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HCUST386 - Isolation Verification Control

The HCUST386 from Lecky's Hunter Valley confirms that a machine is safely isolated, ensuring a safe working environment for all personnel.

The HCUST386 is a device that measures the difference between the isolated battery and machine/load side, analysing the occurrence of a voltage drop to capture isolator internal connection failures. In addition to the visual display, outputs are provided for audible & external indication of isolation.

In effect, the HCUST386 is a device that performs indication and diagnostic functions to enable dangerous failures of the primary function (e.g. voltage remaining on load side when handle turned) to be detectable.

AS4024.1603 requires that isolation devices be equipped with clear and unambiguous identification of their isolation state. It also requires that isolation devices be designed, selected and arranged so that reliable verification of the effectiveness of the isolation can be carried out.

The Hummingbird Electronics Isolation Verification Control Module can provide reliable electronic verification of battery and starter motor isolation, and alternator and battery voltages with clear, unambiguous visual feedback via LED's and an LCD display.



There are 2 options available through an easy selection process on an internal DIP SWITCH and a second DIP SWITCH for voltage application of either 12V or 24V DC.

Optional Control Features:

1. Battery Isolation Control
2. Starter Motor Isolation

HCUST386 Features include

- Isolation verification
- Isolation control interlock
- Isolation indication
- Voltage status
- Over/under voltage warning/indication
- Over/under voltage control interlock
- Dual voltage option (12V or 24V DC application)
- Isolation voltage drop and open circuit protection



Important Instructions

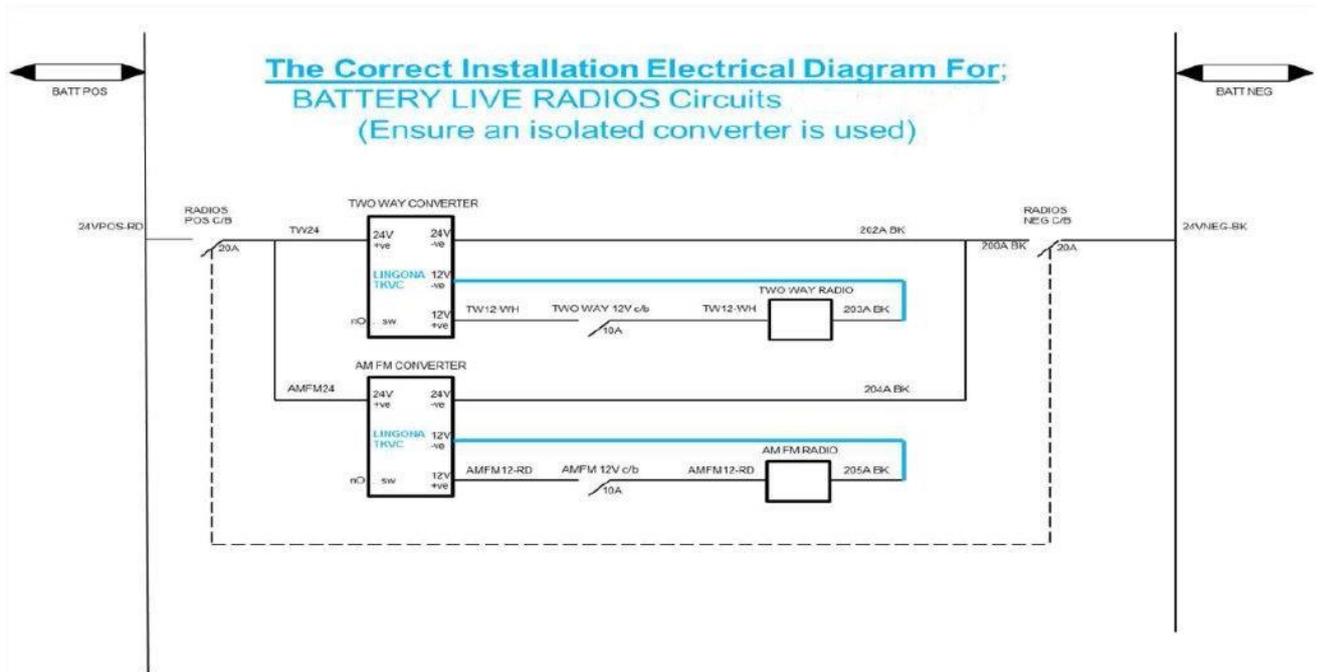
System Awareness Warning (instruction 1 of 2)

This system is a visual isolation reference and verifies isolation electronically. Always perform a positive verification on any system at any time if risks apply.

A recommendation to ensure regular maintenance and system checks are completed every 500-hrs on the isolation verification control system and **replace the unit every 2-years** if working in any harsh environments including the mining industry.

System Awareness Warning (instruction 2 of 2)

To ensure the HCUST386 Isolation Verification control module operates/functions correctly, if the machine/system has a radio system or two way system wired to the battery side of the isolation switch, the diagram below shows the correct circuit diagram & the correct isolated voltage converter (part No. LECVC) that must be used, to ensure that the verification system will function correctly.



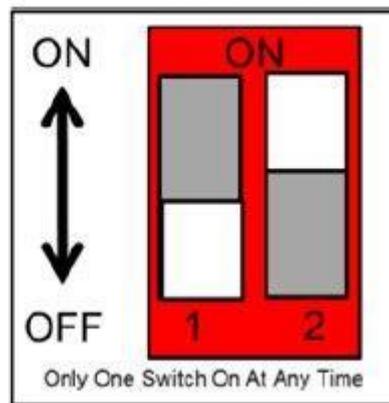
The Operating Voltage Selection Switch DIP Switch

The HCUST386 Isolation Verification control module is 12/24VDC. To select the correct operating voltage, the voltage DIP SWITCH selection is in the rear of the enclosure. By removing the 4 x screws from the rear panel, the DIP SWITCH can be accessed to adjust.

Note- To access the DIP SW setting, remove the rear cover plate from the enclosure to access.

Selection DIP SW Settings Sensitivity Setting

S1- 12 VOLT DC
S2- 24 VOLT DC



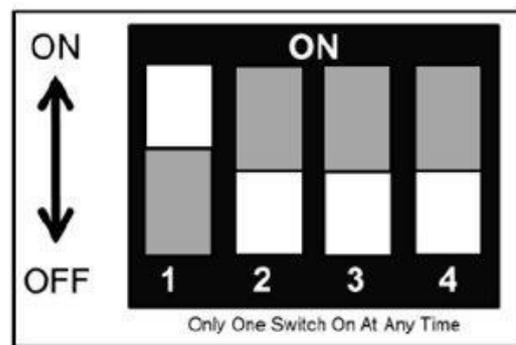
The Function Selection DIP Switch

The Isolation Verification control is a true reference voltage with isolation verification, 4 options available through an easy selection process on an internal DIP SWITCH by removing the rear access panel.

By selecting the required DIP SW, the below image screen will change to suit the below desired options available. Ensure whenever adjusting the DIP SWITCH settings, the supply voltage must be turned OFF.

Selection DIP SW Settings Selection Setting

- S1- Battery Isolation**
- S2- Starter Motor Isolation**



Switch 1 – Battery Isolation Verification

Isolation verification Measures /indicates positive isolation and verifies with a visual status either ON/OFF, measuring both the positive and negative sides of the dual battery isolation switch.

By measuring the difference between the battery positive and machine vehicle positive, also the difference between the battery negative and vehicle negative to confirm isolation.

Isolation control interlock

When the isolation is verified and safe, the LCD Screen will confirm with a visual isolation OFF display, with the interlock external relay device option, the interlock function can isolate either, key supply/ignition control wires to suit the customer demand/preferences.

The isolation verification control also measures the difference between the isolator battery and machine side and determines if there is a voltage drop to capture isolator internal connection failures.

If the machine's isolator is turned off during the machine is running, the isolation control will measure the voltage drop between the battery and the machine to determine this occurrence and will activate a warning LED/alarm with a 20-second delay interlock relay to cut out ignition.

Isolation Indication

The LCD screen illustrates the positive isolation status, with a second external option to have an LED visual in a required location such as the dash console in the cabin.

Voltage status

The LCD display will show the current voltage status whenever the machine battery isolation switch is turned on, or if the isolation switch is turned off but still shows a voltage reference.

Whenever the case the isolation switch is turned off and the voltage is confirmed that the status is zero (with tolerance of up to 5-volts DC to allow for above ground surface back feed voltages), the display will show battery isolation OFF with an indication of ZERO VOLTS reference, this is when the display confirms isolation and the screens changes colour to GREEN for safe operation maintenance.

Over /under voltage warning/indication & interlock

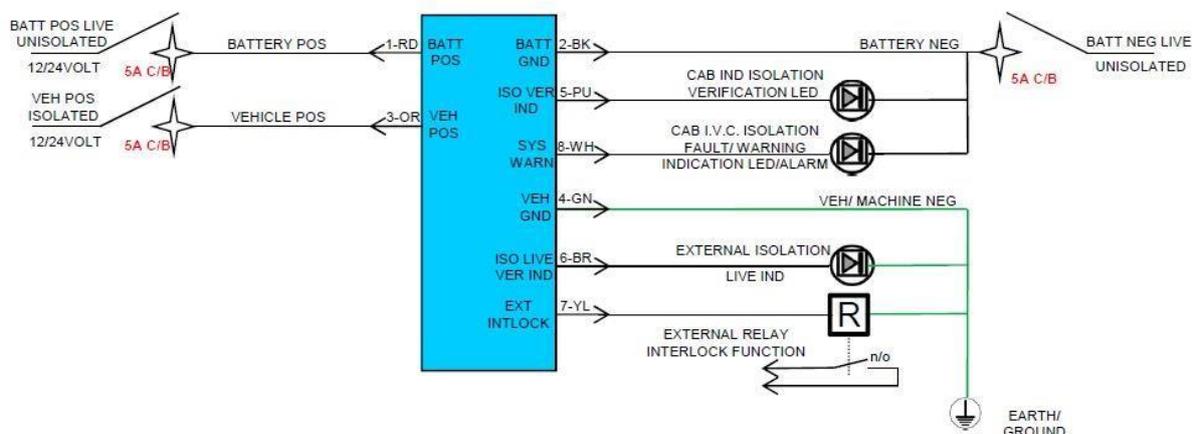
The control module measures and controls the over and under voltage status to protect not only the machine electrics but assists in the service life expectancy of the batteries, but protecting them from over and under voltage cell damage.

12-volt application - When the system falls below 9-volts or above 15-volts. 24-volt application, when the system falls below 18-volts or above 30-volts in the case of over or under voltage is detected with a slosh period of 20-seconds, the control module in normal system operation will have a positive output to engage a relay.

If an over or under voltage fault occurs or a system fault, the output signal will drop away after 20-seconds, to open circuit the desired control system either key supply, ignition supply or start control wiring, to prevent any further damage to the battery service life, using an external LED/ALARM combo to alert the operator.

The Isolation Verification Kit includes:

1xHCUST386 kit- include the display only, ensure indicator lights are LED, pilot panel lights use max 500mA. Not included: circuit breakers, external relay interlock, plug connectors, LED Indicators.



Switch 2 – Starter Motor Isolation Verification

Isolation verification measures/illustrates positive isolation and verifies with a visual status either ON/OFF. The starter motor isolation device measures the positive starter motor isolation only by measuring the difference between the vehicle positive and starter motor positive, accurately indicating isolation verification.

Isolation control interlock

When the isolation is verified and safe, the LCD Screen will confirm with a visual isolation OFF display, with the interlock external relay device option, the interlock function can isolate either, key supply/ignition or start control wires to suit the customer demand/ preferences.

Isolation Indication

The LCD screen illustrates the positive isolation status, with a second external option to have a LED visual in a required location like the dash console in the cabin.

Voltage status

The LCD display will show the current voltage status whenever the machine battery isolation switch is turned on, or if the isolation switch in the case is turned off but still shows a voltage reference.

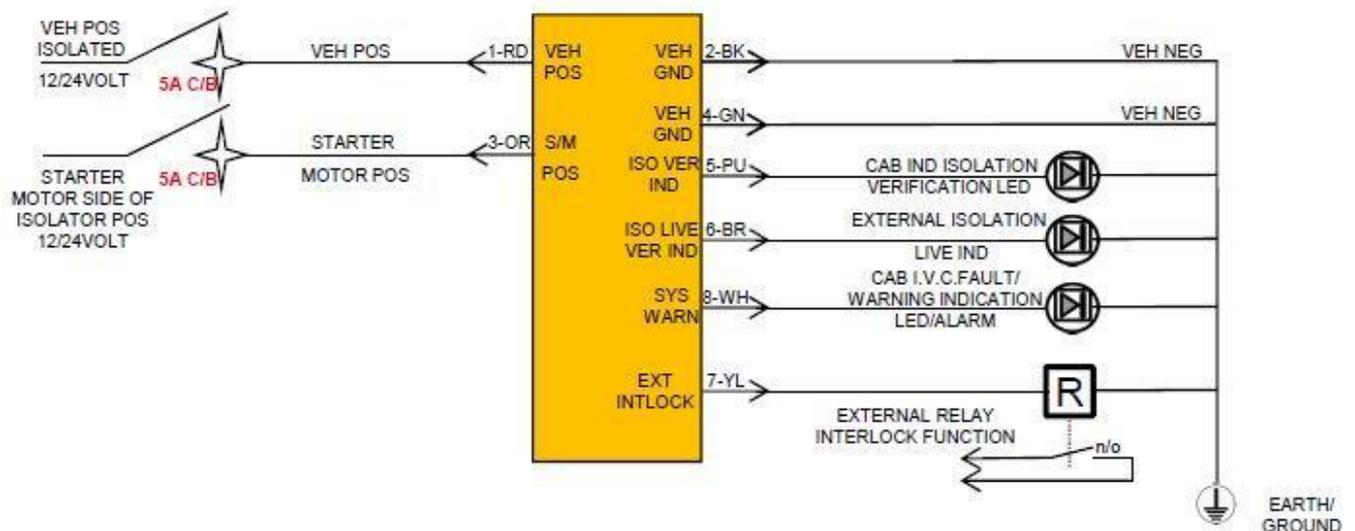
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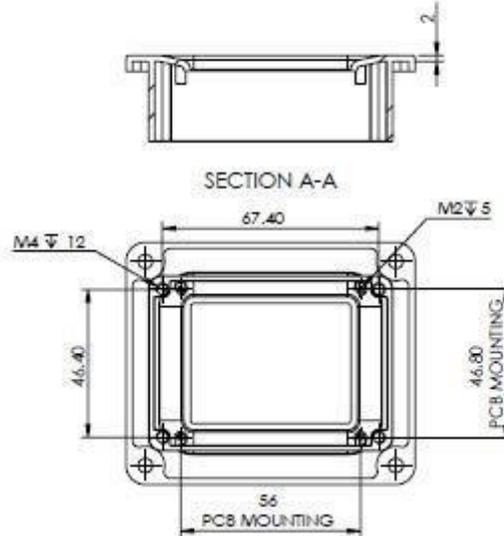
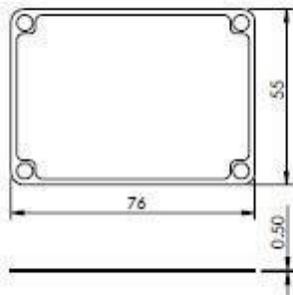
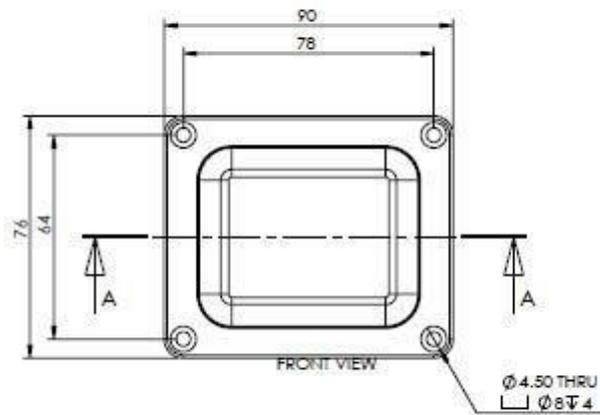
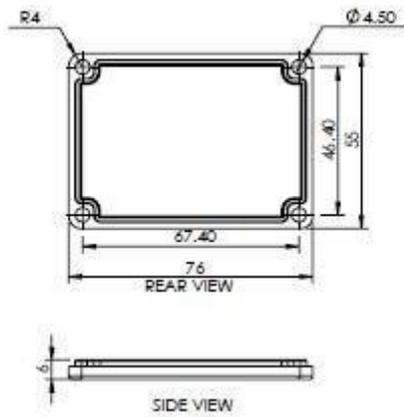
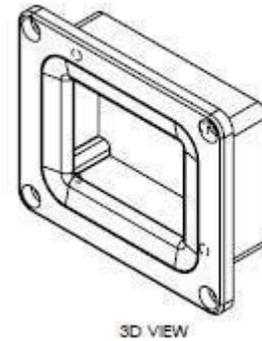
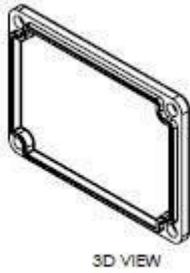
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Enclosure Dimensions



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