HAMILTON-C6

Technical specifications for SW version 2.0.x (160021)

Ventilation modes

Standard: ✓ Option: O Not applicable: --

Mode form	Mode name	Mode	Adult/Ped	Neonatal
Volume-controlled modes, flow controlled	(S)CMV	Breaths are volume controlled and mandatory, including patient-initiated breaths.	✓	--
	SIMV	Volume-controlled mandatory breaths can be alternated with pressure-supported spontaneous breaths.	✓	--
Volume-targeted modes, adaptive pressure controlled	APVcmv / (S)CMV+	Breaths are volume targeted and mandatory.	✓	✓
	APVsimv / SIMV+	Volume-targeted mandatory breaths can be alternated with pressure-supported spontaneous (patient-triggered) breaths.	✓	✓
	VS	Breaths are spontaneous and deliver a set tidal volume to support patient-initiated breaths.	✓	✓
Pressure-controlled modes	PCV+	All breaths, whether triggered by the patient or the ventilator, are pressure controlled and mandatory.	✓	✓
	PSIMV+	Mandatory breaths are pressure controlled. Mandatory breaths can be alternated with pressure-supported spontaneous (patient-triggered) breaths.	✓	✓
	DuoPAP	Mandatory breaths are pressure controlled. Spontaneous breaths can be triggered at both pressure levels.	✓	✓
	APRV	Spontaneous breaths can be continuously triggered. The pressure release between the pressure levels contributes to ventilation.	✓	✓
	SPONT	Every breath is spontaneous, with or without pressure support.	✓	✓
Intelligent ventilation	ASV	Operator sets %MinVol, PEEP, and oxygen. Rate, tidal volume, inspiratory pressure, and I:E ratio are based on physiological input from the patient.	✓	--
	INTELLiVENT-ASV	Ventilator management of CO2 elimination and oxygenation based on clinician-defined target ranges and parameter limits, and physiological input from the patient. The underlying mode is ASV.	O	--
Noninvasive modes	NIV	Every breath is spontaneous, with or without pressure-support.	✓	✓
	NIV-ST	Every breath is spontaneous as long as the patient is breathing above the set rate. A backup rate can be set for mandatory breaths.	✓	✓
	nCPAP-PS	Every breath is spontaneous as long as the patient is breathing above the set rate. A backup rate can be set for mandatory breaths.	--	O
	HiFlowO2	High flow oxygen therapy. No supported breaths.	O	O

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Control settings and ranges

Parameter (units)	Range Adult/Ped[1]	Range Neonatal[1]
%MinVol (%)	25 to 350	--
ΔPcontrol (cmH2O)[2]	5 to 100	3 to 60
ΔPinsp (cmH2O)[2]	3 to 100	3 to 60 *nCPAP-PS:* 0 to 60
ΔPsupport (cmH2O)[2]	0 to 100	0 to 60
Additional O2 for enrichment (%)	10 to 79	10 to 79
Apnea backup	On, Off	On, Off
Cuff pressure[3] (cmH2O)	5–50	5–50
End PEEP (Pend)[4] (cmH2O)	0 to 35	0 to 35
Expiratory trigger sensitivity ETS (%)	5 to 80	5 to 80
Flow[5] (l/min)	2 to 100	2 to 30
Flow pattern	Square, Decel. 50%, Sine, Decel. 100%	--
Flow trigger (l/min)	0.5 to 20, Off	0.1 to 5.0, Off
I:E	1:9 to 4:1	1:9 to 4:1
Max. pressure[3] (cmH2O)	6 to 50	6 to 50
Min. pressure[3] (cmH2O)	5 to 49	5 to 49
Nebulizer Duration (min)	5 to 40, continuous	5 to 40, continuous
Nebulizer Synchronisation	Inspiration, Exhalation, Insp. and Exh.	Inspiration, Exhalation, Insp. and Exh.
Oxygen (%)	21 to 100	21 to 100
P high (cmH2O) (in DuoPAP)	4 to 100	4 to 60
P high (cmH2O) (in APRV)	4 to 100	4 to 60
P low (cmH2O) (in APRV)	0 to 50	0 to 25
Pat. height (cm) (in)	 50 to 250 20 to 98	 --
Pause (%)	0 to 70	--
PBW (kg) *(calculated)*[6]	3.3 to 139	--
Peak flow (l/min)	1 to 195	--
PEEP/CPAP (cmH2O)	0 to 50	0 to 25
Plimit (cmH2O)	5 to 100	5 to 60
P-ramp (ms)[7]	0 to 2000 *ASV, NIV, NIV-ST, SPONT, VS:* max = 200	0 to 600 *NIV, NIV-ST, SPONT, nCPAP-PC, VS:* max = 200
Pressure trigger (cmH2O)	-0.1 to -15.0, Off	-0.1 to -15.0, Off
Pstart[4] (cmH2O)	0 to 35	0 to 35
Ptop[4] (cmH2O)	25 to 60	25 to 60

[1] Parameter settings and ranges can vary depending on the selected mode.
[2] *ΔPcontrol:* Control pressure, added to PEEP/CPAP. *ΔPinsp:* Inspiratory pressure, added to PEEP/CPAP. *ΔPsupport:* Pressure support, added to PEEP/CPAP.
[3] If the IntelliCuff integrated cuff pressure controller option is installed.
[4] If the P/V Tool option is installed.
[5] Only for high flow oxygen therapy.
[6] PBW is calculated using height and sex, and is used for adult and pediatric patients. Actual body weight is used for neonates.
[7] P-ramp is limited to one-third (1/3) of TI time. Adjustment of TI time can override the P-ramp setting.

Parameter (units)	Range Adult/Ped[1]	Range Neonatal[1]
Ramp speed[4] (s)	2 to 5	2 to 5
Rate (b/min)[6]	1 to 100 *APRV*: 5 to 100	1 to 150 *APRV, Apnea backup*: 10 to 150
Rel. pressure[3] (cmH2O)	-15 to 5	-15 to 5
Set temp[8] (°C)	INV: 35 to 41 NIV: 30 to 35 HiFlowO2: 33 to 37	INV: 35 to 41 NIV: 30 to 35 HiFlowO2: 33 to 37
Sex	Male, Female	--
Sigh	On, Off	--
SpeakValve	On, Off	--
T gradient[8] (°C)	-2 to 3	-2 to 3
T high (s) (in DuoPAP and APRV)[9]	0.1 to 40.0	0.1 to 40.0
T low (s) (in APRV)	0.2 to 40.0	0.2 to 40.0
TI (s)[9]	0.1 to 12.0	0.1 to 12.0
TI max (s)	0.5 to 3.0	0.25 to 3.0
Tip (s)	0 to 8	--
Tpause[4] (s)	0 to 30	0 to 30
TRC compensation level (%)	0 to 100	0 to 100
TRC Expiration	On, Off	On, Off
TRC Tube size (mm)	3 to 10	2.5 to 5.0
TRC Tube type	ET tube, Trach tube, Disable TRC	ET tube, Trach tube, Disable TRC
Trigger, expiratory	ETS, IntelliSync+[10]	ETS
Trigger, inspiratory	Flow trigger, Pressure trigger, IntelliSync+[10]	Flow trigger, Pressure trigger
Trigger, flow (l/min)[11]	0.5 to 20.0 *APVcmv, PCV+, S(CMV).* 0.5 to 20.0 / Off	0.1 to 5.0 *APVcmv, PCV+, S(CMV).* 0.1 to 5.0 / Off
Trigger, pressure	-0.1 to -15.0 *APVcmv, PCV+, S(CMV).* -0.1 to -15.0 / Off	-0.1 to -15.0 *APVcmv, PCV+, S(CMV).* -0.1 to -15.0 / Off
Vt (ml)[9]	20 to 2000	2 to 300
Vt/kg (ml/kg)[12]	5 to 12	5 to 12
Weight (kg)	--	0.2 to 30.0

[8] If the HAMILTON-H900 humidifier integration option is installed.
[9] Startup setting derived from PBW (adult/pediatric), body Weight setting (neonatal). Does not apply in ASV mode.
[10] Not available in all markets.
[11] Flow trigger is leak compensated except when SpeakValve is enabled.
[12] Set in Configuration. PBW is calculated using height and sex, and is used for adult and pediatric patients. Actual body weight is used for neonates.

Monitoring parameters

Parameter (units)		Description
Pressure	AutoPEEP (cmH2O)	Unintended positive end-expiratory pressure
	Paw (cmH2O)	Airway pressure
	ΔP (cmH2O)	Driving pressure, calculated value reflecting the difference between Pplateau and PEEP
	PTP (cmH2O*s)	Inspiratory pressure time product
	Ptrans I (cmH2O)	The arithmetic mean value of Ptransp over the last 100 ms of the last inspiration.
	Ptrans E (cmH2O)	The arithmetic mean value of Ptransp over the last 100 ms of the last expiration.
	PEEP/CPAP (cmH2O)	PEEP (positive end-expiratory pressure) and CPAP (continuous positive airway pressure) PEEP and CPAP are constant pressures applied during both the inspiratory and expiratory phases.
	ΔPinsp (cmH2O)	Inspiratory pressure
	Pmean (cmH2O)	Mean airway pressure
	Ppeak (cmH2O)	Peak airway pressure
	Pplateau (cmH2O)	Plateau or end-inspiratory pressure
	Pprox (cmH2O)	Airway pressure at proximal patient interface
	Ptotal	The calculated target inspiratory pressure based on the sum of PEEP + ΔPinsp/ ΔPsupport/ΔPcontrol
	Pes min (cmH2O)	See PEEP. The pressure is measured through the Pes port instead of using airway pressure.
	Pes max (cmH2O)	See Ppeak. The pressure is measured through the Pes port instead of using airway pressure.
	Pes plateau (cmH2O)	See Pplateau. The pressure is measured through the Pes port instead of using airway pressure.
	Pes PTP (cmH2O*s)	See PTP. The pressure is measured through the Pes port instead of using airway pressure.
	Pes P0.1 (cmH2O)	See P0.1. The pressure is measured through the Pes port instead of using airway pressure.
Flow	Flow (l/min)	The flow of gas to the patient when using HiFlowO2
	Insp Flow (l/min)	Peak inspiratory flow, spontaneous or mandatory. Measured every breath.
	Exp Flow (l/min)	Peak expiratory flow
Volume	ExpMinVol or MinVol NIV (l/min)	Expiratory minute volume
	MVSpont or MVSpont NIV (l/min)	Spontaneous expiratory minute volume
	VTE or VTE NIV (ml)	Expiratory tidal volume
	VTESpont (ml)	Spontaneous expiratory tidal volume
	VTI (ml)	Inspiratory tidal volume
	Vt/Kg Vt/Weight (ml/kg)	Tidal volume is calculated by predicted body weight (PBW) for adult and pediatric patients, and according to the actual body weight for neonatal patients.
	VLeak (%) or MVLeak (l/min)	Leakage percent or total minute volume leakage

Parameter (units)		Description
Oxygen	Oxygen (%)	Oxygen concentration of the delivered gas
Time	CPR timer	MMP during CPR ventilation showing duration of CPR ventilation
	I:E	Inspiratory:expiratory ratio
	fControl (b/min)	Mandatory breath frequency
	fSpont (b/min)	Spontaneous breathing frequency
	fTotal (b/min)	Total breathing frequency
	fTrig (b/min)	Patient-initiated breath frequency
	TI (s)	Inspiratory time
	TE (s)	Expiratory time
	Pause (s)	Inspiratory pause or plateau
Lung mechanics	Cstat (ml/cmH2O)	Static compliance
	P0.1 (cmH2O)	Airway occlusion pressure
	PTP (cmH2O*s)	Inspiratory pressure time product
	RCexp (s)	Expiratory time constant
	Rinsp (cmH2O / (l/s))	Inspiratory flow resistance
	RSB (1 / (l*min))	Rapid shallow breathing index
CO2	Capnogram	CO2 waveform
	FetCO2 (%)	Fractional end-tidal CO2 concentration
	PetCO2 (mmHg)	End-tidal CO2 pressure
	slopeCO2 (%CO2/l)	Slope of the alveolar plateau in the PetCO2 curve, indicating the volume/flow status of the lungs
	V'alv (l/min)	Alveolar minute ventilation
	Vtalv (ml)	Alveolar tidal ventilation
	V'CO2 (ml/min)	CO2 elimination
	VDaw (ml)	Airway dead space
	VDaw/VTE (%)	Airway dead space fraction at the airway opening
	VeCO2 (ml)	Exhaled CO2 volume
	ViCO2 (ml)	Inspired CO2 volume
SpO2	Plethysmogram	The waveform that visualizes the pulsating blood volume; it is delivered by the pulse oximeter.
	Pulse (1/min)	Pulse
	SpO2 (%)	Oxygen saturation
	SpO2/FiO2 (%)	The SpO2/FiO2 ratio (%) is an approximation of the PaO2/FiO2 ratio, which, in contrast to PaO2/FiO2, can be calculated noninvasively and continuously.
	OSI	Oxygen saturation index
	PI (%)	Perfusion index
	PVI (%)	Pleth variability index
	SpCO (%)	Carboxyhemoglobin saturation
	SpHb (g/dl) (mmol/l)	Total hemoglobin
	SpMet (%)	Methemoglobin saturation
	SpOC (ml/dl)	Oxygen content

Parameter (units)		Description
Mechanical power	MPdyn (J/min)	The dynamic mechanical power required to expand the lung per minute. 0.5 x VTI x ΔP x Rate
	MPres (J/min)	The resistive mechanical power required to overcome the lung's resistance. VTI x (Ppeak - Pplateau) x Rate
	MPstat (J/min)	The (static) mechanical power required to keep the lung inflated. VTI x PEEP x Rate
	MPtotal (J/min)	The sum of MPdyn, MPres, and MPstat.
Humidifier related[13]	T humidifier (°C)	Measured temperature at water chamber exit
	T Y-piece (°C)	Measured temperature at the Y-piece
IntelliCuff related[14]	PCuff (cmH2O)	Cuff pressure

Environmental requirements

Environment	Specification	
Temperature	Operation[15]:	5°C to 40°C (41°F to 104°F)
	Shipment/storage:	−20°C to 60°C (−4°F to 140°F), in original packaging
Altitude		−650 to 4,000 m (−2,132 to 13,123 ft) Note that at higher altitudes the ventilator performance may be limited.
Atmospheric pressure	Operation,[15] shipment, and storage:	620 to 1,100 hPa
Relative humidity	Operation,[15] shipment, and storage:	10% to 95%, noncondensing
Ingress protection		IP22
For specifications related to any external devices and sensors, refer to the manufacturer's *Instructions for use*.		

Graphical patient data

Graphic type/tab name	Options
Waveforms	Pressure, Flow, Volume, Off, PCO2,[16] FCO2,[16] Plethysmogram,[17] Pes,[18] Ptrach, Ptransp[18]
Graphics (Intelligent panels)	Dynamic Lung,[19] Lung impact,[19] Vent Status, Monitoring SMPs (Secondary monitoring parameters), ASV Graph,[20] O2 assist[21]
Trends	30 minute, 1-, 6-, 12-, 24-, or 72-hour trend data for a selected parameter or combination of parameters
Loops	Pressure/Volume, Pressure/Flow, Volume/Flow, Volume/PCO2,[16] Volume/FCO2,[16] Pes/Volume,[18] Ptransp/Volume[18]

[13] If the HAMILTON-H900 humidifier integration option is installed.
[14] If the IntelliCuff integrated cuff pressure controller option is installed.
[15] The stated operating conditions apply to both continuous and transient operation of the ventilator within the limitations specified in the Intended use.
[16] CO2 option required.
[17] SpO2 option required.
[18] Data is valid only when an esophageal catheter is connected to the Pes port on the ventilator.
[19] Only for adult/pediatric patients.
[20] Only in ASV mode.
[21] If option is installed.

Alarms

Priority	Alarm
High priority	Ambient, Apnea, Blower fault, Buzzer defective, Check flow sensor, Check flow sensor tubing, Check flow sensor for water (Neonatal), Check for blockage, Check patient interface, Device temperature high, Disconnection on patient/ventilator side, Exhalation obstructed, Flow sensor calibration needed (during ventilation), High Pressure during Sigh, Loudspeaker defective, Minute volume high/low, No ventilation after power failure, Options not found, Oxygen high/low, Oxygen supply failed, Panel connection lost, Pressure high/low, Pressure not released, Proximal flow sensor failed, Replace O2 sensor, Self test failed, Vent outlet temperature high, Ventilation not started, Vt high/low Battery 1,2: Defective, Battery 1,2: Temperature high, Battery communication error, Battery low, Battery power loss, Battery totally discharged *HAMILTON-H900:* Check humidifier, Humidifier chamber temp high, Humidifier error, Humidifier tilt, Humidifier water high, Humidifier Y-piece temp high *IntelliCuff:* Check IntelliCuff, Cuff leak *SpO2:* For SpO2-related alarms, see the *Pulse Oximetry Instructions for Use* (PN 624963)[22]
Medium priority	Aerogen nebulizer disconnected, Battery low, Check flow sensor for water (Neonatal), Check for blockage, Cooling fan failure, Flip the flow sensor, Frequency high/low, Function key not operational, High leak, High PEEP, Loss of PEEP, Pressure limitation, Remote communication error, Remote communication timeout, Vt high: breath terminated, Vt high/low *CO2:* PetCO2 high/low[23] *HAMILTON-H900:* Check humidifier, Humidifier chamber temp low, Humidifier check chamber, Humidifier check left/right tube, Humidifier water low, Humidifier Y-piece temp low *IntelliCuff:* Check IntelliCuff, Cuff deflated, Cuff pressure high, Cannot turn off IntelliCuff *INTELLiVENT-ASV:* For INTELLiVENT-ASV-related alarms, see the *INTELLiVENT-ASV Operator's Manual* (PN 624954)[24] *SpO2:* For SpO2-related alarms, see the *Pulse Oximetry Instructions for Use* (PN 624963)[22]
Low priority	Apnea ventilation, Apnea ventilation ended, ASV: Cannot meet target, Blower service required, Check flow sensor tubing, Check Plimit, Check settings, CPR ON, Flow sensor calibration needed (in Standby), Invalid communication board, Language not loaded, Loss of external power, Panel settings file error, Preventive maintenance required, Realtime clock failure, Release valve defective, Replace HEPA filter, Settings file error, SpeakValve ON, Suctioning maneuver, Touch not functional, Vt high/low, Vt low: leakage Battery 1,2: Calibration required, Battery 1,2: Replacement required, Battery 1,2: Wrong battery *O2 sensor:* O2 sensor calibration needed, O2 sensor defective, O2 sensor missing, O2 sensor not system compatible, *CO2 sensor:*[23] CO2 sensor calibration needed, CO2 sensor disconnected, CO2 sensor faulty, CO2 sensor over temperature, CO2 sensor warmup, Check CO2 airway adapter, Check CO2 sampling line, CO2: Poor signal *HAMILTON-H900:* Check humidifier, Check humidifier communication *IntelliCuff:* Check IntelliCuff, Check IntelliCuff communication *INTELLiVENT-ASV:*[24] For INTELLiVENT-ASV-related alarms, see the *INTELLiVENT-ASV Operator's Manual* (PN 624954) *SpO2:*[22] For SpO2-related alarms, see the *Pulse Oximetry Instructions for Use* (PN 624963)

[22] If the SpO2 option is installed and enabled.
[23] If the CO2 option is installed and enabled.
[24] If INTELLiVENT-ASV is installed.

Technical performance

Description	Specification
Means of inspiratory triggering	Flow trigger control, pressure trigger control, or optional IntelliSync+ control
Means of expiratory triggering	Flow cycling (ETS), or optional IntelliSync+ control
Minimum expiratory time	20% of cycle time; 0.2 to 0.8 seconds
Oxygen mixer accuracy	± (Volume fraction of 2.5% + 2.5% of gas level)
Preoperational checks	Leak test, Flow sensor/O2 sensor/CO2 sensor calibration

Electrical specifications

Element	Specifications	
Input power	100 to 240 VAC, 50/60 Hz	
Power consumption	60 VA typical, 210 VA (510 VA with humidifier) maximum	
Output power	300 VA, maximum	
Battery	The power socket on the HAMILTON-C6 ventilator unit is for the HAMILTON-H900 humidifier only.	
HAMILTON-H900 power connection	Hamilton Medical provides a high-capacity battery. An optional second battery is available.	
	Electrical specifications:	14.4 V, 5.4 Ah, 78 Wh
	Type:	Lithium-ion, supplied by Hamilton Medical only
	Recharge time:	Allow a minimum of ≤ 3.0 hours to fully charge one battery, or ≤ 6 hours to fully charge two batteries. At battery temperatures over 43°C, the charge time is doubled (a minimum of ≤ 6 hours to charge one battery, ≤ 12 hours to charge two).
	Storage:	-20°C to 50°C, ≤ 95% relative humidity. The storage location should be free from vibration, dust, direct sunlight, moisture, and corrosive gases, and with a recommended temperature range < 21°C. Extended exposure to temperatures above 45°C can degrade battery performance and life.
	Normal operating time:	See Section Battery runtime.

Battery runtime

Ventilation setting	1 FRESH battery Display brightness *1 = 10%	1 AGED battery[25] Display brightness *1 = 10%
(S)CMV+ mode typical operating times[26]	*1: ≥ 1.5 h	*1: ≥ 1.5 h
Mode = (S)CMV+	ISO 80601-2-12 compliant	
Tidal volume = 500 ml, Set rate = 10 b/min, I:E ratio = 1:2, BAP = 10 hPa Resistance = 5 hPa * (l/s)$^{-1}$ ±10% Compliance = 50 ml hPa^{-1} ±10%	✓	✓
Tidal volume = 150 ml, Set rate = 20 b/min, I:E ratio = 1:2, BAP = 10 hPa Resistance = 20 hPa * (l/s)$^{-1}$ ±10% Compliance = 20 ml hPa^{-1} ±10%	✓	✓
Tidal volume = 30 ml, Set rate = 30 b/min, I:E ratio = 1:2, BAP = 10 hPa Resistance = 50 hPa * (l/s)$^{-1}$ ±10% Compliance = 1 ml hPa^{-1} ±10%	✓	✓
Mode = HiFlowO2	ISO 80601-2-90 compliant	
Flow rate = 80 l/min[27]	✓	✓
Flow rate = 30 l/min	✓	✓
Flow rate = 15 l/min	✓	✓
Flow rate = 8 l/min	✓	✓

Ventilation setting	1 FRESH battery Display brightness *1 = 10%	1 AGED battery[25] Display brightness *1 = 10%	2 FRESH batteries Display brightness *1 = 10%	2 AGED batteries[25] Display brightness *1 = 10%
Mode = PCV+[28]				
ΔPcontrol = 10 cmH2O Rate = 10 b/min I:E = 1:4 PEEP = 5 cmH2O Flow trigger = 5 l/min Oxygen (FiO2) = 40%	*1: ≥ 1.5 h	*1: ≥1.5 h	*1: ≥3.0 h	*1: ≥3.0 h

[25] For an aging battery, the number of charging and discharging cycles is defined in ISO 80601-2-12:2023 as ≥ 50 cycles.
[26] The actual operating time depends on the battery age, and how the battery is used and recharged.
[27] In some markets, the maximum possible Flow setting may be limited.
[28] Measured with fully charged batteries, the blower in use, without option board, and with the settings specified here.

Pneumatic performance

Component	Specification	
Air supply	Integrated blower with warranty for product lifetime[29]	
Inspiratory outlet (*To patient* port)	Connector:	ISO 5356-1 ID15/OD22 conical
Expiratory outlet (*From patient* port)	Connector (inlet on expiratory valve):	ISO 5356-1 ID15/OD22 conical
High-pressure oxygen inlet[30]	Input pressure:	2.8 to 6 bar / 41 to 87 psi
	Peak flow at device input:	150 l/min at 2.8 bar / 41 psi
	Connector:	DISS (CGA 1240) or NIST
Gas mixing system	**Pressure**	
	Inspiratory pressure:	0 to 100 cmH2O
	Pressure accuracy:	±5% or ±1 cmH20 (whichever is greater)
	Flow	
	Maximum inspiratory flow:	Up to 260 l/min ±10% against ambient pressure (at sea level) Up to 150 l/min with 100% oxygen
	Automatic expiratory base flow	Fixed at 4 l/min
	Flow accuracy:	±10% or ±300 ml/min (whichever is greater)
	O2 input flow	Minimum 150 l/min (at 2.8 bar/ 280 kPa / 41 psi input pressure)
	Volume	
	Rated oxygen input concentration:	100%
	Tidal volume/target tidal volume	*Adult/Ped:* 20 to 2000 ml *Neonatal:* 2 to 300 ml
IntelliCuff port	Dedicated connection port for IntelliCuff. For details, see the *IntelliCuff Instructions for use*.	
Pes port	Dedicated esophageal pressure (Pes) port for pressure readings other than airway pressure (Paw).	
Lifetime	40,000 hours of operation (typically 8 years, environmental temperature 20-24°C, with an average inspiration pressure of 15 mbar)	

[29] Limited to expected lifetime of HAMILTON-C6 ventilator.
[30] Flow value measurements expressed in STPD (standard temperature and pressure, dry).

Standards and approvals

Description	Specification
Classification	Class I continuously operating according to IEC 60601-1. Class IIb according to MDR (2017/745).
Valid versions	IEC 61000-3-2:2005, IEC 61000-3-3:2008, IEC 61000-4-2:2008, IEC 61000-4-3:2006 + A1:2007+A2:2010, IEC 61000-4-4:2004, IEC 61000-4-5:2005, IEC 61000-4-8:2009, IEC 61000-4-11:2004, IEC TR/TS 60601-4-2:2016, IEC 60601-1:2005/A2:2020, IEC 60601-1-2:2014+AMD1:2020, IEC 60601-1-8:2006+AMD1:2012+AMD2:2020, IEC 60950-1:2013, IEC 62366-1:2015+AMD1:2020, EN ISO 5356-1:2015, EN ISO 13485:2016, ISO 80601-2-12:2020, ISO 80601-2-55:2018, ISO 80601-2-90:2021
Declaration	The HAMILTON-C6 was developed in accordance with pertinent international standards and FDA guidelines. Design and manufacture of Medical devices at Hamilton Medical AG is under a QMS system as required by EN ISO 13485, EN ISO 9001, and article 10(9) of EC 2017/745.
Electromagnetic compatibility	Complies with the IEC 60601-1-2 EMC (Electromagnetic Compatibility) Collateral Standard.
Safety class	Type B applied part (ventilator breathing system (VBS)), Type BF applied parts (CO2 sensor including CO2 module connector, humidifier, Aerogen system, nebulizer, and SpO2 sensor including SpO2 adapter), continuous operation according to IEC 60601-1.

Standard configuration and options

Standard: ✓ / Option: O / Not applicable: --

Functions	Adult/Ped	Neonatal
Capnography, mainstream (volumetric) and sidestream	O	O
Communication ports: IntelliCuff/USB, two (2) COM ports for the Patient Data Management System (PDMS), one (1) COM port for the H900, one (1) USB port on the interaction panel, DVI/HDMI, Nurse call	✓	✓
Communication protocols GALILEO compatible, Hamilton P2, Hamilton Block, Hamilton Block (ACK), Philips VueLink Open, Dräger-TestProtocol, HAMILTON-H900	✓	✓
CPR ventilation (APVcmv, PCV+, or (S)CMV (Adult/Ped. only))	✓	✓
Distributed alarm system (DAS) compatible	✓	✓
Dynamic Lung (real-time visualization of the lungs)	✓	--
Event log (up to 10,000 events with date and time stamp)	✓	✓
HAMILTON-H900 humidifier integration	O	O
Inspiratory and expiratory hold maneuver[31]	✓	✓
IntelliCuff® integrated cuff pressure controller	O	O
IntelliSync®+ (inspiratory and expiratory trigger synchronization)	O	--
Languages (English, US English, Chinese, Croatian, Czech, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Indonesian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Spanish, Swedish, Turkish, Ukrainian)	✓	✓
Leakage compensation	✓	✓
Lung impact panel (parameters affecting lung protection)	✓	✓
Manual breath/prolonged inspiration	✓	✓

[31] Enables the measurement of NIF/MIP.

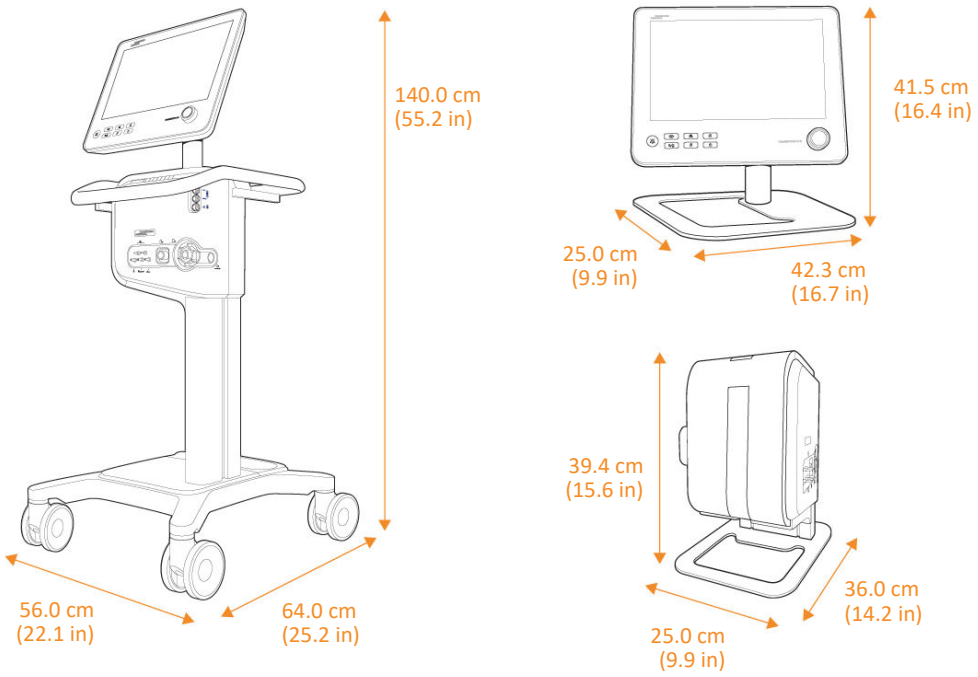
Functions	Adult/Ped	Neonatal
Nebulization (Aerogen)	O	O
Nebulization (pneumatic)	✓	--
O2 assist[32]	O	O
O2 enrichment (adjustable)	✓	✓
On-screen help	✓	✓
P/V Tool®	O	O
Paramagnetic O2 sensor	O	O
Patient group	✓	O
Previous mode	✓	✓
Print screen	✓	✓
Screen lock	✓	✓
Second battery	O	O
SpeakValve	O	--
SpO2 monitoring	O	O
Standby monitoring	✓	✓
Standby with timer	✓	✓
Suctioning tool	✓	✓
Transpulmonary pressure monitoring	✓	✓
TRC (tube resistance compensation)	✓	✓
Trends/Loops	✓	✓
Trigger, expiratory: ETS (Expiratory trigger sensitivity)	✓	✓
Trigger, inspiratory: flow, pressure	✓	✓
Vent Status (visual representation of patient's ventilator dependence)	✓	✓

[32] O2 assist is NOT intended to be used with pre-term infants (gestational age < 37 weeks).

Physical characteristics

Dimension	Specifications
Weight	Monitor (interaction panel) without shelf mount: 7.8 kg (17.2 lb) Monitor (interaction panel) with shelf mount: 10 kg (22 lb) Ventilation unit with shelf mount: 11.6 kg (25.6 lb) Ventilation unit, trolley, and monitor: 46.0 kg (101.0 lb) The trolley can accommodate a maximum safe working load of 80 kg (176 lb).[33]
Dimensions: trolley and device	See Figure 1
Dimensions: shelf mount, monitor tilt/swivel range	See Figures 2 and 3
Monitor	Type: Color TFT, Size: 1920 x 1200 pixels, 17 in (431.8 mm) diagonal
Monitor mounting options	*See the Hamilton Medical e-catalog.*
Trolley accessories	Basket, oxygen cylinder holders (two bottles), HAMILTON-H900 mounting system, trolley support arm, additional standard rail, water bottle holder
Gas cylinder	
Diameter	100 to 140 mm (3.9 to 5.5 inches)
Height	≤ 820 mm (32 inches)
Weight	≤ 8 kg (17.6 lb)

Figure 1. HAMILTON-C6 PN 160021 dimensions



[33] The maximum safe working load applies to a stationary, properly load-balanced trolley.

Dimension	Specifications
Shelf mount dimensions	See Figures 2 and 3
Monitor mounted to *left* of ventilator body, monitor tilt and swivel ranges (See Figure 2)	Monitor tilt range: Forward = 30°; Backward = 37° Monitor swivel range: 34° to the left from neutral
Monitor mounted to *right* of ventilator body, monitor tilt and swivel ranges (See Figure 3)	Monitor tilt range: Forward = 30°; Backward = 37° Monitor swivel range: 144° to the right from neutral to 22° to the left

Figure 2. HAMILTON-C6 (PN 160021) shelf mount dimensions, monitor mounted to the *left* of the ventilator body, monitor swivel and tilt ranges

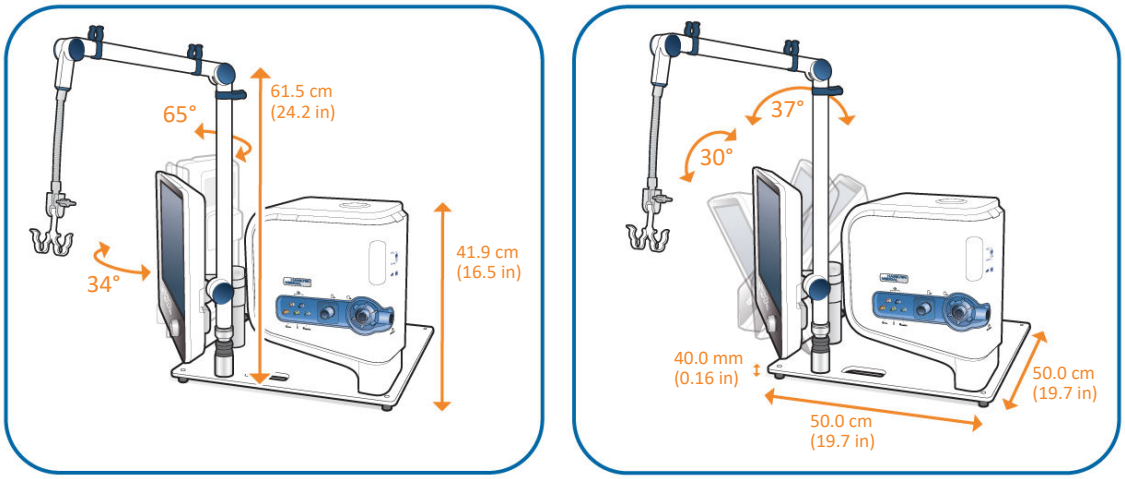
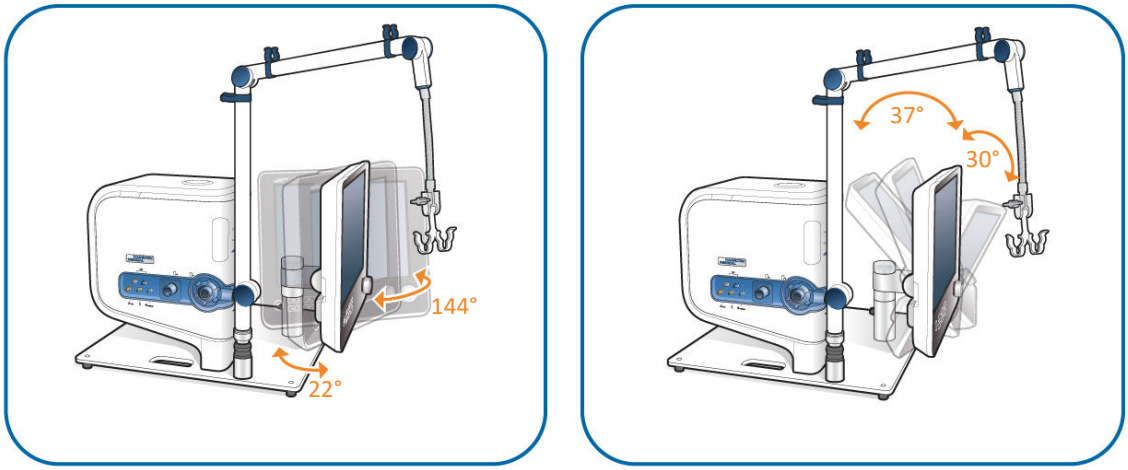


Figure 3. HAMILTON-C6 (PN 160021) shelf mount dimensions, monitor mounted to the *right* of the ventilator body, monitor swivel and tilt ranges



All angles in the figures above are relative to the monitor facing forward, with the bottom of the monitor parallel to the shelf plate, at a 90° angle relative to the floor. References to *left* and *right* refer to the reader's left and right, viewing the monitor from the front.

Device options

Note that not all options are available in all markets. For full details, see the *Hamilton Medical e-catalog*.

Device	Part number (PN)
HAMILTON-C6	160021

Battery power	Part number (PN)
Li-Ion Battery 14.40 V	369130

Power cord	Part number (PN)
Power cord USA	355190
Power cord UK	355191
Power cord EU	355192
Power cord CH	355181
Power cord CHINA	10175086

Communication board	Part number (PN)
Communication board 1: CO2, SpO2, Aerogen	160184
Communication board 2: CO2, SpO2	160185
Cable Nurse call	160166

Filter set	Part number (PN)
HAMILTON-C6 filter set	160735
HAMILTON-C6 HEPA inlet filter	160216

High pressure Oxygen connector / cap	Part number (PN)
O2 DISS connector	160470
O2 NIST connector	160471
Cover cap DISS	10158805
Cover cap NIST	10158868

IntelliCuff integration kit	Part number (PN)
IntelliCuff Integration Kit (PN 60021)	160784

Interaction panel	Part number (PN)
Interaction panel	160880

Mounting adapter	Part number (PN)
Handle mount adapter	160782
Pole mount adapter	160989
Rail mount adapter	160890
VESA mount adapter	10071828

Mounting solution	Part number (PN)
Trolley solution	160029
Shelf mount solution	160030
Pole mount solution	160031
Rail mount solution	160032
Combined shelf mount solution	160060
VESA mount solution	10071827

Mounting conversion kit	Part number (PN)
Conversion kit to shelf	160098
Conversion kit to trolley	160099
Conversion kit to shelf/pole	10099102
Conversion kit to shelf/rail	10099104
Conversion kit to shelf (combined)	10099105
Conversion kit to shelf/VESA	10099106

Monitoring cable kit	Part number (PN)
Monitoring cable kit (10 m)	160786
Monitoring cable kit (3 m)	160785
Monitoring cable kit (0.65 m)	952300

Language kit	Part number (PN)
English	160773
English-US	10112611
German	160774
Spanish	160775
French	160776
Russian	160777
Chinese	160778
Portuguese	160779
Italian	160780

Software option	Part number (PN)
Adult/Ped	160750
DuoPAP-APRV	160754
HiFlowO2	160762
IntelliCuff control	160766
IntelliSync+	160763
INTELLiVENT-ASV	160758
Masimo rainbow	160757
nCPAP-PS	160752
Neonatal	160751
NIV/ NIV-ST	160756
O2 assist	10152288
P/V Tool	160760
SpeakValve	10150314
Trends-Loops	160755
Tube resistance compensation (TRC)	160753

Trolley option	Part number (PN)
Trolley	160130
Accessories	
Basket	160177
Holder: O2 cylinder	160971
Holder: system for humidifier	160969
Holder: tube	160982
Holder: tubing, dual	282722
Holder: water bottle	160162
Quick lock mount	160154
Stand. Rail for Trolley	160178
Support arm, quick-positioning	281533
Support arm, blue-white	282003
Tubing hanger / O2 supply hose hanger	160165
Tubing support arm and quick lock (QL)	160153

Compatible consumables and accessories

Note that not all consumables/accessories are available in all markets. For full details, see the *Hamilton Medical e-catalog*.

Adapter/Connector		Part number (PN)
Adapter	Adapter OD15/ID15	281803
	Straight adapter OD22/OD22	282639
	CO2 Mainstream airway adapter (Adult/Ped)	281719
	CO2 Mainstream airway adapter (Neo)	281720
	CO2 Mainstream airway adapter, reusable (Adult/Ped)	281721
	CO2 Mainstream airway adapter, reusable (Neo)	281722
	ProxyCo CO2 Airway adapter (Adult/Ped)	10159144
	ProxyCo CO2 Airway adapter (Neo)	10159385
Connector	Connector	G-311019
	Airway connector OD15/ID22	G-311003

Airway filters ventilator side	Part number (PN)
Ultipor breathing system filter	U50
Disposable filter REF XHM0011	279988
Aero-Pro HEPA Light Machine, mechanical-hydrophobic filter, (201022)	10160126

Breathing circuit sets	Part number (PN)
Heated, single limb	
HAMILTON-BC4022, single limb, with water chamber, adult/pediatric, 195 cm	260186
HAMILTON-BC4010, single limb, with water chamber, neonatal/pediatric,165 cm	260187
HAMILTON-BC4122, single limb, with water chamber, adult/pediatric,195 cm	260200
Heated, dual limb	
HAMILTON-BC8022, dual limb, with water chamber, adult/pediatric, 195 cm	260161
HAMILTON-BC8010, dual limb, with water chamber, neonatal/pediatric, 165 cm	260185
Unheated, coaxial	
Breathing circuit set, coaxial, extendable expiratory limb, flow sensor, expiratory valve set, calibration adapter, adult/pediatric, single use, 180 cm	260257
For use with HAMILTON-C2/C3/C6 ventilators	
Breathing circuit set, coaxial, extendable expiratory limb, adult/pediatric, single use, 180 cm	260206
For use with HAMILTON-C1/T1/MR1/C2/C3/C6/G5/S1 ventilators	
Breathing circuit set, coaxial, extendable expiratory limb, flow sensor, calibration adapter, adult/pediatric, single use, 180 cm	260207
For use with HAMILTON-C1/T1/MR1/C2/C3/C6/G5/S1 ventilators	
Breathing circuit set, coaxial, extendable expiratory limb, flow sensor, calibration adapter, adult/pediatric, single use, 240 cm	260240
For use with HAMILTON-C1/T1/MR1/C2/C3/C6/G5/S1 ventilators	
Breathing circuit set, coaxial, extendable expiratory limb, adult/pediatric, single use, 240 cm	260239
For use with HAMILTON-C1/T1/MR1/C2/C3/C6/G5/S1 ventilators	
Unheated, dual limb	
Breathing circuit set, dual limb, flow sensor, neonatal/pediatric, 150 cm	260180
Breathing circuit set, dual limb, neonatal/pediatric, 150 cm	260241
Breathing circuit set, dual limb, flow sensor, neonatal/pediatric, 300 cm	260182
Breathing circuit set, dual limb, neonatal/pediatric, 300 cm	260244

Esophageal catheter / Cuff pressure tube	Part number (PN)
NutriVent™ Multifunction Naso-gastric catheter	230154
Cuff pressure tube for IntelliCuff	282016

Expiratory valve sets	Part number (PN)
Expiratory valve set, single use	160176
Expiratory valve set, autoclavable	160245
Membrane, expiratory valve, autoclavable	160500

Flow sensors	Part number (PN)
Flow sensor, single use, neonatal, 160 cm	260177
Flow sensor, single use, neonatal, 188 cm	155500
Flow sensor, single use, neonatal, 310 cm	260179
Flow sensor, single use, adult/pediatric, 188 cm	281637
Flow sensor, single use, adult/pediatric, 260 cm	282049
Flow sensor, single use, adult/pediatric, 330 cm	282051
Flow sensor, autoclavable, adult/pediatric, 188 cm	950185
Flow sensor calibration adapter, single use, neonatal	279964
Flow sensor calibration adapter, single use, adult/pediatric	279937
Flow sensor calibration adapter, autoclavable, adult/pediatric	282323

HME/HMEF		Part number (PN)
HME	Aero-Sat 2 Straight, HME, (000602)	10161580
	Aero-Sat Mini, HME, (000702)	10161582
HMEF	Aero-Sat Filter Compact Straight Connection, (100802)	10161581
	Mechanical HMEF, (BB100E)	279963
	Bacterial Viral HME Filter, (AL-08016.V001)	AL08016
	Bacterial Viral HME Filter, (AL-08032.V001)	AL08032

Humidifiers	Part number (PN)
HAMILTON-H900 Integration kit for HAMILTON-C6	160783
Communication cable D SUB9 for HAMILTON-H900	950474
HAMILTON-H900 Humidifier base 220-240 V	950001
HAMILTON-H900 Humidifier base 110-127 V	950004
HAMILTON-H900 Humidifier base 100 V	950008
Humidification chamber, Adult/Ped (SUA)	260196
Humidification chamber, Neo (SUN)	260197
Pole mounting bracket for HAMILTON-H900	950116
Rail mounting bracket for HAMILTON-H900	950119
Side rail mounting bracket for HAMILTON-H900	950231
Power cord EU for HAMILTON-H900	355234
Power cord CH for HAMILTON-H900	355235
Power cord UK for HAMILTON-H900	355237
Power cord CN for HAMILTON-H900	355238
Power cord US for HAMILTON-H900, Hospital Grade	355353

Nebulizers	Part number (PN)
Aerogen Solo nebulizer (x5)	AG-AS3100
Aerogen Solo nebulizer (x10)	AG-AS3200
Accessories	
Aerogen Solo T piece, 22 mm	AG-AS3010
Aerogen Solo T piece, 15 mm	AG-AS3020
Aerogen Solo T piece, 12 mm	AG-AS3035
Aerogen Solo T piece, 10 mm	AG-AS3036
Aerogen Solo continuous nebulization tube set	AG-AS3075
Aerogen Solo continuous syringe	AG-AS3085
Aerogen Solo plug for T-piece	AG-AS3450
Aerogen USB controller with AC/DC adapter	AG-UC1000NE
Aerogen USB AC/DC power supply	AG-UC1040EU
Hose adapter	279406

Nasal cannula set	Part number (PN)
Nuflow nasal cannula set, size S, neonatal/pediatric	10072354
Nuflow nasal cannula set, size M, neonatal/pediatric	10072355
Nuflow nasal cannula set, size L, neonatal/pediatric	10072356
Nuflow nasal cannula set, size XL, neonatal/pediatric	10072357

NIV Masks	Part number (PN)
BiTrac™ Nasal, Fixed Standard Elbow, Adult Extra Large	10161576
BiTrac™ Nasal, Fixed Standard Elbow, Adult Large	10161577
BiTrac™ Nasal, Fixed Standard Elbow, Adult Medium,	10161578
BiTrac™ Nasal, Fixed Standard Elbow, Adult Small	10161579
BiTrac™ Select Full Face, Interchangeable Standard Elbow, Adult Small	10161769
BiTrac™ Select Full Face, Interchangeable Standard Elbow, Adult Medium	10161770
BiTrac™ Select Full Face, Interchangeable Standard Elbow, Adult Large	10161771
BiTrac™ Select Full Face, Interchangeable Standard Elbow, Adult Extra Large	10161772
BiTrac MaxShield™ Select, Interchangeable Standard Elbow, Adult Small	10161778
BiTrac MaxShield™ Select, Interchangeable Standard Elbow, Adult Large	10161777
BiTrac MaxShield™ Select, Interchangeable Standard Elbow, Adult Extra Large	10161776
Interchangeable Elbow, Standard Nebulizer Elbow	10161781
Interchangeable Elbow, Standard Bronchoscopy Elbow	10161783
Interchangeable Elbow, Standard Elbow	10161785
BiTrac™ Select MaxShield™ Pediatric, Interchangeable Standard Elbow, XXS, Pediatric	10161830
BiTrac™ Select MaxShield™ Pediatric, Interchangeable Standard Elbow, XS, Pediatric	10161831

Electric impedance tomograph	Part number (PN)
Pulmomap for HAMILTON-C6	TPL-EH000-0
Pulmomap neonatal disposable belt N0	ACE-00002-05
Pulmomap neonatal disposable belt N1	ACE-00003-05
Pulmomap neonatal disposable belt N2	ACE-00004-05
Pulmomap neonatal disposable belt N3	ACE-00005-05
Pulmomap neonatal disposable belt N4	ACE-00006-05
Pulmomap neonatal disposable belt N5	ACE-00007-05
Pulmomap neonatal adapter cable	ACE-CAH000P0
Pulmomap adult sensor belt XS	ACE-BFH0A0P0
Pulmomap adult sensor belt S	ACE-BFH0A1P0
Pulmomap adult sensor belt M	ACE-BFH0A2P0
Pulmomap adult sensor belt L	ACE-BFH0A3P0
Pulmomap adult sensor belt XL	ACE-BFH0A4P0
Pulmomap pediatric sensor belt P0	ACE-BFH0P0P0
Pulmomap pediatric sensor belt P1	ACE-BFH0P1P0
Pulmomap pediatric sensor belt P2	ACE-BFH0P2P0
Pulmomap pediatric sensor belt P3	ACE-BFH0P3P0
Pulmomap pediatric sensor belt P4	ACE-BFH0P4P0
Pulmomap adult/pediatric sensor belt XXS	ACE-BFH0P5P0
Pulmomap pediatric adhesive belt P0	ACE-ADL0P0P1
Pulmomap pediatric adhesive belt P1	ACE-ADL0P1P1
Pulmomap pediatric adhesive belt P2	ACE-ADL0P2P1
Pulmomap pediatric adhesive belt P3	ACE-ADL0P3P1
Pulmomap pediatric adhesive belt P4	ACE-ADL0P4P1
Pulmomap adult/pediatric adhesive belt XXS	ACE-ADL0P5P1
Pulmomap adult adhesive belt XS	ACE-ADL0A0P1
Pulmomap adult adhesive belt S	ACE-ADL0A1P1
Pulmomap adult adhesive belt M	ACE-ADL0A2P1
Pulmomap adult adhesive belt L	ACE-ADL0A3P1
Pulmomap adult adhesive belt XL	ACE-ADL0A4P1
Pulmomap reference cable	DX-0TC03-1
Pulmomap shaper size 1	AD-05001-10
Pulmomap shaper size 2	AD-05002-10

Sensor		Part number (PN)
O2 sensors	Galvanic O2 sensor	396200
	Galvanic O2 sensor, lead free	10110473
	Paramagnetic O2 sensor kit	160169
CO2 sensors	ProxyCo CO2 airway adapter, adult/ped (box of 10)	10159144
	ProxyCo CO2 airway adapter, neo (box of 10)	10159385
	ProxyCo CO2 sensor set, angled connector	10169159
	ProxyCo CO2 sensor set, straight connector	10169182
	CAPNOSTAT-5 CO2 sensor (non-CE markets)	281718[34]
	CAPNOSTAT-5 CO2 sensor, straight (CE MDR markets)	1149335[34]
SpO2 sensors	SpO2 sensor adapter (Nihon Kohden)	282010
	SpO2 Multisite Probe, reusable (Nihon Kohden)	281948
	SpO2 fingertip sensor, reusable, > 20 kg (Nihon Kohden)	281949
	SpO2 fingertip sensor, reusable, > 50 kg (Nihon Kohden)	281950
	SpO2 adult finger probe, single use (Nihon Kohden)	281951
	SpO2 pediatric finger probe, single use (Nihon Kohden)	281952
	SpO2 Probe (Neo and Ped), single use (Nihon Kohden)	281953
	SpO2 Finger probe pediatrics, single use (Nihon Kohden)	281954
	SpO2 Multisite Y-Probe, single use (Nihon Kohden)	281955
	SpO2 attachment tape size S, single use (Nihon Kohden)	281956
	SpO2 attachment tape size L, single use (Nihon Kohden)	281957
	SpO2 ear clip adapter, reusable (Nihon Kohden)	281958
	Masimo SpO2rainbow adapter[35]	101952720
	Masimo RD SET DCI	10085445
	Masimo RD SET DCI-P	10085446
	Masimo RD SET TC-I	10085447
	Masimo RD rainbow SET MD20-05 patient cable, 152 cm	10085448
	Masimo RD rainbow SET MD20-12 patient cable, 365 cm	10085449
	Masimo RD to M-LNCS adapter cable 1.5 FT	10085471
	Masimo RD to LNCS adapter cable 1.5 FT	10085472
	Masimo RD SET Pdt CS-3	10103476
	Masimo RD SET Inf CS-3	10103477
	Masimo RD SET Neo CS-3	10103478
	Masimo RD SET NeoPt CS-3	10103752
	License key: PVI	10109015
	License key: SpCO Rainbow	10109013
	License key: SpHb and SpOC Rainbow	10109011
	License key: SpMet Rainbow	10109012
Sensor holder	CAPNOSTAT-5	950241
	ProxyCo	10106089

[34] The CAPNOSTAT-5 CO2 sensor has different Part Numbers (PNs) for CE MDR and non-CE markets: 1149335 for CE MDR markets and 281718 for non-CE markets.
[35] Licenses can be added to enable the measurement of advanced parameters. See the Masimo RD Set Monitoring Configuration sheet (PN ELO20200911) available on the *Hamilton Medical e-catalog*.

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