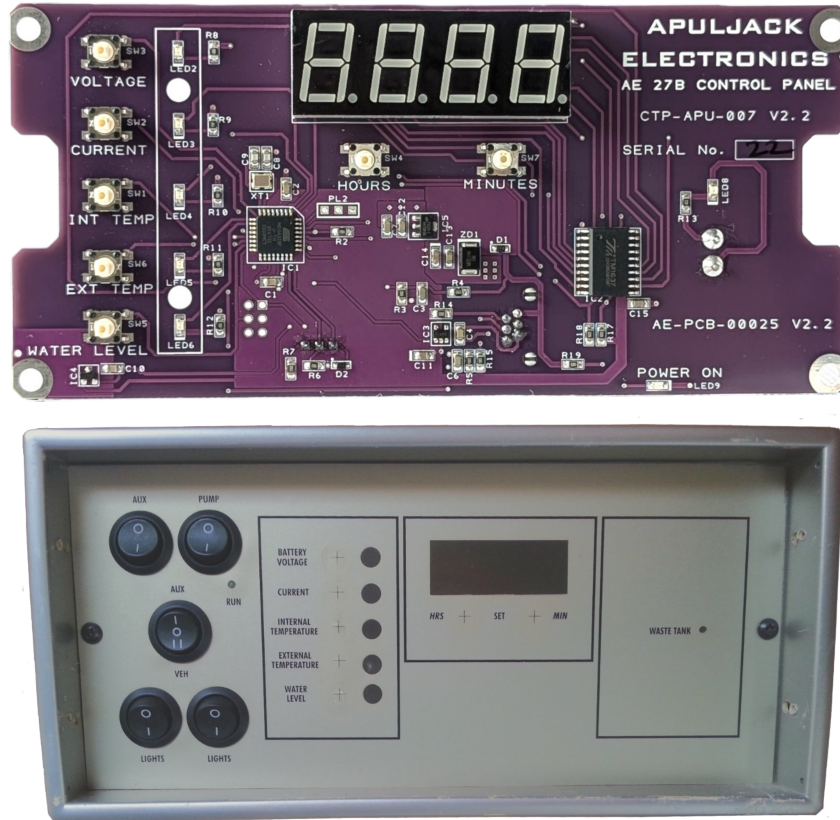




APULJACK ELECTRONICS LTD

DESIGN AND REPAIR SPECIALISTS

AE 27S Replacement PCB



Replacement PCB only for the BCA 27S Control Panel

Product Code: CTP-APU-008-NE

1. Scope

This document is for the AE replacement PCB for the BCA 27S control panel. It is **ONLY APPLICABLE** to the 27S panels.

2. Introduction

The AE 27S PCB, part number CTP-APU-008, is a direct replacement for the BCA 27S panel with a silver fascia (It is **NOT** suitable for replacing 27B panels that have a black fascia and are without the rocker switches to the left of the display). It features an efficient, high-brightness/low-power display, an updated, modern processor, and other components. The poor quality switches have been replaced with larger, positive clicking buttons.

3. Functions

3.1 Time Display

This is the default display screen and all other screens will return to this display after 10 seconds. To set the time, push the 'HRS' and 'MINS' buttons. Between the hours of 10pm and 6am the display dims down significantly to avoid glare at night.

Note that the clock is not battery backed. Hence, if you remove 12V power (e.g. by removing the leisure battery or turning the isolator) the clock will reset to 12:00. Simply set the time again when you power the system back up.

3.2 Voltage Display

When the 'Battery Voltage' button is pushed, the display shows the voltage of the system/battery voltage. With the charger off, the voltage shown is that of the battery and usually between 12.0 and 13.0V. With the charger on, the voltage should be between 13.5 and 14.4V. Note: the voltage display is averaged and updated approximately every 1 second so please allow time for it to settle.

3.3 Battery Current

When the 'Current' button is pushed, the display shows the discharge rate from the battery, in Amps. It is important to note that the current only shows the discharge current, and not charge current (i.e., when the charger is on and charging not discharging the displayed value will be 0). Note: the current display is averaged and updated approximately every 1 second so please allow time for it to settle.

3.4 Internal Temperature

When the 'Int. Temperature' button is pushed, the display shows the internal temperature, measured at the control panel in °C. Many panels are located within the fabric of the wall so can often measure lower than the actual room temperature.

3.5 External Temperature

When the 'Ext. Temperature' button is pushed, the display shows the external temperature, measured where the external temperature probe is located, in °C. If the external temperature probe is not connected, or has a fault then the display will show 0°C all the time.

3.6 Fresh Water Level

When the 'Water Level' button is pushed, the display will show the level of the fresh water as a percentage (displayed as a "P"). If the water level is higher than 95% then the display will show 'FULL'. If the water level is less than 10% then the display will flash 'FILL UP'. If the water probe is not connected or is damaged then the display will show 'OPEN' to indicate that the wiring and/or sensor is faulty/not connected.

3.7 Waste Water Level

If the waste water tank is almost full, then the 'Waste Tank' light will illuminate red on the right hand side of the panel.

4. Warnings and Protections

4.1 Over/Under Voltage Warning

The display is switched to the voltage display and flashes if:-

- The Input voltage is greater than 14.8V
- The Input voltage is less than 12.0V

To rectify this, either remove the battery from the vehicle and charge it or turn on the battery charger in the vehicle. If the voltage is too high then you need to investigate what is causing the issue by switching off/disconnecting any sources of energy/charging current (e.g. Mains Charger or Solar panels).

4.2 Power LED

The main circuit board has a power LED located on the edge of the board near to the data connector. If this LED is not lit the unit has no 12V power and will not operate. This is a diagnostic aid to allow the tester to determine if the panel has power before assuming the panel has a fault.

5. Calibration

When the unit is first installed the following three items should be calibrated on the panel to match the exact parameters of the vehicle system. These calibrations can also be performed at any time, if required.

5.1 Calibrate the Current Reading (required at first install)

To configure the panel to the current shunt fitted in the vehicle perform the following:

- Ensure that you have enough items turned on (e.g. lights) to draw more than 5A from the leisure battery
- Measure the exact current with a current clamp or shunt meter
- Push the 'CURRENT' button to display the existing value of the current draw
- Push HRS to increase the value to match the meter
- Push MIN to decrease the value to match the meter
- The decimal point flashes on every change of ratio. If top or bottom limit is achieved (range is 50) then the decimal point does not flash
- This setting is stored in non-volatile memory, so will be saved permanently even if the 12V power is removed
- Note: The current display shows the amount of current coming OUT of the battery. If you have your charger on then this will be putting power INTO your battery so the display will show there is 0.0A coming from the battery.

5.2 Calibrate the Voltage display (required at first install)

- This allows you to set the exact voltage display to compensate for losses in your system (e.g. cable resistance). To implement this, perform the following:-
- Measure the exact battery voltage with a multimeter
- Push the 'VOLTAGE' button to display the existing value of the battery voltage
- Push HRS to increase the value to match the meter
- Push MIN to decrease the value to match the meter
- The decimal point flashes on every change of setting. If the top or bottom limit is reached then the decimal point does not flash
- This setting is stored in non-volatile memory so will be saved permanently even if the 12V is removed

5.3 Calibrate the water level full point (required at first install)

The water level is displayed in percentage of the 'Full' value. If the percentage is lower than 10% then the display will show 'FILL UP.' If the percentage is above 95% then the display shows 'FULL.' If the percentage is over 120% (i.e. the probe is not connected) then the display shows OPEN. To get reliable messages and fill percentages, the system must be calibrated when first fitted. To implement this perform the following:

- Fill the water tank to the top
- Push the 'WATER' button to Display the current water level
- Push HRS and MIN together to set the Full Value of the tank. The display should change to 'FULL'
- This setting is stored in non-volatile memory so will be saved permanently even if the 12V is removed

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