



Datasheet
Servo-air NIV
System version 4.0

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Servo-air NIV

Technical specifications

General

Intended use	The Servo-air NIV ventilator system is: <ul style="list-style-type: none"> intended for respiratory support, monitoring and treatment of pediatric and adult patients to be used only by healthcare providers to be used only in professional healthcare facilities and for transport within these facilities
Instructions for use	Please carefully read the user's manual
Legal manufacturer	Maquet Critical Care AB
Other products	See separate data sheets. Contact your local Getinge supplier for more information.

The ventilator – general

	Servo-air NIV	Servo-air NIV on mobile cart
Base system weight	Approx. 15 kg (33 lbs)	Approx. 30 kg (66 lbs) <ul style="list-style-type: none"> Base system approx. 15 kg (33 lbs) Mobile cart approx. 15 kg (33 lbs)
Dimensions of base (W x D), see dimensional drawings	375 x 350 mm (14.8"x13.8")	647 x 547 mm (25.5"x21.5") incl. wheels
Height (incl. user interface)	489 mm (19.3")	1335 mm (52.6")
Wheels	N/A	Four wheels with separate brakes
A-weighted sound pressure level (L_{pA})	<49 dB, measured at a distance of 1 m (3.3 ft)	
A-weighted sound power level (L_{WA})	<57 dB	

Ventilation – general

Patient range	Tidal volume: <ul style="list-style-type: none"> • Pediatric: 20 – 350 ml • Adult: 100 – 2000 ml
Bias flow	2 l/min ±5 %
Internal compressible factor	Max. 0.1 ml/cmH ₂ O
Gas delivery system	Air turbine and O ₂ valve
Maximum airway pressure	100 cmH ₂ O
Method of triggering	Flow and pressure
Inspiratory flow range	<ul style="list-style-type: none"> • Adult: 0 – 240 l/min • Pediatric: 0 – 80 l/min
Pressure drop	Max. 3 cmH ₂ O 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	300 x 248 mm (11.8" x 9.8")
Viewing area	12" XGA, 1024x768 pixels with a 24-bit color palette

Power supply

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 2 h (factory new battery)
• Recharge time	• Approximately 3 h/battery
External 12 V DC	12.0 V – 15.0 V DC, 15 A

Gas supply

Inlet gas pressure O ₂	200 – 600 kPa / 2.0 – 6.0 bar / 29 – 87 PSI
Connection standards available	AGA, DISS, NIST, or French standard
Unavailable gas/loss of gas pressure	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	+5 to +40°C (+41 to +104°F)
Relative humidity	5 to 95% non-condensing
Atmospheric pressure	660 to 1060 hPa
Lowest pressure in patient circuit	-400 cmH ₂ O

Non-operating conditions

Storage temperature	-25 to +60°C (-13 to +140°F)
Storage relative humidity	<95% condensing
Storage atmospheric pressure	470 to 1060 hPa

Standards – safety and functionality

	<p>The device complies with requirements and classification IIb of Medical Device Directive 93/42/EEC.</p> <p>CE Mark Notified Body number: 0123.</p>
Classification	<p>IEC 60601-1: 2005 + A1:2012, Class I, continuous operation.</p> <p>Applied parts:</p> <ul style="list-style-type: none"> - Equipment making physical contact with the patient and the gas path ways. Type B - Nebulizer patient unit and cable. Type BF
Standards	<ul style="list-style-type: none"> • Applied parts, i.e. equipment making physical contact with the patient, are described in Ventilation patient connection – System flowchart. • ISO 80601-2-12:2011 • ISO 80601-2-55:2018 • EN 13544-1:2007 + A1:2009
Ingress protection	IP 21
Electromagnetic compatibility (EMC)	According to limits specified in IEC 60601-1-2:2014
<p>The 'EMC Declaration, Information to the Responsible Organization' is available from Getinge.</p>	

Display

Views	<ul style="list-style-type: none"> • Basic view • Advanced view • Distance view • Family view • Each of the screen layout views offers a specific combination of displayed waveforms and presented values.
Real time waveforms	<ul style="list-style-type: none"> • Pressure • Flow • Volume

Non invasive ventilation

Max. leakage compensation level	<ul style="list-style-type: none"> • Adult: <ul style="list-style-type: none"> - Inspiratory: up to 240 l/min* - Expiratory: up to 65 l/min • Pediatric: <ul style="list-style-type: none"> - Inspiratory: up to 240 l/min* - Expiratory: up to 25 l/min <p>* up to 180 l/min with 100% O₂ concentration</p>
Disconnection flow (configurable)	<ul style="list-style-type: none"> • Low: 7.5 l/min • High: 40 l/min • Disabled: Deactivates disconnection detection
Connection detection	Manual or automatic via bias flow

Ventilation modes – non invasive ventilation

Controlled ventilation	NIV PC
Supported ventilation:	NIV PS

High Flow therapy

Flow setting range	<ul style="list-style-type: none"> • Adult: 5 – 60 l/min • Pediatric: 2 – 30 l/min
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Parameter settings

Parameter	Adult range	Pediatric range
Apnea, time to alarm (s)	15 – 45	2 – 45
Pressure level above PEEP in NIV (cmH ₂ O)	0 – 60	0 – 60
PEEP in NIV (cmH ₂ O)	2 – 20	2 – 20
Respiratory rate (breaths/min)	4 – 100	4 – 150
O ₂ concentration (%)	21 – 100	21 – 100
I:E ratio	1:10 – 4:1	1:10 – 4:1
Ti (s)	0.1 – 5	0.1 – 5
Insp. rise time (s)	0 – 0.4	0 – 0.2
End inspiration (% of peak flow) in NIV	10 – 70	10 – 70

Backup parameter settings

Parameter	Adult range	Pediatric range
Inspiratory tidal volume (ml)	100 – 2000	20 – 350
Pressure level above PEEP in NIV backup (cmH ₂ O)	5 – 60	5 – 60
Respiratory rate in backup (breaths/min)	4 – 100	4 – 150
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
Previous mode	Activates previously used mode
Backup ventilation	Backup On/Off
Apnea management	Several parameters

Monitoring and trends

Peak airway pressure	Ppeak
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.
Static compliance	Cstatic
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

Alarms

Alarm	Adult range	Pediatric range
Airway pressure NIV (upper alarm limit)	16 – 70 cmH ₂ O	16 – 70 cmH ₂ O
Respiratory rate (upper alarm limit)	2 – 160 breaths/min	2 – 160 breaths/min
Respiratory rate (lower alarm limit)	1 – 159 breaths/min	1 – 159 breaths/min
Expired minute volume (upper alarm limit)	1 – 60 l/min	0.02 – 30 l/min
Expired minute volume (lower alarm limit)	0.5 – 40 l/min	0.01 – 20 l/min
End expiratory pressure (upper alarm limit)	1 – 55 cmH ₂ O	1 – 55 cmH ₂ O
End expiratory pressure (lower alarm limit)	0 – 47 cmH ₂ O	0 – 47 cmH ₂ O
No patient effort (Apnea) alarm	15 – 45 s	2 – 45 s
	Automatic return to support mode on patient triggering	
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	<ul style="list-style-type: none"> Limited battery capacity: 10 min No battery capacity: less than 3 min Low battery voltage 	
Leakage too high	Yes, described in User's manual	
Technical	Yes, described in User's manual	

Aerogen nebulizers

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)	

Communication / Interface

Serial ports	<ul style="list-style-type: none"> Two RS-232C ports. For data communication via the Servo Communication Interface (SCI).
Servo Communication Interface (SCI)	A protocol for data communication with external devices
Alarm output connection (option)	<ul style="list-style-type: none"> 4-pin modular connector for communication of all active alarms Switching capability: Max. 40 V DC, max. 500 mA, max. 20 W
Data transfer via USB	<ul style="list-style-type: none"> For transfer of trends, logs, screenshots and recordings to a USB memory stick
Ethernet port	<ul style="list-style-type: none"> The network connection (LAN) port is for service use

Log function

Event log	<ul style="list-style-type: none"> Alarms Ventilator settings Apnea periods Immediate functions
Service log	<ul style="list-style-type: none"> Technical alarms Test results Service records Software installation Configuration information

Saving of data

Recording of current waveform and parameter values	30 seconds of data will be recorded (15 seconds before and 15 seconds after activation). Up to 40 recordings can be stored.
Saving screenshots	Up to 40 screenshots can be stored.
Export files	Recordings, screenshots and the event log can be saved together in an export file and transferred to a USB memory stick.

Optional equipment

Optional equipment	Weight	Dimensions	Maximum load
Mobile cart	15.0 kg (33.0 lbs)	W 647 x L 547 x H 860 mm (W 25.5" x L 21.5" x H 33.9")	-
Shelf base	3.0 kg (6.6 lbs)	W 340 x L 270 x H 43 mm (W 13.4" x L 10.6" x H 1.7")	-
Humidifier holder	0.5 kg (1.1 lbs)	W 76 x L 125 x H 140 mm (W 3.0" x L 4.9" x H 5.5")	12 kg (26.5 lbs)
Support arm 179	2.5 kg (5.5 lbs)	Length 900 mm (35.4")	<ul style="list-style-type: none"> • 1 kg (2.2 lbs) at 180° • 1.5 kg (3.3 lbs) at 90° • 3 kg (6.6 lbs) at 45°
Cable holder for handle	0.1 kg (0.2 lbs)	W 138 x L 92 x H 155 mm (W 5.4" x L 3.6" x H 6.1")	10 kg (22.0 lbs)
Waterbag/IV pole	0.4 kg (0.9 lbs)	W 148 x L 26 x H 1007 mm (W 5.8" x L 1.0" x H 39.6")	1.5 kg (3.3 lbs)
Gas cylinder restrainer kit	0.5 kg (1.1 lbs)	Upper: W 104 x L 65 x H 48 mm (W 4.1" x L 2.5" x H 1.9") Lower: W 106 x L 162 x H 76 mm (W 4.1" x L 6.4" x H 3.0")	Two 4.5-liter bottles
Y piece holder	-	W 26 x L 52 x H 46 mm (W 1.0" x L 2.0" x H 1.8")	-

Service

Regular maintenance	Once every 12 months or at least after 5000 operating hours
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Upgrade

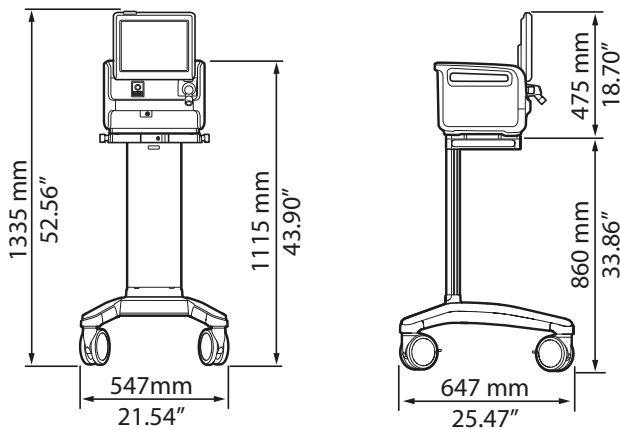
Servo-air NIV can be upgraded to a Servo-air with Invasive ventilation modes and invasive functions and tools.
Please see "System flowchart Servo-air NIV" (Order no: 68 89 289) and "Datasheet Servo-air" (Order no: 68 89 471)
for more information.

Ordering information

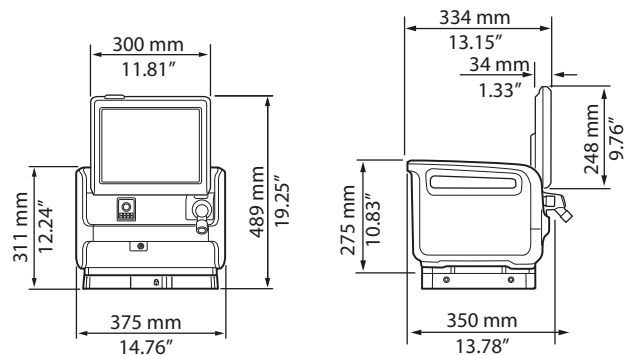
Servo-air NIV, ventilator system and accessories: See separate information:
"System Flow Chart Servo-air NIV" (Order no: 68 89 289).

Dimensional drawings

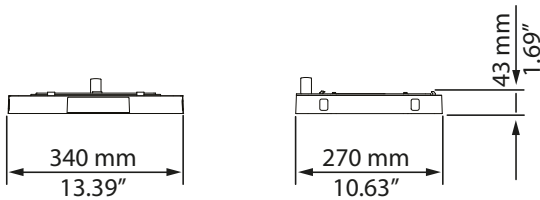
Servo-air NIV on Mobile cart



Servo-air NIV on shelf base



Servo-air NIV shelf base



*Country specific part and directly removable parts excluded



Getinge is a global provider of innovative solutions for operating rooms, intensive care units, sterilization departments and for life science companies and institutions. Based on our firsthand experience and close partnerships with clinical experts, healthcare professionals and medtech specialists, we are improving the everyday life for people, today and tomorrow.

Servo-air NIV may be pending regulatory approvals to be marketed in your country. Contact your Getinge representative for more information. This document is intended to provide information to an international audience outside of the US.

Manufacturer · Maquet Critical Care AB · Röntgenvägen 2 SE-171 54 Solna · Sweden · +46 (0)10 335 73 00

www.getinge.com