Project case study (18kW rack-mounted load bank)

Deyang Rata Technology has successfully delivered an 18kW, 400Vac air-cooled resistive load bank to a leading data center in the Middle East. The unit was specifically designed to support airflow testing and cooling system verification within the facility.

Key Feature

Adjustable Airflow Levels: 30%, 60%, 90%, and 100%, with a control accuracy of within ±2%.

Advanced Protection: Equipped with an 80°C over-temperature alarm and automatic section cut-off at 90°C to ensure safe and reliable operation.

High-Performance Cooling Fans: Customized DC 26V fans, with 10 units providing a total airflow of 5,570 m³/h.

Switching System: Load step control realized through Schneider circuit

breakers, ensuring durability and precise operation.

This load bank is primarily used to:

- Simulate electrical loads within the data center environment.
- Validate cooling performance of precision air-conditioning systems under controlled load conditions.
- Provide reliable testing data to optimize airflow distribution and thermal management.

Through this project, the client was able to verify the performance of their HVAC and cooling infrastructure, ensuring system stability and efficiency in high-demand conditions.

Data sheet :18kW rack-mounted load bank

Description

Model No.	RTLB18-RM
Country of origin	China
Max capacity	18kW
Rated testing voltage	400Vac
Frequency	50Hz.
Phases	3
Load step	L1: 1+2+3kW L2: 1+2+3kW L3: 1+2+3kW
Resistors type	Finned heating resistive tube
Voltage Tolerance (Short Term Operation)	+5%
Load Element Tolerance	± 3%
Insulation Test	500Vac
Load Connections	TYP325 (32A Five-pin plug connector)
Protection	Thermal emergency cut out 80℃ red light alert 90℃ trip off
Thermal protection	Contactor
Cooling method	Air forced cooling
Fans Nos.	10pcs 24Vdc
Airflow volume	5570 CBM/H
Airflow direction	Horizontal
Rated maximum ambient temp. operation	+50°C / +122°F
Rated minimum ambient temp. operation	-20°C / -4°F
Altitude rating	<500m [m.a.s.l.]
Control chamber IP rating	IP 23
Portability	5 Foldable handle clips

Enclosure dimensions

Depth(mm)	610
Length(mm)	483
Height(mm)	844.5 (19U)
Weight(KG)	60

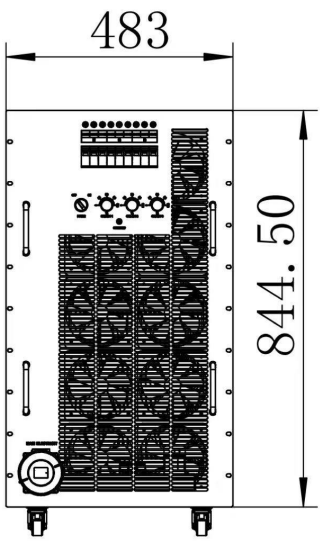
Load bank control system

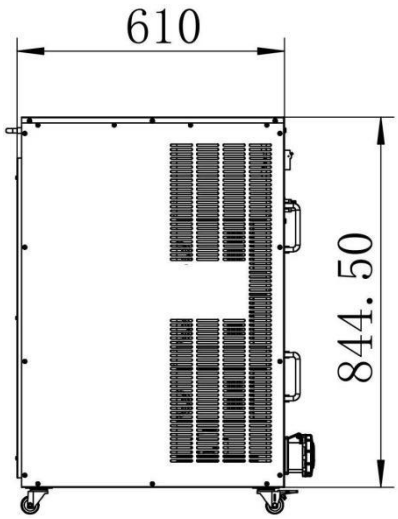
Manual control	Circuit breakers / potentiol meter

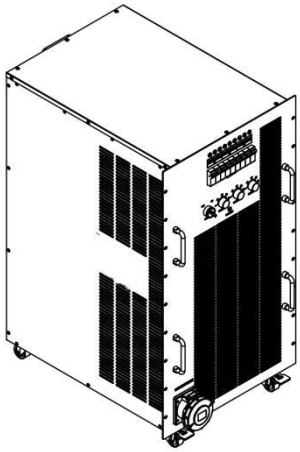
Accessories

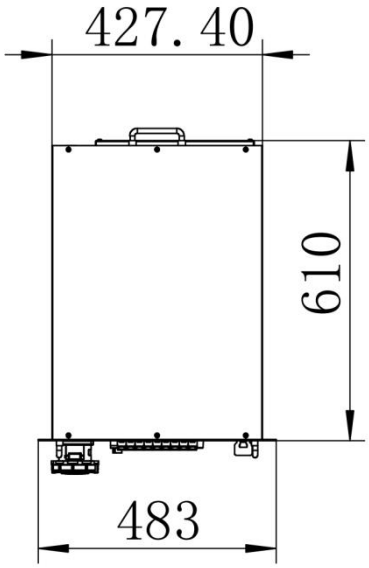
Cables	1pcs copper 5-core 6-square rubber cable 5Meters

Drawings(mm)

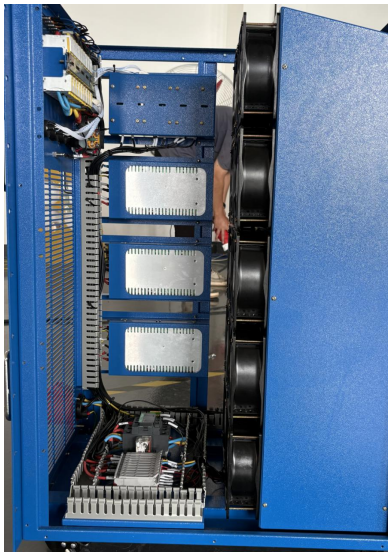


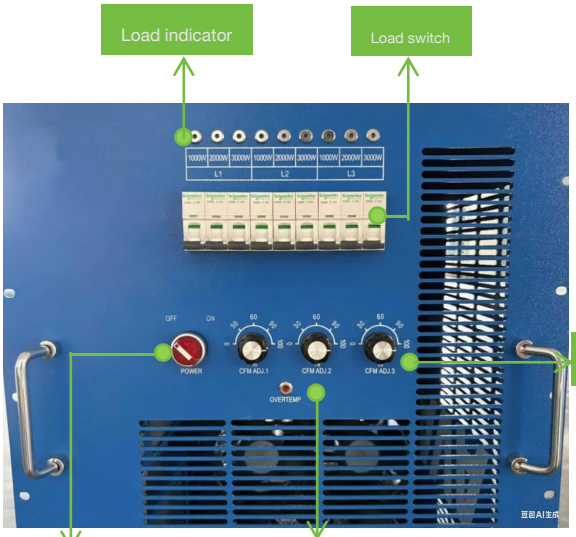


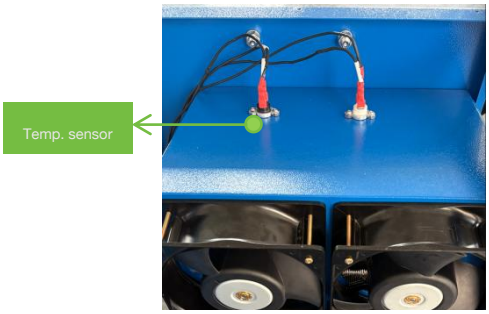


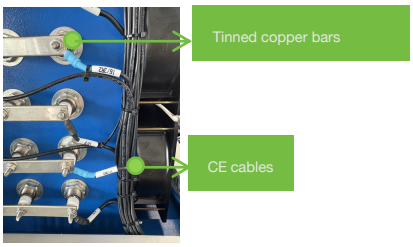


Product construction overview

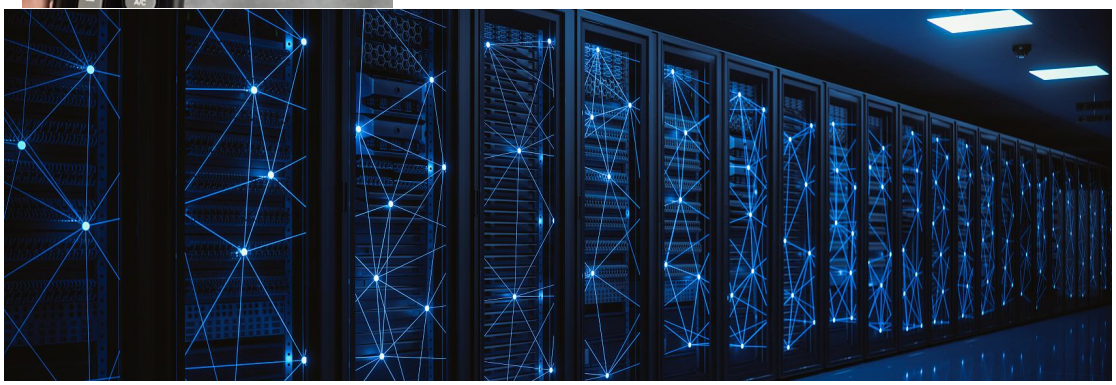








Sound level 84db fans in full operation. distance 1.5 meter



This project demonstrates how the 18kW air-cooled resistive load bank created significant value for the client. Key benefits include:

- **Reliable Cooling Verification** – The load bank enabled precise testing of airflow and thermal distribution, ensuring the data center's HVAC system could maintain stable operation under varying load conditions.
- **Operational Safety** – With accurate airflow control and built-in temperature protection (alarm at 85°C, auto cut-off at 90°C), the client gained confidence in both the safety and resilience of their testing process.
- **High Testing Accuracy** – The finely adjustable airflow steps (30%, 60%, 90%, 100% with ±2% precision) provided engineers with accurate data to optimize cooling efficiency and energy usage.
- **Seamless Integration** – Utilizing Schneider circuit breakers for step switching ensured reliability and simplified maintenance for the client's technical team.
- **Future-Ready Solutions** – Beyond air-cooled systems, Rata can also deliver liquid-cooled load banks to meet the evolving needs of next-generation, high-density data centers.