



P/N: 10099745
REV: H
TITLE: PB500 Power Pack Assembly & Test procedure

INSTRUCTIONS

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DOCUMENTATION ASSOCIATED TO THIS PROCEDURE:

10124919 PB500 Series Power Pack2 DHR LOG

10140875 Powerpack FRU DHR

REV	ECO	PREPARED BY	APPROVED BY	DATE	SUMMARY
X01	ECO-R240823		Refer to Agile	Refer to Agile	Prototype release of proposed Procedure for Powerpack
X02	ECO-R241464		Refer to Agile	Refer to agile	Update proposed pocedure to include Fan & labels.
A	ECO-R249054		Refer to Agile	Refer to agile	Release to Production revision. Update to remove Fan and update illustrations for new housing.
B	ECO-R252464		Refer to Agile	Refer to Agile	Add functional test print instructions. Indicate items that may be batch built.
C	ECO-R253629		Refer to Agile	Refer to Agile	Add FRU assembly instructions
D	ECO-R259742		Refer to Agile	Refer to Agile	Update fru instructions (10131169, 10132667, 10132668) with new FRU assembly numbers (10153315, 10153316, 10153317). Add PCBA to DC Cable Test and AC power Test.
E	EC045537		Refer to Agile	Refer to Agile	Update to clarify that an 18in/lb Adapter tool is used for the Housing Assembly
F	EC089803		Refer to Agile	Refer to Agile	Add Visual Aid for Outer label Verification requirement
G	EC087136		Refer to Agile	Refer to Agile	Update to instruct Operator to record Cal ID of the Digital Multimeter to PHR.
H	EC125118		Refer to Agile	Refer to Agile	Add instruction for checking of dummy battery fit to second battery slot in power pack unit.

APPENDICES TO THIS PROCEDURE

P/N	DESCRIPTION	REV.
N/A	N/A	N/A



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TITLE: PB500 Power Pack Assembly & Test procedure

INSTRUCTIONS

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1. Purpose:

This assembly instruction details the steps required to assemble the Puritan Bennett PB500 Power Pack unit and PB500 FRU assemblies.

2. Scope:

This procedure covers the Puritan Bennett PB500 Series Power Pack

3. Definitions:

DHR Device History Record

S/N Serial Number

OP Operation

FRU Field Replacement Unit

4. References:

G-QAM001	Quality Manual
10071206	PB500 Power Pack Child Serial Number Assignment LOG
10124919	PB500 Power Pack2 DHR LOG
10140875	PB500 Powerpack FRU DHR
10099745	PB500 Powerpack Assembly & Test procedure
10009491	Mfg. Guidelines to Completion of Records
10012479	Generic Daily Cleaning Log
10012472	Generic Cleaning Procedure
10073104	Power Pack Test stand software
10021524	Preventative Maintenance PB540 / PB560 / PB520
G-AMFG-1814-00	Cosmetic Criteria, MONITORS / PB540 / PB560 / PB520
G-AMFG-1013-00	MRB Documentation
G-AMFG-1817-00	Generic line clearance procedure
10021526	PB520 / PB540 / PB560 lot code and serial number assignment
G-AMFG-2913-00	Printing labels using label view
10021527	PB540 / PB560 / PB520 Spare Parts Procedure
10060262	Electrical Safety Test Equipment Verification Log
10022167	PB500 Electrical Safety Doc

5. GENERAL REQUIREMENTS

Tool List & Equipment:

Equipment Description	P/N
18 in-lb torque driver with socket adapter(p/n10124834) (DC connector)	N/A
8.9in-lb torx TX08 bit(charger) & TX15 bit(Cover)	N/A
Isopropyl Alcohol	901048
Kim wipes	901731
Scissors	N/A
6" or 12" Calibrated Steel ruler	N/A
Flat Nose Pliers	N/A
PB500 Power Pack Test Bed	10124050
Calibrated DMM	N/A

General Notes:

- Before using any calibrated equipment, make sure that the calibration data (on calibration label) has not expired and there is no obvious damage to the equipment.
- If a torque tool is dropped on the floor during assembly, send for re-calibration.
- When connecting cables to connectors, check that male pins are straight. If not, place board into MRB.
- Hex wrenches to be used only for nut removal if required. Do not use to tighten nuts (there are specific calibrated angle torque tools for this)
- Ensure all harnesses are fully pushed into mating connectors.
- When printing serial numbers for production, record detail on log 10071206 - PB500 series Power Pack Child Serial Number Assignment LOG
- Paint work can be scratched with sharp objects. To avoid scratching, ensure the Unit is not kept beside sharp objects. Use ESD safe foam to leave unit on during assembly.
- Part numbers or revs can be retrieved from outer packaging.
- For plastic parts it is acceptable to use an approved sample to verify cosmetic criteria.
- Observe all ESD Precautions
- Complete discrepancy Log for fails.

Note: protective gloves must be worn while using alcohol.

- **Note:** If rework/repair is completed at any stage where dis-assembly is required, record all details on the last page of the DHR discrepancy log, **10124919**. On the new DHR, verify that s/ns and labelling revision are still correct, and that the appropriate final assembly checks are completed. If there is not sufficient space on the DHR, add a second DHR to include the additional information.
- **Note:** At the start of each week, it is the responsibility of the Line Leader / Production Supervisor to print out a copy of the BOM from Galway BPCS and sign & date it.
 - Compare revisions for any changes from previous week's build.
 - Prior to recording revisions on DHR, ensure that they match revisions on printout
 - Contact a quality department, line supervisor or manufacturing engineer when any discrepancies noted

Traceability:

- All component S/N and Lot Numbers as listed on the DHR LOG **10124919** must be recorded.

FRU Hotbed Components Powerpack

- Powerpack Hotbed is to consist of all parts of the assembly 4098100.
- If an item is not listed on the FRU BOM use a hotbed part to complete assembly as required.

DHR:**General DHR NOTES:**

- When completing PB500 Power pack DHR's – record all entries / data / dates per Galway Mfg. Guidelines for Completion of Records 10009491.
- N/A sections that are not applicable.
- Verify that the assemblies are complete and packed as per BOM and this procedure
- The Device History Record (DHR) is to be retained by the Covidien QA Records Centre
- Record the relevant product Serial number on page one of the DHR for PB500 Series Power Pack - 10124919
- Complete applicable section of the PB500 PowerPack FRU DHR - 10140875

Assembly tasks completed per this document are to be recorded on DHR



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6. Assembly Procedure:

HOUSING ASSEMBLY



Note: Observe all ESD Precautions

Materials:

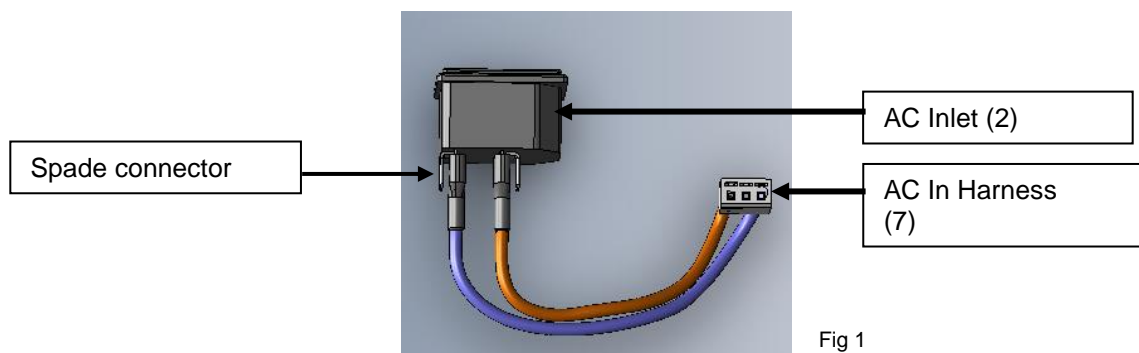
Blln No.	Description	Qty	Blln No.	Description	Qty
11	Housing	1	3	PCBA to DC Out Harness	1
7	AC In Harness	1	6	Charger PCBA	1
2	AC Inlet Snap In Panel	1	17	Screw M3x6	4
25	Fuse, Fast,5A,250VAC,5MM X 20MM	1	16	Keypad	1
1	AC Outlet Snap In Panel	1	15	Powerpack2 board	1
8	AC out Neutral (blue)	1	26	Standoff, snap-in, power pack PCBA	1
9	AC out Live (brown)	1	10	Charger to PCBA harness	1

Equipment:

18 in/lbs socket Adapter tool (PCBA to DC Out Harness)
8.9 in/lbs torque screw driver (Screw M4x6 – Charger PCBA)
Isopropyl Alcohol, 901048
Kim wipes P/N 901731

Process Instruction:

Connectors Installation

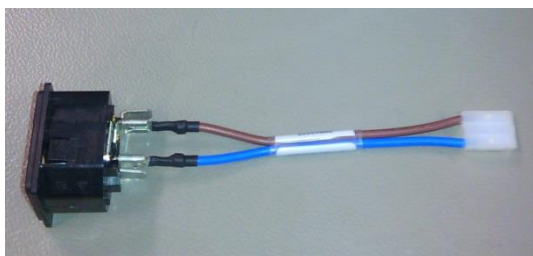


- Using a flat nose pliers connect the wires of the *AC In Harness* (7) Live(brown) and Neutral(blue) to *AC inlet*(2) connector, N(blue) for Neutral and L(brown) for Live, fig 1. Ensure spade connectors are to the outside, as shown in fig 2.

Fig 2

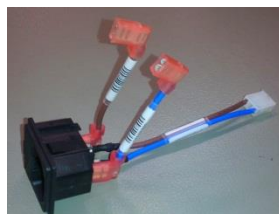


Fig 3



- Connect the AC Neutral(8) and AC Live(9) wires to the Live(L - brown) and Neutral(N - blue) pins of AC Inlet. Fig 4

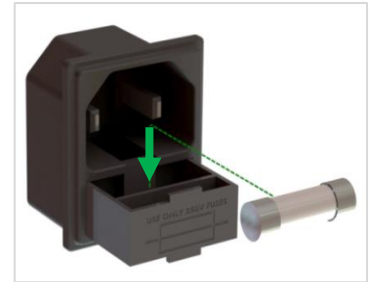
Fig 4



- This Assembly can be completed in batches.

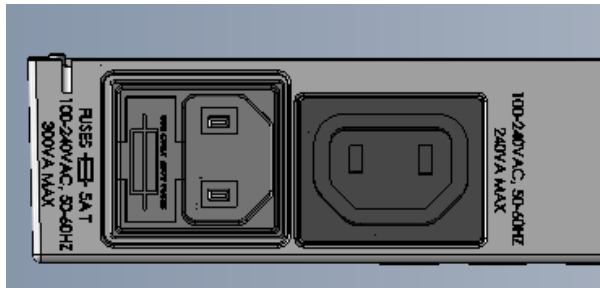
4. Place *Fuse*(25) into *AC Inlet* (2) connector, in compartment shown in Fig 5.

Fig 5

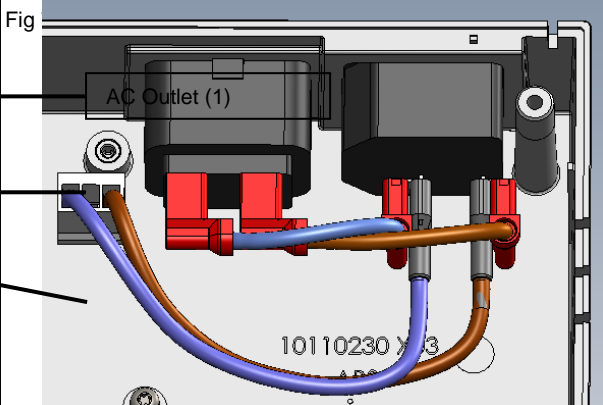


5. Snap *AC Inlet*(2) (with AC In harnesses connected) and *AC outlet*(1) into place through the holes in Housing(11), from outside in. Ensure correct orientation, fig 6.

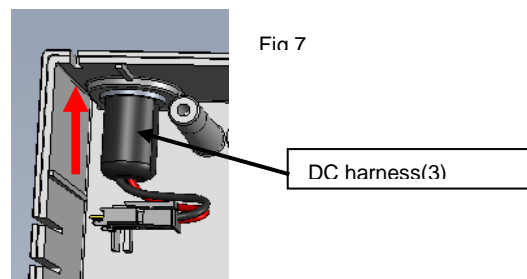
Fig 6



6. Connect the AC Neutral(8) and AC Live(9) wires to the Live(L - brown) and Neutral(N - blue) pins from AC Inlet to live and neutral pins of AC Outlet, fig 7.



7. Unscrew threaded nut from *DC Harness* (3) and remove washer and put aside.
8. Feed Harness(3) through specified location opening in housing, feed from inside to out. As shown fig 7.



9. Apply & tighten previously removed washer then the threaded nut & proceed to torque using 18 in/lbs torque adapter.
10. Check to ensure the washer is positioned on outside of unit before nut is torqued. Note: DC harness will be connected to Powerpack board(15).



Charger Open Frame PCBA Installation

1. Remove *Charger* (6) from its ESD packaging. Record Lot Code in DHR.
2. Align PCBA holes with holes on housing, as per fig 1. Orientate as shown and insert 4 screws (17) and torque to 8.9in/lbs.

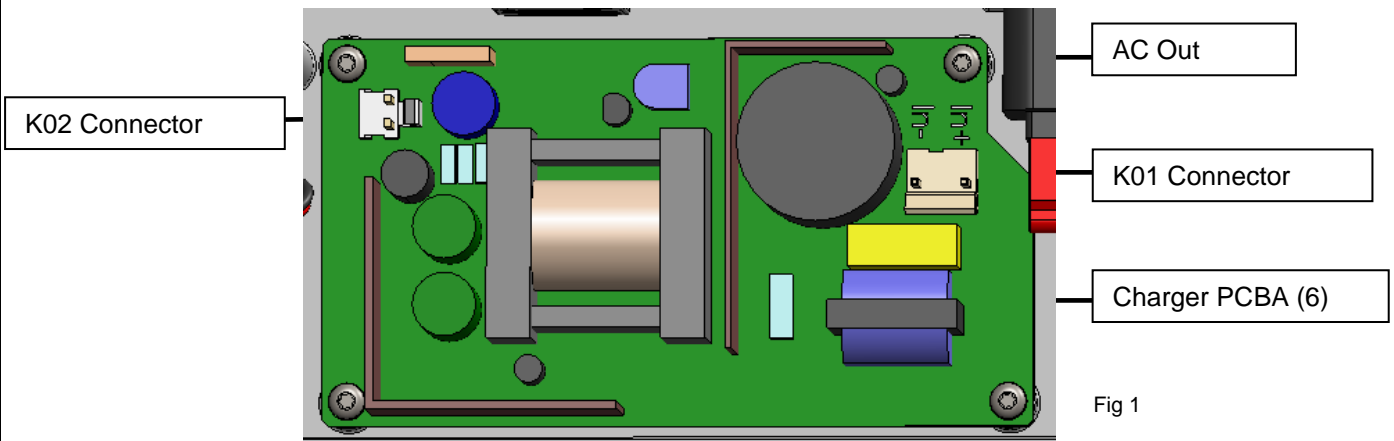
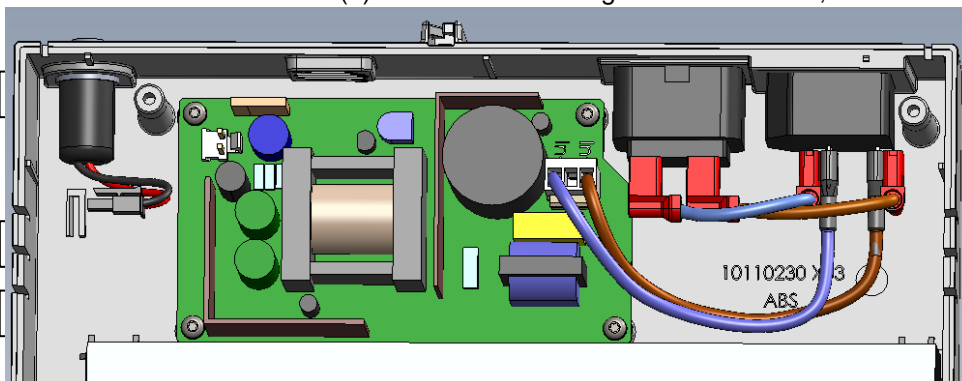


Fig 1

Harness Connections

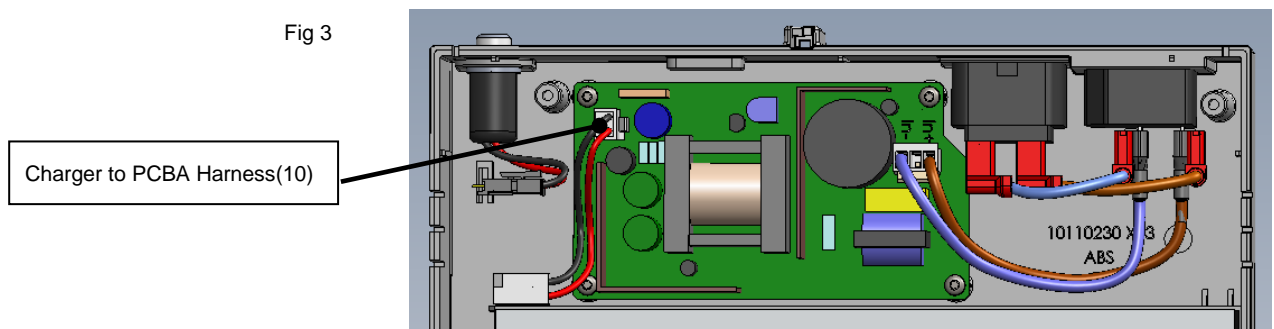
Fig 2

1. Connect the *AC In harness* (7) from AC In to Charger connector K01, as shown in fig 2.



2. Connect the *Charger to PCBA harness*(10) to Charger connector K02, as shown in fig 3.

Fig 3





Keypad Installation

1. Clean Keypad cut out area of housing with kim wipe and alcohol if required.
2. Unpack Keypad(16). Record the Lot number from the label attached to the flex tail in DHR, as per fig 1.
3. Peel off all Keypad adhesive strips.
4. Feed flex tail of keypad through the slot in housing.
5. Carefully affix the keypad to the housing. Do not flex the display section as this can damage the internal circuitry
6. Ensure correct orientation of keypad and that it is correctly adhered to housing and flex tail is not kinked. fig 2

Fig 1



Fig 2



PowerPack PCBA



Note: Observe all ESD Precautions

1. Remove Powerpack2 board(15) from the ESD packaging. Record S/N in DHR. Record S/W version from bottom side of PCB and tick box to verify it matches current S/W version.
2. Insert Standoff(26) through PCBA, it is put through the hole from bottom side of PCBA, same side as J12 connector.
3. Open J12 connector latch mechanism on PCBA; connect keypad flex cable as shown Fig 1. Ensure flex tail is fully pushed home into connector before closing down latches. Secure latches and ensure both sides are closed(fig 2)

Fig 1 - J12 connector latches Open

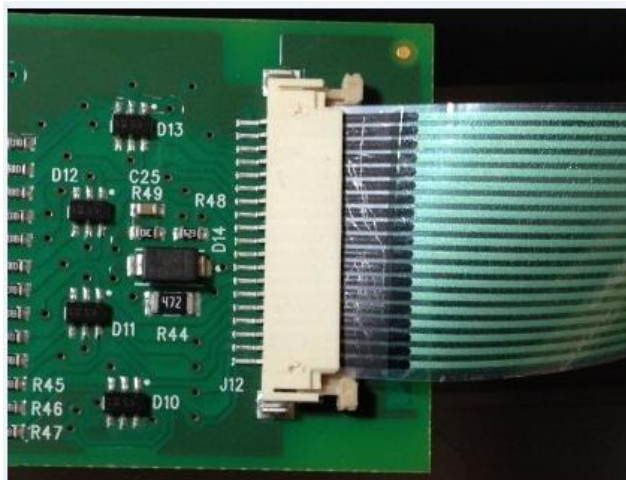


Fig 2 – J12 connector latches closed

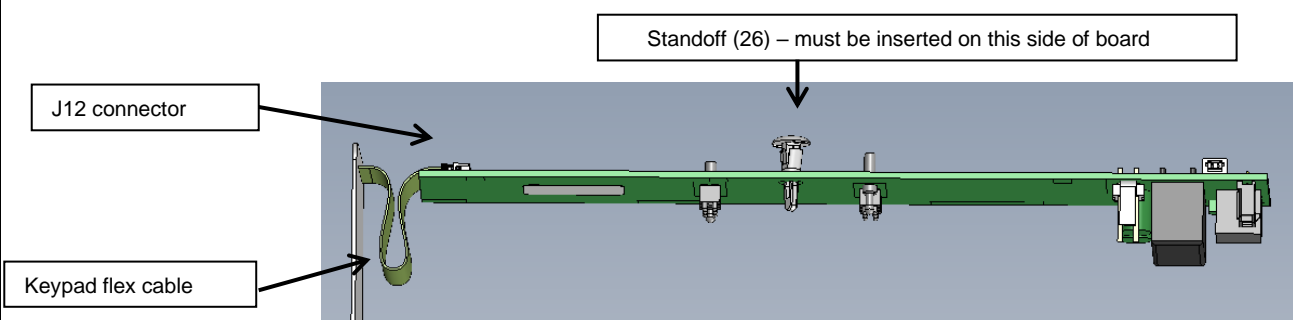
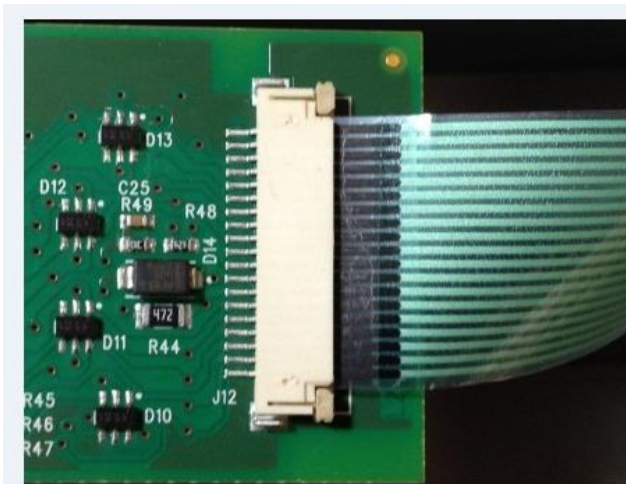


Fig 3

4. To insert Powerpack2 PCBA(15) press down on battery contact guard to slot board into location shown in fig 4, note orientation and cut out sections for battery connections.

Note: For illustration only. The Keypad flex cable is not attached to the powerpack2 board

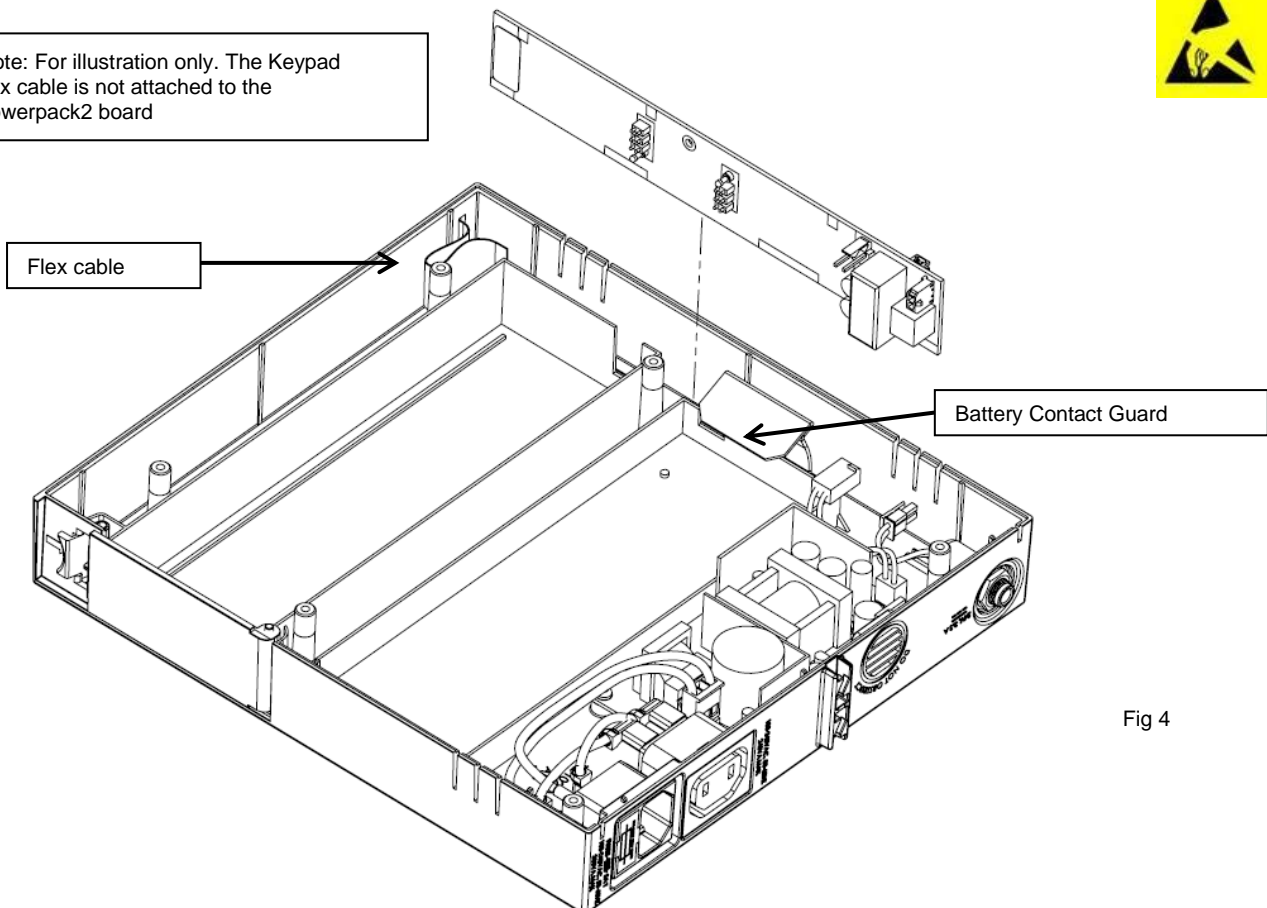


Fig 4

5. Carefully connect *PCBA to DC harness*(3) to J11 on top side of PCBA
 6. Ensure there are no kinks in the cables, the flex cable is looped and board is seated correctly in slots.
 7. Connect Charger to PCBA harness(10) from Charger PCBA to PowerPack PCBA as shown. Fig 5.

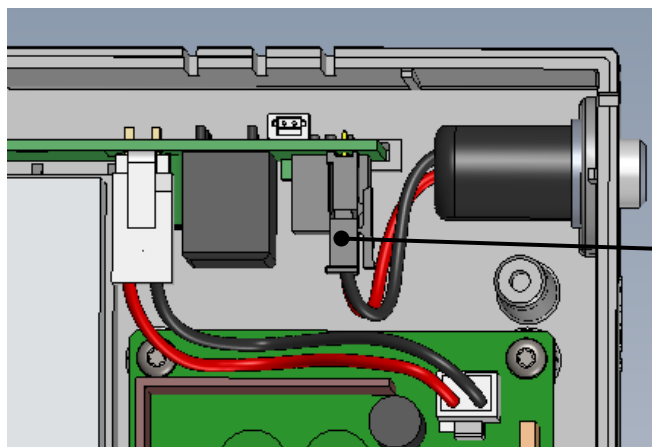


Fig 5

PCBA to DC Harness(3)

Charger to PCBA harness (10)

COVER PREPARATION



Note: Observe all ESD Precautions

Material:

Balloon No.	Description	Qty	Balloon No.	Description	Qty
12	Cover, Powerpack	1	21	Neoprene foam - Adhesive strip	A/R
13	Adhesive Feet 12.7X12.7	4	20	Zinc Plated Screw M4X10	4
23	LBL, Polyester 2.0"x0.5"	1	24	ID label	1

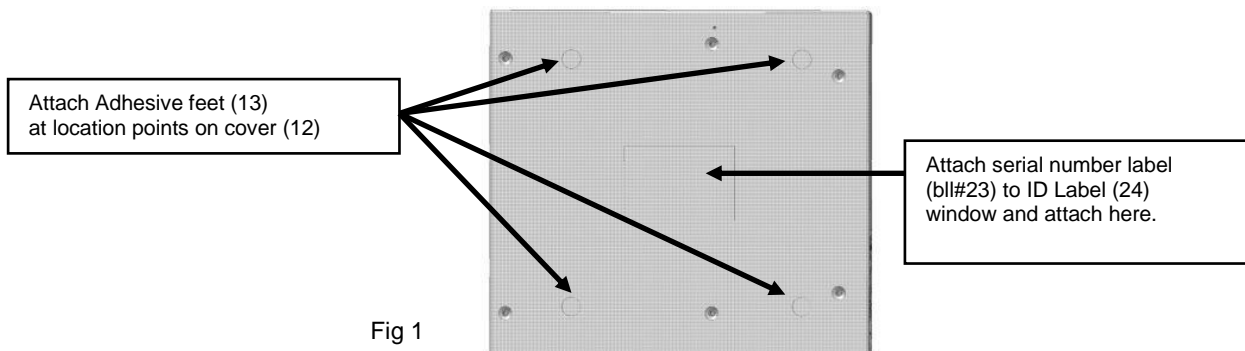
Equipment:

Isopropyl Alcohol, P/N 901048
Kim wipes P/N 901731
Scissors
6" or 12" calibrated steel ruler

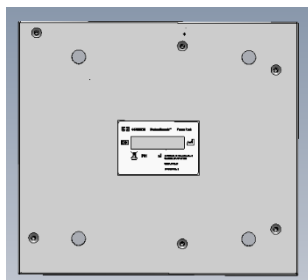
Note: Cover is fully installed during Test Sequence

Process Instructions:

- Using alcohol and Kim wipes, wipe the *Cover*(12) areas where *adhesive feet*(13) are to be attached. Attach adhesive feet(13) to locations shown, refer to fig 1.



- Print the product Serial Number using label (23), refer to G-AMFG-2913-00.
- Ensure unit label S/N printed matches S/N on DHR.
- Record Revision of *ID label*(24) in DHR. Attach Serial Number label to the back of the *Power Pack ID label* (24) window such that the Serial Number is visible through the window in the ID label, fig 3. Ensure the Serial Number is clearly visible and orientated in the same direction as the text on the ID label.
- Attach label assembly to the Cover (12), orientate as shown in fig 2, note screw holes arrangement for guidance. Ensure correct application of ID label & adhesive feet. Ensure product ID label orientated as shown in figure 3.



Attach Serial Number label (23) to ID label window

Product ID label (24)

Note: The serial number pictured in fig 3 is for representation purposes only and serial numbers will vary

6. Cut neoprene foam (21) to size 10mm*15mm (+/-2mm) using scissors and calibrated steel ruler. (this can be completed in batches)
7. Attach the neoprene foam strips to the location shown as per fig 4 & 5.

Foam locations



Fig 4

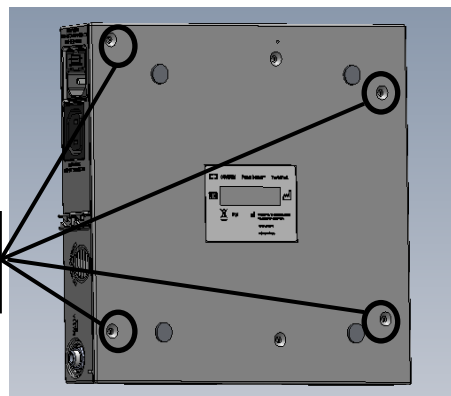


Fig 5

8. Ensure correct application of foam.
9. Cover is fully applied during test sequence but must be temporarily applied prior to conduct Hipot and Electrical Safety tests as follows:
 - 1) Line up holes on cover with the housing. Ensure the PCBA board is seated correctly in slots.
 - 2) PCBA must be correctly aligned with locator points on top cover
 - 3) Place cover on housing assembly.
 - 4) Tighten 4 screws(20) at locations shown in fig 6 to close unit.

Fig 6

Close unit using screws
(20) at location points



Note: Observe all ESD Precautions



COVER & BATTERY DOOR INSTALLATION

Materials:

Balloon No.	Description	Qty
14	Door, battery access	1
18	Battery Change label	1
22	Adhesive stop	1
20	Zinc Plated Screw M4X10	6

Equipment:

8.9 in/lbs automatic torque driver
Torque bit

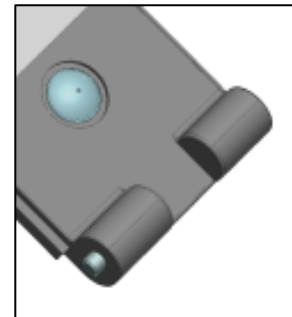
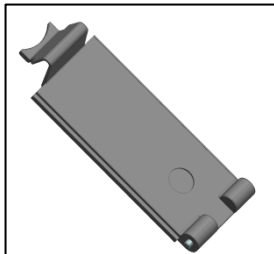
Process Instruction:

Note: Cover and Door are installed during Test Sequence

Battery door

- Before application of label and adhesive stop clean all affected area of *Battery Access door*(14) using a kim wipe and alcohol
- Attach *Battery Change Label*(18) to door latch specified location fig 1, ensure label is orientated as shown and fitted squarely. Record Battery Change Label Revision in DHR.
- Attach *Adhesive stop* (22) to specified location on door latch assembly.

Fig 1



- Insert battery door assembly to housing as per fig 2. Ensure battery door pin is correctly inserted into position.

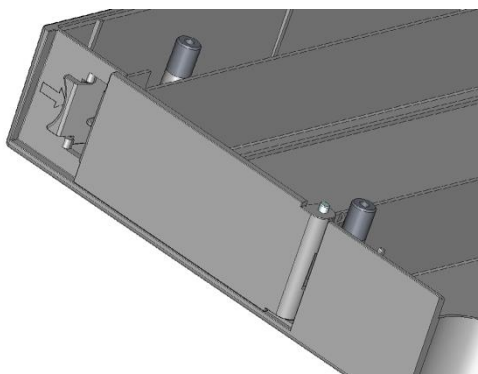


Fig 2

Door latch assembly location

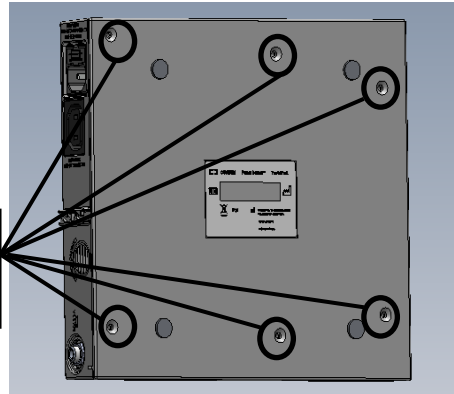
Cover



Note: Observe all ESD Precautions

1. Line up holes on cover with the housing. Ensure the PCBA board is seated correctly in slots.
2. PCBA must be correctly aligned with locator points on top cover
3. Battery door pins are correctly aligned with top & bottom cover
4. Tighten & torque 6 screws(20) to 8.9 in/lbs at locations shown in fig 1 to close unit.

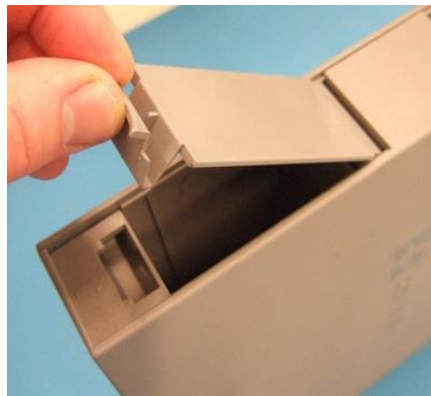
Fig 1



Close unit using screws (20) at location points as per fig 1

5. Check the operation of door latch as per fig 2. Note: door latch may need to be pushed to latch.

Fig 2



6. Insert dummy battery to battery slot to ensure fit, as shown in Fig 3 and Fig. 4. Ensure door latch closes fully on inserted battery per Fig. 5.



Fig. 3



Fig. 4



Fig. 5

7. Remove dummy battery once check completed and record results on relevant section of DHR 10124919.

8. Sign and date assembly section of DHR

HIPOT TEST - SETUP & DAILY CHECKS



Warning: High Voltage Present

Remove all rings, jewellery & watches before continuing.

Do not touch unit or test equipment during test.

Do not perform test if you are grounded.

Insulating Mat must be in position



If any cables or connectors are worn or damaged stop use of tester **IMMEDIATELY** and contact line supervisor or line technician / engineer

Do not perform these tests until you understand the hazards and are confident you can perform them safely.

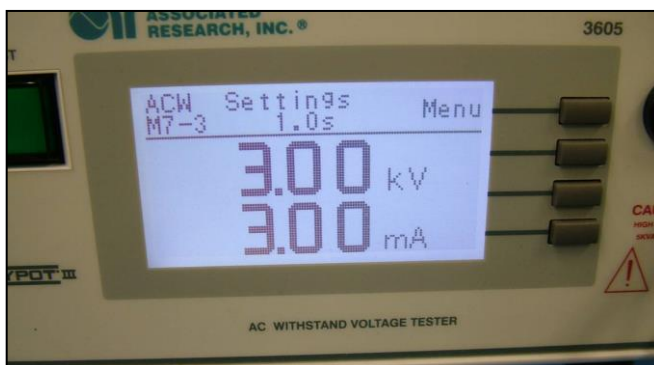
Warning: High Voltage Present During Hipot Testing. AC Voltages up to 3KV are used, take all necessary safety precautions.

Equipment Required

- Associated Research, AC Withstand Voltage Tester, AR Model 3605 or 3705
- Associated Research, Adapter Box with Cable AR P/N 36544
- PB500 PowerPack Hipot Test Power Cable , P/N 10124385
- Hipot Test Load Box (PB540), P/N 10022189
- Electrical Safety Cable Continuity Test Box (PB500), P/N 10022190
- Fluke Handheld DMM Model 87 or equivalent
- Electrical Safety Test Enclosure

Daily Check: Hipot Tester Power ON Settings Check

1. Turn ON the Hipot Tester and Check the settings on the display to be **1.0s, 3.00kV, 3.00mA** as shown in the picture below:
2. Leave the Hipot tester power ON when testing is completed.
3. Repeat this test whenever the Hipot Tester is powered ON having been previously powered OFF.
4. Record the Pass/Fail result in the Electrical Safety Test Equipment Verification Log, P/N 10060262.
5. Notify Test Engineering if this check fails.



Daily Check: Hipot Tester Current Limit Check

The Current Limit Test check is performed daily prior to use to ensure correct operation of the Hi-Pot tester and cable connections. The test load box contains a load resistor with a value to cause a Max Current Limit failure.



CAUTION: Verify Hipot tester is not activated before handling cables!



Procedure:

1. Connect the Hipot Test Load Box P/N 10022189 to the Hipot Tester output
2. When ready to start the test, press the green TEST button on the Hipot Tester to begin the testing
3. The Hipot test must FAIL (long audible beep, red failure indicator will light up) to indicate a successful test. To stop the alarm press the red RESET button on the Hipot tester. If the Hipot test does not Fail please contact Test Engineering.
4. Record the Pass/Fail result in the Electrical Safety Test Equipment Verification Log, P/N 10060262

Daily Check: Hipot Test Cables Continuity Check

The Hipot Test Power Cable P/N 10124385 is to be continuity tested daily prior to use using a DMM to be less than 0.5Ω using the Electrical Safety Cable Continuity Test Box P/N 10022190.

Procedure:

1. Set the DMM to the resistance (Ω) mode. Measure and record the lead resistance (Ω), DMM Cal ID, and Due Date in the Electrical Safety Test Equipment Verification Log, P/N 10060262.
2. Connect both ends of the PowerPack Hipot Test Power Cable P/N 10124385 to the Electrical Safety Cable Continuity Test Box P/N 10022190, see photo below.



10124385- Hipot Test Cable

Photo for Step 2

3. Connect the DMM probes to the **Power Line 1** terminals of the Cable Continuity Test Box P/N 10022190 and record the resistance measured in the Electrical Safety Test Equipment Verification Log, P/N 10060262. Subtract the lead resistance measured in Step 1, verify that the final resistance is less than 0.5Ω and record the result on the log.
4. Connect the DMM probes to the **Power Line 2** terminals of the Cable Continuity Test Box P/N 10022190 and record the resistance measured in the Electrical Safety Test Equipment Verification Log, P/N 10060262. Subtract the lead resistance measured in Step 1, verify that the final resistance is less than 0.5Ω and record the result on the log.



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5. Connect the DMM probes to the **DC Ground** and the RED **GND** terminals of the Cable Continuity Test Box P/N 10022190 and record the resistance measured in the Electrical Safety Test Equipment Verification Log, P/N 10060262. Subtract the lead resistance measured in Step 1, verify that the final resistance is less than 0.5Ω and record the result on the log.
6. Remove the Hipot Test Power Cable P/N 10124385 from the Cable Continuity Test Box P/N 10022190 and plug into the Associated Research, Adapter Box receptacle
7. If any resistance measurement exceeds the resistance limit, call Test Engineering

LEAKAGE CURRENT TESTS - SETUP & DAILY CHECKS



Warning: High Voltage Present During Electrical Safety Testing, take all necessary safety precautions



CAUTION: Never touch the Device Under Test(DUT) or anything connected to it while high voltage is being applied by the Electrical Safety Test Equipment

Equipment Required

- Safety Analyzer Tester, Metron Model QA-90
- PB500 PowerPack Electrical Safety Test Ground Cable, P/N 10124544
- Electrical Safety Cable Continuity Test Box (PB540), P/N 10022190
- AC Power Cord, UK male plug and IEC Female Plug 0.7m \pm 0.1m length
- Fluke Handheld DMM Model 87 or equivalent

Daily Check: Cable Continuity

The following cables are to be continuity tested daily prior to use with a DMM to be less than 0.5 Ω using the Electrical Safety Cable Continuity Test Box P/N 10022190.

- PB500 PowerPack Electrical Safety Test Ground Cable, P/N 10124544
- AC Power Cord used for testing

Procedure:

1. Connect both ends of the AC Power Cord to the Electrical Safety Cable Continuity Test Box P/N 10022190.
2. Set the DMM to the resistance mode. Measure and record the lead resistance (Ω), DMM Cal ID, and Due Date in the Electrical Safety Test Equipment Verification Log, P/N 10060262 if this has not already been completed for today's date
3. Connect the DMM probes to the Power Line 1 terminals on the Cable Continuity Test Box P/N 10022190 and record the resistance measured in the Electrical Safety Test Equipment Verification Log, P/N 10060262. Subtract the lead resistance recorded in the log, verify that the final resistance is less than 0.5 Ω and record the result on the log.
4. Connect the DMM leads to the Power Line 2 terminals on the Electrical Safety Cable Continuity Test Box P/N 10022190 and record the resistance measured in the Electrical Safety Test Equipment Verification Log, P/N 10060262. Subtract the lead resistance recorded in the log, verify that the final resistance is less than 0.5 Ω and record the result on the log.
5. Remove the AC Power Cord from the Electrical Safety Cable Continuity Test Box P/N 10022190 and connect the DC connector end of the PowerPack Electrical Safety Test Ground Cable, P/N 10124544 to the Electrical Safety Cable Continuity Test Box P/N 10022190 and connect the other end to the V Ω terminal of the DMM. Fig 3.

10124544 – PowerPack EST Ground
 Cable (DC Connector end)



Fig 3

Photo for Step 5 & 6

6. Connect the test lead from the DMM COM terminal to the DC GND terminal of the Electrical Safety Cable Continuity Test Box P/N 10022190 and record the resistance measured in the Electrical Safety Test Equipment Verification Log, P/N 10060262. Subtract the lead resistance recorded in the log, verify that the final resistance is less than 0.5Ω and record the result on the log , fig 3
7. Remove the PowerPack Electrical Safety Test Ground Cable, P/N 10124544 from the Electrical Safety Cable Continuity Test Box P/N 10022190
8. If any resistance measurement exceeds the limit, call Test Engineering

Metron QA-90 Setup

Perform these steps to setup the Metron QA-90 prior to testing to load test sequence 'XL2-TEST':

1. Power ON the Metron QA-90
2. After the bootup, press the Memory (F2) button
3. Press the SEQ. MEM (F2) button
4. Press the SEQ (F3) button
5. Press the XL2-TEST (F7) button
6. In the Main Menu press SETUP (F3)
7. Press MORE (F1) in SYSTEM SETUP
8. Press MORE (F1) three more times
9. Press Auxiliary Power (F5) to set to Y (Yes)
10. Press External Isolating Transformer (F7) to set to Y (Yes)
11. Press F4 to return to the Main Menu
12. The Metron QA-90 is now ready to be used for testing the PowerPack

HIPOT TEST

Warning: High Voltage Present
Remove all rings, jewellery & watches before continuing
Do not touch unit or test equipment during test
Do not perform test if you are grounded
Insulating Mat must be in position



If any cables or connectors are worn or damaged stop use of tester **IMMEDIATELY** and contact line supervisor or line technician / engineer
Do not perform these tests until you understand the hazards and are confident you can perform them safely.

Warning: High Voltage Present During HIPOT Testing. AC Voltages up to 3KV are used, take all necessary safety precautions.

Hipot Test Procedure

1. Connect the Hipot AC Power Cable power lead, P/N 10124385, from the HIPOT tester Adapter Box to the AC Mains input at the rear of the PB500 PowerPack.
2. Connect the DC Power connector of the Hipot Test Power Cable to the DC Power inlet at the rear of the PB500 Power Pack.
3. When ready to start the test, press the green *Test* button on the Hipot Tester to begin the test
4. The Hipot test result will be indicated as follows when the test is finished:
 - Pass – short audible beep and the display will indicate Pass on the LCD screen
 - Fail – long audible beep, red failure indicator will light up. To stop the alarm press the red RESET button on the Hipot tester
5. Remove Hipot test cable from the PB500 PowerPack2

LEAKAGE CURRENT TESTS



Warning: High Voltage Present During Electrical Safety Testing, take all necessary safety precautions.



CAUTION: Never touch the Device Under Test (DUT) or anything connected to it while high voltage is being applied by the Electrical Safety Test Equipment

Leakage Current Test Procedure

1. Connect the Power Cord from the AC jack on the front of the Metron QA-90 to the AC inlet of the PB500 PowerPack
2. Connect the Electrical Safety Test Ground Cable P/N 10124544 from the 'ENCL' located next to the AC jack on the front of the Metron QA-90 to the DC Power inlet at the rear of the PB500 PowerPack.
3. If the Sequence Name on the Metron QA-90 does not indicate XL2-TEST perform the Metron QA-90 Setup
4. Press the F7 button, enter the PB500 PowerPack serial number and press the enter <J> button
5. Press the F4 button to start testing
6. When the test is complete, the display will indicate Test Passed or Test Failed.
7. Press the F6 button to print the test results and again to print a second copy.
8. Verify that the vent has passed the 'Electrical Safety - Hipot Test' by writing "Passed Electrical Safety Hipot Test" and signing and dating the comments section of both copies of the METRON QA-90 print-out test results sheet.
9. Indicate the overall Pass or Fail test result for the Hipot and Leakage Current test by signing the Electrical Safety section of DHR & circle Pass or Fail. Note: Only when both tests pass is the DHR result a pass.
10. Attach both copies of the print-out of test results to the DHR. One copy will remain with the DHR and the other will be placed in the shipping carton at PB500 PowerPack pack station.
11. Press F4 to return to the Main Menu
12. Remove the Leakage Current Test Cables from the PB500 PowerPack
13. **NOTE:** When Power Pack Leakage Current Testing is completed for the Power Packs to be tested, complete the following steps in the Metron QA-90, so that it can be used to test the PB500 Series Vent:
 - 13.1 In the Main Menu press SETUP (F3)
 - 13.2 Press MORE (F1) in SYSTEM SETUP
 - 13.3 Press MORE (F1) three more times
 - 13.4 Press Auxiliary Power (F5) to set to N (No)
 - 13.5 Press External Isolating Transformer (F7) to set to N (No)
 - 13.6 Press F4 to return to the Main Menu

POWER PACK TEST PROCEDURE



Note: Observe all ESD Precautions

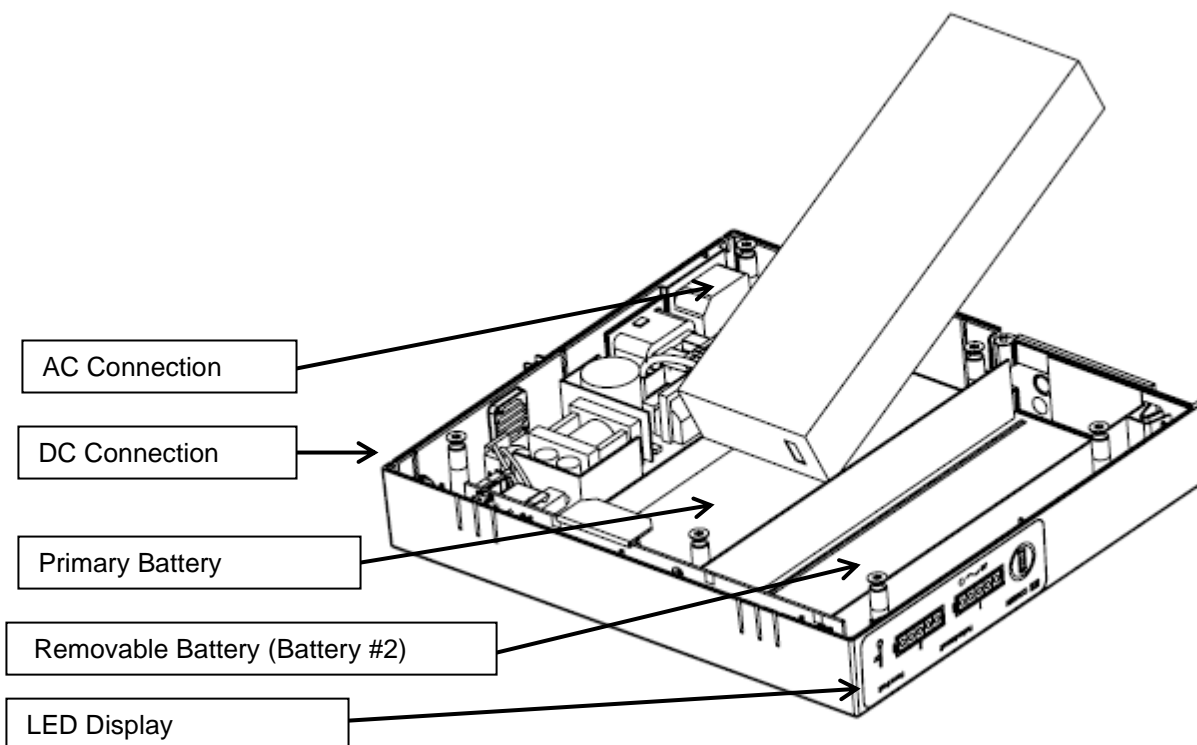
Material:

Balloon No.	Description	Qty
19	Lithium 7S2P Battery	1

1. Logon to Test PC Windows with unique USERNAME & PASSWORD
2. Open(double click) shortcut '*Powerpack2 test*' icon on desktop
3. Login to test stand software using allocated Test Stand USERNAME & PASSWORD
4. Place UUT into Test Bed(P/N 10124050). Remove unit cover and put aside.
5. Click 'Test UUTs' to start test.
6. Enter Serial Number of UUT and click OK.
7. Follow all on screen prompts carefully as directed by test sequence to complete testing.

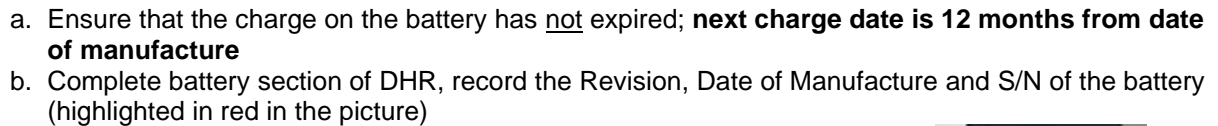
Notes

When requested carefully load test dummy battery boxes or product battery into Unit Under Test (UUT). Insert all Batteries at an angle down towards PCBA Pogo Pins. Pressure must be maintained between test battery contacts & PCBA pogo pins during testing sequence. Keep clamp in place when removing tests dummy batteries.



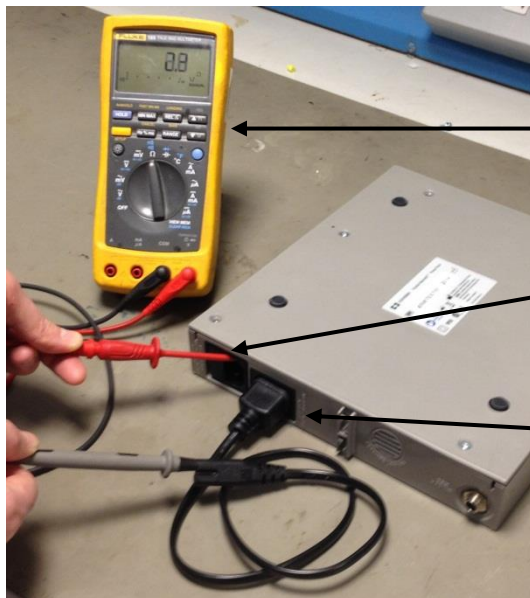


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AC Out Test

- 1) Connect a AC out cord(P/N 10109792) to the Powerpack AC Out socket.
- 2) Use DMM, set to continuity mode. Record the Cal ID of the DMM on PHR 10124919.
- 3) Connect test probe from DMM to a pin of AC cord and connect 2nd test probe to pin of AC In, this should result in continuity beep tone from DMM. If no beep is heard try the alternate pin of AC In. If still no Beep this is a fail.
- 4) Repeat the test on second pin of AC cord
- 5) If a beep is heard for each of the connections this is a pass, complete DHR and route to Charge.
- 6) If test fails recheck all connections to AC Out from AC In and retest. If it fails again route to debug. Record Fail in DHR



DMM – set to check continuity

DMM probe to Pin of AC In

AC Out cord – 10109792 connected to AC out socket.

DMM probe to Pin of AC Out

9. Sign and date the Test Completed By section of the DHR.

Final assembly/ DHR checks:

- Ensure correct application of adhesive feet.
- Check unit S/N matches DHR S/N
- Check the snap in connectors AC Inlet & AC Outlet are not loose.
- Check that the keypad is applied correctly.
- Ensure adhesive stop is attached to the battery door.
- Check to ensure the correct operation of door latch: door latch may need to be pushed to latch.
- Ensure all 6 screws are fitted

DHR LOG 10124919

1. Before moving unit to Charge & Pack, ensure that all applicable sections of DHR LOG 10124919 are completed and signed.

FRU PB500 POWER PACK ASSEMBLY INSTRUCTIONS

Note: Observe all ESD precautions



FRU PCBA, POWERPACK (DUAL BATTERY) - 10131169

Assembly- 10153315 - FRU,PCBA ,POWERPACK ASSEMBLY

Affected items:

Blln No.	Description	Qty
15	Powerpack2 board	1
26	Standoff, snap-in, power pack PCBA	1
10	Charger to PCBA harness	1

- Initiate FRU PHR 10140875, N/A sections that are not applicable.
- BOM items are to be placed into a hotbed.
Note: Place Hotbed PCBA into ESD packaging until FRU assembly 10153315 has been completed.
- **PHR** – Record Hotbed Number.
- To assemble refer to **PowerPack PCBA** section of this procedure.
- To Test refer to **Powerpack Test Procedure** section of this procedure

Notes:

When requested by test stand software enter the Hotbed Number (Unit Under Test S/N)

AC Out test step is not required.

- **PHR** - Ensure PCBA & Software details and Unit System Test result have been recorded
- Remove FRU assembly (PCBA, Standoff & Charger/PCBA harness) from hotbed.
- Place assembly 10153315 into Static Shield bag and seal.
- Complete PHR and N/A Product Release Section.
- Route to PB500 FRU

FRU Powerpack Assembly 10131548



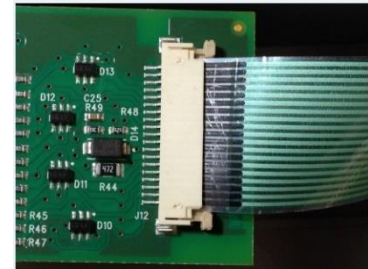
Affected items:

Note: Observe all ESD precautions

BlIn No.	Description	Qty	BlIn No.	Description	Qty
11	Housing	1	8	AC out Neutral (blue)	1
7	AC In Harness	1	9	AC out Live (brown)	1
2	AC Inlet Snap In Panel	1	3	PCBA to DC Out Harness	1
25	Fuse, Fast,5A,250VAC,5MM X 20MM	1	16	Keypad	1
1	AC Outlet Snap In Panel	1	5	Packaging, Power Pack 2	1

- Initiate **POWERPACK FRU PHR 10140875**, N/A sections that are not applicable.
- For items not listed on BOM 10131548 use hotbed items.
- **PHR** – Record Hotbed number
- To assemble refer to **Housing Assembly** section of this procedure
- To attach Keypad refer to **Keypad Installation** section of this procedure.
- **PHR** - Ensure Keypad LC section has been completed.
- Open J12 connector latch mechanism on PCBA; connect keypad flex cable as shown Fig 1. Ensure flex tail is fully pushed home into connector before closing down latches. (fig 1)

Fig 1



- Carefully connect PCBA to DC harness(3) to J11 on top side of PCBA
- Ensure there are no kinks in the cables, the flex cable is looped and board is seated correctly in slots.
- Connect Charger to PCBA harness(10) from Charger PCBA to PowerPack PCBA as shown. Fig 2.

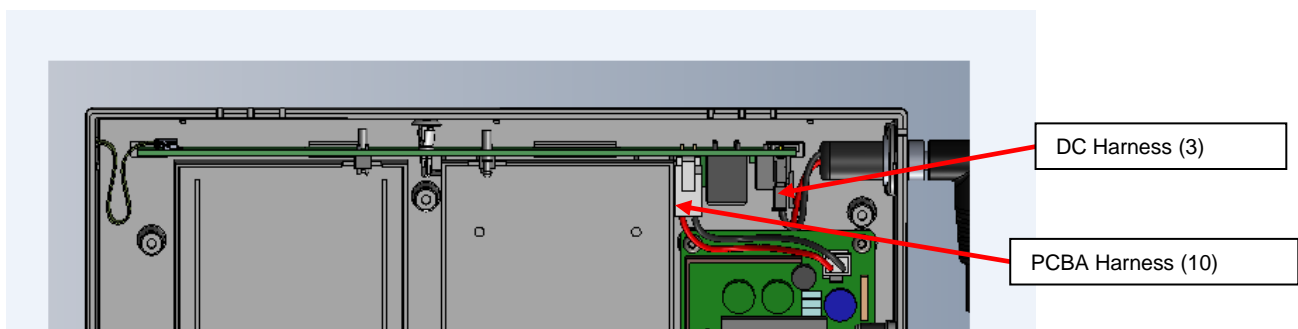


Fig 2

- Place the Powerpack2 unit into test bed P/N 10124050 and close the PCBA clamp
- Insert a battery into the Powerpack2 Primary Battery (#1) slot.
- Press the pushbutton on the Powerpack2 unit keypad and verify the LED for Battery #1(x5), LED for Battery #2(x5) and Battery Fault LED illuminate. See Fig 4. **PHR** - Complete Keypad Test section of PHR, if keypad fails replace and retest.

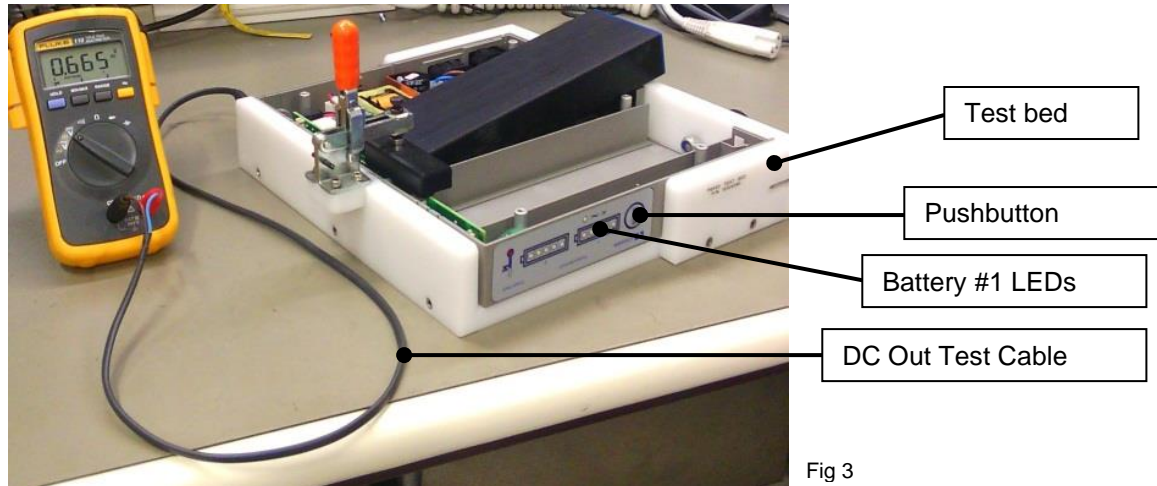
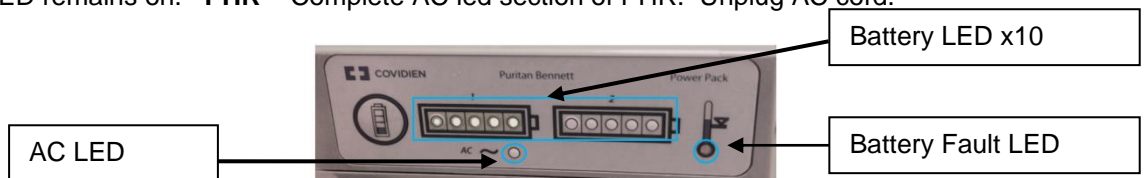


Fig 3

- Connect the Powerpack2 DC Out Test Cable, P/N 10150345, to the Powerpack2 unit DC Out connector and the banana plugs to the DMM observing polarity (red is positive).
- Set the DMM to measure DC Volts. Record the Cal ID of the DMM on FRU PHR 10140875.
- Press and hold the pushbutton on the Powerpack2 unit keypad until the Battery #1 LEDs illuminate.
- Measure the DC voltage using the DMM, verify that the measured voltage is greater than (positive) +21.0VDC. If the DC voltage value fails, replace with a charged battery, and if the test fails again, record fail on the PHR.
- PHR** – PCBA to DC cable Test - Record the DC voltage measurement value and result.
- Disconnect the DC Out Test Cable from the Powerpack2 unit
- Remove the battery from the Primary Battery (#1) slot
- Open the PCBA clamp and remove the Powerpack2 unit from the test bed
- Place a cover onto the unit to conduct tests, Tighten 2 screws(20) to close unit temporarily.
- Conduct AC Out test as per Power pack test procedure section **AC Out Test**. **PHR** – complete AC out section of PHR
- Plug in AC cord to unit.
- Verify the AC LED remains on. **PHR** – Complete AC led section of PHR. Unplug AC cord.

Fig 4



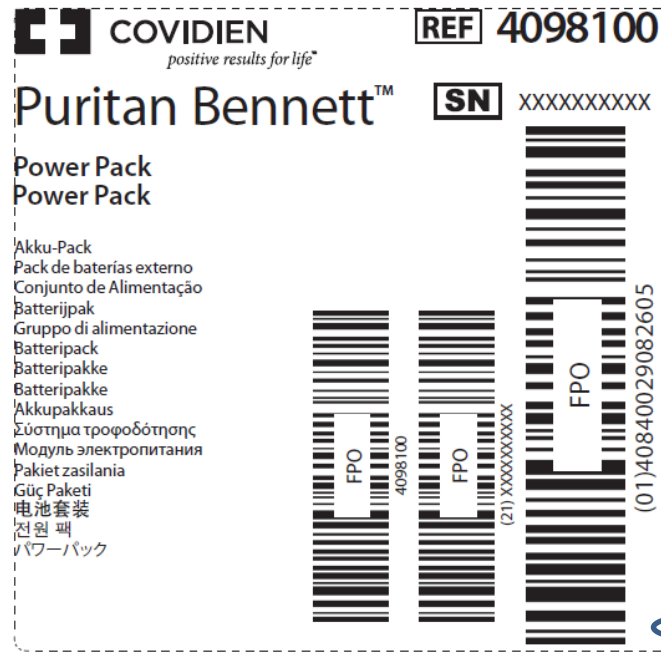
- Conduct Hipot & Leakage Current tests as per **Hipot Test Procedure & Leakage current Procedure**
- Note:** Ensure the Hipot Test & Leakage Current Test - Setup & Daily Checks have been completed & Metron QA-90 is SetupRemove hotbed items when tests are complete.

To Pack

- Place unit into large plastic bag (E-1910022) and secure using scotch tape (753123)
- Open a shipping carton(10128169) and remove top foam piece as per fig 4.
- Place 10131548 assembly with signed second copy of electrical safety report report into packaging and replace top foam piece. **PHR** – Verify Hipot & Leakage test report has been placed in package.
- Close carton with 3 runs of tape (901733)
- Print label from label view using procedure (G-AMFG-2913-00)
 J:\Thermal Print\500 SERIES\PB500
- Place spare parts label on carton.
- Verify that correct P/N is on spare parts label and it matches PHR
- Sign and Date FRU completed by section of PHR



Fig 4



COVIDIEN
positive results for life™

Puritan Bennett™

Power Pack
Power Pack

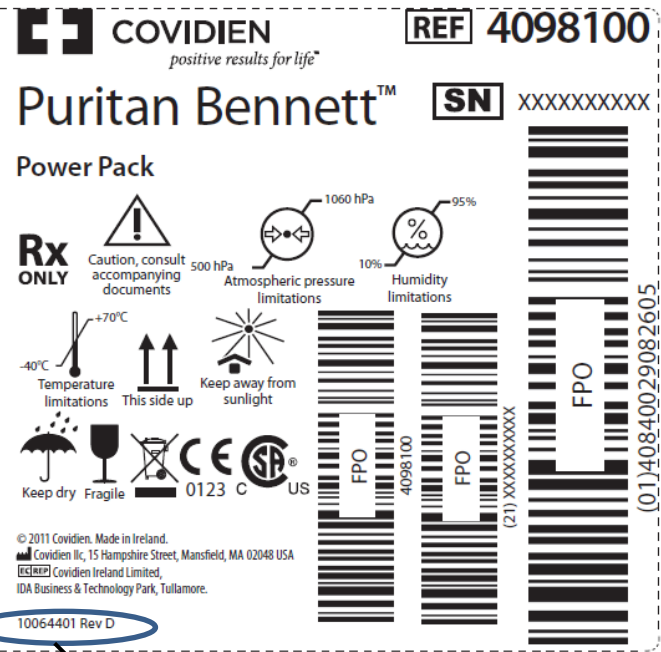
Akku-Pack
 Pack de baterias externo
 Conjunto de Alimentação
 Batterijpak
 Gruppo di alimentazione
 Batteripack
 Batteripakke
 Batteripakke
 Akkupakkaus
 Σύστημα τροφοδότησης
 Модуль электропитания
 Pakiet zasilania
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REF 4098100

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FPO

(01)40840029082605



COVIDIEN
positive results for life™

Puritan Bennett™

Power Pack

Rx ONLY

Caution, consult accompanying documents

Temperature limitations: -40°C to +70°C

This side up

Keep away from sunlight

Atmospheric pressure limitations: 500 hPa to 1060 hPa

Humidity limitations: 10% to 95%

Keep dry

Fragile

0123 C US

FPO

(01)40840029082605

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 Covidien Inc, 15 Hampshire Street, Mansfield, MA 02048 USA
 Covidien Ireland Limited,
 IDA Business & Technology Park, Tullamore.

Labels must be reviewed for print quality and completeness. If any discrepancies identified, please contact line engineer/line lead for direction.

Note: Part number circled is the part number of the wrap around label and the rev of same is recorded on associated PHR.

Above is a representation of a complete carton label.

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10064401 Rev D

FRU Housing cover 10132667

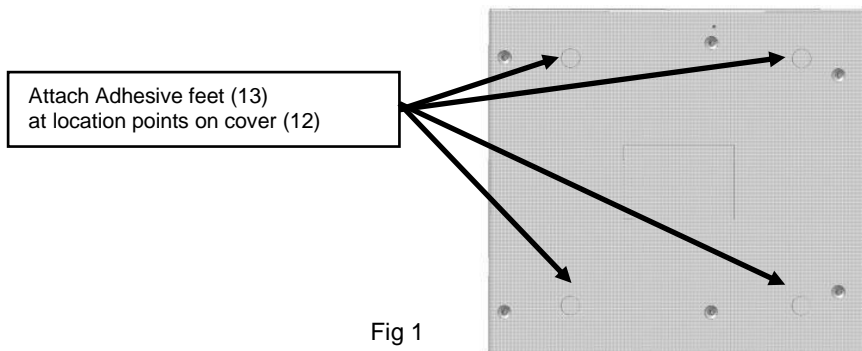
Assembly – 10153316 FRU, HOUSING COVER, POWER PACK

Affected items:

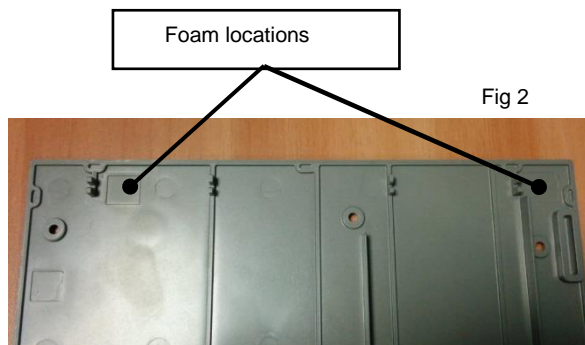
BLIn No.	Description	Qty
12	Cover, Powerpack	1
13	Adhesive Feet Diameter 12.7	4
24	Label, ID	1
21	Neoprene foam	2
20	Zinc plated steel screw M4x10	6

Note: This assembly may be batch built

- Initiate **Powerpack FRU PHR 10140875**, N/A non applicable sections
- Remove Cover(12) from its packaging – retain for use later.
- Using alcohol and Kim wipes, wipe the Cover areas where adhesive feet(13) are to be attached. Attach adhesive feet(13) to locations shown, refer to fig 1.



- Cut neoprene foam (21) to size 10mm*15mm (+/-2mm) using scissors and calibrated steel ruler.
- Attach the neoprene foam strips to the location shown as per fig 2 & 3.
- Ensure correct application of foam.



- Place cover back into its plastic packaging
- Place screws x6(20) and label ID(24) into plastic bags and then into cover package seal with tape.
- Complete PHR and N/A Product Release Section.
- Route to PB500 FRU

FRU Housing Door 10132668

Assembly – 10153317 FRU, HOUSING DOOR, POWER PACK

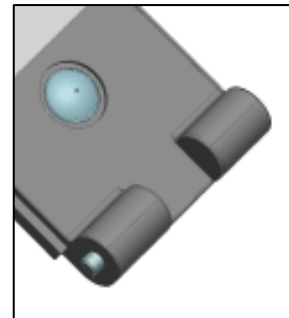
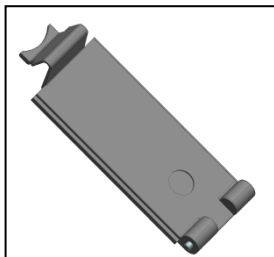
Affected items:

Balloon No.	Description
14	Door, battery access
18	Battery Change label
22	Adhesive stop

Note: This assembly may be batch built

- Initiate **Powerpack FRU PHR 10140875**, N/A non applicable sections
- To Assemble
 1. Remove Battery Access Door(14) from packaging - retain packaging for use later.
 2. Before application of label and adhesive stop clean all affected area of door using a kim wipe and alcohol
 3. Attach Battery Change Label(18) to door fig 1, ensure label is orientated as shown and fitted squarely.
 4. Record Battery Change Label Revision in DHR.
 5. Attach Adhesive stop (22) to specified location on door latch assembly.

Fig 1



- Place completed assembly back into plastic packaging.
- Complete PHR and N/A Product Release Section.
- Route to PB500 FRU