



OPERATING MANUAL

for

HILLSTONE AC / DC LOAD BANK

Type ref.

HLB 240-480-52

HIRE EQUIPMENT

Serial number M36173

ISSUE 1

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INTRODUCTION

The load bank is designed for load testing of single phase UPS equipment, gen-sets or battery discharge testing at load currents up to 200 amps at a maximum voltage of 260V, or 100A at a maximum voltage 520V AC or DC, 52 KW.

Seven switched steps are available with a minimum switch step of 1A.

The equipment incorporates a dual voltage feature which allows double load current at 260V operation.

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.

Cable termination is provided via a removable side mounted terminal cover, which also allows access to the interchangeable “ double current” link feature.

The load bank is force cooled using a mains powered 230V single phase fan.

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

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 all three fans are running
5. Do not attempt to open the terminal cover, insert or remove the battery power lead, or move the selector link with the load circuit energised from a battery or AC power source.
6. When in use the load bank should be cordoned 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 UPS 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 UPS output) is isolated before removing the terminal cover or 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. The connection link must be in position 'A' and the cables connected to 520V +ve & 0-ve for any test above 260 volts AC or DC.
- G. Test carried out below 260V should be connected to the 260V +ve & 0 -ve terminals. The link should be in position 'A' for tests up to 100 amps and moved to position 'B' for tests over 100 amps.
- H. The link must not be moved when the battery or power source is connected.
- I. Check all cables are connected to the correct terminals and the link position is correct for the battery test voltage.
- J. Ensure the interconnecting cable connections are secure.
- K. Replace the termination cover before connecting the UPS or battery.
- L. Ensure the auxiliary mains supply is available at 230 volts single phase.
- M. Connect the mains lead to the 230 volt auxiliary supply.
- N. Connect the load bank to the battery or UPS output.
- O. Observe correct polarity when connecting a battery for discharge testing.
- P. Where practical always earth the load bank during use.

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 230 volts AC single phase 50 Hz.
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 black "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. Ensure the power source (battery or UPS output) is isolated before opening the terminal cover or removing the load power cables from the load bank or changing the link position.
13. Always disconnect the cable connections at the battery terminals first.

SPECIFICATION

Maximum operating voltage	260 Volts or 520 Volts AC or DC
Maximum load current	200 Amps @ 240 Volts AC or DC 100 Amps @ 520 Volts AC or DC
Mains panel fuse rating	5 Amps (20mm x 5 mm mains socket mounted)
Mains cable	2 metres complete with IEC and UK 13A plug
Size	970 mm long x 460 mm wide x 1000 mm high
Weight	75 Kgs (excluding cables)

RATING TABLES**480V connection (link position A)**

Switch number	approx ohms	Approximate current available at different voltages							
		520V	500V	480V	440V	420V	400V	380V	350V
1	540	1A	0.9A	0.9A	0.8A	0.8A	0.7A	0.7A	0.6A
2	268	2A	1.9A	1.8A	1.6A	1.6A	1.5A	1.4A	1.3A
3	132	4A	3.8A	3.6A	3.3A	3.2A	3.0A	2.9A	2.7A
4	87	6A	5.7A	5.5A	5.1A	4.8A	4.6A	4.4A	4.0A
5	43	12A	12A	11A	10A	10A	9A	9A	8A
6	20	26A	25A	24A	22A	21A	20A	19A	18A
7	10	52A	50A	48A	44A	42A	40A	38A	35A
	Total	103A	99A	95A	87A	83A	79A	75A	69A

240V connection (link position A)

Switch number	approx ohms	Approximate current available at different voltages							
		260V	240V	220V	200V	180V	120V	110V	100V
1	270	1.0A	0.9A	0.8A	0.7A	0.7A	0.4A	0.4A	0.4A
2	134	1.9A	1.8A	1.6A	1.5A	1.3A	0.9A	0.8A	0.7A
3	66	3.9A	3.6A	3.3A	3.0A	2.7A	1.8A	1.7A	1.5A
4	44	5.9A	5.5A	5.0A	4.5A	4.1A	2.7A	2.5A	2.3A
5	22	12A	11A	10A	9A	8A	5A	5A	5A
6	10	26A	24A	22A	20A	18A	12A	11A	10A
7	5	52A	48A	44A	40A	36A	24A	22A	20A
	Total	103A	95A	87A	79A	71A	47A	43A	39A

240V connection (link position B)

Switch number	approx ohms	Approximate current available at different voltages							
		260V	240V	220V	200V	180V	120V	110V	100V
1	132	2.0A	1.8A	1.7A	1.5A	1.4A	0.9A	0.8A	0.8A
2	65	4.0A	3.7A	3.4A	3.1A	2.8A	1.8A	1.7A	1.5A
3	34	7.6A	7.1A	6.5A	5.9A	5.3A	3.5A	3.2A	3A
4	20	13A	12A	11A	10A	9A	6A	5.5A	5.0A
5	10	26A	24A	22A	20A	18A	12A	11A	10A
6	5	52A	48A	44A	40A	36A	24A	22A	20A
7	2.5	104A	96A	88A	80A	72A	48A	44A	40A
	Total	209A	193A	177A	160A	144A	96A	88A	80A

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 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 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.