



OPERATING MANUAL

for

HILLSTONE DC LOAD BANK

Type ref. HLB480-375

Serial number M36548

ISSUE 1

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INTRODUCTION

The load bank HLB480-375 is designed for battery discharge testing of lead acid at various power levels upto 174KW. Eleven switched steps are available to achieve the required load profile .

The unit comprises of pre-set, high powered resistors channels of various rating, with each individual channels selectable via panel mounted switches and internal contactors.

A 3.5 metre DC cable set is provided plus a 5 metre auxiliary cable set.

The load bank is force cooled using a mains powered 240V single phase fan.

Failure of the auxiliary mains supply will automatically de-energise the load contactors thereby preventing damage to resistor elements.

Test sockets are provided to allow measurement of DC volts and amps using external digital multimeters.

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. 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.
3. 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..
4. All resistors are rated for operation when force cooled and therefore can only be used when the fans are running
5. Do not attempt to insert or remove the battery power plug with the load circuit energised.
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. During operation the care should be taken as to the exhaust air outlet will be hot.
9. Do not smoke in the proximity of batteries.
- 10.Operators working with batteries should not wear rings, jewellery or metal watch straps.
- 11.Only insulated tools should be used when working on battery connections.
- 12.Refer to battery charger or the battery manufacturers operating instructions for additional safety precautions.
- 13.Ensure all personnel are familiar with the location of the nearest safety kit and eye wash facility.
- 14.During operation the load bank should not be covered or positioned to restrict air flow.
- 15.Caution metal surfaces will be hot during operation
- 16.Always run the fans for several minutes after a test, with the load switched off to cool the resistor elements.

CONNECTION PROCEDURE

- A. Ensure the equipment or battery to be tested is compatible with the load bank operating voltage range.
- B. Do not attempt to operate the load bank above the maximum operating voltage.
- C. Check the power source (battery or charger output) is isolated before connecting any cables to the load bank.
- D. Check the all switches are in the off position.
- E. Ensure the interconnecting cable is adequately rated and correctly insulated to prevent any possibility of electric shock.
- F. Connect the DC power cable to the battery terminals or battery charger observing correct polarity.
- G. Insert the DC power cable plug into the load bank
- H. Ensure the interconnecting cable connections are secure.
- I. Ensure the auxiliary mains supply is available at 240 volts single phase.
- J. Connect the mains lead to the 240 volt auxiliary supply.
- K. Connect digital multi-meters to the tests sockets as required.

OPERATING INSTRUCTIONS

Operators should read the safety considerations and connection procedure before carrying out the following operating instructions.

1. Ensure the mains supply switch is in the OFF position.
2. Ensure the auxiliary supply is 240 volts AC single phase.
3. Ensure all switches are in the OFF position
4. Turn on the mains control rocker switch.
5. Ensure the fans are running correctly and the inlet and exhaust ventilation is not obstructed.
6. Press the green "Start" push button.
7. Select the required load current by operating the appropriate switches.
8. Do not exceed the maximum rating of the load bank.
9. The load bank can be used to perform a constant current battery discharge test by manual selection of the load channels during the test, as the battery voltage falls.
10. At the end of a test switch off all load switches and press the red "stop" push button.
11. Also at the end of a test, the mains control rocker switch should be left on for a few minutes until the resistors have cooled.
12. Always disconnect the cable connections at the battery terminals first.

SPECIFICATION

Maximum operating voltage	480 Volts DC
Maximum load current	375Amps @ 480 Volts DC 187KW
Adjustment	from approx 1.4A to max current in eleven switch steps
Mains cable	5M complete with 3pin plug socket and UK 13A plug
DC power cable	3.5 metre twin 120sq mm, rubber covered, multi strand, flexible power cable
Size	800 mm Width x 1230 mm Height x 1200 mm Length
Weight	208 Kgs
Auxiliary Supply	240V Single Phase 50 hz via 3pin BS4343 plug socket

RATING TABLES

Channel	ohms	amps at 480V	amps at 440V	amps at 415V	amps at 400V	amps at 350V	amps at 240V	amps at 190V	amps at 130V	amps at 97V
1	320	1.5	1.4	1.3	1.3	1.1	0.8	0.6	0.4	0.3
2	170	2.8	2.6	2.4	2.4	2.1	1.4	1.1	0.8	0.6
3	105	4.6	4.2	4.0	3.8	3.3	2.3	1.8	1.2	0.9
4	110	4.4	4.0	3.8	3.6	3.2	2.2	1.7	1.2	0.9
5	40	12.0	11.0	10.4	10.0	8.8	6.0	4.8	3.3	2.4
6	20	24.0	22.0	20.8	20.0	17.5	12.0	9.5	6.5	4.9
7	9.5	50.5	46.3	43.7	42.1	36.8	25.3	20.0	13.7	10.2
8	9.5	50.5	46.3	43.7	42.1	36.8	25.3	20.0	13.7	10.2
9	6.4	75.0	68.8	64.8	62.5	54.7	37.5	29.7	20.3	15.2
10	6.4	75.0	68.8	64.8	62.5	54.7	37.5	29.7	20.3	15.2
11	6.4	75.0	68.8	64.8	62.5	54.7	37.5	29.7	20.3	15.2
	TOTAL	375	344	324	313	274	188	149	102	76

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 shrouds are undamaged.
- 3) Check the fan rotate freely without obstruction.
- 4) Check internal wiring for loose 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 and switched ON.

Check the mains cable connections.

Check the mains fuse in the front panel mains socket

Always replace fuses with the correct rating (see specification)

Check the fan motor operates.

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 load cables are secure.

Check the load cable is inserted correctly.

Check the required current channels have been selected.

Compare the current values with the specification table.

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 all power sources before removing any covers. Testing the load bank with the covers removed is not recommended as high voltages can be present on internal components and the air flow is reduced.

Repair or replacement should be carried out by the manufacturer.