

DATA SHEET

**MAQUET**  
GETINGE GROUP

**VENTILATION  
SERVO-i<sup>®</sup> UNIVERSAL**

CRITICAL CARE



**HIGHLIGHTS**

- For all patient categories - available in two editions
- Intuitive user interface
- Designed for cost-efficiency
- Flexible placement
- Modular – interchangeable plug-in units
- Enables Heliox delivery
- NAVA<sup>®</sup> - improved synchrony and unique monitoring capabilities
- For invasive as well as non invasive ventilation
- The Open Lung Tool<sup>®</sup> - Lung recruitment with Dynamic Compliance and etCO<sub>2</sub>.
- Available in MR and Transport editions for continuity of ventilatory care








# SERVO-i VENTILATOR FAMILY

## SERVO-i UNIVERSAL

### SERVO-i Configurations



























































































The SERVO-i Ventilator family consists of four configurations:

	Infant
	Adult
UBE	Universal Basic Edition
UEE	Universal Extended Edition
	Standard Configuration
	Options
	Not applicable

The SERVO-i Ventilator family addresses the very different requirements of neonatal, pediatric and adult needs from a single ventilation platform. All four configurations are the same ventilator, equipped with different functions. They can be customized and upgraded with different options for future needs. (SERVO-i Adult and SERVO-i Infant can also be upgraded to SERVO-i Universal.) The same ventilator can be used at the bedside, during transport\* and in the MR-room\* facilitating training, operation and maintenance, increasing efficiency and flexibility.

SERVO-i Universal is an intensive care ventilator for all patient categories and is available in two editions - Basic and Extended, the latter featuring a wide range of modes and functions as standard.

\*An agreement with MAQUET must be signed, see conditions in the SERVO-i MR declaration (Order no. 66 71 670) and the Interhospital Transport Declaration (Order no. 66 64 721) respectively.

			UBE	UEE
NIV NAVA <sup>®</sup>				
NAVA <sup>®</sup>				
Heliox				
Nasal CPAP				
NIV PC				
NIV PS				
Bi-Vent				
Y Sensor Measuring				
CO <sub>2</sub> Analyzer				
Nebulizer				
Alarm output connector				
Open Lung Tool <sup>®</sup>				
Automode <sup>®</sup>				
SIMV (PRVC) + PS				
PRVC				
VS				
SIMV (VC) + PS				
VC				
SIMV (PC) + PS				
PC				
PS/CPAP				
All patient category software				

### KEY TO ABBREVIATIONS

NAVA	Neurally Adjusted Ventilatory Assist
NIV	Non-invasive ventilation
SIMV	Synchronized Intermittent Mandatory Ventilation
PRVC	Pressure Regulated Volume Control
VS	Volume Support
VC	Volume Control
PS	Pressure Support
PC	Pressure Control
CPAP	Continuous Positive Airway Pressure

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

#### The system - General

**CE**  
0413

The device complies with requirements of Medical Device Directive 93/42/EEC.

**Classification:** Class I equipment. According to IEC/EN 60 601-1.

**Standards:** IEC/EN 60 601-1 (Type B).  
IEC/EN 60 601-2-12.  
EN 794-1.

**IP classification** IP 20

**Electromagnetic compatibility (EMC):**

- **Emission:** According to IEC/EN 60601-1-2 (Edition 2:2001).
- **Immunity- Extended test to 30 v/m:** According to IEC/EN 60601-1-2.

The 'EMC Declaration, Information to the Responsible Organization' is available from MAQUET.

<b>Patient range:</b>	<b>Weight:</b>
■ Adult, all ventilation modes:	10 - 250 kg
■ Infant, invasive ventilation:	0.5 - 30 kg
■ Infant, NAVA + NIV NAVA:	0.5 - 30 kg
■ Infant, NIV PS+PC:	3 - 30 kg
■ Infant, Nasal CPAP:	0.5 - 10 kg

#### Operating conditions

**Operating temperature:** +10 to +40°C

**Relative humidity:** 15 to 95% non-condensing

**Atmospheric pressure:** 660 to 1060 hPa

**Lowest pressure in breathing system:** -400 cmH<sub>2</sub>O

#### Non-operating conditions

**Impact:** Peak acceleration: 15 g.  
Pulse duration: 6 ms.  
Number of impacts: 1000.

**Storage temperature:** -25 to +60° C (-13 to 140° F)

**Storage Relative Humidity:** < 95%

**Storage Atmospheric Pressure:** 470 to 1060 hPa

#### Power supply

**Power supply, automatic range selection:** 100 – 120 V AC ±10%, 50 – 60 Hz, or 220 – 240 V AC ±10%, 50 – 60 Hz.

**Plug-in battery module:**

- **Battery backup:** Two battery modules are delivered with the ventilator. Up to six battery modules can be included.
- **Battery capacity:** Rechargeable, 12 V, 3.5 Ah each.
- **Recharge time:** Approximately 3 h/battery.
- **Battery backup time:** At least 3 h, when using six batteries.

**External 12 V DC:** 12.0 V – 15.0 V DC, 10 A

**Max power consumption:** At 100 – 120 V: 2 A, 190 VA, 140 W.  
At 220 – 240 V: 1 A, 190 VA, 140 W.

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

#### The ventilator - General

Dimensions:	(See dimensional drawings page 15)
■ User Interface:	W 355 x D 53 x H 295 mm
■ Patient Unit:	W 300 x D 205 x H 415 mm

Weight:	Approximately 20 kg (Patient Unit 15 kg, User Interface 5 kg)
Method of triggering:	Flow and pressure
Max. operating pressure:	Approximately 115 cmH <sub>2</sub> O
Bias flow:	
■ Adult:	2 l/min
■ Infant:	0.5 l/min

#### Gas supply

Inlet gas pressure Air/O <sub>2</sub> :	200 – 650 kPa / 2.0 – 6.5 bar / 29 – 94 PSI
Connection standards available:	AGA, DISS, NIST, or French standard.
Unavailable gas/loss of gas pressure:	The flow from an unavailable gas (air or O <sub>2</sub> ) is automatically compensated for so that the patient gets the preset volume and pressure.

#### Patient system gas connectors

Conical fittings:	Male 22 mm / female 15 mm. In accordance with ISO 5356-1.
Gas exhaust port:	Male 30 mm cone

#### User interface

Weight:	Approximately 5 kg
Attachment:	Can be attached to the mobile cart, a table, rail or pole (15 – 30 mm diameter).

#### Screen

Type:	TFT-LCD module
Size:	31 cm (12.1") diagonal
Viewing area:	246.0 x 184.5 mm

#### Inspiratory channel

Pressure drop:	Max. 6 cmH <sub>2</sub> O at a flow of 1 l/s
Internal compressible factor:	Max. 0.1 ml/cmH <sub>2</sub> O
Gas delivery system:	Microprocessor controlled valve
Inspiratory flow range:	
■ Adult:	0 to 3.3 l/s
■ Infant:	0 to 0.55 l/s

#### Expiratory channel

Pressure drop:	Max. 3 cmH <sub>2</sub> O at a flow of 1 l/s
Internal compressible factor:	Max. 0.1 ml/cmH <sub>2</sub> O
PEEP regulation:	Microprocessor controlled valve
Rise time, expiratory flow measurement:	<12 ms for 10 – 90 % response at flow of 0.05 – 3.2 l/s
Expiratory flow range:	0 to 3.2 l/s

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

Alarms	
Airway pressure (upper):	
■ Adult, invasive ventilation:	16 - 120 cmH <sub>2</sub> O
■ Adult, Non Invasive Ventilation:	16 - 40 cmH <sub>2</sub> O
■ Infant, Invasive ventilation:	16 - 90 cmH <sub>2</sub> O
■ Infant, Non Invasive Ventilation	16 - 40 cmH <sub>2</sub> O
Expired minute volume (Upper alarm limit):	
■ Adult:	0.5 – 60 l/min
■ Infant:	0.01 – 30 l/min
Expired minute volume (Lower alarm limit):	
■ Adult:	0.5 – 40 l/min
■ Infant:	0.01 – 20 l/min
It is possible to permanently silence this alarm (an option with Infant version only)	
No patient effort (Apnea) alarm	
■ Adult:	15 – 45 s
■ Infant	5 – 45 s
Automatic return to support mode on patient triggering	
No consistent patient effort:	Yes, described in User's manual
Respiratory frequency:	1 – 160 breaths/min
High end expiratory pressure:	0 – 55 cmH <sub>2</sub> O
Low end expiratory pressure:	0 – 47 cmH <sub>2</sub> O. Note. Setting the alarm to 0 (zero) is equal to alarm off.
High continuous pressure:	Set PEEP level + 15 cmH <sub>2</sub> O exceeded for more than 15 seconds.
O <sub>2</sub> concentration:	Set value ±5 vol% or ≤18 vol%
Gas supply:	Below 200 kPa / 2.0 bar / 29 PSI and above 650 kPa / 6.5 bar / 94 PSI

Alarms	
Battery:	Limited battery capacity: 10 min. No battery capacity: less than 3 min. Low battery voltage.
End-tidal CO <sub>2</sub> (upper and lower limit):	0.5 – 20%. 4 – 100 mm Hg. 0.5 – 14 kPa.
Leakage out of range in NIV:	Yes. Described in the User's manual.
Technical:	Yes. Described in the User's manual.
Autoset (alarm limits) specification:	Invasive ventilation, controlled modes only.
■ High airway pressure:	Mean peak pressure +10 cmH <sub>2</sub> O or at least 35 cmH <sub>2</sub> O.
■ Upper minute volume:	Expiratory minute volume + 50%.
■ Lower minute volume:	Expiratory minute volume – 50%.
■ Upper respiratory frequency:	Breathing frequency + 40%.
■ Lower respiratory frequency:	Breathing frequency – 40%.
■ High end expiratory pressure:	Mean end expiratory pressure + 5 cmH <sub>2</sub> O.
■ Low end expiratory pressure:	Mean end expiratory pressure – 3 cmH <sub>2</sub> O.
■ Upper end tidal carbon dioxide concentration (etCO <sub>2</sub> ):	End tidal carbon dioxide concentration + 25%.
■ Lower end tidal carbon dioxide concentration (etCO <sub>2</sub> ):	End tidal carbon dioxide concentration – 25%.

# TECHNICAL SPECIFICATIONS

## SERVO-i UNIVERSAL

Ventilation Modes – Invasive ventilation	
Controlled ventilation:	
■ PC	
■ VC	
■ PRVC	Optional with Universal Basic Edition
Supported ventilation:	
■ PS/CPAP	
■ VS	Optional with Universal Basic Edition
Combined ventilation:	
■ SIMV (VC) + PS:	Comes with the corresponding controlled ventilation mode
■ SIMV (PC) + PS:	Comes with the corresponding controlled ventilation mode
■ SIMV (PRVC) + PS	Comes with the corresponding controlled ventilation mode (optional with Universal Basic Edition)
■ Bi-Vent	Pressure controlled ventilation on two independently adjustable levels, allowing unrestricted spontaneous breathing on both levels. (Optional)
■ Automode	Control mode: VC <—> Support mode: VS Control mode: PC <—> Support mode: PS Control mode: PRVC <—> Support mode: VS Optional with Universal Basic Edition

Ventilation modes – Non-invasive Ventilation (optional)
NIV PC
NIV PS
Nasal CPAP

Ventilation modes - NAVA (Optional)	
■ NAVA	Neurally Adjusted Ventilatory Assist via endotracheal tube or tracheostomy
■ NIV NAVA	Neurally Adjusted Ventilatory Assist via non-invasive patient interfaces

Waveform and loop presentations	
Real time waveforms - up to 4 waveforms can be displayed simultaneously:	
■ Pressure	
■ Flow	
■ Volume	
■ CO <sub>2</sub>	Requires SERVO-i CO <sub>2</sub> Analyzer option
■ Edi	Requires SERVO-i NAVA option

Loops:	
■ Volume / Pressure*	*A reference loop and three overlaying loops can be displayed.
■ Flow / Volume*	*Displayed simultaneously with Open Lung Tool graphical trends, if requested.

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

Monitoring	Displayed value	Trended value*
Breathing frequency:	Yes	Yes
Spontaneous breaths per minute (RRsp):	No	Yes
Peak Airway Pressure:	Yes	Yes
Mean Airway Pressure:	Yes	Yes
Pause Airway Pressure:	Yes	Yes
End Expiratory Pressure:	Yes	Yes
CPAP Pressure:	Yes	Yes
Inspired Tidal Volume:	Yes	Yes
Expired Tidal Volume:	Yes	Yes
Inspired Minute Volume:	Yes	Yes
Expired Minute Volume:	Yes	Yes
Leakage fraction in NIV (%):	Yes	Yes
Ti/Ttot:	Yes	No
I:E ratio:	Yes	No
Total PEEP:	Yes	No
Edi peak:	Yes	Yes
Edi min:	Yes	Yes
O <sub>2</sub> Concentration (measured):	Yes	Yes
CO <sub>2</sub> End tidal concentration (etCO <sub>2</sub> ):	Yes	Yes
CO <sub>2</sub> Minute elimination (CO <sub>2</sub> ):	Yes	Yes
Tidal CO <sub>2</sub> elimination (VTCO <sub>2</sub> ):	Yes	Yes
MV <sub>e</sub> sp / MV <sub>e</sub> :	Yes	No
Spontaneous Exp. Minute Volume (MV <sub>e</sub> sp):	Yes	Yes
<i>*Stored trend values for up to 24 hours</i>		

Monitoring	Displayed value	Trended value*
End Expiratory Flow:	Yes	Yes
Static Compliance:	Yes	Yes
Dynamic Compliance:	Yes	Yes
Inspiratory Resistance	Yes	Yes
Expiratory Resistance	Yes	Yes
Elastance	Yes	Yes
Time Constant	Yes	No
P0.1:	Yes	Yes
Work of Breathing patient:	Yes	Yes
Work of Breathing ventilator	Yes	Yes
Shallow Breathing Index (SBI)	Yes	Yes
Supply pressure (O <sub>2</sub> and air):	Yes	No
Battery remaining time:	Yes	No
Barometric pressure:	Yes	No

Log function	
Event log:	Alarms. Ventilator settings. Apnea periods. Immediate functions.
Service log:	Technical alarms. Test results. Preventive maintenance. Service history. Configuration log.



## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

Parameter settings Parameter:	Setting range:	
	Infant	Adult
Inspiratory tidal volume (ml):	2 – 350	100 – 4000
Inspiratory minute volume (l/min):	0.3 – 20	0.5 – 60
Apnea, time to alarm (s):	5 – 45	15 – 45
Automode Trigger timeout (s):	3 – 15	7 – 12
PC/PS above PEEP (cmH <sub>2</sub> O)	0 – (80 - PEEP)	0 – (120 - PEEP)
PC/PS above PEEP in NIV (cmH <sub>2</sub> O)	0 – (32 - PEEP)	0 – (32 - PEEP)
PEEP (cmH <sub>2</sub> O)	0 – 50	0 – 50
PEEP in NIV (cmH <sub>2</sub> O)	2 – 20	2 – 20
CPAP pressure (cmH <sub>2</sub> O):	2 – 20	–
CMV frequency (breaths/min):	4 – 150	4 – 150
SIMV frequency (breaths/min):	1 – 60	1 – 60
Breath cycle time, SIMV (s):	0.5 – 15	1 – 15
P <sub>High</sub> (cmH <sub>2</sub> O)	(PEEP + 1) – 50	(PEEP + 1) – 50
T <sub>High</sub> (s):	0.2 – 10	0.2 – 10
T <sub>PEEP</sub> (s):	0.2 – 10	0.2 – 10
PS above P <sub>High</sub> (cmH <sub>2</sub> O):	0 – (80 - P <sub>High</sub> )	0 – (120 - P <sub>High</sub> )

Parameter settings Parameter:	Setting range:	
	Infant	Adult
O <sub>2</sub> concentration (%):	21 – 100	21 – 100
I:E ratio:	1:10 – 4:1	1:10 – 4:1
T <sub>Insp</sub> (s):	0.1 – 5	0.1 – 5
NAVA level (cmH <sub>2</sub> O/μV):	0 - 15	0 - 15
Edi trigger sensitivity (μV):	0.1 – 2.0	0.1 – 2.0
T <sub>Pause</sub> (s):	0 – 1.5	0 – 1.5
T <sub>Pause</sub> (% of breath cycle time):	0 – 30	0 – 30
Flow trigger sensitivity level (fraction of bias flow):	0 – 100%	0 – 100%
Press. trigg sensitivity (cmH <sub>2</sub> O):	-20 – 0	-20 – 0
Insp. rise time (% of breath cycle time):	0 – 20	0 – 20
Insp. rise time (s):	0 – 0.2	0 – 0.4
Insp. cycle off (% of peak flow):	1 – 70	1 – 70
Insp. cycle off in NIV (% of peak flow):	10 – 70	10 – 70
Nebulizer time (min):	5 – 30	5 – 30

Backup settings Parameter:	Setting range:	
	Infant	Adult
Inspiratory tidal volume (ml):	2 – 350	100 – 4000
PC above PEEP (cmH <sub>2</sub> O)	5 – (80 - PEEP)	5 – (120 - PEEP)
PC above PEEP in NIV	5 – (32 - PEEP)	5 – (32 - PEEP)
CMV frequency (breaths/min):	4 – 150	4 – 150
I:E ratio:	1:10 – 4:1	1:10 – 4:1
T <sub>Insp</sub> (s):	0.1 – 5	0.1 – 5

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

Parameter:	Setting range
Oxygen breaths:	100% for 1 minute
Start breath:	Initiation of 1 breath (In SIMV mode initiation of 1 mandatory breath)
Pause hold:	Insp. or exp (0 – 30 seconds)
Alarm silence/reset:	2 minute silence and reset of latched alarms
Compliance compensation:	On/Off
Automode (optional with Universal Basic Edition):	Automode On/Off
Servo Ultra Nebulizer (optional):	Nebulizer On/Off
Backup ventilation	Backup On/Off

#### Suction Support

Pre oxygenation time:	Max. 2 min
Post oxygenation time:	Max. 1 min
Suction phase time:	No maximum level
Adjustable oxygen level:	21 – 100 %

#### Saving of data

Recording of current waveform and parameter values:	20 seconds of data will be recorded (10 seconds before and 10 seconds after activation).
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#### Communication/Interface

Serial port:	RS-232C - isolated. For data communication via the Communication Interface Emulator (CIE).
Network connection (optional):	MIB (Medical Information Bus) monitor connection
Data transfer (optional):	Via Ventilation Record Card
Screen picture transfer (optional)	Via Ventilation Record Card

#### Non-invasive Ventilation (optional)

Max. leakage compensation level	
■ Adult	65 l/min
■ Infant, NIV:	25 l/min
■ Infant, Nasal CPAP:	15 l/min
Leakage overrange detection:	Automatic
Disconnect detection:	Automatic
Disconnect flow:	Configurable
■ Low	7.5 l/min
■ High	- 40 l/min (Adult) - 15 l/min (Infant)
■ Disabled	Deactivates disconnect detection
Connect detection:	Manual, or automatic via bias flow

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

#### Open Lung Tool (OLT) (optional with Universal Basic Edition)

Three simultaneous graphical trends, presented breath-by-breath:	<ol style="list-style-type: none"> <li>1. EIP and PEEP (End Inspiratory Pressure and Positive End Expiratory pressure).</li> <li>2. <math>VT_i</math> and <math>VT_e</math> (Inspiratory and Expiratory Tidal volume).</li> <li>3. <math>C_{dyn i}</math> and <math>VT_{CO_2}^*</math> (Dynamic inspiratory Compliance [= <math>VT_i/(EIP - PEEP)</math>] and Tidal <math>CO_2</math> elimination*).</li> </ol> <p>* Requires SERVO-i <math>CO_2</math> Analyzer option.</p>
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Values stored breath by breath: Up to 21.600 breaths.

Cursor function: A cursor can be moved with the main rotary dial or via the touch screen. When moving it along the graph, the numeric parameter values valid for that actual moment will be shown.

Zoom function: Time resolution of the x-axis can be selected in five different steps.

Time marking: Hours and minutes (when values are measured).

#### NAVA (optional)

Standards: IEC/EN 60601-1  
(Type CF, defibrillator proof)

Size:

- Edi module: 154 x 90 x 21 mm
- Edi catheter cable: Length: 2 m

Weight - Edi module: 0.25 kg

Power source - Edi module supply voltage: Powered from SERVO-i. <3 W at 12 V (normal operation)

Parameters: Edi waveform  
Edi leads waveforms  
NAVA estimated pressure waveform (Pest)

Edi catheters:

- 6 Fr, length 49 cm
- 6 Fr, length 50 cm
- 8 Fr, length 100 cm
- 8 Fr, length 125 cm
- 12 Fr, length 125 cm
- 16 Fr, length 125 cm

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

#### SERVO-i CO<sub>2</sub> Analyzer (optional)

Standard: EN 864, ISO 9918.  
IEC/EN 60601-1  
(Type BF, defibrillator proof)

#### Size:

- CO<sub>2</sub> Analyzer Module: 154 x 90 x 43 mm
- Sensor: 32.0 x 42.4 x 21.6 mm

#### Weight:

- CO<sub>2</sub> Analyzer Module: 0.45 kg
- Sensor: 18 g
- Airway adapter: 10 g

#### Connectors and cables:

- CO<sub>2</sub> Analyzer Module: 15-pole D-sub female connector.
- Sensor: 20-pole, 2.4 m cable.

#### Power source:

- CO<sub>2</sub> Analyzer Module supply voltage: Powered from the SERVO-i.
- Power consumption: ≤ 8 W at 12 V, during warm up.  
≤ 6.5 W at 12 V, during normal operation.
- Sensor: Powered from the CO<sub>2</sub> Analyzer Module.

#### SERVO-i CO<sub>2</sub> Analyzer – Performance

Measuring method: Mainstream, dual-wavelength, non-dispersive infrared.

Parameters: Capnogram.  
CO<sub>2</sub> End tidal concentration (etCO<sub>2</sub>).  
CO<sub>2</sub> Minute elimination ( $\dot{V}CO_2$ ).  
Tidal CO<sub>2</sub> elimination (VTCO<sub>2</sub>).

Measuring range: 0 to 100 mm Hg CO<sub>2</sub> partial pressure.  
0 to 13.3 kPa CO<sub>2</sub> partial pressure.  
0 to 13.2% CO<sub>2</sub> volume (at a barometric pressure of 1013 hPa).

Step response time: <25 ms (10 to 90% step response).

Warm-up time: 30 s to initial CO<sub>2</sub> indication, max. 5 min to full specification.

Oxygen concentration compensation: Automatic. Values supplied from the SERVO-i Ventilator System.

Barometric pressure compensation: Automatic. Values supplied from the SERVO-i Ventilator System.

Digitizing rate: 87 Hz

#### Airway adapter dead space:

- Adult: <5 ml
- Infant: <0.5 ml

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

#### Y Sensor measuring (optional)

Size:	
■ Y Sensor Module:	154 x 90 x 43 mm
■ Y sensor adult:	Length 84 mm
■ Y sensor infant:	Length 51 mm
Weight:	
■ Y Sensor Module:	0.4 kg
■ Y sensor adult:	10.5 g
■ Y sensor infant:	7.5 g
Sensor material:	Makrolon polycarbonate.
Tubing:	2.0 m. Medical grade PVC.
Power source – Y Sensor Module supply voltage:	Powered from the SERVO-i. <5 W at 12 V (normal operation).

#### Y sensor measuring – Performance

Measuring method:	Fixed orifice, differential pressure.
Parameters:	Airway pressure. Airway flow. Inspiratory and expiratory volumes.
Measuring range:	
■ Adult:	2 to 180 l/min
■ Infant:	0.125 to 40 l/min
Airway adapter dead space:	
■ Adult:	< 9.0 ml
■ Infant:	< 0.45 ml

#### Servo Ultra Nebulizer (optional)

Weight:	Approx. 125 g
Dimensions:	H 105 mm x L 108 mm x W 60 mm
Connection cable length:	2.0 m
Nebulizer T-piece connections:	Inlet/outlet: 22/15 mm outer/inner diameter and 22 mm inner diameter, ISO standard. Pediatric patient tubes: Adapters 22/10 mm outer diameter and 15/10 mm outer diameter.
Internal volume:	60 ml
Ultrasonic generator frequency:	2.4 MHz
Particle size (water):	Mass Median Diameter (MMD) = approximately 4.0 µm, measured distally in endotracheal tube 8 mm inner diameter.
Output from nebulizer (water) – minimum water flux:	Min. 0.1 ml water/min at 0.1 l gas flow/s. Min. 0.3 ml water/min at 0.5 l gas flow/s. Min. 0.5 ml water/min at 1.0 l gas flow/s (Adult only).
Buffer liquid:	Sterile water
Max. medication temperature:	55° C (131° F)
Volume, medication cup:	Max. 10 ml
Noise level:	Max. 50 dBA, measured at 0.3 m distance.

#### Aeroneb Nebulizer Systems (optional)

See separate data sheets.

## TECHNICAL SPECIFICATIONS

### SERVO-i UNIVERSAL

#### SERVO-i Mobile Cart (optional)

Weight:	20 kg
Dimensions:	H 1015 mm x L 640 mm x W 560 mm (see dimensional drawing below)

#### SERVO-i Drawer kit (optional)

Weight:	4.5 kg
Dimensions:	H 240 mm x L 210 mm x W 300 mm

#### SERVO-i Holder (optional)

Weight:	3.5 kg
Dimensions:	H 352 mm x L 247 mm x W 159 mm (see dimensional drawing below)

#### SERVO-i Shelf Base (optional)

Weight:	1.2 kg
Dimensions:	H 29 mm x L 205 mm x W 159 mm (see dimensional drawing below)

#### Gas cylinder restrainer (optional)

Max load:	2 x 5-liter bottles
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#### SERVO-i IV Pole (optional)

Max load (total):	6 kg
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#### Gas trolley (optional)

Max load:	2x10 kg bottles
Docking:	Dockable to SERVO-i Mobile Cart. Dockable to a separate wall clamp.

#### Compressor Mini (optional)

See separate data sheet.

#### Alarm output connector (optional)

Connector:	4-pole Modular connector
Ratings:	Max 40 V DC, Max 500 mA, Max 20 W

#### Service

Regular maintenance:	Once every 12 months or at least after 5000 operating hours.
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#### Note

For inaccuracies and more detailed technical specifications please refer to the User's manual.

### ORDERING INFORMATION

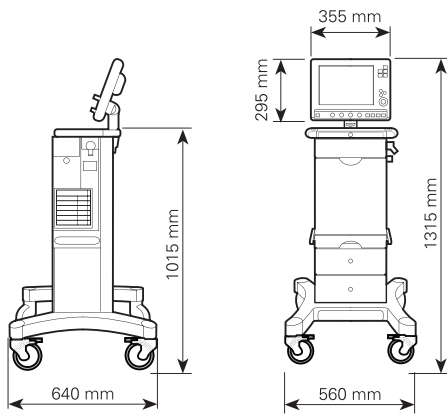
SERVO-i, Ventilator and accessories: See separate information: "SERVO-i, Version 5.0 — System Flow Chart" (Order no: 66 70 102).

# TECHNICAL SPECIFICATIONS

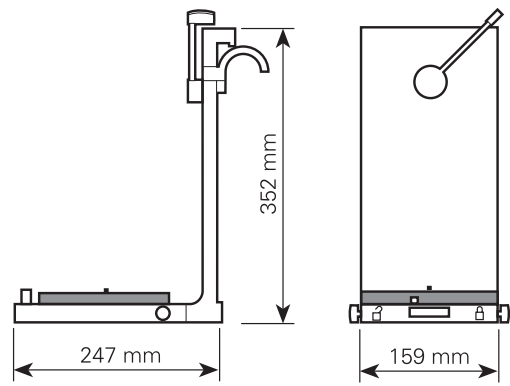
## SERVO-i UNIVERSAL

### Dimensional drawings

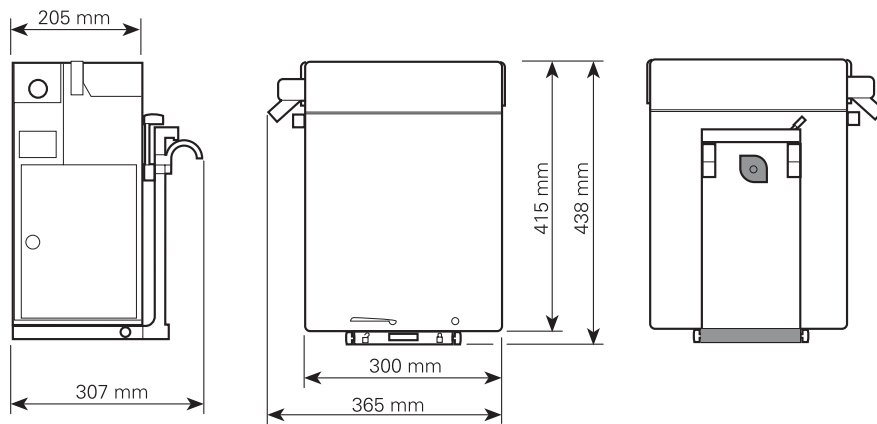
#### SERVO-i on Mobile Cart



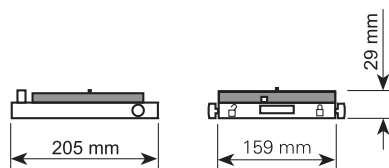
#### SERVO-i Holder



#### SERVO-i (patient unit) on SERVO-i Holder



#### SERVO-i Shelf Base



# MAQUET

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