IP

Intrapartum

Avalon FM50 Fetal/Maternal Monitor

Philips M2705A
Technical Data Sheet

The Philips Avalon FM50 is a state-of-the-art fetal/maternal monitor, offering a high-end solution for intrapartum fetal monitoring requirements in clinics and hospitals, during labor and delivery and for antepartum monitoring of high-risk patients.

With a cutting-edge feature set, including advanced transducers, high quality signal processing, and a touchscreen interface, the Avalon FM50 sets new standards for performance, flexibility, convenience, and ease of use.

Measurements

The **Avalon FM50** lets you monitor and document:

- Up to three fetal heart rates externally using ultrasound
- DECG including ECG waveform display via combined Toco/ECG "Toco+" transducer (also can measure MECG)
- Uterine activity externally, or intrauterine pressure
- Maternal heart rate with ECG waveform display
- 6 second maternal and/or fetal ECG strip, with a choice of real-time recording or "snapshot" together with the fetal trace
- Maternal blood pressure and pulse oximetry

Features

- Touchscreen for intuitive, easy operation
- TFT color display with a wide viewing angle and large numerics
- Built-in 6-inch recorder, with paper guide incorporating tear-off edge, for automatic printing

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of fetal and maternal parameters on the trace
- Intelligent transducers are waterproof, light, comfortable to wear and easy to clean
- Automatic channel management lets you connect any fetal transducer, patient module or remote event marker to any fetal sensor socket
- Cross-Channel Verification between *all* fetal and maternal heart rates
- The blue transducer Finder LED lets you identify at a glance which transducer is monitoring which measurement, while the position indicator shows you to which fetal sensor socket a transducer is connected
- Transmission of fetal and maternal parameters to an obstetrical surveillance system
- Network connectivity to an OB TraceVue[1] system via LAN connection using the optional system interface, where OB TraceVue controls all patient admit/discharge events
- Internal backup memory allows recovery of up to one hour of trace data, either to paper or to an OB TraceVue[1] system over a LAN connection
- Stored Data Recording lets you print a specific patient episode from memory
- Cordless monitoring using the award-winning Avalon CTS Cordless Fetal Transducer System[2]
- Dedicated rear connection for cordless monitoring using the award-winning Avalon CTS Cordless Fetal Transducer System[3]
- Comprehensive patient data presentation, including at-a-glance patient identification, and the choice to add user-configurable notes[4]
- Automatic screen layouts optimize size and presentation of measurements
- VGA output for connection to an external display (touch screen operation supported via optional MIB interface)
- Paper Save Mode for maternal measurements
- Fetal Movement Profile (FMP) detects and automatically records gross fetal body movements for antepartum applications
- NST timer for antepartum applications

Description of Main Components

TFT Color Display

The monitor has an integrated color TFT display with a wide viewing angle, providing high resolution data presentation. Fetal and maternal measurements are displayed as large, easy-to-read numerics.

Information such as patient identification (including the bed label when connected to a surveillance system such as OB TraceVue), date and time, alarm information, icons for recorder status, and prompt and error messages are also clearly shown.

Touchscreen User Interface

The monitor is operated using the touchscreen. All user functions (apart from the On/Off switch) are controlled directly from the screen, and the intuitive, color, graphical user interface not only makes it quick and easy to learn and use, but the lack of mechanical controls also makes cleaning the Avalon fetal monitor much quicker and simpler.

A number of configurable SmartKeys at the bottom of the main screen allow fast access to functions, for starting a recording, or resetting a Toco baseline, for instance.

Heart rate and alarm volume adjustment, with an indication of the current setting, are always available at the top of the screen.

Integrated Recorder

The Avalon fetal monitor has an integrated, high resolution thermal array recorder, with paper-out/-end detection.

Traces are recorded at either 1, 2 or 3 cm/min.

Continuous traces are made for:

- Fetal Heart Rate(s)
- Maternal Heart Rate
- Fetal Movement
- Uterine Activity

The monitor prints the time, the date, trace identification symbols, the monitoring mode and the paper speed when first switched on, every ten minutes after, and whenever the monitoring modes change.

Maternal heart rate and the maternal pulse oximetry valueis printed every 5 minutes. In the case of maternal noninvasive blood pressure measurement, the annotation is made at the end of the measurement.

You can print the ECG waveform (for both DECG and MECG) in addition to viewing it on the screen.

Depending on the geography, there are two possible paper scales:

1. OB TraceVue Revision E.00.00 or later.
2. Requires Avalon CTS interface cable M2731-60001, and monitor software revision D.00.00 or higher.
3. Requires Avalon CTS interface cable M2732-60001 for rear connection, or M2731-60001 for front connection), and monitor software revision D.00.00 or higher.
4. Using standard Roman-8 character sets.

• FHR Scale:
  - Red paper: 30 to 240 bpm @ 30 bpm/cm
  - Green paper: 50 to 210 bpm @ 20 bpm/cm
• Labor Scale:
  - 0 to 100 units @ 25 units/cm

Alarms

When an alarm limit is exceeded, it is signalled 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** for fetal and maternal parameters (to indicate vital sign alarm limit violations, for instance)
• **Technical Alarms (INOPs)** are triggered by signal quality problems, equipment malfunction or equipment disconnect.

Alarm modes:

• **INOP only:** only INOPs are enabled, with audible and visual indication active. This is the default.
• **All:** patient alarms and INOPs are enabled, with audible and visual indicators active.

Alarm suspension:

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

Alarm latching/non-latching:

• Visual
• Audible
• Visual and audible

Interfaces

LAN/RS-232 System Interface

The monitor has an optional LAN/RS-232 interface board with two fully-isolated ports:

- The LAN port is for connecting the monitor to an OB TraceVue obstetrical information and surveillance system on a network, or to a PC for configuration or upgrade using the Support Tool
- The RS232 port can be used for connecting the monitor to an obstetrical information and surveillance system, such as OB TraceVue

Input Device Interface (Dual PS/2 Interface)

This optional interface provides two PS/2 ports to enable the monitor to be connected to off-the-shelf, "plug-and-play" input devices:

- **Mouse:** any specified PS/2 mouse or trackball may be used for navigation and data entry.
- **Computer keyboard:** a PS/2 computer keyboard can be used for data entry instead of the on-screen pop-up keyboard.

Dual MIB/RS232 Interface

The dual MIB/RS232 interface is for external medical grade touch screen connection.

Service Features

• The Support Tool helps technical personnel to
  - carry out configuration, upgrades and troubleshooting on an individual monitor.
  - share configuration settings between monitors.
  - back up the monitor settings.
• The Service Mode is password-protected and 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.
• The Demo Mode is password-protected and is intended for training and educational purposes.

Related Products

The monitor is compatible with the Avalon CTS Cordless Fetal Transducer System (M2720A), 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 CTS Data Sheet for further information, see "Accessory Options" on page 11 for the required Avalon CTS interface cable.

Regulatory and Standards Compliance

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

The monitor is in conformity with the essential requirements of the European Medical Devices Directive 93/42/EEC and the following major international standards:

Safety, Performance

- EN 60601-1:1990+A1:1993+A2:1995/IEC 60601-1:1988+A1:1991+A2:1995
- EN 60601-1-1:2001/IEC 60601-1-1:2000
- EN 60601-1-6:2004/IEC 60601-1-6:2004
- EN/IEC 60601-2-27:1994
- EN/ISO 9919:2005
- EN 60601-2-30:2000/IEC 60601-2-30:1999
- EN/IEC 60601-2-37:2001+A1:2004
- EN 60601-2-49:2001/IEC 60601-2-49:2001
- UL 60601-1:2003
- CAN/CSA C22.2#601.1-M90
- AS/NZS 3200.1.0-1998

The possibility of hazards arising from hardware and software errors was minimized in compliance with ISO 14971:2000+A1:2003, EN60601-1-4:1996+A1:1999 and IEC 60601-1-4:1996+A1:1999.

Alarm sounds are compliant with the draft ISO/IEC 9703-2 Standard.

Electromagnetic Compatibility

- EN/IEC 60601-1-2:2001+A1:2004
- ICES-001:1988

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

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

Environmental Specifications

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

FM50 Monitor		
Temperature Range	Operating	0°C to 45°C (32°F to 113°F)
	Storage	-20°C to 60°C (-4°F to 140°F)
Humidity Range	Operating	<95% relative humidity @ 40°C/104°F
	Storage	<90% relative humidity @ 60°C/140°F
Altitude Range	Operating	-500 to 3000 m/ -1640 to 9840 ft.
	Storage	-500 to 13100 m/ -1640 to 43000 ft.

Transducers (M2734A/M2735A/M2736A/M2738A)		
Temperature Range	Operating	0°C to 40°C (32°F to 104°F)
	Storage	-20°C to 60°C (-4°F to 140°F)
Humidity Range	Operating	<95% relative humidity @ 40°C/104°F
	Storage	<90% relative humidity @ 60°C/140°F
Altitude Range	Operating	-500 to 3000 m/ -1640 to 9840 ft.
	Storage	-500 to 13100 m/ -1640 to 43000 ft.

Physical Specifications

FM50 Monitor		
Power	Supply Voltages	100 VAC to 240 VAC ± 10%
	Supply Frequency Range	50 Hz/60 Hz
	Power consumption (current)	1.3 - 0.7 A
Dimensions and Weight	Size mm/(in) ±1%: W x H x D (without options)	420 x 172 x 370 ±5% (16.5 x 6.8 x 14.6 in ±5%)
	Weight	< 9.0 kg/19.8 lbs

FM50 Monitor		
Degree of Protection Against Electrical Shock	Type CF	
Electrical Class	Class I equipment	
Mode of Operation	Continuous operation	
Startup Time	Time taken from switching on the monitor to seeing the first parameter labels	< 30 seconds

Transducers (M2734A/M2736A)			
Shock Resistance	Withstands ten 1m drops to concrete surface with possible cosmetic damage only		
Water Ingress Protection Code	**M2734A/ M2735A/ M2736A**	IP 68 (immersion up to 1 m water depth for 5 hours)	
	M2738A	IP 67 (immersion up to 0.5 m water depth for 30 minutes)	
Dimensions and Weight	**M2734A/ M2735A/ M2736A**	Size (diameter)	83 mm/3.27 in
		Weight (without cable)	< 220 g/7.8 oz.
	M2738A	Maximum size mm/ (in): W x H x D	50 x 28 x 135 (2.0 x 1.1 x 5.3 in)
		Cable length	2.5 m
		Weight	< 150 g/5.3 oz.
Water Ingress Protection Code	IP 68 (immersion up to 1m water depth of for 5 hours)		
Degree of Protection Against Electrical Shock	Type CF		

Performance Specifications

Complies with EN/IEC 60601-2-37:2001+A1:2004. ECG measurement follows EN/IEC 60601-2-27:1994.

Fetal / Maternal

Fetal/Maternal Performance Specifications			
Ultra-sound	Measurement Method		Ultrasound Pulsed Doppler
	Measure-ment Range	US	50 to 240 bpm
	Resolution	Display	1 bpm
		Printer	1/4 bpm
	Jitter @ 200 bpm		≤ 3 bpm
	Display Update Rate		1 / second
	US Intensity	Average output power	P = (4.3 ± 0.4) mW
		Peak-negative acoustic pressure	p_- = (33.9 ± 3.6) kPa
		Output beam intensity (I_{ob}) (= spatial average - temporal average intensity)	I_{sata} = (2.38 ± 0.75) mW/cm^2
		Spatial-peak temporal average intensity	I_{spta} = (10.3 ± 2.2) mW/cm^2
		Effective radiating area @ -6 dB	1.81 cm^2
	Signal Quality Indication	Poor	Empty
		Acceptable	Two-thirds full
		Good	Full

Fetal/Maternal Performance Specifications			
Ultra-Sound	Beat to Beat Change (max.) for Ultrasound		28 bpm
	US Frequency		1 MHz ± 100 Hz
	US Signal range		3.5 µVpp to 350 µVpp @ 200 Hz
	US Burst	Repetition Rate	3.0 kHz
		Duration	≤ 100 µs
	US LF Frequency Passband @ -3dB		100 to 500 Hz ± 20%
	FMP Signal Range @ 33 Hz		200 µVpp to 40 mVpp
	FMP Frequency Passband @ -3dB		10 to 100 Hz
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 to 127 Units
	Maximum Offset Range		-300 units
	Baseline Setting		20 units
	Update Rate	Display	1 / second
		Printer	~4 / second
	Auto Offset Correction		3 seconds after connecting the transducer, the TOCO value is set to 20 units
	Auto Zero Adjust		TOCO value is set to zero following a negative measurement value for 5 seconds

Fetal/Maternal Performance Specifications			
IUP	Measurement Method		Passive Resistive Strain Gauge Elements
	Measurement Range		-100 to +300 mmHg
	Signal Range		-99 to 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
	Accuracy (not including sensor accuracy)		± 0.5% per 100 mmHg
	Update Rate	Display	1 / second
		Printer	~4 / second
	Auto Offset Correction		3 seconds after connecting the transducer, the IUP value is set to 0 mmHg
Direct ECG and Maternal ECG	Type	DECG	Single Lead ECG (derived from Fetal Scalp Electrode)
		MECG	Single Lead ECG (derived from RA and LA electrodes)
	Measurement Range		30 to 240 bpm
	Resolution	Display	1 bpm
		Recorder	1/4 bpm
	Accuracy		± 1 bpm or 1%, whichever is greater
	Filter Bandwidth		0.8 to 80 Hz
	Inop Auxiliary Current (Leads Off Detection)		< 100 µA
	Input Signal Range	DECG	20 µVpp to 6 mVpp
		MECG	150 µVpp to 6 mVpp
	Defibrillator Protection		None
	ESU Protection		None

Fetal Heart Rate (Ultrasound/DECG) Alarm Specifications			
FHR Alarm Limits	Range	Bradycardia (low limit)	60 to 200 bpm adjustable in 10 bpm steps Default: 110 bpm
		Tachycardia (high limit)	60 to 210 bpm adjustable in 10 bpm steps Default: 170 bpm
FHR Alarm Delay	Range	Bradycardia (low limit) Delay	10 to 300 seconds in steps of 10 s Default: 240 s
		Tachycardia (high limit) Delay	10 to 300 seconds in steps of 10 s Default: 300 s
		Signal Loss Delay	10 to 300 seconds in steps of 10 s

MECG Alarm Specifications	Range	Adjustment
MECG Alarm Limits	High Range: 31 to 240 Default: 120 bpm	1 bpm steps (30 to 40 bpm) 5 bpm steps (40 to 240 bpm)
	Low Range: 30 to 235 Default: 50 bpm	
Tachycardia	Difference to high limit: 0 to 50 bpm Default: 20 bpm	5 bpm steps
	Clamping at: 150 to 240 bpm Default: 200 bpm	5 bpm steps

MECG Alarm Specifications	Range	Adjustment
Bradycardia	Difference to low limit: 0 to 50 bpm Default: 20 bpm	5 bpm steps
	Clamping at: 30 to 100 bpm Default: 40 bpm	5 bpm steps

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 60601-2-30:1999/EN60601-2-30:2000.

Noninvasive Blood Pressure Performance Specifications		
Measurement Ranges	**Systolic**	30 to 270 mmHg (4 to 36 kPa)
	Diastolic	10 to 245 mmHg (1.5 to 32 kPa)
	Mean	20 to 255 mmHg (2.5 to 34 kPa)
Accuracy		Max. Std. Deviation: 8 mmHg (1.1 kPa) Max. Mean Error: ±5 mmHg (±0.7 kPa)
Pulse Rate	**Range**	40 to 300 bpm
	Accuracy (average over non-invasive blood pressure measure-ment cycle)	40 to 100 bpm: ±5 bpm
		101 to 200 bpm: ±5% of reading
		201 to 300 bpm: ±10% of reading

Noninvasive Blood Pressure Performance Specifications	
Measurement Time	Typical at HR > 60bpm Auto/manual: 30 seconds (adult) Maximum time: 180 seconds (adult)
Cuff Inflation Time	Typical for normal adult cuff: Less than 10 seconds
Initial Cuff Inflation Pressure	165 ±15 mmHg
Auto Mode Repetition Times	1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60 or 120 minutes
Venipuncture Mode Inflation	
Inflation Pressure	20 to 120 mmHg (3 to 16 kPa)
Automatic deflation after	170 seconds

Alarm Specifications	Range	Adjustment
Systolic	Adult: 30 to 270 mmHg (4 to 36 kPa)	10 to 30 mmHg: 2 mmHg (0.5 kPa) > 30 mmHg: 5 mmHg (1kPa)
Diastolic	Adult: 10 to 245 mmHg (1.5 to 32 kPa)	
Mean	Adult: 20 to 255 mmHg (2.5 to 34 kPa)	

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

SpO_2

Maternal pulse oximetry provides numerics and pulse trace for oxygen saturation (SpO_2) of functional maternal arterial hemoglobin. Heart rate is measures from maternal ECG electrodes (if connected). Otherwise, the pulse rate is derived from pulse oximetry.

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

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

SpO_2 Performance Specifications		
SpO_2 The specified accuracy is the root-mean-square (RMS) difference between the measured values and the reference values	Range	0 to 100%
	Accuracy	**Philips Reusable Sensors:** M1191A/B, M1191AL/BL, M1191ANL, M1192A, M1192AN = 2% (70% to 100%) M1191T, M1192T, M1194A, M1194AN, M1196A, M1196T = 3% (70% to 100%) **Philips Disposable Sensors with M1943A(L):** M1131A, M1901B, M1903B, M1904B = 3% (70% to 100%) **NellcorPB® Sensors with M1943A(L):** MAX-A, MAX-AL, MAX-P, MAX-N, D-25, D-20, N-25, OxiCliq A, P, N = 3% (70% to 100%)
	Resolution	1%
Pulse	Range	30 to 300 bpm
	Accuracy	±2% or 1 bpm, whichever is greater
	Resolution	1 bpm
Sensors	Wavelength range	500 to 1000 nm. Information about the wavelength range can be especially useful to clinicians (for instance, when photodynamic therapy is performed).
	Emitted Light Energy	≤ 15mW
Pulse Oximeter Calibration Range		70% - 100%

Recorder Specifications

Built-in Thermal Array Fetal Trace Recorder		
Mechanism	Thermal Array Recorder	
Paper & Printing	Type	Standard Z-fold paper

Built-in Thermal Array Fetal Trace Recorder			
	Standard Speeds (real-time traces)		3 cm/min, 2 cm/min, 1cm/min
	ECG Wave Recording (not real-time)		Emulated 25 mm/s Print speed is variable up to 20 mm/s and depends on the print load
	Stored Data Recording/Trace Recovery Printout		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 and DECG)	Twin	Standard	FHR2 +20 bpm
		Classic	FHR1 +20 bpm
	Triplet	Standard	FHR2 +20 bpm FHR3 -20 bpm
		Classic	FHR1 +20 bpm FHR3 -20 bpm

Ordering Guide and Accessory Options

You can order the Avalon FM50 fetal monitor under the product number **M2705A**. To order, precede the required option number with **M2705A** (for example, **M2705A** adds the noninvasive blood pressure measurement). “K” options let you modify your order. Below you will find tables giving you a quick overview of the monitor’s standard capablities, and what is available as options. Refer to “Standard Accessories Included” on page 12 for a list of items shipped as part of the standard configuration. Start-up quantities of fetal supplies are available in five convenient kits.

All features listed as options can be added at a later time (see “Upgrade Options” on page 16).

Standard Measurements

Type	Description	Recommended Accessory Option (See "Accessory Options" on page 11)
Standard Fetal Measure-ments:	Fetal Heart Rate (FHR) via ultrasound	-
	Twins monitoring via ultrasound	K02
	Fetal Movement Profile* (FMP)	-
	Toco	-
	FHR via Direct ECG (DECG) including DECG waveform	-
	Intrauterine Pressure (IUP)	K03
Standard Maternal Measure-ments:	Maternal ECG** and Heart Rate via MECG electrodes, including MECG waveform	K03
	Noninvasive Blood Pressure (NIBP) with Pulse Rate	K31
	Pulse Oximetry (maternal SpO_2)	K91

*We recommend to switch off FMP during labor.

**You can measure MECG using the "Toco+" transducer if you are not already using it to measure DECG. Order M1363A separately (see "MECG Accessories" on page 13).

Optional Measurements

Type	Description	Required Option	Recommended Accessory Option(s) (See "Accessory Options" on page 11)
Optional Fetal Measure-ments:	Triple FHR via ultrasound	**C73**	K02

Standard Interfaces

Description	Option
System Interface (1 x RS232 port and 1 x LAN port)	J70
Rear Telemetry connectors (for connecting to Avalon CTS)	J80
External Display	J90

Optional Interfaces

Description	Required Option	Recommended Accessory Option
Dual MIB/RS232 Interface for connecting external touch screen (M8033B, M8033C)	J13	-
Dual PS/2 Interface for keyboard and mouse connection	J22	M8024A #A01) (See "Input Devices" on page 15)

Accessory Options

Option Number	Description
K01	The monitor comes with one ultrasound transducer. To add a second M2736A ultrasound transducer, order option **K01**.
K02	The monitor comes with one ultrasound transducer. To add two additional M2736A ultrasound transducers, order option **K02** (only in conjunction with C73).
K03	Order ECG/IUP Patient Module M2738A (includes MECG adapter cable M1363A), using option **K03**.
K04	Order the Remote Event Marker (989803143411) using option **K04**.
K10	Toco transducer and Patient Module instead of Toco+ transducer
K30	Avalon CTS Cable M2731-60001 for front connection
K40	Avalon CTS Cable M2732-60001 for rear connection (requires option **J80**)
K31	Order Antimicrobial NIBP Cuff assortment kit with 3 m (10 ft) connection tubing (M1599B) using option **K31**: small adult - M4554A; adult - M4555A; large adult - M4557A
K91	Order reusable Adult Finger SpO_2 sensor (M1191AL), cable length 3 m (10 ft), using option **K91**.

Paper Scaling Options

Option Number	Description
P01	50-210 bpm paper scaling
P02	30-240 bpm paper scaling

Fetal Supplies Starter Kits

Kit Number	Description	Contents
862214	Standard Antepartum Kit (North America)	Paper (30-240), belts, gel, belts buttons, belt clips
862215	Standard Antepartum Kit (Europe, Latin America, Asia)	Paper (50-210), belts, gel, belts buttons, belt clips
862216	Standard Antepartum Kit (Japan)	Paper (50-210), belts, gel, belts buttons, belt clips
862217	Intrapartum DECG Kit (single spiral)	Fetal scalp electrodes, fetal adhesive pad electrodes
862218	Intrapartum DECG Kit (double spiral). Europe only. Not for USA	Fetal scalp electrodes, fetal adhesive pad electrodes

Standard Accessories Included

Description	Quantity
"Toco+" transducer for Toco, DECG, MECG or IUP monitoring	1
Ultrasound transducer	1
Butterfly Belt Kit	2
Fetal paper pack (country-specific, installed)	1
Power cable	1
DECG adapter cable 989803137651	1
Instructions for Use	1
Documentation CD-ROM (includes Service Guide and Instructions for Use)	1

Transducers

Transducer	Part Number
Ultrasound transducer	**M2736A**
Toco transducer for monitoring external Toco	**M2734A**
"Toco+" transducer for monitoring Toco, DECG, MECG or IUP	**M2735A**
ECG Patient Module for monitoring maternal heart rate or IUP	**M2738A**

Fetal Accessories

Fetal Accessories		Part Number
Belt (reusable, gray, water resistant)	32 mm wide, 15 m roll	**M4601A**
	60 mm wide, 5 belts	**M4602A**
	60 mm wide, 15 m roll	**M4603A**
	50 mm wide, 5 belts	**M1562B**

Fetal Accessories		Part Number
Belt (reusable, brown, contains latex)	50 mm wide, 5 belts	**M1562A**
	60 mm wide, 5 belts	**1500-0642**
	60 mm wide, 15 m roll	**1500-0643**
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 max.	**40483B**
Belt buttons, pack of 10		**M1569A**
Butterfly belt clip (pack of 6)		**989803143401**
DECG Accessories: New Philips DECG Solution	DECG reusable legplate adapter cable (with flushing port)	**989803137651**
	DECG leg attachment electrode for DECG legplate adapter cable	**989803139771**
	DECG fetal scalp electrode: single spiral, worldwide availability	**989803137631**
	DECG fetal scalp electrode: double spiral, Europe only. Not for USA	**989803137641**
DECG Accessories: QwikConnect Plus™ Solution	ECG reusable legplate adapter cable (QwikConnect Plus™)	**M1362B**
	ECG leg attachment electrode for DECG legplate adapter cable	**M1349A**
	DECG fetal scalp electrode: single spiral, worldwide availability	**15133E**
	DECG fetal scalp electrode: double spiral, Europe only. Not for USA	**15133D**
Disposable Koala IUP catheter		**M1333A**

Fetal Accessories		Part Number
Reusable Koala IUP adapter cable		**989803143931**
Telemetry interface cable	Avalon CTS Cable M2731-60001, red connector, for front connection	M2731-60501
	Avalon CTS Cable M2732-60001, black connector, for rear connection (requires option **J80**)	M2732-60501
External Marker		**989803143411**

Recorder Paper

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

Product No.	Geography	FHR Scale	Grid Color	Scale Units	High-lighted 3cm Lines?
M1910A	USA/Canada and Asia	30 - 240	Red/ Orange	mmHg	Yes
M1911A	Europe/ Japan	50 - 210	Green	mmHg and kPa	No
M1913A	Japan	50 - 210	Green	mmHg	Yes
M1913J	Japan	50 - 210	Green*	mmHg	Yes
*Bradycardia and tachycardia alarm ranges are shaded.					

MECG Accessories

Maternal Heart Rate Accessories	Part Number
MECG adapter cable	**M1363A**
Foam ECG electrodes, snap-fit, for MECG adapter cable	**40493D/E**

Noninvasive Blood Pressure Accessories

Adult/Pediatric Multi-Patient Comfort Cuffs and Disposable Cuffs

Patient Cate-gory	Limb Circum-ference (cm)	Blad-der Width (cm)	Dispo-sable cuff Part No.	Reus-able cuff Part No.	Tubing
Adult (Thigh)	42.0 - 54.0	20.0	M1879A	M1576A	M1598B (1.5 m) or M1599B (3.0 m)
Large Adult	34.0 - 43.0	16.0	M1878A	M1575A	
Adult	27.0 - 35.0	13.0	M1877A	M1574A	
Small Adult	20.5 - 28.0	10.5	M1876A	M1573A	

Adult Antimicrobial Coated Reusable cuffs

Patient Category (color)	Limb Circum-ference (cm)	Blad-der Width (cm)	Part No.	Tubing
Adult Thigh (grey)	45.0 - 56.5	21.0	M4559A	M1598B (1.5 m) or M1599B (3.0 m)
Large Adult X-Long (burgundy)	35.5 - 46.0	17.0	M4558A	
Large Adult (burgundy)	35.5 - 46.0	17.0	M4557A	
Adult X-Long (navy blue)	27.5 - 36.5	13.5	M4556A	
Adult (navy blue)	27.5 - 36.5	13.5	M4555A	
Small Adult (royal blue)	20.5 - 28.5	10.6	M4554A	

Adult Soft Single Patient Single-Hose Disposable Cuffs

Patient Category	Limb Circum-ference (cm)	Blad-der Width (cm)	Part No.	Tubing
Adult (Thigh)	45.0 - 56.5	20.4	M4579A	M1598B (1.5 m) or M1599B (3.0 m)
Large Adult X-Long	35.5 - 46.0	16.4	M4578A	
Large Adult	35.5 - 46.0	16.4	M4577A	
Adult X-Long	27.5 - 36.5	13.1	M4576A	
Adult	27.5 - 36.5	13.1	M4575A	
Small Adult	20.5 - 28.5	10.4	M4574A	

SpO_2 Accessories

All listed sensors operate without risk of exceeding 41°C on the skin if ambient temperature is below 37°C.

Product No.	Description	Comments
Philips reusable sensors		
M1191A/B	Adult sensor (2.0 m cable), for patients over 50 kg. Any finger except thumb.	No adapter cable required.
M1191AL/BL	M1191A with longer cable (3.0 m)	
M1192A	Small adult, pediatric sensor (1.5m cable) for patients between 15 kg and 50 kg. Any finger except thumb. Use only on adult patients with FM30/40/50	
M1194A	Ear sensor (1.5m cable) for patients more than 40 kg. Use only on adult patients with FM30/40/50	
M1196A	Adult clip sensor (3 m cable) for patients more than 40 kg. Any finger except thumb.	
M1191T	Adult sensor (0.45 m), for patients over 50 kg. Any finger except thumb.	Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable.
M1192T	Small adult, pediatric sensor (0.45m cable) for patients between 15 kg and 50 kg. Any finger except thumb. Use only on adult patients with FM30/40/50	
M1196T	Adult clip sensor (0.9 m cable) for patients more than 40 kg. Any finger except thumb.	
M1191ANL	Special Edition (SE) Adult sensor (3m cable), for patients over 50 kg. Any finger except thumb.	No adapter cable required. SE sensors work with FM30/40/50, as well as with OxiMax-compatible SpO_2 versions of other Philips monitors.
M1192AN	Special Edition (SE) Small adult, pediatric sensor (1.5m cable) for patients between 15 kg and 50 kg. Any finger except thumb. Use only on adult patients with FM30/40/50	
M1194AN	Special Edition (SE) Ear sensor (1.5m cable) for patients more than 40 kg.	
Philips disposable sensors. Not available in the USA.		
M1904B	Identical to OxiMax MAX-A	Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable
M1903B	Identical to OxiMax MAX-P	
M1901B	Identical to OxiMax MAX-N	
Philips disposable sensors. Available worldwide.		
M1131A	Adult/Pediatric finger sensor (0.45 m cable) Use only on adult patients with FM30/40/50	Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable
M1133A	Adult/Infant/Neonatal sensor(0.9 m cable) for patients >40 kg. Any finger except thumb.	

Product No.	Description	Comments
NELLCOR disposable sensors (must be ordered from Nellcor)		
OxiMax MAX-A	Adult finger sensor (patient size >30kg)	Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable.
OxiMax MAX-AL	OxiMax MAX-A with long cable	
OxiMax MAX-P	Pediatric 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	
Oxisensor II D-25	Adult sensor (patient size >30kg)	Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable.
Oxisensor II D-20	Pediatric sensor (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	
OxiCliq A	See OxiMax MAX-A	Requires M1943A (1.0 m) or M1943AL (3.0 m) adapter cable **together with** OC3 adapter cable.
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	
Extension / Adapter Cables		
M1941A[a]	Extension cable (2 m)	For use with Philips reusable sensors and adapter cables.
M1943A[a]	Adapter cable (1.1 m cable)	Adapter cable for Philips/ Nellcor disposable sensors.
M1943AL[a]	Adapter cable (3 m cable)	
OC 3	Adapter Cable for OxiCliq sensors	Available from Nellcor.

a. Do not use more than one extension cable with any sensors or adapter cables. Do not use an extension cable with Philips reusable sensors or adapter cables with part numbers ending in -L (indicates "**L**ong" version).

Input Devices

Description	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		
M2740A #C02	**M2740A #C03**	**M2740A #U01**
		
Cart with fixed angle mount and two drawers	Camlock Kit	*Mounting Kit* for Avalon CTS for use with M2740A #C01

Upgrade Options

Upgrade options are prefixed with **M2705A**. For example, to add a system interface upgrade, order **M2705A** Option J70.

Upgrade Options	
Option Number	**Option Adds**
C73	Triplets monitoring capability.
J13	Dual MIB/RS232 Interface for connecting external touch screen (M8033B, M8033C)
J22	Dual PS/2 Interface for connecting a keyboard and mouse.
K30	Avalon CTS Cable M2731-60001 for front connection
K40	Avalon CTS Cable M2732-60001 for rear connection

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M2705A complies with the requirements of the Council Directive 93/42/EEC of 14 June 1993 (Medical Device Directive).

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