This booklet contains important safety and care information.

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Caution: Read all instructions.

See the Burdick 8300, Burdick 8500 User’s Guide for all other instructions and important safety information. Read all instructions before using the Burdick 8300 or Burdick 8500. A complete manual set is available on the accompanying CD.
Contact information

Cardiac Science provides customer service and technical support.

◆ To order additional product or accessories, contact Customer Care.

◆ For assistance with the product or installation, contact Technical Support.

**Customer Care**

800.426.0337 (U.S.A.)
425.402.2000 (U.S.A.)
care@cardiacscience.com

**Technical Support**

800.426.0337 (U.S.A.)
425.402.2000 (U.S.A.)
techsupport@cardiacscience.com

http://websupport.cardiacscience.com/webchat/

Outside the United States, contact International Operations or your local representative.

**International Operations**

Kirke Vaerloesevej 14
Vaerloese, Denmark DK3500
45.4438.0500
Intended use

Under the supervision of a qualified physician trained in ECG interpretation the Burdick 8300 electrocardiograph and Burdick 8500 electrocardiograph can be used to record the electrical activity of the heart for the purpose of correlating the resultant waveforms with the health of the heart muscle tissue structures.

This equipment produces a resting 12-lead electrocardiogram which can be used as a first step for assessment of patients with cardiac arrhythmias, intraventricular conduction block, pre-excitation syndrome and ischemic heart disease. Records stored and used during the life of the patient can assist physicians in the diagnosis and natural history of heart related illnesses (such as coronary artery disease).

This equipment is not designed to produce a definitive interpretation nor exhaustive evaluation of the patient’s heart but rather provide an effective beginning for evaluation of patients with heart abnormalities.

**WARNING! Follow all instructions**

You are responsible for the safety of your device. Please follow all safety instructions.
Inspection at delivery

Please inspect the electrocardiograph (ECG device) for any shipping damage.

◆ If the ECG device was damaged during shipment, contact your shipping agent.

◆ If an item is missing, contact your local representative or call Customer Service. (See Contact information on page 2)

WARNING! Misdiagnosis, equipment damage, and warranty void.

Only use approved accessories and cables. Using non-approved accessories or cables may cause increased electromagnetic emissions, damage the ECG device, or void the warranty.
Warnings and cautions

Safety alert descriptions

These safety statements may be used in this manual:

DANGER!
This alert identifies hazards that will cause serious personal injury or death.

WARNING!
This alert identifies hazards that may cause serious personal injury or death.

Caution
This alert identifies hazards that may cause minor personal injury, product damage, or property damage.

General warnings and cautions

This section lists general warnings and cautions. Those pertaining to specific functions and procedures are included in the text where appropriate.

WARNING! Shock hazard
Do not touch the ECG device or patient during defibrillation. Otherwise, serious injury or death could result.

WARNING! Burn hazard
Severe burns may result from improper placement of defibrillator paddles. Never position defibrillator paddles close to or over ECG electrodes. Remove all chest electrodes (V-Leads/ C-Leads) from the patient before defibrillation.
Read and follow all defibrillator instructions before attempting defibrillation.
WARNING! Contains latex
Latex adhesive is used to attach the bumpers (feet) to the device. Exposure to products containing natural rubber latex may cause an allergic reaction in susceptible individuals. Immediately discontinue use if skin rashes, hives, sinus symptoms or other allergy symptoms are present.

WARNING! Equipment compatibility.
Use only Cardiac Science approved and specified parts, accessories, and any consumables. Use of other parts can degrade performance and/or safety and may void warranty or contract coverage.

WARNING! Operator or patient injury
Before performing any procedures with the ECG device, read and follow all safety procedures.

WARNING! Operator or patient injury
The Burdick 8500 has a tilt display that you can reposition. Ensure the path is clear to prevent pinching or catching items when moving the tilt display.

WARNING! Misdiagnosis.
Some patient information directly affects ECG analysis. (Age, gender, and race). Your patient’s physician uses this information when interpreting ECG reports. Likewise, an interpretive ECG device provides more accurate and complete analysis statements when you enter complete patient information.

WARNING! Electrical safety
Mis-using the patient cable can cause shock. Use the patient cable only as directed. Do not coil the patient cable tightly. Connect the patient cable directly ECG device only. Never attempt to connect the patient cable to any other type of device. Never attempt to connect the patient cable directly to power.
WARNING! Misdiagnosis
U.S. Federal law restricts this device to sale by or on the order of a physician. This Burdick ECG device must be used by qualified operators only and any results interpreted by a qualified diagnostician.

WARNING! Misdiagnosis
The displayed waveform is for reference only. Always use the printed file to make the final diagnosis.

WARNING: Patient injury
Ensure the device is placed on a stable surface and that it will not fall on a patient or operator. Do not lift the device by the power cord or patient cable.

WARNING! Equipment compatibility
Not for use with high frequency electrosurgery equipment.

WARNING! Equipment compatibility
Do not use this device within the magnetic field during Magnetic Resonance Imaging.

WARNING! Eye damage
The laser in the barcode scanner can cause a retinal burn when directed at a person’s eyes. Do not point the barcode scanner at a person’s eyes.

Caution: Misdiagnosis
This product is designed for medical personnel. A physician must check and confirm every measurement results and diagnoses. Use under clinical supervision only.

Perchlorate Material – special handling may apply.
See www.dtsc.ca.gov/hazardouswaste/perchlorate.
Electrical Safety

This product is intended to be operated from a mains power source of nominally 100 to 230V, 47 to 63 Hz and Maximum AC Power consumption: 35 VA.

DANGER: Explosion hazard!
Operating electrical equipment in an environment containing explosive gases can trigger an explosion. Use this equipment only in a well-ventilated, ambient environment. Do not use the device in the presence of flammable anesthetics, in an explosion-endangered, or oxygen-enriched environment. The device is not classified AP or APG.

WARNING! Electrical shock
Before plugging this device into any power source, ensure the label on the rear panel of the ECG device displays the appropriate voltage range for your location.

WARNING! Electrical hazard
Improperly grounded equipment has the potential to cause electrical shock. Use only the power cords supplied by Cardiac Science and plug the system into a properly grounded power outlet only. Do not use ungrounded adapters or extension cables.

WARNING! Electrical hazard
Improperly grounded equipment has the potential to cause electrical shock. Do not use the ECG device if there is any question about the integrity of the protective ground conductor arrangement. Immediately remove the device from AC power until the grounding issue have been resolved.

WARNING: Electrical shock
Damaged power cords have the potential to cause electrical shock. Before using the system, check for power cords that may be broken or frayed. Do not use any system with damaged power cords and remove power from a system with damaged power cords. Do not tamper with the grounding pin on the plug.
WARNING: Electrical shock
Do not connect the ECG device to an electrical outlet controlled by a wall switch or dimmer.

WARNING: Electrical shock
To reduce the risk of electrical shock, do not remove the cover (or back) of the ECG device. Refer servicing to qualified personnel.

WARNING: Electrical shock
To reduce the risk of shock, always disconnect the device from power before cleaning.

WARNING: Potential for electric shock
Cables in a computer network that lead outward from a system are typically electrically conducting connections. Do not connect any non-isolated accessories to this device.

WARNING! Potential for electric shock
If any matter (gaseous, liquid, or solid matter) enters the ECG device enclosure, you must clean the device and then have it inspected by Cardiac Science service personnel.

WARNING! Potential for electric shock
To prevent current from a non-medical electronic device (computer, monitor, printer) from reaching the patient, the operator must not touch the non-medical device and the patient at the same time.

WARNING! Potential for electric shock
The ECG device was not designed to support USB devices that connect to a standard wall socket. Do not connect externally powered USB devices to this equipment.

WARNING! Fire, explosion, or contamination
Batteries must be disposed of properly. Dispose of batteries in accordance with local regulations.
Caution: Electrical safety
If not all the electrodes are applied to the patient, place the electrodes that are not in use in such a way that they cannot come into contact with a metallic part. Do not touch the electrodes which have not been applied.

Caution: Patient injury
To prevent injury, all system cables including accessories, must be routed to prevent tripping, roll over, and snagging.

Caution: Electrical safety
An inappropriate or defective patient cable can damage the amplifier circuit and prevent the display of patient reaction. Use only Cardiac Science-supplied patient cables and check the cables for damage before each use.

Caution: Equipment disposal
Dispose of batteries, cables, accessories, and the ECG device according to the appropriate federal, state, and local regulations.

Patient cable/ECG electrodes
WARNING! Electrical safety. Misusing the patient cable can cause shock. Use the patient cable only as directed. Never attempt to connect the patient cable to any other type of device. Never attempt to connect the patient cable or lead wires directly to power.

WARNING! Patient safety
Route the patient cable to prevent injuries or cable damage. When attaching the patient cable to the electrodes, minimize the twist stress on the cable. Route the leads and cables to conform to body contours. Route the leads and cables to prevent strangulation. Ensure that no strain is placed on the electrodes. Ensure the cable does not create a trip hazard.
**WARNING! False readings**
The lead status check does not detect lead reversals. Always ensure the correct lead placement is used for the lead configuration selected.

**WARNING! Misdiagnosis**
Dirty, compromised, or unprepared skin may cause incorrect readings. Before applying electrodes, ensure the skin is clean, unbroken, and properly prepared.

**WARNING! Infection**
Lead placement on compromised skin may cause infection. Before applying electrodes, ensure the skin is clean, unbroken and properly prepared.

**Caution: Patient skin irritation**
When applying electrodes, skin preparation, electrolyte solution, or electrode material may cause skin irritation. Monitor the electrode site and, if irritation occurs, use alternative electrolyte or electrodes.

**Caution: Patient safety**
Disposable electrodes are single use only. Never re-use disposable electrodes.

**Caution: Baseline drift**
Never mix patient electrode types or brands. Dissimilar metals or other incompatibilities may cause considerable baseline drift and may increase trace recovery time after defibrillation.

**Defibrillation safety**
**WARNING! Patient cable safety**
To ensure defibrillation protection, you must use the Cardiac Science-approved patient cable. Follow all instructions for the patient cable.
Using multiple electrical apparatus

WARNING! Shock hazard.
If connecting the ECG device to non-medical equipment, use only non-medical equipment compliant with IEC 60950 or 60601-1. In addition, the enclosure leakage current of non-medical equipment connected to the ECG device must not exceed 150μA in fault condition.
If necessary, use an additional isolating transformer or floating power supply to maintain a proper enclosure leakage current and provide additional protection.

WARNING! Patient safety.
Non-medical equipment connected to the ECG device must be outside the patient’s vicinity: 6 feet (1.83 m) beyond the perimeter of the bed, table, or chair, and 7 1/2 feet (2.29 m) above the floor.

WARNING! Misdiagnosis.
Electromagnetic interference may cause trace noise or input overload conditions. This may be caused by the presence of strong EMI fields, or generated by RF noise on the line power, or by electronic, surgical, or diathermy instruments in close proximity to the ECG device. Position the ECG device away from other electrical or electronic equipment, if possible.
If used with, or around, other electrical or electronic equipment, always carefully monitor initial readings to verify normal operation.
The ECG device is compliant with IEC 60601-1-2 EMC immunity requirements. Refer to EMC guidelines on page 39.

To prevent excessive patient leakage current ensure all patient equipment meets certified IEC medical standards.

Note: The ECG device patient leads are electrically isolated from ground and the device meets IEC medical standards for leakage current.
Symbols and labels

Cardiac Science Corporation products display one or more of these symbols and warning labels for your protection.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Attention Symbol" /></td>
<td>Attention: Consult accompanying documents</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td>Warning symbol</td>
</tr>
<tr>
<td><img src="image" alt="Caution Symbol" /></td>
<td>Caution. Indicates potential equipment damage or minor injury hazard.</td>
</tr>
<tr>
<td><img src="image" alt="Danger Symbol" /></td>
<td>Danger! High voltage.</td>
</tr>
<tr>
<td><img src="image" alt="Hazardous Voltage Symbol" /></td>
<td>Hazardous voltage</td>
</tr>
<tr>
<td><img src="image" alt="Equipotentiality Symbol" /></td>
<td>Equipotentiality (used to label the grounding lug)</td>
</tr>
<tr>
<td><img src="image" alt="AC Symbol" /></td>
<td>Alternating Current (AC)</td>
</tr>
<tr>
<td><img src="image" alt="DC Symbol" /></td>
<td>Direct Current (DC)</td>
</tr>
<tr>
<td><img src="image" alt="Automatic Rhythm Symbol" /></td>
<td>Automatic Rhythm</td>
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<tr>
<td><img src="image" alt="Manual Rhythm Symbol" /></td>
<td>Manual Rhythm</td>
</tr>
<tr>
<td><img src="image" alt="On/Standby Symbol" /></td>
<td>On/Standby</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
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<td>--------------------------------------------------</td>
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<tr>
<td></td>
<td>Stop function</td>
</tr>
<tr>
<td></td>
<td>Home</td>
</tr>
<tr>
<td></td>
<td>Patient menu</td>
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<tr>
<td></td>
<td>Patient directory</td>
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<tr>
<td></td>
<td>Send/Receive menu</td>
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<tr>
<td></td>
<td>Setup menu</td>
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<td></td>
<td>Help menu</td>
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<td></td>
<td>ECG</td>
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<td></td>
<td>Stat ECG</td>
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<td></td>
<td>Form feed</td>
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<tr>
<td></td>
<td>Select</td>
</tr>
<tr>
<td></td>
<td>Alt key (selects special characters)</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
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<td>--------</td>
<td>-------------</td>
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<tr>
<td><img src="image" alt="Back" /></td>
<td>Back</td>
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<tr>
<td><img src="image" alt="Delete" /></td>
<td>Delete</td>
</tr>
<tr>
<td><img src="image" alt="Symbols" /></td>
<td>Symbols (Special character key for adding symbols)</td>
</tr>
<tr>
<td><img src="image" alt="Ethernet port" /></td>
<td>Ethernet port</td>
</tr>
<tr>
<td><img src="image" alt="USB port" /></td>
<td>USB port</td>
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<tr>
<td><img src="image" alt="Indoor, dry location use only" /></td>
<td>Indoor, dry location use only</td>
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<tr>
<td><img src="image" alt="Device or component is certified for the Japanese and/or Asian markets" /></td>
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<tr>
<td><img src="image" alt="Type CF equipment with defibrillation protection" /></td>
<td>Type CF equipment with defibrillation protection</td>
</tr>
<tr>
<td><img src="image" alt="Sold by prescription only" /></td>
<td>Sold by prescription only</td>
</tr>
<tr>
<td><img src="image" alt="Caution: Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner" /></td>
<td>Caution: Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner</td>
</tr>
<tr>
<td><img src="image" alt="Interference may occur in the vicinity of equipment marked with this symbol" /></td>
<td>Interference may occur in the vicinity of equipment marked with this symbol</td>
</tr>
<tr>
<td><img src="image" alt="Date of manufacture" /></td>
<td>Date of manufacture</td>
</tr>
</tbody>
</table>
Manufactured for

This product is listed by CSA International as certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian safety standards

Meets or exceeds Council Directive 93/42/EEC, MDD, Class IIa

Component is certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian safety standards

Battery symbol

Product has passed CB compliance testing.

TUV certification (EU Notified Body) device complies with medical standard 60601-1

Ground pinout

Disposal Instructions
System setup

External connections

*Equipotential ground*

The Burdick 8300 electrocardiograph and Burdick 8500 electrocardiograph are considered CLASS II (ungrounded) equipment.

The exposed metal on the ECG device is not likely to become energized because all the exposed metal is double insulated from the internal live circuitry (i.e., will not become energized under single fault conditions). As a result, it is safer not to connect the exposed metal to the internal chassis or the functional earth of the ECG device.

This method of protection is recognized by all national and international consensus standards and safety agencies. Since the exposed metal in the ECG device cannot become energized by any fault of the internal live circuitry and cannot become energized as a result of differences in the ground potential (because the exposed metal is not connected to ground via any Protective Earth conductor), then there is no reason to provide voltage equalization.

Therefore, the equipotential ground contact is not connected to the exposed metal.

*Input power*

**WARNING! Patient shock.**

The ECG device must be used with a medical grade power cord connected to medical grade AC outlet only. Use only Cardiac Science-approved power cables and power brick cables.
WARNING! Trip hazard.
Route all cables away from main work areas to minimize risk of tripping and injury.

WARNING! Shock hazard
If connecting the ECG device to non-medical equipment, use only non-medical equipment compliant with IEC 60950 or 60601-1. In addition, the enclosure leakage current of non-medical equipment connected to the ECG device must not exceed 150 μA in fault condition. If necessary, use an additional isolating transformer or floating power supply to maintain a proper enclosure leakage current and provide additional protection.

WARNING! Misdiagnosis
Using unshielded or excessively long cables may cause or increase susceptibility to electromagnetic interference. Always use the shortest possible shielded cables.

Caution: Equipment damage
You must operate the ECG device must be operated only at the line voltage and frequency specified on the external medical grade power supply.

Grounding
All connected equipment must be IEC 60950 approved or equivalent. Consult a qualified technician to verify equipment compatibility.
Before operating

Before using the ECG device for the first time, you must connect the ECG device to power and charge the battery. Connecting the device to AC power charges the battery.

**Note:** The battery must be charged for **six hours** before the ECG device can be operated on battery power alone. To charge the battery, connect the unit to AC power.

**Charge the battery**

After the battery is fully charged, you can use the ECG device on battery power or keep it connected to AC power. Monitor the power indications to prevent the battery from completely discharging.

When operating on battery power, press **On/Standby** to power off the device between tests.

**Caution: Data loss.**

The battery pack must be installed at all times for proper operation.

During normal operation, the following power indications are displayed

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AC</strong></td>
<td>Indicates the ECG device is connected to AC power.</td>
<td>none</td>
</tr>
<tr>
<td><strong>Bat</strong></td>
<td>Indicates the ECG device is not connected to AC power and is running on the battery.</td>
<td>none</td>
</tr>
</tbody>
</table>
Connect to power

The input power cable includes a 3-conductor, medical-grade power cable.

To connect the ECG device to power:

1. Connect the external power supply (brick cable 010-1684-00) to the external power connector (see 7, in Figure 1) on the back of the ECG device.

2. Connect the AC power cable (007082 or 047262) to the external power supply (brick cable).

3. Connect the AC power cable to a properly grounded, medical grade wall outlet.

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Indicates the ECG device is running on battery power and less than 15 minutes of operating time remain. The ECG device also beeps every 30 seconds as an audible low battery warning.</td>
<td>When <strong>Low</strong> displays, immediately connect the ECG device to AC power to recharge the battery and prevent operation interruption.</td>
</tr>
<tr>
<td>Power down</td>
<td>Indicates the battery no longer has enough power to maintain normal operation and shuts off approximately 5 seconds after the message is displayed.</td>
<td>Connect the ECG device to AC power to resume operation.</td>
</tr>
</tbody>
</table>
Figure 1: Back panel

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SDIO</td>
</tr>
<tr>
<td>2</td>
<td>USB&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3</td>
<td>Network</td>
</tr>
<tr>
<td>4</td>
<td>Internal use only</td>
</tr>
<tr>
<td>5</td>
<td>Equipotential grounding</td>
</tr>
<tr>
<td>6</td>
<td>Power indicator</td>
</tr>
<tr>
<td>7</td>
<td>External power connector</td>
</tr>
</tbody>
</table>

<sup>a</sup>The ECG device conforms to all safety and essential performance standards. Every effort has been made to ensure the ECG device is safe when used with systems containing other equipment. When the ECG device is connected to another device using a USB cable, it is important to ensure the cable will not create excessive radio frequency emissions. To minimize this risk, a ferrite USB cable emissions reducer kit is available as an accessory (see the Accessories List for ordering instructions) and must be used with any USB cable connected to the ECG device. Follow the installation instructions supplied with the ferrite USB cable kit.
Set date and time

Use the Date and Time selections to enter the correct date and time. Use Date Format to set the display format for the date.

To set the date and time:

1. Press On/Standby.
2. Press Setup.
3. Use the arrow keys (Next and Previous) to scroll to Date and press Select.
   - If the date is correct, press Next.
   - If the date is incorrect, press Select and use the keyboard to enter the correct date and press Select.

4. The system displays the time.
   - If the time is correct, press Next.
   - If the time is incorrect, press Select and use the keyboard to enter the correct time in a 24-hour format and press Select.

4. Press Home to return to the main display.
Patient cable

Figure 2: Front view

Connect the patient cable via connector on the front of the ECG device.

◆ Ensure the connector on the cable is arrow-side-up then firmly push the connector until the arrow point is aligned with the edge of the ECG device.

For proper patient preparation, skin preparation, and electrode placement, see the User’s Guide.

Note: If a lead wire disconnects the system indicates the lead that has failed in the lower left corner of the display.
Powering the ECG device on and off

**Power on**

Press On/Standby to power on the ECG device. The unit performs self-tests and displays the Home screen. The system may take two to three seconds to display the date and time.

**Standby mode**

The ECG device must be connected to AC power to go into Standby mode. At any time during operation, press On/Standby.

*Note:* The internal battery charges in Standby mode.

**Power off**

To power off the ECG device completely, disconnect the AC power cord and then press On/Standby.

The automatic power down feature may be temporarily turned off by changing the battery saver setting. For more information, see the User’s Guide.

*Note:* Automatic power down is disabled when the ECG device is connected to a patient.

**Power indicator**

A green light on the back of the ECG device (see Figure 1 on page 1-21) is lit whenever the ECG device is receiving power from the external power source.
Connectivity

When the ECG device is connected to a wired or wireless network, the ECG device can transmit data to a network share, to an EMR, or to an information system. For more information on connectivity see the Network Setup Guide. The documentation CD contains an example of the xml network schema.

Loading recording paper

Be prepared to load new paper when the system indicates that paper is low. Cardiac Science-approved paper contains a red streak at the bottom of each sheet when the paper is low.

Caution: Possible data loss.

Loading paper can create a static charge that causes the ECG device to delete unsaved ECG data. If paper runs out while acquiring an ECG, save the ECG before replacing the paper.

Caution: Warranty void.

Using unapproved recording paper may damage the ECG device and void the warranty. The ECG device is intended for use only with approved ECG supplies.

Use only the following approved, thermal ECG paper:

- Assurance™, permanent trace, Z-fold. Guaranteed image integrity for 25 years when stored per manufacturer’s specifications.
- HeartLine™, standard trace, Z-fold. Guaranteed image integrity 5 years when stored per manufacturer’s specifications.
To load paper:

1. Open the paper tray door on the left side of the unit.
   - With your left hand, firmly pull the door to the left until it opens.
     The door pivots down when fully opened.
     DO NOT ATTEMPT TO REMOVE THE DOOR FROM THE UNIT.

2. Place a stack of paper in the compartment so that the black queue mark on the lower left corner of the paper is visible.

3. With your right hand, lift the top sheet of paper and hold it out of the way of the door.
4. Carefully slide the door back into the unit.

**WARNING! Operator or patient injury**
The paper door can pinch. Ensure fingers, skin, and clothing are clear of the paper door while closing.

**DO NOT INSERT THE DOOR AT AN ANGLE.** The door must be inserted parallel to the device.

![Diagram showing incorrect door insertion angle](image)

**Note:** Pushing on the slanted surface near the paper door guides puts the door in the appropriate position.

5. Before snapping the door into place, pull the paper out so it covers the door.

**Important:** CENTER THE EDGES OF THE PAPER BETWEEN AND PARALLEL TO THE DOOR GUIDES AND PARALLEL TO THE GRAY GUIDELINES ON THE QUICK REFERENCE GUIDE LABEL.

6. Push the door firmly until it snaps into place.

7. Press **On/Standby** to power on the unit and Wait until the unit beeps.
8. Press **Form Feed** once.

   Ensure the paper feeds out straight. If the paper is not straight, repeat this procedure from step 1 until the paper is straight.

9. Tear off extra pages at the perforation.

   **Note:** You must select the correct paper type. The default paper setting is **Assurance**. If using HeartLine paper, see the **System Settings** in the *User’s Manual* to change the setting.

### Restore system settings

Use a USB drive to create a settings file backup. Use the settings file to configure multiple ECG devices with the same configuration or to restore settings.

**Caution: Possible data corruption**

This procedure requires access to the Service functions menu. The Service functions menu is intended for qualified Service personnel. If you have any question, please contact Technical Support.

<table>
<thead>
<tr>
<th>To</th>
<th>Do this</th>
</tr>
</thead>
</table>
| Save a copy of the system settings to a USB drive | 1. Connect a USB drive to a USB port on the back of the ECG device.  
   **Note:** When using a USB device to import or export data, ensure only one USB device is connected to the ECG device.  
   2. Press **Setup**.  
   3. Scroll to the **Import/Export** menu  
   4. Select **Export to USB**.  
   The system exports the settings to the USB drive. Wait a few minutes. When the menu screen can be selected it is safe to remove the USB drive.  
   5. Remove the USB drive. |
<table>
<thead>
<tr>
<th>To</th>
<th>Do this</th>
</tr>
</thead>
</table>
| Restore system settings from a USB drive | 1. Connect a USB drive containing an xml file with the system settings to a USB port on the back of the ECG device.  
   **Note:** When using a USB device to import or export data, ensure only one USB device is connected to the ECG device.  
2. Press **Setup**.  
3. Scroll to the **Import/Export** menu  
4. Select **Import from USB**.  
   The system prompts you to enter the name of the file.  
5. Enter the name of the system settings file.  
   The default name is: **PhoenixSettings.xml**  
   The system imports the settings to the USB drive. This takes a few minutes. When the system restarts it is safe to remove the USB drive.  
6. Remove the USB drive.  
   The settings on the ECG device are the same as the imported settings file. |
Once per shift: clean

Clean the ECG device at least once per shift, or as needed.

**Caution: Equipment damage.**

Do not use ether, bleach, acetone, benzene, or similar solvents to clean the ECG device, cables, or electrodes. Use only these cleaning agents: 3M™ 23H, PDI® Nice Pak® Sani-System, or Virex II™.

**Caution: Equipment damage.**

Do not immerse the ECG device, cables, or electrodes in any type of fluid.

If the ECG device is immersed in, or comes in contact with, large quantities of fluid, immediately discontinue use and contact a qualified service technician.

**Caution: Equipment damage.**

Do not hot sterilize ECG device, cables, or electrodes. Do not sterilize the patient cable.

**Exterior**

To clean the exterior of the ECG device:

- Use a clean damp cloth to apply a disinfectant listed above.

**Patient cable and reusable electrodes**

See the *Accessory List* for Cardiac Science-approved patient cables and electrodes. To clean and disinfect:

- Use a clean damp cloth to apply a disinfectant listed above.
**Printhead**

**Caution: Equipment damage.**
Abrasive cleaners or harsh chemicals may damage the printhead.
If cleaning is required use a lint free swab dampened with isopropyl alcohol.

Check the printout to ensure the printing is legible and dark.
Light printing (particularly at the baseline) may indicate a dirty printhead.

**Inspect for damage**

**WARNING! Hazardous voltage.**
The interior of the ECG device may retain hazardous voltages even after the ECG device is shut off and the power cord disconnected.
There are no internal user serviceable parts other than the battery.
Do not remove any other cover or try to disassemble the ECG device.
If the ECG device appears damaged, immediately discontinue use and contact a qualified service technician.

**WARNING! Misdiagnosis.**
Operating a damaged ECG device or using worn or damaged cables or connectors may cause incorrect or unreliable readings.
If the ECG device appears damaged, immediately discontinue use and contact a qualified service technician.
Immediately replace worn or damaged cables or electrodes.

Before each use, or at least once per shift, Check the ECG device, cables, and electrodes for wear or damage. This includes:

- **ECG device housing**—Ensure the housing is clean and undamaged. Check for dents, bulges, or cracks.
- **Power cords**—(including the plugs, jacks and outlet). Ensure the power cords are not worn or damaged. Specifically, check for loose, cracked, or bent connectors at the plug ends and cuts, nicks, or fraying of the cords.
◆ Wall outlet—Check the wall outlet for cracks or other damage.
◆ Other cables and electrodes—Check all other cables and electrodes for loose, bent or cracked connectors and cuts, nicks or fraying of the cords.

**Testing**
The ECG device performs a self-test at power up. No additional testing or calibration is necessary.

**Check the patient cable**
If the patient cable appears damaged in any way (including nicks, cuts, bulging, or fraying), contact your local representative for replacement.

◆ Visually inspect the cable for cracks, stress marks and broken or bent pins.
◆ Connect the patient cable to the ECG and attach each electrode lead to an electronic heart signal simulator. (If a simulator is not available, a test subject may be used.)
◆ Check the signal transmission through the cable by flexing the cable and electrode lead wires and observing the ECG rhythm for irregular tracings.

**Note:** If using a test subject, be sure not to disturb the electrode site since common baseline artifact will occur. This should not be confused as a broken wire.
Testing the battery

**WARNING! Fire or explosion.**

Never remove the battery pack and attempt to recharge using an external battery charger.

The ECG device automatically monitors battery status. No additional battery tests or calibration are required.

If the battery does not retain a charge for more than 30 minutes of operation, see the *User’s Guide*.

Annually

A complete safety and component check must be performed annually by a qualified service technician.

The testing must include a 1 mV calibration pulse test to verify the gain hardware is properly calibrated.

As needed

Perform these functions as necessary.

<table>
<thead>
<tr>
<th>To...</th>
<th>Do this...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace the power cord</td>
<td>1. Disconnect the AC power cable from the wall socket.</td>
</tr>
<tr>
<td></td>
<td>2. Disconnect the external power supply (brick cable) from the back of the ECG device.</td>
</tr>
<tr>
<td></td>
<td>3. Replace the portions of the cable as necessary and follow the instructions <em>Connect to power</em> on page 20.</td>
</tr>
<tr>
<td>Replace the patient cable</td>
<td>1. Disconnect the patient cable from the ECG device.</td>
</tr>
<tr>
<td></td>
<td>2. Replace the patient cable with the Cardiac Science-approved cable, see the <em>Accessory List</em>.</td>
</tr>
</tbody>
</table>
# Technical specifications

## Physical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>15.0&quot; x 13.125&quot; x 5.5&quot; (381mm x 334mm x 140mm)</td>
</tr>
<tr>
<td>Weight (unit only)</td>
<td>11 lbs (5 kg) (including external power supply)</td>
</tr>
<tr>
<td>Display</td>
<td>8300: 5.7 inch mono LCD screen</td>
</tr>
<tr>
<td></td>
<td>8500: 7 inch color LCD screen</td>
</tr>
<tr>
<td>Keyboard</td>
<td>Full alphanumeric keypad plus designated quick keys</td>
</tr>
<tr>
<td>Data Storage</td>
<td>8300: 50 records standard</td>
</tr>
<tr>
<td></td>
<td>8500: 150 records standard, optional upgrade to 300</td>
</tr>
<tr>
<td>Input Power</td>
<td>AC Operation 100-240 VAC ± 10%, 50-60 Hz ± 3 Hz</td>
</tr>
<tr>
<td>Battery duration</td>
<td>In manual mode at 25 mm/s:</td>
</tr>
<tr>
<td></td>
<td>• 8300 — 200 pages or 35 minutes continuous printing</td>
</tr>
<tr>
<td></td>
<td>• 8500 — 300 pages or 55 minutes continuous printing</td>
</tr>
</tbody>
</table>

## Printout

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printout device</td>
<td>216 mm thermal dot array</td>
</tr>
<tr>
<td>Paper dimension</td>
<td>8.5&quot; x 11&quot; (US letter)</td>
</tr>
<tr>
<td></td>
<td>210mm x 300mm (A4)</td>
</tr>
<tr>
<td>Paper type</td>
<td>Thermal sensitive (Burdick Assurance® or HeartLine™ paper recommended)</td>
</tr>
<tr>
<td>Chart speeds</td>
<td>12.5, 25, 50 mm/sec</td>
</tr>
<tr>
<td>Gain</td>
<td>5, 10, 20 mm/mV Chest or Limb (may be split)</td>
</tr>
<tr>
<td>Printout formats</td>
<td>3, 4, 6, or 12 channels; additional rhythm formats</td>
</tr>
</tbody>
</table>
## Technical specifications

### Input/Output

- **Ethernet (RJ45)**
- **USB type A, FAT32 format only**
- **Optional Upgrades 802.11**

Barcode scanner, reads up to 3 barcodes per patient, including these barcode types:

- **1-D**
  - UPC/EAN
  - Code 39, Code 39 Full ASCII, Tir-optic Code 39
  - GS1 DataBar (formerly RSS) variants
  - GS1-128 (formerly UCC/EAN-128), Code 128, Code 128 Full ASCII
  - Interleaved 2 of 5, Discrete 2 of 5
  - Code 93

- **2-D**
  - PDF 417, microPDF417
  - DataMatrix (ECC 200)
  - MaxiCode
  - QR Code
  - Aztec

### Equipment Type

<table>
<thead>
<tr>
<th>Class</th>
<th>Class IIa (Council Directive 93/42/EEC, MDD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of protection from electric shock</td>
<td>IEC 60601-1 Class II, Type CF - Defibrillator Proof</td>
</tr>
<tr>
<td>Mode of operation</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
### Acquisition

<table>
<thead>
<tr>
<th>Lead selection</th>
<th>I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6 and Alternate Chest Lead (chest lead selection V2R through V9R, V7, V8, and V9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modes</td>
<td>Automatic, automatic rhythm, or manual rhythm</td>
</tr>
<tr>
<td>Frequency response</td>
<td>Meets or exceeds IEC 60601-2-51 standards</td>
</tr>
<tr>
<td>Input impedance</td>
<td>Meets or exceeds IEC 60601-2-51 standards</td>
</tr>
<tr>
<td>Electrode offset tolerance</td>
<td>±300 mV</td>
</tr>
<tr>
<td>Sampling</td>
<td>8000 Samples/Sec. 2.5μV LSB, Burst acquisition &lt;100 μS</td>
</tr>
<tr>
<td>Artifact filter response</td>
<td>40 Hz, -3db</td>
</tr>
<tr>
<td>Storage</td>
<td>500 samples/second, 2.5μV LSB</td>
</tr>
<tr>
<td>Pacemaker display capability</td>
<td>Meets or exceeds IEC 60601-2-51</td>
</tr>
<tr>
<td>Interpretation (optional)</td>
<td>Diagnosis, measurements, reasons statements based on five demographic criteria</td>
</tr>
</tbody>
</table>

### Environmental (Electrodes)

| Operating and storage           | Follow the electrode package labeling for operating and storage. To prevent electrodes from drying out Cardiac Science recommends storing electrodes in a reclosable pouch. |
## Environmental (Device only)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>50°F to 104°F (10°C to 40°C)</td>
</tr>
<tr>
<td>Operating relative humidity</td>
<td>20% to 75% non-condensing</td>
</tr>
<tr>
<td>Operating atmospheric pressure</td>
<td>1060 hPa to 700 hPa (-500 ft to 10,000 ft reference to sea level)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-4°F to 113°F (-20°C to 45°C)</td>
</tr>
<tr>
<td>Storage relative humidity</td>
<td>10% to 90% non-condensing</td>
</tr>
<tr>
<td>Storage atmospheric pressure</td>
<td>1060 hPa to 190 hPa (-500 ft to 40,000 ft reference to sea level)</td>
</tr>
</tbody>
</table>

### Standards

- **Conforms to Regulations**
  - 21 CFR Subchapter H (*Title 21 Food and Drugs - Food and Drug Administration, Department of Health and Human Services (Parts 1-1299)*)
  - 2002 No. 236 (*Therapeutic Goods (Medical Devices) Regulations 2002*)

- **Conforms to Guidance**
  - ANSI/AAMI EC57
  - IEC 60417
  - IEC/TR 60878
  - ISO 7000
  - ISO 15223-1
  - EN 1041
  - EN 980

- **Wireless Specification**
  - IEEE802.11-2007
### Product Safety and Setup

<table>
<thead>
<tr>
<th>Conforms to Standards</th>
<th>CAN/CSA-C22.2 No. 601.1-M90 (Medical Electrical Equipment – Part 1: General Requirements for Safety)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA C22.2 No. 601.2.25 (Medical electrical equipment, Part 2: Particular requirements for the safety of electrocardiographs)</td>
</tr>
<tr>
<td></td>
<td>UL 60601 (Medical Electrical Equipment, Part 1: General Requirements for Safety)</td>
</tr>
<tr>
<td></td>
<td>EN 60601-2-25 &amp; Amend. 1 (Medical electrical equipment, Part 2: Particular requirements for the safety of electrocardiographs)</td>
</tr>
<tr>
<td></td>
<td>ANSI/AAMI EC53 (ECG cables and leadwires)</td>
</tr>
<tr>
<td></td>
<td>EN 60601-2-51 (Particular requirements for safety, including essential performance, of recording and analysing single channel and multichannel electrocardiographs)</td>
</tr>
<tr>
<td></td>
<td>EN/ISO 10993-1 (Biological Evaluation of Medical Device – Part 1: Evaluation and Testing)</td>
</tr>
<tr>
<td></td>
<td>EN/ISO 10993-10 (Biological Evaluation Of Medical Devices - Part 10: Tests For Irritation And Delayed-Type Hypersensitivity)</td>
</tr>
<tr>
<td></td>
<td>EN/ISO 13485 (Medical Devices – Quality Management Systems – Requirements for Regulatory Purposes)</td>
</tr>
<tr>
<td></td>
<td>EN/ISO 14971 (Medical Devices – Application of Risk Management to Medical Devices)</td>
</tr>
<tr>
<td></td>
<td>ISTA 1A (Package products 150 lbs (68 Kg) or less)</td>
</tr>
</tbody>
</table>

### Safety

<table>
<thead>
<tr>
<th>Safety Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leakage current</td>
<td>patient &lt;10 μA, chassis &lt;100 μA</td>
</tr>
<tr>
<td>Defibrillation protection</td>
<td>to 5000V, 360J</td>
</tr>
</tbody>
</table>

### Warranty

<table>
<thead>
<tr>
<th>Warranty Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>8300</td>
<td>3 years with return of warranty card</td>
</tr>
<tr>
<td>8500</td>
<td>4 years with return of warranty card</td>
</tr>
</tbody>
</table>
EMC guidelines

WARNING! Electromagnetic interference.
Position the Burdick 8300/8500 away from other electrical or electronic equipment, if possible. The presence of strong EMI fields, or generated by RF noise on the line power, or by electronic, surgical, or diathermy instruments in close proximity to the ECG device may cause trace noise or input overload conditions.

If used with, or around, other electrical or electronic equipment, always carefully monitor initial readings to verify normal operation.

The Burdick 8300/8500 is compliant with IEC 60601-1-2 EMC immunity requirements. Refer to *EMC guidelines* on page 39.

The Burdick 8300/8500 needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this document.

Portable and mobile RF communications equipment can affect the Burdick 8300/8500.

Essential Performance (as defined by 60601-1-2 section 6.8.3.201a 6) is the ability of an operator under the supervision of a qualified physician trained in ECG interpretation to use the Burdick 8300/8500 electrocardiograph to record the electrical activity of the heart for the purpose of correlating the resultant waveforms with the health of the heart muscle tissue structures.

The Burdick 8300/8500 is intended for use in the electromagnetic environment specified below.

WARNING! Electromagnetic interference.
This system should not be used adjacent to or stacked with other equipment except the Cardiac Science-approved accessories listed in the accessories list.
List of cables

WARNING! Use only specified cables and accessories. The use of accessories or cables other than those specified may result in increased emissions or decreased immunity of the system.

There are no accessories (other than the cables listed in Table 1) applicable to EMC compliance for the Burdick 8300/8500.

Table 1: List of cables for Burdick 8300/8500 cables EMC Compliance

<table>
<thead>
<tr>
<th>Cable description</th>
<th>Cable type</th>
<th>Maximum cable length</th>
<th>Connection 1</th>
<th>Connection 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient cable</td>
<td>ECG Cable</td>
<td>3.4m</td>
<td>Patient connector</td>
<td>Patient</td>
</tr>
<tr>
<td>AC power cable</td>
<td>IEC320M / IEC320F</td>
<td>3.0m</td>
<td>AC power</td>
<td>Power brick input</td>
</tr>
<tr>
<td>Power brick cable</td>
<td>DC Power</td>
<td>1.2m</td>
<td>AC power cable</td>
<td>DC power input</td>
</tr>
</tbody>
</table>
### Table 2: Electromagnetic emissions

<table>
<thead>
<tr>
<th>Emissions test</th>
<th>Compliance</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF emissions CISPR 11</td>
<td>Group 1</td>
<td>The Burdick 8300/8500 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td>
</tr>
<tr>
<td>RF emissions CISPR 11</td>
<td>Class B</td>
<td>The Burdick 8300/8500 is suitable for use in all establishments including domestic establishments and those directly connected to the low-voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>Harmonic emissions IEC 61000-3-2</td>
<td>Class B</td>
<td></td>
</tr>
<tr>
<td>Voltage fluctuations/ flicker emissions IEC 61000-3-3</td>
<td>Complies</td>
<td></td>
</tr>
</tbody>
</table>
## Table 3: Electromagnetic immunity

<table>
<thead>
<tr>
<th>Immunity test</th>
<th>IEC 60601 test level</th>
<th>Compliance level</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic discharge (ESD)</td>
<td>±6 kV contact, ±8 kV air</td>
<td>±6 kV contact, ±8 kV air</td>
<td>Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.</td>
</tr>
<tr>
<td>IEC 61000-4-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical fast transient/burst</td>
<td>±2 kV for power supply lines</td>
<td>±2 kV for power supply lines</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>IEC 61000-4-4</td>
<td>±1 kV for input/output lines</td>
<td>±1 kV for input/output lines</td>
<td></td>
</tr>
<tr>
<td>Surge</td>
<td>±1 kV line(s) to line(s)</td>
<td>±1 kV differential mode</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>IEC 61000-4-5</td>
<td>±2 kV line(s) to earth</td>
<td>±2 kV common mode</td>
<td></td>
</tr>
<tr>
<td>Voltage dips, short interruptions and voltage variations on power supply input lines</td>
<td>&lt;5% $U_T$ (&lt;95% dip in $U_T$) for 0.5 cycle, 40% $U_T$ (60% dip in $U_T$) for 5 cycles, 70% $U_T$ (30% dip in $U_T$) for 25 cycle, &lt;5% $U_T$ (&lt;95% dip in $U_T$) for 5 sec</td>
<td>&lt;5% $U_T$ (&lt;95% dip in $U_T$) for 0.5 cycle, 40% $U_T$ (60% dip in $U_T$) for 5 cycles, 70% $U_T$ (30% dip in $U_T$) for 25 cycle, &lt;5% $U_T$ (&lt;95% dip in $U_T$) for 5 sec</td>
<td>Mains power quality should be typical of a commercial or hospital environment. If the Burdick 8300/8500 user requires continued operation during power mains interruptions, then the Burdick 8300/8500 must be powered from an uninterruptible power supply or a battery.</td>
</tr>
<tr>
<td>IEC 61000-4-11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power frequency (50/60 Hz) magnetic field</td>
<td>3 A/m</td>
<td>3 A/m</td>
<td>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>IEC 61000-4-8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 1:** $U_T$ is the a.c. mains voltage prior to application of the test level.
Table 3: Electromagnetic immunity (continued)

<table>
<thead>
<tr>
<th>Immunity test</th>
<th>IEC 60601 test level</th>
<th>Compliance level</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
</table>
| Conducted RF  | 3 Vrms               | 3 Vrms           | Portable and mobile RF communications equipment should be used no closer to any part of the Burdick 8300/8500, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance
| IEC 61000-4-6 | 150 kHz to 80 MHz    |                  | $d = 1.2 \sqrt{P}$ 80 MHz to 800 MHz
| Radiated RF$^c$ | 3 V/m                | 3 V/m            | $d = 1.2 \sqrt{P}$ 800 MHz to 2.5 GHz
| IEC 61000-4-3 | 80 MHz to 2.5 GHz    |                  | Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,$^a$ should be less than the compliance level in each frequency range$^b$. Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.
Product Safety and Setup

Table 3: Electromagnetic immunity (continued)

<table>
<thead>
<tr>
<th>Immunity test</th>
<th>IEC 60601 test level</th>
<th>Compliance level</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
</table>

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Burdick 8300/8500 is used exceeds the applicable RF compliance level above, then the Burdick 8300/8500 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Burdick 8300/8500.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

c Amplitude modulated at 80% with a modulation frequency of 10 KHz per EN 60601-2-25.
## Recommended separation distances

### Recommended separation distances between portable and mobile RF communications equipment and the Burdick 8300/8500

The Burdick 8300/8500 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Burdick 8300/8500 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Burdick 8300/8500 as recommended below, according to the maximum output power of the communications equipment.

<table>
<thead>
<tr>
<th>Rated maximum output power of transmitter W</th>
<th>Separation distance according to frequency of transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 kHz to 80 MHz</td>
</tr>
<tr>
<td></td>
<td>( d = 1.2 \sqrt{P} )</td>
</tr>
<tr>
<td>0.01</td>
<td>0.12</td>
</tr>
<tr>
<td>0.1</td>
<td>0.38</td>
</tr>
<tr>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>100</td>
<td>12</td>
</tr>
</tbody>
</table>

For transmitters rated at a maximum output power not listed above, the recommended separation distance \( d \) in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where \( P \) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

**NOTE 1:** At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

**NOTE 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.