Page 1: Product introduction
Page 2: Operating instructions
Page 3: Pump assembly photograph
Page 4: Left hand mains end cap photograph
Page 5: Right hand end cap photograph
Page 6: Removing the back plate assembly
Page 7: Compressor replacement
  Pressure control valve replacement
  Manifold replacement
Page 8: Basic logo! operating sequence
Page 9: Replacing the pressure sensor
  Replacing logo modules
  The power supply unit
Page 10: Logo! expansion unit replacement
Page 11: PCB photograph
Page 12: Removal of mains fail/low pressure alarm PCB
Page 13: Wiring harness replacement
Page 14: Replacing control panel membrane
Page 15: Bed hook assembly photograph
  Bed hook removal
Page 16: PHP 596 phase II pump troubleshooting
Page 17: Drawing 002 (Logo! logic control unit)
Page 18: Drawing 003 (Logo! logic expansion unit)
Page 19: Drawing 004 (Logo! logic power supply unit)
Page 20: Drawing 005 (compressor)
Page 21: Drawing 006 (pressure control valves)
Page 22: Drawing 007 (pressure sensor)
Page 23: Drawing 008 (PCB for phase II)
Page 24: Drawing 009 (pneumatic end cap fitting)
Page 25: Drawing 010 (wiring assembly)
Page 26: Product codes and descriptions
Page 27: Technical data

Document Reference: QAP/AS1/88a     Amendment No: 00     Date: 2-2-04
PART 1: PRODUCT INTRODUCTION
General Function and Component Details

1 ABOUT THE PHP 596
The PA7500 offers a comfortable support, whose cells gently inflate and deflate (in accordance with established alternating principles). It is cost effective for both the prevention and treatment of pressure ulcers. The Phase II power unit operates a 10-minute alternating cycle, and is both energy efficient and quiet in operation. In the event of cardiac arrest the CPR can be released allowing the system to be deflated in 10 seconds or less.

2 TECHNICAL DESCRIPTIONS
The PA7500 is comprised of a pressure regulated pump and an air flotation mattress system. The pump is constructed from a metal alloy case with abs endcaps and meets the following safety standards.
Type B

FOR US AND CANADA ONLY

Medical Equipment-Air Pump
With respect to electric shock,
Fire and mechanical hazards only
In accordance with UL2601-1
CAN/CSA C22.2 No.601.1

IT FEATURES
1. Mains on/off switch with indicator light
2. Mains live and neutral circuit breakers
3. Three push button comfort control with led indicators
4. Static push button with led indicator
5. Low pressure audible alarm with led indicator
6. Mains fail audible alarm with reset push button

3. COMFORT CONTROL
Different ranges adjustable to patient's comfort while maintaining low tissue interface pressure.
Internal pressure of the mattress is ranged from 30-80 mm/Hg +/-10%

4. Static control
The static function overrides the alternating cycle for 20 minutes

5. Mains Failure alarm
Audible alarm will activate at any time that the mains supply is removed or switched off.
OPERATING INSTRUCTIONS

1. Place the pump on a flat surface or suspend the pump unit by its hooks at the end of the bed.
2. Place the air mattress over the bed making sure it is extended completely without any kinks. Place with the printed feet at the bottom of the bed.
3. Connect the air hoses from the mattress with the air outlet connectors on the pump unit. These are CPC quick release connectors. Make sure you hear them click when connecting.
4. Plug in the AC power cord to the AC outlet (Be sure the switch is in the off position before plugging in)
5. Plug in and turn on power
6. The led on the medium position will be illuminated and all mattress cells will inflate after which the alternating sequence will automatically commence.
7. Comfort pressure is adjusted by pressing the light, medium or heavy control positions.
Phase 2 Pump Component Assembly

- logo power supply unit
- mains fail / low pressure alarm pcb
- logo logic expansion unit
- logo logic control unit
- pressure sensor
- compressor
- non return valves
- output feed pipes
- pressure control valves

Page3

Document Reference: QAP/AS1/88d
Amendment No: 01
Date: 21-2-05
Phase 2 left hand endcap (mains in)

- Illuminated mains rocker switch
- Earth connector
- Circuit breakers, live & neutral
Phase 2 right hand endcap (mattress feed)

Mains fail reset button

Male & Female cpc connectors
Removing the backplate assembly from the case

Note: ensure the pump is disconnected from the mains supply

1. Remove the four allen bolts from each endcap.
2. In the lefthand endcap remove the live and neutral leads to the mains switch from the logo power supply separate the male and female bullet terminals connecting the ground cable to the chassis.
3. In the right hand endcap, remove the white connector (s1) from the PCB which is connected to the mains failure reset button.
4. Detach the silicon pressure feed pipes from the two cpc connectors.
5. Remove the four securing bolts which fix the assembly backplate to the case, there are two bolts in each side.
6. Slide the chassis to the right hand side of the case. When one third removed, disconnect the 12 way control panel connector from the PCB. (j2)
7. Continue to slide out the backplate completely. Use the instructions in reverse order to re-assemble.
Compressor replacement
(PHOTOGRAPH PAGE 3)

Ensure the component assembly backplate is completely isolated from the mains supply.
The compressor operates on 230 volts ac and, therefore, it is essential the backplate is disconnected from the power source.
Remove the pressure feed pipe from the red outlet on the compressor to the valve/manifold assembly. (refer to drawing 009).
Unscrew the neutral terminal on the power supply unit, top left and remove the live feed to the compressor from terminal Q3/2 on the logo! Main logic controller. (refer to drawing 010).
Snip the appropriate zip ties to remove the compressor leads.
Unfasten the fixing nuts and bolts to release the compressor and mounting bracket from the backplate. Remove the whole compressor assembly away from the backplate.
Simply pull each rubber mounting post from each locating hole in the bracket.
Taking the replacement compressor, cut and trim each lead to the same lengths as the original compressor. Snip the short blue neutral lead (which connects to the mains switch) away from the original compressor.
Using new ferrules fit and crimp to the new compressor remembering to reconnect the short blue neutral lead.
Mount the compressor onto the bracket by simply pulling through each rubber mounting post through the corresponding holes.
Before finally fixing the compressor and bracket back in place on the backplate, reroute the leads back into their correct locations and connect to the respective terminals.
Fix to the backplate using the nuts and bolts. Reconnect the silicon pressure feed pipe.

Pressure control valve replacement
(PHOTOGRAPH PAGE 3)

To replace either of the control valves, firstly remove the electrical connector with the yellow led indicator. Simply remove the single fixing screw and pull the connector away.
There are only two fixing screws connecting the valve to the manifold. With the valve removed, ensure the rubber seal is fitted correctly between the manifold and the valve.
Refit the replacement valve as above in reverse order.

Manifold replacement
(PHOTOGRAPH PAGE 3)

Remove both valves as explained above. The power feed terminals can be left in place attached to the valves.
Make a note of the three silicon tubes and then remove from the manifold. Unfasten the manifold from the backplate by removing the two nuts and bolts.
Replace the manifold and assemble the unit by following the above instructions in reverse order. (refer to drawing 006).
**Basic logo operating sequence**

**Warning!** Only suitably qualified personnel should work on live equipment under test conditions.

To test the operating status of the logo! Components it is necessary to reconnect the mains end cap to the logo! Power supply unit whilst the assembly backplate is out of the case. Ensure the earth cable is reconnected. To the left hand side of the logic controller and the expansion unit, there is a small indicator alongside which is the legend RUN/STOP.

When the unit is switched on, these indicators will immediately show red and after a few seconds turn green. With green showing, then the hardware and software programme are operating correctly.

Should the indicators not light at all, then the power supply unit should be tested.

In normal operating mode with a green indication on the logic controller but a red or amber on the expansion unit, then this would suggest a faulty expansion unit.

If the RUN/STOP indicator is red or amber on the logic controller then assistance should be obtained from Parkhouse healthcare technical department.

The logo logic controller cannot be replaced without the assistance of Parkhouse technical personnel due to the nature of the stored software programme.
Replacing the pressure sensor

Locate the pressure sensor on the left hand side of the component assembly backplate (see drawing 009 or 010).
Remove the silicon pressure feed pipe from the sensor (see drawing 009).
Using a pair of side cutters snip the two zip ties to release the body of the pressure sensor.
Using a terminal screwdriver, unscrew the two centre terminals + and – of the output connectors on the logo power supply unit (see drawing 010).
Remove the black lead from input connector I7 on the logo main logic unit.
Take the new pressure sensor and trim the electrical leads to the same corresponding lengths as the previous pressure sensor.
You are advised to fit ferrules to the trimmed leads.
Attach the new pressure sensor to the backplate with two replacement zip ties.
Referring to drawing 010, fit the brown lead from the pressure sensor to the + output connection on the logo power supply as shown.
Connect the blue lead to the – output connection on the logo power supply.
Finally, connect the black lead from the sensor to I7 on the logo logic unit.
Refit the silicon pressure feed pipe to the pressure sensor.

Replacing logo modules

It is important to make a note of the relative connections to each of the logo terminals before disconnecting.

The power supply unit

Unscrew terminals L1 & N, refer to drawing 004, remove live & neutral leads, unscrew the two + and the two – terminals which connect into the wiring harness and the pressure sensor (refer to drawing 010).
At the base and centre of the power supply there is a small grey latch. This should be eased back using a small screwdriver and lifting the unit upwards will release it from the din rail (refer to drawing 011).
Logo! Expansion unit replacement

Make a note of all connections to the expansion unit before commencing disconnection. Using a small terminal screwdriver remove the two power feed connections to L+ and M at the top of the unit. Below these terminals there is a small grey sliding connector which will be located to the left of the slot.

To disconnect, slide the locator to the right as shown in drawing 003, with all connections removed, ease the expansion unit to the right, away from the main controller in drawing 003, one can see the three locating pegs which must be cleared from the main controller. At the base of the expansion unit in the centre, there is a light grey plastic latch and when pulled back slightly (using a small screwdriver) the unit can be lifted upwards and released from the din rail. (refer to drawing 011).

To refit the expansion unit, refer to the above instructions in reverse order. Remember to slide the grey slider to the left after the expansion unit is correctly fitted to the logic controller.
Mains Fail / Low Pressure Printed Circuit Assembly

- 12 way control panel membrane connectors (j2)
- 12 way wiring harness connector (j3)
- Low pressure alarm connector (j1)
- Mains fail reset connector (s1)
To Remove Mains Alarm / Low Pressure Alarm PCB

1. Pull off the 12 way connector attached to the wiring harness (j3)
2. Disconnect low pressure alarm connection to (j1)
3. One by one, squeeze closed the top part of each white plastic fixing post and ease the pcb upwards.
4. To refit a pcb, place the board fixing holes on each corresponding white plastic mounting post.
   Gently press the board onto the fixing posts. Refit the respective connectors to j1 & j3.

*Refer to drawing 008 for connector locations*
WIRING HARNESS REPLACEMENT

Please note that the mains feed to the power supply unit and compressor connecting leads are not attached to the wiring harness. The pressure sensor is also a separate item.

To assist with the ease of replacement, (refer to drawing 010) make notes where required.
During the removal of the original harness several zip ties may require removing and disconnecting. These should be replaced when the replacement harness is fitted. Referring to the four dc 24v output terminals.
The two outer terminals on the power supply unit should be disconnected. Leave the inner connections, which feed the pressure sensor. Disconnect all inputs and power feeds sequentially along the top of the logo! logic controller and expansion unit.

Disconnect all relay connections along the bottom of the logo! logic controller and expansion unit with the exception of Q3/1 and Q3/2 (compressor feed).
Carefully release the 12 way connector J3 & 3 way connector J1 from the mains fail/low pressure printed circuit board. Remove the harness from the assembly backplate.

Refit the replacement harness according to the instructions above but in reverse order. The fitting should be straight forward as the harness is preformed and fitted with identifying markers corresponding to the information on the modules and drawing 010.
Replacing the control panel membrane

Should the control panel membrane become damaged, it is relatively easy to replace. Remove the component assembly or chassis as described on page 6. Simply pull one corner of the panel away from the case and continue until the whole panel has been removed.

Pay attention to remove any adhesive film, which is still attached to the case.

Remove the protective brown sheet from the new replacement panel but leave the small section behind the conductive ribbon in place.

Offer the long top edge of the control panel membrane to the lip on the angled section of the case.

With this correctly positioned, begin to press down the control panel on to the case. Take care not to leave any air bubbles.

When this is successfully fitted, slide the component assembly back into the case remembering to fit the 12 way connector from the control panel onto the mains fail/low pressure alarm pcb (j2).

Reassemble the phase II pump as described previously.
B. **BEDHOOK REMOVAL**

1. PLACE THE PUMP FACE DOWN WITH BED HOOKS FACING UP
2. REMOVE THE LOCKING NUT AND WASHER.
3. SLIDE OUT THE BED HOOK.
4. REFITTING IS AS ABOVE BUT IN REVERSE.
<table>
<thead>
<tr>
<th>SYMPTON</th>
<th>CAUSE</th>
<th>DIAGNOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) PUMP DEAD MAINS SWITCH UNLIT</td>
<td>A. PLUG FUSED</td>
<td>A. CHANGE FUSE</td>
</tr>
<tr>
<td></td>
<td>B. CIRCUIT BREAKER TRIPPED</td>
<td>B. RESET</td>
</tr>
<tr>
<td></td>
<td>C. DISCONNECTED WIRE IN THE END CAP</td>
<td>C. RECONNECT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) PUMP DEAD MAINS SWITCH LIT</td>
<td>A. DISCONNECTED BROWN WIRE FROM MAINS SWITCH TO P.S.U.</td>
<td>A. RECONNECT</td>
</tr>
<tr>
<td></td>
<td>B. FAULTY POWER SUPPLY UNIT</td>
<td>B. REPLACE THE UNIT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) PUMP FUNCTIONS BUT MAINS SWITCH UNLIT</td>
<td>A. MAINS SWITCH FAULTY</td>
<td>A. REPLACE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) PUMP OPERATION NORMAL BUT VERY LOW PRESSURE OUT (LOW PRESSURE ALARM ACTIVATED)</td>
<td>A. CHECK INTERNAL PRESSURE FEED PIPES FOR LEAKS</td>
<td>A. RECONNECT OR REPLACE</td>
</tr>
<tr>
<td></td>
<td>B. FAULTY COMPRESSOR</td>
<td>B. REPLACE COMPRESSOR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) PUMP NOISY HEAVY VIBRATIONS</td>
<td>A. FAULTY COMPRESSOR</td>
<td>A. REPLACE</td>
</tr>
<tr>
<td></td>
<td>B. BROKEN RUBBER COMPRESSOR MOUNTS</td>
<td>B. REPLACE</td>
</tr>
</tbody>
</table>

FOR TECHNICAL SUPPORT CONTACT PARKHOUSE HEALTHCARE LTD
PHP596 SPARE PARTS LIST

PHSP201   Logo Power Supply
PHSP202   Logo Logic
PHSP203   Logo Expansion Pack
PHSP204   L5T Compressor
PHSP204a  Compressor Mounting Plate
PHSP205   Complete Solenoid Assembly
PHSP205a  Solenoid Valve
PHSP206   Internal Hose Manifold
PHSP207   Pressure Transducer
PHSP208   PCB
PHSP209   Wire Loom
PHSP210   Complete metal case
PHSP210a  Membrane Panel
PHSP210b  Bed Hooks
PHSP210c  Handle
PHSP210d  Blank metal case
PHSP211   Back Plate
PHSP212   Din Rail
PHSP213   End Panel – Mains Complete
PHSP213a  End Panel – Mains – Stickers Only
PHSP213b  Double Pole Rocker Switch – Green / Silver
PHSP213c  Circuit Breaker
PHSP213d  mains cable securing gland
PHSP213e  5 Metre Mains Cable
PHSP213f  Double Pole Rocker Switch – All Green
PHSP214   End Panel – Air - Complete
PHSP214a  End Panel – Air – Stickers Only
PHSP214b  Male CPC Connector for Pump
PHSP214c  Female CPC Connector for Pump
PHSP214d  Mains Failure Alarm (reset push button)
PHSP215   Mattress Side rail (complete)
PHSP215a  One Way Valve Manifold
PHSP216   CPR Unit
PHSP217   Base Sheet
PHSP218   Static Cell
PHSP219   Alternating Cell
PHSP220   Feed Pipes Inc Connectors
PHSP220a  Male CPC Connector for Mattress
PHSP220b  Female CPC Connector for Mattress
PHSP221   Mains Failure Alarm Reset Button Assembly
PHSP229   Mattress Conversion Kit
Technical data

Model: PHP596

Compressor: L5T

Pressure settings: Low = 30mmHg +/- 10%  High = 50mmHg +/- 10%

Air flow: 7 litres/minute

Cycle time: 10 minutes

Low pressure alarm: LED with audible warning and reset switch

Mains fail alarm: audible warning with reset push button

Cpc connectors: 160-04 / 420-04

Power supply: 220/240 vac 50Hz

Power input: 12 watts

Safety approval: BS 5724 (IEC 601/1)

Mains plug fuse: 3A

Mains in line circuit breaker: 1A