Make sure that the software is fully compatible with all hardware, software and mechanical components in the system. See the *Compatibility chart* in chapter Revision history.

5.3.3 Check after installation

- A software installation may change the system functionality and therefore require a new version of the User's Manual.
- After any software installation in the system, perform a Pre-use check according to instructions in the User's Manual.

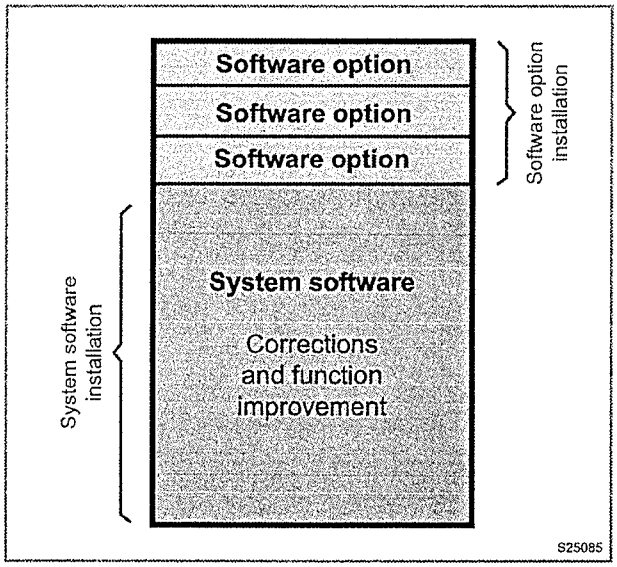
CAUTION: The system must not be switched off during the software installation process. Such interruption may cause malfunctions on PC boards.

5.3.4 Materials/documents required

- USB memory stick with the System software version/Software option to be installed. Only Getinge approved USB memory sticks must be used.
- User's Manual.
- Gas supply required for the Pre-use check.

5.3.5 Software information

- **System software:** A System software installation installs a new System software version. A
2.5 System software installation is not depending on the serial number of the system and does not alter the installed Software options.
- **Software option:** A Software option installation installs Software options ordered for the concerned system. A Software option is individually created for each system and can only be installed on the intended system. Serial number of the system must be stated when ordering a Software option.



5.3.6 System software installation

To perform a System software installation:

- Turn the system On.
- Enter Service & Settings (*Biomed* or *Service* user level).
- Connect the USB memory stick, with the System software version to be installed.

Alarms

Alarm	Pediatric range	Adult range
Airway pressure (upper alarm limit)	16 – 90 cmH_2O	16 – 120 cmH_2O
Airway pressure NIV (upper alarm limit)	16 – 70 cmH_2O	16 – 70 cmH_2O
Respiratory rate (upper alarm limit)	1 – 160 breaths/min	1 – 160 breaths/min
Respiratory rate (upper and lower alarm limit)	1 – 159 breaths/min	1 – 159 breaths/min
Expired minute volume (upper alarm limit)	0.02 – 30 l/min	1 – 60 l/min
Expired minute volume (lower alarm limit)	0.01 – 20 l/min	0.5 – 40 l/min
Expiratory tidal volume high	6 – 400 ml	60 – 4 000 ml
Expiratory tidal volume low	5 – 390 ml	50 – 3 900 ml
End expiratory pressure (upper alarm limit)	1 – 55 cmH_2O	1 – 55 cmH_2O
End expiratory pressure (lower alarm limit)	0 – 47 cmH_2O	0 – 47 cmH_2O
No patient effort (Apnea) alarm	2 – 45 s	15 – 45 s
	Automatic return to support mode on patient triggering	
No consistent patient effort	Yes, described in User's manual	
High continuous pressure	Yes, described in User's manual	
O_2 concentration	Set value ±5 vol% or ≤18 vol% **	
	** When the set O_2 concentration is higher than 90 %, the O_2 concentration low alarm is set to 85 %.	
Gas supply	Below 200 kPa (2.0 bar/29 PSI), above 600 kPa (6.0 bar/87 PSI)	
Battery	• Limited battery capacity: 10 min • No battery capacity: less than 3 min • Low battery voltage	
End tidal CO_2 (upper and lower limit)	0.5–20 %, 4–100 mmHg, 0.5–14 kPa	
Leakage too high	Yes, described in User's manual	
Technical	Yes, described in User's manual	

Autoset (alarm limits) specification

Autoset (alarm limits) specification	Invasive ventilation, controlled modes only
High airway pressure:	Mean peak pressure +10 cmH_2O or at least 35 cmH_2O
Expiratory minute volume (upper alarm limit)	Mean expiratory minute volume +50 %
Expiratory minute volume (lower alarm limit)	Mean expiratory minute volume -50 %
Expiratory tidal volume (upper alarm limit)	Mean tidal volume +50 %
Expiratory tidal volume (lower alarm limit)	Mean tidal volume -50 %
Respiratory rate (upper alarm limit)	Mean respiratory rate +40 %
Respiratory rate (lower alarm limit)	Mean respiratory rate -40 %
End expiratory pressure (upper alarm limit)	Mean end expiratory pressure +5 cmH_2O
End expiratory pressure (lower alarm limit)	Mean end expiratory pressure -3 cmH_2O
End tidal CO_2 concentration (upper alarm limit)	Mean end tidal CO_2 concentration +25 %
End tidal CO_2 concentration (lower alarm limit)	Mean end tidal CO_2 concentration -25 %

Aerogen nebulizers 2.6

Aerogen nebulizers	Pro	Solo
Size	W 50 x L 50 x H 45 mm (W 2.0" x L 2.0" x H 1.8")	W 48 x L 25 x H 67 mm (W 1.9" x L 1.0" x H 2.6")
Weight	Approx. 25 g (0.88 oz)	Approx. 14 g (0.49 oz)
Particle size	1 – 5 µm mass median aerodynamic diameter (MMAD)	
Flow rate	>0.2 (average: ~0.4) ml/min	
Max. volume	10 ml	6 ml
Residual volume	<0.1 ml for 3 ml dose	
Control cable	1.8 m (5.9 ft)	

Backup parameter settings

Parameter	Pediatric range	Adult range
Inspiratory tidal volume (ml)	10 – 350	100 – 4 000
Pressure level above PEEP in backup (cmH_2O)	5 – 80	5 – 120
Pressure level above PEEP in NIV backup (cmH_2O)	5 – 60	5 – 60
Respiratory rate in backup (breaths/min)	4 – 150	4 – 100
I:E ratio	1:10 – 4:1	1:10 – 4:1
Ti (s)	0.1 – 5	0.1 – 5

Special functions

Special function	Setting range
Manual breath	Initiation of 1 breath (In SIMV mode initiation of 1 mandatory breath)
Static measurements	Insp. or exp. hold (0 – 30 seconds)
Nebulization	5 – 30 min/Continuous/Off
O_2 boost level	Off, 1 – 79 %
O_2 boost function	Activate O_2 boost up to 1 minute
Leakage compensation	Automatic in all non invasive modes
Circuit compensation (not available in NIV)	On/Off
Previous mode	Activates previously used mode
Backup ventilation	Backup On/Off
Apnea management	Several parameters

Disconnection / Suction 2.7

Pre-oxygenation time	Max. 2 min
Post-oxygenation time	Max. 1 min
Patient disconnected	High priority alarm activated after 1 min
Adjustable oxygen level	21 – 100 %

Monitoring and trends

Peak airway pressure	Ppeak
Pause airway pressure	Pplat
Mean airway pressure	Pmean
Driving pressure	Pdrive
Positive end expiratory pressure	PEEP
Spontaneous breaths per minute	RR sp
Respiratory rate	RR
Spontaneous expiratory minute volume	MVe sp
Inspired minute volume	MVi
Expired minute volume	MVe
Leakage fraction (%)	Leakage
Inspired tidal volume	VTi
Expired tidal volume	VTe
End expiratory flow	Flowee
Measured oxygen concentration	O_2 conc.
CO_2 end tidal concentration	$etCO_2$
CO_2 minute elimination	VCO_2
CO_2 tidal elimination	$VTCO_2$
Dynamic compliance	Cdyn
Static compliance	Cstatic
Inspiratory resistance	Ri
Expiratory resistance	Re
Work of breathing, ventilator	WOBvent
Work of breathing, patient	WOBpat
Elastance	E
P 0.1	P 0.1
Shallow Breathing Index	SBI
Ratio of expired tidal volume to predicted body weight	VT/PBW
Ratio of expired tidal volume to body weight	VT/BW
Switch to backup (/minute)	Trended value only
Backup (s/min)	Trended value only

2.8

6.16 Suction

6.16.1 Open suctioning

For open suctioning procedures, use Disconnection function.
Refer to section Disconnection on page 99.

6.16.2 Closed suctioning

The O_2 boost function can be used for oxygenation purposes.

If no pre-oxygenation is necessary, consider pre-silencing alarms before suctioning.

Use one of the pressure-based modes listed here. Adjust settings to levels suitable for the patient and follow hospital guidelines for closed suctioning.

- PC
- PS
- Bi-Vent/APRV
- Automode PC ⇄ PS
- SIMV (PC) + PS

6.17 Previous mode

When *Modes* is tapped during operation, the current mode tile is always highlighted and the previous mode tile is marked *Previous*, together with the date and time it was used.

If the previous mode was non invasive and the current mode is invasive, or vice versa, it is necessary to go to Standby and choose the relevant ventilation type to find the previous mode.

The previous mode function is not available:
- after a pre-use check
- after changing the patient category
- after admitting a new patient
- after using the same ventilation mode for more than 24 hours
- after restarting the system.

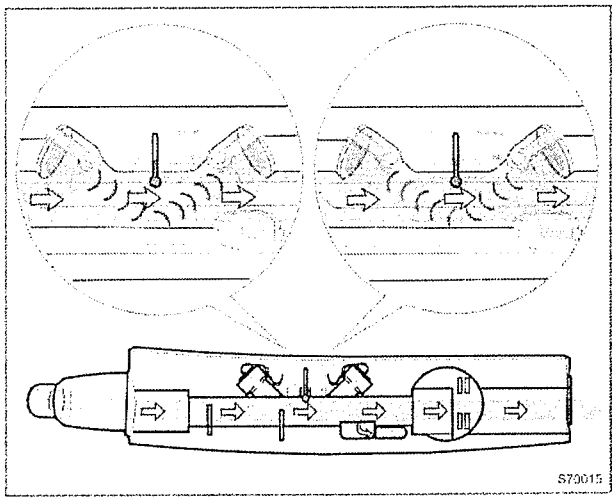
When the previous mode function is activated during backup ventilation, the ventilator system returns to the mode that was active before the supported mode was initiated.

A recall of previous settings is only possible after a change of ventilation mode.

To recall the previous ventilation mode used:
- Tap the tile marked with an arrow in the *Modes* window.
- A dialog will open asking *Do you want to keep the previous settings for the mode?*
- Tap one of the two choices *Yes* or *No* as appropriate.
  - If *Yes* is tapped, the mode settings window will open with the previous settings intact.

3.12.3 Ultrasonic flowmeter 2.9

The Ultrasonic flowmeter (expiratory flow transducer) is a measuring device for the expiratory gas flow, using ultrasound technique with two ultrasonic transducers/receivers. The measuring process is controlled from PC 2024 Expiratory channel.



The left hand side transducer is sending out an ultrasonic sound that is reflected against the inner wall of the Expiratory channel. The ultrasonic sound is received by the right hand side transducer now acting as a receiver. The time from sending to receiving ultrasonic sound in downstream expiratory gas flow is measured.

Then the right hand side transducer (earlier receiving) is sending out ultrasonic sound upstream the expiratory gas flow. The ultrasonic sound is received by the left hand side transducer now acting as a receiver. The time from sending to receiving ultrasonic sound in upstream expiratory gas flow is measured.

The time difference between the downstream and the upstream time measurements provides flow information.

A temperature sensor inside the cassette measures the expiratory gas temperature. This temperature measurement is also used when calculating the expiratory flow.

3.12.4 Bacteria filter and expiratory pressure tube

Via a Bacteria filter inside the cassette, the Expiratory pressure tube connects the cassette to the Expiratory pressure transducer. The filter and the connector are integrated parts of the cassette. The filter protects the transducer on PC 1781 Pressure transducer from contamination.

3.13 Expiratory valve (13)

The Expiratory valve consists of a membrane in the cassette that is operated by the axis of the Expiratory valve coil. The valve is fully open as long as no power is supplied to the coil.

Operating capacity for the membrane is estimated to 10 000 000 breathing cycles. When this limit is passed or if the membrane for some reason has become defective, it must be replaced. Refer to instructions in chapter Disassembling and assembling.

Select *Menu* > *Status & Configuration* > *Status* > *Expiratory cassette* to check *Membrane capacity*. The operating capacity meter must be reset after replacement of the membrane.

Ventilation – general

Patient range	Tidal volume: • Pediatric: 10 – 350 ml • Adult: 100 – 4000 ml
Bias flow	• Pediatric: 0,5 l/min • Adult: 2 l/min
Internal compressible factor	Max. 0.1 ml/cmH_2O
Gas delivery system	Microprocessor controlled valves
Maximum airway pressure	125 cmH_2O
Method of triggering	Flow and pressure
Inspiratory flow range	• Pediatric: 0 – 33 l/min • Adult: 0 – 200 l/min
Pressure drop	Max. 6 cmH_2O at a flow of 60 l/s (exp. channel)
PEEP regulation	Microprocessor controlled valve
Rise time, expiratory flow measurement	<12 ms for 10 – 90 % response at flow of 3 – 192 l/min
Expiratory flow range	0 – 192 l/min

User interface

Type	TFT-LCD touchscreen
Size	344x194 mm (13,5"x7,6")
Viewing area	15,6" Full HD, 24 bit color extra wide angle
Touch glass coating	Anti refelctive, Anti finger print

Power supply 2.10

Power supply, automatic range selection	100 –240 V AC ±10%, 50 – 60 Hz
Plug-in battery module:	
• Battery backup (Li-ion)	• Two battery module slots. One battery is delivered with the ventilator.
2.11 • Battery capacity	• Rechargeable, 14.4 V, 6.6 Ah each
• Battery backup time	• Approximately 1.5 h (factory new battery)
• Recharge time	• Approximately 4 h/battery

Gas supply

Inlet gas pressure air/O_2	200 – 600 kPa / 2.0 – 6.0 bar / 29 – 87 PSI (O_2: 99 – 100%)
Connection standards available	AGA, DISS, NIST, or French standard
Unavailable gas/loss of gas pressure 2.2	The flow from an unavailable gas (O_2) is automatically compensated for so that the patient gets the preset volume and pressure.
Patient system gas connectors	Male 22 mm / female 15 mm. In accordance with ISO 5356-1.
Gas exhaust port	Male 30 mm cone

Operating conditions

Operating temperature	+10 to +40°C (+50 to +104°F)
Relative humidity	15 to 95% non-condensing
Atmospheric pressure	700 to 1060 hPa
Lowest pressure in patient circuit	-400 cmH_2O

Non-operating conditions

Storage temperature	+5 to +40°C (41 to +104°F)
Storage relative humidity	5 to 85% non-condensing
Storage atmospheric pressure	660 to 1060 hPa
Transport temperature	-25 to +60°C (-13 to +140°F)
Transport relative humidity	<95% non-condensing
Transport atmospheric pressure	470 to 1060 hPa

Ventilation – general

Patient range	Tidal volume: • Pediatric: 10 – 350 ml • Adult: 100 – 4000 ml
Bias flow	• Pediatric: 0,5 l/min • Adult: 2 l/min
Internal compressible factor	Max. 0.1 ml/cmH_2O
Gas delivery system	Microprocessor controlled valves
Maximum airway pressure	125 cmH_2O
Method of triggering	Flow and pressure
Inspiratory flow range	• Pediatric: 0 – 33 l/min • Adult: 0 – 200 l/min
Pressure drop	Max. 6 cmH_2O at a flow of 60 l/s (exp. channel)
PEEP regulation	Microprocessor controlled valve
Rise time, expiratory flow measurement	<12 ms for 10 – 90 % response at flow of 3 – 192 l/min
Expiratory flow range	0 – 192 l/min

User interface

Type	TFT-LCD touchscreen
Size	344x194 mm (13,5"x7,6")
Viewing area	15,6" Full HD, 24 bit color extra wide angle
Touch glass coating	Anti refelctive, Anti finger print

Power supply 2.10

Power supply, automatic range selection	100 –240 V AC ±10%, 50 - 60 Hz
Plug-in battery module:	
• Battery backup (Li-ion)	• Two battery module slots. One battery is delivered with the ventilator.
• Battery capacity	• Rechargeable, 14.4 V, 6.6 Ah each
• Battery backup time	• Approximately 1.5 h (factory new battery)
• Recharge time	• Approximately 4 h/battery

Gas supply

Inlet gas pressure air/O_2	200 – 600 kPa / 2.0 – 6.0 bar / 29 – 87 PSI (O_2: 99 – 100%)
Connection standards available	AGA, DISS, NIST, or French standard
Unavailable gas/loss of gas pressure 2.2	The flow from an unavailable gas (O_2) is automatically compensated for so that the patient gets the preset volume and pressure.
Patient system gas connectors	Male 22 mm / female 15 mm. In accordance with ISO 5356-1.
Gas exhaust port	Male 30 mm cone

Operating conditions

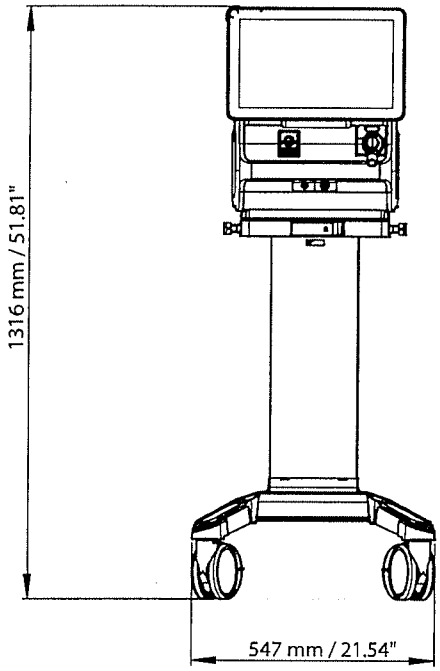
Operating temperature	+10 to +40°C (+50 to +104°F)
Relative humidity	15 to 95% non-condensing
Atmospheric pressure	700 to 1060 hPa
Lowest pressure in patient circuit	-400 cmH_2O

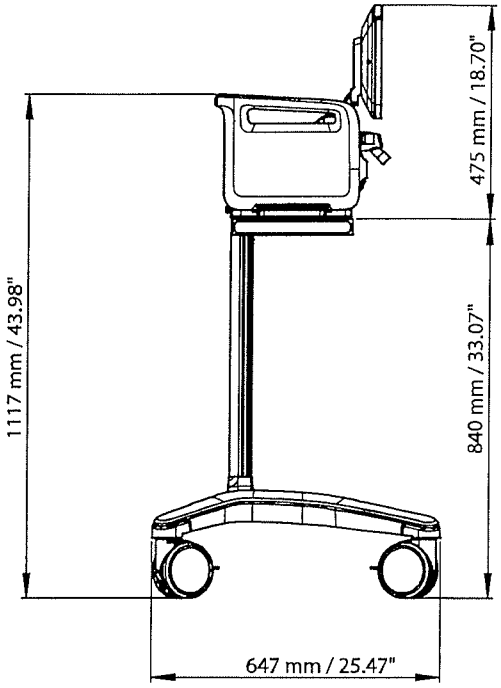
Non-operating conditions

Storage temperature	+5 to +40°C (41 to +104°F)
Storage relative humidity	5 to 85% non-condensing
Storage atmospheric pressure	660 to 1060 hPa
Transport temperature	-25 to +60°C (-13 to +140°F)
Transport relative humidity	<95% non-condensing
Transport atmospheric pressure	470 to 1060 hPa

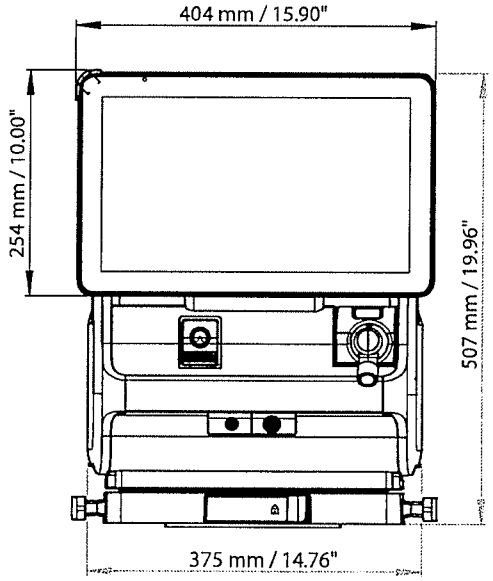
Dimensional drawings

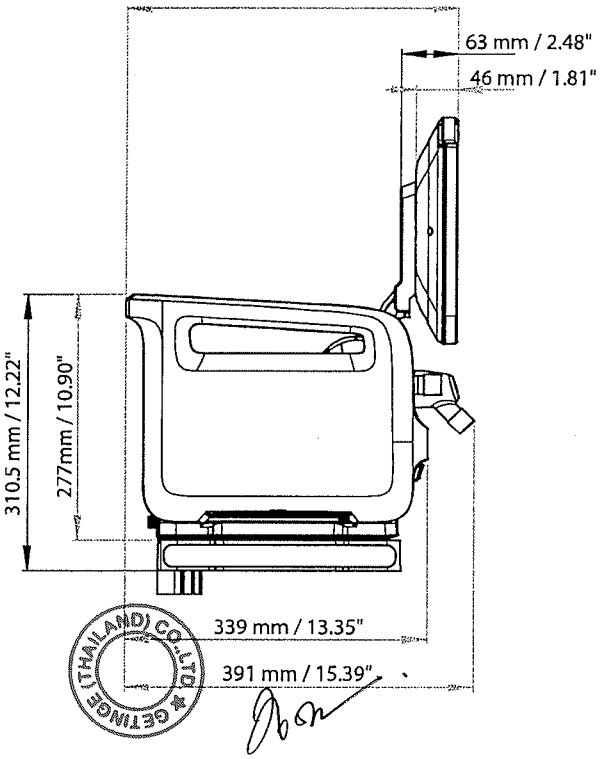
Servo-c on Mobile cart 2.12





Servo-c on shelf base





3.1 Ventilation modes – invasive ventilation

Controlled ventilation	• PC (Pressure Control) 3.1.1 • VC (Volume Control) 3.1.2 • PRVC (Pressure Regulated Volume Control), option 3.1.3
Supported ventilation:	• PS/CPAP (Pressure Support / Continuous Positive Airway Pressure) 3.1.5 • VS (Volume Support), option 3.1.6
AUTOMODE (option)	• Control mode: VC <--> Support mode: VS • Control mode: PC <--> Support mode: PS • Control mode: PRVC <--> Support mode: VS
3.1.4 Combined ventilation	• SIMV (VC) + PS (Synchronized Intermittent Mandatory Ventilation) 3.1.4.1 • SIMV (PC) + PS 3.1.4.2 • SIMV (PRVC) + PS (option) 3.1.4.3 • Bi-Vent/APRV (Airway Pressure Release Ventilation), option

3.1.7 Ventilation modes – non invasive ventilation

Controlled ventilation 3.1.7.1	• NIV PC (option)
Supported ventilation: 3.1.7.2	• NIV PS (option) • Nasal CPAP (option)

Non invasive ventilation

Max. leakage compensation level	• Adult: - Inspiratory leakage: up to 200 l/min - Expiratory leakage: up to 65 l/min • Pediatric and neonatal: - Inspiratory leakage: up to 33 l/min - Expiratory leakage: up to 25 l/min - Nasal CPAP leakage: up to 20 l/min
Disconnection flow (configurable)	• Low: 7.5 l/min • High: 40 l/min • Disabled: Deactivates disconnection detection
Connection detection	Manual or automatic via bias flow

3.1.8 High Flow therapy (option)

Flow setting range	• Pediatric: 0.5 – 50 l/min • Adult: 5 – 60 l/min

Stress Index

Patient category	Adult
Modes	VC, SIMV (VC)+PS, Automode VC <-->VS
Values	0.5 – 1.5 (A Stress Index above 1.05 suggest that the lungs are over-distended)

Open Lung Tool trends (option)

OLT trends (option)

Graphical trend areas	1: - Pei (end-inspiratory pressure) - Pdrive * - PEEP 2: - $VTCO_2$ (when applicable) - SI * (Stress Index, adult patient category only) - Cdyn 3: - VTi - VTe

* Pdrive and SI only shown as values – not graphical trends

Modes	All invasive modes
Trend time	5, 10, 15, 30, or 60 minutes
Recruitment recording	Recording of recruitments for retrospective review of recruitments

CO_2 analyzer (option)

CO_2 analyzer (option)	Size	Weight
Sensor (Capnostat 5)	32.0 x 47.0 x 21.6 mm (1.3" x 1.9" x 0.8")	20 g (0.70 oz)
Airway adapter		10 g (0.35 oz)
Operating temperature	10 to 33 °C (50 to 91 °F)	
Power source	Powered by the ventilator	
Connectors and cables	Sensor	2.8 m (9.2 ft) cable
Measuring method	Mainstream, dual-wavelength, non-dispersive infrared	
Measured parameters	• CO_2 end tidal concentration ($etCO_2$) • CO_2 minute elimination (VCO_2) • CO_2 tidal elimination ($VTCO_2$)	
Measuring range	• 0 to 100 mmHg CO_2 partial pressure • 0 to 13.3 kPa CO_2 partial pressure • 0 to 13.2 % CO_2 volume (at a barometric pressure of 1013 hPa)	
System response time CO_2	The total system response time of the CO_2 monitor when exposed first to air and then to a gas mix with 5.0 % CO_2 is <250 ms	
Warm-up time	15 s to initial CO_2 indication maximum 2 minutes to full specification	
Oxygen concentration compensation	Automatic. Values supplied from the ventilator system	
Barometric pressure compensation	Automatic. Values supplied from the ventilator system	
Digitizing rate	100 Hz	
Airway adapter dead space	• Pediatric: <1 cm^3 • Adult: <6 cm^3	

3.2.11

3.2.13

3.2 Parameter settings

Parameter	Pediatric range	Adult range
Tidal volume (ml)	10 – 350	100 – 4000 3.2.2
Minute volume (l/min)	0.3 – 20	0.5 – 60
Apnea, time to alarm (s)	2 – 45	15 – 45
Max. apnea time in Automode (s)	3 – 15	7 – 12
Pressure level above PEEP (cmH_2O)	0 – 80	0 – 120 3.2.3/3.2.
Pressure level above PEEP in NIV (cmH_2O)	0 – 60	0 – 60
PEEP (cmH_2O)	0 – 50	0 – 50 3.2.4
PEEP in NIV (cmH_2O)	2 – 20	2 – 20
Respiratory rate (breaths/min)	4 – 150	4 – 100 3.2.1
SIMV rate (breaths/min)	1 – 60	1 – 60
Breath cycle time, SIMV (s)	0.5 – 15	1 – 15
P_{High} (cmH_2O)	2 – 50	2 – 50
T_{High} (s)	0.2 – 30	0.2 – 30
T_{PEEP} (s)	0.1 – 10	0.1 – 10
PS above Phigh in Bi-Vent/APRV (cmH_2O)	0 – 78	0 – 118
O_2 concentration (%)	21 – 100	21 – 100 3.2.12
I:E ratio	1:10 – 4:1	1:10 – 4:1 3.2.6
Ti (s)	0.1 – 5	0.1 – 5 3.2.7
T_{Pause} (s)	0 – 1.5	0 – 1.5
T_{Pause} (% of breath cycle time)	0 – 30	0 – 30 3.2.10
Flow trigger (l/min) 3.2.11.2	0 – 0.5	0 – 2
Pressure trigger (cmH_2O) 3.2.11.1	-1 to -20	-1 to -20
Insp. rise time (% of breath cycle time)	0 – 20	0 – 20
Insp. rise time (s)	0 – 0.2	0 – 0.4 3.2.8
End inspiration (% of peak flow)	1 – 70	1 – 70 3.2.9
End inspiration (% of peak flow) in NIV	10 – 70	10 – 70
Decelerating flow pattern in VC (%)	0–100	0–100
Flow adaptation in VC	on/off	on/off

Backup parameter settings

Parameter	Pediatric range	Adult range
Inspiratory tidal volume (ml)	10 – 350	100 – 4 000
Pressure level above PEEP in backup (cmH_2O)	5 – 80	5 – 120
Pressure level above PEEP in NIV backup (cmH_2O)	5 – 60	5 – 60
Respiratory rate in backup (breaths/min)	4 – 150	4 – 100
I:E ratio	1:10 – 4:1	1:10 – 4:1
Ti (s)	0.1 – 5	0.1 – 5

Special functions

	Special function	Setting range
3.2.14	Manual breath	Initiation of 1 breath (In SIMV mode initiation of 1 mandatory breath)
	Static measurements	Insp. or exp. hold (0 – 30 seconds)
	Nebulization	5 – 30 min/Continuous/Off
3.2.15	O_2 boost level	Off, 1 – 79 %
	O_2 boost function	Activate O_2 boost up to 1 minute
	Leakage compensation	Automatic in all non invasive modes
	Circuit compensation (not available in NIV)	On/Off
	Previous mode	Activates previously used mode
	Backup ventilation	Backup On/Off
	Apnea management	Several parameters

Disconnection / Suction

Pre-oxygenation time	Max. 2 min
Post-oxygenation time	Max. 1 min
Patient disconnected	High priority alarm activated after 1 min
Adjustable oxygen level	21 – 100 %

Monitoring and trends

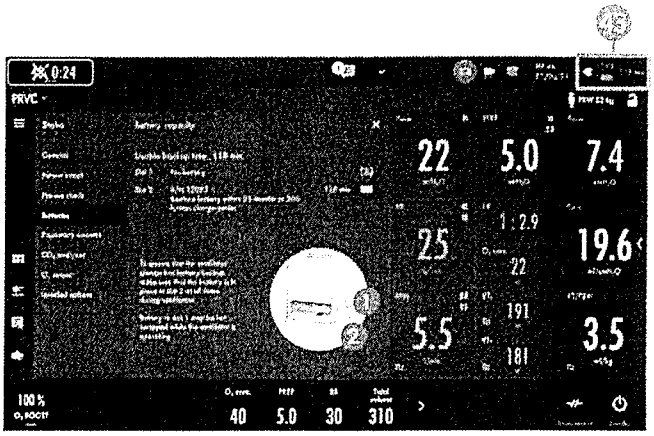
Peak airway pressure	Ppeak
Pause airway pressure	Pplat
Mean airway pressure	Pmean
Driving pressure	Pdrive
Positive end expiratory pressure	PEEP
Spontaneous breaths per minute	RR sp
Respiratory rate	RR
Spontaneous expiratory minute volume	MVe sp
Inspired minute volume	MVi
Expired minute volume	MVe
Leakage fraction (%)	Leakage
Inspired tidal volume	VTi
Expired tidal volume	VTe
End expiratory flow	Flowee
Measured oxygen concentration	O_2 conc.
CO_2 end tidal concentration	etCO_2
CO_2 minute elimination	VCO_2
CO_2 tidal elimination	VTCO_2
Dynamic compliance	Cdyn
Static compliance	Cstatic
Inspiratory resistance	Ri
Expiratory resistance	Re
Work of breathing, ventilator	WOBvent
Work of breathing, patient	WOBpat
Elastance	E
P 0.1	P 0.1
Shallow Breathing Index	SBI
Ratio of expired tidal volume to predicted body weight	VT/PBW
Ratio of expired tidal volume to body weight	VT/BW
Switch to backup (/minute)	Trended value only
Backup (%/min)	Trended value only

Battery

75. Unplug the mains cable.

76. Click on the battery symbol . 15
The battery compartment is divided into two slots – slot 1 (optional) and slot 2 (main). The battery module in slot 1 may be exchanged during ventilation.

NOTE: You can see how much capacity remains for each battery.



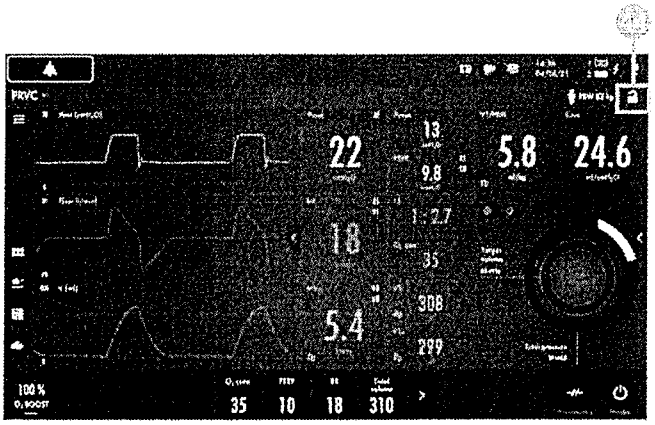
Step 75

Lock screen

77. LOCK SCREEN is found in the upper right corner. Lock the screen. 16

78. Tap anywhere on the screen and see what happens.

79. UNLOCK the screen by tapping and holding on the screen.



Step 77

O_2 boost 3.2.15 Page 2

80. Activate O_2 BOOST by tap and hold. 18

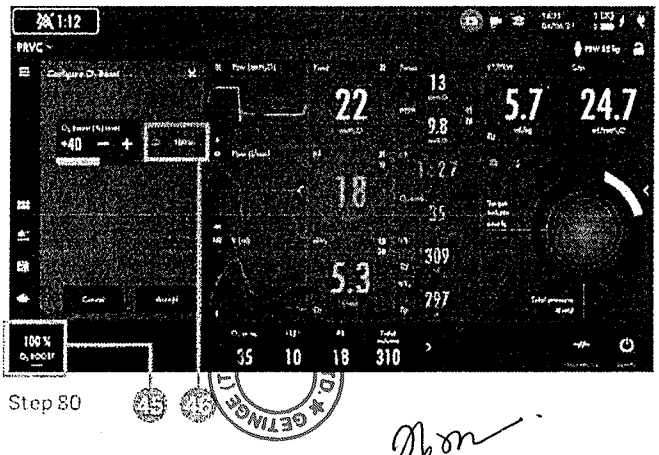
NOTE: O_2 boost is active for one minute. The alarms are silent for 2 min.

81. CANCEL O_2 boost by tapping .

82. Go to and configure O_2 BOOST. Unlock the 100% O_2 boost by tapping the 100% lock symbol. 19

83. Observe the new O_2 BOOST level. Change the O_2 BOOST LEVEL to 40% and accept.

NOTE: The value entered under O_2 boost (%) level specifies the number of percentage units that will be added to the value set for the O_2 concentration. For example: if the current O_2 concentration is 40% and the O_2 boost level is 30%, the O_2 boost function will, when tapped, deliver 70% O_2. The O_2 boost function figure displayed will change accordingly. Since the minimum O_2 concentration is 21%, the O_2 boost (%) level scale goes from 0 to 79%.



Step 80

Step 81

Backup parameter settings 3.3

Parameter	Pediatric range	Adult range	
Inspiratory tidal volume (ml)	10 – 350	100 – 4 000	3.3.1
Pressure level above PEEP in backup (cmH_2O)	5 – 80	5 – 120	
Pressure level above PEEP in NIV backup (cmH_2O)	5 – 60	5 – 60	
Respiratory rate in backup (breaths/min)	4 – 150	4 – 100	3.3.5
I:E ratio	1:10 – 4:1	1:10 – 4:1	
Ti (s)	0.1 – 5	0.1 – 5	

Special functions

3.3.2

Special function	Setting range	
Manual breath	Initiation of 1 breath (In SIMV mode initiation of 1 mandatory breath)	3.3.3
Static measurements	Insp. or exp. hold (0 – 30 seconds)	3.3.6
Nebulization	5 – 30 min/Continuous/Off	3.3.4
O_2 boost level	Off, 1 – 79 %	
O_2 boost function	Activate O_2 boost up to 1 minute	
Leakage compensation	Automatic in all non invasive modes	
Circuit compensation (not available in NIV)	On/Off	
Previous mode	Activates previously used mode	
Backup ventilation	Backup On/Off	
Apnea management	Several parameters	

Disconnection / Suction

Pre-oxygenation time	Max. 2 min
Post-oxygenation time	Max. 1 min
Patient disconnected	High priority alarm activated after 1 min
Adjustable oxygen level	21 – 100 %

Monitoring and trends

Peak airway pressure	3.3.1.1	Ppeak
Pause airway pressure	3.3.1.3	Pplat
Mean airway pressure	3.3.1.2	Pmean
Driving pressure		Pdrive
Positive end expiratory pressure	3.3.1.4	PEEP
Spontaneous breaths per minute		RR sp
Respiratory rate	3.3.5.1	RR
Spontaneous expiratory minute volume		MVe sp
Inspired minute volume		MVi
Expired minute volume		MVe
Leakage fraction (%)		Leakage
Inspired tidal volume	3.3.2.1	VTi
Expired tidal volume	3.3.2.2	VTe
End expiratory flow		Flowee
Measured oxygen concentration		O_2 conc.
CO_2 end tidal concentration		$etCO_2$
CO_2 minute elimination		VCO_2
CO_2 tidal elimination		$VTCO_2$
Dynamic compliance	3.3.4.1	Cdyn
Static compliance	3.3.4.2	Cstatic
Inspiratory resistance		Ri
Expiratory resistance	3.3.4.3	Re
Work of breathing, ventilator		WOBvent
Work of breathing, patient		WOBpat
Elastance		E
P 0.1		P 0.1
Shallow Breathing Index		SBI
Ratio of expired tidal volume to predicted body weight		VT/PBW
Ratio of expired tidal volume to body weight		VT/BW
Switch to backup (/minute)		Trended value only
Backup (%/min)		Trended value only

Standards – safety and functionality

CE 0123	The device complies with requirements and classification IIb of Medical Devices Regulation (EU) 2017/745. CE Mark Notified Body number: 0123.
Classification	IEC 60601-1: 2005 + A1:2012 + A2:2020, Class I, continuous operation. Applied parts: - Equipment making physical contact with the patient and the gas path ways. Type B - Nebulizer patient unit and cable. Type BF - CO_2. Type BF
Standards	• ISO 80601-2-12:2020 • EN 13544-1:2007 + A1:2009
Ingress protection	IP 21
Electromagnetic compatibility (EMC)	According to limits specified in IEC 60601-1-2:2014 + A1:2020

Display

Views	• Basic view • Advanced view • Loops view • Distance view • Family view • Each of the screen layout views offers a specific combination of displayed waveforms, loops and presented values.
Real time waveforms	• Pressure • Flow • Volume • CO_2 (option)
Loops	• Pressure – Volume • Volume – Flow • Pressure – Flow loop

A reference loop and two overlaying loops can be displayed.

Servo Compass	Visualizes volume (VT/PBW) and pressure (total or driving) in relation to set targets in invasive modes.
Short trends	• During ventilation in all ventilation modes, short trends of the numerical values in the first column can be displayed. • Trend time 15 minutes to 72 hours.
Trends 3.3.7	Trending of measured and calculated values: • Trend time 1 to 72 hours. • Order of trended values can be set by the user.