOLUME - HIGH / LOW TIDAL VOLUME - HIGH / LOW RATE

POWER SUPPLY

Electric power supply	220 Vac 50-60 Hz (110 Vac optional)
Power	50 W
Internal power supply	12Vdc battery / 3 Ah
Internal battery operation	Max. 1,5 hours
Re-charging time	Around 10 hours
External Connections	RS232 (VM2000/S) / Connectors (VM2000)

CONFORMITY TO NORMS

Class and type according to IEC 601-1	Class 1 Type B
Class according to EEC 93/42 Directive	Class IIB
EN 1281-1, IEC 601-1, IEC 601-1-2, 93/42 EEC, IEC 601-1-4, UNI EN 740	

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ACCESSORIES

Supplied accessories with PERSEO	• User's Manual
	• O$_2$ tube (code: G60005100)
	• N$_2$O tube (code: G60006100)
	• Air tube (code: G60007100)
	• O$_2$ cell (code: E75000004)
	• O$_2$ cell cable (code: E85500997)
	• Silicone patient circuit for adults (code: 001562/SLR)
	• KIT for manual ventilations (code: M2000)
	• To-and-Fro adult patients circuit (Mapleson C)(code: 002627EN)
	• O$_2$ supply hose for cylinder (code: G60005101)
	• N$_2$O supply hose for cylinder (code: G60006101)
	• Scavenging hose (code: A36.049012)
Optional Modules	• SEVOFLURANE vaporizer Selectatec compatible interlock system (code: 100145/I)
	• FLUO-HALOTHANE vaporizer Selectatec compatible interlock system (code: 100148/I)
	• ETHRANE vaporizer Selectatec compatible interlock system (code: 100149/I)
	• ISOFLURANE vaporizer Selectatec compatible interlock system (code: 100150/I)
	• DESFLURANE vaporizer Selectatec compatible interlock system (code: 100151/I)
Accessories	• Open circuit (code: G00205000)
	• Open, semi-closed, closed ventilation circuit (code: G00155000)
	• Supporting arm for patient circuit (code: 06750/SB)
	• Respiratory monitor for VM2000/S (code: 713006)
	• Alphanumeric spirometer for VM2000 (code: 713010/PER)
	• AGGS Monitor (code: 990550 or 990551)
	• Vital sign monitor David line - Neptune – HB100)
Optional Accessories	See on Export Price List

OPTIONAL DEVICES

Optional 6,5" TFT respiratory monitor for VM2000/S (code: 713006)

Description	The TFT Monitor can display the respiratory parameters and the curves and loops clearly, providing immediate information on the patient's ventilation. The user interface and the alarm and patient monitoring functions are designed to make future equipment updates easier. The TFT Monitor can be connected to multigas analyzer modules.
Intended use	On equipment for anaesthesia and reanimation for adults, children and newborn patients.
Functioning and control	Microprocessor electronic: every time the equipment is switched on, a check lasting a few seconds is carried out of all the hardware and software of the system for safety purposes.
Operator interface	Keyboard controls (function selection; ESC; return; alarm silencing) and Encoder knob
Technical data	Front and rear container in ABS white RAL 7004 (L x P x H) 23.5 x 9.5 x 15 cm approx. 1 Kg
Display area	Parameters measured ; Messages ; Graphs ; Zoom alarms (2 areas) ; Functioning modes
Parameters measured	Pmax, Pmean, Pause, PEEP, Vti, Vte, ExpMV, Rate, FLOWi, FLOWe, I:E, Tinsp, Tesp, Tpause, Cs, Ri
Messages	Operating mode; Interruptions; Functioning time; Alarm
Graphs available	Ventilation graphs; Loop ; Trend ; Help ; Parameter Zoom page
Zoom alarms	2 areas for the selection of the ventilation parameters
Functioning Modes	Zoom alarms (2 zones); Alarm (default) ; Loop ; Trend ; Help ; Monitor ; Alarm volume ; Demo display

Zoom alarms	Possibility of selecting and displaying any parameter measured
Alarms	Manual or automatic setting of the alarm minimum and maximum limits
	Buzzer (volume adjustment) and visual alarm (flashing symbol in the message area) indication
	Alarms: Pmax, Pmean, Ppause, PEEP, VTi, VTe, Expmv, Rate, Cs, Ri.
Ventilation curves	Paw ; Flow ; Volume
Loop	Volume / Paw ; Volume / Flow
Trend	Trend scale and period setting
	Trends: Pmax ; Pmean ; Ppause ; PEEP ; VTi ; VTe ; ExpMV ; Rate ; FLOWi
Help	Display of the user's manual
Monitor	Setting of the following display conditions: LCD / Remote 1 ; LCD / Remote 2 ; LCD / Remote 3 ; VGA / Remote 4 ; Zoom parameter page display
Zoom Parameter Page	Parameters displayed: PEEP ; Flow Insp ; Minute Vol. ; I:E ; Pmax ; Flow ; Exp ; Tidal Volume ; Rate
	Curves displayed: Paw ; Flow ; Volume
Alarm volume	Can be set from 1 to 3
Demo option	Available
Language option	Available
Multigas analyzer modules connections	Available: see on relative Multigas Analyzer Modules technical data sheet
Power supply voltage	12 Vdc (with RS-232 connection)
Absorbed power	30 VA
External connections	9 pin male connector, RS-232

Multigas analyzer modules (optional)

Multigas analyzer modules connection	Available
Description	Ultra small infrared main stream multi-gas probe comprising a multi channel IR-bench, barometric pressure sensor, power regulator, signal processor and a RS-232 interface.
Measuring mode	Mainstream
Dimensions and weight	37 x 27 x 25 mm < 30 g (cable not included)
General specifications	See on relative Multigas Analyzer Modules technical data sheet

Alphanumeric spirometer for VM2000

(code: 713010/PER)

Type	High contrast back enlightened built-in monitor
Intended use	On equipment for anaesthesia and reanimation for adults, children and newborn patients.
Functioning and control	Microprocessor electronic: every time the equipment is switched on, a check lasting a few seconds is carried out of all the hardware and software of the system for safety purposes.
Operator interface	Keyboard controls (selection; return; alarm silencing)
Technical data	• Front and rear container in ABS white RAL 7004 • (L x P x H) 15 x 9.5 x 23,5 cm • approx. 1 Kg
Measured and displayed parameters	Flow / Minute Volume / Tidal Volume / Rate
Alarms	High / Low Minute Volume - High / Low Tidal Volume - High / Low Rate
Electric power supply	100 ÷ 240 Vac 50 - 60 Hz
Power consumption	30 VA
External connections	Power supply connector, flow transducer connector

SIARE applies the UNI EN ISO 13485:2004 Quality System and the EEC 93/42 Medical Devices Directive.