IntelliVue MP2 Patient Monitor

Philips M8102A **Technical Data Sheet**

The IntelliVue MP2 portable patient monitor is compact in size, ergonomic, and modular in design. It provides an easy-to-use touchscreen user interface, is highly customizable and shares a technological platform with the Philips IntelliVue MP5-MP90 patient monitors.

The IntelliVue series offers a complete monitoring solution that is flexible and modular, designed to suit a broad spectrum of monitoring needs.

Measurement Features

- Compact, rugged, lightweight monitor with built in measurements
- ECG monitoring using any combination of three to 10 electrodes.
- 12-lead ECG monitoring with five electrodes using the EASI method or with 10 electrodes using the conventional method.
- Multi-lead arrhythmia and ST segment analysis at the bedside on all available leads.
- Mainstream or Sidestream CO_2
- FAST SpO_2 for accurate performance even with low perfusion.
- Invasive Pressure and Temperature measurement
- The monitor can operate using battery power for up to 3 hours with basic monitoring configuration to let you safely and easily monitor patients during in-hospital transfer. AC power is provided by an external power supply.

Usability Features

- Touchscreen and hardkeys as input device.
- Intuitive user interface.

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- Simple menu hierarchy gives fast access to all basic monitoring tasks.
- Patient data management with tabular and graphic trends.
- Settings "Profiles" for rapid case turnover.
- Patented automatic alarm limits help clinicians provide care more efficiently.
- 3.5" TFT flat panel display with QVGA (320 x 240) resolution, wide viewing angle, large numerics, permanently visible alarm limits, and up to three real-time waves.
- Capable of functioning in a wireless infrastructure (IIT)

Intended Use

The monitor is intended to be used for monitoring and recording of, and to generate alarms for, multiple physiological parameters of adults, pediatrics, and neonates in a hospital environment and during patient transport inside and outside of hospitals. The monitor is intended for use by health care professionals.

The monitor is only for use on one patient at a time. It is not intended for home use. Not a therapeutic device.

Rx only: U.S. Federal Law restricts this device to sale by or on the order of a physician.

ST segment monitoring is intended for use with adult patients only and is not clinically validated for use with neonatal and pediatric patients.

The ECG measurement is intended to be used for diagnostic recording of rhythm and detailed morphology of complex cardiac complexes (according to AAMI EC 11).

EMC Environment:

The monitor is suitable for use in all establishments incl. those directly connected to the public low-voltage supply network that supplies buildings for domestic purposes. When used with the M2741A Sidestream CO2 sensor, the monitor can only be used in hospital environments.

Upgradability

The MP2 monitor allows new capabilities to be added in the future as your monitoring requirements evolve. This upgradability gives the security of knowing that the monitors can be enhanced and updated as practices and technologies advance, and it protects long-term investments.

Main Components

Monitor

The monitor has a color LCD TFT display with a wide viewing angle, providing high resolution waveform and data presentation.

The display, processing unit and measurements are integrated into one device. An external power supply provides power for the monitor.

User Interface

The user interface is designed for fast and intuitive operation. The color graphical user interface ensures that clinicians quickly feel at ease using the monitor.

Configurable SmartKeys with intuitive icons allow monitoring tasks to be performed quickly and easily, directly on the monitor screen.

Waves and numerics are color-coded.

The monitor displays up to three measurement waves simultaneously. For 12-lead ECG monitoring it can display 12 real-time ECG waves, with a rhythm strip and all ST values.

The MP2 monitor is supplied with a resistive touchscreen.

Simulated Keyboard

If alpha or numeric data entry is required, for example to enter patient demographics, an on-screen keyboard will automatically appear on the screen.

Mounting

The mounting options available enable flexible, space saving placement of the monitors for an ergonomic work space. The monitor is shipped with a low cost mounting plate if not specified otherwise.

Application Features

Critical and Cardiac Care Features

- The monitor performs multi-lead **arrhythmia detection** analysis on the patient's ECG waveform at the bedside. It analyzes for ventricular arrhythmias, calculates heart rate, and generates alarms, including asystole, bradycardia, and ventricular fibrillation.
- Up to 12 leads of **ST segment analysis** can be performed on adult patients at the bedside, measuring ST segment elevation and depression and generating alarms and events. The user can trend ST changes, set high and low alarm limits, and set both ST and isoelectric measurement points. Using ST Snippets, one-second wave segments can be compared with a baseline segment for each measured ST lead.
- optional **ST Map** application shows ST changes over time in two

multi-axis spider diagrams.

- ***QT/QTc interval monitoring*** provides the measured QT interval, the calculated heart-rate corrected QTc value and a ΔQTc value, which tracks variation in the QT interval in relation to a baseline value.
- optional **12-lead ECG** data can be measured, using either the EASI placement method with five standard electrodes or conventional electrode placement with 10 electrodes.[1]
- 12 realtime ECG waveforms can be displayed simultaneously.
- **FAST-SpO2**, using Fourier Artifact Suppression Technology, performs accurately even in cases with low perfusion.
- Choice of sidestream or mainstream **CO_2 monitoring** for high quality measurements with intubated and non-intubated patients.

Ease of Use

- **Screen layouts** are easily adjustable, allowing flexible display of measurement information.
- Temperature, height, and weight can be configured either in metric or imperial **units**. Pressure measurements can be displayed in kPa or mmHg. Gases can be displayed in kPa, mmHg.

Trends

- The **trend database** stores patient data from up to 30 measurement numerics. The measurement information can be sampled every 12 seconds, one minute, or five minutes, and stored for a period ranging from four to 48 hours.
- ***Horizon Trends*** show the deviation from a stored baseline.

Transport Features

- The monitor's portable design means it can be used for in and out-of-hospital transport: a basic monitor weighs 1.5 kg.
- The monitor can operate using battery power for up to 3 hours, to let you safely and easily monitor patients during procedures or in-hospital transfer.
- Specially-designed mounting solutions let you quickly disconnect the monitor for transport and reconnect to the mount after transport.
- The Universal Admit, Discharge and Transfer (ADT) feature means that all ADT information is shared between the networked monitor and the Information Center. Information need only be entered once.

Patient Data Documentation

- An extensive range of **Patient Reports** can be printed:
  - 12-lead ECG Reports
  - Alarm Limit Reports
  - Vital Signs
  - Graphic Trends
  - Realtime Wave Reports

  Report templates can be defined in advance, enabling print-outs tailored to each hospital's specific requirements to be started quickly. Reports can be printed on centrally-connected printers or via the IntelliVue PC Printing Solution, and they can be initiated manually or automatically at user-defined intervals.
- The IntelliVue PC Printing Solution allows printing of reports, waveform captures and trends from the MP2 to a standard off-the shelf printer or to an electronic file.

Alarms

The alarm system can be configured to present either the traditional HP/Agilent/Philips alarm sounds or sounds compliant with the draft ISO/IEC 9703-2 Standard.

Alarm limits are permanently visible on the main screen. The Alarm Limits page provides a graphic depiction of alarm limits in relation to the currently monitored measurement values and lets you adjust alarm limits. It also lets you preview wide and narrow automatic alarm limits before you apply them.

When an alarm limit is exceeded, it is signalled by the monitor in the following ways:

- an alarm tone sounds, graded according to severity
- an alarm message is shown on the screen, color-coded according to severity
- the numeric of the alarming measurement flashes on the screen
- alarm lamps flash for red and yellow alarms and are illuminated for technical INOPs

If the monitor is connected via a network to a central monitoring station, alarming is simultaneous at the monitor and at the Information Center.

Alarms are graded and prioritized according to severity:

- **Red Alarms*** ** identify a potentially life threatening situation for a patient .
- **Yellow Alarms**** indicate conditions violating preset vital signs limits.
- **Technical Alarms (INOPS)** are triggered by signal quality problems, equipment malfunction or equipment disconnect.

  The Silence/Pause Alarms function (equivalent to Silence/Suspend with previous monitor generations) allows the user to switch off alarm tones with one touch.

  All alarms can be paused for a period of one, two, three, five, or 10 minutes or turned off indefinitely.

1. EASI-derived 12-lead ECGs and their measurements are approximations to conventional 12-lead ECGs. As the 12-lead ECG derived with EASI is not exactly identical to the 12-lead conventional ECG obtained from an electrocardiograph, it should not be used for diagnostic purposes.

Alarm strip recordings are available on a centrally-connected recorder or via the IntelliVue PC Printing Solution.

Patented automatic alarm limits automatically adapt the alarm limits to the patient's currently measured vital signs within a safe margin defined individually for each patient.

Visual and/or audible latching and non-latching alarm handling is available.

Profiles

Profiles are predefined configuration settings for Screens, measurement settings, and monitor settings. Each Profile can be designed for a specific application area and patient category, for example OR adult, or ICU neonatal. Profiles enable a quick reaction to patient and care location changes: activating a Profile with a particular patient category (Adult, Pediatric or Neonatal) automatically applies suitable alarm and safety limits and saves time usually spent carrying out a complete set-up procedure.

Profiles can be created directly on the monitor or remotely on a personal computer and transferred to the monitor using the IntelliVue Support Tool. A selection of Profiles for common monitoring situations is provided with the monitor. These profiles can be changed, added to, renamed, or deleted.

Optional Networking Capabilities

The monitor can operate as part of a wired or wireless hospital network system, using the Philips IntelliVue Clinical Network interface.

Service Features

- The Support Tool helps technical personnel to
  - carry out configuration, upgrades and troubleshooting via the network, or on an individual monitor
  - share configuration settings between monitors
  - back up the monitor settings.
- A password-protected Service Mode ensures that only trained staff can access service tests and tasks.
- The Configuration Mode is password-protected and allows trained users to customize the monitor configuration.

Device Connections

The monitor can be connected to:

- an Information Center (for example M3150B)
- a PC
- MMS Extensions (M3012A, M3014A, M3015A, M3016A)[1]

Network Interface

The network interface provides the system with networking capability via a wired or wireless network connection.

Wireless Network (optional)

The monitor can function within a telemetry infrastructure compatible with the Philips Cellular Telemetry System (CTS) in the WMTS and ISM bands. Additional components are required to complete the system. Please refer to the M3185A IntelliVue Clinical Network Technical Data Sheet for further information.

Monitor Specifications

Safety Specifications

The monitor complies with the Medical Device Directive 93/42/EEC (CE_{0366}) and with IEC 60601-1:1988 + A1:1991 + A2:1995; EN60601-1:1990 + A1:1993 + A2:1995; UL 60601-1:2003; CAN/CSA C22.2#601.1-M90; JIS T 0601-1:1999; IEC 60601-1-1:2000; EN 60601-1-1:2001.

All applied parts are Type CF unless otherwise specified. They are protected against damage from defibrillation and electrosurgery.

The possibility of hazards arising from software errors was minimized in compliance with ISO 14971:2000, EN60601-1-4:1996 + A1:1999 and IEC 60601-1-4:1996 + A1:1999.

The monitor complies with the EMC standards IEC 60601-1-2:2001; EN 60601-1-2:2001

This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.

The MP2 patient monitor can be used in a transport environment such as road ambulance, airplane or helicopter, except when used with the M2741A Sidestream CO2 sensor. For this purpose, the monitor fulfills the following additional mechanical, EMC and environmental requirements:

- ***Shock Tests*** according to IEC TR 60721-4-7, Class 7M3. Test procedure according to IEC/EN 60068-2-27 (peak acceleration up to 100g).
- ***Random Vibration*** according to IEC TR 60721-4-7, Class 7M3. Test procedure according to IEC/EN 60068-2-64 (RMS acceleration 5g).
- ***Sinusoidal Vibration*** according to IEC TR 60721-4-7, Class 7M3. Test procedure according to IEC/EN 60068-2-6 (acceleration up to amplitude 2g).

1. The MMS Extensions will only function when the monitor is connected to the external power.

- ***Bump Test*** according to IEC/EN60068-2-29 (peak acceleration 15g, 1000 bumps).
- ***Free Fall Test*** according to EN1789 (covers also IEC TR 60721-4-7 and Class 7M3). Test procedure according to EN 60068-2-32 (height 0.75 m).
- Specification for degrees of protection provided by enclosures according to ***IEC/EN 60529: IP 32***
- ***EN 1789 +A1:2003*** Medical vehicles and their equipment - Road ambulances (chapter 6 - Medical Devices).
- ***Radiated susceptibility 20 V/m*** according to EN ISO 9919 (SpO2) and EN ISO 21647 (CO2).
- ***Altitude Range*** from -500 to 3000 m operating and -500 to 4600 m storage and transportation.
- Extended radiated susceptibility tests

The MP2 patient monitor with its out-of-hospital parameter set provides a general immunity level of 20 V/m with only few restrictions. Details are as listed below:

- GSM 900: Immunity at 900 MHz (uplink mobile phone), 20V/m, duty cycle 1:8
- GSM 1800: Immunity at 1800 MHz (uplink mobile phone), 20V/m, duty cycle 1:8.
- DECT: Immunity at 1800 MHz (digital cordless phone), 20V/m, duty cycle 1:24
- AM: 1 kHz Immunity from 80 MHz to 2.5 GHz (any radio communication unit, broadcasting and TV transmitter), 20V/m, modulation factor 80%. (ECG: 20 V/m except 0.8-1.2 GHz where it is 10V/m)

- ***Operating ambient temperature*** testing over the range from 0 to 40 °C (32 to 104 °F).
- ***Operating ambient humidity*** testing up to 95% RH at 40 °C (104 °F), non condensing.

Physical Specifications

Product	Max Weight	W x H x D
M8102A IntelliVue MP2 (without handle and options)	1.5 kg (3.3 lb)	< 188 x 99 x 86 mm (7.4 x 3.9 x 3.4 in)

Environmental Specifications

Item	Condition	Range
Temperature Range	Operating	0 to 40°C (32 to 104 °F)
	Storage (incl. Transport)	-20 to 60°C (-4 to 140 °F)
Temperature Range when charging the battery	Operating	0 to 35°C (32 to 95°F)
Humidity Range	Operating	15% to 95% Relative Humidity (RH) (non condensing)
	Storage and Transport	5% to 95% Relative Humidity (RH)
Altitude Range	Operating	-500 m to 3000 m (10000 ft)
	Storage and Transport	-500 m to 4600 m (15000 ft)[a]
Ingress Protection	Monitor	IP32 (protected against the ingress of solid foreign objects 2.5 mm in diameter or larger, and the ingress of water when the water is dripping vertically and the monitor is tilted up to 15°).
	External Power Supply (M8023A)	IP31(protected against the ingress of solid foreign objects 2.5 mm in diameter or larger, and the ingress of water when the water is dripping vertically) when rested on its rubber feet on a flat, level surface.
		IP32 when mounted with the connectors facing downwards

a. sufficient for flight altitudes up to 12,000 m with pressurized cabins

Performance Specifications

Monitor Performance Specifications		
Power Specifications	Power consumption	< 40W average, <65W peak
	Line Voltage	100 to 240 V ~
	Current	1.3 to 0.7A
	Frequency	50/60 Hz
Battery Specifications	Operating Time (with new, fully charged battery at 25 °C)	Basic monitor configuration: 3 hours
	Charge Time	When MP2 is off: 2 h When MP2 is in use and connected to MP20/30/ 40/50/60/70/80/90 without extensions: 12 h approx. When MP2 is in use and connected to the external power
Indicators	Alarms Off	red LED
	Alarms	red/yellow/cyan LED
	On/Standby/Error	green/red LED
	AC Power	green LED
	Battery	yellow (charging)/red blinking (empty) LED
	External Power	green LED
Sounds	Audible feedback for user input. Prompt tone. QRS tones, or SpO_2 modulation tone. Four different alarm sounds.	
Trends: 12, or 16 numerics @ 12 sec, 1 minute, 5 minute resolution. Multiple choices of number of numerics, resolution and duration depending on trend option and application area.		

Monitor Performance Specifications		
Alarm Signal	System delay	less than 3 seconds
	Pause duration	1,2,3 minutes or infinite, depending on configuration
	Extended alarm pause	5 or 10 minutes
Review Alarms	Information: all alarms / inops, main alarms on/off, alarms acknowledged and time of occurrence	
	capacity	500 items
Real Time Clock	Range: from: January 1, 1997, 00:00 to: December 31, 2080, 23:59	
	Accuracy: < 4 seconds per day (typically)	
	Hold Time: infinite if powered by host monitor or external power supply; otherwise at least 48 hours	
Buffered Memory	Contents: Active settings, trends, patient data, realtime reports, review alarms	
	Hold Time: infinite if powered by external power supply; otherwise at least 48 hours	
Restart time: After power interruption, an ECG wave will be shown on the display after 30 seconds maximum.		

M8023A External Power Supply Performance Specifications

M8023A External Power Supply Performance Specifications		
Power Specifications	Power Consumption	< 12 W average < 30 W peak
	Line Voltage	100 to 240 V ~
	Current	0.7 to 0.4 A
	Frequency	50/60 Hz ~
Indicators	AC Power	green LED

Interface Specifications

MP2 (M8102A) Interface Specifications		
Measurement Link (MSL)	Connectors	Female ODU (Proprietary)
	Power	30 V to 60 V input
	Power Sync	RS-422 compliant input 78.125 kHz (typical
	LAN signals	IEEE 802.3 10-Base-T complaint
	Serial signals	RS-422 compliant
	Local signals	Provided for connecting MMS extensions
ECG Sync Pulse Output	Cable Detection	Yes
	Marker In	No
	Wave Output	No
	Connector	Binder Series 709/719
	Output Levels	Output low <0.8V @ I = -4 mA
		Output high >2.4 V @ I= 4 mA
	Isolation	None
	Pulse Width	100 +/- 10 ms (high)
	Delay from R-wave peak to start of pulse	20 ms maximum per AAMI EC13
	Minimum required R-wave amplitude	0.5 V

M8023A External Power Supply Interface Specifications		
Measure-ment Link (MSL)	Connectors	Male ODU (Proprietary)
	Power	48 V output
	Power Sync.	RS-422 compliant output 78.125 kHz (typical)
	LAN signals	IEEE 802.3 10-Base-T complaint
	Serial signals	RS-422 compliant output 78.125 kHz (typical)
	Local signals	Not connected

Display Specifications		
Integrated QVGA Display	Sweep Speeds	6.25, 12.5, 25 and 50 mm/s;
	Resolution	320 x 240
	Refresh frequency	60 Hz
	Useful screen	72 x 54 mm (2.8 x 2.1 in)
	Pixel size	0.22 x 0.22 mm

MP2 (M8102A) Compatible Devices		
IntelliVue Instrument Telemetry Wireless Network (USA only)		
Internal WMTS Adapter	Technology	compatible with Philips Cellular Telemetry System (CTS), cellular infrastructure
	Frequency Band	WMTS, 1395-1400 MHz and 1427-1432 MHz
IntelliVue Instrument Telemetry Wireless Network (except USA)		

MP2 (M8102A) Compatible Devices		
Internal ISM Adapter	Technology	compatible with Philips Cellular Telemetry System (CTS), cellular infrastructure
	Frequency Band	2.4 GHz ISM

M4607A Battery Specifications	
Physical Specifications	
W x D x H	66 mm (2.36 in) x 80 mm (3.15 in) x 20 mm (0.79 in)
Weight	160 g ±5%
Performance Specifications	
Nominal Voltage	10.8 Volt
Rated Capacity at discharge C/5	1000 mAh (typical)
Environmental Specifications	
Temperature Range	Discharge 0 to 60°C (32 to 122°F) Charge 0 to 60°C (32 to 122°F) Storage and Transportation: -20 to 65°C (-4 to 140°F)
Humidity Range	Operating: 15 % to 95 % Relative Humidity (RH) Storage and Transportation: 5 % to 95 % Relative Humidity (RH)
Battery Type	Lithium Ion Mangan, 10.8 V, 1000 mAh,
Safety	complies with UL 1642 (UL Recognized)
Electromagnetic Compatibility (EMC)	complies with the requirements for FCC Type B computing Device, and EN 61000-4-2 and EN 61000-3-2
Communication Standard	complies with the SMBus specification v1.1

Measurement Specifications

ECG/Arrhythmia/ST/QT

Complies with IEC 60601-2-25:1993 + A1:1999 /EN60601-2-25:1995 + A1:1999, IEC 60601-2-27:2005/EN60601-2-27:2006, IEC 60601-2-51:2003 /EN 60601-2-51:2003 and AAMI EC11/EC13:1991/2002.

ECG/Arrhythmia/ST Performance Specifications		
Cardiotach	Range	Adult/pedi: 15 to 300 bpm Neo range: 15 to 350 bpm
	Accuracy	±1% of range
	Resolution	1 bpm
	Sensitivity	≥200 μV_{peak}
PVC Rate	Range	0 to 300 bpm
	Resolution	1 bpm
ST Numeric	Range	-20 to +20 mm
	Accuracy	±0.5 mm or 15%, whichever is greater
	Resolution	0.1 mm
QT Numeric	Range	200 to 800 ms
	Accuracy	±30 ms
	Resolution	8 ms
QTc Numeric	Range	200 to 800 ms
	Resolution	1 ms
ΔQTc Numeric	Range	-600 to +600 ms
	Resolution	1 ms
QT-HR Numeric	Range - adult	15 to 300 bpm
	Range - pediatric and neonatal	15 to 350 bpm

ECG/Arrhythmia/ST Performance Specifications		
Sinus and SV Rhythm Ranges	Brady	Adult: 15 to 60 bpm Pedi: 15 to 80 bpm Neo: 15 to 90 bpm
	Normal	Adult:60 to 100 bpm Pedi: 80 to 160 bpm Neo: 90 to 180 bpm
	Tachy	Adult: > 100 bpm Pedi: >160 bpm Neo: >180 bpm
Bandwidth	Diagnostic Mode	Adult/neo/pedi: 0.05 to 150Hz
	Extended Monitoring Mode	Neo/pedi: 0.5 to 150Hz
	Monitoring Mode	Adult: 0.5 to 40Hz Neo/pedi: 0.5 to 55Hz
	Filter Mode	Adult/neo/pedi: 0.5 to 20Hz
Differential Input Impedance		>2MΩ RA-LL leads (Resp) >5MΩ at all other leads (at 10Hz including patient cable)
Common Mode Rejection Ratio		Diagnostic mode: >86 dB (with a 51 kΩ/47 nF imbalance). Filter mode: >106 dB (with a 51 kΩ/47 nF imbalance).
Electrode Offset Potential Tolerance		±500mV
Auxiliary Current (Leads off Detection)		Active electrode: <100 nA Reference electrode: <900 nA
Input Signal Range		±5 mV

ECG/ Arrhythmia/ ST Alarm Specifications	Range	Adjustment
HR	15 to 300 bpm maximum delay: 10 seconds according to AAMI EC 13-1992 standard	Adult:1 bpm steps (15 to 40 bpm) 5 bpm steps (40 to 300 bpm) Pedi/Neo:1 bpm steps (15 to 50 bpm) 5 bpm steps (50 to 300 bpm)
Extreme Tachy	Difference to high limit 0 to 50 bpm	5 bpm steps
	Clamping at 150 to 300 bpm	5 bpm steps
Extreme Brady	Difference to low limit 0 to 50 bpm	5 bpm steps
	Clamping at 15 to 100 bpm	5 bpm steps
Run PVCs	2 PVCs	Not adjustable by user
PVCs Rate	1 to 99 PVCs/minute	1 PVC
Vent Tach HR	20 to 300 bpm	5 bpm
Vent Tach Run	3 to 99 PVCs/minute	1 PVC
Vent Rhythm Run	2 to 99 PVCs/minute	1 PVC
SVT HR	120 to 300 bpm	5 bpm
SVT Run	3 to 99 SV beats	1 SV beat
ST High	-19.8 to +20 mm	0.2 mm
ST Low	-20 to +19.8 mm	0.2 mm
QTc High	200 ms to 800 ms	10 ms steps
ΔQTc High	30 ms to 200 ms	10 ms steps

ECG/Arrhythmia/ST Supplemental Information as required by AAMI EC11/13		
Respiration Excitation Waveform		Sinusoidal signal, 260 µA, 39 kHz
Noise Suppression		RL drive gain 44 dB max., max. voltage 1.8 Vrms
Time to Alarm for Tachycardia	Vent Tachycardia 1 mV_{pp},206 bpm	Gain 0.5, Range 6.5 to 8.4 seconds, Average 7.2 seconds
		Gain 1.0 Range 6.1 to 6.9 seconds, Average 6.5 seconds
		Gain 2.0, Range 5.9 to 6.7 seconds, Average 6.3 seconds
	Vent Tachycardia 2 mV_{pp},195bpm	Gain 0.5, Range 5.4 to 6.2 seconds, Average 5.8 seconds
		Gain 1.0, Range 5.7 to 6.5 seconds, Average 6.1 seconds
		Gain 2.0, Range 5.3 to 6.1 seconds, Average 5.7 seconds
Tall T-Wave Rejection Capability		Exceeds ANSI/AAMI EC 13 Sect. 3.1.2.1(c) minimum recommended 1.2 mV T-Wave amplitude
Heart Rate Averaging Method		Three different methods are used: Normally, heart rate is computed by averaging the 12 most recent RR intervals. For runs of PVCs, up to 8 RR intervals are averaged to compute the HR. If each of 3 consecutive RR intervals is greater than 1200 ms (that is, rate less than 50 bpm), then the 4 most recent RR intervals are averaged to compute the HR.
Response Time of Heart Rate Meter to Change in Heart Rate		HR change from 80 to 120 bpm: Range: [6.4 to 7.2 seconds] Average: 6.8 seconds HR change from 80 to 40 bpm: Range: [5.6 to 6.4 sec] Average: 6.0 seconds

ECG/Arrhythmia/ST Supplemental Information as required by AAMI EC11/13	
Heart Rate Meter Accuracy and Response to Irregular Rhythm	Ventricular bigeminy: 80 bpm Slow alternating ventricular bigeminy: 60 bpm Rapid alternating ventricular bigeminy: 120 bpm Bidirectional systoles: 90 bpm
Accuracy of Input Signal Reproduction	Methods A and D were used to establish overall system error and frequency response.

Respiration

Respiration Performance Specifications		
Respiration Rate	Range	Adult/pedi: 0 to 120 rpm Neo: 0 to 170 rpm
	Accuracy	at 0 to 120 rpm ±1 rpm at 120 to 170 rpm ±2 rpm
	Resolution	1 rpm
Bandwidth		0.3 to 2.5Hz (–6dB)
Noise		Less than 25mΩ (rms) referred to the input

Respiration Alarm Specifications	Range	Adjustment	Delay
High	Adult/pedi: 10 to 100 rpm Neo: 30 to 150 rpm	under 20 rpm: 1 rpm steps over 20 rpm: 5 rpm steps	max. 14 seconds
Low	Adult/pedi: 0 to 95 rpm Neo: 0 to 145 rpm	under 20 rpm: 1 rpm steps over 20 rpm: 5 rpm steps	for limits from 0 to 20 rpm: max. 4 seconds for limits above 20 rpm: max. 14 seconds

Respiration Alarm Specifications	Range	Adjustment	Delay
Apnea Alarm	10 to 40 seconds	5 second steps	

SpO_2

Complies with EN ISO 9919:2005 (except alarm system; alarm system complies with IEC 60601-2-49:2001).

Measurement Validation: The SpO_2 accuracy has been validated in human studies against arterial blood sample reference measured with a CO-oximeter. Pulse oximeter measurements are statistically distributed, only about two-thirds of the measurements can be expected to fall within the specified accuracy compared to CO-oximeter measurements. Display Update Period: Typical: 2 seconds, Maximum: 30 seconds. Max. with NBP INOP suppression on: 60 seconds.

SpO_2 Performance Specifications		
SpO_2*	Range	0 to 100%
	Accuracy	**Philips Reusable Sensors:** M1191A, M1191AL, M1191ANL, M1191B, M1191BL, M1192A, M1192AN: 2% (70% to 100%) M1193A, M1193AN, M1194A, M1194AN, M1195A, M1195AN, M1196A: 3% (70% to 100%)
		Philips Reusable Sensors with M1943A(L): M1191T, M1192T, M1193T (Adult), M1196T: 3% (70% to 100%) M1193T (Neonate): 4% (70% to 100%)
		Philips Disposable Sensors with M1943A(L): M1132A, M1133A (adult/infant): 2% M1131A, M1133A (neonate), M1901B, M1902B, M1903B, M1904B: 3% (70% to 100%)

SpO_2 Performance Specifications		
SpO_2*	Accuracy	**NellcorPB® Sensors with M1943A(L):** MAX-A, MAX-AL, MAX-P, MAX-I, MAX-N, D-25, D-20, I-20, N-25, OxiCliq A, P, I, N: 3% (70% to 100%)
		Masimo Reusable Sensors® with LNOP MP12 or LNC MP10: LNOP DC-I, LNOP DC-IP, LNOP YI, LNCS DC-I, LNCS DC-IP, LNCS TF-I: 2% (70% to 100%) LNOP TC-I, LNCS TC-I: 3.5% (70% to 100%)
		Masimo Disposable Sensors® with LNOP MP12 or LNC MP10: LNOP Adt, LNOP Adtx, LNOP Pdt, LNOP Pdtx, LNOP Inf-L, LNCS Adtx, LNCS Pdtx, LNCS Inf-L: 2% (70% to 100%) LNOP Neo-L, LNOP NeoPt-L, LNCS Neo-L, LNCS NeoPt-L: 3% (70% to 100%)
	Resolution	1%
Pulse	Range	30 to 300 bpm
	Accuracy	±2% or 1 bpm, whichever is greater
	Resolution	1 bpm
Sensors		Wavelength range: 500 to 1000 nm Emitted Light Energy: ≤ 15mW Information about the wavelength range can be especially useful to clinicians (for instance, when photodynamic therapy is performed)
Pulse Oximeter Calibration Range		70 - 100%

*The specified accuracy is the root-mean-square (RMS) difference between the measured values and the reference values

SpO_2 Alarm Specifications	Range	Adjustment	Delay
SpO_2	Adult: 50 to 100% Pedi/Neo: 30 to 100%	1% steps	(0, 1, 2, 3,... 30) + 4 seconds
Desat	Adult: 50 to Low alarm limit Pedi/Neo: 30 to Low alarm limit	1% steps	
Pulse	30 to 300 bpm	Adult: 1 bpm steps (30 to 40 bpm) 5 bpm steps (40 to 300 bpm) Pedi/Neo: 1 bpm steps (30 to 50 bpm) 5 bpm steps (50 to 300 bpm)	max. 14 seconds
Tachycardia	Difference to high limit 0 to 50 bpm	5 bpm steps	max. 14 seconds
	Clamping at 150 to 300 bpm	5 bpm steps	
Bradycardia	Difference to low limit 0 to 50 bpm	5 bpm steps	max. 14 seconds
	Clamping at 30 to 100 bpm	5 bpm steps	

NBP

Complies with IEC 60601-2-30:1999/EN60601-2-30:2000.

NBP Performance Specifications		
Measurement Ranges	Systolic	Adult: 30 to 270 mmHg (4 to 36 kPa) Pedi: 30 to 180 mmHg (4 to 24 kPa) Neo: 30 to 130 mmHg (4 to 17 kPa)
	Diastolic	Adult: 10 to 245 mmHg (1.5 to 32 kPa) Pedi: 10 to 150 mmHg (1.5 to 20 kPa) Neo: 10 to 100 mmHg (1.5 to 13 kPa)
	Mean	Adult: 20 to 255 mmHg (2.5 to 34 kPa) Pedi: 20 to 160 mmHg (2.5 to 21 kPa) Neo: 20 to 120 mmHg (2.5 to 16 kPa)
	Pulse Rate	Adult:40 to 300 Pedi: 40 to 300 Neo: 40 to 300
Accuracy		Max. Std. Deviation: 8 mmHg (1.1 kPa) Max. Mean Error: ±5 mmHg (±0.7 kPa)
Pulse Rate Measurement Accuracy		40 to 100 bpm: ± 5 bpm 101 to 200 bpm: ± 5% of reading 201 to 300 bpm: ± 10% of reading (average over NBP measurement cycle)
Heart Rate Range		40 to 300 bpm
Measurement Time		Typical at HR > 60bpm Auto/manual: 30 seconds (adult) 25 seconds (neonatal) Stat: 20 seconds Maximum time: 180 seconds (adult/pediatric) 90 seconds (neonates)

NBP Performance Specifications		
Cuff Inflation Time		Typical for normal adult cuff: Less than 10 seconds Typical for neonatal cuff: Less than 2 seconds
Initial Cuff Inflation Pressure		Adult: 165 ±15 mmHg Pedi: 130 ±15 mmHg Neo: 100 ±15 mmHg
Auto Mode Repetition Times		1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60 or 120 minutes
STAT Mode Cycle Time		5 minutes
Venipuncture Mode Inflation		
Inflation Pressure	Adult	20 to 120 mmHg (3 to 16 kPa)
	Pediatric	20 to 80 mmHg (3 to 11 kPa)
	Neonatal	20 to 50 mmHg (3 to 7 kPa)
Automatic deflation after	Adult/ pediatric	170 seconds
	Neonatal	85 seconds

Measurement Validation: In adult and pediatric mode, the blood pressure measurements determined with this device comply with the American National Standard for Electronic or Automated Sphygmomanometers (ANSI/AAMI SP10 - 1992) in relation to mean error and standard deviation, when compared to intra-arterial or auscultatory measurements (depending on the configuration) in a representative patient population. For the auscultatory reference the 5th Korotkoff sound was used to determine the diastolic pressure.

In neonatal mode, the blood pressure measurements determined with this device comply with the American National Standard for Electronic or Automated Sphygmomanometers (ANSI/AAMI SP10 - 1992 and AAMI/ANSI SP10A -1996) in relation to mean error and standard deviation, when compared to intra-arterial measurements in a representative patient population.

NBP Alarm Specifications	Range	Adjustment
Systolic	Adult: 30 to 270 mmHg (4 to 36 kPa)	10 to 30 mmHg: 2 mmHg (0.5 kPa) > 30 mmHg: 5 mmHg (1kPa)
	Pedi: 30 to 180 mmHg (4 to 24 kPa)	
	Neo: 30 to 130 mmHg (4 to 17 kPa)	
Diastolic	Adult: 10 to 245 mmHg (1.5 to 32 kPa)	
	Pedi: 10 to 150 mmHg (1.5 to 20 kPa)	
	Neo: 10 to 100 mmHg (1.5 to 13 kPa)	
Mean	Adult: 20 to 255 mmHg (2.5 to 34 kPa)	
	Pedi: 20 to 160 mmHg (2.5 to 21 kPa)	
	Neo: 20 to 120 mmHg (2.5 to 16 kPa)	

NBP Overpressure Settings		
Adult	> 300 mmHg (40 kPa) > 2 sec	not user adjustable
Pedi	> 300 mmHg (40 kPa) > 2 sec	
Neo	> 150 mmHg (20 kPa) > 2 sec	

Invasive Pressure and Pulse

Complies with IEC 60601-2-34:2000/EN60601-2-34:2000.

Invasive Pressure Performance Specifications		
Measurement Range		–40 to 360 mmHg
Pulse Rate	Range	25 to 350 bpm
	Accuracy	±1% Full Range
	Resolution	1 bpm
Input Sensitivity		Sensitivity:5μV/V/mmHg (37.5μV/V/kPa) Adjustment range:±10%
Transducer		Load Impedance:200 to 2000 Ω (resistive) Output Impedance:≤3000 Ω (resistive)
Frequency Response		dc to 12.5 Hz or 40 Hz
Zero Adjustment	Range	±200 mmHg (±26 kPa)
	Accuracy	±1 mmHg (±0.1 kPa)
	Drift	Less than 0.1mmHg/°C (0.013 kPa/°C)
Gain Accuracy	Accuracy	±1%
	Drift	Less than 0.05%/°C
	Non linearity and Hysteresis	Error of ≤ 0.4% FS (@CAL 200 mmHg)
Overall Accuracy	(including transducer)	± 4% of reading or ± 4 mmHg (± 0.5 kPa), whichever is greater
Volume displacement of CPJ840J6		0.1 mm^3 /100 mmHg

Invasive Pressure Alarm Specifications	Range	Adjustment	Delay
Pressure	–40 to 360 mmHg (–5.0 to 48 kPa)	-40 to 30 mmHg 2 mmHg (0.5 kPa) > 30 mmHg 5 mmHg (1 kPa)	max. 12 seconds
Extreme High	Difference to high limit 0 to 25 mmHg	5 mmHg steps (0.5 kPa)	
	Clamping at -40 to 360 mmHg	5 mmHg steps (1.0 kPa)	
Extreme Low	Difference to low limit 0 to 25 mmHg	5 mmHg steps (0.5 kPa)	
	Clamping at 40 to 360 mmHg	5 mmHg steps (1.0 kPa)	
Pulse	25 to 300 bpm	Adult: 1 bpm steps (25 to 40 bpm) 5 bpm steps (40 to 300 bpm) Pedi/Neo: 1 bpm steps (25 to 50 bpm) 5 bpm steps (50 to 300 bpm)	
Tachycardia	Difference to high limit 0 to 50 bpm	5 bpm steps	max. 14 seconds
	Clamping at 150 to 300 bpm	5 bpm steps	

Invasive Pressure Alarm Specifications	Range	Adjustment	Delay
Bradycardia	Difference to low limit 0 to 50 bpm	5 bpm steps	max. 14 seconds
	Clamping at 25 to 100 bpm	5 bpm steps	

Temp

Complies with EN 12470-4:2000

Temp Performance Specifications		
Temp	Range	–1 to 45 °C (30 to 113 °F)
	Resolution	0.1 °C (0.2 °F)
	Accuracy	±0.1 °C (±0.2 °F)
Average Time Constant		Less than 10 seconds
Alarms	Range	–1 to 45 °C (30 to 113 °F)
	Adjustment	-1 to 35 °C (30 to 95 °F): 0.5 °C (1.0 °F) steps 35 to 45 °C (95 to 113 °F): 0.1 °C (0.2 °F) steps

Temp Alarm Specifications	Range	Adjustment
Temp High/ Low Alarms	–1 to 45 °C (30 to 113 °F)	-1 to 35 °C (30 to 95 °F), 0.5 °C (1.0 °F) steps 35 to 45 °C (95 to 113 °F), 0.1 °C (0.2 °F) steps

CO_2

The CO_2 measurement in the monitor, M3014A and M3015A complies with EN ISO 21647:2004 + Cor.1:2005 (except alarm system; alarm system complies with IEC 60601-2-49:2001).

M3015A Microstream CO_2 Performance Specifications		
CO_2	Range	0 to 98 mmHg (0 to 13 kPa), or 13 % CO_2, whichever is lower
	Accuracy	Up to 5 minutes during warmup: ±4 mmHg or 12 %, whichever is greater After 5 minutes warmup: 0 to 40 mmHg (0 to 5.3 kPa): ±2.2 mmHg (±0.3 kPa) Above 40 mmHg (5.3 kPa):±(5.5 % + (0.08 %/mmHg above 40 mmHg)) of reading These specifications are valid for 21 % O_2 and N_2 balance, up to 35°C ambient temperature, up to 60 rpm in adult mode and 100 rpm in neonatal mode. Outside of these conditions the accuracy reaches at a minimum ±4 mmHg or ±12 % of the reading, whichever is greater.
	Resolution	Numeric: 1.0 mmHg (0.1 kPa) Wave: 0.1 mmHg (0.01 kPa)
	Stability	Included in Accuracy specifications
awRR	Range	0 to 150 rpm
	Accuracy	0 to 40 rpm: ±1 rpm 41 to 70 rpm: ±2 rpm 71 to 100 rpm: ±3 rpm >100 rpm: ±5 % of reading
Warm-up Time		5 minutes for full accuracy specification
Rise Time		190 ms for neonatal mode (measured with FilterLine H for neonatal) 240 ms for adult mode (measured with FilterLine H for adult)
Sample Flow Rate		50 + 15/-7.5 ml/minute

M3015A Microstream CO_2 Performance Specifications	
Gas Sampling Delay Time	Typical:2.3 seconds Maximum:3 seconds
Sound Pressure	Acoustic noise: <45 dBA
Total System Response Time	The total system response time is the sum of the delay time and the rise time.

M3014A Mainstream CO_2 Performance Specifications		
CO_2	Range	0 to 150 mmHg (0 to 20.0 kPa)
	Accuracy	after 2 minutes warmup: For values between 0 and 40 mmHg: ±2.0 mmHg (±0.29 kPa) For values from 41 to 70 mmHg: ±5 % of reading For values from 71 to 100 mmHg: ±8 % of reading The specifications are valid for standard gas mixtures, balance air, fully hydrated at 35°C, P_{abs} = 760 mmHg, flow rate = 2 l/min.
	Resolution	Numeric: 1.0 mmHg (0.1 kPa) Wave: 0.1 mmHg (0.01 kPa)
	Stability: Short term drift Long term drift	±0.8 mmHg over four hours Accuracy specification will be maintained over a 120 hour period
awRR	Range	2 to 150 rpm
	Accuracy	±1 rpm
Warm-up Time		2 minutes with CO_2 transducer attached for full accuracy specification
Response Time		Less than 60 ms (with adult or infant reusable or disposable adapter)

M3014A Sidestream CO_2 Performance Specifications		
CO_2	Range	0 to 150 mmHg (0 to 20.0 kPa)
	Accuracy	after 2 minutes warmup: For values between 0 and 40 mmHg: ±2.0 mmHg (±0.29 kPa) For values from 41 to 70 mmHg: ±5 % of reading For values from 71 to 100 mmHg: ±8 % of reading For values from 101 to 150 mmHg: ±10 % of reading At respiration rates above 80 rpm, all ranges are ±12 % of actual. The specifications are valid for gas mixtures of CO_2, balance N_2, dry gas at 760 mmHg within specified operating temperature range.
	Resolution	Numeric: 1.0 mmHg (0.1 kPa) Wave: 0.1 mmHg (0.01 kPa)
	Stability: Short term drift Long term drift	±0.8 mmHg over four hours Accuracy specification will be maintained over a 120 hour period
awRR	Range	2 to 150 rpm
	Accuracy	±1 rpm
Warm-up Time		2 minutes with CO_2 sensor attached for full accuracy specification
Sample Flow Rate		50 ±10 ml/minute
Total System Response Time		3 seconds
Operating Temperature		0 to 40°C (32 to 104°F)

M3014A Mainstream and Sidestream CO_2 Humidity Correction Factor

Either BTPS or STPD can be selected as the humidity correction factor for the CO_2 readings. The formula for the correction calculation is:

$$P_{STPD} = P_{BTPS} \cdot \frac{P_{abs}}{P_{abs} - P_{H2O}}$$

Where p = partial pressure, P_{abs} = absolute pressure, and P_{H2O} = 42 mmHg @35°C and 100 % RH.

M3016A Mainstream CO_2 Performance Specifications		
CO_2	Range	–4 to 150 mmHg (-0.5 to 20.0 kPa)
	Accuracy	after 20 minutes warmup and calibration: For values between 0 and 40 mmHg: ±2.2 mmHg (±0.29 kPa) For values between 40 and 76 mmHg: ±5.5 % of reading The specifications are valid for 45 % O_2 and N_2 or N_2O balance. Outside these conditions the accuracy reaches at a minimum the requirements of EN864/ISO9918.
	Resolution	Numeric: 1.0 mmHg (0.1 kPa) Wave: 0.1 mmHg (0.01 kPa)
	Stability	±1.0 mmHg over a 7 day period
awRR	Range	0 to 150 rpm
	Accuracy	±2 rpm
Warm-up Time		20 minutes with CO_2 transducer attached for full accuracy specification
Response Time		Less than 125 ms (for step from 10 % to 90 %)

Mainstream CO_2 Humidity Correction Factor

Either BTPS or STPD can be selected as the humidity correction factor for the Mainstream CO_2 readings. The formula for the correction calculation is:

$$P_{STPD} = P_{BTPS} \cdot \frac{P_{abs}}{P_{abs} - P_{H2O}}$$

Where p = partial pressure, P_{abs} = absolute pressure, and P_{H2O} = 47 mmHg @37°C and 100 % RH.

CO_2 Alarm Specifications	Range	Adjust-ment	Delay
etCO2 High	20 to 95 mmHg (2 to 13 kPa)	1 mmHg (0.1 kPa)	M3014A/ M3016A: less than 14 seconds M3015A: less than18 seconds.
etCO2 Low	10 to 90 mmHg (1 to 12 kPa)		
imCO2 High	2 to 20 mmHg (0.3 to 3.0 kPa)	steps of 1 mmHg (0.1 kPa)	M3014A/ M3016A: less than 14 seconds M3015A: less than18 seconds.
awRR High	Adult/pedi: 10 to 100 rpm Neo: 30 to 150 rpm	under 20 rpm: 1 rpm steps over 20 rpm:5 rpm steps	M3014A/ M3016A: less than 14 seconds M3015A: less than18 seconds.
awRR Low	Adult/pedi: 0 to 95 rpm Neo: 0 to 145 rpm		M3015A: settings <20 rpm: less than 8 seconds >20 rpm: less than 18 seconds M3014A/ M3016A settings <20 rpm: less than 4 seconds >20 rpm: less than 14 seconds
Apnea delay	10 to 40 seconds	5 second steps	set apnea delay time + 4 seconds (M3014A/ M3016A) or 8 seconds (M3015A)

Ordering Information

Ordering information for the M81052A patient monitor is given here.

Parameters	M8102A
Order one Bxx option	
ECG, Resp, NBP, SpO_2	B20
ECG, Resp, NBP, SpO_2, Press/Temp	B22
ECG, Resp, NBP, SpO_2, CO_2	B23

Application Options

Application Options	M8102A
Full Arrhythmia Capability	C01
12-Lead ECG Application (conventional)	C12
ST Map	C13
Full Networking	C15

Hardware Options

Hardware Add-Ons	M8102A
Anti-slip pad	E18
MMS Mount	E20
Add 1X Lithium-Ion battery	E24
Add 2X Lithium-Ion battery	E26
SN3 ECG Sync Cable	SN3

Interface Options

Interfaces	M8102A
Instrument Telemetry 1.4 GHz	J45
Instrument Telemetry 2.4 GHz	J47

Sensors and Disposables

Accessory	M8102A
3-lead Accessories Bundle ICU-AAMI Tyco low cost cable	G06
3-lead Accessories Bundle ICU-IEC Tyco low cost cable	G07
5-lead Accessories Bundle ICU-AAMI Tyco low cost cable	G08
5-lead Accessories Bundle ICU-IEC Tyco low cost cable	G09
5-lead Accessories Bundle ICU-AAMI	H06
5-lead Accessories Bundle ICU-IEC	H07
5-lead Accessories Bundle OR-AAMI	H08
5-lead Accessories Bundle OR-IEC	H09
Accessories Bundle Neonatal-AAMI	H14
Accessories Bundle Neonatal-IEC	H15
3-lead Accessories Bundle ICU-AAMI	H16
3-lead Accessories Bundle ICU-IEC	H17
3-lead Accessories Bundle OR-AAMI	H18
3-lead Accessories Bundle OR-IEC	H19
CO_2 Mainstream Sensor	N01
Reusable Adult Airway Adapter ($msCO_2$)	N02
Reusable Infant Airway Adapter ($msCO_2$)	N03
Single Use Adult Airway Adapter ($msCO_2$)	N04
Single USe Infant Airway Adapter ($msCO_2$)	N05
CO_2 Sidestream Sensor	N11
Non-intubated Adult Airway Adapter ($ssCO_2$)	N12
Non-intubated pediatric Airway Adapter ($ssCO_2$)	N13
Intubated Adult Airway Adapter ($ssCO_2$)	N14
Intubated Pediatric Airway Adapter ($ssCO_2$)	N15

Related Products

M3086A Support Tool

Mounting Information

The Intellivue MP5 Roll Stand Mounting Kit (Order No. 989803002531) is compatible with the table top mount and the standard mounting plate. For information on other mounting hardware, contact your local Philips sales representative. For GCX mounting hardware information, see www.gcx.com/philips.

Documentation

All documentation is available in .pdf format on documentation CD-ROM. Additionally, a printed copy of the Instructions for Use and Quick Guide ships with each monitor.

- Instructions for Use (printed)
- Quick Guide (printed)
- Installation and Service Guide
- Configuration Guide
- Documentation CD-ROM
- Training Guide (printed)
- Computer Based Training (optional)

ECG Accessories

This symbol indicates that the cables and accessories are designed to have special protection against electric shocks (particularly regarding allowable leakage currents), and are defibrillator proof.

Trunk Cables

	3-Electrode Cable Set	5-Electrode Cable Set	6-Electrode Cable Set	10-Electrode Cable set (5+5)	10-Electrode Cable set (6+4)
Part No.	M1669A	M1668A	M1667A	M1663A	M1665A
Length	2.7m	2.7m	2.7m	2.0m	2.7m

3-Electrode Cable Sets

Description	Length	AAMI Part No.	IEC Part No.
OR Grabber shielded	1.0m	M1675A	M1678A
ICU Grabber shielded	1.0m	M1671A	M1672A
ICU snap shielded	1.0m	M1673A	M1674A
ICU Clip non-shielded	0.45m	M1622A	--
ICU Clip non-shielded	0.7m	M1624A	M1626A

5-Electrode Cable Sets

Description	Length	AAMI Part No.	IEC Part No.
OR Grabber shielded	1.0m/1.6m	M1973A	M1974A
ICU Grabber shielded	1.0m/1.6m	M1968A	M1971A
ICU Snap shielded	1.0m/1.6m	M1644A	M1645A
ICU Miniclip non-shielded	0.7m/1.3m	M1647A	M1648A

6-Electrode Cable Sets

Description	Length	AAMI Part No.	IEC Part No.
OR Grabber	1.0m/1.6m	M1684A	M1685A
ICU Grabber	1.0m/1.6m	M1680A	M1681A
ICU Snap	1.0m/1.6m	M1682A	M1683A

10-Electrode (5+5)Cable Sets

Description	Length	AAMI Part No.	IEC Part No.
ICU Grabber, chest, shielded	1.0m	M1976A	M1978A
ICU Snap, chest, shielded	1.0m	M1602A	M1604A
OR Grabber, chest, shielded	1.0m	M1979A	M1984A
For Limb Leads see 5-electrode cable sets			

10-Electrode (6+4)Cable Sets

Description	Length	AAMI Part No.	IEC Part No.
ICU Grabber, chest, shielded	1.0m	M1532A	M1533A
ICU Snap, chest, shielded	1.0m	M1537A	M1538A
OR Grabber, chest, shielded	1.0m	M1557A	M1558A
For Limb Leads see 6-electrode cable sets			

One-piece Cables

Description	Length	AAMI Part No.	IEC Part No.
3-lead Grabber, ICU	1.0m	989803143181	989803143171
5-lead Grabber, ICU	1.0m	989803143201	989803143191

Radio-translucent Cables

Pack of five single wires, radio-translucent, 0.9m, M1649A

Set Combiners and Organizers

Set combiners and organizers		Part No.
Set combiner	3-electrode	M1501A
	5-electrode	M1502A
Set organizer for shielded leadsets - grabber and snap	3-electrode	M1503A
	4-electrode	M1664A
	5-electrode	M1504A
	6-electrode	M1679A
Set organizer for non-shielded lead sets - miniclip	3-electrode	M1636A
	5-electrode	M1638A
Bedsheet clip		M1509A
Replacement red cover for trunk cable (for 5-electrode cable sets)		989808148861

Philips FAST SpO_2 Accessories

Philips Reusable Sensors

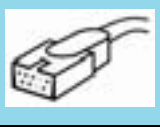
Part Number	Description	Connector Type
M1191A/B	Adult Sensor (2m cable)	Philips 8-pin 
M1191AL/ BL	Adult Sensor (3m cable)	
M1191ANL	Adult Sensor (3m cable) Nellcor OxiMax-compatible[a]	
M1191T	Adult Sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 
M1192A	Small Adult/Pediatric sensor (1.5m cable)	Philips 8-pin 
M1192AN	Small Adult/Pediatric sensor (1.5m cable) Nellcor OxiMax-compatible[a]	
M1192T	Small Adult Pediatric sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 
M1193A	Neonatal Hand/Foot Sensor (1.5m cable)	Philips 8-pin 
M1193AN	Neonatal Hand/Foot Sensor (1.5m cable) Nellcor OxiMax-compatible[a]	
M1193T	Neonatal Sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 

Part Number	Description	Connector Type
M1194A	Adult/Pediatric Clip Sensor (ear) (1.5m cable)	Philips 8-pin 
M1194AN	Adult/Pediatric Clip Sensor (ear) (1.5m cable) Nellcor OxiMax-compatible[a]	
M1195A	Infant Sensor (1.5m cable)	Philips 8-pin 
M1195AN	Infant Sensor (1.5m cable) Nellcor OxiMax-compatible[a]	
M1196A	Adult Clip Sensor (3m cable)	Philips 8-pin 
M1196T	Adult Clip Sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 

a. only in combination with Philips FAST-SpO_2 and Philips OxiMax-compatible patient monitors.

Philips Disposable Sensors

Part Number	Description	Connector Type
M1131A	Adult/Pediatric Sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 
M1132A	Infant Sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 

Part Number	Description	Connector Type
M1133A	Adult/Infant/ Neonatal Sensor (requires M1943A (1.1m) or M1943AL (3m) adapter cable)	Generic D-Sub 

NELLCOR® Disposable Sensors[1]:

Purchase Nellcor OxiCliq sensors and adapter cables directly from Tyco Healthcare.

Product Number	Description	Philips Part Number
OxiMax MAX-A [a]	Adult Sensor	**M1904B**[b]
OxiMax MAX-AL [a]	Adult Sensor (long cable)	n/a
OxiMax MAX-P [a]	Pediatric Sensor	**M1903B**[b]
OxiMax MAX-I [a]	Infant Sensor	**M1902B**[b]
OxiMax MAX-N [a]	Neonatal Sensor	**M1901B**[b]
Oxisensor II D-25 [a]	Adult Sensor	n/a
Oxisensor II D-20 [a]	Pediatric Sensor	n/a
Oxisensor II I-20 [a]	Infant Sensor	n/a
Oxisensor II N-25 [a]	Neonatal Sensor	n/a
OxiCliq A [c]	Adult Sensor	n/a
Oxicliq P [c]	Pediatric Sensor	n/a
OxiCliq I [c]	Infant Sensor	n/a
OxiCliq N [c]	Neonatal Sensor	n/a

a. Requires M1943 A(L) adapter cable

b. not available from Philips in the U.S.A.

c. Requires M1943 A(L) **and** OC3 adapter cables

MASIMO LNOP®[2] Reusable Sensors:

Product Number	Description	Philips Part Number
LNOP DC-I	Adult Sensor	**989803140321**
LNOP DC-IP	Pediatric Sensor	**989803140331**
LNOP-YI	Reusable Multi-Site Sensor	n/a
LNOP TC-I	Tip Clip reusable Sensor	**989803140341**

MASIMO LNCS®[1] Reusable Sensors:

Product Number	Description	Philips Part Number
LNCS DC-I	Adult Sensor	**989803148281**
LNCS DC-IP	Pediatric Sensor	**989803148291**
LNCS-TC-I	Reusable Ear Sensor	**989803148301**
LNCS TF-I	Reusable Forehead Sensor	**989803148311**

1. Nellcor, OxiMax and OxiCliq are trademarks of Nellcor Puritan Bennett Inc., a part of Tyco Healthcare.

2. LNOP and LNCS are federally registered trademarks of Masimo Corporation

MASIMO LNOP® Disposable Adhesive Sensors:

Product Number	Description	Philips Part Number
LNOP Adt	Adult Sensor	**989803140231**
LNOP Adtx	Adult Sensor	n/a
LNOP Pdt	Pediatric Adhesive Sensor	**989803140261**
LNOP Pdtx	Pediatric Sensor	n/a
LNOP INF-L	Neo/Infant Adhesive Sensor	**989803140311**
LNOP NEO-L	Neo Adhesive Sensor	**989803140291**
LNOP NEOPT-L	Neo Pre-Term Sensitive Skin Adhesive Sensors	**989803140301**

MASIMO LNCS® Disposable Adhesive Sensors:

Product Number	Description	Philips Part Number
LNCS Adtx	Adult Finger Sensor	**989803148231**
LNCS Pdtx	Pediatric Finger Sensor	**989803148241**
LNCS INF-L	Infant Toe Sensor	**989803148251**
LNCS NEO-L	Neo Foot Sensor or Adult Finger Sensor	**989803148271**
LNCS NEOPT-L	Neo Pre-Term Sensitive Skin Adhesive Sensors	**989803148261**

The Philips M8102A uses Masimo certified pulse oximetry for reduced noise and low perfusion performance with Masimo Sensors under the Masimo NR&LP protocol available from Masimo.

Extension/Adapter Cables:

Part Number	Description
M1941A	Extension Cable (2m) (8-pin to 8-pin)
M1943A	Adapter Cable (1.1m) for Philips and Nellcor disposable sensors (8-pin to 9-pin D-Sub)
M1943AL	Adapter Cable (3m) for Philips and Nellcor disposable sensors (8-pin to 9-pin D-Sub)
OC3	Adapter cable for OxiCliq Sensors (available from Nellcor only)
LNOP MP12 (451261000761)	LNOP MP Series Patient Cable (3.6 m) Adapter Cable for Masimo LNOP Sensors
LNC MP10 (989803148221)	LNCS MP Series Patient CAble (3.0 m) Adapter Cable for Masimo LNCS Sensors

Non Invasive Blood Pressure Accessories

These cuffs and tubings are designed to have special protection against electric shocks (particularly regarding allowable leakage currents), and are defibrillator proof.

Multi-Patient Comfort Cuffs and Disposable Cuffs		
Patient Category	**Disposable cuff**	**Reusable cuff**
Adult (Thigh)	M1879A	M1576A
Large Adult	M1878A	M1575A
Adult	M1877A	M1574A
Small Adult	M1876A	M1573A
Pediatric	M1875A	M1572A
Infant	M1874A	M1571A
Tubing: Use M1598B or M1599B		

Reusable Cuff Kits	Part No.
Infant, pediatric, small adult, adult	M1577A

Reusable Cuff Kits	Part No.
Small adult, adult, large adult, thigh	M1578A
Infant, pediatric, small adult, adult, large adult, thigh	M1579A

Adult/Pediatric Antimicrobial Coated Reusable cuffs			
Cuff Size (color)	**Circumference (cm)**	**Bladder Width**	**Single-Hose Part No.**
Infant (orange)	9.0 - 14.8	5.4 cm 2.1 inches	M4552A
Pediatric (green)	13.8 - 21.5	8.0 cm 3.1 inches	M4553A
Small Adult (royal blue)	20.5 - 28.5	10.6 cm 4.2 inches	M4554A
Adult (navy blue)	27.5 - 36.5	13.5 cm 5.3 inches	M4555A
Adult X-long (navy blue)	27.5 - 36.5	13.5 cm 5.3 inches	M4556A
Large Adult (burgundy)	35.5 - 46.0	17.0 cm 6.7 inches	M4557A
Large Adult X-long (burgundy)	35.5 - 46.0	17.0 cm 6.7 inches	M4558A
Thigh (grey)	45 - 56.5	21.0 cm 8.3 inches	M4559A
Tubing: Use M1598B or M1599B			

Adult/Pediatric Soft Single Patient Single-Hose Disposable Cuffs			
Patient Category	**Limb Circumference**	**Bladder Width**	**Disposable cuff Part No.**
Adult (Thigh)	45.0-56.5 cm	20.4 cm	M4579A

Adult/Pediatric Soft Single Patient Single-Hose Disposable Cuffs			
Patient Category	**Limb Circumference**	**Bladder Width**	**Disposable cuff Part No.**
Large Adult X-long	35.5-46.0 cm	16.4 cm	M4578A
Large Adult	35.5-46.0 cm	16.4 cm	M4577A
Adult X-long	27.5 to 36.5 cm	16.4 cm	M4576A
Adult	27.5-36.5 cm	13.1 cm	M4575A
Small Adult	20.5-28.5 cm	10.4 cm	M4574A
Pediatric	15.0-21.5 cm	8.0 cm	M4573A
Infant	9.0-15.0 cm	5.6 cm	M4572A
Tubing: Use M1598B or M1599B			

Neonatal/Infant Cuffs (Disposable, non-sterile)			
Cuffs	**Limb Circumference**	**Bladder Width**	**Part No.**
Size 1	3.1 to 5.7 cm	2.2 cm	M1866A
Size 2	4.3 to 8.0 cm	2.8 cm	M1868A
Size 3	5.8 to 10.9 cm	3.9 cm	M1870A
Size 4	7.1 to 13.1 cm	4.7 cm	M1872A
Tubing: Use M1596B or M1597B			

Cuff Tubing		
Adult	1.5 m /4.9’	M1598B
	3.0 m/9.8’	M1599B
Neonatal	1.5 m /4.9’	M1596B
	3.0 m/9.8’	M1597B

Temperature Accessories

Temperature Probes	Part No.
Reusable	
General purpose probe	21075A
Small flexible vinyl probe (Infant/Pediatric)	21076A
Attachable surface probe	21078A
Disposable	
General purpose probe	M1837A
Skin probe	21091A
Esophageal/Stethoscope Probe (12 French)	21093A
Esophageal/Stethoscope Probe (18 French)	21094A
Esophageal/Stethoscope Probe (24 French)	21095A
Foley Catheter Probe (12 French)	M2255A
Foley Catheter Probe (16 French)	21096A
Foley Catheter Probe (18 French)	21097A
Adapter cable 1.5m/4.9’	21082B
Adapter cable 3.0m/9.8’	21082A

PRESS Accessories


These transducers and accessories are designed to have special protection against electric shocks (particularly regarding allowable leakage currents), and are defibrillator proof.

Pressure Transducers and Accessories	Part No.
Reusable	
Reusable pressure transducer 5 µV/V/mmHg sensitivity	CPJ840J6
Sterile disposable pressure domes for CPJ840J6 (pack of 50)	CPJ84022
Transducer holder for CPJ840J6 (pack of 4)	CPJ84046
IV pole mount for CPJ840J6	CPJ84447
Disposable (EU/EFTA only. Not available in USA)	
Single channel disposable sensor kit (20)	M1567A
Dual channel disposable sensor kit (20)	M1568A
Transducer holder for M1567/8A	M2271A
IV pole mount for M1567/8A	M2272C
Adapter cable for disposable sensor kit, 3.0m, for M1567/8A	M1634A

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