

Three Phase Lamp Load

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Abstract: *A lamp load bank is a device which used as an electrical load, applies the load to an electric al power source and converts or dissipates the resultant power output of the source. The purpose of a load bank is to accurately mimic the operational or “real” load that a power source will see in actual application. However, unlike the “real” load, which is likely to be dispersed, unpredictable and random in value, a load bank provides a contained, organized and fully controllable load. Consequently, a load bank can be further defined as a self-contained, unitized, systematic device that includes load elements with control and accessory devices required for operation.*

- *This project is used to load for AC electrical system.*
- *For laboratory to check any equipment in both balanced and unbalanced condition the lamp load is used.*
- *To measure the rated parameters like voltage, current and power etc.*
- *The lamp load is the resistive load.*
- *Lamp load can be connected in series with load termination points.*
- *Switches are provided in each branch to vary the load.*
- *Voltmeter and Ammeter are used to measure the voltage and current.*
- *MCB is used for protection along with indicators.*
- *This Lamp load offers load of 3kW at unity power factor.*

Keywords: Lamp Load

I. INTRODUCTION

A load bank is a device designed to provide electrical loads for testing various power sources. Load banks are also used to provide additional loads to diesel generators to ensure the engine fully consumes the fuel in the combustion process, reducing “wet stacking” problems.

A Load Bank is a device which develops an electrical load, applies the load to an electrical power source and converts or dissipates the resultant power output of the source. Ensuring proper operation of your backup power system is critical. Today’s emergency standby diesel generator sets are designed to operate under a specific load level. Permanent, Portable, Containerized, Trailer-Mounted, Skid-Mounted, Radiator-Mounted, and Server Load Banks (HVAC commissioning) provide a continuous and accurate means for load testing.

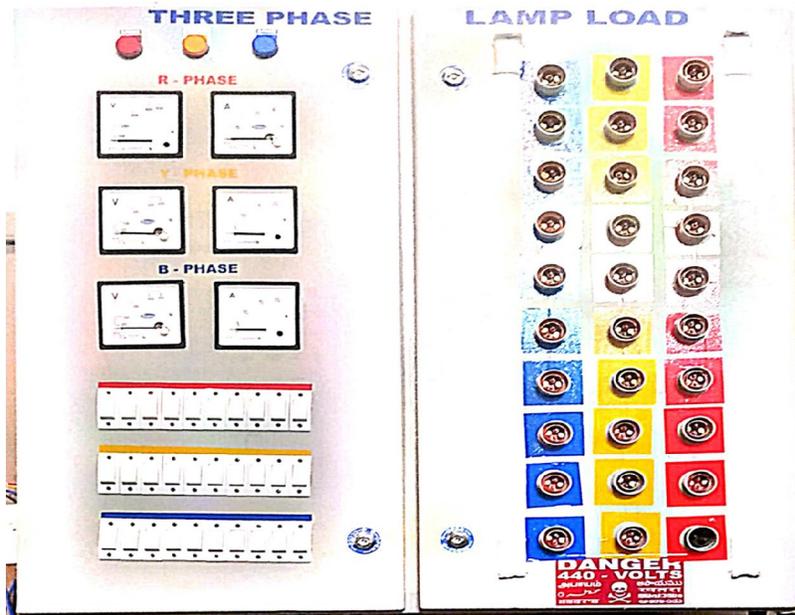
Resistive Load Bank- A resistive load bank, the most common type, provides equivalent loading for both generators and prime movers. That is, for each kilowatt (or horsepower) of load applied to the generator by the load bank, an equal amount of load is applied to the prime mover by the generator. A resistive load bank impacts upon all aspects of a generating system.

- We have electrical loading such as, resistive load, inductive load, and capacitive load.
- There are different types of loads such as fan, bulbs, mixer, geyser, electrical pump motor etc..
- So, we are making resistive lamp load to load electrical systems in laboratory.
- In a testing system, a lamp load simulates real-life resistive loads, such as incandescent lighting and heating loads as well as the resistive or unity power factor component of magnetic loads.
- The most common type uses wire resistance, usually with fan cooling, and this type is often portable and moved from one place to another for loading purposes. Sometimes a load of this type is built into a building, but this is unusual.
- Rarely a salt water rheostat is used. It can be readily improvised, which makes it useful in remote locations.

For testing automotive batteries, a carbon pile load bank allows an adjustable load to be placed on the battery or charging system, allowing accurate simulation of the heavy load on the battery during cranking of the engine. Such devices are usually portable and may include metering to show voltage and current.

II. METHODOLOGY

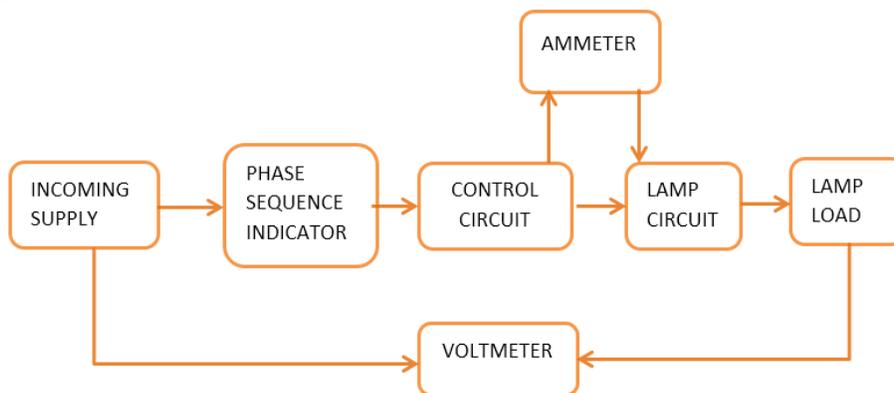
In resistive load bank, the incandescent lamps are used as resistive load. We use total around 48 incandescent lamps, out of which around 24 are of a around 100 watt and remaining around 24 lamps are of 200 watt. The combination of series parallel connection of lamp is used. Lamps are connected in series in horizontal manner and parallel in vertical manner. The material used for this load bank are such as MCB, holder, switches, connecting wires, connecting knobs, square net, particle board etc.



2.1 Input Stage

The below block diagram shows the three phase lamp load for the testing of any equipment. The above block diagram consist of Incoming supply unit, phase sequence indicators, control circuit, Lamp circuit, Lamp load and for measuring the voltage and current the ammeter and voltmeter are connected.

2.2 Block Diagram

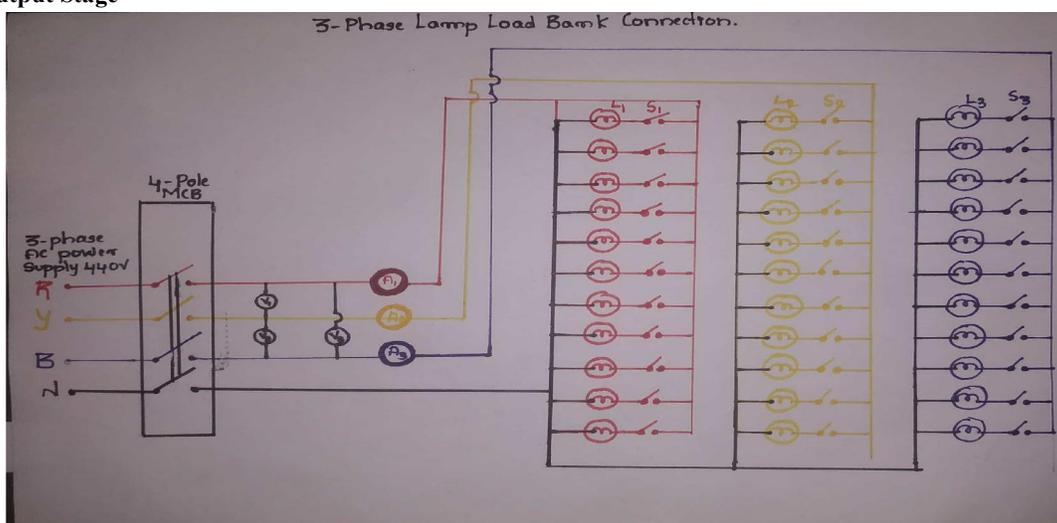


III. INTERMEDIATE SATGE

3.1 Components Used

1. Panel board with movable trolley
2. 4 pole Miniature circuit breaker.
3. Phase sequence indicators(RYB)
4. Analog Ammeter.
5. Analog Voltmeter.
6. Switches.
7. Lamp Holders.
8. Connecting wires.
9. Cable Tie and insulation tape.

3.2 Output Stage



The above circuit diagram shows the three phase lamp load bank connection. The three phases (R Y B) are connected with MCB and series with ammeter and parallel with voltmeter .ammeter measures the rated phase current and voltmeter measures between the two phases voltage.

IV. CONCLUSION

Load banks are used in a variety of applications, including:

- Factory testing of turbines and engine diesel generator sets
- Reduction of wet stacking problems
- Periodic exercising of stand-by engine generator sets
- Battery and UPS system testing
- Ground power testing
- Load optimization in prime power applications
- Removal of carbon build-up on piston rings
- Load rejection test