OPERATING MANUAL

for

TYPE HLB60-450

ISSUE 2

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HILLSTONE PRODUCTS

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INTRODUCTION

The load bank HLB60-450 is designed for battery discharge testing of 25 lead acid cell and rectifier chargers testing up to 57V, 450A.

The top panel contains the control switches and the mains input socket.

The unit comprises of pre-set, high powered resistor channels, which are controlled from a 7 position binary coded switch, giving increments of 57A @ 57V, and a variable adjustment current channel. The variable channel allows fine tuning adjustment from 0A to 57A at a nominal voltage 57V DC.

Isolation of the load bank from the battery is provided from internal contactors.
Panel mounted Stop and Start controls allow test commencement and emergency stop (isolation of the load bank)

The load bank is force cooled by a mains 220V / 110V powered fans and is supplied with a carrying handles and swivel castors for easy movement.
A battery socket and plug are provided for cable connection to the battery under test.

SAFETY CONSIDERATIONS

1. The equipment is designed for use in a clean, dry, indoor environment and should only be operated by competent electrical engineers who are completely familiar with the operation and specification of the load bank.
2. Heavy duty lifting handles are provided on each side of the load bank and provides assistance when wheeling the load bank.
3. As with any electrical equipment the load bank should not be used in close proximity to recently charged batteries where a build up of explosive gases may have occurred.
4. Operators must ensure that interconnecting cables are correctly rated to carry the required load current and adequately insulated to prevent the possibility of electric shock when operating at high voltages.
5. When connecting the load bank to a battery both cable connections should be made at the load bank terminal's first. Connection to the terminals should always be last.
6. When in use the load bank should be cordon off using safety barriers.
7. The load bank should only be operated in an area with adequate ventilation.
8. Care should be taken as to the exhaust air outlet that may be hot.
9. The resistor elements used within the load bank are mica insulated and can make a cracking noise during heating and cooling.
10. Do not smoke in the proximity of batteries.
11. Operators working with batteries should not wear rings, jewellery or metal watch straps.
12. Only insulated tools should be used when working on battery or power supply connections.
13. Refer to UPS or the battery manufacturers operating instructions for additional safety precautions.
14. Ensure all personnel are familiar with the location of the nearest safety kit and eye wash facility.
15. During operation the load bank should not be covered or positioned to restrict air flow
16. Caution Metal surfaces will be hot during operation

CONNECTION PROCEDURE

A. Ensure the battery or rectifer system to be tested is compatible with the load bank operating voltage.
B. Do not attempt to operate the load bank above the maximum operating voltage.
C. Check the battery is isolated before connecting to the load bank.
D. Check all load bank switches are in the off position.
E. Use the interconnecting cable provided to prevent any possibility of electric shock.
F. Connect the mains lead (provided) into the panel mounted socket.
G. Connect the battery cables to the load bank. Ensuring the correct polarity.
H. Always connect the interconnecting cable at the load bank battery socket before connecting to the battery or power supply.
I. Ensure the cable connections are secure.

OPERATING INSTRUCTIONS

Operators should read the
SAFETY CONSIDERATIONS and **CONNECTION PROCEDURE**
before carrying out the following operating instructions

1. Ensure all switches are in the OFF position.
2. Turn on the mains switch to operate the fan.
3. The contactor is energised from the black start button.
4. The binary **Current Selector Switch** will increase the load current in steps of approx. 57A @ 57V
   The variable channel allows up to 57A @ 57V amps of manual current adjustment control, by turning the pot in a clockwise direction
   Refer to usage tables (page 4) for full details of current load channels.
5. Do not exceed the maximum rating of the load bank.
6. The load bank can be used to perform a constant current battery discharge testing by manual selection of the load channels during the test.
7. **All current channels must be switched off at the end of a test.**
8. Disconnect the load bank from the battery by pressing the Red button to de-energise the contactor.
9. Also at the end of a test the mains supply switch should be left on for a few minutes until the resistors have cooled.
10. Ensure the battery is isolated before removing the interconnecting cables from the load bank.
11. Always disconnect the cables at the battery terminal's first.

SPECIFICATION

Nominal voltage	50V DC
Maximum power rating	35 kW
Maximum operating voltage	58V DC
Maximum load	470A

Auxiliary fuse rating	Mains fuse 5 amps (panel mounted)
Size	840mm long x 420mm wide x 600mm high
Weight	57 KGs

Typical HLB60-450 usage tables

Switch Position	Ohms	I @ 57V	I @ 50V	I @ 43.2V
1	1.0Ω	57A	50A	43A
2	0.5Ω	114A	100A	87A
3	0.33Ω	173A	152A	131A
4	0.24Ω	232A	204A	176A
5	0.2Ω	290A	254A	220A
6	0.16Ω	349A	306A	265A
7	0.14Ω	407A	357A	308A
Var	1.0Ω	57A	50A	43A
		464A	**407A**	**352A**

MAINTENANCE PROCEDURES

The load bank should not require any special maintenance, however as with any electrical equipment periodic checks should be carried out to ensure the equipment is in a safe and satisfactory condition.

The following periodic checks are recommended;

1) Check the inlet and outlet grills are free from obstruction.
2) Check the controls and terminal are undamaged.
3) Check the fan rotates freely without obstruction.
4) Check internal wiring for lose connections or damage.

FAULT FINDING PROCEDURES

The following fault finding procedure is intended to identify simple operational errors and has been categorised into two possible problem areas as follows;

FAN COOLING NOT OPERATIONAL

Check the power source is available.
Check the interconnecting cable connections.
Check the mains switch is in the correct ON position.
Check the fan motor operates.
Check the mains fuse.
Check for air blockage.
Check fan blades are secure to motor shaft.

LOAD BANK DOES NOT PROVIDE SUFFICIENT LOAD CURRENT

Check the power source is at the required voltage.
Check the required current channels have been selected.
Compare the current values with the specification table.
Check the internal fuse.
Identify individual current channels for reduced output.

Any faults not corrected by carrying out the above procedures may require the internal wiring or components of the load bank to be inspected for damage.

Note: Isolate the load bank from any power source before removing any covers. Testing the load bank with the covers removed is not recommended as high voltages can be present on power resistors or terminals. Repair or replacement should be carried out by the manufacturer.