

DATA SHEET





CARACTERISTIQUES TECHNIQUES

APPLICATION AREA

Application:	Intensive care respirator designed for resuscitation, intensive care and the postoperative room
Patient categories:	Adult, Child and Infant.
Weight:	3 to 250 kg

STANDARDS AND DIRECTIVES

CE Mark:	CE 0459. The device complies with the European requirements in the Directive 93/42/EEC concerning medical devices.
Medical classification:	Class IIb, according to Directive 93/42/CEE.
Standards:	ISO 14971 CEI 60601-1 CEI 60601-2-12
Electromagnetic compatibility (EMC):	Complying with CEI 60601-1-2 (2001)
First launch:	France: end of 2008 Other countries: please contact us
Available languages:	French, English, Italian, German, Russian, Spanish, Lithuania, Polish, Czech, Portuguese, Chinese, Japanese Other language: please contact us

PHYSICAL SPECIFICATIONS

Size:	H 35 x W 30 x D 40 cm
Ventilator with trolley:	H 135 x W 55 x D 60 cm
Weight:	16 kg - Ventilator 31,8 kg - Ventilator + trolley
Noise level:	48 dB (A) at 1m

OPERATING CONDITIONS

Operating Temperature:	+10 to +40°C (+50 to +104°F)
Relative humidity:	0 to 90 % (at 40°C without condensation)
Atmospheric pressure:	700 (3075 mètres) to 1060 mbar Altitude effect compensation

STORAGE CONDITIONS

Storage temperature:	-20 to +70°C (-4 to +158°F)
Storage relative humidity:	0 to 90 % (at 40°C without condensation)
Storage atmospheric pressure:	500 (5550 meters) to 1060 mbar

TECHNICAL SPECIFICATIONS**POWER SUPPLY**

Power supply:	100-240 V _{AC} ± 5 %
Frequency:	50 – 60 Hz
Electric power consumed:	250 VA
Electric class:	I
Type:	B
Connection standards available:	EU, AFS, JP, US, AR, BR Please contact us for more information concerning other standards
Continuous external supply:	20 to 30 V DC

EXTERNAL BATTERY:

If no mains are available, switch to external battery

Type:	Rechargeable, NiMH, 24V, 2x4500 mAh
Autonomy:	2,5 to 3 hours in standard ventilation
Charge time:	12 hours
Interval between two recharges:	It is advised to perform one complete discharge cycle every 6 months

INTERNAL BATTERY:

If neither the mains nor the external source is available, switch to internal battery

Type:	Rechargeable, NiMH, 24V, 2x4500 mAh
Autonomy:	2,5 to 3 hours in standard ventilation
Charge time:	12 hours
Interval between two recharges:	It is advised to perform one complete discharge cycle every 6 months

PNEUMATIC SUPPLY**Oxygen pneumatic supply**

High pressure:	2.8 – 6 bar / 280 – 600 kPa / 40 – 86 psi Operating possible starting from 1.5 bar
Connection standards available:	NF, NIST, DISS For other standards, please contact us
Low pressure:	0 – 1.5 bar / 0 – 150 kPa / 0 – 21 psi

Air pneumatic supply

Turbine peak flow:	200 l/mn at Patm
Ambiant air inlet:	Equipped with HEPA filter Monnal Clean'In (High Efficiency Particulate Air Filter)

PATIENT SYSTEM GAS CONNECTOR

Inspiratory breathing tube connector:	22 mm male.
Expiratory breathing tube connector:	22 mm male.

SCREEN

Type:	Flat color touch screen TFT-LCD Module
Technology:	Resistive analogical technology
Size:	10.4 inches
Resolution:	640 x 480 pixels

TECHNICAL SPECIFICATIONS



PNEUMATIC SPECIFICATIONS

Method of triggering:	Flow and pressure
Max. Operating pressure:	90 cmH ₂ O
Bias flow:	3 L/min (flow by)
Max. Inspiratory peak flow:	180 L/min (regarding supply pressures)

INSPIRATORY CHANNEL

Pressure drop:	Max. 4 cm H ₂ O at a flow rate of 1L/s (without filter)
Gaz supplier system:	Turbine and proportional solenoid valve managed by microprocessor
Inspiratory flow range:	0 to 3,3 L/s

EXPIRATORY CHANNEL

Pressure drop:	Max. 3 cm H ₂ O at a flow rate of 1L/s
Expiratory flow range:	0 to 3,3 L/s

MODES – INVASIVE VENTILATION

VCV	Volume Controlled Ventilation or Assist volume controlled ventilation
PCV	Pressure Controlled Ventilation or Assist pressure controlled ventilation
PRVC	Pressure Regulated Volume Controlled ventilation
SIMV	Synchronized Intermittent Mandatory Ventilation
PSIMV	Pressure Synchronized Intermittent Mandatory Ventilation
PSV	Spontaneous ventilation with Pressure Support and PEEP
CPAP	Continuous Positive Airway Pressure
PS-Pro	Spontaneous ventilation with Pressure Support, PEEP and variable frequencies
Duo-Levels	Alternation between two levels of CPAP
Safety ventilation	Apnea ventilation (V_T , RR and T apnea can be adjusted, constant flow rate, $T_i.T_{tot}$ 33%)

MODES – NON INVASIVE VENTILATION

PSV-VNI	Non-invasive spontaneous ventilation with Pressure Support and PEEP
CPAP	Continuous Positive Airway Pressure
Duo-Levels	Alternation between two levels of CPAP

OXYGENOTHERAPY

Flow	Adult: 2 to 80 L/min Child: 2 to 60 L/min Infant: 2 to 60 L/min
FiO₂	21% to 100%

This function requires specific nasal cannula and use a heating humidifier.

TECHNICAL SPECIFICATIONS



PARAMETER SETTINGS

PARAMETER SETTINGS (NEXT)

PARAMETERS:

SETTINGS RANGE:

PARAMETERS:

SETTINGS RANGE:

Inspiratory tidal volume (V_T):

20 to 2000 mL

Adult: 100 to 2000 mL

Child: 50 to 500 mL

Infant: 20 to 75 mL

Inspiratory plateau (Tplat):

0 to 60 % of TI

Adult: 0 to 60 % of TI

Child: 0 to 40 % of TI

Infant: 0 to 40 % of TI

Respiratory Rate (RR):

4 to 120 Bpm

Adult: 4 to 80 Bpm

Child: 5 to 120 Bpm

Infant: 10 to 120 Bpm

Inspiratory ratio (TI/Ttot):

3 to 80 %

Adult: 3 to 80 %

Child: 5 to 60 %

Infant: 5 to 60 %

SIMV respiratory rate (SIMV RR):

4 to 120 Bpm

Adult: 4 to 80 Bpm

Child: 5 to 120 Bpm

Infant: 10 to 120 Bpm

Inspiratory time (I/E):

1/0,5 (=2) to 1/19

Adult: 1/0,5 to 1/19

Child: 1/0,5 to 1/19

Infant: 1/0,7 to 1/19

Minimum frequency:

1 to 100 Bpm

Adult: 4 to 80 Bpm

Child: 5 to 100 Bpm

Infant: 10 to 100 Bpm

Inspiratory time (TI):

0,2 to 10 s

Adult: 0,2 to 10 s

Child: 0,2 to 8 s

Infant: 0,2 to 3 s

Apnea time:

Adjustable VCV mode

Adult: 15 to 60 s

Child: 4 to 60 s

Infant: 2 to 30 s

Max. inspiratory time in spontaneous modes (TI max.):

0,2 to 5 s

Adult: 0,3 to 5 s

Child: 0,3 to 5 s

Infant: 0,2 to 2,5 s

TECHNICAL SPECIFICATIONS



PARAMETER SETTINGS (NEXT)

PARAMETERS:	SETTING RANGE:
Positive End of Expiration Pressure (PEEP):	0 to 50 cmH ₂ O
Pressure Support (PS):	2 to 40 cmH ₂ O
Insufflation Pressure (PI):	2 to 99 cmH ₂ O
Max. airways pressure:	90 cmH ₂ O
Inspiratory slope:	20 to 200 cmH ₂ O / s
Flow rate shape:	Constant, decelerated
O ₂ concentration (FiO ₂):	21 to 100 %
Inspiratory flow trigger:	1 to 10 L/min OFF position available in VCV, PCV and PRCV modes
Inspiratory pressure trigger:	Always activated and automatically set in function of the flow trigger setting
Expiratory trigger:	0 (OFF) to 90 % of inspiratory peak flow Adult: 5 to 90% Child: 0 to 90%
Inspiratory plateau:	0 to 15 s
Expiratory plateau:	0 to 15 s
Sigh frequency:	1 sigh every 9 to 200 cycles
Sigh Tidal volume:	1 to 2 per V _T
Sigh insufflation pressure:	1 to 2 per PI Infant: 0 to 90%

O₂: INTELLIGENT SUCTION:

Pre-oxygénation time:	30 to 900 s
Post-oxygénation time:	30 to 300 s
FiO ₂ target	21% to 100%

PARAMETERS SETTINGS: SPECIAL FEATURES

NON INVASIVE VENTILATION:

Positive End of Expiration Pressure (PEEP):	0 to 15 cmH ₂ O
Pressure Support (PS):	2 to 25 cmH ₂ O
Low VMe alarm:	OFF position available

PRCV MODE:

Target Tidal volume:	OFF to maximum of each patient category
Insufflation pressure (PI):	AUTO, 2 to 99 cmH ₂ O
Max. Insufflation pressure (PI max):	2 to 99 cmH ₂ O

PS-PRO MODE:

Support frequency (RRsupport)	Adult: 4 to 99 Bpm Child: 5 to 120 Bpm Infant: 5 to 120 Bpm
Pressure Support (PS) :	AUTO, 2 to 40 cmH ₂ O
Max. Insufflation pressure (PI max):	2 to 99 cmH ₂ O
Target Tidal volume :	OFF to maximum of each patient category

O₂ : ASPIRATION INTELLIGENTE

Durée de pré-oxygénation	30 à 900 s
Durée de post-oxygénation	30 à 300 s
Cible FiO ₂	21% à 100%

TC: TUBE COMPENSATION

Applicable on:	Pressure modes only
Compensation level:	0 to 100%
Tube type:	Endotracheal or tracheostomy
Tube diameter:	2.5 to 11 mm

TECHNICAL SPECIFICATIONS



MONITORING

MEASURED PARAMETERS:	MEASURE RANGE:	TREND VALUE*:
Expired Minute Volume (VMe)	0 to 99 L/min	Yes
Expired Tidal Volume (Vte)	0 to 5000 mL	Yes
Insufflated Tidal Volume (VTi)	0 to 5000 mL	Yes
Respiratory Rate (RR)	0 to 120 Bpm	Yes
Peak Airways pressure (Ppeak)	0 to 120 cmH ₂ O	Yes
Positive End of Expiration Pressure (PEEP):	0 to 99 cmH ₂ O	Yes
Plateau pressure (Pplat) **	0 to 99 cmH ₂ O	Yes
FiO ₂	15 to 100%	Yes
Mean pressure	0 to 99 cmH ₂ O	Yes
Ti / Ttot	0 to 99%	Yes
RR / Vte	0 to 5000 pm/L	Yes
MVe Spont	0 to 99 L/min	Yes
RR Spont	0 to 120 Bpm	Yes
Insp Peak Flow **	0 to 200 L/min	Yes
Exp Peak Flow	0 to 200 L/min	Yes
Leak Flow (in VNI)	0 to 150 L/min	Yes
Spontaneous ratio	-- to 100	Yes
Leak ratio	-- to 100	Yes
P0.1 **	0 to 20	Yes
Rstat **	0 to 500 cmH ₂ O/(L/s)	Yes
Cstat **	0 to 150 mL/ cmH ₂ O	Yes
Auto-PEEP **	0 to 99 cmH ₂ O	Yes

LOOPS AND WAVEFORMS PRESENTATION

Real-time curves:	Pressure curve Flow curve
Loop curves:	Pressure / Volume Volume / Flow Flow / Pressure

CONFIGURATION

Selection of ventilation mode:	Enabled, Disabled (except VCV always enabled)
Alarms:	Save alarms current settings
Settings:	Save current ventilation settings in the ventilation mode used
Alarm volume setting:	25% to 100% of custom alarm
Min. frequency:	Enabled, Disabled (only in PS and NIV-PS)
Setting in VCV mode:	Ti, Flow, TI/Ttot or I/E
Setting in PCV / PRCV mode:	Ti, TI/Ttot or I/E

EVENT HISTORY

Alarms history:	200 last triggered alarms recorded Technical messages with error codes
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COMMUNICATION / INTERFACE

Serial port:	RS 232 port (X 2)
OTP:	Open Taema Protocol
Video output:	Screen report to external monitor.
BOW MEDICAL Interface:	Communication with DIANE anaesthesia sheet
DATA CAPTOR:	Capsuleteck
CLINISOFT interface:	Communication with the GE data collection software

* Stored trend values for up to 80 hours

** Only in Invasive Ventilation

TECHNICAL SPECIFICATIONS**ALARMS SETTINGS**

Ppeak high	10 to 100 cmH ₂ O
Pplat high	OFF, 1 to 50 cmH ₂ O
RR low	Adult: 1 to 70 Bpm Child: 1 to 110 Bpm Infant: 1 to 110 Bpm
RR high	Adult: 11 to 80 Bpm Child: 11 to 120 Bpm Infant: 11 to 120 Bpm
Vti low	Adult: OFF to 2900 mL Child: OFF to 1900 mL Infant: OFF to 500 mL
Vti high	Adult: 100 to 3000 mL Child: 100 to 2000 mL Infant: 100 to 800 mL
Vte low	Adult: OFF to 2000 mL Child: OFF to 2000 mL Infant: OFF to 500 mL
Vte high	Adult: 10 to 3000 mL Child: 10 to 3000 mL Infant: 10 to 800 mL
VMe low	0,5 to 39 L/mn
VMe high	Adult: 1,5 to 40 L/mn Child: 1,5 to 40 L/mn Infant: 1 to 40 L/mn
FiO ₂ low	18 to 95 %
FiO ₂ high	23 to 100 %

ALARMS SETTINGS: SPECIAL FEATURES OF NIV

VMe low	OFF to 39 L/mn
VMe high	Adult: 1,5 to 60 L/min Child: 1,1 to 60 L/min Infant: 1 to 40 L/min
VTi	Low and High not measured

ALARMS SYSTEMS

Visual alarms classified by priority:	3 priority levels with specific colours 1 information level
Sound alarms classified by priority:	3 priority levels with specific melodies
Technical alarms:	Categorized by severity
Supply alarms:	O ₂ supply failure Switch over to external battery Switch over to internal battery Internal battery power low Internal battery exhausted Internal battery absent Alarm indicating total loss of electrical power
Automatic thresholds:	Direct access key
Sound inhibition:	2 minutes
Apnea ventilation:	Adjustable VCV mode
Non-adjustable patient alarms:	Disconnection PEEP > PEEP set-point + 5 cmH ₂ O Active patient. Increase inspiratory flow rate

CLEANING AND STERILIZATION

Autoclavable:	Reusable expiratory valve Patient circuit Reusable spirometry sensor
Single use:	Single use expiratory valve Patient circuit Single use spirometry sensor
Turbine inlet:	« Monnal Clean'in » filter (quarterly inspection)

MAINTENANCE

Periodic maintenance:	Annual, performance check
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CONSUMABLES & ACCESSORIES**LIST OF CONSUMABLES**

Autoclavable expiratory flow sensor	KY632200
Autoclavable expiratory valve Monnal EVA (per unit)	KY694500
Group of 5 single-use expiratory valves Monnal EVA	KY694800
Group of 20 single-use expiratory valves Monnal EVA	KY694900
Oxygen cell (electrochemical O2 sensor)	YR049700
Oxygen filtrabloc	KB002800
Monnal Clean'In filter (HEPA filter, per-unit)	KB030100
Group of 20 single-use adult-patient circuits, 1.6 meter without any water-trap, but with a smooth inside surface Can be connected to a pneumatic nebulizer	KG020200
Group of 10 single-use adult-patient circuits, 1.6 meter with inspiratory/expiratory water trap	KG019300
Group of 12 single-use child-patient circuits, 1.6 meter with inspiratory/expiratory water trap Can be connected to a pneumatic nebulizer	KG019400
Group of 15 single-use adult-patient circuits, 1.6 meter with a water-trap on the inspiratory circuit and a corrugated surface expiratory circuit Cannot be connected to a pneumatic nebulizer	VD315100
Group of 10 single-use child-patient circuits 1.5 meter With a water-trap on the inspiratory circuit and a corrugated surface expiratory surface Cannot be connected to a pneumatic nebulizer	VD317600
Group of 5 single-use expiratory flow sensors	KY664500
Group of 20 single-use expiratory flow sensors	KY664600
Group of 6 air intake filters	KY650300
Group of 50 bacteria filters (inspiratory output)	KV103300
Membrane Monnal EVA x 5	KY665300
Air intake filter mount	KY652700

HUMIDIFIERS

Heating humidifier MR850 230V EU, FR / ES / EN	VD324500
Heating humidifier MR850 115V US, PT / ES / EN	VD324600
Heating humidifier MR850 230V EU, IT / ES / PT	VD324700
Autoclavable humidifier adult accessories kit	VD324900
Pediatric humidifier accessories kit	VD324800

LIST OF ACCESSORIES

Oxygen tank hook (maximum height: 80 cm)	KY665000
External battery (plus 3 hours battery life)	YR109900
Autoclavable patient circuit plug (3 parts: plug, screw, and clip) included in the stand	KY669800
Fast-locking patient circuit arm, no clamps (30+43+43+27 cm) Mounted on the plate of the stand (for reference KB027500)	KB024200
Fast-locking patient circuit arm, with clamps (10+33+33+27 cm) To be mounted on a rail (adapted for reference KB022600)	KB019200
Patient circuit arm with three locking joints, no claims (8+43+43+55 cm)	KB005200
Mains power cord, 3 m long, EU standard	KY120500
Mains power cord, 3 m long, AFS standard	KY647300
Side hook alone with pincers (max 3 kg)	KY669600
Cable/hose winder (rear-fastening)	KY669700
O2 supply hose (NF plugs) 1.5 m long	BF030600
O2 supply hose (NF plugs) 3 m long	BF030200
O2 supply hose (NF plugs) 5 m long	BF030000
Monnal T75 cover (dimensions: 80x60x46 cm)	KB028500
Clamp for 3-positions arm mounting rail (for KB005200)	KY252800
Rear-fastening stainless steel basket (dimensions: H11xL30xP17 cm)	KY664700
Stand alone (3 parts: platform, column, and 4-wheel base, 2 wheels having latches)	KY659700
Infusion pole (106 cm, can be lowered)	KB029600
Base with 3 additional outlets (EU standard with fastening)	YR110000
Side tablet with pincers and hook (max 3 kg, dimensions 32x23 cm)	KY669500
Wall tablet (47.5 x 45 x 12 cm)	KY690500

PNEUMATIC NEBULIZERS

Group of 20 single-use pneumatic nebulizer	KB025200
Full kit autoclavable pneumatic nebulizer	KB007200

ULTRASONIC NEBULIZERS

International autoclavable Aeronex nebulizer (English)	KB025500
Autoclavable Aeronex nebulizer, Switzerland	KB029100
Autoclavable Aeronex nebulizer, France	KB028600
Autoclavable Aeronex nebulizer, Italy	KB028700
Autoclavable Aeronex nebulizer, Latin America	KB029000
Autoclavable Aeronex nebulizer, Portugal	KB028900
Autoclavable Aeronex nebulizer, Spain	KB028800
Single-use Aeronex nebulizer, FR/DE/NL/IT	KB029300
Single-use Aeronex nebulizer, International	KB029200
Single-use Aeronex nebulizer ES/IT/PT/EL/TR	KB029400



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