The M3/M4 Compact Portable Patient Monitor (M3046A)\(^1\) is a small, light patient monitor offering a flexible monitoring solution to suit a broad spectrum of monitoring needs.

The monitor works together with the M3001A\(^2\) Multi-Measurement Server (MMS) and the M3012A/M3015A/M3016A Measurement Server Extensions to give you standard-of-care measurements.

**Measurement Features**

- Patient demographics, measurement data and trends, acquired and stored in the MMS, can be transferred to the M-Series (M3/M4)\(^3\) and Philips IntelliVue (MP60/MP70/MP90) patient monitors.

- EASI™-derived 12-lead ECG\(^4\) using a 5-electrode cable set.

- Multi-lead Arrhythmia.

- Up to 3 channels of ECG with basic Arrhythmia and ST Analysis capability.

- FAST-SpO\(_2\) measurement, using Fourier Artifact Suppression Technology, for accurate performance even with low perfusion.

- Respiration, Non-invasive and Invasive Blood Pressure, and Temperature measurements.

- Mainstream or Sidestream CO\(_2\), a second Invasive Blood Pressure and Temperature measurements, and enhanced Arrhythmia capability, available optionally.

---

1. This data sheet describes monitors with Software Revision E. The M3046A is also available with Software Revision D (M3046A option #C90) and there is a separate data sheet for this (publication number: 4522 981 83061).
2. Not compatible with M3000A.
3. Software Revision E only.
4. EASITM-derived 12-lead ECGs and their measurements are approximations to conventional 12-lead ECGs. As the 12-lead ECG derived with EASITM is not exactly identical to the 12-lead conventional ECG obtained from an electrocardiograph, it should not be used for diagnostic interpretations.
Usability Features

- Choice of serial interface for a dedicated external strip chart recorder (as default), or IrDA interface for connecting to a local printer.
- 3-wave or 4-wave displays are available.
- Trend data, with manual and automatic event storage, together with a range of report styles help you track and document your patient’s progress.
- Color display with a wide viewing angle.
- Optional battery informs you of remaining capacity, and allows longer transport times. It can be easily exchanged during transport with no loss of settings.
- TouchBar human interface — quick to learn and easy to use.
- Rubber bezel protector, available in four colors, gives additional protection in transport scenarios.

Patient Transfers

Patient demographics, measurement data and trends (for up to the last eight hours at one minute resolution for all numerics), are stored in the MMS, and can be uploaded to other Philips patient monitors - up to the last four hours to the M-Series (M3/M4)\(^5\), and the full eight hours to the IntelliVue family.

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

Local Recorder

You can connect a dedicated, standalone strip chart recorder (GSI Lumonics XE-50p, order number M3080A #H20) to your monitor via the optional serial recorder interface (see Ordering Information).

The following recordings are supported:
- Real-time local strips
- Delayed local strips
- Alarms
- Vital signs
- Trends and stored events

Display

The color display has a wide viewing angle, and excellent visibility from a distance, so you can easily recognize and see the data you need for decision making.

For applications where a larger display is required, an additional display can be connected to the monitor via the standard VGA output (consult your Philips representative for further information).

Networked Systems

In larger installations, several of these monitors can be networked and connected to a Philips Information Center — with or without wires, for ultimate flexibility. Such a networked system not only allows central monitoring, but also bed-to-bed overview on any connected monitor. A permanent indication at the top of the screen conveniently shows the alarm status for beds assigned to the caregiver’s group at all times.

Intended Use

The M3 and M4 patient monitors are designed for use by clinicians for adult, pediatric and neonatal patients in Critical and Intermediate Care areas, in Operating Rooms and General Wards, and for transport inside and outside the hospital.

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

M3001A/M3046A Monitor and Measurement Server Safety Specifications

The M3046A monitor together with the M3001A Measurement Server and the M3015A/M3016A Measurement Server Extensions comply with the Medical Device Directive 93/42/EEC (CE\(^0\)).

In addition, the product complies with:
- UL 2601-1
- CAN/CSA C22.2#601.1-M90
- JIS T 1001-1992

Monitor Physical Specifications

Size (WxDxH)

Without Handle:
210mm × 135mm × 210mm
(8.27” × 5.31” × 8.27”)

Weight

Without battery:
3200 g (7.05 lb.)
Monitor Environmental Specifications

Temperature Range (without wireless network interface)
Operating: 0 to 45°C (32 to 113°F).
Storage: -20 to 60°C (-4 to 140°F).

Temperature Range (with wireless network interface)
Operating: 0 to 35°C (32 to 95°F).
Storage: -20 to 60°C (-4 to 140°F).

Humidity Range
Operating: 95% RH max. @ 40°C (104°F)
Storage: 85% RH max. @ 50°C (122°F)

Altitude Range
Operating: -500m to 4,600m (-1,600’ to 15,000’)
Storage: -500m to 13,100m (-1,600’ to 43,000’)

Electrical Specifications
100 to 240VAC, 50/60Hz, 0.4 to 0.7A
Power Fail Protection.

Monitor Performance Specifications

Display
6.5” (diagonal) active color LCD (TFT)
Resolution: 640 x 480 pixels

Indicators
- Up to 4 waves (depending on monitor option)
- Alarms Off (red crossed-bell LED).
- Alarms (red/yellow LED, 3 different alarm tones).
- On/Standby (green LED).
- AC Power (green LED)
- Battery Status (green/yellow/red LED).
- QRS tone or tick, or SpO2 modulation tone.

Interfaces

- Server link between monitor and measurement server
- Network (RJ45)
- Infrared Interface to local printer
- Serial Interface to local recorder (supported recorder: GSI Lumonics XE-50p)
- Nurse Call relay (1/8” phone jack, ≤60W, ≤2A, ≤36VDC, ≤25VAC, active=closed)
- ECG Output/Marker Input (1/4” stereo phone jack with tip, ring, sleeve)

ECG Output:
Signal Gain: 320 to 3200 (depending upon ECG display gain)
Full Scale on Display: 3.2Vpp
Gain Error: <20%
Baseline Offset: <150mV
Noise:<20mVRMS at signal gain 1000
Bandwidth: 1 to 80Hz in ECG Diagnostic mode
Output Impedance:
<2.2KΩ ±20% ECG Output (ring)
<2.5kΩ ±20% ECG Output/Marker Input (tip)
Signal delay: <30ms

Marker Input Requirements:
Signal Type: 0 to -12V, negative edge pulse.
Pulse Source Impedance: <7kΩ
Pulse Fall Time: <100µs
Pulse Duration: >4ms

VGA Interface
Refresh rate: 60 Hz.
Horizontal frequency: 31.5 kHz
Resolution: 640 x 480 pixels
Video Signal: 0.7 Vpp @ 75 Ohm
HSYNC/VSYNC signal type: TTL
Connector: 15-pin D-SUB

Wireless Network Interface (optional)
Antenna: integrated into handle.
Technology: Frequency Hopping Spread Spectrum (FHSS)
Frequency band: 2.4 GHz Industrial Scientific Medical (ISM) band
Output Power: 100mW (max.)
Weight: < 200g
Battery (optional)
Moltech NJ1020 Smart Battery, 3500mAh (typical), Nickel-Metal-Hydride (removable). Also possible: Toshiba TR36, Duracell DR36

Discharge Time:
2.5h minimum [new and fully charged battery, with NBP every 15 minutes, ECG, SpO₂, and automatic reduction of display brightness.]
With a CO₂ measurement in use, typically 15 minutes shorter.

Charge Time (after connection to AC power):
- typically 24h with monitor on and functioning.
- typically 4.5h with monitor off.

Weight:
600 g (1.3 lb.)

Real-time Clock
Accuracy:
<2 seconds per day.

Operating Time:
6h without battery or AC power, otherwise unlimited.

Active Settings and Stored Data
Operating Time:
6h without battery or AC power, otherwise unlimited.

Trends
Short trend:
10 hours with 1 minute resolution.

Long trend:
48 hours with 5 minutes resolution. Both trends are stored.

Ordering Information

Monitor Options
M3046A #A03
M3 with 3 wave channels.
Supports CO₂ from M3015/M3016A Measurement Server Extensions.

M3046A #A04
M4 with 4 wave channels.
Supports M3015/M3016A Measurement Server Extensions, and the Pressure/Temperature channel from M3012A Measurement Server Extension.

M3046A #C01
Add enhanced arrhythmia capability

M3046A #C15
Add basic network capability

M3046A #C16
Add full network capability
(requires #C15)

M3046A #C40
Add battery.

M3046A #C90
Software Revision D (works with M3000A, not with M3001A). No local recorder support.

M3046A #C91
Software Revision E (works with M3001A, not with M3000A). Support for local recorder M3080A #H20.

M3046A #J14
Add IrDA Interface to connect to local printer
(you cannot also order M3046A #J16)

M3046A #J16
Add Serial Interface to connect to local recorder
(you cannot also order M3046A #J14; not compatible with M3046A #C90)

M3046A #J20
Add Wireless Network Interface
(requires #C15).

Monitor Mounting Options
M3080A #A10
Table Top Mount

M3080A #A11
Universal Hanger (including Table Top Mount)

M3080A #A13
Wall Rail

M3080A #A14
Tilt/Swivel Wall Mount
(includes wall rail)

M3080A #A15
GCX Wall Channel

M3080A #A21
Transport Bed Hanger

M3080A #A22
Roller Top Stand

M3080A #C05
Universal Pole Mount Clamp

M3080A #C06
Mounting Clamp for transport of Measurement Server and Measurement Server Extension

M3080A #C10
Monitor Rail Mount

**Measurement Server Mounting Options**

**M3080A #A01**  
Measurement Server Mounting Plate  
(pack of five plates)

**M3080A #A02**  
Rotating Clamp Mount

**Monitor Accessory Options**

**M3080A #C12**  
Monitor carrying case

**M3080A #C30**  
Battery Charger for use with PowerSmart-compatible batteries.  
[Original Equipment Manufacturer Product Number: DR36-SMB-TNT]

**M3080A #C32**  
12V Adapter for use with a vehicle 12V power supply  
(for CE countries only)  
[Original Equipment Manufacturer Product Number: NotePower 75i/NotePower 75j]

**M3080A #C40**  
Spare battery

**Upgrade Options**

**M3060A #A01**  
Upgrade software to the latest revision (E)

**M3060A #A03**  
Upgrade M2 to M3

**M3060A #A04**  
Upgrade M3 to M4

**M3060A #C01**  
Upgrade to full Arrhythmia

**M3060A #C15**  
Upgrade to basic network

**M3060A #C16**  
Upgrade to full network

**M3060A #J14**  
Upgrade to IrDA Interface for connection to external printer (exchanging the Serial Interface for the external recorder)

**M3060A #J16**  
Upgrade to Serial Interface for connection to external recorder (exchanging the IrDA Interface for the external printer). Revision E software is required.

**M3060A #K01**  
Rubber Bezel Protector - Gray

**M3060A #K02**  
Rubber Bezel Protector - Blue

**M3060A #K03**  
Rubber Bezel Protector - Aqua

**M3060A #K04**  
Rubber Bezel Protector - Yellow

**Local Printer Options**

**M3080A #H05**  
Wireless Infrared Printer Connector

**Local Recorder Options**  
For GSI Lumonics XE-50p:

**M3080A #H20**  
GSI Lumonics XE-50p Strip Chart Recorder  
(Software Revision E and Serial Interface connector required)

**M3080A #A30**  
Roller Stand Mount

**M3080A #A31**  
Wall Mount

**M4816A**  
Paper, 10 Rolls

**M4817A**  
Paper, 80 Rolls

**M3081A #A70**  
1.0m serial recorder cable

**Local Printer Options**

**M3080A #H05**  
Wireless Infrared Printer Connector

**Local Recorder Options**  
For GSI Lumonics XE-50p:

**M3080A #H20**  
GSI Lumonics XE-50p Strip Chart Recorder  
(Software Revision E and Serial Interface connector required)

**M3080A #A30**  
Roller Stand Mount

**M3080A #A31**  
Wall Mount

**M4816A**  
Paper, 10 Rolls

**M4817A**  
Paper, 80 Rolls

**M3081A #A70**  
1.0m serial recorder cable
Philips Medical Systems is part of Royal Philips Electronics

INTERESTED?
Would you like to know more about our imaginative products? Please do not hesitate to contact us. We would be happy to provide specific information about our products and services, or put you on our mailing list for news about new product developments, upcoming events or for our clinical journal, MedicaMundi. We would be glad to hear from you.

On the web
Contact us through our web site:
www.medical.philips.com

Via e-mail
Our e-mail for all remarks and requests is:
medical@philips.com

By fax
We can be reached at the following fax number:
+31 40 27 64 887

By postal service
Please write to us at the following address:
Philips Medical Systems
Global Information Center
I.B.R.S. / C.C.R.I. Numéro 11088
5600 VC Eindhoven
Pays-Bas / The Netherlands
(no stamp required)

This device complies with the requirements of the Council Directives 93/42/EEC (Medical Device Directive) of 14 June 1993.

United States:
Philips Medical Systems
Cardiac and Monitoring Systems
3000 Minuteman Road
Andover, MA 01810
(800) 934-7372

Canada:
Philips Medical Systems Canada
281 Hillmount Road
Markham, ON
L6C 2S3
(800) 291-6743

Europe, Middle East and Africa:
Philips Medizin Systeme Boeblingen GmbH
Cardiac and Monitoring Systems
Hewlett-Packard Str. 2
71034 Boeblingen
Germany
Fax: (+49) 7031 463 1552

Latin America Headquarters:
Philips Medical Systems
1550 Sawgrass Corporate Parkway #300
Sunrise, FL 33323
Tel: (954) 835-2600
Fax: (954) 835-2626

Asia Pacific Headquarters:
Philips Medical Systems
30/F Hopewell Centre
17 Kennedy Road
Wanchai
Hong Kong
Tel: (852) 2821 5888
Fax: (852) 2527 6727

© 1995-2003 Koninklijke Philips Electronics N.V.
All Rights Reserved.

Printed in the Netherlands, November 2003
4522 981 85491