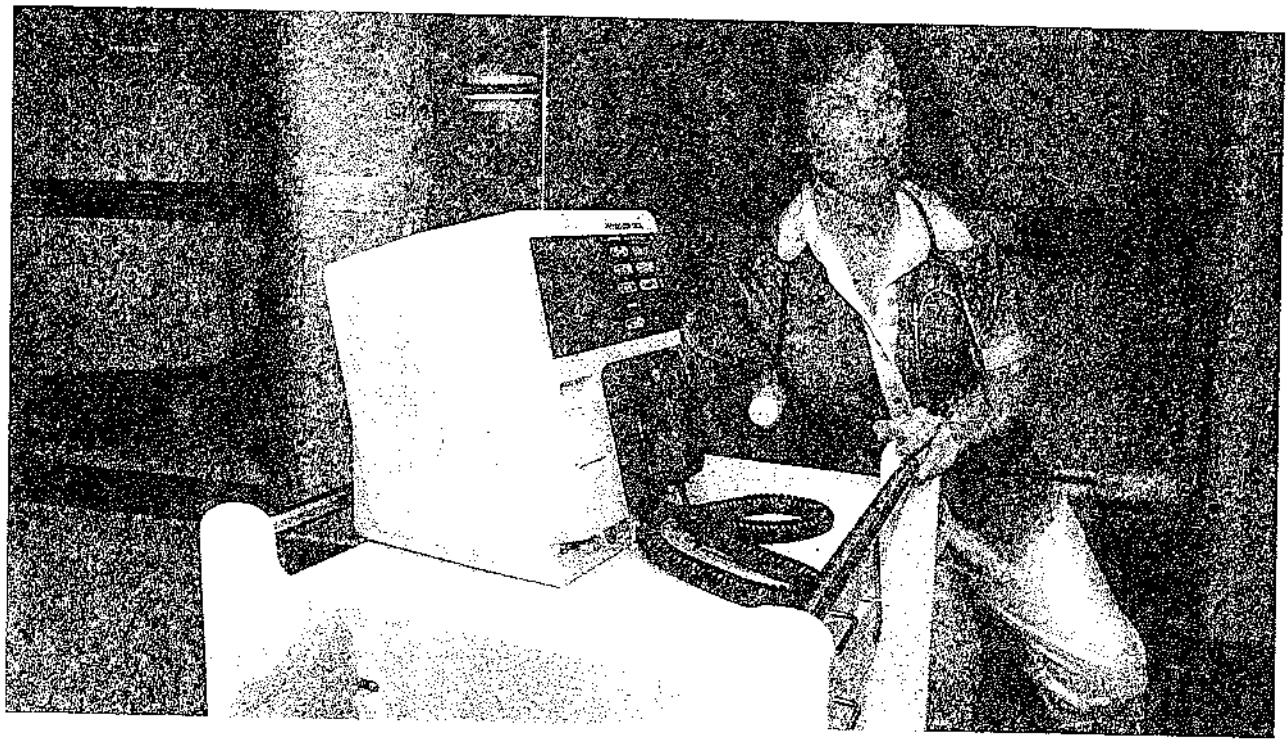
OPERATING INSTRUCTIONS

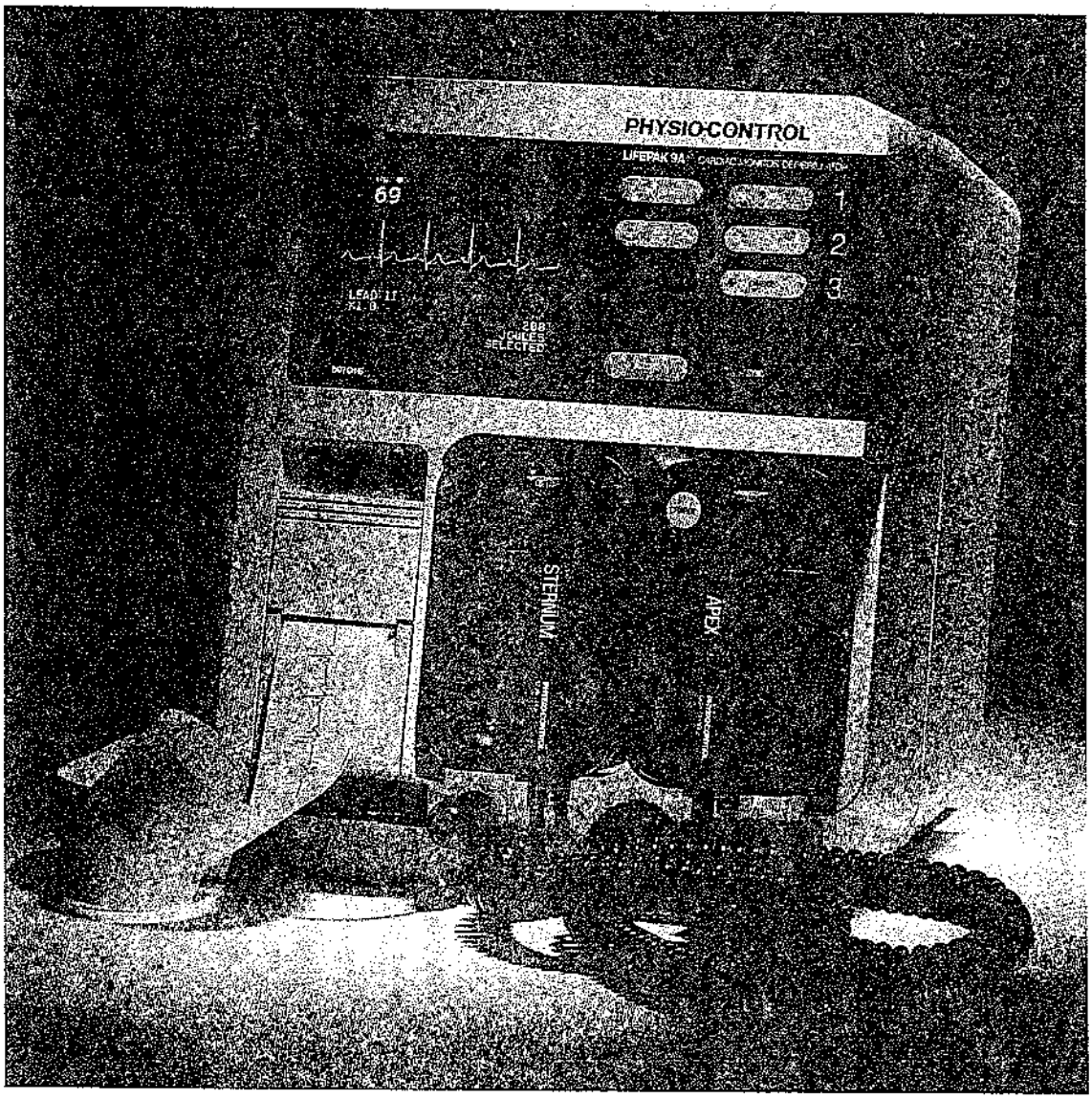


PHYSIO CONTROL

CONTENTS

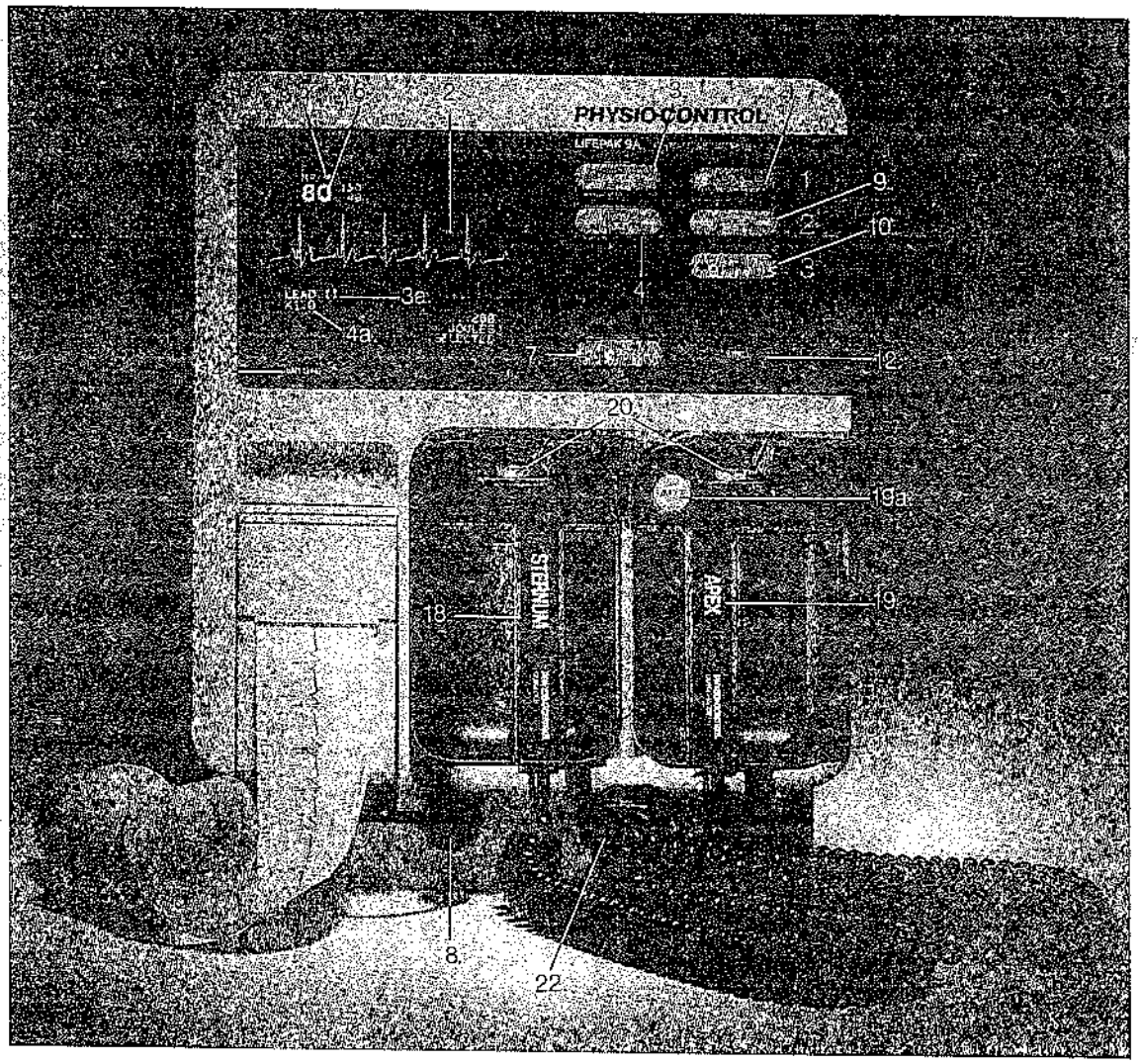
CAUTIONS

- This instrument is to be used by authorized medical personnel only.
- Operator should be thoroughly familiar with the information in this manual before using instrument. Manuals should be reviewed periodically.
- Federal (U.S.A.) law restricts this device to sale by or on the order of a physician.
- LIFEPAK 9A defibrillator/monitor should not be used in oxygen-enriched environments or in the presence of flammable agents or anesthetics. These present a possible fire or explosion hazard.
- Do not discharge defibrillator with paddles shorted together as it may create shock hazard or damage the instrument.
- Do not discharge defibrillator into open air as it may create a shock hazard. Change energy selection or turn defibrillator "POWER" off to discharge defibrillator internally.
- Stay clear of patient when defibrillating. Contact with patient or any electrode presents a potential shock hazard during defibrillation.
- Keep defibrillator paddles clean. Paddle handles covered with gel (wet or dry) present a hazardous electrical pathway between the paddle electrodes and the user (i.e., shock hazard) during defibrillator discharge.
- If the integrity of the grounding system is in doubt, the unit should be operated from internal batteries.
- Do not allow water or other fluid to enter the instrument. Spillage into the instrument may damage it and may present a fire or shock hazard.
- When not in the diagnostic mode, this product is intended for rhythm interpretation only; it should not be used to evaluate ST segment abnormalities or more elaborate ECG interpretation.



The Physio-Control LIFEPAK®9A defibrillator/monitor is flexible, compact, and easy to use during resuscitation or routine monitoring. Optional adapters let you tailor the device for use in areas of special need. The defibrillation adapter allows use of internal or external sterilizable paddles, as well as "hands off" defibrillation with FAST-PATCH® disposable defibrillation/ECG electrodes.

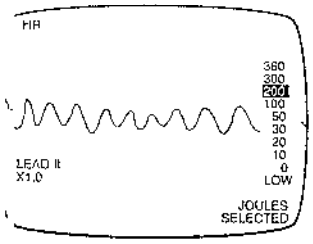
The LIFEPAK 9A defibrillator/monitor has special low energy selections, a synchronizer for cardioversion, and an annotating recorder designed for easy paper loading. Pediatric and posterior paddles slip over the standard adult paddles. The integral battery is easy to access and permits continuous operation even in the event of AC power interruption.



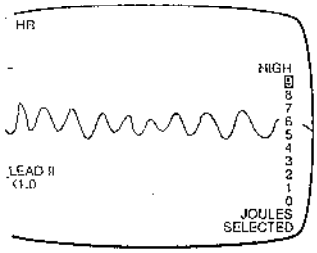
Defibrillator/Monitor

1.	**(1)** ON	Lighted pushbutton for activation of the instrument. (For IEC units, AC power selection is controlled via "MAINS POWER" switch on rear panel.)
2.	CARDIOSCOPE	Non-fade display ECG trace moves from right to left. Alphanumeric information as described below.
3.	LEAD SELECT	Pushbutton selects ECG input: Std., Paddles, Leads I, II, III. Push momentarily to advance one position.
3a.	LEAD SELECT INDICATOR	Alphanumerics on screen indicate lead selected.
4.	ECG SIZE	Control adjusts vertical size of ECG trace on cardioscope and recorder. x1 gain selected automatically at power up. Push ▲ or ▼ to increase or decrease ECG size.

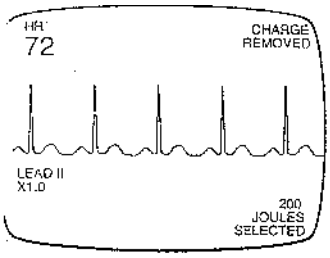
4a.	ECG SIZE INDICATOR	Alphanumerics on screen indicate actual gain selected from 0.2 cm/mV to 4.0 cm/mV.
5.	QRS	Display symbol (❤) flashes when QRS is sensed.
6.	HEART RATE	Digital display of QRS rate from 20-300 bpm.
7.	RECORDER	Records ECG and annotation on ECG paper designed for thermal array recorders. Prints time, date, ECG lead, ECG gain, heart rate, defibrillation or synchronization parameters, and heart rate alarm when violated.
8.	PATIENT CONNECTION	Connector for Physio-Control 3-lead 6-pin patient cable. Use only Physio-Control 9-10418-02 (AHA) or 800947-01 (IEC) 3-lead cable.
9.	(2) ENERGY SELECT	Pushbutton to select energy levels. Energy levels will appear on right side of monitor screen. Two ranges, high and low, are available. The energy level selected will be highlighted on the screen. To change selected level, push ▲ or ▼ to increase or decrease. 200 joules is selected automatically at power up. Energy selection range will stay on screen for 10 seconds following the last energy level selected or until another button is pushed.



9a.	HIGH RANGE ENERGY SELECT	High range energy display shows "Low, 0, 10, 20, 30, 50, 100, 200, 300, and 360" joules. When in high range, selecting the "LOW" setting will cause low energy selection range to appear with 9 joule setting highlighted. (Note: Selection of 0 joules will inhibit charging of defibrillator.)



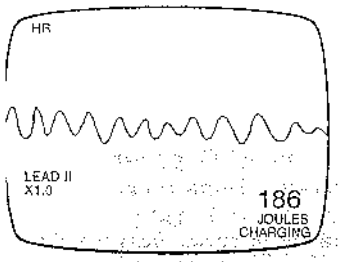
9b.	LOW RANGE ENERGY SELECT	Low range energy display shows "0, 1, 2, 3, 4, 5, 6, 7, 8, 9, High" joules. When in low range, selecting "HIGH" setting will cause high energy selection range to appear with10 joule selection highlighted. (Note: Selection of 0 joules will inhibit charging of defibrillator.)



9c.	"JOULES SELECTED" INDICATOR	Message displayed in lower right corner of screen indicating number of joules selected. At power on, 200 joules is preselected and will remain selected until another energy is selected by using "ENERGY SELECT" button.

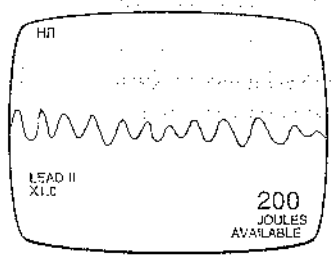
10. (3) CHARGE

Momentary pushbutton to initiate defibrillator charge cycle. Pushbutton indicator light flashes when unit is charging, glows steadily when selected energy is reached. Charged energy is available for approximately one minute.



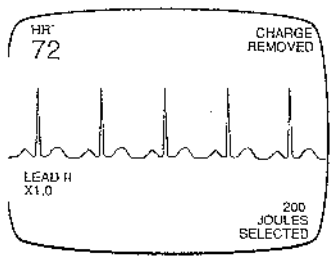
10a. "JOULES CHARGING" INDICATOR

Pushing "CHARGE" will cause existing defibrillator status message in lower right corner of screen to change to "JOULES CHARGING" message. Increasing numbers indicate energy level as defibrillator charges.



10b. "JOULES AVAILABLE" INDICATOR

When defibrillator is charged to selected energy, "JOULES CHARGING" message is replaced by a "JOULES AVAILABLE" message accompanied by a charge complete tone. The amount of stored energy will appear in bold numbers above "JOULES AVAILABLE" message.

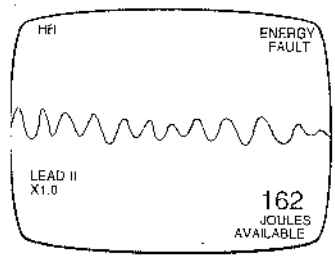


10c. "CHARGE REMOVED" INDICATOR

"JOULES AVAILABLE" message will revert to "JOULES SELECTED" after approximately one minute, indicating that energy has been dumped. "CHARGE REMOVED" message will appear in upper right corner of screen. Accompanied by audible tone.

If standard or optional paddles become disconnected when unit is charging or charged, energy will be dumped and "CHARGE REMOVED" message will be displayed for 5 seconds or until "CHARGE" is pushed again.

If defibrillator is charging or is charged, pushing "ENERGY SELECT" button will cause charge to be removed. A "CHARGE REMOVED" message will appear in upper right corner of screen for 5 seconds or until "CHARGE" is pushed again.

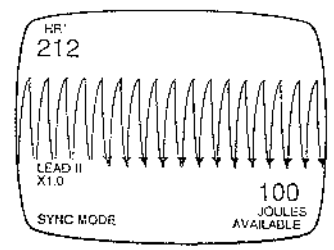


11. "ENERGY FAULT" INDICATOR

If selected energy and stored energy disagree, a flashing "ENERGY FAULT" message will appear in upper right corner of screen, accompanied by an audible tone. This message will remain until energy is transferred or internally dissipated, new energy is selected, or power is turned off. Indicates system malfunction requiring examination by a qualified service representative.

12. SYNC

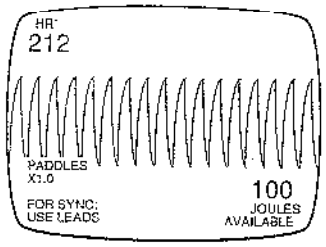
Pushbutton to select synchronized mode. Pushbutton indicator light will illuminate and flash off whenever QRS is detected. To return to defibrillate (asynchronous) mode, push button again.



13. "SYNC MODE" INDICATOR

Message appears in lower left corner of screen when sync mode is selected. Sync markers (▼) appear on each detected QRS.

Note: Defibrillate (asynchronous) mode is automatically selected when defibrillator is powered "ON". Unit automatically returns to defibrillate (asynchronous) mode after each synchronous discharge.



13a. "FOR SYNC: USE LEADS" INDICATOR

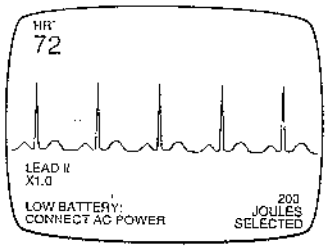
Sync mode will not operate in "PADDLES" lead if standard, external sterilizable, or internal paddles are installed. If "PADDLES" is selected, a "FOR SYNC: USE LEADS" message will flash for 3 seconds in lower left corner of screen. Accompanied by 3 short tones. Sync mode will not activate.

If "PADDLES" lead is selected while defibrillator is charging or is charged, energy will be internally dumped and a "CHARGE REMOVED" message will appear in upper right corner of screen.

Exception: If FAST-PATCH disposable defibrillation/ECG electrodes are being used with the optional defibrillation adapter, sync mode will operate in "PADDLES" lead.

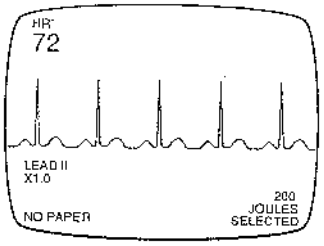
14. "BATT CHRG" INDICATOR (yellow)

Lighted message indicates battery is charging and that power source is AC line.



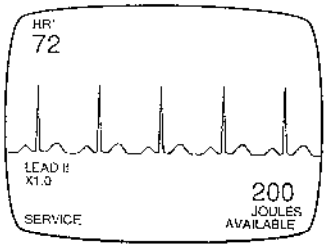
15. "LOW BATTERY: CONNECT AC POWER" INDICATOR

Message appears in lower left corner of screen, accompanied by 3 short tones every 20 seconds. Indicates minimum battery reserve is available and AC power should be connected. Message will blank when AC power connected.



16. "NO PAPER" INDICATOR

Flashing "NO PAPER" message appears in lower left corner of screen accompanied by 3 short tones if: 1) no paper is installed when "RECORD" is pushed, or 2) recorder is running and paper runs out. Recorder will stop.



17. "SERVICE" INDICATOR

Flashing message in lower left corner of screen indicates system malfunction requiring examination by a qualified service representative.

Paddles and storage area

18. STERNUM PADDLE

Defibrillating electrode with one discharge pushbutton; usually placed to left of sternum (patient's right). Also serves as negative ECG electrode during QUIK-LOOK® paddle monitoring.

19. APEX PADDLE

Defibrillating electrode with QUIK-CHARGE®control ("CHARGE") and second discharge pushbutton; usually placed near cardiac apex. Also serves as positive ECG electrode during monitoring.

19a. CHARGE (QUIK-CHARGE CONTROL)

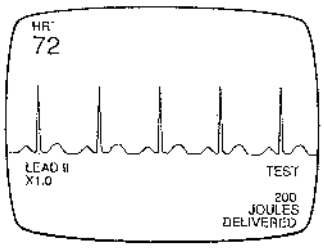
Momentary pushbutton to charge defibrillator from "APEX" paddle. Pushbutton indicator light flashes during charge cycle and glows steadily when energy has reached preselected level.

20. DISCHARGE PUSHBUTTONS

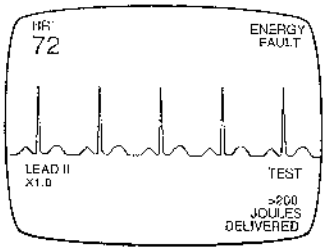
Pushbuttons to discharge defibrillator. Both buttons must be pushed simultaneously to deliver energy to the paddles. Energy will not be delivered unless unit is fully charged to preselected level.

21. TEST LOAD

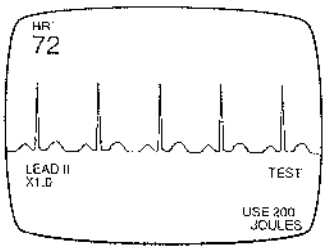
50 ohm defibrillator test load. Metal contacts (under paddles) receive defibrillation pulse from paddles. Test load allows defibrillator testing at 200 joules only.



Successful completion of test is accompanied by "TEST 200 JOULES DELIVERED" message in lower right corner of screen for 5 seconds accompanied by a tone. Recorder will print time, date, defibrillator mode, and "TEST 200 JOULES DELIVERED."



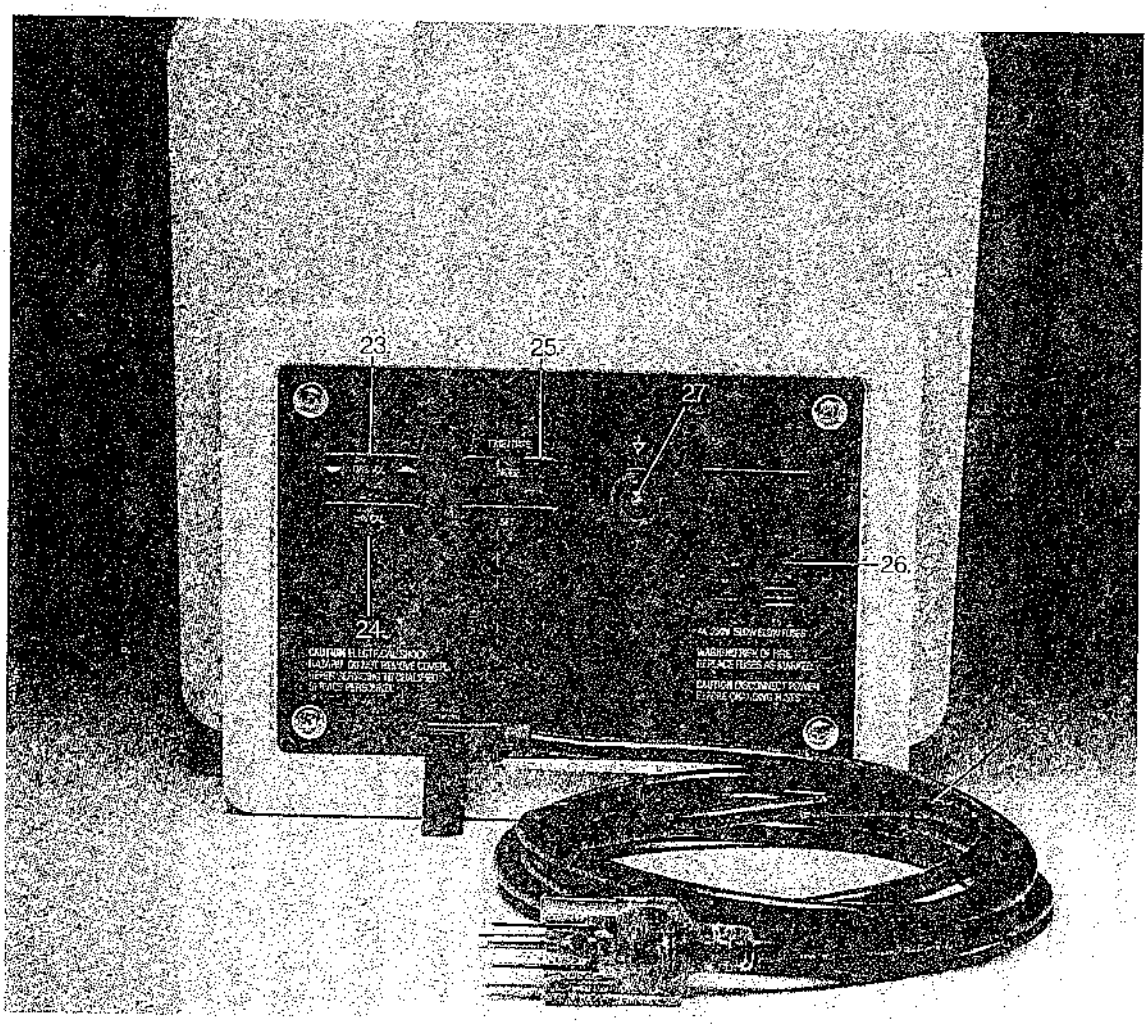
Test failure will cause a "TEST< 200 (or > 200) JOULES DELIVERED" message in lower right corner of screen, "ENERGY FAULT" will flash in upper right corner of screen accomplished by a tone. Recorder will print time, date, defibrillator mode and "TEST < 200 (or > 200) JOULES DELIVERED."



If testing is attempted with energies other than 200 joules, a "TEST USE 200 JOULES" message will be displayed in lower right corner of screen for 5 seconds.

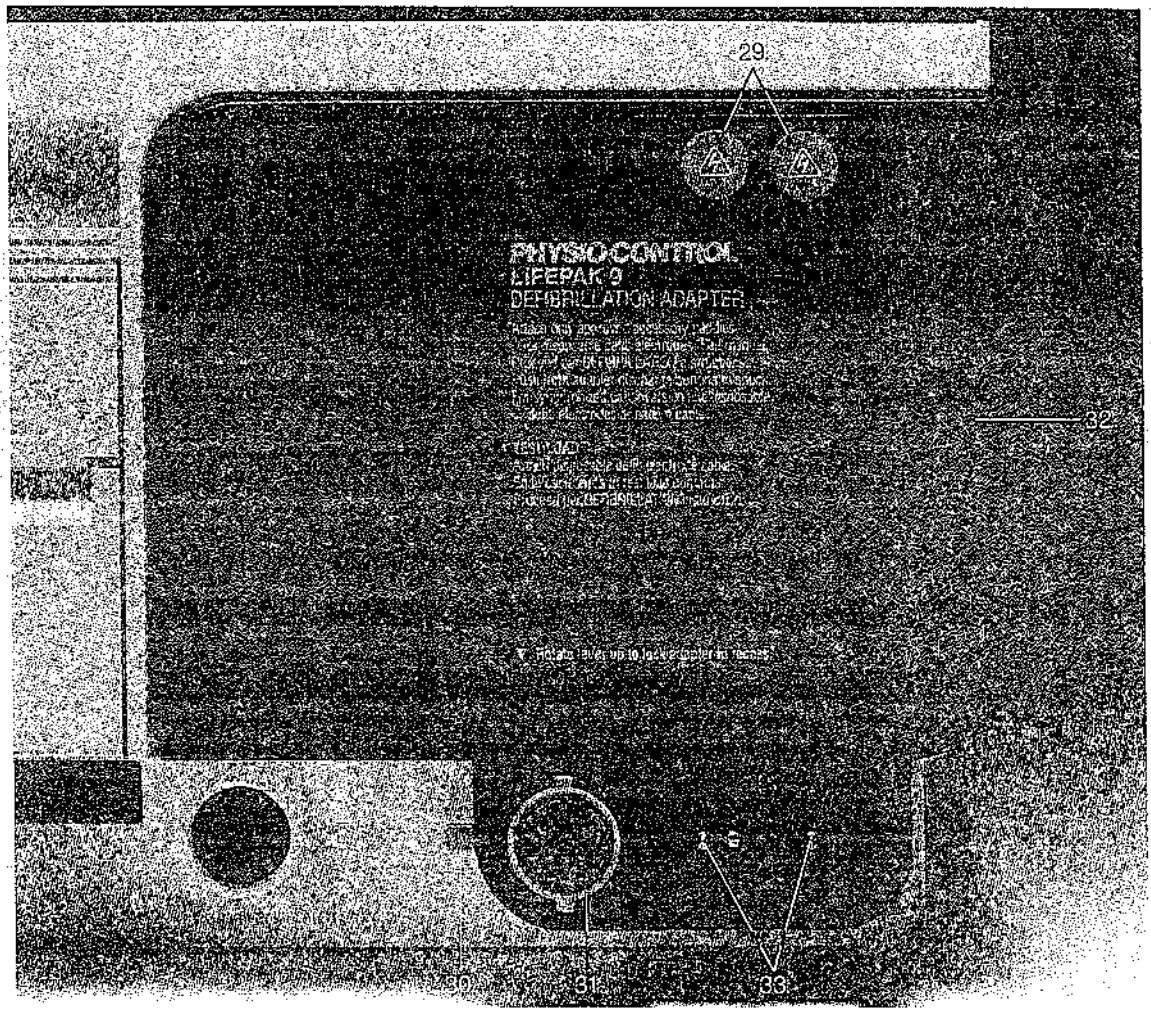
22. PADDLE CABLE CONNECTION

Connector for Physio-Control standard defibrillator paddles and optional paddle adapters for use with disposable defibrillation/ECG electrodes, external sterilizable paddles and internal paddles.



Back Panel

23. QRS VOLUME	Adjusts the volume of systole "beeper". Push ▲ or ▼ to increase or decrease. Setting at power up will be that when last turned off.
24. 1 mV CAL	Push and release button to superimpose 1mV calibration signal on cardioscope and recorder.
25. TIME/DATE MODE AND SET	Pushbuttons to set date and time.
26. MAINS POWER	Rocker switch to select AC line power and battery charging ("ON" or "I" position) or battery power with AC power OFF ("OFF" or "O" position). Battery will not charge if AC mains is left in "OFF" or "O" position (see page 11). **Note:** On U.S. units, this switch is locked in "ON" or "I" position.
27. GROUND	Equipotential ground tie point.
28. POWER CORD	Connect to grounded AC receptacle. Check that label on bottom of instrument matches available voltage/frequency.



Defibrillation Adapter

29. DISCHARGE PUSHBUTTONS	Pushbuttons to discharge defibrillator. Both buttons must be pushed simultaneously to deliver energy to the paddles. Energy will not be delivered unless unit is fully charged to preselected level.
30. DEFIBRILLATION ADAPTER LOCK	Lever to lock adapter in place. Rotate lever upward to lock, down to unlock.
31. CABLE CONNECTOR	Allows use of FAST-PATCH disposable defibrillation/ECG electrodes, external sterilizable paddles, or internal paddles.
32. DEFIBRILLATION ELECTRODES STORAGE AREA	Slot on right side of adapter holds 1 pair of FAST-PATCH disposable defibrillation/ECG electrodes (P/N 804545).
33. TEST LOAD	50 ohm defibrillator test load. For use with defibrillation electrode cable. Allows defibrillation testing at 200 joules only.

AC AND DC OPERATION

The LIFEPAK 9A defibrillator/monitor may be operated on AC line or DC battery power.

When the defibrillator/monitor is connected to AC line power, the internal battery will charge whether or not the front panel power ("ON") switch is activated. (For IEC units, the rear panel "MAINS POWER" switch must be in "ON" or "I" position.) The "BATT CHG" indicator light will illuminate whenever the battery is charging. A fully depleted battery can be recharged to 90% capacity in 3 hours. A new unit or one that has been stored for a prolonged period of time will require charging. When not in use, the LIFEPAK 9A defibrillator/monitor should be connected to AC line power but turned off to maintain full battery charge.

To operate from the internal battery, disconnect power cord from the AC receptacle. A fully charged battery will typically provide seventy-five (75) 360 joule discharges or approximately two (2) hours continuous monitoring. Minimally, a fully charged battery will provide fifty (50) 360 joule discharges or sixty (60) minutes monitoring with continuous recording. A "LOW BATTERY - CONNECT AC POWER" message will appear in the lower left corner of the monitor display to indicate that a reserve capacity of 10 to 15% is available. The message, accompanied by 3 short tones, will occur every 20 seconds until battery power is exhausted or the unit is connected to line power.

Note: Frequent discharge of the batteries into the minimum reserve capacity will degrade battery life.

The sealed lead-acid battery system used in the LIFEPAK 9A defibrillator/monitor requires no user maintenance and will provide optimal life when the unit is continuously connected to line power. The battery selected for the LIFEPAK 9A defibrillator/monitor works well in cyclic applications, where it is discharged to the low battery warning immediately after receiving a full 16 hour charge. The battery can also provide more than 90% of its capacity after several hours of charging, but should not be used in this mode on an extended basis. A full recharge should be performed after one or two of these short charge cycles to prevent battery degradation.

Although the LIFEPAK 9A defibrillator/monitor battery system was chosen to optimize performance and battery life in a wide range of operating conditions, end of battery life is inevitable. This end of life will be noticed by reduced battery operating time. Batteries that no longer meet operating time specification should be replaced by the following procedure:

- Disconnect line power and turn the unit off.
- Open the battery access door on the bottom of the unit.
- Disconnect the battery harness connector.
- Remove the old battery and replace it with a fresh battery pack.

Batteries should be replaced only with approved batteries from Physio-Control.

MONITORING

Paddle monitoring

ECG monitoring may be done through standard external paddles, sterilizable external paddles, or through FAST-PATCH disposable defibrillation/ECG electrodes.

To monitor through standard or sterilizable external paddles:

- Apply conductive gel to paddles.

  Warning: Keep hands and paddle handles free of gel. Failure to do so may create shock hazard.

- Push defibrillator/monitor "ON".

Note: The monitor will power up in one of two leads as described below. The preselected lead (mode) may be selected by a qualified service representative using the "SET UP" mode.

Mode 1: The monitor will preselect "PADDLES" lead whenever it is turned on.
Mode 2: The monitor will preselect Lead II whenever it is turned on.

For information on how to change this mode, see the Operating and Service Manual, or contact your local Physio-Control service representative.

- Push "LEAD SELECT" to "PADDLES" position.
- Place paddles firmly on patient's bare chest with "APEX" paddle (positive electrode) on patient's lower left chest and "STERNUM" paddle (negative electrode) near upper sternum on patient's right.
- Observe cardioscope to determine patient's rhythm.

Note: "ECG SIZE" may need to be adjusted if QRS complex is not clearly visible on cardioscope.

To monitor through disposable defibrillation/ECG electrodes, install the optional defibrillation adapter:

- Remove paddles from paddle wells. Disconnect standard external paddles from defibrillator. (Turn connector lock to the left to unlock.)
- Insert defibrillation adapter into well by first inserting top of adapter, then push bottom of adapter into connector. Lock connector into place by moving connector lock up.
- Connect and lock defibrillation cable to adapter and attach cable to disposable defibrillation/ECG electrodes.
- Apply disposable defibrillation ECG electrodes to clean dry skin in the standard defibrillation position. Cable connectors are labelled "APEX" and "STERN" (sternum) for proper positioning to obtain Lead II.
- Proceed as above for paddle monitoring.

Paddle monitoring after defibrillation is usually delayed by a short electrode recovery time of several seconds. During this short time span, it may not be possible to determine defibrillation results from the monitor trace.

Patient cable monitoring

The LIFEPAK 9A defibrillator/monitor comes with a 3-lead wire cable (P/N 9-10418-02 or for IEC units, P/N 800947-01) which is fully shielded to reduce noise to a minimum and allows patient monitoring of Leads I, II or III.

Warning: Use of patient cables other than that listed above may provide less than optimum performance or erroneous ECG data.

To enhance baseline stability and clean trace, the operator should: (1) prepare the patient's skin (clean and dry it) prior to electrode application, (2) make certain that electrodes (whether pre-gelled or not) have sufficient wet gel to conduct, and (3) secure and support the patient cable.

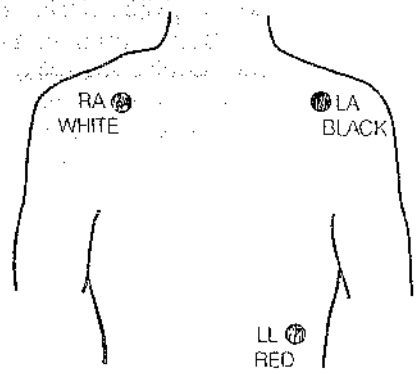
Note:

- Monitoring in the presence of electrocautery or diathermy may cause artifact on the ECG tracing.
- A 50/60 Hz filter may be selected in the "set-up" mode to reduce noise and artifact in certain environments. Selection of the filter may impact performance of the "R" wave detector and 1 mV CAL signal.

Patient cables

Lead wires are color coded according to AHA or IEC standards.

- AHA color coding:
  White - Right arm or "RA" (or upper right chest)
  Black - Left arm or "LA" (or upper left chest)
  Red - Left leg or "LL" (or lower left chest)
- IEC color coding:
  Red - Right arm or "R" (or upper right chest)
  Yellow - Left arm or "L" (or upper left chest)
  Green - Left leg or "F" (or lower left chest)



When electrodes and lead wires are attached as above, Leads I, II and III are obtained by pushing "LEAD SELECT".

When other lead configurations are desired, use the following information as a guide: (If using IEC color coded cable, substitute red, yellow, and green for white, black, and red respectively).

- When "LEAD SELECT" is set to "I":
  White: negative pick up
  Black: positive pick up
  Red: reference
- When "LEAD SELECT" is set to "II":
  White: negative pick up
  Black: reference
  Red: positive pick up
- When "LEAD SELECT" is set to "III":
  White: reference
  Black: negative pick up
  Red: positive pick up

ECG electrode requirements

For best ECG monitoring results, silver/silver chloride (Ag/AgCl) electrodes such as Physio-Control LIFE•PATCH® ECG electrode (P/N 800139) should be used with this equipment. Post-defibrillation recovery of silver/silver chloride electrodes is much faster than with other electrode types. This means that the patient's ECG will be visible on the cardioscope sooner following defibrillation.

Note: Use of stainless steel electrodes should be avoided since post-defibrillation recovery of ECG data may be delayed for 10 seconds or longer. If stainless steel electrodes must be used, it is recommended that careful patient evaluation combined with a more prolonged period of cardioscope observation take place prior to instituting further electric therapy.

QRS detection

QRS detection is essential for use of the digital heart rate display, systole sound ("QRS VOLUME"), and for synchronized cardioversion.

The QRS detector in the LIFEPAK 9A defibrillator/monitor selectively detects QRS complexes greater than one centimeter in height on the cardioscope. It discriminates against noise, muscle artifact, "T" waves, and other random signals.

Detection of QRS complexes and rejection of other signals is dependent on proper setting of the "ECG SIZE" control (see ECG Monitoring Procedure). If "ECG SIZE" is set too low, QRS complexes will not be detected; no systole sound or synchronizer marker will appear and heart rate display will be incorrect. If "ECG SIZE" is set excessively high, signals other than QRS complexes may be detected; systole sound and synchronizer marker may occur on signals other than QRS complexes and heart rate display may be incorrect.

Monitoring pacemakers

The LIFEPAK 9A monitor will detect pacing stimuli produced by permanent or transvenous internal pacemakers. The QRS detection circuitry will not use the pacing stimuli for heart rate calculation or synchronization. Large amplitude pacemaker spikes can overload the QRS detector circuitry so that no paced QRS complexes are counted resulting in blanking of the heart rate display. To minimize ECG pick up of the pacemaker impulse when monitoring unipolar pacemakers, the following may be helpful:

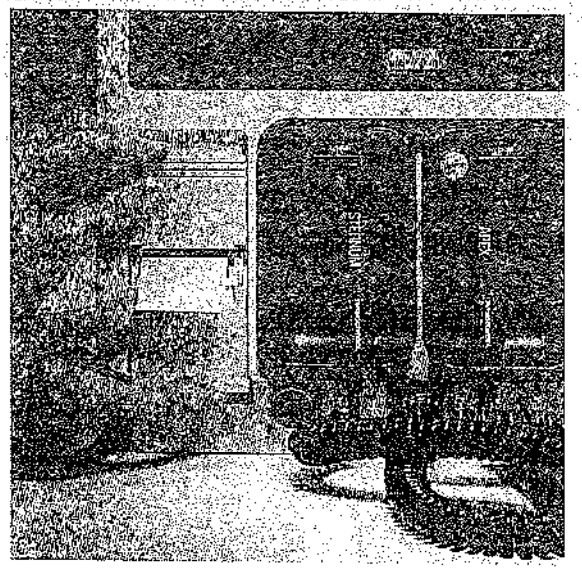
- Place the electrodes so that a straight line drawn between the positive and negative electrodes intersects a line between the pacemakergenerator and the heart at right angles. Electrode placement will not be as critical when the pacemaker is bipolar.
- When monitoring patients with noninvasive (external transchest) pacers, it may not always be possible to display an accurate heart rate; therefore, do not rely upon the heart rate display or heart rate alarms. Direct observation of patient is essential.

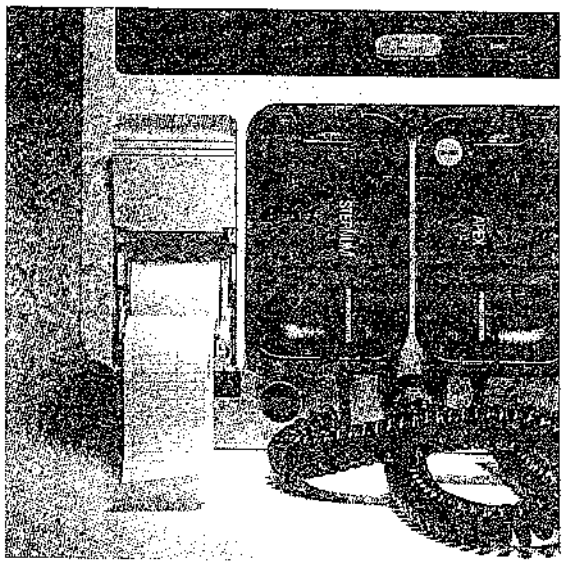
ECG monitoring procedure

- Attach 6-pin patient cable to ECG receptacle on front panel.
- Prepare patient's skin for electrode application (clean and dry sites).
- Attach lead wires to electrodes.
- Apply electrodes to prepared sites. (Make certain the gel of pre-gelled electrodes has not dried. If using non pre-gelled type, apply 1/4"-1/2" gel in mound over contact.)
- Push defibrillator/monitor "ON". Pushbutton indicator light and cardioscope will illuminate.
- Select proper lead with "LEAD SELECT".
- Adjust "ECG SIZE" if necessary. Size is automatically set to x1 gain at power up. To properly count heart rate during routine monitoring and to accurately detect "R" waves during synchronized cardioversion, the "ECG SIZE" must be adjusted correctly (see page 12).
- Push "ECG SIZE" ▲ or ▼ until QRS beeper and flashing QRS symbol (♥) in upper left corner of monitor screen coincide with every "R" wave.

PAPER LOADING

- Pull out top of recorder; recorder will open for paper insertion.
- Remove old paper roll.
- Insert new paper roll as illustrated. Paper must be wound with grid facing inside of roll.
- Pull out a short length of paper.
- Close recorder case. Push bottom recorder door up and in and push top recorder door down.
- Push "RECORD" to print.





Caution: For thermal array recorders use thermal sensitive paper such as Physio-Control paper (P/N 804700). Do not use waxed paper. Incorrect paper may damage the recorder.

Note: To avoid fading or disappearance of annotation and ECG tracings, follow these guidelines for thermal sensitive papers.

- Do not apply tape or other adhesives over annotation or ECG tracing.
- Adhesives may be applied to the back of the paper.
- Store only in paper folders; do not store in the same file compartment with plastics.
- Avoid extended exposure to sunlight.
- Avoid temperatures in excess of 80° F and relative humidity over 70 percent.

Recording procedure

Recorder may be used during paddle monitoring as well as cable monitoring. The thermal array annotating recorder prints the time, date, ECG lead, ECG gain, heart rate and defibrillation or cardioversion parameters.

- Push "RECORD" to activate recorder. Push again to stop recorder.
- Recorder operates in an 8-second delayed ECG mode.
- Adjust "ECG SIZE" if necessary.
- The beginning of each annotation will be marked with an arrow (⇩).
- When the recorder is on, annotated information will be updated every 20 seconds and when a new lead is selected, or defibrillation is performed. Information annotated during defibrillation will also include joules selected and defibrillation mode (defibrillation or synchronized cardioversion).
- A flashing "NO PAPER" message appears in lower left corner of screen accompanied by 3 short tones if 1) no paper is installed when "RECORD"I is pushed, or 2) recorder is running and paper runs out. Recorder will stop. Install paper as instructed.

It is important that defibrillation is carried out with as little delay as possible. Paddle position is crucial. The standard paddle placement (anterior-anterior) locates one paddle at the right of the upper sternum (patient's right) just below the clavicle, and the second paddle just to the left of the nipple in the anterior auxiliary line (patient's lower left chest).*

ECG gel, paste, or defibrillation gel pads may be used for the conductive interface.

Warning: (shock hazard)

- Do not allow this material to become continuous between the paddle sites or to reach the handles, since the current will follow this alternate path and conduct across the chest wall or to the handles, rather than entering the chest cavity. Firmly pressing the paddles against the chest wall (25 lbs. pressure per paddle) helps deliver the energy to the thorax.
- Operator and other members of the resuscitation team should stand clear of the patient and bed during actual defibrillation.
- Clean paddles after use to help prevent operator shock. (See Maintenance.)

Defibrillation procedure

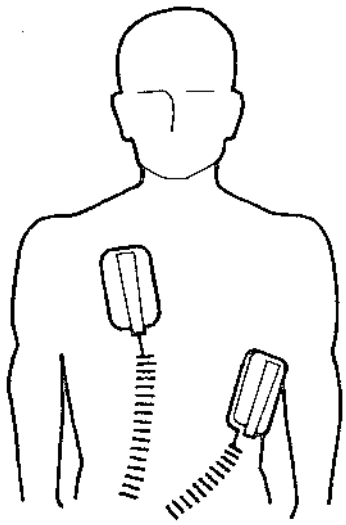
- Apply conductive gel to paddles.
- Turn defibrillator power on by pushing **1** "ON" button. Button indicator light will illuminate. "200 JOULES SELECTED" will appear in lower right corner of screen.
- If 200 joules is the desired energy, the defibrillator is immediately ready to be charged. If another energy level is desired, push **2** "ENERGY SELECT" and select energy to be delivered.

  Note: Energy is limited to 50 joules if internal paddles are connected.

- Push **3** "CHARGE" button on defibrillator front panel or on apex paddle. Indicator lights on "CHARGE" button and apex paddle will flash while unit is charging. A "JOULES CHARGING" message will appear in lower right corner of monitor screen. Increasing numbers indicate energy level as the defibrillator charges.

* American Heart Association, Advanced Cardiac Life Support, Chap. 6, pub. 1987.

Note: If "ENERGY SELECT" is changed after charge is initiated, energy will be discharged internally. A "CHARGE REMOVED" message will appear in upper right corner of screen for 5 seconds or until the "CHARGE" button is pushed again. The operator must re-initiate charge by pushing **3** "CHARGE".



- Place defibrillator paddles **firmly** on patient's chest. "STERNUM" paddle is generally placed near the upper sternum and slightly toward the patient's right shoulder. "APEX" paddle is placed near the cardiac apex or on patient's lower left chest.
- When the defibrillator is ready, "JOULES CHARGING" will be replaced by the energy selected and a "JOULES AVAILABLE" message. A charge complete tone will be heard. "CHARGE" button indicator will glow steadily. Charged energy is available for approximately one minute.

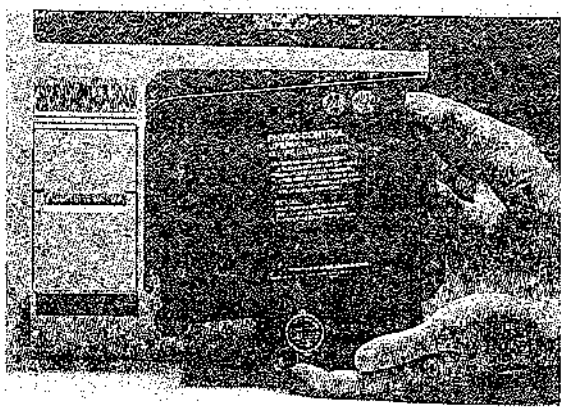
The defibrillator will not discharge while "CHARGE" button indicator light is flashing and numbers are scrolling up. Recharge defibrillator if energy is required after "JOULES AVAILABLE" message is removed.

- Discharge defibrillator by pushing **both** paddle discharge buttons **simultaneously**.
- Observe patient and cardioscope to determine results. If repeat countershock is necessary, select energy, push **3** "CHARGE" and repeat as above.
- To dump an unwanted charge, push "ENERGY SELECT" or turn off defibrillator power. A "CHARGE REMOVED" message will appear in upper right corner of screen for 5 seconds or until "CHARGE" is pushed again.

Note: If standard or optional paddles become disconnected when unit is charging or charged, energy will be dumped and the "CHARGE REMOVED" message will be displayed for 5 seconds or until paddles are reconnected and "CHARGE" button is pushed again.

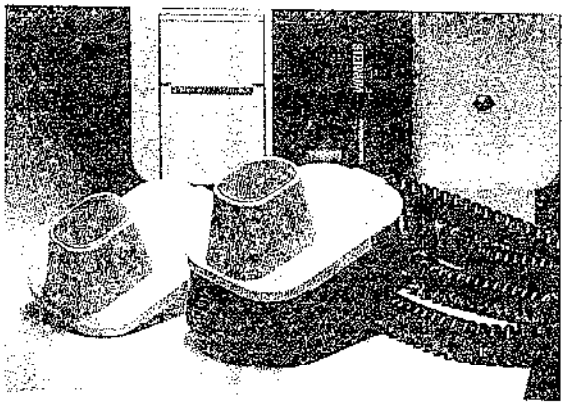
Warning:

- Do not discharge defibrillator paddles into open air or shorted together. This may damage the unit and may create a shock hazard.
- To turn off defibrillator, push 1 "ON" again. Pushbutton indicator light will go out.
- Thoroughly clean defibrillator paddles and store them in test load (storage) area.



Use of alternate paddles

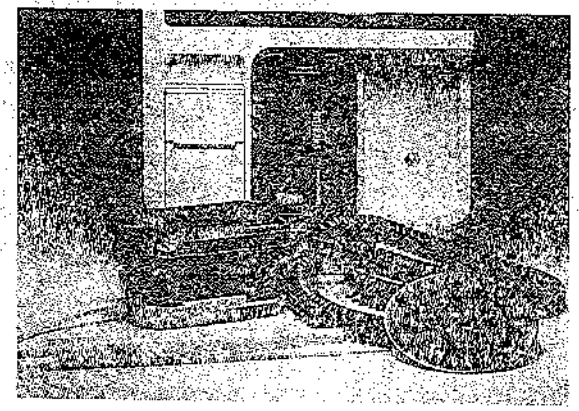
Pediatric and posterior paddles slide directly over the standard adult paddles. FAST-PATCH disposable defibrillation/ECG electrodes, sterilizable external paddles, or internal paddles may be used with the LIFEPAK 9A defibrillator/monitor with the optional defibrillation adapter. The defibrillation adapter fits into the paddle well after the standard defibrillator paddles are removed.



Pediatric clip-on paddles

Use of the pediatric clip-on paddles does not require the optional defibrillation adapter.

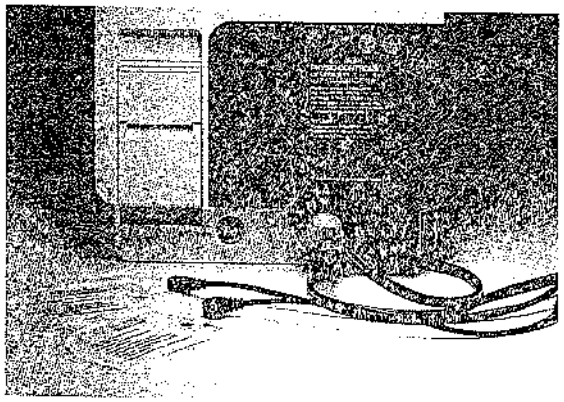
- Slide pediatric paddles over clean adult paddles as shown.
- Apply gel to pediatric paddles and place in the standard defibrillation position.
- Select appropriate energy for size/age of child.
- Charge and discharge in the usual manner.



Posterior clip-on paddle

Use of the posterior clip-on paddle does not require use of the optional defibrillation adapter.

- Slide posterior paddle over clean APEX paddle as shown. An audible click will occur when fully engaged.
- Apply gel to posterior paddle surface and place in posterior position.
- Apply gel to STERNUM paddle and place in anterior position.
- Charge and discharge using usual controls.



Disposable defibrillation/ECG electrodes

Use of FAST-PATCH disposable defibrillation/ECG electrodes requires the optional defibrillation adapter. One set of electrodes can be stored in the slot on right side of adapter.

FAST-PATCH disposable defibrillation/ECG electrodes provide clinicians with a fast, easy alternative to standard paddle defibrillation. The electrodes also allow monitoring in Lead II and quickly restore ECG on the monitor after defibrillation.

The electrode has a dry self-adhesive gel and a flexible, low profile backing material that contours to the patient.

One electrode set will withstand up to fifty 400 joules shocks and can remain on a patient for 24 hours. The electrodes are radiolucent (except for the connection post).

FAST-PATCH electrodes are shipped with 18 to 24 months shelf-life remaining.

Note: The use of defibrillation electrodes and adapter devices from sources other than Physio-Control is not recommended. Physio-Control has no information regarding the performance or effectiveness of its LIFEPAK defibrillators if they are usd in conjunction with defibrillation electrodes from other sources. If device failure is attributable to defibrillation electrodes not manufactured by Physio-Control, this may void warranty.

Procedure

- Remove paddles from paddle well. Disconnect standard external defibrillaton paddles from defibrillator. (Turn connector lock to the left to unlock.)
- Insert defibrillation adapter into well by first inserting top of adapter, then by pushing bottom of adapter into connector. Lock connector in place by moving connector lock up.
- Connect and lock defibrillation cable to adapter.
- Attach the defibrillation cable to FAST-PATCH electrodes by snapping the cable ends onto the electrode posts. Peel off protective liner from electrodes. **Peel** liner **slowly** to prevent damage to self-adhesive gel.

Note: Poor adhesion may result if patient has excessive chest hair. Shave or clip hair in electrode placement areas.

- Apply electrodes to clean dry skin in the standard apex-sternum position. Make sure each electrode adheres around its edge. Cable connectors are labeled "APEX" and "STERN" (sternum) for proper positioning to obtain Lead II when monitoring in "PADDLES" mode.

Note: If anterior/posterior defibrillation is desired, place the "APEX" electrode posteriorly and the "STERN" (sternum) electrode anteriorly. For patient comfort, orient the posterior cable/post connection away from the spine. Monitoring in "PADDLES" mode will not provide an accurate ECG signal if anterior/posterior placement is used. ECG signal must be via patient ECG cable with a lead selected.

Note: Do not apply FAST-PATCH electrodes in the anterior-posterior position when used with LIFEPAK 200 automatic advisory defibrillator.

- Proceed as per defibrillation instructions.
- Push **both** discharge buttons on paddles adapter **simultaneously** to discharge.

- To remove electrodes, slowly peel from patient's skin.

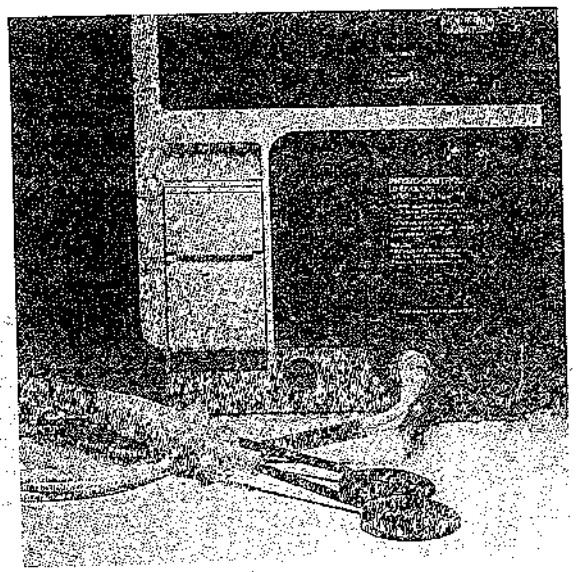
Warnings

- Use FAST-PATCH electrodes with Physio-Control LIFEPAK defibrillators only. Effectiveness may be reduced with other defibrillators.
- Do not use any conductive paste, gel or pads with FAST-PATCH electrodes. FAST-PATCH electrodes are pre-gelled.
- Do not discharge standard paddles on FAST-PATCH electrodes.
- Do not immerse FAST-PATCH electrodes in water or other fluid.
- Do not use alcohol or other solvents on the electrodes. Do not autoclave or gas sterilize the electrodes.
- Do not use FAST-PATCH electrodes if gel is torn, separated or split from the foil, as this may cause patient burns.

Transfer between LIFEPAK defibrillators

If patient care is transferred between LIFEPAK defibrillators that use FAST-PATCH electrodes, keep the electrodes on the patient. To disconnect the cable from the electrode:

- Press down on the electrode area around the post with one hand to stabilize.
- Grasp the connector with the other hand and pull straight up. It is important to support the area around the post while the connector is removed.
- Repeat steps 1 and 2 to remove cable from other electrode.
- Snap connectors of the follow-on cable onto the posts. For some patients, it may be necessary to place one or two fingers directly beneath the post for support while the connector is pressed into place.
- To remove electrodes, slowly peel from patient's skin.



External sterilizable paddles

Use of external sterilizable paddles requires the optional defibrillation adapter.

- Remove paddles from well. Disconnect standard external paddles from defibrillator. (Turn connector lock to left to unlock.)
- Insert defibrillation adapter into well by first inserting top of adapter, then push bottom of adapter into connector. Lock connector into place by moving connector lock up.
- Attach and lock sterilizable external paddle cable to adapter.
- Proceed as per defibrillation instructions.
- Push **both** discharge buttons on defibrillation adapter **simultaneously** when directed to do so by person holding paddles on patient's chest.

Procedure for internal defibrillation

Use of internal paddles requires the optional defibrillation adapter. Energy selection and delivery is limited to 50 joules or less when paddles are connected. Current literature indiates that 90% of adult human hearts can be defibrillated with 10J or less delivered directly to the heart.

- Remove paddles from paddle well. Disconnect standard paddles from defibrillator. (Turn connector lock to left to unlock.)
- Insert defibrillation adapter into well by first inserting top of adapter, then pushing bottom of adapter into connector. Lock connector in place by moving connector lock up.
- Connect and lock internal handles connector to adapter. (Sterility of connector will be compromised.)
- Attach sterile paddles to handles using sterile technique.
- Push defibrillator **1** "ON".
- Push **2** "ENERGY SELECT" ▲ or ▽ to select energy. Select "HIGH" energy range for 0, 10, 20, 30, or 50 joules. Select "LOW" energy range for 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 joules.
- Place paddles over right atrium and left ventricle. Push **3** "CHARGE".
- Push **both** buttons on adapter **simultaneously** when directed to do so by person holding paddles on patient's chest.

- Push 1 "ON".

There are two ways to monitor ECG for synchronized cardioversion.

1. Use the patient ECG cable and select Lead I, II or III. Electrodes should be placed away from paddle sites and such that resultant lead will give a tall QRS (may be positive or negative).
2. Use the optional defibrillation adapter and FAST-PATCH disposable defibrillation/ECG electrodes and select "PADDLES" lead.

   Note: Sync mode will not operate in "PADDLES" lead if standard, external sterilizable or internal paddles are installed. A "FOR SYNC: USE LEADS" message will flash in lower left corner of screen, acompanied by 3 short tones. Sync mode will not activate.

Synchronized cardioversion energy may be delivered by any of the alternate paddles or by the disposable defibrillation/ECG electrodes.

- If using standard paddles, apply conductive gel to paddles.
- Select energy to be delivered with 2 "ENERGY SELECT".
- Push "SYNC" button. The "SYNC" button indicator light will illuminate and the SYNC MODE message will appear in the lower left corner of the monitor screen.

For proper synchronization, "ECG SIZE" must be adjusted correctly.

- Observe cardioscope. Sync markers (▼) should occur within each QRS complex. If they do not appear or appear elsewhere on the ECG signal, adjust "ECG SIZE" ▲ or ▼ until markers occur within each QRS complex. If this is not successful, select another lead or move the ECG electrodes. "SYNC" button indicator light will blink off with each detected QRS.

  Sync markers indicate the time of QRS dectection which is used to synchronize the discharge of the defibrillator. Markers may appear to move slightly from complex to complex. This is normal.

  Occasionally, sync markers may occur near the end of the QRS complex. Sometimes, adjusting "ECG SIZE" to minimum, then adjusting upward will move the marker closer to the middle of the QRS.

- If using standard paddles, place paddles on patient's chest as described under defibrillation procedure.
- Push 3 "CHARGE" to charge defibrillator. Defibrillator is ready when the energy selected and the "JOULES AVAILABLE" message appears in lower right corner of screen. "CHARGE" button indicator light will glow steadily and a charge complete tone will be heard.
- **Push** and **hold** pushbuttons on paddles (or on defibrillation adapter if using FAST-PATCH disposable defibrillation electrodes) until discharge occurs with next detected QRS complex. Release.
- If rhythm does not convert and cardioversion is to be reattempted, **push "SYNC" button again (message will illuminate) since unit switches back to defibrillate mode automatically after each synchronous discharge.**
- Thoroughly clean and store paddles in test load (storage) area.

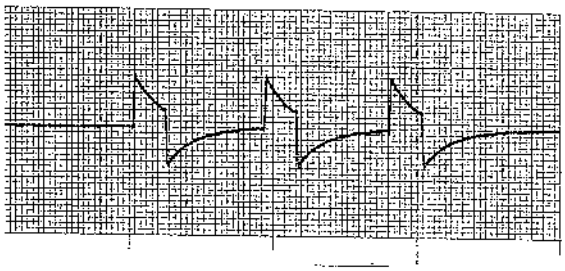
TESTING THE LIFEPAK 9A DEFIBRILLATOR/MONITOR

The LIFEPAK 9A defibrillator/monitor should be routinely tested to detect possible electrical and mechanical problems and to keep personnel acquainted with normal operating procedure. Contact qualified service representative if discrepancies are noted.

- For IEC units, "AC MAINS" should be in "ON" or "I" position.
- Disconnect AC line power.
- Push defibrillator/monitor power "ON". All LED's (pushbutton indicator lights) should light briefly.

Monitor/Recorder function

- Connect power cord to grounded AC receptacle. "BATT CHG" indicator light should illuminate.
- Push lead select to "STD" position.
- Attach patient cable to monitor. Do not connect cable to patient or simulator.
- Push and release rear panel "CAL" button. Calibration wave should appear on cardioscope.
- Adjust rear panel "QRS VOLUME" so that sound is heard with each calibration signal.
- Push "LEAD SELECT" to Lead I. Interference should be present on cardioscope. Place snap ends of white lead wire and black lead wire together; trace on cardioscope should stabilize. Repeat process for Lead II using white lead wire and red lead wire; for Lead III using black and red.
- Push "LEAD SELECT" to "STD".
- Push "RECORD". Recorder should run and trace should appear within one second. Push rear panel "CAL" several times. Calibration signal should appear on scope and be recorded on ECG paper approximately 8 seconds later. Signal recorded should match figure below.



- Push "RECORD" again to turn recorder off.

Caution: For thermal array recorders use thermal sensitive paper such as Physio-Control paper (P/N 804700). Do not use waxed paper.

Note: To avoid fading or disappearance of annotation and ECG tracings, follow these guidelines for thermal sensitive papers.

- Do not apply tape or other adhesives over annotation or ECG tracing.
- Adhesives may be applied to the back of the paper.
- Store only in paper folders; do not store in the same file compartment with plastics.
- Avoid extended exposure to sunlight.
- Avoid temperatures in excess of 80° F and relative humidity over 70 percent.

Defibrillator function

- Paddles should be firmly seated in test load (storage) area.
- Push **2** "ENERGY SELECT". Select 200 joules if not already selected.
- Push **3** "CHARGE". "JOULES CHARGING" will appear in lower right corner of monitor screen. Increasing numbers indicate energy level as defibrillator charges. Defibrillator is ready when the selected energy and the "JOULES AVAILABLE" messages appear in the lower right corner of monitor screen. "CHARGE" button indicator light will glow steadily and a charge complete tone will be heard. Charge cycle should take 10 seconds or less.
- Push the apex discharge button only and verify that the unit does not discharge.
- Push the sternum discharge button only and verify that the unit does not discharge.
- Discharge defibrillator by pushing both paddle discharge buttons simultaneously.

  The message "TEST 200 JOULES DELIVERED" will appear in the lower right corner of screen for 3 seconds. Recorder will print time, date and "DEFIB TEST 200 JOULES DELIVERED".

Caution: Because of heat created as a result of discharge into test load, do not repeat testing of defibrillator more often than 10 times per hour. Do not discharge with paddles in "open air". Do not dump energy by changing "ENERGY SELECT" or turn off power to discharge energy more than 4 times per minute.

- Test failure will cause a "TEST < 200 (or > 200) JOULES DELIVERED" message to appear in lower right corner of monitor screen. "ENERGY FAULT" will appear in upper right corner of monitor screen. Recorder will print time, date and "DEFIB TEST < 200 (or > 200) JOULES DELIVERED".

Monitor and defibrillator function

- Push "LEAD SELECT" to select "PADDLES" lead. Touch one paddle face. Cardioscope should show interference. Repeat with second paddle.
- Place paddle electrodes together. Interference should disappear on cardioscope.
- To test synchronizer:
  - Connect monitor to ECG simulator via patient cable.
  - Observe cardioscope. Select lead with tall QRS. (May be positive or negative).
  - Push "SYNC" button. "SYNC MODE" message will appear in lower left corner of monitor screen. Adjust "ECG SIZE" to minimum position and advance slowly until marker appears within each QRS complex. "SYNC" button indicator light will blink off with each detected QRS.
  - Leave paddles in storage area. Select 200 joules by pushing **2** "ENERGY SELECT".
  - Charge defibrillator.
  - Push and hold both paddle discharge buttons simultaneously until defibrillator discharges on next detected QRS.
  - Defibrillator should return to defibrillate mode ("SYNC MODE" message no longer appears in lower left corner of monitor screen). The message "TEST 200 JOULES DELIVERED" will appear in the lower right corner of screen for 3 seconds. Recorder will print time, date and "SYNC TEST 200 JOULES DELIVERED".
  - Test failure will cause a "TEST < 200 (or > 200) JOULES DELIVERED" message to appear in lower right corner of monitor screen. "ENERGY FAULT" will appear in upper right corner of screen. Recorder will print time, date and "SYNC TEST< 200 (or > 200) JOULES DELIVERED".

Optional defibrillation adapter function

- Remove standard paddles.
- Insert defibrillation adapter, locking connector in place.
- Connect defibrillation cable for use with FAST-PATCH disposable defibrillation/ECG electrodes to paddles adapter.
- Connect cable ends to test load contacts.
- Select 200 joules by pushing **2** "ENERGY SELECT".
- Charge defibrillator.
- Push the left adapter discharge button only and verify that the unit does not discharge.
- Push the right adapter discharge button only and verify that the unit does not discharge.
- Discharge defibrillator by pushing **both** defibrillation adapter discharge buttons **simultaneously**.

The message "TEST 200 JOULES DELIVERED" will appear in lower right corner of screen for 3 seconds. Recorder will print time, date, and "DEFIB TEST 200 JOULES DELIVERED".

- Test failure will cause a "TEST< 200 (or > 200) JOULES DELIVERED" message to appear in lower right corner of screen. "ENERGY FAULT" will appear in upper right corner of screen. Recorder will print time, date, and "TEST< 200 (or > 200) JOULES DELIVERED".

SETTING THE CLOCK

- Push power "ON".
- Push rear panel TIME/DATE "MODE" button. Day, month, year, hours, and minutes will be displayed in the lower left corner of monitor screen. The single minutes field will be highlighted.
- Push rear panel TIME/DATE "SET" button to change the single minute setting. Each button push increases the value of the field by one increment. When the maximum value for a field is reached, the display rolls over to the lowest value for that field.
- Push "MODE" again to change the highlighted field. Push "SET" to scroll through selectable values.
- Repeat this process to adjust year, month and day.
- Push "MODE" again to remove clock setting display from the screen.

Note: If any front panel button is pushed or the unit is turned off while setting the clock, the clock set mode will be terminated without implementing any changes.

CLEANING THE LIFEPAK 9A DEFIBRILLATOR/MONITOR

The LIFEPAK 9A defibrillator/monitor case, paddles, cables, test load contacts, cardioscope screen, and optional defibrillation adapter should be cleaned with mild soap and water. Use a damp sponge or towel to clean.

Warning: Shock hazard.

Do not immerse the LIFEPAK 9A defibrillator/monitor or defibrillation adapter in water. Do not use alcohol or ketones (MEK, acetone, etc.).

Warning: Special care should be taken to clean the defibrillator paddles after each use. Build-up of gel will not only interfere with ECG pick-up through the paddles (artifact will be evident), but could produce a shock hazard to the operator if dried (or wet) gel accumulates between the paddle surfaces and the operator handles. Clean paddle storage area anytime it becomes soiled with gel.

Do not autoclave the LIFEPAK 9A defibrillator/monitor or any Physio-Control defibrillator paddles except internal paddle spoons (paddles must be separated from handles). Internal paddle spoons will tolerate short-term autoclaving up to 290°F and long-term autoclaving up to 260°F.

Do not gas sterilize the LIFEPAK 9A defibrillator/monitor or defibrillation adapter.

Internal paddle handles and cables may be gas sterilized and will tolerate temperatures to 150°F.

Note: After every ten (10) sterilization cy-cles, all connectors should be visually inspected for signs of corrosion or damage. A defibrillator tester should be used to verify that the delivered energy is within product specifications outlined in the Service Manual.

Product life is impacted by sterilization rather than age. Spoons and handles which are subjected to repeated sterilization may require more frequent replacement.

Clip-on posterior and pediatric paddles and sterilizable external paddles without discharge switches may be gas sterilized at temperatures up to 150°F. Gas sterilization of paddles must be in accordance with procedures accepted by the Joint Commission on Accreditation of Hospitals and as recommended by the gas sterilization equipment manufacturer.

TROUBLESHOOTING

This brief checklist is intended for nontechnical personnel. If trouble persists after consulting this guide, call your qualified service technician.

Monitor

Problem	Possible Cause
1. Unit does not function when "ON" is pushed. No trace on cardioscope. "ON" button does not light.	1A. Battery powered (DC): Power cord disconnected (or in IEC units, "MAINS POWER" switch on rear panel in "OFF" or "O" position). (1) Battery discharged below operating level. Test by using line power. 1B. Line operation (IEC units: "MAINS POWER" in "ON"or "I" position). (1) Unit not plugged in. (2) Failed power cord. (3) Blown fuse or tripped circuit breaker in building.
2. Interference on cardioscope when using patient cable as ECG pick-up.	2A. Patient cable not connected to unit. 2B. Poor skin preparation, electrode contact, electrode placement, or outdated electrodes. 2C. Failed or incorrect patient cable. 2D. Strong radio frequency electrical field present in area (such as diathermy). Turn other equipment off.
3. Excessive interference or 60 cycle interference on cardioscope when using paddles for ECG pick-up.	3A. Paddles dirty. 3B. "LEAD SELECT" not set to "PADDLES". 3C. If using FAST-PATCH disposable defibrillation/ECG electrodes, poor skin preparation, electrode contact, electrode placement, or outdated electrodes.
4. No ECG signal on cardioscope when using patient cable.	4A. "LEAD SELECT" set to "STD" or "PADDLES". 4B. Failed patient cable. 4C. Active electrodes positioned together.
5. No ECG signal on cardioscope with QUIK-LOOK paddle monitoring.	5A. "LEAD SELECT" not in "PADDLES" position.
6. Recorder does not run.	6A. Power not on. 6B. If operating from internal battery, try AC line power. 6C. Recorder out of paper.
7. Straight line on cardioscope and recorder when signal is applied or "1 mV CAL" is pushed.	7A. "ECG SIZE" set too low.
8. No systole sound.	8A. "QRS VOL" set to inaudible. 8B. "ECG SIZE" adjusted too low. 8C. Amplitude of ECG signal too low in that lead. Select another lead or move electrodes.
9. No "SYNC" marker on cardioscope.	9A. Unit not in synchronous mode. 9B. "ECG SIZE" adjusted too low. 9C. Amplitude of ECG signal too low in that lead. Select another lead or move electrodes.
10. "QRS" indicator (♥) fails to flash with each QRS.	10A. "ECG SIZE" adjusted too low. 10B. Amplitude of ECG signal too low in that lead. Select another lead or move electrodes.

Problem	Possible Cause
11. Heart rate does not register.	11A. "ECG SIZE" adjusted too low. 11B. Amplitude of ECG signal too low in that lead. Select another lead or move electrodes.
12. "LOW BATTERY: CONNECT AC POWER" message remains lit despite charging attempts. Unit operates normally on line power (AC).	12A. Call a qualified service representative.
13. "BATT CHARGE" indicator fails to light when unit connected to AC line power. Unit otherwise operational.	13A. Light failed. 13B. Power cord failed or not connected. 13C. Building fuse blown or circuit breaker tripped. Unit operating from internal battery. 13D. Battery not charging properly. 13E. No battery installed. 13F. For IEC units, "MAINS POWER" switch on rear panel in "OFF" or "O" position.
14. ECG recording appears smudged.	14A. Incorrect ECG paper inserted. Use paper for thermal array recorders such as Physio-Control chemical paper (P/N 804700).
15. "SERVICE" message appears in lower left corner of screen.	15A. Call a qualified service representative.
16. Time or date on recorder incorrect.	16A. Time or date not set properly. Adjust using "TIME/DATE MODE and SET" controls on rear panel (see page 21). 16B. Clock battery requires replacement.
17. Indicator lights momentarily flash.	17A. The LIFEPAK 9A defibrillator/monitor has a self-test feature which includes lamp tests. This function may occur during normal operation and is represented by momentary flashing of indicator lights.

Defibrillator

1. Charge time to 360 joules exceeds 10 seconds.	1A. Battery powered (DC): battery level low. 1B. AC line powered: battery not installed or battery depleted.
2. Numbers in "JOULES CHARGING" message scroll very slowly when "CHARGE" pushed.	2A. Internal battery level low. Connect to line power.
3. Energy is not delivered to patient when both paddle or Defibrillation Adapter pushbuttons are pushed simultaneously.	3A. Unit in "SYNC" mode but no QRS detected. 3B. Defibrillator has not reached full energy selected. 3C. More than approximately one minute has elapsed and energy is no longer available for discharge, (paddle "CHARGE" button indicator not lit). 3D. Charge has been "dumped" due to changed "ENERGY SELECT" after charge initiated. (No indicators lit). 3E. Defibrillator adapter not connected. 3F. Paddles or defibrillation electrode cable not connected.
4. Displayed "JOULES AVAILABLE" does not match energy selected. Accompanied by "ENERGY FAULT" message.	4A. Defibrillator energy storage may not meet specifications. Call a qualified service representative.

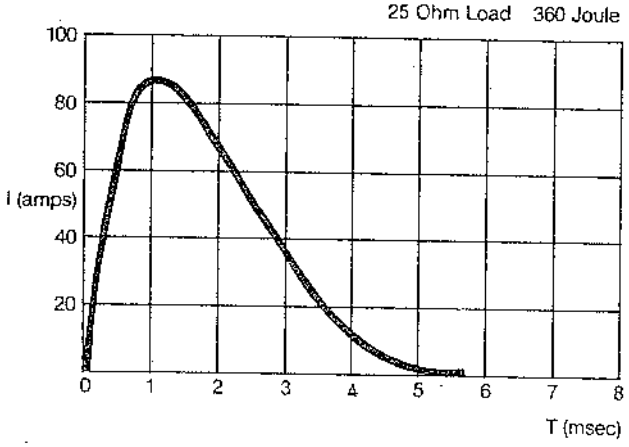
5.	"JOULES CHARGING" message does not appear when "CHARGE" pushed.	5A. Battery powered: Internal battery discharged below operating level.
6.	Message "TEST < 200 (or > 200) JOULES DELIVERED" displayed when 200J selected and dumped into Test Load. Accompanied by "ENERGY FAULT" message and warning tone.	6A. Defibrillator energy output may not meet specifications. Call Service. 6B. Defibrillator energy transfer timing may not meet specifications. Call a qualified service representative.
7.	SYNC MODE message does not appear when "SYNC" mode is selected.	7A. "LEAD SELECT" set to "PADDLES" when not using standard paddles. Use patient cable and select lead.
8.	(When using defibrillation adapter) No test load display messages appear when a defibrillation electrode cable test load is performed.	8A. Defibrillation electrode cable snap connectors are not fully seated in defibrillation adapter test load.

SPECIFICATIONS

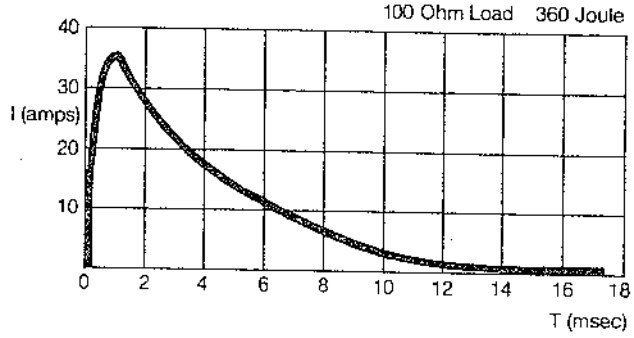
DEFIBRILLATOR/MONITOR

INPUT	Isolated ECG via QUIK-LOOK defibrillator paddles, FAST-PATCH disposable defibrillation/ECG electrodes, or 3-lead patient cable; 6-pin patient cable connector per AAMI ECG Connector Standard ECGC 5/83.
PATIENT CABLE LENGTH	4.0 m (13 ft); cable 3.1 m (10 ft), leads 0.9 m (3 ft).
COMMON MODE REJECTION	100 dB minimum with respect to chassis ground at 60 Hz. 65 dB minimum with respect to isolated ground. Common mode range for patient cable input ≥ 10 volts peak with respect to isolated ground.
CARDIOSCOPE DISPLAY	
Size:	76 mm (3 in) x 102 mm (4 in), non-fade.
Sweep Speed:	25 ± 1 mm/sec..
Frequency Response (-3 dB):	.8 Hz to 40 Hz.
RECORDER TYPE	Thermal array.
RECORDER DISPLAY	
Paper Size:	50 mm x 30 m (100 ft).
Paper Speed:	25 ± 1 mm/sec..
Recorder Mode:	Delayed by approximately 8 seconds.
Frequency Response (-3 dB):	1 Hz to 40 Hz (.05 Hz to 100 Hz option through "SET UP" mode).
Annotation:	Includes time, date, ECG lead, ECG gain, heart rate and defibrillation parameters.
HEART RATE METER	3 digit readout displays rates from 20 to 300 beats/min..
CALIBRATION	Momentary pushbutton switch on rear panel simulates 1milli-volt signal to preamplifier.
AC INPUT OPTIONS	Nominally 120 VAC (90 VAC minimum, 129 VAC maximum) or 240 VAC (198 VAC minimum, 264 VAC maximum), 50 or 60 Hz. Unit is compatible with all specified inputs without modification.
BATTERY TYPE	Sealed lead acid; 3 Ah; 16v nominal.
BATTERY CAPACITY	Typically: Seventy-five (75) 360 joule discharges or approximately 2 hours continuous monitoring with a fully charged battery. Minimally: Fifty (50) 360 joule discharges or sixty (60) minutes monitoring with continuous recording with a fully charged battery.
LOW BATTERY INDICATOR	Indicates low voltage level of battery; approximately 15% operating reserve capacity remains.
BATTERY CHARGING INDICATOR	Illuminates when battery is charging.
BATTERY CHARGE TIME	3 hours to 90% capacity; 16 hours to full capacity.

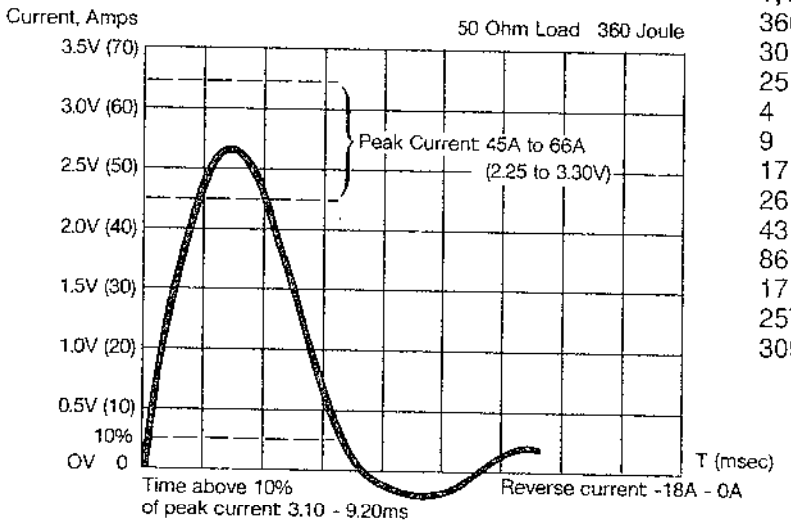
SERVICE INDICATOR	Indicates continuous self-diagnostic routines have detected improper operation requiring service attention.
MAXIMUM POWER CONSUMPTION	30 watts while monitoring. 50 watts while monitoring with recorder on. 150 watts while monitoring with recorder on and defibrillator charging or charging a fully depleted battery.
SIZE	35.3 cm H x 29.7 cm W x 31.0 cm D (13.9 in H x 11.7 in W x 12.2 in D)
WEIGHT	12.7 Kg (28.0 lb)
DEFIBRILLATION WAVEFORM	5 millisecond monophasic pulse (Edmark) per AAMI Standard



DC Defibrillator Output Waveform (25 Ohm Load)



DC Defibrillator Output Waveform (100 Ohm Load)



DC Defibrillator Output Waveform (50 Ohm Load)

OUTPUT ENERGY (delivered:)
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 50, 100, 150, 200, 300, 360 joules. Internal paddles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 50, joules. Defibrillator output electrically isolated.

25 ohms (30%)	50 ohms (15%)	100 ohms (30%)
4	5	5
9	10	11
17	20	22
26	30	33
43	50	55
86	100	109
171	200	218
257	300	327
309	360	393

ACCESSORIES AND REPLACEMENT ITEMS

OPTIONAL ADAPTER

803747-00	Defibrillation Adapter. Required for use with FAST-PATCH dispo able defibrillation electrodes/ECG electrodes, external sterilizable paddles, or internal paddles. Complete with operating instructions, defibrillation electrode cable (804089-08), and one set FAST PATCH disposable defibrillation/ECG electrodes.

OPTIONAL PADDLES

	FAST-PATCH disposable defibrillation/ECG electrodes. Fo use with defibrillation adapter (803747) and defibrillation electrode cable (804089-13).
804545-001	1 set (2 electrodes)
804545-010	10 sets (20 electrodes)
804545-050	50 sets (100 electrodes)
804507-01	External sterilizable paddles and connector. For use wit defibrillation adapter (803747).
800441-03	Handles and connector for internal paddles. For use wit defibrillation adapter (803747).
	Internal paddles. **For use with handles and connector 800441-03.**
802154-10	2.5 cm (1.0 in) diameter, pair
802154-11	3.8 cm (1.5 in) diameter, pair
802154-12	5.1 cm (2.0 in) diameter, pair
802154-13	6.4 cm (2.5 in) diameter, pair
802154-14	8.9 cm (3.5 in) diameter, pair
	Handles and Connector
	Internal Paddles
800418-00	Pediatric paddle, external 1 each (2 required). Slips on to standar adult, QUIK-LOOK, QUIK-CHARGE paddles, or external sterilizable paddles.
802461-00	Posterior paddle, external adult. Slips on to standard adult, apex QUIK-LOOK, QUIK-CHARGE paddle, or external sterilizable paddles.

ACCESSORIES

804089-13	Defibrillation electrode cable. For use with FAST-PATCH disposable defibrillation/ECG electrodes.
9-10418-02	Patient cable, 3-lead, I, II, III. 6-pin connector, snap type, low noise
800539-02	Emergency cart. Flip-up workshelf, with 3 drawers, swivel castors, tubular top railings, cardiac board, IV pole, and "lock" system.
200349-001	Red security ties for emergency cart, 50 ties/package

REPLACEMENT ITEMS

	LIFE•PATCH ECG electrodes, adult
800139-030	Box of 30 electrodes (3 electrodes per package; 10 packages per box)
800139-300	Case of 300 electrodes (10 boxes/case)
	DERMA JEL® electrode gel
9-10236-00	4 oz. tube
9-10236-012	Twelve tubes/case
	ECG paper, chemical, 50 mm x 30 m (100 ft), 40 mm grid
804700-003	3 rolls/box (1 box)
804700-150	50 boxes/case (150 rolls)
803619-08	Power cord
805383-00	Operating instructions for LIFEPAK 9A defibrillator/monitor and defibrillation adapter
803763-00	Service manual for LIFEPAK 9A defibrillator/monitor

TESTING AND MAINTENANCE GUIDELINES

Physio-Control LIFEPAK defibrillator/monitors are designed and manufactured to be reliable and to require minimal maintenance. Routine periodic testing and maintenance will help to ensure that this instrument remains in good operating condition and is ready for use when needed. It will also promote operator familiarity with the defibrillator/monitor.

The following guideline is intended to test the functional and electrical safety of the defibrillator/monitor at periodic intervals. It complements the internal quality assurance programs of the hospital, clinic, or emergency medical service and is not a substitute for such programs.

Testing should be accompanied by a thorough visual inspection of the defibrillator/monitor. The unit should be examined for cracks in the case, power cord, and strain relief bushings; for pitted paddle plates; for the presence of gel on paddles or paddle storage wells; and for the proper function of controls. If necessary, corrective action should be taken immediately.

While examining the unit, the operator should ensure that all accessories (e.g., internal defibrillation cables and paddles, patient cable, pediatric paddle adapters, etc.) are present and functional.

Routine testing of defibrillator/monitors operating from battery power will consume battery power. The operator should assure that batteries are promptly recharged according to the procedure in the Operating Instructions.

Physio-Control recommends the following minimum program of routine testing and maintnance. Consult the Operating Instructions and Service Manual provided with the defibrillator/monitor for specific instructions. If necessary, replacement manuals may be ordered in the USA by calling the Physio-Control Partsline at 1-800/331-1086. Outside the USA, please contact your local Physio-Control sales and service office.

	Clinical Staff				Biomedical Engineering
	Daily	After Use	As Required	Weekly	Quarterly
Clean defibrillator/ monitor		●	●		●
Ensure that all supplies and accessories are present and in operating condition (e.g., gel, ECG paper, patient cable, electrodes, etc.)	●	●	●		
Check/change recorder paper			●		
Operational tests: monitor function			●		●
defibrillator discharge	●				●
Inspect case, and power and paddle cords, for damage				●	●
Verify that paddles are clean	●	●			
Electrical safety test, performance verification, and calibration check					●

If a discrepancy in defibrillator/monitor operation is found, ensure that corrective action is taken immediately.

NDICATIONS, CONTRAINDICATIONS AND PRECAUTIONS FOR DEFIBRILLATOR USE

This Physio-Control defibrillator/monitor is a therapeutic medical device intended for use under the direction or guidance of a physician. Direct current defibrillation is a recognized means of terminating certain potentially fatal cardiac arrhythmias.

A direct current defibrillator applies a brief high-energy pulse of electricity to the heart. This energy may be delivered either through external paddles or electrodes on the chest, or through internal paddles applied directly to the heart.

Defibrillation is only one aspect of the medical care required to resuscitate a patient in ventricular fibrillation. Depending on the situation, other supportive measures may include:

- establishment and maintenance of a patient airway
- ventilation, including administration of oxygen
- maintenance of blood circulation
- pharmacologic measures

Among other factors, it is recognized that the likelihood of successful resuscitation of a patient depends on the length of time between the onset of ventricular fibrillation and defibrillation. Rapid defibrillation and prompt follow-up care are essential. The physiological state of the patient may affect the likelihood of defibrillation or skeletal muscle contractility. Thus, failure to convert the arrhythmia or to resuscitate a patient is not a reliable indicator of defibrillator performance. Similarly, the patient's muscular response to the defibrillator shock is not a reliable indicator of the energy delivered.

INDICATIONS FOR DEFIBRILLATOR USE

Asynchronous

1. Ventricular fibrillation
2. Ventricular tachycardia with cardiovascular collapse (when preparation for synchronized cardioversion may cause unacceptable delay)

Synchronized cardioversion

Rhythms which are commonly cardioverted include:

1. Atrial fibrillation or atrial flutter
2. Paroxysmal atrial tachycardia or junctional tachycardia
3. Ventricular tachycardia

CONTRAINDICATIONS

1. Idiojunctional or idioventricular rhythms
2. Second or third degree heart blocks
3. Digitalis toxicity

PRECAUTIONS

Because of the high energy delivered by the defibrillator, certain precautions should be taken.

1. Ensure that all defibrillator operators are thoroughly familiar with the Operating Instruction Manual, indicators, controls and their functions.
2. Ensure that the defibrillator is kept in proper operating condition at all times through routine maintenance and repair by qualified personnel. See the Service Manual for details.
3. If battery powered, ensure that the batteries are kept charged and ready for use. Also, ensure that battery maintenance procedures are followed. See Operating Instructions for details. If the integrity of the grounding system is in doubt, the unit should be operated from internal batteries.
4. Before delivering a defibrillator shock, verify that the patient's rhythm is one for which a shock is indicated. Eliminate sources of electrocardiograph (ECG) artifact by assuring good electrode contact with the skin, minimizing motion of patient and electrode cables (this may necessitate a brief (less than 5 to 10 seconds) interruption in cardiopulmonary resuscitation), and by using adequate conductive gel, interface material, or adhesive defibrillation electrodes. Radio transmitters and diathermy equipment may also be a source of ECG interference. If the patient ECG is monitored through defibrillator paddles, make certain that the lead selector is set to "PADDLES".
5. Protect the patient from skin burns by using an adequate amount of an appropriate conductive material. Be sure that the gel or conductive pads cover the entire surface of the paddle electrode yet do not become continuous from one paddle to the other, and that the gel or pads do not dry. Ensure that self-adhesive defibrillation electrodes remain firmly attached to the skin.
6. Apply gel, paste, defibrillation electrodes or defibrillation gel pads before turning on the defibrillator.
7. Disconnect from the patient any equipment which may be damaged by the defibrillator shock. This may include external transvenous pacing devices.
8. If the patient has an implanted pacemaker, check pacemaker function following defibrillation or cardioversion.
9. Press paddles firmly to the patient's chest.
10. Do not place defibrillator paddles, electrodes, gel, or pads in contact with ECG monitoring electrodes.
11. Always use the patient cable for ECG monitoring during synchronized cardioversion. This will reduce the possibility that discharge may be inadvertently triggered by paddle motion. Also, refer to Operating Instructions for information on setting the "ECG Size" control for proper R-wave sensitivity.
12. Be sure that gel is not in contact with the operator's hands on the paddles.
13. Ensure that all personnel are clear of the patient before delivering a shock.
14. During defibrillation, the operator should not make any contact with the patient except through the defibrillator paddle handles. The operator should also avoid contact with metal objects such as bed frames or stretchers which may provide unwanted current pathways.
15. Do not discharge the defibrillator to "open air". To remove unwanted charge, turn the defibrillator to the OFF setting.
16. Do not discharge the defibrillator with the paddles shorted together. Doing so may cause pits on the paddles which can increase the risk of patient burns. Use a defibrillator test load.
17. Treat a defibrillator with respect. Do not touch the metal paddle plates, defibrillation electrodes, or hold the paddles to your body when the defibrillator is on.
18. Clean the paddles and paddle storage areas after use. Even dried gel is a conductive pathway that could endanger the operator during a later use, and could impair paddle monitoring. Discard self-adhesive defibrillation electrodes after use.
19. Only gas sterilize internal paddles and cable sets. Periodically inspect all connections for evidence of corrosion or degradation. Replace sets which show signs of corrosion or degradation.
20. Periodically test the defibrillator. This will help to ensure that the defibrillator will be ready to use in an emergency. It will also help maintain operator familiarity. Press paddles firmly into the test load when discharging to prevent formation of pits. Such pits may increase the risk of patient burns. The frequency and extent of routine testing should be determined by institutional policy and practice.

PHYSIO CONTROL

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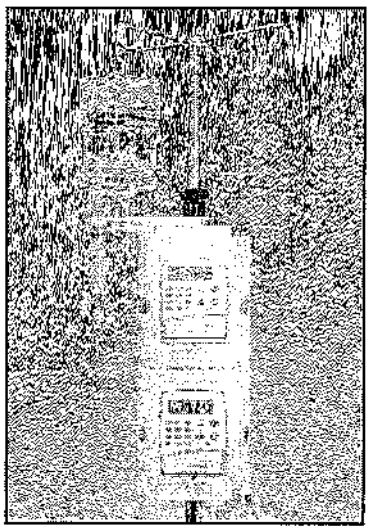

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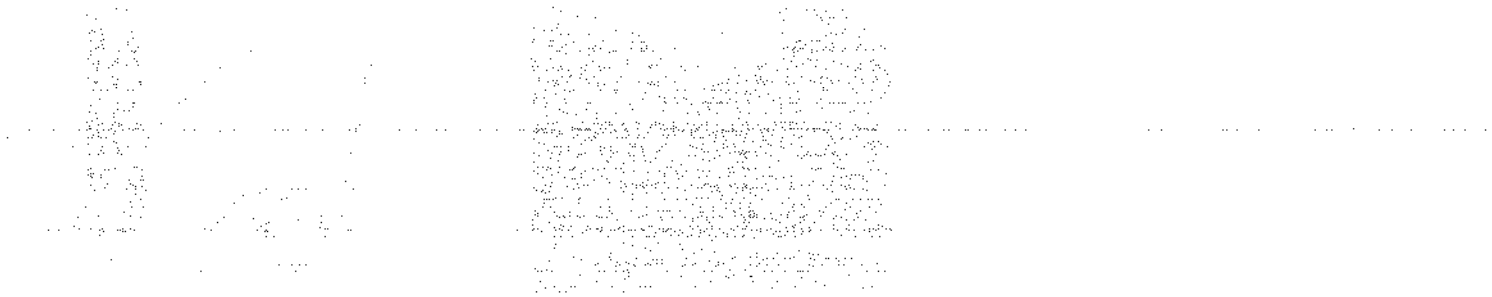

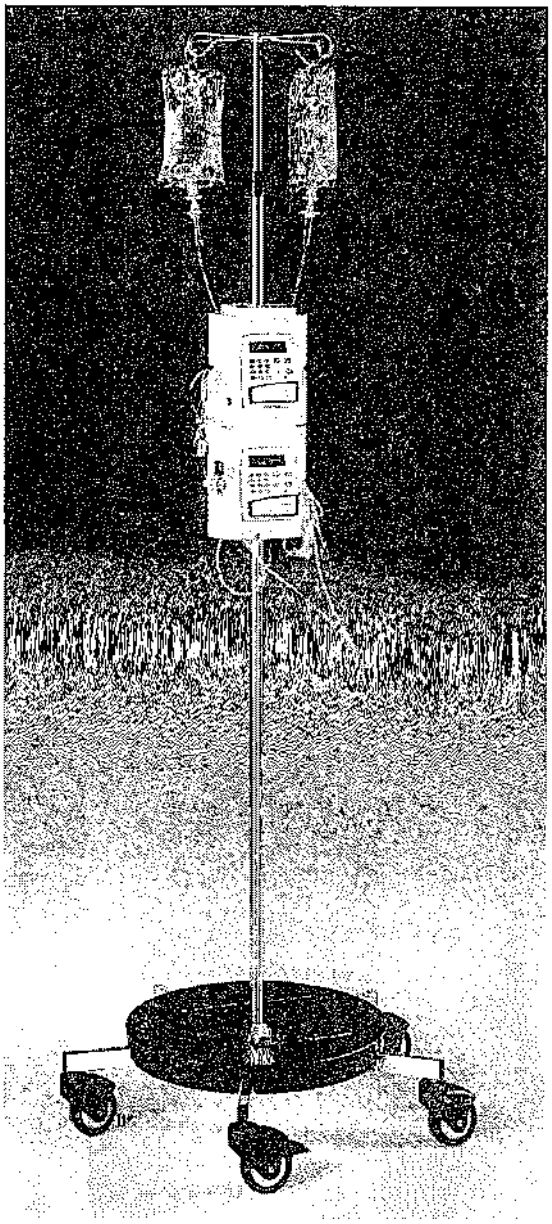

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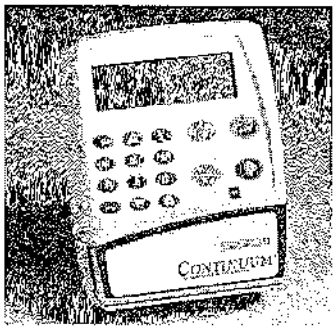
CNT EN BA 201336 Rev. A

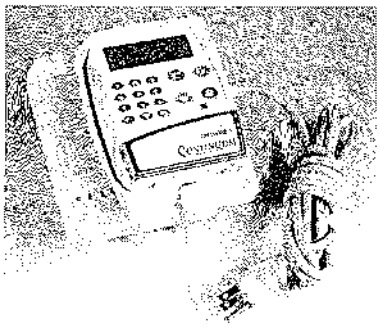
Continuum MR System Features

- System compatibility with scanners up to and including 1.5 Tesla
- Positioning next to scanner bore
- Easy set up and operation
- Configurable to single, dual or triple channel delivery into a single line
- Continuous, and weight-based dose (mcg/kg/min or mg/kg/min) delivery protocols
- Automatic-Bolus function
- Keypad lockout
- User-definable:
  - Max flow rate and bolus limit
  - Occlusion Pressure
  - Priming Volume from 20 ml to 60 ml, with a default of 40 ml
  - Air bubble size detection (Ultrasonic air sensor)
  - KVO Rate of 1 ml/hr to 5 ml/hr
  - Start Delay
- Red LED alarm indicator and audible alarm
- Alarms: Low and End battery, Pump unattended, Air in line, Down-occlusion, Door open, Program end, Missing key

Pump Specifications

Flow Rate Range	-	0.1 to 500 ml/hr (continuous and weight-based modes)
	-	0.1 to 99.9 ml/hr in 0.1 ml increments
Volume	-	0.1 ml to 9,999 ml
Maximum Pressure	-	0.7 bar or 10 psi adjustable (high, normal, low)
Dimensions (H x W x D)	-	4.5" x 3.5" x 1.6", or 115 x 89 x 40 mm
Weight	-	Pump-1 lb. (280 grams); Standard System 39 lbs. (17.8 kilograms)
Pump Mechanism	-	Linear Peristaltic
Battery	-	7450 mA/hr, 7.2V Li-Ion, (rechargeable)
Battery Operation	-	4 hours at max flow rate of 500 ml/hr
Battery Charging	-	6 hours to full charge
Power Requirements	-	110-240 VAC, 50/60 HZ 0.12A
Memory Protection	-	Current program and 250 event history log





Standard System Configuration for Continuum MR Compatible Infusion System:

Catalog Number: CONTINUUM MRIP

- Two (2) Infusion Pumps
- Two (2) Battery Chargers
- Two (2) Mounting Brackets
- One (1) IV Pole
- Two (2) Standard Administration Kits
- One (1) Syringe Holder

Also available as one or three pump system

MR Infusion Administration Set

The MEDRAD MR Infusion Administration Set incorporates integral free-flow protection, needle-free Y-site injection ports, coiled tubing for easy handling and an aseptic coupler for easy disconnection. The MEDRAD administration line easily attaches to the existing patient administration line or other fluid source.

Two Administration Sets are Available:

Set	Components	Catalog Number
Standard Kit (for single fluid channel delivery)	One (1) primary line, One (1) clip clamp	MIK 200A
Secondary Line (for addition of a second or third fluid channel)	One (1) secondary line	MIL 200B

Line	Length	Priming Volume
Primary Line	126 inches	~10 ml
Secondary Line	29 inches	~5 ml

June 16, 2005

Dorothy Balacco
Newark Beth Israel Medical Ctr
PO 480
Long Branch, NJ 07740

Dear: Dorothy,

Thank you for taking time out of your busy day to discuss your critical care medical equipment and disposable needs.

Ardus Medical is a Cincinnati, OH based provider of medical products supplying hospitals and alternate site healthcare organizations in North, Central, and South America. The company specializes in sales and rental of pre-owned infusion delivery devices, defibrillators, pulse oximeters, SCD's, and related disposables such as administration sets and TPN bags. Please visit our website at www.ardusmedical.com for detailed information.

We will also buy your surplus equipment. We will purchase infusion pumps, syringe pumps, PCA's, and defibrillators to name a few. Please call us today to see if we can help you dispose of your old equipment.

All products are shipped patient ready and are tested in accordance with all manufacturer specifications and good manufacturing practices. In addition, our biomedical technicians are factory trained.

Ardus sells, rents, and services many pieces of quality medical equipment per year. I believe your organization will be extremely satisfied with the products and services we provide.

Should you have questions, please call me at 1-800-878-1388, ext. 27. Our office hours are 8:00-5:00 Eastern Time. The fax number is 513-469-2329. Thanks again for your consideration.

Sincerely,

Kelly Piening
Account Executive
Ardus Medical
800-878-1388 ext 27
Ph. 513-469-7867 ext 27
Fx. 513-469-5243
www.Ardusmedical.com

Ardus Medical is a Cincinnati, OH based provider of medical products supplying hospitals and alternate site healthcare organizations worldwide. The company specializes in sales and rental of pre-owned infusion delivery devices, defibrillators, pulse oximeters, SCD's, and related disposables. Below are our current specials:

Pole Mounted Infusion, PCA, and Syringe Pump with 1-year warranty.	**Purchase Price**	**Rental Rate/ Month**
Abbott Aim+ ambulatory IV Pump	$1,295.00/ea.	$105.00
Abbott Plum IV Pump	$495.00/ea.	$50.00
Abbott 4100 PCA+2 IV Pump	$750.00/ea.	$90.00
Alaris Medsystem III IV Pump	$995.00/ea.	$105.00
Baxter 6201 IV Pump	$1,125.00/ea.	$110.00
Baxter 6301 IV Pump	$1,495.00/ea.	$120.00
Baxter Colleague IV Pump	$1,195.00/ea.	$125.00
Baxter Colleague Triple IV Pump	$3,295.00/ea.	$275.00
Baxter APII PCA Pump	$795.00/ea.	$80.00
Baxter AS40A Syringe Pump	$1,095.00/ea.	$95.00
Baxter Sabratek 6060 (Pre-Owned)	$1,095.00/ea.	$110.00
Baxter/Bard PCA II	$1,795.00/ea.	$175.00
Braun Curlin 4000 Ambulatory Pump	NA	$145.00
BD360 Syringe Pump	$430.00/ea.	$55.00
Deltec Prizm IV Pump	CALL	$115.00
Imed PC-1 IV Pump	$450.00/ea.	$60.00
Imed PC-2 IV Pump	$600.00/ea.	$85.00
Imed PC-4 IV Pump	$1,695.00/ea.	$150.00
Ivac Signature IV Pump	CALL	CALL
Medex/Medfusion 2001 Syringe Pump	$995.00/ea.	$105.00
Medex/Medfusion 2010/2010i Syringe Pump	$1,295.00/ea.	$115.00
Medex 3010a Syringe Pump	**CALL**	**$180.00**
Sigma 6000+ Prog. IV Pump	$875.00/ea.	$50.00
Sigma 8000 Prog. IV Pump	$1,050.00/ea.	$110.00
McGaw NXT IV Pump	$895.00/ea.	$80.00

Sequential Compression Devices with 1-yr. warranty.	**Purchase Price**	**Rental Rate per Month**
Kendall 6325	$795.00/ea.	$85.00
Kendall 7325	$995.00/ea.	$115.00
Kangaroo 324	$325.00	$45.00

*Quantity may be limited. Payment terms are net 15 days. Pricing firm through 10/31/04.

Also, we can provide your facility with parts for the following devices: Medsystem III, IMED PC-1, PC-2, and McGaw Horizon Classic.

Ardus Medical sells, rents, and services over 5,000 pieces of quality pre-owned medical equipment per year. Should you have questions or have equipment needs, please call us at 1-800-878-1388, ext. 15. Please visit our Web site for equipment specials and new product information at WWW.ARDUSMEDICAL.COM. Thanks again for your business and Ardus looks forward to serving you and your organization in the future.

Sarah Shannon

From: Alison Hamann
Sent: Thursday, June 16, 2005 12:32 PM
To: Sarah Shannon
Subject: FW: Customer Service Inquiry

From: online_response@ardusmedical.com [mailto:online_response@ardusmedical.com]
Sent: Thursday, June 16, 2005 12:24 PM
To: Troy Powell; Alison Hamann; seo_ardus@hyperdrivei.com; Jeff Smith
Subject: Customer Service Inquiry

Amy Ballard has requested more information about Ardus Medical, Inc.
Listed below is their information:

Name: Amy Ballard
Business Name: MMS Medical
Email: aballard@mms medical.com
Phone: 860-291-8080
Other: product info.
Contact by Email: No
Question About: After-Sales Services
Comments: Good Afternoon, I would like you know if you would mail me 3 copies of your Product Catalogs. Our account # is A0725. The Address is: MMS Medical, 238 Prestige Park Road, East Hartford, CT. 06108. ATT:Amy/Customer Service.