



**PHILIPS**

**Avalon**

**FM20/FM30**

**Fetal Monitor 2.1.**

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# Flexible Fetal & Maternal Monitoring FM20/30

## Philips M2702A/M2703A Technical Data Sheet Release L.3

The Philips Avalon FM20/FM30 fetal monitor offers a reliable, cost-effective, high-performance solution for fetal monitoring needs in clinics and hospitals, doctors' practices, and private households. This ranges from prenatal check-ups to antepartum monitoring of high-risk pregnancies, and monitoring during labor and delivery.

With a cutting-edge feature set, including advanced transducers, **triplets** monitoring, high-quality signal processing, and a **touchscreen** interface, the Avalon FM20/FM30 sets new standards for performance, flexibility, convenience, and ease of use.

The unique **Smart Pulse** measurement integrated into the Toco transducer simplifies monitoring. Without an additional sensor, the maternal pulse rate is monitored and continuously compared with the heart rate from the fetal sensor (cross-channel verification).

In combination with an **Avalon CL Transducer System**, all fetal and maternal measurements can be monitored cablelessly, including twins, triplets, and Smart Pulse.

The **battery option** gives monitoring flexibility for in-house transport, or bridging a mains power outage

### Features

#### Transducers and Measurements

- Smart transducers are waterproof, comfortable to wear, and easy to clean
- **Ultrasound (US)** fetal heart rate monitoring of singletons, twins, and even triplets
- **Fetal Movement Profile (FMP)** automatically detects fetal body movements for antepartum applications using an ultrasound transducer
- **External uterine activity (Toco)** monitoring
- **Smart Pulse** integrated into the Toco MP transducer detects the maternal pulse rate without the need for an additional sensor (SpO<sub>2</sub> or MECG), confirming correct fetal heart rate monitoring
- **Cross-Channel Verification (CCV)** detects the coincidence between all fetal and maternal heart and pulse rates
- **NST timer** for antepartum applications
- Optional **Non-Stress Test (NST)** report software allows the interpretation of fetal heart rate and Toco traces. It generates automatically a printed report for an NST, based on NICHD guidelines from 2008 for electronic fetal heart rate monitoring, or based on the Dawes/Redman method (not available for USA, other FDA regulated territories, and Canada).

- Optional **maternal noninvasive blood pressure (NBP)** including pulse rate
- Heart rate with **maternal ECG (MECG)**
- Cableless monitoring with an Avalon CL Transducer System
- Beltless monitoring with the Avalon CL Fetal & Maternal Pod and Patch (not available for USA, other FDA regulated territories, and Canada)
- Extended wireless monitoring with the Avalon CL Wide Range Pod
- Optional monitoring of maternal temperature with the Tympanic Temperature Thermometer
- Entering of manually taken maternal temperature
- Direct fetal heart rate monitoring with fetal **ECG (DECG)** including waveform display (FM30 only)
- Intrauterine pressure monitoring (IUP) (FM30 only)
- Optional maternal pulse oximetry (SpO<sub>2</sub>) and continuous maternal pulse rate (FM30 only)
- Access of all screen-operable functions of the fetal monitor on a remote display through the support of the XDS Remote Display application in combination with IntelliSpace Perinatal

### Monitor

- High-resolution **color TFT touchscreen display** with a wide viewing angle. Fetal and maternal measurements are displayed as large, easy-to-read numerics



- Intuitive user functionality via the touchscreen
- Quick and simple cleaning due to the absence of mechanical controls
- Optimized size and presentation of measurements with automatic screen layouts
- Displaying information such as **Patient Identification** (including the bed label when connected to a surveillance system such as IntelliSpace Perinatal), date and time, alarm information, recorder status, and prompt and error messages
- Fast access to functions, for example starting a recording or resetting the Toco baseline via configurable **SmartKeys**
- Adjustment of the heart rate and alarm volume with an indication of the current setting
- With the automatic channel management, all wired fetal transducers, patient modules, or remote event markers can be connected to any of the fetal sensor sockets at the left side of the monitor
- Identification of the relation between transducer and numeric through a **transducer finder LED**, with the position indication on the screen that shows to which fetal sensor socket a transducer is connected
- Comprehensive patient data presentation, including at-a-glance patient identification, and the choice to add **user-configurable notes** or **individual typed notes**

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- Optional battery operation with a built-in Smart Battery (M4605A) and an external AC/DC power supply (M8023A 2.1.17 with option E25). **The fetal monitor can operate using battery power for at least four hours.**

### Recorder

- Built-in six-inch high-resolution thermal array recorder with paper type detection and paper-out warning
- Trace output of fetal and maternal heart rates, fetal movements, and uterine activity, and annotation of time, date, trace identification symbols, patient information, and software versions
- Maternal heart and pulse rate are printed every five minutes
- SpO<sub>2</sub> value is printed every five minutes (configurable to every 1 minute) (FM30 only)
- Maternal noninvasive blood pressure and temperature values are annotated at the end of the measurement
- Recording of six-second MECG and/or DECG wave snapshots with 25 mm/s scaling in parallel to, or separate from the fetal traces (FM30 only)
- Internal backup memory for at least 7 hours of trace data (>3.5 hours with previous hardware revision <A 00.18):
  - Stored data recording to print a specific patient episode from a selected patient at high speed, even multiple times
  - Bridge paper-out for printing the missing piece of trace after new paper has been loaded
  - Data recovery after an interruption of the online data transmission to an IntelliSpace Perinatal system over a LAN connection
- Paper Save Mode for maternal measurements

### Alarms

When an alarm condition is fulfilled, it is signaled by the monitor in the following ways:

- An alarm tone sounds
- An alarm message is shown on the screen
- The numeric of the alarming measurement flashes on the screen

### Alarm categories

- **Physiological Alarms:** are triggered by fetal and maternal parameters (for example, to indicate vital sign alarm limit violations)
- **Technical Alarms (INOPs):** are triggered by signal quality problems, equipment malfunction, or equipment disconnection

### Alarm modes

- **All:** patient alarms and INOPs are enabled, with audible and visual indications active (default setting)
- **INOP only:** INOPs are enabled, with audible and visual indications active

### Alarm suspension

- Alarms Off/Pause Alarms function
- Alarm pause period: one, two, or three minutes, or indefinite

### Alarm latching/non-latching

- Visual
- Audible
- Visual and audible

## Standard Interfaces

Cableless monitoring with the Avalon CL Transducer System, that is connected to a fetal sensor socket.

## Optional Interfaces

### LAN/RS232 System Interface

The LAN/RS232 interface has two fully isolated ports:

1. The LAN port is used to connect the monitor to an IntelliSpace Perinatal obstetrical information and surveillance system (revision E.0 or later) on a network. IntelliSpace Perinatal controls all patient admit/discharge events.
2. The RS232 port can be used for connecting the monitor to an obstetrical information and surveillance system, such as IntelliSpace Perinatal.

Dual system interface support: If an obstetrical information and surveillance system is connected via LAN, another information system (EMR) can be independently connected via RS232 in read-only mode.

### Dual MIB/RS232 Interface

The dual MIB, Medical Information Bus (IEEE P1073), is a standard for interfacing medical devices, used for the Data Export functionality to export measurement values from the monitor to other devices or to connect the Tympanic Temperature Thermometer.

### Flexible Nurse Call Interface

- Alarms generated on the monitor are signaled on an external device such as a nurse call system, a beeper, or a light
- Providing three general alarm relays
- Connection of the external device to the alarm relay of the monitor
- Configurable alarm criteria
- Active open and closed contacts and a user-definable delay time

### Device Interface (USB Interfaces)

- USB interfaces are used to connect USB devices (mouse, keyboard, or barcode reader) to the monitor.

## Service Features

- The Configuration Mode is password-protected and allows trained users to customize the monitor configuration
- The Demo Mode is password-protected and is intended for training and educational purposes
- The Service Mode is password-protected and ensures that only trained staff can access service tests and tasks
- The Support Tool uses the LAN interface of the fetal monitor and helps technical personnel to:
  - carry out configuration, upgrades, and troubleshooting on an individual monitor
  - share configuration settings between monitors
  - back up the monitor settings

## Related Products

### Avalon CL Transducer System

The monitor is compatible with the Avalon CL Transducer System allowing expectant mothers to be continuously monitored without wires, whether in the bath or shower, in the bed, or while ambulating. Refer to the Avalon CL Technical Data Sheet for further information.



Avalon CL Transducer System

### Avalon CL Fetal & Maternal Pod and Patch

The CL F&M Pod provides measurement values for fetal and maternal heart rate and uterine activity. It is controlled via short-range radio from the Avalon CL base station and the connected fetal monitor. The operating range is in-room, unless the CL F&M Pod is used in connection with the CL Wide Range Pod.

The CL F&M Pod is assigned by docking it at the Avalon CL base station. For monitoring, the CL F&M Pod is placed on a CL F&M Patch and held in place by integrated magnets. Monitoring with the CL F&M Pod and Patch can continue when the patient takes a shower. The CL F&M Pod is not intended for underwater monitoring, for example in a bathtub.



Avalon CL Fetal & Maternal Pod

### Avalon CL Wide Range Pod

The Avalon CL Wide Range Pod is an extension of the Avalon CL solution. The Avalon CL Wide Range Pod extends the signal range of the cableless and beltless measurements. It transmits the cableless and beltless measurement signals via the hospital WLAN to the fetal monitors. Wearing the Avalon CL Wide Range Pod, the patient can walk freely within the hospital's WLAN range during monitoring. Prior to use, the Avalon CL Wide Range Pod is charged with and assigned to the Avalon CL base station.



Avalon CL Wide Range Pod

### Tympanic Temperature Thermometer

The monitor is compatible with the Tympanic Temperature Thermometer which measures the maternal temperature in the ear. The value of this measurement can be automatically adjusted to correspond to a different body reference site. The measured value is shown on the display of the thermometer and transmitted to the monitor. Refer to the Tympanic Temperature Thermometer Technical Data Sheet for further information.



Tympanic Temperature Thermometer

## Regulatory and Standards Compliance

The monitor complies with the requirements of the European Medical Devices Directive 93/42/EEC and the following major international standards.

### Safety Specifications

The fetal monitors comply with the following major international safety and performance standards:

- IEC 60601-1:2005+A1:2012 / EN 60601-1:2006+A1:2013
- IEC 60601-1-6:2010-A1:2013 / EN 60601-1-6:2010+A1:2015
- IEC 60601-1-8:2006+A1:2012 / EN 60601-1-8:2007+A1:2013
- IEC 60601-2-49:2011 / EN 60601-2-49:2015
- ANSI/AAMI ES60601-1:2005+A1:2012+C1:2009+A2:2010/2012
- CAN/CSA C22.2#60601-1-14
- JIS T 1303 2005

The possibility of hazards arising from hardware and software errors was minimized in compliance with ISO 14971:2007 / EN ISO 14971:2012 and IEC 60601-1:2005+A1:2012 / EN 60601-1:2006+A1:2013.

Alarm sounds are compliant with Standard IEC 60601-1-8:2006+A1:2012 / EN 60601-1-8:2007+A1:2013

### Electromagnetic Compatibility

- IEC 60601-1-2:2007 / EN 60601-1-2:2007+AC:2010
- ICES-003:2012

The monitor is classified as electromagnetic emissions Class B, except when used with the IUP/ECG patient module M2738A, then it is classified as Class A.

This ISM device complies with Canadian ICES-003. Cet appareil ISM est conforme à la norme NMB-001 du Canada.

### Environmental Specifications

The monitor may not meet the given performance specifications if it is stored and used outside the specified temperature and humidity ranges.

### FM20/FM30 Monitor

| Item              | Condition | Range   |
|-------------------|-----------|---|
| Temperature range | Operating | without battery:<br>0-45°C (32-113°F)<br>with fully charged battery: 0-40°C (32-104°F)<br>with battery charging: 0-35°C (32-95°F) |
|                   | Storage   | -20-60°C (-4-140°F)<br>(except recorder paper)  |
| Humidity range    | Operating | <95% relative humidity @ 40°C (104°F)   |
|                   | Storage   | <90% relative humidity @ 60°C (140°F)<br>(except recorder paper)  |
| Altitude range    | Operating | -500-3000 m (-1640-9840 ft)   |
|                   | Storage   | -500-13100 m (-1640-43000 ft)   |

## Transducers (M2734A/M2734B/M2735A/M2736A/M2738A)

| Item              | Condition | Range                                 |
|-------------------|-----------|---------------------------------------|
| Temperature range | Operating | 0–40°C (32–104°F)                     |
|                   | Storage   | –20–60°C<br>(–4–140°F)                |
| Humidity range    | Operating | <95% relative humidity @ 40°C (104°F) |
|                   | Storage   | <90% relative humidity @ 60°C (140°F) |
| Altitude range    | Operating | –500–3000 m<br>(–1640–9840 ft)        |
|                   | Storage   | –500–13100 m<br>(–1640–43000 ft)      |

## Philips SpO<sub>2</sub> Sensors (FM30 only)

| Item              | Condition | Range  |
|-------------------|-----------|--|
| Temperature range | Operating | Reusable sensors (M119xX) 10–37°C (50–98.6°F)<br><br>Disposable sensors (M113xA) 0–55°C (32–131°F) |

## Physical Specifications

### FM20/FM30 Monitor

FM30 monitorius

| Item                              | Condition                   | Range  |
|-----------------------------------|-----------------------------|--|
| Power (without battery option)    | Supply voltages             | 100–240 VAC ± 10%                            |
|                                   | Supply frequency range      | 50–60 Hz                                     |
|                                   | Power consumption (current) | 0.7–0.4 A                                    |
| Dimensions and weight (W x H x D) | Without options             | 286 x 134 x 335 mm<br>(11.3 x 5.3 x 13.2 in) |
|                                   | Weight without battery      | 5.1 kg (11.2 lbs)                            |
| 2.1.16.                           | Weight with battery         | 5.3 kg (11.7 lbs)                            |

Svoris su akumulatoriumi: 5.3 kg

| Item               | Condition  | Range                        |
|--------------------|--|------------------------------|
| Classification     | Degree of protection against electrical shock  | Type CF                      |
|                    | Electrical class   | Class II equipment           |
|                    | Mode of operation  | Continuous operation         |
|                    | Startup time (time taken from switching on the monitor to seeing the first parameter labels) | <30 seconds                  |
| Ingress protection | (Provided recorder drawer is shut)   | IPX1                         |
| Display            | Resistive touchscreen with LED backlight   | 6.5" LCD<br>640 x 480 pixels |

## Transducers (M2734B/M2735A/M2736A/M2738A)

| Product              | Item  | Range  |
|----------------------|---|--|
| M2734B/M2735A/M2736A | Diameter                                      | 83 mm (3.27 in)  |
|                      | Weight  | 0.2 kg (0.5 lb)  |
|                      | Degree of protection against electrical shock | Type CF  |
|                      | Shock resistance                              | Withstands a 1 m drop to concrete surface with possible cosmetic damage only |
|                      | Ingress protection                            | IP68 (immersion up to 1 m water depth for 5 hours)                           |

| Product            | Item  | Range  |
|--------------------|---|--|
| M2738A             | W x H x D   | 42 x 30 x 123 mm<br>(1.7 x 1.2 x 4.8 in)                                     |
|                    | Cable length  | 2.5 m (8.2 ft)   |
|                    | Weight  | 0.2 kg (0.5 lb)  |
|                    | Degree of protection against electrical shock           | Type CF  |
|                    | Shock resistance  | Withstands a 1 m drop to concrete surface with possible cosmetic damage only |
| Ingress protection | IP67 (immersion up to 0.5 m water depth for 30 minutes) |  |

### Performance Specifications

Complies with IEC 60601-2-37:2007 / EN 60601-2-37:2008. ECG measurement follows IEC 60601-2-27:2011 / EN 60601-2-27:2014 except clauses listed below:

- 201.6.2, 201.8.5.5
- 201.12.1.101
- 202.6.2.101

### Fetal/Maternal Performance Specifications

#### Ultrasound (M2736A/AA)

|  |   |
|--|---|
| Measurement method   | Ultrasound Pulsed Doppler                             |
| US measurement range   | 50-240 bpm  |
| Resolution   |   |
| Display  | 1 bpm   |
| Printer  | 1/4 bpm   |
| Jitter @ 200 bpm   | ≤3 bpm  |
| US intensity   |   |
| Average output power   | $P = (7.4 \pm 0.4) \text{ mW}$                        |
| Peak rarefactional pressure  | $p_r = (40.4 \pm 4.3) \text{ kPa}$                    |
| Output beam intensity ( $I_{ob}$ )<br>(= spatial average - temporal average intensity) | $I_{ob} = I_{sata} = (2.38 \pm 0.59) \text{ mW/cm}^2$ |
| Spatial-peak temporal average intensity  | $I_{spta} = (15.0 \pm 3.2) \text{ mW/cm}^2$           |
| Effective radiating area @ -12 dB  | $(3.11 \pm 0.74) \text{ cm}^2$                        |

#### Ultrasound (M2736A/AA)

|   |                            |
|---|----------------------------|
| US frequency                              | 1 MHz ± 100 Hz             |
| US signal range                           | 3.5 μVpp-350 μVpp @ 200 Hz |
| US burst                                  |                            |
| Repetition rate                           | 3.0 kHz                    |
| Duration                                  | ≤100 μs                    |
| Signal quality indication                 |                            |
| Good                                      | Full                       |
| Acceptable                                | Half-full                  |
| Poor                                      | Empty                      |
| Beat to beat change (max.) for ultrasound | 28 bpm                     |

#### Fetal Heart Rate (DECG) (FM30 only)

|  |                                    |
|--|------------------------------------|
| Measurement range                            | 30-240 bpm                         |
| Resolution                                   |                                    |
| Display                                      | 1 bpm                              |
| Printer                                      | 1/4 bpm                            |
| Accuracy                                     | ±1 bpm or 1%, whichever is greater |
| Filter bandwidth                             | 0.8-80 Hz                          |
| INOP auxiliary current (leads off detection) | <100 μA                            |
| Input signal range                           |                                    |
| DECG   | 20 μVpp-6 mVpp                     |
| Defibrillator Protection                     | None                               |
| ESU Protection                               | None                               |

#### Toco

|                        |  |
|------------------------|--|
| Measurement method     | Strain Gauge Sensor Element  |
| Sensitivity            | 1 unit = 2.5 g   |
| Resolution             |  |
| Display                | 1 unit   |
| Printer                | 1/4 unit   |
| Measurement range      | 400 units  |
| Signal range           | 0-127 units  |
| Maximum offset range   | -300 units   |
| Baseline setting       | 20 units   |
| Auto offset correction | 3 seconds after connecting the transducer, the Toco value is set to 20 units |

## Toco

|                  |  |
|------------------|--|
| Auto zero adjust | Toco value is set to zero following a negative measurement value for 5 seconds |
|------------------|--|

## Pulse from Toco MP

|                      |                                    |
|----------------------|------------------------------------|
| Measurement range    | 40-240 bpm                         |
| Accuracy             | ±2% or 1 bpm, whichever is greater |
| Resolution           | 1 bpm                              |
| Wavelength range     | 780-1100 nm                        |
| Emitted light energy | ≤15 mW                             |

## Maternal Heart Rate (MECG)

|  |                                    |
|--|------------------------------------|
| Measurement range                            | 30-240 bpm                         |
| Resolution                                   |                                    |
| Display                                      | 1 unit                             |
| Printer                                      | 1/4 unit                           |
| Accuracy                                     | ±1 bpm or 1%, whichever is greater |
| Filter bandwidth                             | 0.8-80 Hz                          |
| INOP auxiliary current (leads off detection) | <100 µA                            |
| Input signal range                           |                                    |
| MECG   | 150 µVpp - 6 mVpp                  |
| Defibrillator protection                     | None                               |
| ESU protection                               | None                               |

## IUP (FM30 only)

|                     |   |
|---------------------|---|
| Measurement method  | Passive Resistive Strain Gauge Elements |
| Measurement range   | -100-300 mmHg                           |
| Signal range        | -99-127 mmHg                            |
| Resolution          |   |
| Display             | 1 mmHg                                  |
| Printer             | 1/4 mmHg                                |
| Sensitivity         | 5 µV/V/mmHg                             |
| Offset compensation | +100 to -200 mmHg                       |
| Baseline setting    | 0 mmHg                                  |

## IUP (FM30 only)

Accuracy (not including sensor accuracy) ±0.5% per 100 mmHg

|                        |   |
|------------------------|---|
| Auto offset correction | 3 seconds after connecting the transducer, the IUP value is set to 0 mmHg |
|------------------------|---|

## Alarm Specifications

### Fetal Heart Rate (Ultrasound Alarm Specifications)

| FHR/DECG alarm limits    | Range      | Adjustment   | Default |
|--------------------------|------------|--------------|---------|
| Bradycardia (low limit)  | 60-200 bpm | 10 bpm steps | 110 bpm |
| Tachycardia (high limit) | 70-210 bpm | 10 bpm steps | 170 bpm |

| FHR/DECG Alarm Delay     | Range          | Adjustment | Default     |
|--------------------------|----------------|------------|-------------|
| Bradycardia (low limit)  | 10-300 seconds | 10 seconds | 240 seconds |
| Tachycardia (high limit) | 10-300 seconds | 10 seconds | 300 seconds |
| Signal loss delay        | 10-300 seconds | 10 seconds |             |

### MHR/MECG Alarm Specifications

| MHR/MECG alarm limits | Range                              | Adjustment  | Default |
|-----------------------|------------------------------------|---|---------|
| High range            | 31-240 bpm                         | 1 bpm steps (31-40 bpm), and 5 bpm steps (40-240 bpm) | 120 bpm |
| Low range             | 30-235 bpm                         | 1 bpm steps (30-40 bpm), and 5 bpm steps (40-235 bpm) | 50 bpm  |
| Tachycardia           | Difference to high limit: 0-50 bpm | 5 bpm steps   | 20 bpm  |
|                       | Clamping at: 150-240 bpm           | 5 bpm steps   | 200 bpm |

| MHR/MECG alarm limits | Range                             | Adjustment  | Default |
|-----------------------|-----------------------------------|-------------|---------|
| Bradycardia           | Difference to low limit: 0-50 bpm | 5 bpm steps | 20 bpm  |
|                       | Clamping at: 30-100 bpm           | 5 bpm steps | 40 bpm  |

### Noninvasive Blood Pressure

**Measurement Validation:** In adult 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. Complies with IEC 80601-2-30:2009 / EN 80601-2-30:2010.

### Noninvasive Blood Pressure Performance Specifications

|  |   |
|--|---|
| <b>Measurement range</b>   |   |
| Systolic   | 30-270 mmHg (4-36 kPa)  |
| Diastolic  | 10-245 mmHg (1.5-32 kPa)  |
| Mean   | 20-255 mmHg (2.5-34 kPa)  |
| <b>Accuracy</b>  |   |
|  | Max. std. deviation: 8 mmHg (1.1 kPa)<br>Max. mean error: ±5 mmHg (±0.7 kPa)      |
| <b>Pulse rate</b>  |   |
| Range  | 40-300 bpm  |
| Accuracy (average over noninvasive blood pressure measurement cycle) | 40-100 bpm: ±5 bpm<br>101-200 bpm: ±5% of reading<br>201-300 bpm: ±10% of reading |
| <b>Measurement time</b>  |   |
|  | Typical at HR >60 bpm<br>Auto/manual: 30 seconds<br>Maximum time: 180 seconds     |
| <b>Cuff inflation time</b>   |   |
|  | Typical for normal cuff:<br>less than 10 seconds                                  |
| <b>Initial cuff inflation pressure</b>                               |   |
|  | 165 ± 15 mmHg   |
| <b>Auto mode repetition times</b>                                    |   |
|  | 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, or 120 minutes                           |
| <b>Venipuncture mode inflation</b>                                   |   |
| Inflation pressure   | 20-120 mmHg (3-16 kPa)  |
| Automatic deflation after  | 170 seconds   |

### Alarm Specifications NBP

| Alarm Specifications | Range                    | Adjustment   |
|----------------------|--------------------------|--|
| Systolic             | 30-270 mmHg (4-36 kPa)   |  |
| Diastolic            | 10-245 mmHg (1.5-2 kPa)  | 10-30 mmHg:<br>2 mmHg (0.5 kPa)<br>>30 mmHg:<br>5 mmHg (1 kPa) |
| Mean                 | 20-255 mmHg (2.5-34 kPa) |  |

| Overpressure Settings     | Adjustment          |
|---------------------------|---------------------|
| >300 mmHg (40 kPa) >2 sec | not user adjustable |

### SpO<sub>2</sub> (FM30 only)

Maternal pulse oximetry provides SpO<sub>2</sub>, pulse numerics, and a pulse trace for oxygen saturation (SpO<sub>2</sub>) of maternal arterial hemoglobin. Pulse rate is derived from SpO<sub>2</sub> if ECG is not connected.

Complies with ISO 80601-2-61:2011 / EN ISO 80601-2-61:2011 (except alarm system; alarm system complies with IEC 60601-2-49:2011 / EN 60601-2-49:2015).

**Measurement Validation:** The SpO<sub>2</sub> 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. Maximum with noninvasive blood pressure INOP suppression on: 60 seconds. The specified accuracy is the root-mean-square (RMS) difference between the measured values and the reference values.

### SpO<sub>2</sub> Performance Specifications

|       |        |
|-------|--------|
| Range | 0-100% |
|-------|--------|

## SpO<sub>2</sub> Performance Specifications

### Accuracy

**Philips Reusable Sensors:**  
M1191A/B, M1191AL/BL,  
M1191ANL, M1192A, M1192AN =  
2% (70%-100%)  
M1191T, M1192T, M1194A,  
M1194AN, M1196A, M1196T =  
3% (70%-100%)

**Philips Disposable Sensors  
with M1943A(L):**  
M1131A, M1901B, M1903B,  
M1904B = 3% (70%-100%)  
M1133A, M1134A =  
±2% (70%-100%)

**Nellcor PB® Sensors with  
M1943A(L):**  
MAX-A, MAX-AL, MAX-P,  
MAX-N, D-25, D-20,  
N-25, OxiCliq A, P, N =  
3% (70%-100%)

**Masimo Reusable Sensors®  
with LNOP MP12 or LNC MP10:**  
LNOP DC-I, LNOP DC-IP,  
LNOP YI, LNCS DCI, LNCS  
DCIP: 2% (70%-100%)  
LNOP TC-I, LNCS TC-I:  
3.5% (70%-100%)

**Masimo Disposable Sensors®  
with LNOP MP12 or LNC MP10:**  
LNOP Adt, LNOP Adtx, LNOP  
Pdt, LNOP Pdtx, LNCS Adtx,  
LNCS Pdtx: 2% (70%-100%)  
LNOP Neo-L, LNCS Neo-L:  
3% (70%-100%)

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| Resolution                          | 1%                                   |
| Pulse<br>Range                      | 30-300 bpm                           |
| Accuracy                            | ±2% or 1 bpm whichever is<br>greater |
| Resolution                          | 1 bpm                                |
| Sensors                             |                                      |
| Wavelength range                    | 500-1000 nm                          |
| Emitted light energy                | ≤15 mW                               |
| Pulse oximeter calibration<br>range | 70%-100%                             |

<sup>1</sup> Information about the wavelength range can be especially useful to clinicians (for instance, when photodynamic therapy is performed)

## Alarm Specifications SpO<sub>2</sub>

| SpO <sub>2</sub> Alarm | Range   | Adjustment | Delay                              |
|------------------------|---------|------------|------------------------------------|
| SpO <sub>2</sub>       | 50-100% | 1% steps   | (0, 1, 2, 3,... 30)<br>+ 4 seconds |

| SpO <sub>2</sub> Alarm | Range                                   | Adjustment  | Delay                              |
|------------------------|---|---|------------------------------------|
| Desat                  | 50 - low alarm<br>limit                 | 1% steps  | (0, 1, 2, 3,... 30)<br>+ 4 seconds |
| Pulse                  | 30-300 bpm                              | 1 bpm steps<br>(30-40 bpm)<br>5 bpm steps<br>(40-300 bpm) | max.<br>14 seconds                 |
| Tachycardia            | Difference<br>to high limit<br>0-50 bpm | 5 bpm steps   | max.<br>14 seconds                 |
|                        | Clamping at<br>150-300 bpm              | 5 bpm steps   | max.<br>14 seconds                 |
| Bradycardia            | Difference<br>to low limit<br>0-50 bpm  | 5 bpm steps   | max.<br>14 seconds                 |
|                        | Clamping at<br>30-100 bpm               | 5 bpm steps   | max.<br>14 seconds                 |

## External Power Supply Specifications

### M8023A External Power Supply

#### Dimensions and Weight

|           |  |
|-----------|--|
| W x H x D | 208 x 105 x 135 mm<br>(8.2 x 4.1 x 5.3 in) |
| Weight    | 0.6 kg (1 lbs)                             |

#### Power Specifications

|              |                         |
|--------------|-------------------------|
| Line Voltage | 100-240 V approximately |
| Current      | 1.3-0.7 A               |
| Frequency    | 50-60 Hz approximately  |

#### Indicators

|          |           |
|----------|-----------|
| AC Power | Green LED |
|----------|-----------|

#### Ingress Protection

IP31 (protected against the ingress of solid foreign objects 2.5 mm in diameter or larger, and the ingress of water when water is dripping vertically) when rested on its rubber feet on a flat, level surface.  
IP32 when mounted with the connectors facing downwards.

## Performance Specifications Avalon FM20/30 Battery Option E25

### M4605A Battery

Operating time (with new, fully charged battery)

Basic monitoring configuration: >2 hours  
(Display brightness: 70%, Recorder: "On" at 3 cm/min, NBP: Auto Mode at 15 min, 2 US transducers, 1 Toco\* with MECC, 1 Patient Module with DECG)

## M4605A Battery

|             |   |
|-------------|---|
| Charge Time | When the monitor is off, approx. 6 hours. When monitor is in use, more than 10 hours (depending on monitor configuration) |
|-------------|---|

## Recorder Specifications

### Built-in Thermal Array Fetal Trace Recorder

|   |  |
|---|--|
| Type  | Standard Z-fold thermal paper  |
| Standard speeds (real-time traces)                | 3 cm/min, 2 cm/min, 1 cm/min   |
| Paper and Printing                                |  |
| ECG Wave Recording (FM30 only. Not real-time.)    | Emulated 25 mm/s print speed is variable up to 20 mm/s and depends on the print load |
| Paper advance                                     | Up to 20 mm/s  |
| Sensing   | Optical Reflex Sensor for black page marks   |
| Accuracy @ 3 cm/min, 2 cm/min, 1 cm/min           | ±5 mm/page   |
| Usable Print Width                                | 128 mm   |
| Resolution  | 8 dots/mm (200 dpi)  |
| Time delay to see trace on paper                  | <30s @ 1 cm/min  |
| Trace Separation Offset for FHR (Ultrasound/DECG) |  |
| Twin Standard Classic                             | FHR2 +20 bpm<br>FHR2 +20 bpm   |
| Triplet Standard Classic                          | FHR2 +20 bpm/FHR3-20 bpm<br>FHR1 +20 bpm/FHR3-20 bpm                                 |

## Ordering Information and Accessory Options

You can order the Avalon FM20/FM30 fetal monitor with the product number M2702A/M2703A. There are several ordering options available.

### Fetal Monitor Ordering Options

The following tables give an overview of the monitor's standard capabilities and its options. To order, precede the required option number with M2702A or M2703A (for example, M2702A with option B71 adds the noninvasive blood pressure measurement). "L" options let you modify your order. Features listed as options can also be added at a later time (see "Upgrade Options" on page 18).

The fetal monitor can be operated with the Avalon CL Transducer System, or with cabled transducers. The maternal measurements NBP and SpO<sub>2</sub> can also be measured cablelessly by ordering the IntelliVue Cableless Pods that are supported by the Avalon CL Transducer System.

If you want to operate the fetal monitor only cablelessly, order the L00 option so that the fetal monitor is delivered without cabled transducers. The fetal monitor can also be ordered with both, cabled and cableless transducers, to switch between cabled and cableless monitoring, if necessary. Refer to "Additional Accessories" on page 16 for a list of items shipped as part of the standard configuration. Start-up quantities of fetal supplies are available in five convenient kits.

### Fetal Monitor Options for the Avalon CL Transducer System

| Description                           | Comments  | Options |
|---------------------------------------|---|---------|
| FM20/30 Fetal Monitor (M2702A/M2703A) | The monitor is delivered without cabled transducers and adapter cables. The Avalon CL Transducer System is required for monitoring. | L00     |
| CL Base Station (866074)              |   |         |
| CL Toco*MP Transducer (866075)        |   |         |
| CL Ultrasound Transducer (866076)     | See the Avalon CL Technical Data Sheet for ordering details, options, and accessories.  |         |
| CL ECG/IUP Transducer (866077)        |   |         |
| CL Wide Range Pod (866487)            |   |         |
| CL Fetal & Maternal Pod (866488)      | Not available for USA, other FDA regulated territories, and Canada.   |         |

| Description                                 | Comments   | Options |
|---|--|---------|
| IntelliVue CL SpO <sub>2</sub> Pod (865215) | See the IntelliVue Cableless Measurements Technical Data Sheet for ordering details, options, and accessories. |         |
| IntelliVue CL NBP Pod (865216)              |  |         |

### Optional Interfaces

| Description                                | Comments  | Options <sup>1</sup> |
|--|---|----------------------|
| System Interface (RS232 port and LAN port) | For interfacing to Philips IntelliSpace Perinatal and service (software upgrade). | J70                  |
| Dual MIB/RS232 interface board             | For data export or interface to the Tympanic Temperature Thermometer.             | J13                  |
| Dual PS/2 interface board                  | For keyboard and mouse connection (M8024A #A01)                                   | J22                  |
| Quad. USB interface board                  | For keyboard, mouse, or barcode reader)   | J25                  |
| Flexible Nurse Call Relay interface board  |   | J30                  |

<sup>1</sup> Only two interfaces from the Jxx options can be fitted in the fetal monitor at the same time.

### Paper Scaling Options (Factory configuration)

| Description              | Options |
|--------------------------|---------|
| 50-210 bpm paper scaling | P01     |
| 30-240 bpm paper scaling | P02     |

### Transport Options (Battery and External Power Supply)

| Description   | Options |
|---|---------|
| Battery (M4605A), external power supply (M8023A with option E25), and MSL cable (1 m) | E25     |

## Standard Measurements Cabled Transducers

### Fetal Heart Rate (FHR)

| Description   | Comments                       | Option |
|---|--------------------------------|--------|
| Ultrasound FHR singletons<br>1 M2736A (M2736AA for US) transducer | M2736A includes fetal movement | L01    |
| Ultrasound FHR twins<br>2 M2736A (M2736AA for US) transducers     | Profile (FMP)                  | L02    |
| Ultrasound FHR triplets<br>3 M2736A (M2736AA for US) transducers  | Option C73 is required.        | L03    |

### Direct ECG (DECG) FM30 only

Includes DECG wave display. All transducers require a K51 DECG adapter cable.

| Description   | Option |
|---|--------|
| M2735A Toco* transducer (includes ECG/IUP capability) | L11    |
| 1 M2738A ECG/IUP patient module                       | L21    |
| 2 M2738A ECG/IUP patient modules                      | L22    |
| 3 M2738A ECG/IUP patient modules                      | L23    |

| DECG Accessories: Philips DECG Solution                                      | Part No.     |
|--|--------------|
| DECG reusable leg plate adapter cable (with flushing port) (K51)             | 989803137651 |
| DECG leg attachment electrode for DECG leg plate adapter cable, box of 25    | 989803139771 |
| DECG fetal scalp electrode: single spiral, worldwide availability, box of 25 | 989803137631 |

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**DECG Accessories: Philips DECG Solution Part No.**

DECG fetal scalp electrode: double spiral, 989803137641  
Europe only. Not for USA, box of 25

**Remote Event Marker**

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| Description  | Option |
|--|--------|
| Remote Event Marker (989803143411)<br>Can be connected to the fetal sockets at the fetal monitor and is operated manually to record an event on the trace. | L30    |

**Uterine Measurements****Toco (External)**

Toco and maternal pulse are measured in parallel.

---

| Description   | Option |
|---|--------|
| M2734B Toco MP transducer (maternal Smart Pulse integrated) | L10    |
| M2735A Toco* transducer (includes ECG/IUP capability)       | L11    |

**Intrauterine Pressure (FM30 only)**

---

| Description   | Option |
|---|--------|
| M2735A Toco* transducer (includes ECG/IUP capability) | L11*   |
| 1 M2738A ECG/IUP patient module                       | L21*   |
| 2 M2738A ECG/IUP patient modules                      | L22*   |
| 3 M2738A ECG/IUP patient modules                      | L23*   |

\* All transducers require a K52 IUP adapter cable

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| Koala IUP Accessories                                  | Part No.     |
|--|--------------|
| Disposable Koala IUP catheter, box of 10               | M1333A       |
| Reusable IUP adapter cable (corresponds to option K52) | 989803143931 |

**Optional Fetal Measurements**

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| Description  | Option |
|--|--------|
| NST Report capability and NST trace interpretation.<br>Analyzes the data according to the NICHD or based on the Dawes & Redman guidelines (not available for USA, other FDA regulated territories, and Canada) | C71    |
| Triple FHR via ultrasound<br>Requires the option L03.<br>FM30 only: Triplets monitoring is also possible with 2 x US and 1 x DECG (membranes ruptured)   | C73    |

**Maternal Heart Rate (MHR)****Maternal Pulse (MP) Rate Monitoring**

---

| Description   | Option |
|---|--------|
| M2734B Toco MP transducer (maternal Smart Pulse integrated)<br>Toco and maternal pulse are measured in parallel | L10    |

**Maternal ECG (MECG) Heart Rate Monitoring**

All transducers require a K53 MECG adapter cable. MECG wave available with FM30 only.

---

| Description   | Option |
|---|--------|
| M2735A Toco* transducer (includes ECG/IUP capability) | L11    |
| 1 M2738A ECG/IUP patient module                       | L21    |
| 2 M2738A ECG/IUP patient modules                      | L22    |
| 3 M2738A ECG/IUP patient modules                      | L23    |

---

| MECG Accessories  | Part No. |
|---|----------|
| MECG adapter cable (corresponds to option K53)                                    | M1363A   |
| Foam MECG electrodes, snap-fit, for MECG adapter cable, 5 per pack, 300 per case  | 40493D   |
| Foam MECG electrodes, snap-fit, for MECG adapter cable, 30 per pack, 300 per case | 40493E   |

**Optional Maternal Measurements****Noninvasive Blood Pressure (NBP)**

---

| Description                                      | Option |
|--|--------|
| Noninvasive Blood Pressure (NBP) with pulse rate | B71    |

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| Description  | Option |
|--|--------|
| Antimicrobial NBP cuff assortment (Accessory option) | K31    |

Noninvasive Blood Pressure Accessories

**Multi-Patient Comfort Cuffs with M1598B (1.5 m) or M1599B (3.0 m) Tubing**

| Maternal Patient Category | Limb Circumference | Part No. |
|---------------------------|--------------------|----------|
| Adult (thigh)             | 42.0–54.0 cm       | M1576A   |
| Large adult               | 34.0–43.0 cm       | M1575A   |
| Adult                     | 27.0–35.0 cm       | M1574A   |
| Small adult               | 20.5–28.0 cm       | M1573A   |
| Cuff kit of 4 adult sizes |                    | M1578A   |

**Disposable Cuffs with M1598B (1.5 m) or M1599B (3.0 m) Tubing**

| Maternal Patient Category | Limb Circumference | Part No. |
|---------------------------|--------------------|----------|
| Adult (thigh)             | 42.0–54.0 cm       | M1879A   |
| Large adult               | 34.0–43.0 cm       | M1878A   |
| Adult                     | 27.0–35.0 cm       | M1877A   |
| Small adult               | 20.5–28.0 cm       | M1876A   |
| Cuff kit of 4 adult sizes |                    | M1578A   |

**Antimicrobial Coated Reusable Cuffs with M1598B (1.5 m) or M1599B (3.0 m) Tubing**

| Maternal Patient Category                      | Limb Circumference | Part No. |
|--|--------------------|----------|
| Adult thigh (gray)                             | 45.0–56.5 cm       | M4559B   |
| Adult thigh (gray), pack of 5 cuffs            | 45.0–56.5 cm       | M4559B5  |
| Large adult X-long (burgundy)                  | 35.5–46.0 cm       | M4558B   |
| Large adult X-long (burgundy), pack of 5 cuffs | 35.5–46.0 cm       | M4558B5  |
| Large adult (burgundy)                         | 35.5–46.0 cm       | M4557B   |

| Maternal Patient Category  | Limb Circumference | Part No. |
|--|--------------------|----------|
| Large adult (burgundy), pack of 5 cuffs  | 35.5–46.0 cm       | M4557B5  |
| Adult X-long (navy blue)   | 27.5–36.5 cm       | M4556B   |
| Adult X-long (navy blue), pack of 5 cuffs  | 27.5–36.5 cm       | M4556B5  |
| Adult (navy blue)  | 27.5–36.5 cm       | M4555B   |
| Adult (navy blue), pack of 5 cuffs   | 27.5–36.5 cm       | M4555B5  |
| Small adult (royal blue)   | 20.5–28.5 cm       | M4554B   |
| Small adult (royal blue), pack of 5 cuffs  | 20.5–28.5 cm       | M4554B5  |
| Cuff kits containing one small adult, one adult, one large adult, and one thigh cuff   |                    | 864288   |
| Cuff kits containing one small adult, one adult, one adult X-long, one large adult, one large adult X-long, and one thigh cuff |                    | 864291   |

**Soft Single Patient Single-Hose Disposable Cuffs with M1598B (1.5 m) or M1599B (3.0 m) Tubing**

| Maternal Patient Category | Limb Circumference | Part No. |
|---------------------------|--------------------|----------|
| Adult (thigh)             | 45.0–56.5 cm       | M4579B   |
| Large adult X-long        | 35.5–46.0 cm       | M4578B   |
| Large adult               | 35.5–46.0 cm       | M4577B   |
| Adult X-long              | 27.5–36.5 cm       | M4576B   |
| Adult                     | 27.5–36.5 cm       | M4575B   |

| Maternal Patient Category | Limb Circumference | Part No. |
|---------------------------|--------------------|----------|
| Small adult               | 20.5–28.5 cm       | M4574B   |

#### NBP Cuff Assortment Kit

| Description  | Part No.                                      |
|--|---|
| Antimicrobial NBP cuff assortment kit with 3 m (10 ft) connection tubing (corresponds to option K31) | M1599B (tubing)<br>M1573A<br>M1574A<br>M1575A |

#### Pulse Oximetry

| Measurement                                 | Description                             | Option |
|---|---|--------|
| Pulse Oximetry (maternal SpO <sub>2</sub> ) | B73 includes NBP monitoring (FM30 only) | B73    |

Reusable maternal SpO<sub>2</sub> sensor M1191BL (3 m cable) K91

#### SpO<sub>2</sub> Accessories

All listed sensors operate without the risk of exceeding 41°C on the skin if the initial skin temperature is below 37°C (FM30 only).

#### Philips Reusable Sensors

| Description   | Part No. |
|---|----------|
| Adult sensor (2.0 m cable), for patients over 50 kg. Any finger except thumb. | M1191B*  |

2.1.18.3. **su ilgesniu pajungimo kabeliu (3.0 m) M1191BL with longer cable (3.0 m) M1191BL\***

Small adult, pediatric sensor (1.5 m cable) for patients between 15 kg and 50 kg. Any finger except thumb. Use only on adult patients with FM30/40/50. M1192A\*

Ear sensor (1.5 m cable) for patients more than 40 kg. Use only on adult patients with FM30/40/50. M1194A\*

Adult clip sensor (3 m cable) for patients over 40 kg. Any finger except thumb. M1196A\*

Adult clip sensor (2 m cable) for patients over 40 kg. Any finger except thumb. M1196S\*

\* No adapter cable required.

| Description  | Part No. |
|--|----------|
| Adult sensor (0.45 m cable), for patients over 50 kg. Any finger except thumb. | M1191T*  |

| Description   | Part No. |
|---|----------|
| Small adult or pediatric sensor (0.45 m cable) for patients between 15 kg and 50 kg. Any finger except thumb. Use only on adult patients with FM30/40/50. | M1192T*  |

Adult clip sensor (0.9 m cable) for patients over 40 kg. Any finger except thumb. M1196T\*

\* Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable.

| Description   | Part No.  |
|---|-----------|
| Special Edition (SE): Adult sensor (3 m cable), for patients over 50 kg. Any finger except thumb. | M1191ANL* |

Special Edition (SE): Small adult or pediatric sensor (1.5 m cable) for patients between 15 kg and 50 kg. Any finger except thumb. Use only on adult patients with FM30/40/50. M1192AN\*

Special Edition (SE): Ear sensor (1.5 m cable) for patients more than 40 kg. M1194AN\*

\* No adapter cable required. SE sensors work with FM30/40/50, as well as with OxiMax-compatible SpO<sub>2</sub> versions of other Philips monitors.

#### Philips Disposable Sensors

| Description               | Part No. |
|---------------------------|----------|
| Identical to OxiMax MAX-A | M1904B*  |
| Identical to OxiMax MAX-P | M1903B*  |
| Identical to OxiMax MAX-N | M1901B*  |

\* Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable. Not available in the USA.

| Description   | Part No. |
|---|----------|
| Adult/pediatric finger sensor (0.45 m cable). Use only on adult patients with FM30/40/50. | M1131A*  |

Adult/pediatric finger sensor (0.9 m cable) for patients >40 kg. Any finger except thumb. Use only on adult patients with FM30/40/50. M1133A\*

\* Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable

#### Nellcor Sensors

Nellcor sensors must be ordered from Medtronic.

| Product Name   | Description                               |
|----------------|---|
| OxiMax MAX-A*  | Adult finger sensor (patient size >30 kg) |
| OxiMax MAX-AL* | OxiMax MAX-A with long cable              |

| Product Name  | Description  |
|---------------|--|
| OxiMax MAX-P* | Pediatric or small adult foot/hand sensor (patient size 10-50 kg). Use only on adult patients with FM30/40/50. |

|               |   |
|---------------|---|
| OxiMax MAX-N* | Adult finger or neonatal foot/hand sensor (patient size >40 kg or <3 kg). Use only on adult patients with FM30/40/50. |
|---------------|---|

\* Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable.

| Product Name       | Description  |
|--------------------|--|
| Oxisensor II D-25* | Adult sensor (patient size >30 kg)   |
| Oxisensor II D-20* | Pediatric sensor or small adult (patient size 10-50 kg). Use only on adult patients with FM30/40/50. |

|                    |   |
|--------------------|---|
| Oxisensor II N-25* | Neonatal/adult sensor (patient size <3 kg or >40 kg). Use only on adult patients with FM30/40/50. |
|--------------------|---|

\* Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable

| Product Name | Description   |
|--------------|---|
| OxiCliq A*   | See OxiMax MAX-A  |
| OxiCliq P*   | See OxiMax MAX-P. Use only on adult patients with FM30/40/50. |
| OxiCliq N*   | See OxiMax MAX-N. Use only on adult patients with FM30/40/50. |

\* Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable together with OC-3 adapter cable

#### Masimo LNOP Reusable Sensors

| Product Name | Description   | Part No.     |
|--------------|---|--------------|
| LNOP DCI*    | Adult finger sensor (>30 kg)  | 989803140321 |
| LNOP DCIP*   | Pediatric finger sensor (10-50 kg). Use only on adult patients with FM30/40/50. | 989803140331 |
| LNOP YI*     | Multi-site sensor (>1 kg). Use only on adult patients with FM30/40/50.          | n/a          |
| LNOP TC-I*   | Ear sensor (>30 kg). Use only on adult patients with FM30/40/50.                | 989803140341 |

\* These sensors require the adapter cable Masimo MP12 Cable (M1020-61100).

#### Masimo LNCS Reusable Sensors

| Product Name | Description   | Part No.     |
|--------------|---|--------------|
| LNCS DCI*    | Adult Finger Sensor (>30 kg)  | 989803148281 |
| LNCS DCIP*   | Pediatric Finger Sensor (10-50 kg). Use only on adult patients with FM30/40/50. | 989803148291 |
| LNCS TC-I*   | Ear Sensor (>30 kg). Use only on adult patients with FM30/40/50.                | 989803148301 |

\* These sensors require the adapter cable LNC MP10 (989803148221).

#### Masimo LNOP Disposable Adhesive Sensors

| Product Name | Description   | Part No.     |
|--------------|---|--------------|
| LNOP Adt*    | Adult Sensor (>30 kg)   | 989803140231 |
| LNOP Adtx*   | Adult Sensor (>30 kg)   | n/a          |
| LNOP Pdt*    | Pediatric Sensor (10-50 kg). Use only on adult patients with FM30/40/50.                  | 989803140261 |
| LNOP Pdtx*   | Pediatric Sensor (10-50 kg). Use only on adult patients with FM30/40/50.                  | n/a          |
| LNOP Neo-L*  | Neonatal (<3 kg) or Adult adhesive Sensor (>40 kg). Use only on adult patients with FM30. | 989803140291 |

\* These sensors require the adapter cable Masimo MP12 Cable (M1020-61100).

#### Masimo LNCS Disposable Adhesive Sensors

| Product Name | Description   | Part No.     |
|--------------|---|--------------|
| LNCS Adtx*   | Adult Sensor (>30 kg)   | 989803148231 |
| LNCS Pdtx*   | Pediatric Finger Sensor (10-50 kg). Use only on adult patients with FM30/40/50. | 989803148241 |

| Product Name | Description   | Part No.     |
|--------------|---|--------------|
| LNCS Neo-L*  | Neonatal Foot Sensor (<3 kg) or Adult Finger Sensor (>40 kg). Use only on adult patients with FM30/40/50. | 989803148271 |

\* These sensors require the adapter cable LNC MP10 (989803148221).

### Tympanic Temperature Thermometer

| Tympanic Temperature Thermometer   | Part No.    |
|--|-------------|
| Tympanic Temperature Thermometer (requires J13), including:  | 866149      |
| <ul style="list-style-type: none"> <li>• A base station for mounting on a table, wall, or a roll stand</li> <li>• A starter pack of 96 probe covers</li> </ul> |             |
| Adding a 1.5 m, RS232 connection cable   | 866149 #A01 |
| Adding a 3.0 m, RS232 connection cable   | 866149 #A02 |

### Additional Accessories

The following accessories are delivered with any fetal monitor order.

| Description   | Quantity |
|---|----------|
| Fetal paper pack (country-specific, installed)                                      | 1        |
| Power cable   | 1        |
| Documentation DVD (Instructions for Use, and all other fetal monitor documentation) | 1        |

### Fetal Supplies Starter Kits

| Description   | Contents  | Kit Number |
|---|---|------------|
| Standard Antepartum Kit (North America)               | Paper (30-240), belts, gel, belt buttons, belt clips  | 862214     |
| Standard Antepartum Kit (Europe, Latin America, Asia) | Paper (50-210), belts, gel, belt buttons, belt clips  | 862215     |
| Standard Antepartum Kit (Japan)                       | Paper (50-210), belts, gel, belt buttons, belt clips  | 862216     |
| Intrapartum DECG Kit (single spiral) FM30 only        | Fetal scalp electrodes, fetal adhesive pad electrodes | 862217     |

| Description                                    | Contents  | Kit Number |
|--|---|------------|
| Intrapartum DECG Kit (double spiral) FM30 only | Fetal scalp electrodes, fetal adhesive pad electrodes | 862218     |

### Additional Fetal Accessories

### Fetal Accessories

| Description                                | Content   | Part No.     |
|--|---|--------------|
| Belt (reusable, gray, water resistant)     | 32 mm wide, 15 m roll (32 mm belts for use with M2738A Patient Module only) | M4601A       |
|  | 60 mm wide, 5 belts   | M4602A       |
|  | 60 mm wide, 15 m roll   | M4603A       |
|  | 50 mm wide, 5 belts   | M1562B       |
| Belt (disposable, yellow, water resistant) | 60 mm wide, pack of 100   | M2208A       |
| Ultrasound Gel                             | 12 bottles  | 40483A       |
|  | 5 liter refill (with dispenser) for 40483A. Shelf life: 24 months maximum   | 40483B       |
| Belt Buttons and Belt Clip                 | Belt buttons (pack of 10)   | M1569A       |
|  | Butterfly belt clip (pack of 6)   | 989803143401 |

### Recorder Paper

Supplied in cases of 40 packs. Each pack has 150 numbered pages.

|                         | USA/Canada and Asia | Europe/Japan | Japan             |
|-------------------------|---------------------|--------------|-------------------|
| FHR Scale               | 30-240              | 50-210       | 50-210            |
| Grid Color              | Red/Orange          | Green        | Green             |
| Scale units             | mmHg and kPa        | mmHg         | mmHg              |
| Highlighted 3 cm lines? | Yes                 | No           | Yes               |
| Part No.                | M1910A              | M1911A       | M1913A/<br>M1913J |

## Input Devices

| Description  | Part No./Option |
|--|-----------------|
| Slimline keyboard with integrated trackball (includes spill cover) | M8024A #A01     |
| Optical mouse  | M8024A #B01     |
| Trackball  | M8024A #C01     |
| Wireless trackball   | M8024A #C02     |
| Hand-Track   | M8024A #C03     |

## Mounting Hardware

Mounts, Carts, and Rollstands

| Description                                 | Picture   | Part No./Option |
|---|---|-----------------|
| Flush Wall Mount for a flat wall mounting   |   | M2740A #A01     |
| Wall Mount (Arm)                            |  | M2740A #A05     |
| Bed Hanger                                  |  | M2740A #B01     |
| Cart with fixed angle mount and two drawers |  | M2740A #C02     |

| Description         | Picture   | Part No./Option |
|---------------------|---|-----------------|
| Rollstand with tray |  | M2740A #R01     |

|   |   |             |
|---|---|-------------|
| Mounting Kit for Avalon CL for use with M2740A #C02 |  | M2740A #U02 |
|---|---|-------------|

|   |  |             |
|---|--|-------------|
| Wall Channel required for wall mounts A01 and A05 |  | M2740A #W01 |
|---|--|-------------|

|                                |   |                   |
|--------------------------------|---|-------------------|
| Additional drawer for the cart |  | M2740A Option C11 |
|--------------------------------|---|-------------------|

## Upgrade Options

Upgrade options are prefixed with M2702AU/M2703AU. For example, to add a system interface upgrade, order M2702AU option J70.

| Description   | Option |
|---|--------|
| Noninvasive blood pressure, no supplies included  | B71    |
| Pulse oximetry (SpO <sub>2</sub> ), no supplies included (FM30 only)                                      | B72    |
| NBP and SpO <sub>2</sub> measurement (FM30 only)  | B73    |
| NST Trace Interpretation  | C71    |
| Maternal Pulse  | C72    |
| Triplets monitoring capability  | C73    |
| Intrapartum   | C81    |
| Battery upgrade for monitors with Rev. G software or higher   | E25    |
| Dual MIB/RS232 Interface for Data Export functionality, and for maternal infrared temperature measurement | J13    |
| Dual PS/2 Interface for connecting a keyboard and mouse   | J22    |
| Quadruple USB Interface (keyboard, mouse, barcode reader)   | J25    |
| Flexible Nurse Call Relay Interface   | J30    |
| System Interface: RS232 port and LAN port   | J70    |
| Release J.3 Software Upgrade  | SJ3    |
| Release L.3 Software Upgrade  | SL3    |





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The Avalon Fetal monitors comply with the requirements of the Council Directive 93/42/EEC of 14 June 1993 (Medical Device Directive) as amended.