



# IntelliVue MP80/MP90 Patient Monitor

## Philips M8008A, M8010A **Technical Data Sheet**

The Philips IntelliVue MP80 and MP90 patient monitors offer a flexible and modular monitoring solution, designed to suit a broad spectrum of needs. The two models can be connected to the Philips Multi-Measurement Module (MMS) family with its extensions, plug-in measurement modules and the IntelliVue anesthetic gas modules to extend their functionality with plug-and-play convenience. For each model, dedicated configurations are available for the anesthesia, critical and cardiac, and neonatal care environments.

### Features

- Intuitive user interface.
- Simple menu hierarchy gives fast access to all basic monitoring tasks.
- Screen layouts are easily adjustable, allowing flexible display of measurement information.
- Previous/Next Screen function provides access to the ten most recently used screens including the last three modified screens.
- 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 or mmHg.
- Patient data management with tabular and graphic trends, and high resolution trends to track changes with beat-to-beat resolution.
- Drug, ventilation, hemodynamic, and oxygenation calculations.
- User or case-specific profiles enable rapid case turnover.
- Patented automatic alarm limits help clinicians provide care more efficiently.

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- Event Surveillance including Neonatal Event Review for automatic detection of patient status deterioration.
- Bed-to-bed overview provides clinicians with an overview of all the patient beds in their care.
- Choice of input devices: touchscreen, SpeedPoint, trackball, mouse, keyboard or barcode reader.
- 15-inch or 17-inch color TFT display with wide viewing angle, large numerics, permanently visible alarm limits, and up to 12 real-time waves.
- D80 Intelligent Display can be used as third display to an MP90, which can be configured individually and operated independently.
- Capable of functioning in a wireless infrastructure.
- Graphical measurement window shows which measurements are being measured by which device, making it easier to resolve measurement label conflicts.
- Timers application allows you to set timers to notify you when a specific time period has expired.

## Intended Use

The IntelliVue MP80 and MP90 are intended to be used for monitoring, recording, and alarming of multiple physiological parameters of adults, pediatrics, and neonates in hospital environments by trained health care professionals.

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

## Modularity

The monitor is available in a choice of models - MP80 and MP90 - to suit different needs throughout the care environment. All the models offer the same comprehensive range of measurements.

The monitors' functionality can be extended by connecting Philips plug-in modules, the multi-measurement module (MMS) family with extensions, and anesthetic gas modules with plug-and-play convenience.

The monitors are available as standalone or networked solutions.

The monitors' modular design allows new capabilities to be added in the future as monitoring requirements change. This upgradability gives the security of knowing that the monitors can be enhanced and updated as practices and technologies advance, protecting long-term investments.

## Main Components

### Display

The monitors have color LCD TFT displays with a wide viewing angle, providing high resolution waveform and data presentation.

The standalone M8031B 15-inch and the M8033C 17-inch color LCD TFT displays with touchscreen operation can be ordered for the MP80, MP90 and D80 Intelligent Display. Other medical quality XGA and SXGA standalone off-the-shelf displays can also be used. The MP90 can operate with two freely configurable displays. In combination with a D80 Intelligent Display, the MP90 can operate with three freely configurable displays. The additional displays can be operated using standard input devices. With the MP80 and MP90, the central processing unit is located in a separate module.

### User Interface

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

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 MP80 displays up to eight waves simultaneously. The MP90 can display up to 12 waves of any kind simultaneously. For 12-lead ECG monitoring they can all display 12 real-time ECG waves, with a rhythm strip and all ST values.

The Basic Help provides on-screen operating help, explaining INOP and alarm messages.

### Touchscreen Operation

- The touchscreen is the primary method of operation for the MP80 and MP90 monitors. The touchscreen displays have resistive touch surfaces.

### Input Devices

Supported input devices include the SpeedPoint (remote) and PS/2 compatible off-the-shelf computer accessories such as mouse, keyboard, trackball or barcode reader. All input devices can be used singly or in combination.





## SpeedPoint



The remote SpeedPoint combines joystick with dial control and enables full two-dimensional navigation across the monitor screen. A tactile resistance at every step gives the user control over cursor movement.

The SpeedPoint hardkeys are backlit, enabling it to be used in dark environments.

The SpeedPoint has four hardkeys:

	<b>Audio key</b> to acknowledge all active alarms or switch alarm indicators on or off
	<b>Alarms key</b> to pause alarm indicators or switch alarm indicators on or off
	<b>Back key</b> to take the user back from a sub.menu to a main menu
	<b>Main Screen key</b> to take the user from any window to the main screen

The remote SpeedPoint can be mounted away from the monitor, for example at the bedside. The remote SpeedPoint has an additional five function keys with configurable functions and an On/Standby key to remotely switch the monitor on or put it into standby. It also has two PS/2 connections.

## Mouse

Any specified PS/2 mouse or trackball may be used for data entry.

## Computer Keyboard

A computer keyboard can be connected to the monitor via a PS/2 connection and used for data entry.

## Simulated Keyboard

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

## Barcode Reader

A keyboard wedge (PS/2) barcode reader can be connected to any IntelliVue monitor via a PS/2 connection.

## Remote Alarm Device



The Remote Alarm Device can be connected to an external device interface connection on any of the monitors and mounted in a conspicuous position to improve the visibility of alarm signals generated by the monitor.

The device has three optical alarm indicators and an integrated speaker to transmit audible alarm signals and an On/Standby key to remotely switch the monitor on or put it into standby.

The Remote Alarm Device is standard with the MP80 and MP90.

## Multi-Measurement Module



The M3001A Multi-Measurement Module (MMS) can be connected without cables onto the side of the Flexible Module Rack (FMS) with all monitor models. The MMS can also be connected to the FMS with cables in order to place it in patient vicinity. It sends measurement waves and numerics to the monitor screen and generates alarms and

INOPs. Patient demographic details are stored in the MMS. Eight hours of patient trends can be transferred to the monitor.

The MMS provides measurement data for Electrocardiogram (ECG)/ Arrhythmia, Respiration, Oxygen Saturation of Arterial Blood (SpO<sub>2</sub>), Non-Invasive Blood Pressure (NBP), and Invasive Pressure or Temperature. It features 12-lead ECG capability, multi-lead arrhythmia, and 12-lead ST analysis.

An MMS Extension can optionally be slotted onto the Multi-Measurement Module to add:

- an additional Invasive Pressure *and* Temperature Measurement, a third Invasive Pressure or Temperature Measurement (one at a time) and optionally a Cardiac Output/Continuous Cardiac Output measurement (M3012A), **OR**
- an additional Invasive Pressure Measurement, a third Invasive Pressure or Temperature Measurement (one at a time), an integrated mainstream or sidestream CO<sub>2</sub> measurement and optionally a Cardiac Output/Continuous Cardiac Output measurement (M3014A), **OR**
- an additional Invasive Pressure or Temperature measurement (one at a time) and a Microstream® CO<sub>2</sub><sup>1</sup> measurement (M3015A).

## X2 Multi-Measurement Module

The M3002A X2 Multi-Measurement Module can be connected without cables onto the side of the Flexible Module Rack (FMS) with all monitor models. The X2 can also be connected to the FMS with cables in order to place it in patient vicinity. It sends measurement waves and numerics to the monitor screen and generates alarms and INOPs. Up to 24 hours of patient trends are stored in the X2, as well as patient demographic details. Eight hours of patient trends can be transferred to the host monitor.



IntelliVue X2 Multi-Measurement Module

The X2 provides measurement data for Electrocardiogram (ECG)/ Arrhythmia, Respiration, Oxygen Saturation of Arterial Blood (SpO<sub>2</sub>), CO<sub>2</sub>, Non-Invasive Blood Pressure (NBP), and Invasive Pressure or

Temperature. It features 12-lead ECG capability, multi-lead arrhythmia, and 12-lead ST analysis.

The X2 can also be used as a stand-alone monitor.

## Flexible Module Rack with Plug-In Modules

The Flexible Module Rack has eight slots for plug-in measurement modules.



Individual plug-in measurement modules are available to measure:

- M1006B Invasive Blood Pressure
- M1012A Cardiac Output/Continuous Cardiac Output
- M1014A Spirometry
- M1018A Transcutaneous Gas
- M1020B SpO<sub>2</sub>
- M1021A Mixed Venous Oxygen Saturation (SvO<sub>2</sub>)
- M1027A Electroencephalograph (EEG)
- M1029A Temperature
- M1034A Bispectral Index (BIS™)<sup>2</sup>

Additional plug-in modules available are:

- M1116B Thermal Array Recorder
- M1032A VueLink Device Interface.

## IntelliVue Anesthetic Gas Modules

Versatile IntelliVue G1 and G5 gas modules measure the five most commonly used anesthetic gases, as well as N<sub>2</sub>O and CO<sub>2</sub>. They all provide inspiration and expiration values for display on Philips IntelliVue patient monitors and the values required for MAC calculation in the IntelliVue patient monitors. The IntelliVue G1 gas module measures the single agent chosen by the clinician. The IntelliVue G5 features automatic agent identification and mixed-agent measurement capability. Advanced O<sub>2</sub> technology based on paramagnetic measurements is optional with the G1 and included standard with the G5.

Additionally, the AGM (Anesthetic Gas Module) offers auto-ID and single agent measurement capabilities.

1. Microstream is a registered trademark of Oridion Systems Ltd.

2. Bispectral Index and BIS are registered trademarks of Aspect Medical Systems, Inc.

## Mounting

The mounting options available enable flexible, space saving placement of the monitors for an ergonomic work space.

# Applications for Specific Care Settings

## Anesthesia Features

- The **IntelliVue G1** and **G5** and the **Anesthetic Gas Module (AGM)** measure the five most commonly used anesthetic gases, as well as N<sub>2</sub>O and CO<sub>2</sub>.
- The **BIS** module assesses the level of consciousness in the OR, providing a measure of the effect of anesthetic agents.
- **VueLink** provides an external device interfacing capability to Anesthesia Machines and other external instruments which have a serial RS-232 and/or analog output. It generates alarms and provides up to two waves and six numerics, depending on the device.
- The **EEG** module determines coma prognosis and extent of cerebral insult. CSA information can be either permanently displayed on specially designed screens or viewed in a separate window.
- **Screens** provide flexible viewing of patient information during different procedures or phases of an anesthesia case.
- **Respiratory Loops**  
The IntelliVue Patient monitor can generate three types of respiratory Loops and can display one real-time loop and up to 6 stored loops simultaneously. This assists in early detection of patient airway problems (e.g. atelectasis, bronchospasm) and ventilator problems (e.g. leaks and kinked tubes).
- The **Spirometry Module** provides airway pressure, volume and flow measurements to monitor changes in respiratory status.

## 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. ST points can be set either relative to the J-point or directly by selecting a numeric value.
- **QT/QTc interval monitoring** provides the measured QT interval, the calculated heart-rate corrected QTc value and a  $\Delta$ QTc value, which tracks variation in the QT interval in relation to a baseline

value.

- **ST Map** application shows ST changes over time in two multi-axis spider diagrams.
- **12-lead ECG** data can be measured, using either the EASI placement method with five standard electrodes or conventional electrode placement with 10 electrodes.<sup>1</sup> 12 realtime ECG waveforms can be displayed simultaneously on all IntelliVue models.
- High performance pulse oximetry technologies perform accurately even in cases with low perfusion.
- Choice of Microstream, sidestream and mainstream **CO<sub>2</sub> monitoring** for high quality measurements with intubated and non-intubated patients.
- **Continuous cardiac output** and advanced hemodynamic assessment are provided using the PiCCO™ method without a pulmonary catheter.<sup>2</sup>
- **Clinical calculations** enable stored and manually entered data to be used to perform hemodynamic, ventilation and oxygenation calculations. Calculated data is displayed in both indexed and non-indexed format.
- **BIS** monitoring provides sedation assessment in critical and cardiac care environments.
- **Spirometry** measurements help to manage ventilator settings and weaning.

## Neonatal Monitoring Features

- Transcutaneous gas (**TcGas**) monitoring helps to optimize respiratory therapy in neonates.
- The Oxygen CardioRespiroGram (**oxyCRG**) screens provide a simultaneous presentation of up to three High-Resolution Trends:
  - beat-to-beat heart rate (btbHR)
  - an oxygenation measurement trend (SpO<sub>2</sub> or tcpO<sub>2</sub>)
  - compressed respiration rate.This customized display gives clinicians a convenient overview of the neonatal patient's most important vital signs, helping them to identify significant events.  
  
Continuous oxyCRG recordings can be made at the bedside on the M1116B Recorder.
- Dual SpO<sub>2</sub> measurement provides clinical support through comparison and trending of the pulse oximetry values from two distinct patient sites.

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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.

2. PiCCO™ is a trademark of Pulsion Medical Systems AG.

# IntelliVue Applications

## Clinical Decision Support

Clinicians are continuously drawing mental images from their observations of patients' vital signs. The IntelliVue's clinical decision support applications offer this dynamic "minds eye view" directly on the monitoring screen display.

## ProtocolWatch

ProtocolWatch allows clinicians to run clinical protocols that can monitor developments in the patient's condition. The SSC Sepsis Protocol runs on the ProtocolWatch application and is used in screening for severe sepsis and monitoring its treatment.

## ST Map

ST Map provides a graphical display that can help clinicians to recognize ST changes and their location in the heart more easily. ST Map collects ST values created from the frontal (limb leads) and horizontal (chest leads) plane into an integrated display. The maps are multi-axis portraits of the patient's ST segments as measured with the ST/AR arrhythmia algorithm.

## Advanced Event Surveillance

Events are electronic records of episodes in the patient's condition. They can be used to drive alert notification to assist compliance to any protocol that is being used by the clinician.

## Horizon display

Horizon trends provide clinicians with a graphical visualization tool that allows the end user to detect at a glance the patients' current clinical status. By combining parameters together on the display, the clinician is assisted in their cognitive process of pattern recognition.

## Loops

Up to six loops of each type can be stored and compared to detect respiratory changes more easily.

## Screen display flexibility

Up to 20 different screens can be created per monitor, which means that the clinician has the ability to have a screen created to match a specific clinical scenario and that on the data that matters is displayed.

This streamlines the information that needs to be processed and interpreted to make the right decision at the right time.

## Trends

- A choice of four **standard** trend database configurations is provided, designed to suit specific application areas. Patient data from up to 16 measurement numerics can be sampled every 12 seconds, one minute, or five minutes, and stored for a period ranging from four to 48 hours.
  - With the **extended** trends database, the number of measurement numerics trended or the period can be increased.
  - **Tabular Trends** (Vital Signs) show data for up to 32 measurement numerics in tabular form. Tabular Trends can either be viewed in a separate window or permanently displayed on specially designed screens.
  - With **Graphic Trends**, up to three rows of measurement trends can be displayed in graphic form, each combining up to three measurement. Graphical Trends can either be viewed in a separate window or permanently displayed on specially designed screens.
  - **Screen Trends** permanently display trend data for periodic and aperiodic parameters in graphical format on special screens. The displayed time period can be set to 30 min, 1 h, 2 h or 4 h.
  - **High Resolution Trends** allow the user to track fast-changing measurement trends with beat-to-beat resolution (four samples/second). The number of High Resolution Trends available for display depends on the wave option purchased. (e.g. eight for wave option #A08).
  - **Horizon Trends** show the deviation from a stored baseline. Navigation arrows provide easy access to the stored trends. Trend data can be documented on a locally or remotely connected printer.
  - With **Event Surveillance**, changes in patients' condition are automatically detected and an electronic record of data called an Episode is stored. The Episode can store
    - 15 seconds of high-resolution wave trace,
    - four minutes of data sampled four times a second, or
    - 20 minutes of data sampled every 12 seconds.Event triggers can use the preset alarm limits or they can be user-defined. With user-defined triggers, event episodes are stored even when alarms are paused. A Manual Event SmartKey enables manual episode storage.
- Event Annotation allows immediate or retrospective annotation of events using a user-defined list of event markers such as "ventilated".

Events can be stored in a database for retrospective review, and episode data including graphic event reviews can be documented on a local or central printer. In addition, episode data without graphic

elements can be documented on the M1116B Recorder Module. Events are also marked on the Event Line of an Information Center.

The **standard Event Surveillance** package includes one Event Group plus the OxyCRG Group. Up to 50 event episodes can be stored over a 24 hour-period.

The **advanced Event Surveillance** package offers increased storage capability, enabling the monitor to store data from up to 100 events over a 48-hour period. Up to six user-defined Event Groups can be configured, each made up of up to four measurements. All six groups can be active at the same time. Advanced user-configurable trigger mechanisms allow the clinician to define event triggers combining information from up to four measurements. Either alarm limits or user-defined thresholds or deviations can be configured as event triggers. The user can set event notifications in order to be notified when an event is detected.

## Patient Data Documentation

• An extensive range of **Patient Reports** can be printed:

- Event Review and Episode Reports
- 12-lead ECG Reports
- Vital Signs
- Graphic Trends
- Cardiac Output Reports
- Wedge Procedure Reports
- Calculations Reports
- EEG Report
- Loops Report

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 locally or centrally- connected printers, and they can be initiated manually or automatically at user-defined intervals.

## Recordings

The M1116B plug-in recorder records numerics for all active measurements and up to three wave forms. It can be used for local recording either in the FMS or the integrated module slots.

## 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. 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
- the Remote Alarm Device signals the alarm visibly and audibly.

The alarm limit review page offers an overview of alarm limit settings and the possibility to modify these settings for all parameters.

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

The nurse call relay has active open and closed contacts and a user-definable delay time.

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.
- **Yellow Alarms\*** indicate arrhythmia alarms.
- **Technical Alarms (INOPS)** are triggered by signal quality problems, equipment malfunction or equipment disconnect.

The Audio off/Pause Alarms function (equivalent to Silence/Suspend with previous monitor generations) allows the user to switch off alarm tones with one touch or click while retaining visual alarm messages.

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

Alarm strip recordings are available on the M1116B Recorder Module or on a centrally-connected recorder.

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.

## Patient Transfers

- 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.
- Patients can be transferred by disconnecting the MMS from a monitor, and then reconnecting it at a new monitor. Patient

demographics are stored in the MMS, so they do not have to be re-entered at the new monitor.

## Profiles

Profiles are predefined configuration settings for Screens, measurement settings, and monitor properties. 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 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.

## Networking Capabilities

The monitor can operate as part of a networked system (wired & wireless) using the Philips IntelliVue Clinical Network interface.

## Other Bed Overview Capability

The alarm status of beds in the same Care Group on the hospital network can be permanently displayed on the screen of each monitor in the Care Group. The user can also view measurement data from all other monitors connected to the hospital network. Other Bed information can either be viewed in a separate window or permanently displayed on specially designed screens.

## Clinical Calculation Set

The clinical calculation set consists of: Hemodynamic, Oxygenation, and Ventilation calculations.

Hemodynamic Calculations:

- Cardiac Index (C.I.) and Continuous Cardiac Index (C.C.I.)
- Stroke Volume (SV)
- Stroke Index (SI)
- Systemic Vascular Resistance (SVR)
- Systemic Vascular Resistance Index (SVRI)
- Pulmonary Vascular Resistance (PVR)
- Pulmonary Vascular Resistance Index (PVRI)
- Pulmonary Vascular Permeability Index (PVPI)
- Pulse Pressure Variation (PPV)
- Left Cardiac Work (LCW)

- Left Cardiac Work Index (LCWI)
- Left Ventricular Stroke Work (LVSW)
- Left Ventricular Stroke Work Index (LVSWI)
- Right Cardiac Work (RCW)
- Right Cardiac Work Index (RCWI)
- Right Ventricular Stroke Work (RVSW)
- Right Ventricular Stroke Work Index (RVSWI)
- Extra Vascular Lung Water Index (EVLWI)
- Intrathoracic Blood Volume Index (ITBVI)
- Global End Diastolic Volume Index (GEDVI)
- Global Ejection Fraction (GEF)

Oxygenation Calculations:

- Arterial Oxygen Content ( $CaO_2$ )
- Venous Oxygen Content ( $CvO_2$ )
- Arteriovenous Oxygen Content ( $avDO_2$ )
- Oxygen Availability Index ( $O_2AVI$ )
- Oxygen Consumption ( $VO_2$ )
- Oxygen Consumption Index ( $VO_2I$ )
- Oxygen Extraction Ratio ( $O_2ER$ )
- Alveolar-Arterial Oxygen Difference ( $AaDO_2$ )
- Percent Arteriovenous Shunt ( $Qs/Qt$ )

Ventilation Calculations:

- Minute Volume (MINVOL)
- Compliance (COMP)
- Dead Space ( $V_d$ )
- Dead Space/Tidal Volume Ratio ( $V_d/TV$ )
- Alveolar Ventilation (ALVENT)

## Drug Calculator

The drug calculator allows you to calculate the fourth value when three of the following values are entered: dose, amount, volume, rate of infusion.

A titration table and drip table can be displayed and printed. Measurement units can be converted (e.g. lbs to kg).

The drug calculator can also be configured to include a list of commonly used drugs using the support tool.

## 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
  - document configuration 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:

- Multi-Measurement Module (MMS) family (M3001A, M3002A), and its extensions (M3012A, M3014A, M3015A, M3016A)
- Flexible Module Rack
- Anesthetic Gas Module
- Information Center (for example M3150B)
- Slave display (XGA)
- PC.

## Parallel Printer Interface

The Parallel Printer Output port can be used to connect any off-the-shelf printer that complies with the specifications.

## Network Interface

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

## Wireless Network

Option J20 enables the monitor to function within a wireless infrastructure. The infrastructure is based on an IEEE 802.11 a/b/g network in the 2.4 GHz or 5 GHz bands (ISM). Additional components are required to complete the system. Please refer to the M3185A IntelliVue Clinical Network Technical Data Sheet for further information.

## Flexible Nurse Call Relay

The Flexible Nurse Call Relay board provides a means for alarms generated on the monitor to be signalled on an external device such as a nurse call system, a beeper or a light. It provides three general alarm relays and one power fail alarm. The external device is connected to the alarm relay and alarms are triggered by criteria defined by the user. It has active open and closed contacts and a user-definable delay time.

## MIB-ready/RS-232 Interface

MIB, Medical Information Bus (IEEE P1073), is a standard for interfacing medical devices, allowing full integration of these devices. The monitors have an serial MIB/RS-232 interface board with two

fully-isolated MIB ports. Both ports can be independently configured to be used for:

- input for connection to a touchscreen
- numeric, wave and alarm data export using a computer interface, to an automated anesthesia record keeper or a personal computer (not available in all geographies)
- connection to an Anesthetic Gas Module.

## Input Device Interface (2 PS/2 Interfaces)

This interface is required to connect the integrated SpeedPoint to the monitor. The interface additionally provides two PS/2 ports to enable the monitor to be connected to other off-the-shelf input devices.

## Remote Device Interface

This interface is required to connect the Remote Alarm Device and one Remote SpeedPoint to the monitor.

# Monitor Specifications

See the individual Data Sheets for measurement module, MMS extension, and plug-in module specifications.

## Safety Specifications

The monitors, together with the Multi-Measurement Module (M3001A), the X2 Multi-Measurement Module (M3002A) and the Flexible Module Rack (M8048A), all modules and MMS extensions, comply with the Medical Device Directive 93/42/EEC (CE<sub>0366</sub>) and with IEC 60601-1-1:1988 + A1:1991 + A2:1995; EN60601-1-1:1990 + A1:1993 + A2:1995; UL 2601-1:1994; CAN/CSA C22.2#601.1-M90; IEC 60601-1-1:2000; EN 60601-1-1:2000; IEC 60601-1-2:2001; EN 60601-1-2:2001.

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/EN 14971 and IEC/EN60601-1-4.

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

## Physical Specifications

Product	Max Weight	W x H x D
M8008A IntelliVue MP80 M8010A IntelliVue MP90 M8016A D80 Intelligent Display including power cable, cable cover and feet	<10 kg <22.05 lb	342 x 108 x 505 mm (13.47 x 4.25 x 19.88 in)
M3001A Multi-Measurement Module (MMS)	<650 g <1.4 lb	188 x 96.5 x 51.5 mm (7.4 x 3.8 x 2 in)
M3002A IntelliVue X2	1.5 kg (3.3 lb)	< 188 x 99 x 86 mm (7.4 x 3.9 x 3.4 in)
M3012A Hemodynamic MMS Extension	<550 g	190 x 98 x 40 mm (7.5 x 4 x 1.6 in)
M3014A Capnography Extension	<4.50 g <0.99 lb	190 x 98 x 40 mm (7.5 x 4 x 1.6 in)
M3015A MMS Extension - Microstream CO <sub>2</sub>	<550 g <1.21 lb	188.0 x 96.5 x 38.5 mm (7.4 x 3.8 x 1.5 in)
M8048A Flexible Module Rack (FMS) (without plug-in modules)	<3500 g <7.7 lb	<315 mm x 130 mm x 120 mm (12.4 x 5.1 x 4.7 in)
M1013A IntelliVue G1 & M1019A IntelliVue G5	<4000 g <8.8 lb	300 x 85 x 232 mm, (11.81 x 3.35 x 9.13 in)
M1026B Anesthetic Gas Module (AGM)	<8.2 kg <18 lb	370 x 90 x 467 mm (14.6 x 3.5 x 18.4 in)
M8025A Remote Alarm Device	<300 g <0.7 lb	62 x 125 x 63 mm (2.4 x 5 x 2.5 in)
M8026A Remote SpeedPoint	<400 g <0.9 lb	103 x 139 x 63 mm (4 x 5.5 x 2.5 in)
M8031B XGA Touchscreen LCD Display weight with mounting bracket; useful screen: 304 mm x 228 mm (12 x 9 in); pixel size 0.297 mm x 0.297 mm	<4.9 kg <10.8 lb	408 x 333 x 85 mm (16 x 13.1 x 3.4 in)
M8033C SXGA Touchscreen LCD Display	<7 kg <15.4 lbs	410 x 362 x 103 mm (16.1 x 14.25 x 4.1 in.)

## Environmental Specifications

Item	Condition	Range
Temperature Range	Operating	0 to 35°C (32 to 95°F)
	Non-operating	-20 to 60°C (-4 to 140°F)
Humidity Range	Operating	20 % to 85 % Relative Humidity (RH) (non condensing)
	Non-operating	5 % to 85 % Relative Humidity (RH)
Altitude Range	Operating	0 m to 3000 m (10000 ft)
	Non-operating	0 m to 12000 m (40000 ft)

## Performance Specifications

Monitor Performance Specifications		
Power Specifications	Power consumption	<145 W
	Line Voltage	100 to 240 V ~
	Current	1.6 to 0.7 A
	Frequency	50/60 Hz
XGA Display	Resolution	1024 x 768
	Refresh rate	60 Hz
	Useful screen	304 x 228 mm
	Pixel size	0.297 x 0.297 mm
Sweep Speeds	6.25, 12.5, 25 and 50 mm/s with ±5 % accuracy (guaranteed only for integrated displays)	
Indicators	Alarms Off	red LED
	Alarms	red/yellow/cyan LED
	On/Standby	green LED
	AC Power	green LED
	Error	red LED

Monitor Performance Specifications	
Sounds	Audible feedback for user input. Prompt tone. Two different QRS tones, SpO <sub>2</sub> modulation tone. Four different alarm sounds
<p><b>Trends:</b>            12, 16, 24 or 32 numerics @ 12 sec, 1 minute, 5 minute resolution.            Multiple choices of number of numerics, resolution and duration depending on trend database option and application area.            Standard database configuration options:  <b>H10:</b> 16 parameters for 4h@12s, 24h@1min, 48h@5min  <b>H20:</b> 12 parameters for 9h@12s, 24h@1min, 24h@5min  <b>H30:</b> 16 parameters for 5h@12s, 24h@1min, 24h@5min  <b>H40:</b> 16 parameters for 4h@12s, 24h@1min, 48h@5min            The option CO3 extends the database by increasing the number of trended parameters or modifying the time period:  <b>H10:</b>            32 parameters for 4h@12s, 24h@1min, 48h@5min or            32 parameters for 2h@12s, 32h@1min, 48h@5min or            24 parameters for 48h@1min, 72h@5min  <b>H20:</b>            24 parameters for 9h@12s, 24h@1min, 24h@5min or            24 parameters for 12h@12s, 12h@1min, 12h@5min or            12 parameters for 24h@12s, 24h@1min, 24h@5min  <b>H30:</b>            32 parameters for 5h@12s, 24h@1min, 24h@5min or            32 parameters for 9h@12s, 9h@1min, 9h@5min or            24 parameters for 12h@12s, 12h@1min, 12h@5min  <b>H40:</b>            32 parameters for 4h@12s, 24h@1min, 48h@5min or            32 parameters for 2h@12s, 32h@1min, 48h@5min or            24 parameters for 48h@1min, 72h@5min</p>	
Events	information: trigger condition and time, event classification and associated detailed view of episode data
	episode data: configurable, includes all current numerics, alarms and inops, and either: 4 minutes of high resolution trend or 20 minutes of numerics trend @ 12 sec. resolution or 15 seconds of 4 waves @ 125 samples/sec. (Snapshot)
	capacity (max): 25 or 50 events for either 8 or 24 hours
Review Alarms Window	Information: all alarms / inops, main alarms on/off, alarms acknowledged and time of occurrence
	capacity

Monitor Performance Specifications	
Real Time Clock	Range: from: January 1, 1997, 00:00 to: December 31, 2080, 23:59
	Accuracy: <2 seconds per day (typically)
	Hold Time: infinite if powered by AC; otherwise at least 48 hours (typical: >72 hours)
Buffered Memory	Contents: Patient data, Active settings, trends, snapshots, events, review alarms
	Hold Time: infinite if powered by AC; otherwise at least 48 hours (typical: >72 hours)
Restart time: After power interruption, an ECG wave will be shown on the display after 30 seconds maximum.	

## Interface Specifications

Monitor Interface Specifications		
Network	Standard	IEEE 802.3 10-Base-T
	Connector	RJ45 (8 pin)
	Isolation	1.5 kV
Parallel Printer Port	Standard	IEEE 1284-I
	Connector	DB-25
	Isolation	1.5 kV
Dual PS/2 Inputs	Output Voltage	5 V $\pm$ 10 %
	Output Current	250 mA (comb. max) to connected PS/2 devices
Dual MIB/RS232	Standard	IEEE 1073-3.2-2000
	Connectors	RJ45 (8 pin)
	Mode	Software-controllable BCC (Rx/D/TxD cross over) or DCC (Rx/D/TxD straight through)
	Power	5 V $\pm$ 5 %, 100 mA (max.)
	Isolation	1.5 kV
ECG Output/Marker Input (1/4" stereo phone jack with tip, ring, sleeve)		
General	Connector	1/4" phone each with tip, ring, sleeve
	Isolation	500 V
ECG Output (ring, tip)	Signal Gain	320 to 3200
	Full Scale on Display	3.2 V <sub>pp</sub>
	Gain Error	<20 %
	Baseline Offset	<150 mV
	Bandwidth	1 to 80Hz
	Output Impedance	ECG Output (ring): <2.2 K $\Omega$ $\pm$ 20 % ECG Output/Marker Input (tip) <2.5 k $\Omega$ $\pm$ 20 %
Signal delay	$\leq$ 30 ms	

Monitor Interface Specifications		
Marker Input Requirements (tip)	Signal Type	0 to -12 V, negative edge pulse
	Pulse Source Impedance	<7 k $\Omega$
	Pulse Fall Time	<100 $\mu$ s
	Pulse Duration	>4 ms
Video Interface	SXGA, XGA	
	Refresh frequency	60 Hz
	Horizontal Frequency	48.4 kHz or 64.0 kHz (M8008A, M8010A, M8016A only)
	Resolution	1280 pixel x 1024 pixel (M8008A, M8010A, M8016A only), 1024 pixel x 768 pixel
	Video Signals	0.7 V <sub>pp</sub> @ 75 Ohm, HSYNC/ VSYNC Signals TTL
	DDC	Signals I2C compliant, 5 V, 100 mA (max) (M8008A, M8010A, M8016A only)
	Connector	15 pin D-SUB
Digital Video	Video Signals	Single Link TMDS
	DDC Signals	I2C compliant
	DDC Power	5 V, 100 mA (max)
	Connector	DVI
Flexible Nurse Call Relay	Connector	20 pin MDR (Mini D-Ribbon), active open and closed contacts 3.5 mm phone jack, active closed contact only
	Contact	$\leq$ 100 mA, $\leq$ 24 V DC
	Isolation	1.5 kV
	Delay	<(Configured Latency +0.5 sec)

Monitor Interface Specifications		
Basic Nurse Call Relay	Connector	3.5 mm phone jack, Active closed contact only
	Contact	<=100 mA, <=24 V DC
	Isolation	1.5 kV
802.11 Bedside Adapter	Wireless Technology	IEEE 802.11 a/b/g
	Frequency Band	2.4 GHz and 5 GHz ISM

Compatible Devices		
Printers		<b>native</b> PCL5 capability or higher required e.g. HP DeskJet 2500 C+ (color)
Displays	SXGA, XGA	Displays must be approved for medical use

## Ordering Information

Ordering information for the M8008A (MP80) and M8010A (MP90) patient monitors and for M8016A (D80 Intelligent Display) is given here. See the individual Data Sheets for detailed ordering information for the multi-measurement module family, MMS extensions and plug-in modules.

Basic Functionality	MP80 (M8008A)	MP90 (M8010A)
General/ICU Configuration <sup>a</sup>	H10	H10
Neonatal Configuration	H20	H20
OR/Anesthesia Configuration	H30	H30
Cardiac Configuration	H40	H40
4 Realtime Wave Segments	A04	---
6 Realtime Wave Segments	A06	A06
8 Realtime Wave Segments	A08	A08
12 Realtime Wave Segments	---	A12
Slave Display Interface	Analog and digital Incl.	Analog and digital Incl.
Supported Flexible Module Racks	1	2

a. One Hxx option and one Axx must be chosen. If AGM is required, H30 must be ordered.

## Application Options

Applications	M8008A	M8010A
Patient Data Management		
Extended Trend Capability	C03	Incl.
Event Surveillance		
Standard Capability	C06	Incl. in H10, H30, H40
Advanced Capability	C07	Incl.
Neonatal	C04	Incl. in H20
Information Portal	C17	Incl.
Anesthesia OLEH support	C90	n/a

## D80 Intelligent Display

Description	Model Number	Option
<b>D80 Intelligent Display</b> for use as a third independent display with MP90.	M8016A	
PS/2 Interface		J22
Remote Speedpoint		J23
MSL Coupling Cable (0.75 m) <sup>a</sup>		MC1
MSL Coupling Cable (2 m) <sup>a</sup>		MC2
MSL Coupling Cable (4 m) <sup>a</sup>		MC4

a. incl. clamp

## ProtocolWatch

Application Options	M8008A	M8010A
SSC Sepsis Protocol	P02	P02

## Measurement Options

Measurements	Model Number	Option
<b>Measurement Modules</b>		
Multi-Measurement Module, for Resp, ECG (inc. EASI), NBP, SpO <sub>2</sub> (FAST SpO <sub>2</sub> (#A01), Nellcor OxiMax-compatible (#A02), Masimo SET (#A03)), and Pressure/Temperature. See the MMS Data Sheet for details.	M3001A	A01, A02 <sup>a</sup> or A03 <sup>a</sup>
Add Press/Temp		C06
Add Press/Temp and Conventional 12 lead ECG		C18
X2 Multi-Measurement Module, for Resp, ECG (inc. EASI), NBP, SpO <sub>2</sub> (FAST SpO <sub>2</sub> (#A01), Masimo SET (#A03)), and Pressure/Temperature. See the X2 Data Sheet for details.	M3002A	A01, or A03 <sup>a</sup>
<b>MMS Extensions</b>		
Microstream CO <sub>2</sub> Extension	M3015A	
Add Press/Temp		C06
Hemodynamic Extension (with Press, Temp, Press/Temp)	M3012A	
Add C.O.		C05
Add C.O./CCO		C10
Capnography Extension	M3014A	
Add Press, Press/Temp and C.O.		C05
Add Press and Press/Temp		C07
Add Press, Press/Temp and C.O./CCO		C10
<b>Flexible Module Rack</b>		
Flexible Module Rack (M8048A), for up to eight plug-in modules		
MMS mount (left)		E20
<b>Measurement Modules</b>		
See the individual module Data Sheets for details.		
Invasive Blood Pressure	M1006A/ B <sup>b</sup>	

Measurements	Model Number	Option
Cardiac Output with CCO	M1012A	
Spirometry	M1014A	
Transcutaneous Gases	M1018A	
SpO <sub>2</sub> (FAST SpO <sub>2</sub> )	M1020B	A01
SpO <sub>2</sub> (Nellcor Compatible)	M1020B	A02
SpO <sub>2</sub> (Masimo SET)	M1020B	A03
SvO <sub>2</sub>	M1021A	
EEG	M1027A	
Temperature	M1029A	
VueLink	M1032A	
BIS Module	M1034A	
Thermal Array Recorder	M1116B	
Gas Modules		
IntelliVue G1	M1013A	
IntelliVue G5	M1019A	
Anesthetic Gas Module	M1026B	

a. may not be available in all geographies

b. Option #C01 provides an analog output signal

## Hardware Options

Hardware Add-Ons	M8008A/M8010A
Performance Extension (2nd CPU)	E30

## Interface Options

Interfaces	M8008A	M8010A
2 RS232 Interface (MIB-ready) <sup>a</sup>	J13	J13
Parallel Printer Interface	J14	J14
Wireless System Interface Board	J20	J20
2nd interface for MMS	---	J19

Interfaces	M8008A	M8010A
2 PS/2 Interfaces <sup>b</sup>	J22	J22
Flexible Nurse Call Relay	J30	J30
IntelliVue 802.11 Bedside Adapter	J35	J35
ECG Output Interface	Incl.	Incl.

a. Hardware supports multiple boards of this type.

b. Multiple boards of this kind may be used to support more input devices

## Related Products

Related Products	Model Number
<b>Input Devices</b>	<b>M8024A</b>
Slimline keyboard with protective cover	M8024A #A01
Mouse; wired	M8024A #B01
Trackball; wired	M8024A #C01
Trackball; wireless	M8024A #C02
off table track mouse wired	M8024A #C03
<b>Remote Alarm Device</b>	<b>M8025A</b>
Connection cables:	1.5 m #HF2 3 m #HF3 10 m #HF6 15 m #HF7 25 m #HF9
<b>Remote SpeedPoint Device</b>	<b>M8026A</b>
Connection cables:	1.5 m #HF2 3 m #HF3 10 m #HF6 15 m #HF7 25 m #HF9
<b>Displays</b>	
<b>15" Color Flat Screen (XGA, Touch)</b>	<b>M8031A/B</b>
Analog Video Cable Kit: (Video Cable + Touch Cable)	1.5 m VA2 3.0 m VA3 10.0 m VA6 15.0 m VA7 25.0 m VA9
Digital Video Cable Kit (Video Cable + Touch Cable)	1.5 m VD2 3.0 m VD3 10.0 m VD6
<b>17" Color Flat Screen (XGA, Touch)</b>	<b>M8033A/B</b>
Analog Video Cable Kit: (Video Cable + Touch Cable)	1.5 m VA2 3.0 m VA3 10.0 m VA6 15.0 m VA7 25.0 m VA9
Digital Video Cable Kit (Video Cable + Touch Cable)	1.5 m VD2 3.0 m VD3 10.0 m VD6

Related Products	Model Number
Support Tool	M3086A
<b>Computer Based Training</b>	
English	M8000-9461E
French	M8000-9462E
German	M8000-9463E
Swedish	M8000-9468E
Japanese	M8000-9470E



## Cables

Length	Description <sup>a</sup>	Product/Option
Analog Video		
1.5 m	Monitor to Display	M8022A #VA2
3.0 m	Monitor to Display	M8022A #VA3
10.0 m	Monitor to Display	M8022A #VA6
15.0 m	Monitor to Display	M8022A #VA7
25.0 m	Monitor to Display	M8022A #VA9
Digital Video		
1.5 m	Monitor to Display	M8022A #VD2
3.0 m	Monitor to Display	M8022A #VD3
10.0 m	Monitor to Display	M8022A #VD6
Interface Cables		
Length	Description <sup>b</sup>	Product/Option
1.5 m	Monitor to Remote Device	M8022A #HF2
3.0 m	Monitor to Remote Device	M8022A #HF3
10.0 m	Monitor to Remote Device	M8022A #HF6
15.0 m	Monitor to Remote Device	M8022A #HF7
25.0 m	Monitor to Remote Device	M8022A #HF9
MSL Cable		
0.75 m	Monitor to FMS	M8022A #SC1
2 m	Monitor to FMS	M8022A #SC2
4 m	Monitor to FMS	M8022A #SC4
10 m	Monitor to FMS	M8022A #SC6
15 m	Monitor to FMS	M8022A #SC7
25 m	Monitor to FMS	M8022A #SC9
MIB RS/232 Cables		
1.5 m	Serial cable	M8022A #SR2
3.0 m	Serial cable	M8022A #SR3
10.0 m	Serial cable	M8022A #SR6
15.0 m	Serial cable	M8022A #SR7
25.0 m	Serial cable	M8022A #SR9

Length	Description <sup>a</sup>	Product/Option
Touch Cables		
1.5 m	Touch cable	M8022A #TC2
3.0 m	Touch cable	M8022A #TC3
10.0 m	Touch cable	M8022A #TC6
15.0 m	Touch cable	M8022A #TC7
25.0 m	Touch cable	M8022A #TC9
Nurse Call Relay Cable		
3.0 m	standard (backward compatible) nurse paging relay cable <sup>c</sup>	M8022A #NC3
10.0 m	cable	M8022A #NC6
ECG Out Cable		
3.0 m	standard ECG out cable <sup>d</sup>	M8022A #SY3
25 m	ECG Sync Extension cable	M8022A #SY9
Wireless LAN Adapter Cable		
0.3 m	Y-Piece, DC supply plus LAN	M8022A #WLO
MSL Coupling Cable for D80		
0.75m	Adapter cable MSL coupling incl. clamp	M8016A #MC1
2 m	Adapter cable MSL coupling incl. clamp	M8016A #MC2
4 m	Adapter cable MSL coupling incl. clamp	M8016A #MC4

a. Both ends terminated with HDSUB15 (VGA) connectors.

b. Both ends terminated with straight MDR connectors.

c. One end terminated with phone plug; other end w/o connector.

d. Both ends terminated with 1/4" phone plug.

## Mounting Information

For mounting hardware, contact your local Philips sales representative. For more information, see [www.medical.philips.com/goto/mountingsolutions](http://www.medical.philips.com/goto/mountingsolutions).

## Documentation

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

- Instructions for Use (printed)
- Documentation CD-ROM including:
  - Installation and Service Guide
  - Configuration Guide
  - Online Help

## Training Material

Interactive Computer Based Training, featuring all Basic Measurements and Cardiac Output, with scoring. Available in English, French, German, Swedish and Japanese.

## Software Upgrades M8029A

Upgrade Option	Option Number
Software Upgrade to Rev. A.2	A02
Software Upgrade to Rev. B.0	B00
Software Upgrade to Rev. F.0	F00

## Upgrade Options M8008AU/M8010AU/M8016AU

Options	MP80 M8008A	MP90 M8010A
<b>Waves</b>		
Upgrade from 4 to 6 waves	A06	n/a
Upgrade from 4 to 8 waves	A07	n/a
Upgrade from 6 to 8 waves	A08	A08
Upgrade from 6 to 12 waves	n/a	A11
Upgrade from 8 to 12 waves	n/a	A12
<b>Interfaces</b>		
Serial interface / MIB-ready(2 ports)	J13	J13
Parallel Printer Interface	J14	J14
2nd measurement module interface for MP90	n/a	J19

Options	MP80 M8008A	MP90 M8010A
Wireless System Interface Board	J20	J20
PS/2 Interface (2 ports)	J22	J22
Interface for Remote Devices	n/a	J23
Flexible Nurse Call Relay	J30	J30
IntelliVue 802.11 Bedside Adapter	J35	J35
<b>Clinical Applications</b>		
Extended Database	C03	n/a
Neonatal Event Review	C04	n/a
Basic Event Surveillance	C06	n/a
Advanced Event Surveillance	C07	C07
Information portal	C17	n/a
Anesthesia OLEH support	C90	n/a
<b>Protocol Watch</b>		
Severe Sepsis Screening	P02	P02
<b>Hardware Add-On</b>		
Single CPU Upgrade	n/a	E31
Rev B Performance Extension 4MB	n/a	E35
Rev B Performance Extension 8MB	n/a	E36
SSC Sepsis Protocol	P02	P02
SSC Sepsis Protocol + SW Upgrade	P42	P42
SSC Sepsis Protocol + SW & HW Upgrade	P72	P72

## Upgrade Options M8048AU for FMS

Description	Option #
Cable Management for FMS	E15
Multi-Measurement Module Mount for FMS	E20



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+31 40 27 64 887

**By mail**

Philips Medical Systems  
Global Information Center  
P.O Box 1286  
5602 BG Eindhoven  
The Netherlands

**By phone**

Asia

Tel: +852 2821 5888

Europe, Middle East, Africa

Tel: +49 7031 463 2254

Latin America

Tel: +55 11 2125 0764

North America

Tel: +1 800 229 6417



M8008A and M8010A comply with the requirements of the Council Directive 93/42/EEC of 14 June 1993 (Medical Device Directive).



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