GE Datex-Ohmeda Cardiocap™/5 for Anesthesia

Related to software S-XANE 01

User's Guide

CE 0537

Conformity according to the Council Directive 93/42/EEC concerning Medical Devices

CAUTION: U.S. Federal law restricts this device to sale by or on the order of a licensed medical practitioner. Outside the USA, check local laws for any restriction that may apply.

All specifications are subject to change without notice.

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About this guide

This guide describes the most common features and functions offered by the GE Datex-Ohmeda Cardiocap/5 monitor. Descriptions refer to the Anesthesia software (S-XANE 01).

Related documentation

More information about clinical aspects, basic methods of measurement and technical background:
"Cardiocap/5 User's Reference Manual - Anesthesia"

More information about technical solutions and servicing:
"Cardiocap/5 Technical Reference Manual"

More information about other devices closely related to the Cardiocap/5:
"S/5 iCentral Technical Reference Manual"

Intended use

The GE Datex-Ohmeda Cardiocap/5 and accessories are indicated for indoor monitoring of hemodynamic (ECG, impedance respiration, NIBP, temperature, SpO_2, and invasive pressure), respiratory (CO_2, O_2, N_2O, respiration rate, anesthetic agent, and agent identification), ventilatory (airway pressure, volume, and flow), and relaxation status (NMT) of all hospital patients.

With the N-XOSAT option, monitoring of arterial oxygen saturation includes monitoring during conditions of clinical patient motion.

Cardiocap/5 is indicated for patients weighing 5 kg (11 lb.) or more.

Impedance respiration measurement is indicated for patients ages 3 years and older.

The monitor is indicated for use by qualified medical personnel only.

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Classifications

IEC/EN 60601-1:

- Type of protection against electric shock: Class I
- Degree of protection against electric shock (indicated by a symbol beside each connector): Type BF or Type CF applied part
- Mode of operation: Continuous
- Equipment is not suitable for use in the presence of a flammable anesthetic mixture with air, or with oxygen or nitrous oxide.

IEC/EN 60529:
Degree of protection against the harmful ingress of water: IPX1

EU Medical Device Directive: Iib

CISPR 11: Group 1, class A

Responsibility of the manufacturer

Datex-Ohmeda Division, Instrumentarium Corp. is responsible for the safety, reliability and performance of the equipment only if:

- Assembly, operations, extensions, readjustments, modifications, service and repairs are carried out by personnel authorized by the manufacturer.
- Electrical installation complies with appropriate requirements.
- The equipment is used in accordance with this guide

Trademarks

Datex®, Ohmeda®, and other trademarks S/5, D-lite, D-lite+, Pedi-lite, Pedi-lite+, Mini D-fend, D-fend, D-fend+, OxyTip+, MemCard, ComWheel, EarSat, FingerSat, FlexSat, PatientO_2, Entropy, Patient Spirometry and Tonometrics are property of Instrumentarium Corp. or its subsidiaries. All other product and company names are property of their respective owners.

PRODUCT NAMING AND PRODUCT OPTIONS

Later in this manual the following acronyms will be used for clarity to refer the monitor options. Note that depending on the monitor configuration you may not have all of the options or functionalities.

Abbreviation	Description	Order code
F-MX	Cardiocap/5 Hemodynamic Frame	6050-0005-614
F-MXG	Cardiocap/5 Hemodynamic Frame with gas measurement	6050-0005-617
S-XANE01	Cardiocap/5 Anesthesia Software	6050-0005-615
N-XC	Airway Gas Option (CO_2)	6050-0005-611
N-XCO	Airway Gas Option (CO_2, O_2 and N_2O)	6050-0005-612
N-XCAIO	Airway Gas Option (CO_2, O_2, N_2O and anesthesia agents with automatic identification)	6050-0005-613
N-XV	Patient Spirometry Option	6050-0005-620
N-XP	Invasive Pressure Option with second temperature channel	6050-0005-940 or 6050-0005-939
N-XREC	Recorder Option	6050-0005-941
N-XNET	Network Option	6050-0005-622
N-XDNET	DataCard and Network Option	6050-0005-700, 6050-0005-735 or 6050-0005-736
N-XNMT	NeuroMuscular Transmission (NMT) Option	6050-0005-914
N-NSAT	Nellcor Compatible SpO_2 Option	6050-0005-916
N-XOSAT	Enhanced Datex-Ohmeda SpO_2	6050-0005-917

SAFETY PRECAUTIONS

These precautions refer to the entire system. Precautions specific to parts of the system can be found in the relevant section.

Warnings

A WARNING indicates a situation in which the user or the patient may be in danger of injury or death.

- It is possible for any device to malfunction; therefore, always verify unusual data by performing a formal patient assessment.
- Connect only one patient to a monitor at a time.
- Use only hospital-grade grounded electrical outlets and power cords.
- Make sure external equipment is hospital-grade grounded before connecting. Do not connect any external equipment to the system, except that specified by the manufacturer.
- Constant attention by a qualified professional is needed whenever a patient is connected to a ventilator. Some equipment malfunctions may pass unnoticed in spite of the monitor alarm.
- All invasive procedures involve risks to the patient. Use aseptic technique. Follow the catheter manufacturer's instructions.
- Use only approved accessories, mounts and defibrillator-proof cables and invasive pressure transducers. For a list of approved supplies and accessories, see the "Supplies and Accessories" catalog delivered with the monitor. Other cables, batteries, transducers and accessories may cause a safety hazard, damage the equipment or the system, result in increased emissions or decreased immunity of the equipment or system or interfere with the measurement. Protection against cardiac defibrillator discharge is due in part to the accessories for pulse oximetry (SpO_2), temperature (T) and invasive pressure (P) measurement. Single-use accessories are not designed to be re-used. Re-use may cause a risk of contamination and affect the measurement accuracy.
- To avoid an explosion hazard, do not use the monitor in the presence of flammable anesthetics. The monitor measures only non-flammable anesthetics.
- Do not use antistatic or electrically conductive breathing tubes. They may increase the risk of burns when an electrosurgery unit is used.
- Do not use the monitor in high electromagnetic fields (for example, MRI).
- To prevent erroneous readings, do not use physically damaged sensors or sensor cables. Discard a damaged sensor or sensor cable immediately. Never repair a damaged sensor or cable; never use a sensor or cable repaired by others. A damaged sensor or a sensor soaked in liquid may cause burns during electrosurgery.
- If liquid has accidentally entered the equipment, disconnect the power cord from the power supply and have the equipment serviced by authorized service personnel.
- The monitor or its components should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the monitor and its components should be observed to verify normal operation in the configuration in which it will be used.
- PACEMAKER PATIENTS. Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance. See this manual for disclosure of the pacemaker pulse rejection capability of this instrument.

Cautions

A **CAUTION** indicates a situation in which the unit or devices connected to it may be damaged.

- Use only cables and accessories approved by the manufacturer. Other cables and accessories may damage the system or interfere with measurement.
- Turn off the power before making any rear panel connections.
- Vibrations during transport may disturb SpO_2, ECG, impedance respiration, and NIBP measurements.
- Leave space for circulation of air to prevent the monitor from overheating.
- Dispose of the whole device, or parts of it (the back-up battery, for example), in accordance with local environmental and waste disposal regulations.

Points to note

- Medical electrical equipment needs special precautions regarding electromagnetic compatibility and needs to be installed and put into service according to the electromagnetic compatibility information provided in the "Technical Reference Manual" by qualified personnel.
- Portable and mobile RF communications equipment can affect the medical electrical equipment.
- The allowed cables, transducers and accessories for the system are listed in the “Supplies and Accessories“ catalog delivered with the monitor.
- The equipment is suitable for use in the presence of electrosurgery. Please notice the possible limitations in the parameter sections and in this section.
- Service and reparations are allowed for authorized service personnel only.
- CISPR classifications:

  Group 1 contains all ISM (industrial, scientific and medical) equipment in which there is intentionally generated and/or used conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.

  Class A equipment is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.

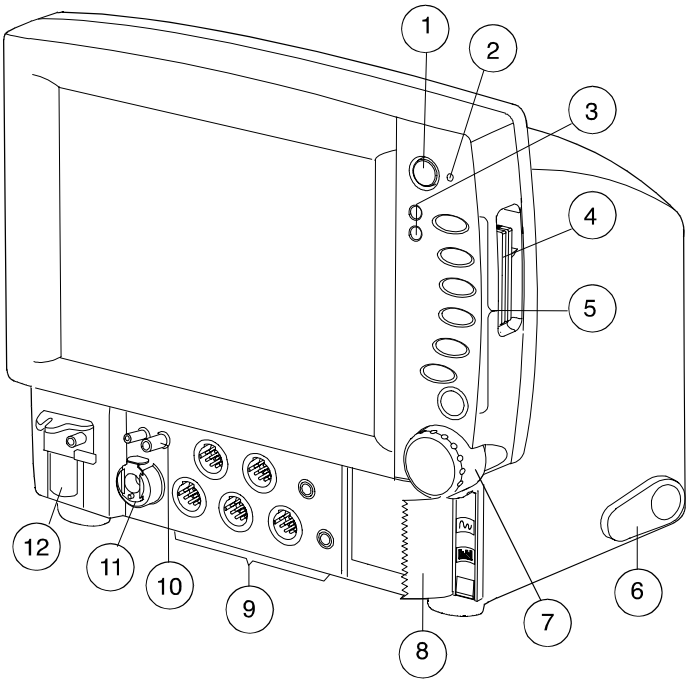
CONTENTS

MONITOR INTRODUCTION

There are two models of Cardiocap/5 monitors: hemodynamic monitor (F-MX) and hemodynamic monitor with airway gas measurement (F-MXG). You can enhance the functions of the monitor with different factory-configured options. Due to these different factory configurations, some menus, displays, and functions described in this manual may not be available in your monitor.

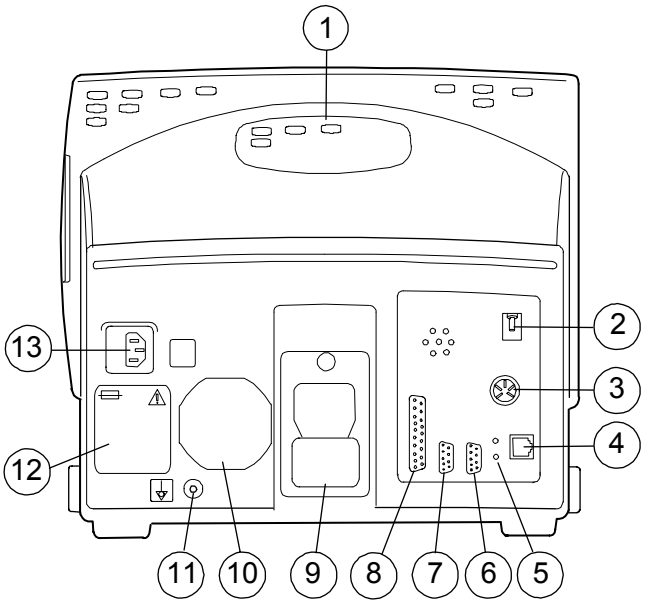
You can use the Cardiocap/5 monitor as a stand-alone monitor or connect it to the network. See “Data Management”.

Parts of the monitor



(1) Power On/Standby key
(2) External power indicator / Battery charge status LED
(3) Alarm indicators
(4) Insertion slots for two memory cards
A cover for the slots is available. See “Supplies and Accessories”.
(5 Direct access keys
(6) Adjustable rear support
(7) ComWheel
(8) Recorder (optional)
(9) Patient connectors
(10) Spirometry connectors
(11) NIBP connector
(12) D-fend water trap

Rear panel



CAUTION: Turn off the power before making any rear panel connections.

(1) Built-in lifting slot
(2) Gas outlet, X6
(3) Remote Control connector, X5
(4) Ethernet connector, X4
(5) Network connection LEDs
(6) Network identification plug connector, X3
(7) Serial communication interface / local printer connector, X2
(8) Analog / digital output connector, X1
(includes nurse call and defibrillator synchronization signals)
(9) Mounting attachment
(10) Dust filter
(11) Potential equalization
(12) Fuse and voltage information
(13) Receptacle for mains power cord

WARNING Before starting to use the system, ensure that the whole combination complies with the international standard IEC 60601-1-1 and with the requirements of the local authorities.
Do not connect any external devices to the system other than those specified.

PERFORMANCE

All specifications are subject to change without notice.

WARNING: Operation of the monitor outside the specified values may cause inaccurate results.

GE Datex-Ohmeda Cardiocap/5

Power supply

Rated voltages and frequencies:
100-240 VAC, 60/50 Hz
Allowed voltage fluctuations: ± 10%
Maximum power consumption: 80 VA
Fuses (2): T2AH/250V

Back-up battery

Type: 12V 2.6AH, lead acid
Back-up battery time:
at least 15 minutes when fully charged
Charging time: 5 hours (typical)
Charging indicator:
Green LED On—full charge, battery on the holding voltage
Green LED flashing—charging

Environmental conditions

Operating temperature: +10 to +40°C (50 to 104°F)
Storage and transport temperature: –10 to +50°C (14 to 122°F)
Relative humidity:
0 to 85% noncondensing;
in airway 0 to 100% condensing
Atmospheric pressure:
660 to 1060 hPa (500 to 800 mmHg)

Alarm behavior

If the alarm mode is latched, the technical alarms are latched as well. This does not comply with the NIBP (IEC 60601-2-30) and invasive pressure (IEC 60601-2-34) standard requirements.

ECG

Waveform display (with 50 Hz power supply frequency):
Monitoring filter: 0.5 to 30 Hz
ST filter: 0.05 to 30Hz
Diagnostic filter: 0.05 to 100 Hz
Waveform display (with 60 Hz power supply frequency):
Monitoring filter: 0.5 to 40 Hz
ST filter: 0.05 to 40 Hz
Diagnostic filter: 0.05 to 100 Hz
Minimizing the effects of the line isolation monitor transients: Crystal controlled oscillator used as the operating frequency source of the patient isolation power supply.
Offset voltage range: ±0.4 V

WARNING. The ±0.4 V offset voltage range of the ECG measurement may be insufficient to handle the offset potentials when using ECG electrodes of dissimilar metals

The isolation barrier capacitance has been minimized to reduce the hazard of burns in the event of a defect in the ESU return electrode connection.

Direct current for leads-off detection through any patient electrode : ≤50 nA
The normalized respiration sensing current : ≤3.0 µA
Frequency of respiration sensing current: 31.25 kHz
Maximum Tall T wave amplitude that does not disturb the heart rate calculation time (according to ANSI/AAMI EC13 4.1.2.1): 10 mV

Pacemaker pulse detection:

detection level: 2 to 700 mV
pulse duration: 0.5 to 2 ms

The monitor is specified for both of the methods A and B required in ANSI/AAMI EC13 4.1.4.2.

Pacer pulse rejection of fast ECG signals:

0.2 V/s with Sensit pacemaker selection and 1.6 V/s with other selections according to the test defined in ANSI/AAMI EC13 section 4.1.4.3.

Heart rate

Measurement range: 30 to 250 bpm
Measurement accuracy: ± 5% or ± 5 bpm
Pacemaker pulse detection:
Detection level: 2 to 500 mV
Pulse duration: 0.5 to 2 ms

The heart rate calculation operates with irregular rhythms of ANSI/AAMI EC13 4.1.2.1 (e) as follows:
a): 40 bpm b): 87 bpm c): 60 bpm
d): 117 bpm

Average heart rate response time and time range of response time (according to ANSI/AAMI EC13 4.1.2.1 (f)):
Response time 80 to 120 bpm: 5.0s (3.7 to 6.2 s)
Response time 80 to 40 bpm: 6.5s (4.1 to 9.2 s)

The average time and time range ( ) to alarm for tachycardia are as follows (ANSI/AAMI EC13 4.1.2.1 (g)):
Figure 4a halved amplitude: 5.5 s (4.8 to 5.9 s)
Figure 4a normal amplitude: 6.6 s (4.8 to 7.2 s)
Figure 4a doubled amplitude: 7.2 s (5.3 to 9.4 s)
Figure 4b halved amplitude: 7.4 s (7.0 to 7.7 s)
Figure 4b normal amplitude: 6.2 s (4.7 to 8.1 s)
Figure 4b doubled amplitude: 6.4 s (4.4 to 8.2 s)

ST segment analysis

Measured and displayed simultaneously for up to three ECG leads
ST level range: –6 to +6 mm (–0.6 to +0.6 mV)
QRS minimum detection level:
Minimum level 0.5 mV with duration between 40 and 120 ms fulfils ANSI/AAMI EC13 standard.
Display resolution: 0.1 mm (0.01 mV)
Averaging: calculated from 16 QRS complexes
Display update interval: 5 seconds

Auxiliary ECG output:

Bandwidth of auxiliary output: 0.5 to 40Hz

Gain: 1 mV ECG signal is 1 V at the auxiliary output.

Propagation delay: < 15 ms

The pacemaker pulses are absent but may cause interference at the auxiliary ECG output.

An auxiliary device that fulfils the requirements of the IEC 60601-1 standard can be connected to the auxiliary output. There are no other limitations, because the auxiliary output of the monitor is galvanically isolated from patient applied part of the ECG measurement.

Respiration

Respiration range: 4 to 120 resp/minute
Accuracy: ± 5% or ± 5 resp/minute

NIBP

Measurement range:
Adult 25 to 260 mmHg
Child 25 to 195 mmHg
Infant 15 to 145 mmHg
Pulse rate range accepted: 30 to 250 bpm
Cuff pressure measurement range:

-15 to +350 mmHg

NOTE: The cuff pressure measurement range is equal with cuff nominal and cuff indication ranges.

Typical measuring time:
Adult 23 seconds
Infant 20 seconds

Invasive Blood Pressure

Measurement range: –40 to 320 mmHg
Measurement accuracy: ± 5% or ± 2 mmHg
Transducer sensitivity:
5 µV/V/mmHg, 5 VDC, maximum 20 mA
Pulse rate
Measurement range: 30 to 250 bpm
Accuracy: ± 5% or ± 5 bpm

Temperature

Measurement range: 10 to 45°C (50 to 113°F)
Measurement accuracy:
25 to 45.0 °C ± 0.1 °C (77 to 113 °F ± 0.2 °F)
10 to 24.9 °C ± 0.2 °C (50 to 76.8 °F ± 0.4 °F)

Pulse Oximetry, Standard

Display update time: 5 seconds
Averaging time: adjustable
Plethysmographic waveform scaling: adjustable

SpO_2

Calibration range: 50 to 100%
Calibrated against functional saturation
Measurement range: 40 to 100%
Measurement accuracy (% SpO_2 ± 1 SD):
80 to 100% ± 2 digits
50 to 80% ± 3 digits
Below 50% unspecified
NOTE: SpO_2 measurement accuracy is based on deep hypoxia studies using Datex-Ohmeda Sat Sensors on volunteers. Arterial blood samples were analyzed by a Radiometer OSM CO-oximeter. Refer to the sensor instructions for specific SpO_2 accuracy data.

Pulse rate

Measurement range: 30 to 250 bpm
Measurement accuracy: ± 5% or ± 5 bpm

Default alarm limits**

SpO_2: high Off, low 90%
Pulse rate: high 160, low 40
Limits are adjustable.***

Sensor emitter wavelength ranges

Red LED: 660 nm
Infrared LED: 900 nm

Pulse Oximetry, Enhanced (N-XOSAT)

Display update time: 5 seconds
Averaging time: 12 seconds
Plethysmographic waveform scaling: automatic

SpO_2

Calibration range: 70 to 100%

Calibrated against functional saturation
Measurement range: 1 to 100%
Measurement accuracy (± 1 SD):
70 to 100% ± 2 digits
70 to 100% ± 3 digits during conditions of clinical patient motion
Below 70% unspecified
NOTE: SpO_2 measurement accuracy is statistically derived and correlated to simultaneous arterial blood gases measured on a Radiometer OSM3 CO-oximeter. Refer to the sensor instructions for specific accuracy data.

Pulse rate

Measurement range: 30 to 250 bpm
Measurement accuracy: ± 2% or ± 2 bpm (whichever is greater)

Default alarm limits**

SpO_2: high Off, low 90%
Pulse rate: high 160, low 40
Limits are adjustable.***

Sensor emitter wavelength ranges

Red LED: 650 to 665 nm
Infrared LED: 930 to 950 nm
Average power: ≤ 1 mW

Pulse Oximetry, Nellcor® (N-XNSAT)

Display update time: 5 seconds
Averaging time: 5 to 7 seconds
Plethysmographic waveform scaling: automatic

SpO_2

Calibrated against functional saturation
Measurement range: 1 to 100%
Measurement accuracy (% SpO_2 ± 1SD):
70 to 100% (± 2 digits to ± 3.5 digits, depending on the sensor)
Below 70% unspecified
See the "User's Reference Manual" for a list of approved sensors and accuracy details.
NOTE: SpO_2 measurement accuracy is based on testing healthy adult volunteers in induced hypoxia studies.

Pulse rate

Measurement range: 30 to 250 bpm
Measurement accuracy: ± 3 digits

Default alarm limits**

SpO_2: high Off, low 90%
Pulse rate: high 160, low 40
Limits are adjustable.***

Sensor emitter wavelength ranges

Red LED: 660 nm
Infrared LED: 920 nm

Airway Gases

Sampling rate*: 200 ml/minute
Sampling delay: 2.5 seconds typical with a 3 m sampling line
Total system response time: 2.9 seconds typical with a 3 m sampling line, including sampling delay and rise time
Warm-up time:
2-5 minutes, 30 minutes for full spec.

Respiration rate (RR)

Measurement range: 4 to 60 breaths/minute
Detection criteria: 1% variation in CO_2

Default alarm limits**

$EtCO_2$ high 8%, low 3%
$FiCO_2$ high 3%, low Off
FiN_2O high 82%
EtO_2 high Off, low 10%
FiO_2 high Off, low 18%
EtDes high 12%, low Off
FiDes high 18%, low Off
EtEnf high 3.4%, low Off
FiEnf high 5.1%, low Off
EtHal high 1.5%, low Off
FiHal high 2.2%, low Off
EtIso high 2.3%, low Off
FiIso high 3.4%, low Off
EtSev high 3.4%, low Off
FiSev high 5.1%, low Off
Non-disturbing gases:
Ethanol C_2H_5OH (< 0.3%)
Acetone (< 0.1%)
Methane CH_4 (< 0.2%)
Nitrogen N_2
Carbon monoxide CO
Nitric oxide NO (< 200 ppm)
Water vapor
Effect of helium: decreases CO_2 readings < 0.6 vol% typically
Maximum effect on readings:
CO_2 < 0.2 vol%,
N_2O, O_2 < 2 vol%
Anesthetic agents: < 0.15 vol%

Carbon dioxide (CO_2)

Measurement range:
0 to 15%, (0 to 15 kPa), (0 to 113 mmHg)
Measurement rise time < 400 ms (typical)
Accuracy*: +/-(0.2 vol% + 2% of reading)
Gas cross effects: < 0.2 vol% (O_2, N_2O, anesthetic agents)

Oxygen (O_2)

Measurement range: 0 to 100%
Measurement rise time: < 400 ms typical
Accuracy: +/-(1 vol% + 2% of reading)
Gas cross effects:
< 1 vol% anesthetic agents
< 2 vol% N_20

Nitrous oxide (N_2O)

Measurement range: 0 to 100%

Measurement rise time: < 450 ms typical
Accuracy: +/-(2 vol% + 2% of reading)
Gas cross effects: < 2 vol% anesthetic agents

Anesthetic agent (AA)
Measurement rise time: < 400 ms typical
Halothane, Isoflurane, Enflurane
Gas cross effects: < 0.15 vol% N_2O
Measurement range: 0 to 6%
Accuracy: +/- 0.2 vol%
Sevoflurane
Measurement range: 0 to 8%
Accuracy: +/- 0.2 vol%
Desflurane
Measurement range: 0 to 20%
Accuracy*:
0 to 5 vol%: +/- 0.2 vol%
5 to 10 vol%: +/- 0.5 vol%
10 to 20 vol%: +/- 1.0 vol%

Agent identification
Identification threshold*: 0.15 vol%
Patient Spirometry
Detection through D-lite™ or Pedi-lite™ flow sensor and gas sampler with following specifications:

Tidal volume (D-lite)
Measurement range: 150 to 2000 ml
Accuracy*: ± 6% or 30 ml

Tidal volume (Pedi-lite)
Measurement range: 15 to 300 ml
Accuracy*: ± 6% or 4 ml

Minute volume (D-lite)
Measurement range: 2 to 20 l/minute
Accuracy*: ± 6%

Minute volume (Pedi-lite)
Measurement range: 0.5 to 5 l/minute
Accuracy*: ± 6%

Airway pressure (D-lite)
Measurement range: –20 to +100 cmH_2O
Accuracy*: ±1 cmH_2O

Airway pressure (Pedi-lite)
Measurement range ***: –20 to +100 cmH_2O

Flow (D-lite)
Measurement range: 1.5 to 100 l/minute

Flow (Pedi-lite)
Measurement range: 0.25 to 25 l/minute

Compliance (D-lite and Pedi-lite)
Measurement range: 4 to 100 ml/cmH_2O

Airway resistance (D-lite and Pedi-lite)
Measurement range: 0 to 40 cmH_2O/l/second

Sensor specifications (D-lite)
Dead space: 9.5 ml
Resistance at 30 l/minute: 0.5 cmH_2O

Sensor specifications (Pedi-lite)
Dead space: 2.5 ml
Resistance at 10 l/minute: 1.0 cmH_2O

NMT

Stimulation modes:
Train of four (TOF)
Double burst (3.3) (DBS)
Single twitch (ST)
50 Hz tetanic + post-tetanic count (PTC)
Measurement intervals:
TOF and DBS: manual; 10 seconds, 12 seconds, 15 seconds, 20 seconds, 1 minute, 5 minutes, 15 minutes
ST: manual; 1 second, 10 seconds, 20 seconds

Stimulator

Stimulus pulse: square wave, constant current
Pulse width: 100, 200 or 300 µs
Stimulus current range (supramax and manual): 10 to 70 mA with 5 mA steps
Stimulus current accuracy: 10% or ± 3mA (whichever is greater)
Max load: 3 kΩ
Max voltage: 300 V

Regional block mode

Stimulation mode: single twitch (ST)
Intervals: 1 second, 2 seconds, 3 seconds
Stimulus pulse: square wave, constant current
Pulse width: 40 µs
Stimulus current range: 0 to 5.0 mA with 0.1 mA steps
Stimulus current accuracy: 20% or 0.3 mA (whichever is greater)

Recorder

Principle: thermal array
Print resolution:
Vertical: 8 dots/mm (200 dots/inch)
Horizontal: 32 dots/mm (800 dots/inch) at speed of 25 mm/second and slower
Paper width: 50 mm; printing width 48 mm
Traces: selectable; 1, 2, or 3 traces
Print speed: 1, 6.25, 12.5, 25 mm/second

* Typical value

** Alarm limits and their adjustment range may vary depending on the mode used.

*** The user may set the SpO_2 low alarm limit lower than 80% and Ppeak alarm limit higher than 50 cmH_2O during normal use of the monitor. To guarantee patient safety, the user cannot save such limits as user default values.

SYMBOLS

Attention, consult accompanying documents.

When displayed beside the O_2 value, indicates that FiO_2 low alarm limit is set below 21%.

When displayed next to the HR value, indicates that there is a risk that the monitor counts pacemaker spikes because the pacer is set on R, or T-waves because a wide QRS is selected.

On the front panel indicates that protection against cardiac defibrillator discharge is due in part to the accessories for pulse oximetry (SpO_2), temperature (T) and invasive pressure (P) measurement.

On the rear panel indicates the following warnings and cautions:

- Electric shock hazard. Do not open the cover or the back. Refer servicing to qualified personnel.
- For continued protection against fire hazard, replace only with same type and rating of fuse.
- Disconnect power supply before servicing.
- Do not touch battery operated monitor during defibrillation procedure.

Type BF (IEC-60601-1) defibrillator-proof protection against electric shock.

Type CF (IEC-60601-1) defibrillator-proof protection against electric shock.

Indicates the beats detected.

Respiration rate is measured using impedance respiration measurement.

Appears in the message field when the alarms are silenced. Appears in the digit field or a menu when the alarm source is selected off.

Back-up battery operation and remaining capacity

Back-up battery charging

Main Menu. Pressing the ComWheel while no menu is displayed opens the **Main Menu**.

Submenu. Selecting an alternative with this symbol in a menu opens a new menu.

The monitor is connected to the monitor network.

Data card (green) and /or the Menu card (white) is inserted.

Sample gas outlet

Ethernet connectors

Equipotentiality. Monitor can be connected to potential equalization conductor.

Alternating current

Fuse

Symbol for non-ionizing electromagnetic radiation. Interference may occur in the vicinity of equipment marked with the symbol.

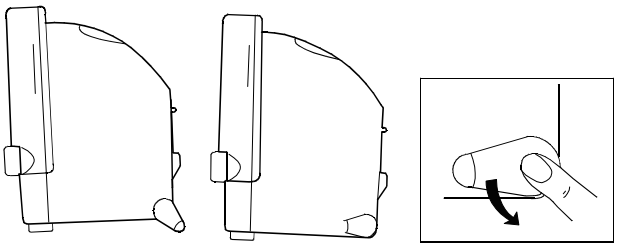
Date of manufacturing

ESD warning symbol for electrostatic sensitive devices. Pins of connectors identified with the ESD warning symbol should not be touched. Connections should not be made to these connectors unless ESD precautionary procedures are used. See "Safety precautions: ESD precautionary procedures" in the “User’s Reference Manual” for details.

MONITORING BASICS

Preparation

- Turn on the monitor. See *Monitor Keys and Menus*.
- Tilt the monitor to the optimal viewing angle:
  Press the center of the foot and adjust.
  Make sure both feet are at the same angle.



  If wall mounting solutions are used, make sure the monitor's front and back attachment bars fit tightly to the edges of the mounting plate and the locking bolt in the monitor's back locks into place.
- If necessary, change the operating mode:
  Press the ComWheel. Select **Monitor Setup** and **Select Mode**.
  NOTE: Changing the mode also changes some settings, such as alarm limits.

Starting monitoring

- Prepare the patient connections. See the corresponding measurement section in this guide. Use only supplies and accessories approved by the manufacturer.
- Alarms and the parameter default settings become active. Review alarm limits. See "Alarms".
- Check that you have the desired waveforms and digits in the fields. See "Display Setup".
- Carry out measurement-specific startup. See the corresponding measurement section in this guide.
- Enter patient identification data:
  Press the ComWheel and select **Patient Data**.
  See "Data Management".

During monitoring

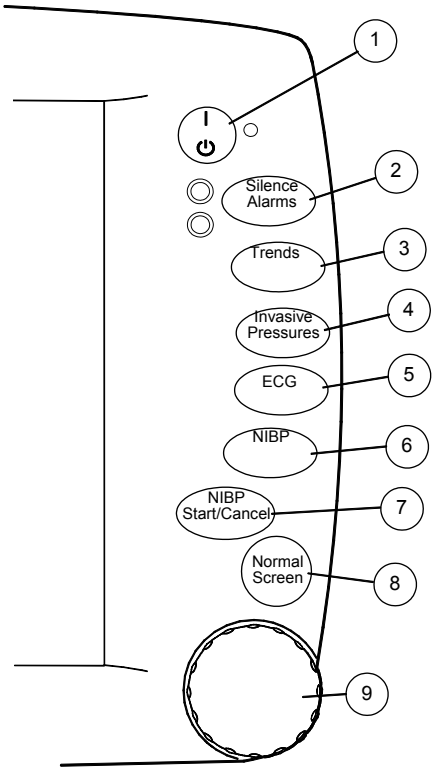
- To suppress alarms, press **Silence Alarms**.
- If you press the **Power On/Standby** key accidentally during monitoring, press the **Power On/Standby** key within eight seconds to return to monitoring. Otherwise, the monitor will switch to standby mode after eight seconds.

Ending monitoring

- Print necessary information. See "Recording and Printing".
- Wait until printing is finished. Then clear patient identification data and return settings to their defaults:
  Press the ComWheel and select **Reset Case**.
  Select **Reset ALL** and **YES**.
- Turn the power switch to standby if the monitor will not be used. Clean the monitor according to the instructions.

MONITOR KEYS AND MENUS

You can control monitoring with the ComWheel, direct access keys, or the Remote Control. The ComWheel, the main navigating tool, provides access to all menu functions. With the direct access keys, you can control most frequently-used functions.



(1) Power On/Standby key

NOTE: The monitor will start only when connected to mains power.

(2) Silences an active alarm or pre-silences all alarms for two minutes (press the key once) or for five minutes (press the key for three seconds). To clear the alarm message field of all alarm messages and to enable new alarms, press the key again.

(3) Displays numerical or graphical trends, and snapshots.

(4) Displays the **Invasive Pressures** menu to adjust Invasive Pressure measurement settings.

NOTE: Depending on the options, this key may be **Pulse Oximetry** or **NMT**.

(5) Displays the **ECG** menu to adjust ECG measurement settings.

(6) Displays the **NIBP** menu to adjust NIBP measurement settings.

(7) Starts a single non-invasive blood pressure measurement or cancels single NIBP measurement, STAT and manual measurements, and stops venous stasis.

(8) Returns to normal monitoring display.

(9) ComWheel. Menu functions are controlled by turning and pressing the ComWheel. Opens the **Main Menu** when no other menu is displayed

.

Moving in menus

A menu is a list of functions or commands displayed on the monitor screen.

You open the **Main Menu** by pressing the ComWheel when no other menu is displayed. You can enter other menus from the **Main Menu** by turning and pressing the ComWheel. Turn and press the ComWheel to make adjustments in menus.

You can also display a menu by pressing the corresponding direct access key. For example, to adjust the ECG display:

1. Press the direct access key to open the menu.

2. Turn the ComWheel to choose a function in the window.

3. Press the ComWheel to open a submenu or an adjustment window.

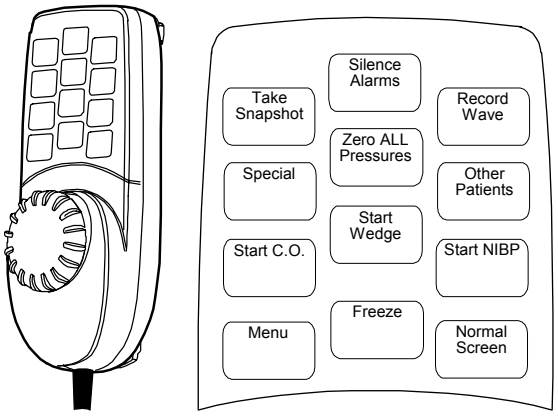
   or

   Press the ComWheel to confirm a selection.

4. Press the **Normal Screen** key to return to the normal monitoring display.

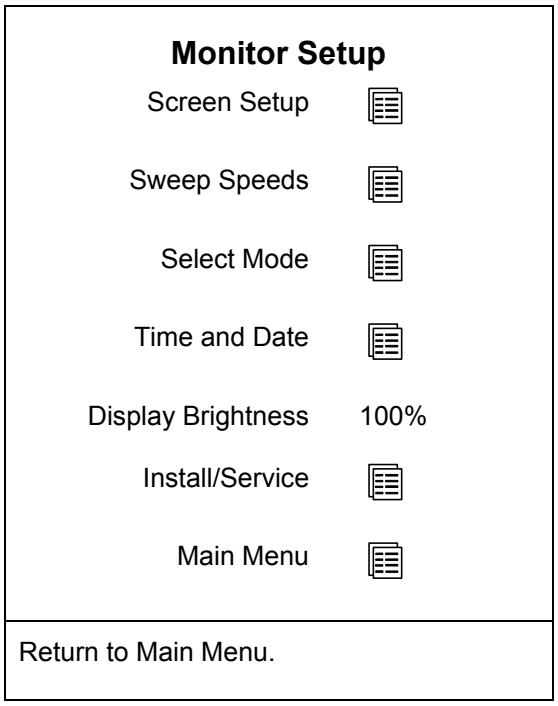
Remote Control

The Remote Control gives you access to the same menus as the direct access keys on the monitor. When using the Remote Control, you can enter all monitoring functions by pressing the **Menu** key, and the most common functions by pressing the direct access keys.



NOTE: The **Special** and **Start C.O.** keys are not in use with Cardiocap/5

DISPLAY SETUP



Setting up the display

Modes determine how the information is presented (what is displayed on the screen and trends, etc.) and what the alarm limits are. Modes are preconfigured.

The monitor starts in startup mode, which is one of your monitor modes chosen during configuration. To change it:

1. Press the ComWheel and select **Monitor Setup**.
2. Select **Select Mode** and choose from the options.

Modifying the display temporarily

1. Press the ComWheel and select **Select Mode**.
   In the corresponding submenu, you can modify waveform and digit field measurements, minitrend length, and sweep speeds or choose the split screen option.
2. To make other setup changes, like scale changes:
   Return to the **Main Menu** and select a desired parameter.
   or
   Press a direct access key and select the setup menu for that parameter.

Changes are valid until the monitor is turned off (+15 minutes) or until you reset the case. Only the time and date are stored permanently.

Modifying the display permanently

You can make permanent changes in the display setup. To find out about passwords, etc., refer to the “User’s Reference Manual”.

Setting the time and date

The clock format is 24 hours. A Cardiocap/5 monitor that is connected to the monitor network follows the time and date settings of the network.

1. Press the ComWheel and select **Monitor Setup**.
2. Select **Time and Date** and adjust the time (hour, minutes, zero seconds) and date (day, month, year).

To prevent the loss of trend data, time settings cannot be changed after the case is reset.

Modifying waveform fields

You can have up to six waveforms on the display at a time.

1. Press the ComWheel and select **Monitor Setup**.
2. Select **Screen Setup**.
3. Select **Waveform Fields**.

NOTE:

- When fewer than six waveforms are displayed, the remaining waveforms are enlarged in most cases.
- Selecting **Combine Pressures** displays invasive pressures in the same waveform field with the same zero line but with individual scales.
- If a 5-lead set is used in the ECG measurement, up to three different ECG leads can be displayed simultaneously in different fields.

Modifying digit fields

You can display data in up to four digit fields.

1. Press the ComWheel and select **Monitor Setup**.
2. Select **Screen Setup**.
3. Select **Digit Fields**.

NOTE: When fewer than four digit fields contain data, the remaining fields are enlarged in most cases.

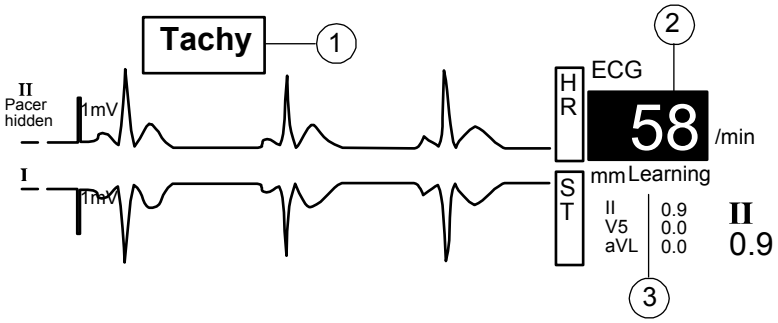
Modifying split screen

You can split a waveform display so that one part of it displays spirometry or trend data all the time.

1. Press the ComWheel and select **Monitor Setup**.
2. Select **Screen Setup**.
3. Select **Split Screen** and choose from the options: **None, Spiro1, Spiro2** or **Trend**.
   - **Spiro1** is a basic view of spirometry information.
   - **Spiro2** is a basic view with additional values.
   - **Trend** is a minitrend of the parameters that have been selected to the waveform field.

ALARMS

After the monitor is turned on or after the case is reset, the alarm limits are activated only when the physiological signals have been inside the alarm limits for 15 seconds. To enable the alarms, connect the patient cables. Alarms are operative even when the measurement is not selected on the screen (except for the respiration measurement), unless the source is selected **OFF**.



When an alarm becomes active:

(1) Messages appear in order of priority.

(2) The measurement value and the alarm LED flash. The background color signifies the alarm category.

(3) A message gives more detailed information in some cases.

An audible alarm sounds.

Alarm categories

The priority depends primarily on the cause and alarm duration.

Visual	Meaning	Tone pattern (selected when the system is configured)
Red	For life threatening situations	Triple + double beep every 5 seconds or continuous beeping: – – – – – 5 – – – – – / – – – – –
Yellow	For serious but not life threatening problems	Triple beep every 19 seconds or double beep every 5 seconds: – – – 19 – – – / – – 5 – –
White	Advisory	Single beep: –

Adjusting limits

1. Press the ComWheel and select **Alarms Setup**.
2. Select **Adjust Limits** and highlight the measurement.
3. Press the ComWheel. An adjustment window appears.
4. In the adjustment window, turn the ComWheel to change the limits. Press the ComWheel to confirm the selection and to move between selections.

Changing sources

For NIBP, P1, P2, O2, AA, T1, and T2 you can select which measured values trigger the alarm. For example, for pressures the possibilities are systolic, diastolic, mean value, or OFF.

Only the last modified source is active.

1. Press the ComWheel and select **Alarms Setup**.
2. Select **Adjust Limits** and select the measurement.
3. In the adjustment window, press the ComWheel as many times as required to get to the menu selections.
4. Select the alarm.

Receiving other site alarms (with N-XNET or N-XDNET option)

The monitor needs to be connected to the network.

1. Press the ComWheel and select **Patient Data**.
2. Select **Other Patients**.
3. Select **Receive Alarms** and choose a site.

Adjusting volume

1. Press the ComWheel and select **Alarms Setup**.
2. Select **Alarm Volume**.

Suppressing audible alarms temporarily

For two minutes: Press the **Silence Alarms** key.

For five minutes: Press the **Silence Alarms** key for more than three seconds.

If the alarms are not active when you press the **Silence Alarms** key, they are pre-silenced for two or five minutes.

Exception: FiO_2 <18%, EtO_2 <10%, FiN_2O >82%, and high Ppeak alarms are silenced for 20 seconds. New alarms are displayed.

- To reactivate alarms, press the **Silence Alarms** key during the silencing period.

New alarms are activated. Silenced alarms are active after two minutes. Apnea alarm is activated after five breaths.

Suppressing audible alarms permanently

1. Press the ComWheel and select **Alarms Setup**.
2. Select **Audio ON/OFF**.
3. Select **Silence Apnea**, **Silence ECG**, **Silence Apn&ECG**, or **Silence ALL**.

If an active alarm is suppressed, a reminder beep appears every two minutes.

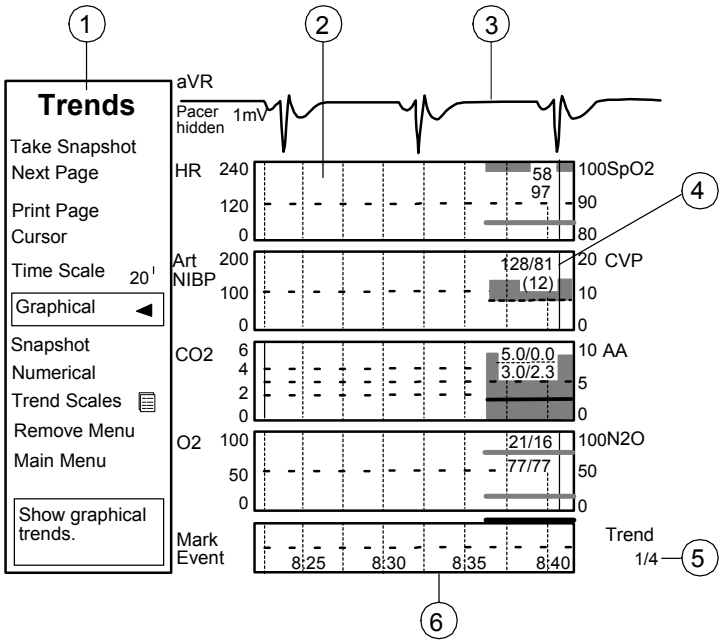
- To reactivate alarms, select **Activate Alarms**.

WARNING: Always make sure that necessary alarm limits are set and active when you start monitoring.

WARNING: **Suppression of alarms may compromise patient safety.**

TRENDS

Graphical trend view



Adjust the parameter and time scales to see the desired trend detail.

Trends view

(1) **Trends** menu
(2) Measurement trend field
(3) Real time ECG or measurement trend field
(4) Numeric value of a measurement at the trend cursor point
(5) Trend page number
(6) Time and marker field

Symbols

Trend bar. Gap shows the mean value.

NIBP trend bar.

Indicates change, such as change of the ECG lead, zeroing of the invasive blood pressure channel, or change of the anesthetic agent.

Blue line indicates the point from which the data have been gathered.

White line indicates the proportion of data you see on the screen.

Red line indicates the time period during which 20 minutes of trend data have been gathered.

Automatic and manual information gathering

The monitor displays two types of trend information: graphical and numerical. You can also create snapshots of the information.

Viewing graphical trends

1. Press the **Trends** key.
2. Select **Graphical**.
3. To see more parameters, select **Next Page**.
4. To see more data, select **Cursor** and scroll the ComWheel.

Graphical trends contain up to four trend pages, each of which has up to five fields with different parameters.

The graphical trend time scale varies from 20 minutes to 24 hours, the resolution from 10 seconds to 12 minutes. With the 20 minute trend you see data from the last 1/2 hour; with other lengths from the last 24 hours. For HR and temperature you can select the scale in the **Trend Scales** menu.

Viewing numerical trends

1. Press the **Trends** key.
2. Select **Numerical**.
3. To see more parameters, select **Next Page**.
4. To see more data, select **Cursor** and scroll the ComWheel.

Numerical trends contain three pages of a maximum of 24 hours of trend data. On the top of each page is a real-time ECG waveform.

Creating snapshots and placing markers in trends

Snapshot is a frozen frame containing 15 seconds of real-time waveforms (preconfigured waveforms and trends) that are saved to the monitor memory.

1. Press the **Trends** key.
2. Select **Take Snapshot**.

The monitor saves an image of preconfigured waveforms and trends. You can take up to 16 snapshots depending on the data load.

When creating a snapshot, a marker is placed in the trends. A number beside the numerical trend indicates this marked event.

Viewing snapshots

1. Press the **Trends** key.
2. Select **Snapshot**.
3. Select **Next Snapshot**.

Turn the ComWheel to move to the next snapshot. In the upper right hand corner, you can see the time the snapshot was created. You can display five fields on the snapshot page. You can print six fields.

Erasing trends and snapshots

1. Press the ComWheel to open **Main Menu** and select **Reset Case**.
2. Select **Reset Trends**.

NOTE: Trend data will be stored in memory for 15 minutes after the power has been turned to Standby.

DATA MANAGEMENT

Collecting and saving information

The Cardiocap/5 monitor continuously collects and saves patient data such as trends. Saving is activated when the monitor receives vital signs.

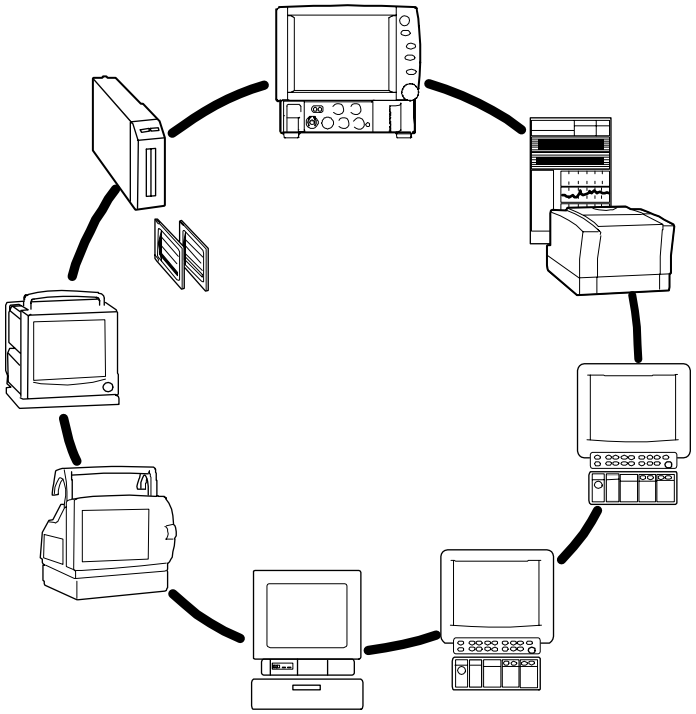
Information is saved to:

- Monitor memory

  The most recent case is saved to the monitor memory if neither the network or memory card is in use.
- Data memory card (with N-XDNET option)

  Up to 48 hours of information, depending on the data load, can be saved to the Data card.
- Network (with N-XNET or N-XDNET option)

  When the monitor is connected to the monitor network, cases from 2-90 days (depending on the configuration) can be saved to it.



Adding patient identification data

1. Press the ComWheel and select **Patient Data**.
2. Select **Demographics**.
3. Enter patient height and weight.

   The body surface area (BSA) is calculated automatically.

Retrieving information

1. Press the ComWheel and select **Patient Data**.
2. Select one of the following:
   - **Load Prev. Case**
     Loads the most recent case when less than 15 minutes has elapsed since you turned off the system. If the monitor has been on but not reset, you can retrieve the last case from the previous 24 hours.
   - **Patient from Net.** (with N-XNET or N-XDNET option)
     Loads a case from the network. The last 24 hours of information is retrievable.
   - **Patient from Card** (with N-XDNET option)
     Loads a case from the Data card. The last 24 hours of information is retrievable.

Viewing other sites (with N-XNET or N-XDNET option)

With your Cardiocap/5 monitor you can see the numerics, waveforms, and alarms of another monitor if both monitors are connected to the monitor network.

To do this:

1. Press the ComWheel and select **Patient Data.**
2. Select **Other Patients.**
3. Select **Show Vital Signs.**
4. Select the site you wish to view.

Viewing other site alarms (with N-XNET or N-XDNET option)

With a networked Cardiocap/5, you can view the alarms of another monitor on the same Central Network.

To do this:

1. Press the ComWheel and select **Patient Data**.
2. Select **Other Patients**.
3. Select **Receive Alarms**.
4. Select the site you wish to view.

Using the Data card (with N-XDNET option)

The Data card is for storage and transfer of trend data.

The N-XDNET option lets you load collected patient data from the Data card. Saved trend data can be transferred to and viewed at other monitors (Cardiocap/5, S/5, AS/3, or CS/3).

You can also continue collecting data at another site:

1. End the case and remove the Data card from the first monitor.
2. Insert the Data card in the receiving monitor.
3. Press the ComWheel and select **Patient Data**.
4. Select **Patient from Card**.

NOTE: Make sure the internal clocks of the two monitors are synchronized.

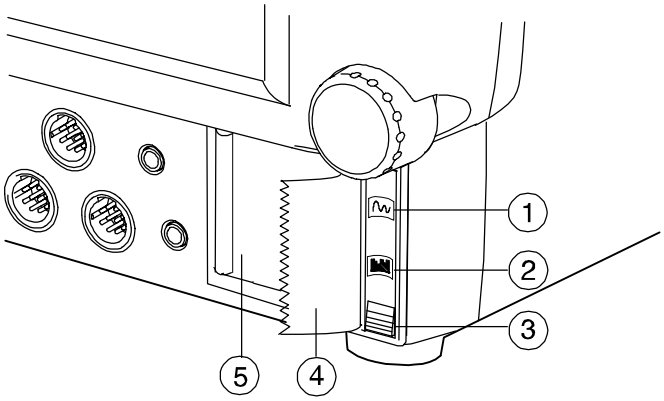
CAUTION: Do not subject memory cards to excessive heat, bending, or magnetic fields.

RECORDING AND PRINTING

You need

- Built-in recorder for recordings
- Thermal paper for the recorder
- Laser printer for printouts

NOTE: Recordings on thermal paper may be destroyed when exposed to light, heat, alcohol, etc. Take a photocopy for your archives.



(1) **Record Waveform/Stop** key to start recording selected real-time waveforms and to stop recording

(2) **Record Trend/Stop** key to start recording a numerical trend or selected graphical trend and to stop recording

(3) Key to release the recorder paper compartment

(4) Recorder paper

(5) Recorder paper compartment

Recording waveforms

To record waveforms, press the **Record Waveform/Stop** key.

To stop recording, press **Record Waveform/Stop** again.

To configure the waveform recording:

1. Press the ComWheel to open **Main Menu** and select **Record/Print**.
2. Select **Record Waveforms**.
3. Select **Waveform 1**, **Waveform 2** or **Waveform 3** and choose the parameter(s) for up to three waveforms.
4. Select **Delay** to choose when to start the recording: (0, for recording only real-time data, or 12 seconds).
5. Select **Paper Speed** to adjust the paper speed (slower speeds result in sharper images).
6. Select **Length** and choose the recording time (30 seconds or continuous).

Recording on alarms

1. Press the ComWheel and select **Record/Print**.
2. Select **Record Waveforms**.
3. Select **Start on Alarms** and **YES**.

Recording is activated by Asystole, HR High/Low or P1 High/Low.
P1 and ECG waveforms are recorded. Selections are preconfigured.

Recording trends

Trends are recorded from the time period that corresponds to the **Time Scale** setting (20 minutes to 24 hours) in the **Trends** menu.

To record the default trend (numerical or graphical), press the **Record Trend/Stop** key.

To stop recording, press **Record Trend/Stop** again.

To configure the trend recording:

1. Press the ComWheel to open **Main Menu** and select **Record/Print**.
2. Select **Record Trends**.
3. To change the resolution, select **Trend Resolution** and choose the time (1, 5, 10, or 30 minutes).
4. To select the parameters for the graphical trends, select **Graphic. Trend 1** or **Graphic. Trend 2** and choose the parameter.

Adjust the parameter and time scales to see the desired trend detail.

Printing

Selecting a printer

1. Press the ComWheel to open **Main Menu** and select **Record/Print**.
2. Select **Printer Connection**.
   - If the printer is connected directly to your monitor, select **Serial**.
   - If your monitor and printer are connected to the monitor network, select **Net**.

Printing one view

You can print one loop or the currently viewed trend data in the corresponding parameter menu.

To print a loop:

1. Press the ComWheel and select **Parameters**.
2. Select **Airway Gas**.
3. Select **Spirometry Loops** and **Print Saved**.

To print trend data:

1. Press **Trends**.
2. Select the trend type you wish to print (**Graphical, Snapshot** or or **Numerical**).
3. Select the desired trend page with **Next Page**.
4. Select **Print Page**.

Adjust the parameter and time scales to see the desired trend detail.

Printing all information

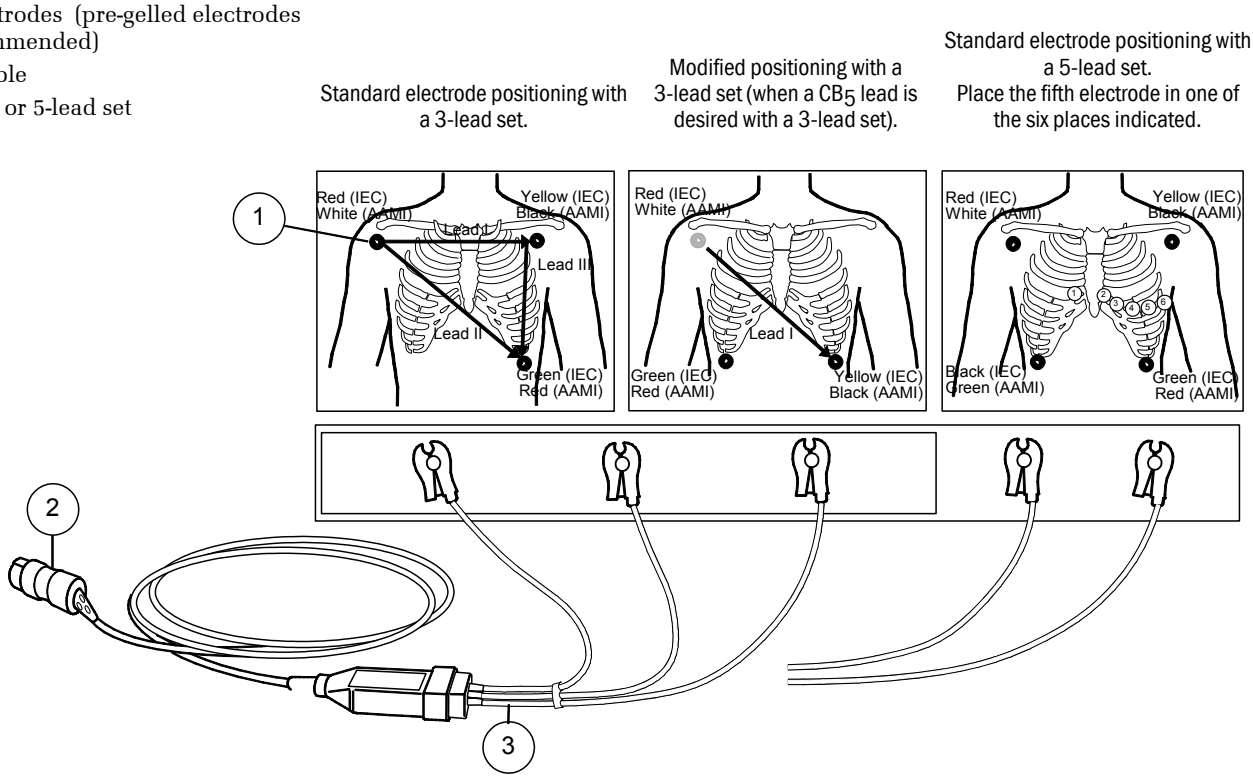
To print all graphical trend data or all saved loops:

1. Press the ComWheel and select **Record/Print**.
2. Select **Print Graphical** or **Print Loops**.

ECG

You need

(1) ECG electrodes (pre-gelled electrodes are recommended)
(2) Trunk cable
(3) 3-lead set or 5-lead set



WARNING: Make sure that the lead set clips or snaps do not touch any electrically conductive material, including earth.

Selecting a lead

With a 3-lead set you can monitor one lead at a time. With a 5-lead set you can monitor three different leads at a time.

- To select monitored leads, press the **ECG** key and select **ECG1 Lead**, **ECG2 Lead**, or **ECG3 Lead**.

Improving waveform readability

1. Press the **ECG** key.
2. Select **ECG Size** and increase the scale height.

NOTE: The module input circuits are protected against the effects of electrosurgery and defibrillation. However, the ECG waveform on the monitor screen may be disturbed during electrosurgery.

Changing the HR source

If the ECG signal is affected by too much noise to produce a reliable heart rate calculation, choose the rate to be calculated from pressure (Art) or plethysmographic pulse waveform (Pleth). The selection is shown above the numerical display of the heart rate.

1. Press the **ECG** key.
2. Select **ECG Setup**.
3. Select **HR Source**.

   AUTO selects the first available of ECG, Art, ABP, and Pleth.

Viewing several leads

With a 5-lead set you can monitor up to three different leads at a time, each one in its own waveform field.

1. Press the ComWheel and select **Monitor Setup**.
2. Select **Screen Setup**.
3. Select **Waveform Fields** and select the fields (up to three) for ECG measurement.

Viewing a cascaded ECG

With both types of lead sets, you can display one lead in cascaded form, in up to three waveform fields. This means the signal continues on selected fields.

1. Ensure that several waveform fields have ECG measurement.
2. Press the **ECG** key, select a lead, and choose **Casc.**

WARNING: **Ensure proper contact of the return electrode of the electrosurgery unit to your patient to avoid possible burns at ECG electrode or other probe sites.**

Monitoring the ST segment

The monitor analyses changes in the ST segment when you are monitoring ECG. The changes are analyzed from the active leads.

1. To enter the ST Analysis View, press the **ECG** key and select **ST Analysis**.
2. For optimal results, select **STfilt** to be the filter and one of the following leads:
   - with 5-lead set: II, V5, and aVF.
   - with 3-lead set: II.

You can also connect a 3-lead set to a 5-lead trunk cable. The combination functions as a 3-lead set.

NOTE: ST segment changes may be affected by myocardial ischemia or other factors, such as drugs, metabolic disturbances, or conduction disturbances.

For details about detection performance and test results of ST segment measurement testing, see "User's Reference Manual: ECG."

NOTE: A clinician must analyze the ST segment changes in conjunction with other clinical findings.

Monitoring Pacemaker Patients

1. Press the **ECG** key.
2. Select **ECG Setup - Pacemaker** and select one of the following:

- **Show** = Pacemaker spike is displayed on ECG.
- **Sensit** = Sensitive pacemaker detection; spike displayed on ECG
- **ON R** = Pacemaker suppression weakened; asystole alarm may not be reliable with active pacemakers.
- **Hide** = Pacemaker spike is not displayed on ECG.

NOTE: Pacemaker detector may not operate correctly during the use of high-frequency (HF) surgical equipment. The disturbances of HF surgical equipment typically cause false positive pacer detection.

WARNING: The impedance respiration measurement may cause rate changes in Minute Ventilation Rate Responsive Pacemakers. Set the pacemaker rate responsive mode off or turn off the impedance respiration measurement on the monitor.

WARNING: Do not rely entirely upon rate meter alarms when monitoring patients with pacemakers. The monitor may count the pacemaker pulses as heartbeats. In this case, asystole and ventricular fibrillation may go undetected. Always keep these patients under close surveillance and monitor their vital signs carefully.

IMPEDANCE RESPIRATION

NOTE: The respiration measurement is recommended only for patients over three years old.

You need

- The same setup as in ECG measurement. You can use 3-lead or 5-lead ECG sets.

Starting

1. Select respiration in a waveform or a digit field to include the respiration information in the trends and to activate alarms.
2. Turn on the measurement:
   - Press the ComWheel and select **Parameters**.
   - Select **Resp Setup**.
   - Select **Measurement** and **ON**.

Improving waveform readability

1. Press the ComWheel and select **Parameters**.
2. Select **Resp Setup**.
3. Select **Size** and adjust the size by turning the ComWheel.

Correcting respiration number

When respirations are weak or affected by artifacts, they may not be included in the respiration rate. To ensure the correct respiration number, adjust detection limits closer to each other.

1. Press the ComWheel and select **Parameters**.
2. Select **Resp Setup**.
3. Select **Detection Limit**.

WARNING: Respiration movements and impedance variations may continue in obstructive apnea.

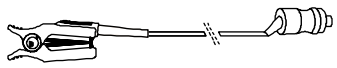
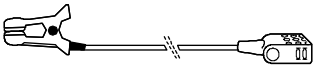
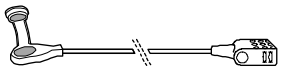
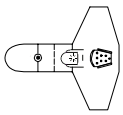
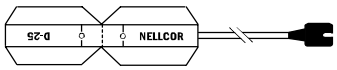
WARNING: Ensure proper contact of the return electrode of the electrosurgery unit to your patient to avoid possible burns at ECG electrode or other probe sites.

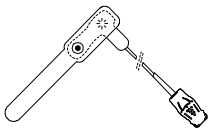
WARNING: Pacemaker patients. The impedance respiration measurement may cause rate changes in Minute Ventilation Rate Responsive Pacemakers. Set the pacemaker rate responsive mode Off or turn the impedance respiration measurement Off on the monitor.

PULSE OXIMETRY

You need

- Reusable or adhesive SpO_2 sensor (examples shown below).
- A separate cable is required for some sensors. Refer to Sensor Instructions for Use for details on sensor site selections and cleaning instructions.

Reusable Sensors	Description
	OxyTip+Finger Sensor. Quick application is possible. Recommended for short term monitoring and spot checks. Designed for use on adult and pediatric patients > 20 kg (44 lb)
	OxyTip+ Ear Sensor. Similar in appearance to finger sensor, but smaller. Recommended for short to medium term monitoring. Designed for use on adult and pediatric patients > 10 kg (22 lbs)
	OxyTip+ Wrap Sensor. Recommended for short to medium term monitoring. Ideal for high motion environments if used with adhesive tape. Recommended for fragile skin if used with foam wrap. Ideal for patients with long fingernails, acrylic nails or arthritic fingers. May be used on fingers and toes and on the fleshy part of hands and feet on patients 3 - 20 kg (6.6 - 44 lbs). Designed for use on patients > 3 kg (6.6 lbs)
Adhesive Sensors	**Description**
	OxyTip+ Sensitive Skin Sensor. Semi-reusable sensor designed for use from premature infants < 3 kg (6.6 lbs) through small adults. Recommended for medium to long term monitoring. Ideal for patients with long fingernails or acrylic nails. May be used on hands, feet, fingers and toes.
	OxyTip+ Adult/Pediatric adhesive sensor, for use on fingers or toes. Recommended for short to long term monitoring in high motion environments, low-perfusion conditions. Ideal for infection control. Designed for use on patients > 20 kg (> 44 lb). A separate sensor cable snaps into the connector on sensor.
	Adhesive sensor with integrated cable; wraps around a finger or toe. For use with N-XNSAT option only.

	OxyTip+ AllFit adhesive sensor for use on fingers, toes and the fleshy part of hand or foot depending on patient weight. Recommended for short to long term monitoring in high motion environments, low-perfusion conditions. Ideal for infection control. Designed for use on all patient weight ranges. Ideal for patients with arthritic fingers, long or acrylic finger nails.

NOTE: Datex-Ohmeda OxyTip+ sensors are latex-free, PVC free and Cadmium free.

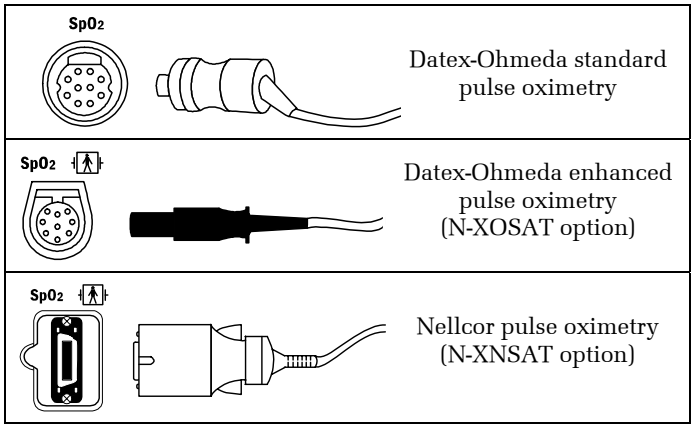
Applying sensors

WARNING: Discard a damaged sensor or cable immediately. Never repair a damaged sensor or cable; never use a sensor or cable repaired by others.

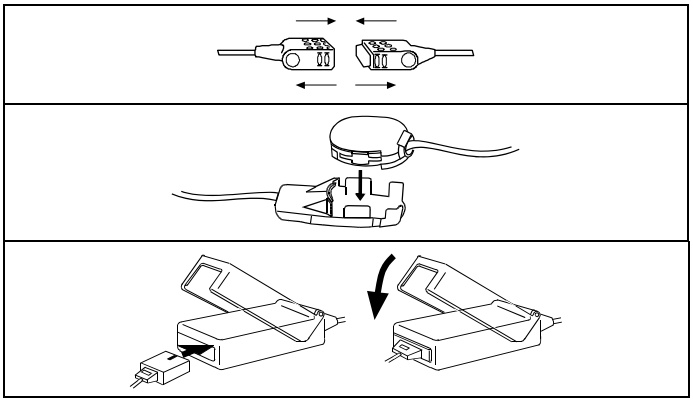
WARNING: Use clean and dry sensors and cables only. Moisture and debris on connectors may affect measurement accuracy.

- Choose a well-perfused site. Refer to the sensor packaging or instructions to choose the correct sites for a specific sensor.
- Clean the application site.
  Finger sensor: remove nail polish and artificial fingernails; clip long fingernails. Ear sensor: remove earrings. Positioning sensor over a pierced area may adversely affect the SpO2 reading.
- Attach the sensor cable to the wrist or bed clothes to prevent the cable and sensor from moving.

Monitor connections



Cable connections



To disconnect, grasp the connector. If applicable, press the buttons on the connector to release the connector.

WARNING: **Patient safety. Patient conditions (such as reddening, blistering, skin discoloration, ischemic skin necrosis, and skin erosion) may warrant changing the sensor site frequently or using a different style of sensor. For details, refer to the instructions supplied with the sensor.**

WARNING: To prevent erroneous readings, do not use an inflated blood pressure cuff or arterial blood pressure measurement device on the same limb as the oximeter sensor.

Displaying pulse rate

The heart rate can originate from various sources.

To display the pulse rate measured with pulse oximetry:

1. Press the **Pulse Oximetry** key.
   or
   Press the ComWheel. Select **Parameters** and **Pulse Oximetry**.
2. Select **HR Source**.
3. Select **Pleth**.

Adjusting SpO_2 settings

You can adjust the volume of the beat sound, the waveform scaling, and response averaging time.

NOTE: With the N-XOSAT or N-XNSAT option, waveform scaling is set to **AUTO**. Response averaging time is set to 12 seconds for N-XOSAT or 5-7 seconds for N-XNSAT.

1. Press the **Pulse Oximetry** key.
   or
   Press the ComWheel. Select **Parameters** and **Pulse Oximetry**.
2. Select Beat Sound Volume.
3. (Standard pulse oximetry only) Select **Pleth Scale** and **SpO2 Response**.

Measuring limitations

WARNING: Data validity. Conditions that may cause inaccurate readings and impact alarms include interfering substances, excessive ambient light, electrical interference, ventricular septal defects (VSD), excessive motion, low perfusion, low signal strength, incorrect sensor placement, poor sensor fit, and/or movement of the sensor on the patient.

- Use Cardiocap/5 pulse oximetry only for patients weighing 5 kg (11 lb.) or more, even if the SpO_2 sensor can be used for patients weighing less than 5 kg.
- The pulse oximeter cannot distinguish between oxyhemoglobin and dyshemoglobins (for example, methemoglobin or carboxyhemoglobin).
- Ambient light, electrosurgery, intravascular dyes and vaso-constrictive drugs may affect the accuracy of the measurement.
- Do not use the pulse oximeter with magnetic resonance imaging (MRI).
- Poor perfusion may effect the accuracy of measurement when using the ear probe.

Using Nellcor® sensors

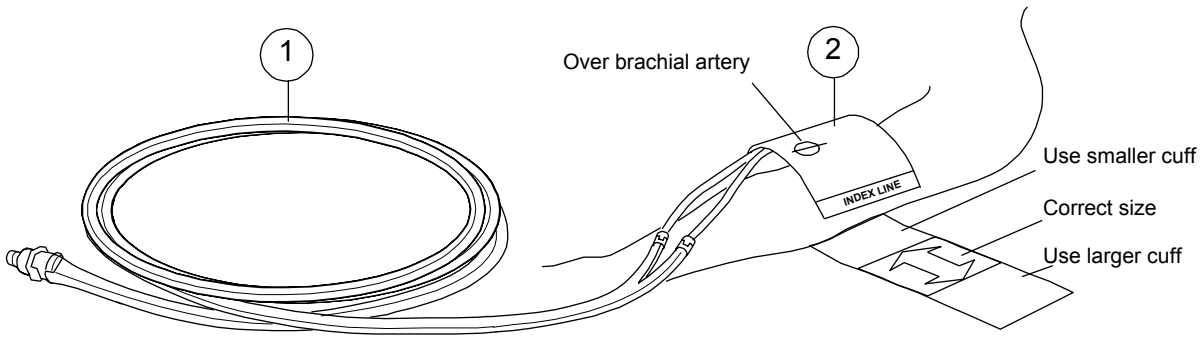
Use only Nellcor sensors with the N-XNSAT pulse oximetry option. See the “User’s Reference Manual” for a list of approved sensors.

NON-INVASIVE BLOOD PRESSURE (NIBP)

You need

(1) Cuff hose
(2) Cuff of correct size

Cuff size	Color	Limb circumference	Hose
Child	Green	12-19 cm	Adult - Black
Small adult	Royal Blue	17-25 cm	Adult - Black
Adult	Navy Blue	23-33 cm	Adult - Black
Adult Long	Navy White	23-33 cm	Adult - Black
Long Adult	Wine	31-40 cm	Adult - Black
Large Adult Long	Wine	31-40 cm	Adult - Black
Thigh	Brown	38-50 cm	Adult - Black
Infant	Orange	8-13 cm	Infant - White
Neonatal #3	White	6-11 cm	Infant - White
Neonatal #4	White	7-13 cm	Infant - White
Neonatal #5	White	8-15 cm	Infant - White



Starting

The monitor sets inflation limits automatically for adults and infants according to the hose used and inflation limit selected from the menu.

NOTE: When using infant cuffs the white infant cuff hose must be used. The child selection increases the maximum inflation pressure to 200 mmHg when using infant cuff/hoses.

To produce a single measurement:

- Press the **NIBP Start/Cancel** key.
  or
  Press the **NIBP** key and select **Start Manual**.

To measure automatically after set intervals:

- Press the **NIBP** key and select **Start Cycling**.

To measure continuously for five minutes:

- Press the **NIBP** key and select **Start STAT**.

During measurement

- Observe the cuffed limb frequently. Measurement may impair blood circulation.
- Make sure that tubes are not bent, pressed or stretched. Measurement may impair blood circulation. Intervals below 10 minutes and STAT measurements are not recommended for extended periods of time.
- NOTE: The presence of some arrhythmias during NIBP measurement may increase the time required for the measurement. For details about the test results of the function of NIBP measurement in the presence of arrhythmias, see the “User’s Reference Manual”.
- Blood pressure values may be affected by a change in the patient's position.

Stopping

To release the cuff pressure before the measurement is finished:

- Press the **NIBP Start/Cancel** key.

Setting cycling intervals

1. Press the **NIBP** key.
2. Select **Cycle Time**.
3. Choose the new cycle time.

Using NIBP cuff for Venous Stasis

1. Press the **NIBP** key.
2. Select **Start Ven.Stasis**.

	Maximum Inflation	Venous Stasis Pressure	Venous Stasis Time
Infant	150 mmHg	40 mmHg	1 minute
Child	200 mmHg	60 mmHg	2 minute
Adult	280 mmHg	80 mmHg	2 minute

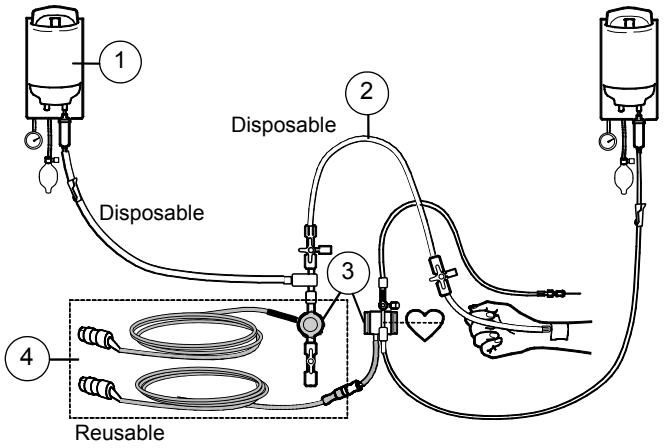
WARNING: The monitor sets the inflation pressure automatically according to the first measurement. Reset the case to reset the inflation limit before measuring a new patient.

CAUTION: Vibrations during transport may disturb the NIBP measurement.

INVASIVE BLOOD PRESSURE

You need

(1) Heparinized fluid bag with pressure infuser
(2) Flushing set
(3) Transducer
(4) Adapter cable for using disposable transducers



NOTE: Patient connections made according to the picture above using D-O specified accessories are defibrillator proof.

WARNING: Use only defibrillator proof transducers and cables.

You can monitor up to two pressure channels.

CAUTION: Mechanical shock to pressure transducer may change zero balance and calibration

Starting

- When doing the setup, prepare the transducer kit according to the manufacturer's instructions.
- Ensure there is no air in the line. Refer to transducer manufacturer's instructions on how to remove trapped air from the transducer.
- Zero the transducer; open the transducer to air:
  Press the **Invasive Pressures** key or press the ComWheel and select **Parameters** and **Invasive Press.** Select **Zero ALL**.
- Open the line to the patient.

Combining pressures

You can display two invasive pressure waveforms one on top of the other, using an area of one normal waveform, or both waveforms combined in the same field with the same zero line.

1. Press the ComWheel and select **Monitor Setup.**
2. Select **Screen Setup**.
3. Select **Waveform Fields**.
4. Select **Combine Pressures** and **YES.**

WARNING: Ensure proper contact of the return electrode of the electrosurgery unit to your patient to avoid possible burns at sensor sites.

WARNING: Make sure that no part of the patient connections touches any electrically conductive material including earth.

WARNING: Use only defibrillator proof transducers and cables.

Labeling channels

The label of the pressure channel sets its display scale, color, filter, alarm source, and alarm limits. The labels' descriptions are preconfigured. To change the label:

1. Press the **Invasive Pressures** key.

   or

   Press the ComWheel. Select **Parameters** and **Invasive Press.**
2. Select **P1 Setup** or **P2 Setup**.
3. Select **Label**.

The channels have the following factory default descriptions:

LABEL	P1, Art, ABP	P2, CVP	RAP, LAP	ICP	PA	RVP
Scale	200	20	20	20	60	60
Color	Red	Blue	White	White	Yellow	White
Alarm source	Sys	off	off	off	off	off
Digit format	S/D	Mean	Mean	CPP	S/D	S/D
Filter	22	9	9	9	9	9

Pulmonary Capillary Wedge Pressure (PCWP)

Because the PCWP measurement site is in an extremely delicate area, only specially qualified medical personnel should perform the insertion of the Swan-Ganz catheter. Follow the catheter manufacturer's instructions.

NOTE: During the wedge pressure measurement, PA values are not trended and PA alarms are disabled.

Starting PCWP

- Position the Swan-Ganz catheter in pulmonary artery. Continuous monitoring of the pressures along the route of the catheter tip will help to identify the location of the tip. Use the distal lumen for the pressure line.
- Label the wedge pressure channel as **PA**.
- Check that the monitor has correct information about the patient's ventilation status:

  Press the **Invasive Pressures** key or press the ComWheel and select **Parameters** and **Invasive Press.**

  Select **Ventilation Mode** and choose **Spont** (spontaneous) or **Contrl** (controlled).
- In the **Invasive Pressures** menu, select **Wedge Pressure** and **Measurement**.
- Inflate the catheter balloon when the 'Inflate the balloon' message is displayed in the PA waveform field. The monitor freezes the waveform for 20 seconds automatically.
- When the 'Deflate the balloon' message appears, deflate the catheter balloon. The pressure waveform will stay frozen until you accept the PCWP level.
- Adjust the PCWP level by turning the ComWheel. Press the ComWheel to accept the PCWP level that represents the true PCWP level.

After accepting the PCWP level, normal pressure monitoring will continue.

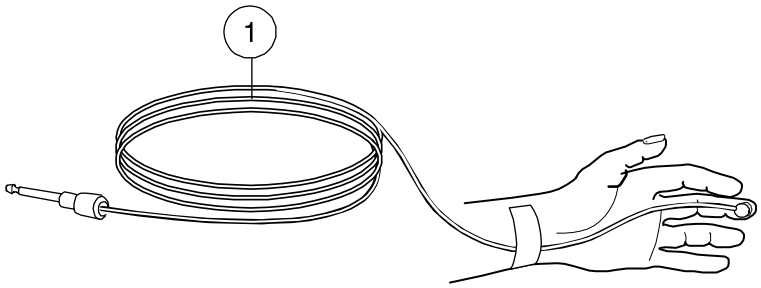
Canceling PCWP measurement

In the **Wedge** menu, select **Cancel**.

TEMPERATURE

You need

(1) Temperature probe



WARNING: Patient safety. To prevent patient injury, use Datex-Ohmeda temperature probes only.

Starting

- Use Datex-Ohmeda temperature probes only.
- Select temperature in a digit field to include the temperature information in the trends and to activate alarms.

Changing temperature label

1. Press the ComWheel and select **Parameters**.
2. Select **Temp Setup**.
3. Select **T1 Label** or **T2 Label**.

Changing temperature unit

1. Press the ComWheel and select **Parameters**.
2. Select **Temp Setup**.
3. Select **Unit** and choose **°C** or **°F**.

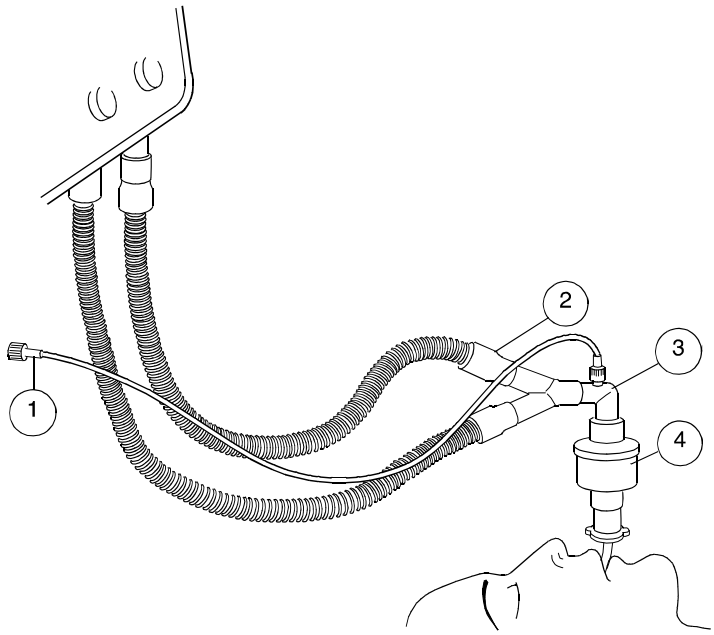
AIRWAY GASES

You can monitor, for example, end-tidal CO_2, inspiratory O_2, N_2O, and anesthetic agents.

You need

(1) Gas sampling line
(2) Y-piece
(3) Airway adapter with sampling line connector
(4) Heat and moisture exchanger including filter (HMEF)

CAUTION: Do not connect anything to the reference gas inlet.



Using D-fend

- Use the black D-fend for most cases.
- Use the green D-fend+ with patients who have increased mucous secretions or infectious disease.

Starting

Before connecting the patient:

- Check that the airway adapter connections are tight and that the adapter is operating properly.
- Before you turn on the monitor, attach the gas sampling line to the sampling line connector on the D-fend water trap.
- Wait until the 'Calibrating gas sensor' message disappears.

During monitoring

Keep the D-fend water trap container downwards during use.

CAUTION: Remove the airway sampling line from the patient airway while nebulized medications are being delivered.

Agent mixture situation

The monitor warns you in an agent mixture situation with a message and an alarm. The message disappears when the concentration of the first agent becomes insignificant.

Preventing operating room pollution

When N_2O or volatile anesthetics are used, prevent operating room pollution by doing one of the following:

- Return the sample gas to the patient circuit.
- Connect the exhaust line between the monitor sample gas outlet and a ventilator's gas scavenging.
- Connect the exhaust line only to an open scavenging system where gas is removed at room pressure. Do not connect the monitor directly to a vacuum scavenging system.

CAUTION: Strong scavenging suction may change the operating pressure of the monitor and cause inaccurate readings or internal damage.

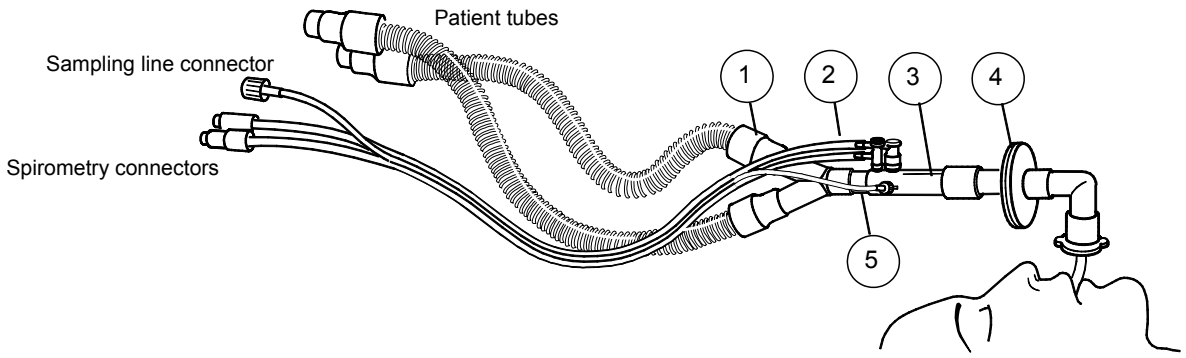
NOTE: 1 MAC is the alveolar minimum agent concentration at which 50% of individuals fail to move in response to a noxious stimulus, such as a surgical incision. MAC numbers differ at gas concentrations.

PATIENT SPIROMETRY

In addition to airway gases, you can monitor patient lung mechanics and volumes.

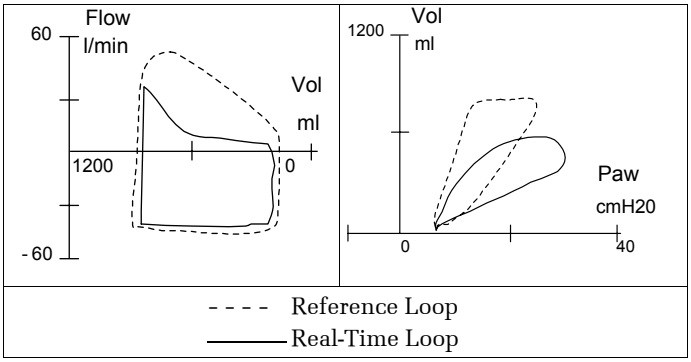
You need

(1) Y-piece
(2) Spirometry tube
(3) D-lite sensor
(4) Bacterial filter
(5) Gas sampling line



Displaying loops

The loops allow you to visually detect changes in the patient's respiratory status.



1. Press the ComWheel and select **Parameters.**
2. Select **Airway Gas**.
3. Select **Spirometry Loops**.
4. Select the loop type you wish to monitor.

To display patient spirometry values continuously, in **Screen Setup** select split screen option **Spiro1** (basic view) or **Spiro2** (basic view with additional values).

Saving reference loops

You can save up to six pairs (flow/volume and pressure/volume) of reference loops. Both loops are saved at the same time. When more loops are saved, the most recent one is erased from memory.

1. Press the ComWheel and select **Parameters**.
2. Select **Airway Gas**.
3. Select **Spirometry Loops**.
4. When the current loop is drawn, select **Save Loop**.
5. To recall a saved loop, select **Reference Loop** and select the number of the loop you wish to recall.

Changing the loop appearance

If the flow, volume, or pressure axis of the loop is not drawn to suit your needs, change the scaling.

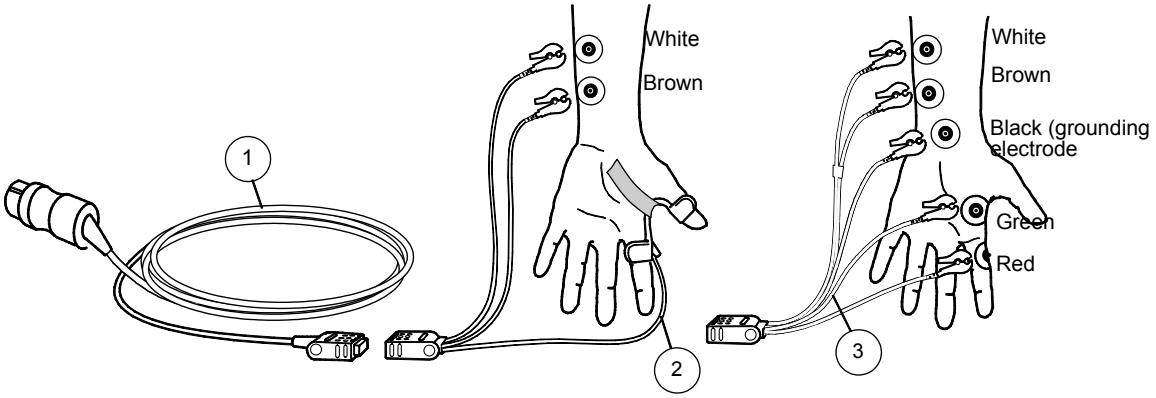
1. Press the ComWheel and select **Parameters**.
2. Select **Airway Gas**.
3. Select **Spirometry Loops**.
4. Select **Scaling**.

NOTE: Also read the "Airway Gases" section.

NEUROMUSCULAR TRANSMISSION (NMT)

You need

(1) NMT sensor cable
(2) MechanoSensor
or
(3) ElectroSensor



Preparation

- Clean grease and dirt from the application area. Make sure the area is free of excessive hair or lesions.
- Place the stimulating electrodes (brown and white) along the ulnar nerve. Do not let the electrodes touch each other.
- Place the piezoelectric probe or recording electrodes as shown in the illustration. Secure the piezoelectric probe with tape.
- Start monitoring after the induction of sleep but before the administration of a muscle relaxant drug.

WARNING: Make sure the lead set clips do not touch electrically conductive material, including earth.

WARNING: Do not place the NMT stimulation electrodes on the patient's chest or any area with excessive hair or lesions.

WARNING: Always stop the NMT measurement before handling stimulation electrodes.

Start/stop monitoring

1. To start, press the **NMT** key and select **Start-up**.
   The monitor measures the supramaximal current, then begins the selected measurement.
2. To stop, press the **NMT** key and select **Stop**.

Suspend/resume monitoring

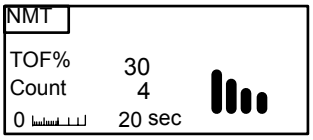
If you temporarily stop monitoring a patient, you can preserve the current and reference values.

1. To suspend monitoring, press the **NMT** key and select **Stop**.
2. To resume monitoring the same patient, press the **NMT** key and select **Continue**.

TOF and other stimulation modes

You can use TOF (train of four), DBS (double burst), and ST (single twitch) stimulation modes. TOF is the most common.

In TOF, four impulses are generated at 0.5 second intervals. The ratio of the fourth to the first response is the TOF%. The TOF% declines as relaxation deepens. Normally, a TOF% over 90 indicates adequate clinical recovery. You can view the TOF% and the number of responses, or count.



1. Press the **NMT** key.
2. Select **Stimulus Mode** and choose the mode.

Selecting recovery note

If the count reaches a set limit, a single beep sounds and the 'Block recovery' message appears.

1. Press the **NMT** key.
2. Select **Recovery Note** and choose the count limit.

Measuring deep relaxation

When the neuromuscular block deepens, you receive no stimulation response. TOF% is not calculated when the count is less than four.

Relaxation Meter

100 TOF% 20	**4 Count 0**	**10 PTC 0**
Light ———		**Deep**

To monitor the relaxation level, start tetanic stimulation (continuous 5 seconds).

1. Press the **NMT** key.
2. Select **Tetanic/PTC** and select **Start.**

After tetanic stimulation, single impulses are generated and the number of responses is counted, resulting in PTC (Post Tetanic Count). After PTC, NMT measurements stop for one minute. Then, the previous measurement cycle continues.

Locating nerve using regional block (Plexus) stimulation

1. Set up the regional block adapter, needle, and syringe. Connect the adapter cable to the monitor cable.
2. Connect the cable to the monitor.
3. Press the **NMT** key.
4. Select **Cycle Time** and choose the time.
5. Select **Regional Block**.
   - To start the stimulation, select **Run**.
   - To stop the stimulation, select **Stop**.

ABBREVIATIONS

/min	beats per minute, breaths per minute
°C	Celsius degree
°F	Fahrenheit degree
µg	microgram
A	alveolar
A	arm (describing location)
a	arterial
a/AO_2	arterio-alveolar PO_2 ratio
AA	anesthetic agent
$AaDO_2$	alveolo-arterial oxygen difference
AAMI	Association for the Advancement of Medical Instrumentation
ABG	arterial blood gases
ABP	arterial pressure
ADU	Anesthesia Delivery Unit
AirW	airway temperature
Alpha, Al	alpha frequency band
AM	Anesthesia Monitor
Amp	amplitude
Ant.	anterior
APN	apnea
Arrh.	arrhythmia
Art	arterial pressure
ASY	asystole
ATMP	atmospheric pressure
ATPD	atmospheric/ambient temperature and pressure, dry gas
ATPS	ambient temperature and pressure, saturated gas
aw	airway
AV	atrioventricular
aVF	left foot augmented lead
Avg.	average
aVL	left arm augmented lead
aVR	right arm augmented lead
Axil	axillatory temperature
BAEP	brainstem auditory evoked potential
Bal	balance gas
bar	1 atmosphere
Bigem.	bigeminy
Blad	bladder temperature
Blood	blood temperature (C.O. measurement)
Body	body temperature
BP	blood pressure
Brady	bradycardia
BSA	body surface area
B-TO-B	beat-to-beat
BTPS	body temperature and pressure, saturated gas
c	calculated/derived value
C	chest
$C(a\text{-}v)O_2$	arteriovenous oxygen content difference
C.I.	cardiac index
C.O.	cardiac output
cal.	calibration
Calc	calculated/derived value
Calcs	calculations
CM	Compact Anesthesia Monitor
CaO_2	arterial oxygen content
Casc.	cascaded (ECG)
cc	cubic centimeter
CCM	Critical Care Monitor
CCO	continuous cardiac output
CcO_2	capillary oxygen content
CCU	cardiac (coronary) care unit
CEL	Celsius degree
CISPR	International Special Committee on Radio Interference
cmH_2O	centimeter of water
CMRR	common mode rejection ratio
CO	carbon monoxide
CO_2	carbon dioxide
COHb	carboxyhemoglobin
Compl	compliance
Cont.	continuous
Contrl	controlled ventilationCore core temperature
Count	count of responses
CPB	cardiopulmonary bypass
CPP	cerebral perfusion pressure
CT	computer tomography

CvO_2	(mixed) venous oxygen content
CVP	central venous pressure
DEL	delete
depr.	depression
Des	desflurane
Dia	diastolic pressure
Diagn	diagnostic (ECG filter)
DIFF	difference
DIS	S/5 Device Interfacing Solution
DO_2	oxygen delivery
DO_2I	oxygen delivery index
DSC	digital signal converter
Dyn.	dynamic
e	estimated
ECG	electrocardiogram
ECG1	first ECG waveform (top)
ECG1/r	real-time ECG
ECG2	second ECG waveform
ECG3	third ECG waveform
ED	emergency department
EDV	end-diastolic volume
EDVI	end-diastolic volume index
elect	electrode
elev.	elevation
EMC	electromagnetic compatibility
Enf	enflurane
ESD	electrostatic discharge
Eso	esophageal temperature
ESV	end-systolic volume
ESVI	end-systolic volume index
ET, Et	end-tidal concentration
EtAA	end-tidal anesthetic agent
EtBal	end-tidal balance gas
$EtCO_2$	end-tidal carbon dioxide
EtN_2O	end-tidal nitrous oxide
EtO_2	end-tidal oxygen
ET-tube, ETT	endotracheal tube
exp	expiratory
F	foot (describing location)
FAH	Fahrenheit degree
FFT	fast Fourier transform
FI, Fi	fraction of inspired gas
FiAA	fraction of inspired anesthetic agent
Fib	fibrillation
FiBal	fraction of inspired balance gas
$FiCO_2$	fraction of inspired carbon dioxide
FiN_2	fraction of inspired N_2
FiN_2O	fraction of inspired nitrous oxide
FiO_2	fraction of inspired oxygen
Flow	airway gas flow
Freq.	frequent
ft	foot, feet
FVloop	flow volume loop
g	gram
Graph.	graphical
H	hand (describing location)
h	hour
Hal	halothane
Hgb	hemoglobin
Hbtot	total hemoglobin
Hemo Calcs	hemodynamic calculations
Hemo	hemodynamic
HHb	reduced hemoglobin
HME	heat and moisture exchanger
HMEF	heat and moisture exchanger with filter
hPa	hectopascal
HR dif	heart rate difference
HR	heart rate
ht	height
HW	hardware
Hz	hertz
I:E	inspiratory-expiratory ratio
IABP	intra-aortic balloon pump
IC	inspiratory capacity
ICP	intracranial pressure
ICU	intensive care unit
ID	identification
IEC	International Electrotechnical Comission
Imped.	impedance; impedance respiration
in	inch
Inf.	inferior
Infl.	inflation (limit)
insp	inspiratory
Inv.	invasive
InvBP	invasive blood pressure
Irreg.	irregular

ISO	International Standards Organisation
Iso	isoflurane
IVR	idioventricular rhythm
J	joule
K	kelvin
kcal	kilocalorie
kJ	kilojoule
kPa	kilopascal
L	left (describing location)
L	leg (describing location)
L, l	liter
l/min	liters/minute
LAN	local area network
LAP	left atrial pressure
Lat.	lateral
LCD	liquid crystal display
LED	light emitting diode
LVEDP	left ventricular end diastolic pressure
LVEDV	left ventricular end diastolic volume
LVSW	left ventricular stroke work
LVSWI	left ventricular stroke work index
MAC	minimum alveolar concentration
Max	maximum
mbar	millibar
mcg	microgram
Mean	mean blood pressure
MetHb	methemoglobin
mg	milligram
Min	minimum
min	minute
ml	milliliter
MLAEP	middle-latency auditory evoked potential
mmHg	millimeters of mercury
mol	mole
Monit	monitoring (ECG filter)
MRI	magnetic resonance imaging
Mult.	multiple
Multif. PVCs	multifocal PVCs
MV	minute volume
MVexp	expired minute volume (l/min)
MVexp(BTPS)	expired minute volume in BTPS conditions
MVexp(STPD)	expired minute volume in STPD conditions
MVinsp	inspired minute volume (l/min)
MVspont	spontaneous minute volume
Myo	myocardiac temperature
N	neutral
N_2	nitrogen
N_2O	nitrous oxide
Na	sodium
Naso	nasopharyngeal temperature
neo	neonate
Net	network
NIBP	non-invasive blood pressure
Ni-Cd	nickel-cadmium
Ni-MH	nickel-metal hydride
NMT	neuromuscular transmission
NO	nitric oxide
NTPD	normal temperature and pressure, dry gas
Num.	numerical
O_2	oxygen
O_2ER	oxygen extraction ratio
O_2Hb	oxygenated hemoglobin
OR	operation room
Oxy	oxygenation
P	partial pressure
P	pressure
P(BTPS)	pressure in BTPS conditions
P(g-a)CO_2	difference between gastrointestinal carbon dioxide and arterial blood carbon dioxide concentration
P(g-ET)CO_2	difference between gastrointestinal carbon dioxide and end tidal carbon dioxide concentration
P(STPD)	pressure in STPD conditions
P1..6	invasive pressure channel identification on module
PA	pulmonary arterial pressure
PA	pulmonary artery
Pa	Pascal (unit of pressure)
Paced	paced beats

$PaCO_2$	partial pressure of carbon dioxide in the arteries
PAO_2	partial pressure of oxygen in the alveoli
PaO_2	partial pressure of oxygen in the arteries
PAOP	pulmonary artery occlusion pressure
Paw	airway pressure
Pbaro	barometric pressure
PCWP	pulmonary capillary wedge pressure
PE	polyethylene
Pedi	pediatric
PEEP	positive end-expiratory pressure
PEEPe	extrinsic positive end expiratory pressure
PEEPe+i	total positive end expiratory pressure (ICU)
PEEPe+PEEPi	total positive end expiratory pressure (ICU)
PEEPi	intrinsic positive end expiratory pressure
PEEPtot	total positive end expiratory pressure (anesthesia)
$PgCO_2$	gastrointestinal carbon dioxide concentration
PIC	patient interface cable
Pleth	plethysmographic pulse waveform
PM non-capt.	pacemaker non-capturing
PM non-funct.	pacemaker non-functioning
PM	pacemaker
Pmax	maximum pressure
Pmean	mean pressure
Pmin	minimum pressure
Ppeak	peak pressure
Pplat	plateau (pause) pressure
PR	pulse rate
Prev.	previous
psi	pounds per square per inch
pt	patient
PTC	post tetanic count (NMT)
pts	patientsPVC polyvinylchloride
PVC	premature ventricular contraction
PVloop	pressure volume loop
PvO_2	partial pressure of oxygen in (mixed) venous blood
PVR	pulmonary vascular resistance
PVRI	pulmonary vascular resistance index
Px	standard pressure label, x being 1, 2, 3, 4, 5, or 6
QRS	QRS complex
Qs/Qt	venous admixture
R	right (describing location)
RAP	right atrial pressure
Raw	airway resistance
Rect	rectal temperature
REF	right ventricular ejection fraction
ref.	reference
Resp Rate	respiration rate (total) (measured)
Resp	respiration rate (total) (set)
RF	radio frequency
RMS	average (root mean square) power
Room	room temperature
RQ	respiratory quotient
RR	respiration rate (total) (measured)
rtm	rhythm
RV	residual volume
EDV	right ventricular end-diastolic volume
ESV	right ventricular end-systolic volume
RVP	right ventricular pressure
RVSW	right ventricular stroke work
RVSWI	right ventricular stroke work index
s	second
SA	sinoatrial
SaO_2	arterial oxygen saturation
SD	standard deviation
SEMG	spontaneous electromyogram
Sev	sevoflurane
SI	stroke index
Skin	skin temperature
SN, S/N	serial number
Spiro	patient spirometry
SpO_2	oxygen saturation
Spont	spontaneous breathing
ST	ST segment of electrocardiograph

STAT	continuous NIBP cuff inflation for five minutes
stat	static
STBY	standby
STfilt	ST filter (ECG)
STPD	standard temperature and pressure, dry gas
Surf	surface temperature
SW	software
SV	stroke volume
SVC	supraventricular contraction
SVI	stroke volume index
SvO_2	(mixed) venous oxygen saturation
SVR	systemic vascular resistance
SVRI	systemic vascular resistance index
Sys	systolic pressure
T	temperature
t	time (min)
T(BTPS)	temperature in BTPS conditions
T1%	first stimulus as % of the reference value (NMT)
T1..4	temperature channel identification on module
Tab.	tabular
Tachy	tachycardia
Tbl, Tblood	blood temperature
Temp	temperature
Trigem.	trigeminy
TV	tidal volume
TVexp	expired tidal volume (ml)
TVinsp	inspired tidal volume (ml)
Tx	temperature label, x being 1, 2, 3, r 4 or one of the other label choices
Tymp	tympanic temperature
V Fib	ventricular fibrillation
V Run	ventricular run
V Tachy	ventricular tachycardia
v	venous
V	ventricular
V	volume
V/Q	ventilation/perfusion ratio
V0.5	volume expired during the first 0.5 seconds
V1.0	volume expired during the first second
VC	vital capacity
VCO2	carbon dioxide production
Vd	dead space
Vd/Vt	dead space ventilation
WLAN	wireless local area network
VO_2	oxygen consumption
VO_2calc	calculated oxygen consumption*
VO_2I	oxygen consumption index
VO_2Icalc	calculated oxygen consumption index*
Vol	volume
wt	weight
X	extreme
yr	year
yrs	years

* with Fick equation

MESSAGES

If any problem or message persists, contact qualified service personnel.

Message	Explanation
Alarms acknowledged	Acknowledged alarms are silenced. (**Silence Alarms** key pressed during silencing period).
Air leakage	NIBP: Air leakage in NIBP cuff or hose. Check connections.
Apnea	No breath detected for 20 seconds (respiration or CO_2 measurement).
Apnea deactivated	Apnea alarm is silenced until alarm is reactivated after five breaths.
ARRWS arrh analysis OFF	Arrhythmia analysis is selected for display but arrhythmia workstation is on standby or off.
Artifacts	Unsuccessful NIBP, SpO_2, or ECG measurement because of patient's: ▪ movements ▪ shivering ▪ deep breathing ▪ arrhythmia or irregular beats Calm the patient and start a new measurement.
Asystole	ECG: No QRS detected in ECG.
Back-up battery failure	Discharged or faulty back-up battery. Use mains power for 4 hours, then switch to battery power. If the message reappears, contact authorized service personnel.
Batt. empty	Connect the monitor to the power supply.
Batt. low	About five minutes of battery operating time. Connect the monitor to the power supply.
Cable off	NMT or regional block adapter cable is not connected.
Calibrate Agent ID	Agent identification error. Perform gas calibration.
Check D-Fend	Check that water trap and sampling line are properly attached.
Check NIBP	NIBP measurement is only partially successful. Check setup.
Check sample gas out	Gases: Sample gas outlet is blocked. Remove blockage.

Message	Explanation
Check stim. electrodes	NMT stimulus current could not be delivered due to poor stimulus electrode connection or damaged cable.
Cuff loose **Cuff occlusion** **Cuff overpressure**	NIBP: ▪ Cuff is not attached to patient. ▪ Cuff is too loose or hose is not connected. ▪ Tubes or hose are kinked. ▪ Cuff is squeezed during measurement. Check NIBP cuff hose and tubes and restart measurement.
EEPROM error	Memory checking failed. Contact authorized service personnel.
EMG electrodes off	NMT: EMG recording electrodes are off.
Infl. limits! Check setup	NIBP: Adult or child cuff is used but the infant mode has been selected.
Leads off	ECG trunk cable, all lead wires, or neutral electrode (RL/N) are disconnected. ECG inoperative (offset voltage between two electrodes is too high). Possible during defibrillation.
Measurement off	NMT cable is connected but measurement has not started.
MVexp << MVinsp	Exhaled volume is markedly smaller than inhaled. Check the whole system for leakage.
MVexp < 0.5l/min (with Pedi-lite: MVexp < 0.2l/min)	Measured volumes are too small for reliable calculation and, for example, waveforms and loops may be unreliable.
NIBP manual	Autocycling mode is interrupted because of air leakage or loose cuff. Check setup and restart autocycling.
No P1 transducer	Invasive blood pressure transducer or cable of channel P1/P2 not connected.
No SpO2 probe	Check SpO_2 sensor connection.
No SpO2 pulse	SpO_2 pulse signal is poor. Try other measuring sites.
Noise	ECG: Unreliable HR calculation or distorted waveform; possible during diathermy.
Performing temp test	Monitor makes a two point calibration test for temperature immediately after the warm-up time and after that once in 10 minutes. Test lasts 10 seconds.

Message	Explanation
Printer failure	Printer is not responding, not turned on, not connected, or not on-line.
RAM error	Memory checking failed. Contact authorized service personnel.
Reference not stable	The deviation between the four NMT reference stimulation responses is too big, causing reference setting to fail.
Replace D-Fend	D-fend water trap is partially blocked.
Response too weak	NMT: The maximum gain is insufficient to increase the response signal amplitude to a measurable level. This can occur if: ▪ Stimulation current is too weak. ▪ Stimulation electrodes are not connected or are improperly placed on the nerve. ▪ Recording electrodes are disconnected. ▪ One or more electrodes are dry and should be replaced. ▪ The skin at the electrode site is not properly prepared.
Sample line blocked	Sampling line inside or outside the monitor is blocked or the water trap is occluded. Change sampling line and/or water trap.
Sensor INOP	The gas measuring sensor is inoperative or the temperature in the monitor has increased. Contact authorized service personnel.
Setting reference	NMT reference search in progress.
SpO2 probe off	Check SpO_2 sensor connection to patient. The finger or ear lobe may be too thin, or sensor halves are not aligned.
SRAM error	Memory checking failed. Contact authorized service personnel.
Supramaximal not found	NMT: Supramaximal stimulus current (70 mA) not found. Stop measurement, reposition stimulating or recording electrodes, and restart measurement.
Supramax search	NMT: Supramaximal stimulus current search in progress.
Temperature error	A repeated temperature test has failed. Contact authorized service personnel.
TETANIC	NMT: Tetanic stimulation is on.
Unable to measure Dia	NIBP: Accurate diastolic pressure difficult to measure because of artifacts, weak pulsation, etc.

Message	Explanation
Unable to measure Sys	NIBP: Systolic pressure probably higher than maximum inflation pressure or artifacts interfere in the systolic area.
Unstable zero pressure	NIBP: Pressure is unstable at start of the measurement. Calm the patient and retry.
Weak pulsation	NIBP measuring problem: ▪ Improper cuff position or attachment. ▪ Weak or abnormal blood circulation. ▪ Slow heart rate associated with artifacts. ▪ Patient is moving ▪ Air leakage.
... high/... low	Measured value (...) exceeds the alarm limit. Check patient condition. Adjust alarm limits.
... Lead off	One of the ECG lead wires (...) is off.

TROUBLESHOOTING

What if ...	Try this ...
The desired measured values do not appear on the screen?	▪ Check that you have selected the parameter in the digit or waveform field. Press the ComWheel to open **Main Menu**. Select **Monitor Setup** and **Screen Setup**.
The monitor does not start?	▪ Connect the power cord to the power supply. The monitor will not start on battery power. ▪ Check the fuses. Replace if necessary.
ECG signal is noisy, or no QRS is detected?	▪ Ensure that the patient is not shivering. ▪ Select the correct filter by pressing **ECG** and selecting **ECG Setup** and **Filter**. **Monit** filters artifacts produced by the electrosurgery unit and respiration. **Diagn** gives more information about the wave, but is susceptible to high frequency artifacts and baseline wander. **STfilt** gives more information about the ST segment. Filters the high frequency artifacts but catches slow changes in the ST segment. Susceptible to baseline wander. ▪ Check electrode quality and positioning. Avoid placing over body hair, bones close to skin, layers of fat and major muscles. Pre-gelled electrodes are recommended. ▪ Change lead. ▪ Enlarge the size from 1.0 mV to 2.0 mV.
Respiration measurement fails?	▪ Check electrode quality and positioning as above. ▪ Adjust the detection limits. During ventilator-supported breathing the resp calculation may count only ventilator-produced inspirations and expirations. Other electrical devices may interfere with the measurement.
Invasive blood pressure readings are unreliable?	▪ Make sure that there are no air bubbles in transducer system. Flush and zero. ▪ Place transducer on patient's mid-heart level, and zero.
SpO_2 signal is poor?	▪ Make sure that the patient is not shivering. ▪ Check sensor placement. ▪ Be aware of differences caused by skin pigment. ▪ (Standard pulse oximetry only) Change averaging time from slow to normal.

What if ...	Try this ...
NIBP measuring does not work or values are unreliable?	▪ Check that cuff tubings are not bent, stretched, compressed or loose. ▪ Prevent motion artifacts. ▪ Use cuffs of correct size.
Temperature measuring fails?	▪ Check that you have the correct kind of probe. ▪ Try another probe.
Airway gas values are too low?	▪ Check the sampling line and other connectors for leakage. ▪ Make sure the scavenging vacuum is not too strong.
Patient spirometry values are unreliable?	▪ Check that selected **Sensor Type** corresponds to the sensor attached to the patient. ▪ Remove D-lite and shake drops away. ▪ Check that connectors on D-lite are intact and all connections are tight.
NMT values are unreliable?	▪ Clean the application site of oil and dirt. ▪ Check that electrodes are positioned correctly, electrode gel is moist, and skin contact is good. Avoid placement over lesions or excessive body hair.
Cannot see some **trend details**?	▪ Adjust the parameter and time scales to see the desired trend detail.

CLEANING AND CARE

Permitted cleaners	Permitted disinfectants	DO NOT!
Datex-Ohmeda Cleaning Fluid Other mild detergents	Ethanol Isopropyl alcohol Chlorite compounds Glutaraldehyde	Do not use hypochlorite, acetone-, phenol- or ammonia-based cleaners. Do not autoclave the device or its parts. Do not immerse any part of the device in liquids or allow liquid to enter the interior. Do not apply pressurized air to any outlet or tubing connected to the monitor.

Before cleaning

- Turn the power switch to Standby.
- Disconnect the power cord.

After cleaning

- Let dry completely.
- Connect the power cord.
- Turn on the power.

WARNING: If liquid has accidentally entered the equipment, disconnect the power cord from the power supply and have the equipment serviced by authorized service personnel.

Daily and between patients	Once a month	Every six months
• Wipe monitor surface. • Wipe ECG trunk cable, NIBP cuff and cables, and SpO_2 sensors. • Change or sterilize all airway and invasive patient accessories. • Change green D-fend+ or empty black D-fend water trap. • Check that the accessories and monitor parts are clean and intact.	Check the fan filter on the monitor's rear panel and clean if necessary: 1. Pull out the filter. 2. Wash in detergent solution. 3. Allow to dry before reinserting. Do not use pressurized air. Replace the filter if it is damaged.	Perform gas calibration for airway gas monitoring, see "Calibrating airway gases." Use only Datex-Ohmeda calibration gases. NOTE: If gas measurement is used extensively, calibration is recommended every two months.

Backup battery check

1. Turn on the monitor. When the battery is fully charged, the no charging symbol should appear on the screen.
2. Disconnect the monitor from mains power. The monitor should function normally for 15 minutes.

Changing fuses

1. Remove the power cord.
2. Remove the fuse holder by pushing the locking pin and gently pulling out the holder.
3. If a fuse is blown, ensure that you replace it with a fuse of the correct type and rating.

Other accessories

See the accessory package for cleaning and checking. Do not reuse disposable accessories.

D-fend water trap

Empty the container whenever half full.

- Black D-fend water trap: change every two months or when a 'Sample line blocked' or 'Replace D-Fend' message appears.
- Green D-fend+ water trap (for patients with extensive mucus secretion and for single-patient use only): replace every 24 hours or when a 'Sample line blocked' or 'Replace D-Fend' message appears.

Do not wash or reuse the D-fend water trap cartridge.

Reusable D-lite sensor

The reusable D-lite sensor can be washed in the washing machine and steam autoclaved. After washing:

- Make sure that the connectors are undamaged.
  A tight connection is essential for correct measuring.
- Make sure that the sensor is dry.

Calibrating airway gases

Follow recommended calibration intervals (every 6th month in normal use and every 2nd month in continuous use) to ensure that measurement accuracy stays within specifications.

1. Attach a regulator to the calibration gas container. See "Supplies and Accessories".
2. Attach a new sampling line to the water trap. Connect the loose end of the sampling line to the regulator on the gas container.
3. Turn on the monitor. Let it warm up for 30 minutes.
4. Select **Gas Calibration** in the **Airway Gas** menu.
5. Wait until the 'Zero OK' and then 'Feed gas' messages appear after each gas on the screen.
6. Open the regulator and feed gas until 'Adjust' appears.
7. Check that displayed gas values match the values on the gas container. If not, adjust with the ComWheel.

During gas calibration, % units are used for CO_2 regardless of selected measurement units.

More comprehensive checking

For safe and reliable function and operation of the monitor, regular care has to be carried out according to the instructions in this manual and to the maintenance procedures described in the "Technical Reference Manual."

Calibration check of temperature, NIBP and invasive blood pressures

Calibration check of temperature, NIBP and invasive blood pressures should be performed at least once a year by qualified service personnel as a part of the Planned Maintenance, see "Technical Reference Manual."

Regular checks

When you start monitoring, check that

- accessories are intact and properly connected.
- you have selected desired parameters to be displayed on digit and waveform fields.

ECG, Impedance respiration

Check that the 'Leads off' disappears and the waveforms are displayed when the cable is connected to the patient.

Pulse oximetry

Check that the red light is lit in the sensor. Check that the SpO2 value is displayed and 'SpO2 probe off' disappears when the sensor is connected to the patient.

Temperature

Check that the temperature value is displayed when the probe is connected to the patient.

InvBP

Check that the monitor recognizes cable connections (activates the display) for all the pressure channels used and the pressure values are shown. Make sure that all the transducers are zeroed correctly.

NIBP

Ensure that you are using correct cuff size and have selected correct inflation limits.

Check that the cuff hose detection (Adult/Child) works properly.

Check that the pressure values are displayed.

Start the Venous Stasis mode and check that the pump is not restarting during the measurement. If it does, the cuff may be leaking.

Airway gases and Patient Spirometry

Occlude the sampling line and check that the 'Sample line blocked' message appears within 30 s and gas waveforms are showing zero at the same time.

During spirometry measurement, check that the loops are whole. A gap between the starting and ending points may indicate a leak.

NMT

Check that the electrodes are correctly positioned on the ulnar nerve and the message 'Supramax search' is displayed. Ensure that you get a stimulus response. If the supramaximal stimulus current is not found, the message 'Supramaximal not found' is displayed. If the current is set manually the message 'Setting reference' is displayed directly. Always check the electrode quality.

Functioning of the alarms

Set a parameter value outside the alarm limits. For example, connect the SpO2 sensor and adjust the SpO2 High limit under the measured SpO2 values. The alarms go from white to red according to sequence given in the "Alarms" chapter. Check that the yellow and red LEDs function as indicated in the table.

If the monitor does not work as described, refer to "Troubleshooting".

SUPPLIES AND ACCESSORIES

Approved and specified for the GE Datex-Ohmeda Cardiocap/5.

ECG

Trunk cables, IEC color coding

545305 3-lead cable, 1.2 m m/4 ft.

545300 3-lead cable, 3 m m/10 ft.
545304 3-lead cable, 5 m/16 ft.
545306 5-lead cable, 1.2 m m/4 ft.
545301 5-lead cable, 3 m/10 ft.

Lead sets, IEC color coding

545315 3-lead set, clip, 0.75 m/30 in.
8001960 3-lead set, clip, 1.5 m/60 in
545316 5-lead set, clip, 1.25 m/49 in.(leg) and 75 cm/30 in (chest)
8001961 5-lead set, clip, 1.5 m/60 in

Trunk cables, AAMI color coding

545307 3-lead cable, 1.2 m/4 ft.
545302 3-lead cable, 3 m/10 ft
545308 5-lead cable, 1.2 m/4 ft.
545303 5-lead cable, 3 m/10 ft.

Lead sets, AAMI color coding

545317 3-lead set, clip, 0.75 m/30 in.
8001958 3-lead set, clip, 1.5 m/60 in
8001959 5-lead set, clip, 1.5 m/60 in.
545318 5-lead set, clip, 1.25 m/49 in.(leg) and 75 cm/30 in.(chest)
545327 3-lead set, snap, 0.75 m/30 in.
545328 5-lead set, snap, 1.25 m/49 in. (leg) and 75 cm/30 in.(chest

Electrodes

572683 Solid gel, Ag/AgCl, 50/pkg
572684 Safety pin for infant, 60 cm, 15/pkg

Temperature

Reusable probes

165602 Skin temp probe, 1.5 m/4.9 ft.
16560 Skin temp probe, 3.5 m/11.5 ft.
165622 Central temp probe, adult, 1.5 m/4.9 ft.
16561 Central temp probe, adult, 2.8 m/9 ft.
165612 Central temp probe, pediatric, 1.5 m/4.9 ft.
165611 Central temp probe, pediatric, 2.8 m/9 ft.

Disposable probes

165640 Extension cable for disposable temperature probes, 1.3 m/4.3 ft.
165641 Extension cable for disposable temperature probes, 2.8 m/9 ft.
8001642 Skin temperature probe for adult and infants
8001643 Central temperature probe 12 F
8001644 Central temperature probe 9 F
8002910 Esophageal stetoscope with temperature probe 9 F
8002911 Esophageal stetoscope with temperature probe 12 F
8002908 Esophageal stetoscope with temperature probe 18 F
8002909 Esophageal stetoscope with temperature probe 24 F

Pulse Oximetry, Standard

Integrated reusable sensors

OXY-E4-N OxyTip+ integrated Ear Sensor 4 m / 13 ft.
OXY-F4-N OxyTip+ Finger, 4 m/13 ft.

Intergrated reusable sensors (OXY-C cable required)

OXY-F-DB OxyTip+ Finger, 2 m/6.5 ft.
OXY-W-DB OxyTip+ Wrap, 2 m/6.5 ft.
OXY-E-DB Interconnect ear sensor with "DB" connector, 2 m / 6.5 ft.

Cables for integrated reusable sensors

OXY-C1 Interconnect cable with "DB" connector, 1.5 m/5 ft.
OXY-C3 Interconnect cable with "DB" connector, 3 m/10 ft.
OXY-C7 Interconnect cable with "DB" connector, 7 m/23 ft.

Interconnect cable for use with universal connector and adhesive sensors

OXY-SL3 Cable, 3 m/10 ft.

Universal sensors (OXY-SL3 cable required)

OXY-F-UN OxyTip+ Finger, 1 m/3.3 ft.
OXY-W-UN OxyTip+ Wrap, 1 m/3.3 ft.

OXY-SE-3 OxyTip+ Sensitive Skin, 1 m/3.3 ft., 3/pkg
Adhesive sensors (OXY-SL3 cable required)
OXY-AP-10 OxyTip+ Adult/Pediatric, 10/pkg
OXY-AP-25 OxyTip+ Adult/Pediatric, 25/pkg
OXY-AF-10 OxyTip+ AllFit, 10/pkg

Pulse Oximetry, Enhanced (N-XOSAT)

Integrated reusable sensors
OXY-F4-H OxyTip+ Finger, 4 m/13 ft.
OXY-W4-H OxyTip+ Wrap, 4 m/13 ft.
OXY-E4-H OxyTip+ Ear Sensor with "H" connector.
Integrated reusable sensors (OXY-SL3 cable required)
OXY-F-UN OxyTip+ Finger, 1 m/3.3 ft.
OXY-W-UN OxyTip+ Wrap, 1 m/3.3 ft.
OXY-SE-3 OxyTip+ Sensitive Skin, 1 m/3.3 ft., 3/pkg
Adhesive sensors (OXY-SL3 cable required)
OXY-AP-10 OxyTip+ Adult/Pediatric, 10/pkg
OXY-AP-25 OxyTip+ Adult/Pediatric, 25/pkg
OXY-AF-10 OxyTip+ AllFit, 10/pkg
Interconnect cable for use with universal connector and adhesive sensors
Interconnect cable with "H" connector, 3 m / 10 ft

Pulse Oximetry, Nellcor (N-XNSAT)

See the “User’s Reference Manual” for a list of approved sensors.

NIBP

Latex-free reusable DURA-CUFS^{R}
2754E Large adult cuff, wine
2753E Adult cuff, navy blue
2752E Small adult cuff, navy blue
2751E Child cuff, green
2750E Infant cuff, orange
DisposableSOFT-CUFS^{R}
2753 Infant cuff #3, white,20/pkg
2754 Infant cuff #4,white, 20/pkg
2755 Infant cuff #5, white,20/pkg
Cuff hoses
895732 Adult hose, black, 1.8 m/6 ft.
877235 Adult hose, black, 3 m/10 ft.
879739 Adult hose, black, 6 m/20 ft.
877514 Infant hose, white, 3 m/10 ft.
890639 Infant hose, white, 6 m/20 ft.
Plastic connectors
646588 Plastic connectors for upgrading adult NIBP cuffs and hoses

Invasive Blood Pressure

Reusable transducers and cables
78000 SensoNor 844, 3 m/10 ft.
78002 Disposable dome for SensoNor 844 transucer
16578 Disposable dome for SensoNor 844 transucer
78001 Disposable flushing kit for SensoNor 844 transducer
16577 Disposable flushing kit for SensoNor 840 transducer
16579 Holder for 2x SensoNor 840 or 844 transducers
165700 Spectramed P10EZ-1,0.45 m/1.5 ft.
16571 Disposable flushing kit for Spectramed transducer P10EZ-1
M1002525 Biotrans interference cable
54586 Adapter cable for DTX™ disposable pressure transducers, 3.8 m/12 ft
875408 Cable for HP 1290C-type pressure transducers, 30 cm/1 ft.
M1002423 Biotrans Base Plate
M1002427 Biotranssingle pressure kit

Accessory kits

Hemo start up kit for Cardiocap 5

Order Code: **8000086**

Specification:

- 1 five-lead ECG trunk cable, AAMI color coding (545303)
- 1 five-lead set ECG, AAMI color coding (545318)
- 1 adult NIBP hose (877235)
- 1 adult DURA-CUF^{R} (2753E)
- 1 adult skin temperature probe (16560)
- 1 OXY-C3 interconnect cable, 3 m/10 ft. (OXY-C3)
- 1 OXY-F-DB interconnect sensor, 2 m/6.5 ft. (OXY-F-DB)

Hemo start up kit for Cardiocap 5

Order Code:

8000087

Specification:

- 1 five-lead ECG trunk cable, IEC color coding (545301)
- 1 five-lead set ECG, IEC color coding (545316)
- 1 adult NIBP hose (877235)
- 1 adult DURA-CUF^{R} (2753E)
- 1 adult skin temperature probe (16560)
- 1 OXY-C3 interconnect cable, 3 m/10 ft. (OXY-C3)
- 1 OXY-F-DB interconnect sensor, 2 m/6.5 ft. (OXY-F-DB)

Includes ECG cables with AAMI color coding

Start-up kit gas, anesthesia for Cardiocap 5

Order Code:

897609

Specification:

- 5 disposable anesthesia gas sampling lines (73319)
- 1 D-fend water trap, black (876445)
- 2 spirometry tubes (884101)
- 2 reusable D-lite sensors (733910)http://supplies.datex-ohmeda.com/ACCProductSet.asp?ID=99&title=99,24,1 - s

Stat-up kit gas, critical care Cardiocap 5

Order Code:

897608

Specification:

- 5 disposable CO2 sampling lines (733163)
- 1 D-fend+ water trap, green (881319)
- 2 spirometry tubes (884101)
- 2 reusable D-lite sensors (733910)

Flushing kits

16577	Disposable, for transducer SensoNor 840, sterile, 10 kits
16578	Disposable, dome for transducer SensoNor 840, sterile, 50/pkg

Airway Gases

Anesthesia gas sampling lines

73319	Disposable, 3 m/10 ft., 10/pkg

CO_2 sampling lines

733163	Disposable, 3 m/10 ft., 10/pkg

D-fend water traps

876446	D-fend, black, 10/pkg
881319	D-fend+, green, 10/pkg
876107	Container, 5/pkg

Adapters for low dead-space pediatric endotracheal tubes:

877583	ID 2.5 mm, 5/pkg
877584	ID 3 mm, 5/pkg
877585	ID 3.5 mm, 5/pkg
877586	ID 4 mm, 5/pkg

Reusable airway adapters

84995	Steel adapter, 15F-15M

Disposable airway adapters

73385	Straight T-adapter, 10/pkg
73386	Elbow adapter, 10/pkg

Filtration

70605	Bacterial/viral removal Y-filter/S, 35/pkg

Calibration gases

755583	(For outside North America; must use with regulator 755533) Quick Cal calibration gas (CO_2, N_2O, O_2, Des)
755533	Regulator for 755583
755571	(For North America; must use with regulator 75553-01) Quick Cal calibration gas (CO_2, N_2O, O_2, Des)
75553-01	Regulator for 755571

Gas return and scavenging

881644	Adapter for gas return, 5/pkg
733195	Sample exhaust line for gas return or scavenging, disposable, 5/pkg

Patient Spirometry

Sensors:

733910	Reusable D-lite sensor
73393	Reusable Pedi-lite sensor
733950	Single use D-lite sensors, 50/pkg

Disposable spirometry tubes

884101	3 m/10 ft., yellow, 5/pkg

Disposable spirometry accessory kit

889560	50 kits

NMT

888417 Regional block adapter, 0.5 m/1.5 ft.
57268 Electrodes, solid gel, 30/pkg
871251 NMT simulator
891192 Bed sheet clip, 3/pkg

NMT sensors (cable required)

888418 MechanoSensor, 0.3 m/1 ft.
897439 MechanoSensor, pediatric, 0.3 m/1 ft.
888416 ElectroSensor, 0.3 m/1 ft.

Cables for NMT sensors

888415 Cable, 1.5 m/5 ft.
888414 Cable, 3.3 m/11 ft.

Other Monitor Supplies

M1022178 Dust filter for Cardiocap/5
74205 Thermal recorder paper, 20 rolls
85969 Cleaning fluid
887045 Datex-Ohmeda Data card, Eng/Ger
887047 Datex-Ohmeda Data card, Fra

Fuses

511200 T2AH/250V, 5x20 mm

Interface cables

894193 Printer cable
883857 PC-interface cable

Mounting Elements

572239 Wall mount
572238 Portable monitor wall mount
572235 Portable monitor roll stand
891844 Remote Control holder

Mounting Solution for Aestiva Anesthesia Machine

1006-8070-000 Factory-installed left hand display arm mount
1006-8071-000 Factory-installed right hand display arm mount
1006-8072-000 Factory-installed folding arm mount
1006-8067-000 Field upgrade display arm mount
1006-8068-000 Field upgrade folding arm mount

Mounting Solution for Excel 210 and Modulus I

1001-3482-000 Dovetail 38 cm/15 in. arm mounting kit, 36 kg/80 lb. weight kit
1004-3943-000 Dovetail 38 cm/15 in. arm mounting kit 18 kg/40 lb. weight kit

Mounting Solution for S/5 Aespire Anesthesia Machine

1009-8168-000:
Factory installed monitor mount (includes 1009-3265-000 and 1009-8167-000 folding display mount)

1009-3265-000:
Mounting bracket for existing Aespire machines (requires 1009-3262-000 long folding display mount)

1009-3262-000
Long folding display mount (for upgrading existing Aespire machines with short folding display arm to add 1009-3265-000 Cardiocap/5 mounting bracket)

Upgrade Products for Cardiocap/5

K-CREMCO Remote Control
U-XDNET U-XDNET Data card and Network upgrade, English
U-XDNET U-XDNET Data card and Network upgrade, French
U-XDNET U-XDNET Data card and Network upgrade, German
U-XNET U-XNET Network upgrade

For more information, see the *Supplies and Accessories Catalog*.

Patient accessories designed for use with this device are made of biocompatible materials conforming to requirements of EN 30993 *Biological Evaluation of Medical Devices*. Therefore, they do not contain toxic ingredients or primary skin irritants. The conformity is based either on laboratory testing or material knowledge and the long history of the used materials.