GPU Emulator 160

Introducing the 'AI' Liquid Cooling Commissioning Load Bank Solution
Model GPU Emulator 160

OVERVIEW

Powerload is proud to introduce a breakthrough in load bank technology — a liquid cooled compact, high-performance rack level GPU simulator load bank unit designed to meet the rigorous demands of colocation data centres. Delivering consistent, reliable, and safe testing capacity, ensures that your infrastructure operates at peak performance with the highest levels of protection and operational control. The Model LCLB 160 is a specialised solution for data centre commissioning and testing that integrates seamlessly with existing cooling infrastructure. This comprehensive technical data sheet provides detailed specifications, including power ratings, control interfaces, and physical dimensions.

SYSTEM OVERVIEW AND SPECIFICATIONS

The Powerload Model LCLB 160 consists of up to 160kW resistive liquid cooled load designed for operation indoors to simulate IT rack operation. Our standard layout comprises a total of 160kW of Water-cooled load configured in a server rack format for maximum compatibility with existing data center infrastructure. The unit fully replicates any GPU server operation up to 160kW. We believe this is the only CE marked load bank with Solid State Switching fully manufactured in the UK.

KEY FEATURES

- Up to maximum 160KW water cooled load on a 0-100% control.
- Adjustable Pressure drop to simulate GPU
- Flow, pressure and temperature measurement
- Integrated power metering displaying 3 – Phase voltage, Current, Power, Frequency and power factor.
- Full trending and recording of all results.
- Controller enables networking of up to 240 liquid cooled load banks

- Full system drainage capability to prevent cross contamination between testing projects
- Robust steel enclosure with sturdy welded frame and heavy-duty casters for durability.
- Solid-State Switching (Optional Extra)

LOAD BANK SOLID STATE SWITCHES (SSR)

Features:

- PMW Zero-cross switching
- Optical isolation between input and output
- Fast switching < 25ms at 50HZ, 16.7 at 60HZ
- No moving parts → long service life
- Low EMI / RFI noise
- Compact design
- 3 Leg switching

ELECTRICAL SPECIFICATIONS

Parameter	Value / Range	Notes
Control Voltage (DC)	3–32 VDC	Input side
Control Current	5–20 mA (typical @ 10 VDC)	
Turn-On Time	< 25 ms at 50hz 16.7 at 60hz	
Turn-Off Time	< 25 ms at 50hz 16.7 at 60hz	
Load Voltage (AC)	24–480 VAC	Output side
Load Current	231 A	
Switching Device	SCR	For AC loads
Leakage Current	≤ 10 mA (Off-State)	Typical at 480 VAC
On-State Voltage Drop	1.2–1.6 V	Depends on load
Indication	LED Power ON & Temperature fault	
Filling Capacity	120 L	

MECHANICAL & ENVIRONMENTAL

Parameter	Value
Operating Temp.	0 °C to +90 °C
Storage Temp.	0 °C to +85 °C
Humidity	5–95% RH, non-condensing
Dielectric Strength	2500 Vrms (Input ↔ Output)
Insulation Resistance	≥ 50 MΩ @ 500 VDC
Cooling	Convection / Heatsink / Dual Fan (Auto on off)
Mounting	Panel mount

Housing Material	Metal
Dissipated Heat	250w
Parameter	Value
Load Bank Capacity (kW)	160kW
Step Load Increment (kW)	Solid state switches, 0 - 160kW
Inlet / Outlet Temperature (°C)	Min Inlet 14 degrees C / Maximum Inlet 35 Degrees C. Maximum Outlet 50 Degrees C
Max Liquid Capacity (kW)	160kW
Hydronic Flow Rate (LPM)	Minimum Flow Rate 70 LPM, Maximum Flow Rate 400 LPM
Allowable Pressure Drop (Kpa)	100 kPa - Adjustable
Pipe Size (mm)	2 inch
FD 83 Connection Size (mm)	2 Inch
Power Connection Type (Socket/Amps rating)	4 x 63a 3PN+E
Dimensions of Load Bank (L × W × H)	L = 1400 x W = 600 x H = 1930
Flow Meter Make / Model	IFM SU2030 Ultrasonic flow meter (CX Manifold)
Temperature Sensor Make / Model	IFM
Control Interface (Modbus/BACnet)	RJ45 Ethernet over IP web browser Network connection to each 500kW load bank, simultaneous operation.
Master–Slave Control Logic	Master Only in each 160kW load bank
Delta T Range	10 -16 Degrees C

PROTECTIONS

- Overcurrent protection: external fast-acting semiconductor fuse or MCB
- Overtemperature protection: 90°C on Heat Sink

CERTIFICATIONS

- CE, UL, UKCA
- RoHS compliant

PHYSICAL SPECIFICATIONS

- Control System Interface – User friendly color controller with network connectivity and comprehensive monitoring capabilities

- Hydraulic Configuration – The system features common internal manifolds with NPS 2” flow and return connections, pressure relief safety valve and manual drain points.

TECHNICAL DETAILS AND INTEGRATION

- The user-friendly LCD color controller displays full operation of the load bank. It supports TCP/IP Modbus communication, utilising an Ethernet-based wiring infrastructure for seamless

connectivity with building management systems.

- The control panel features power on/off functions, master load on/off management, and comprehensive alarm indicators for low flow, over-temperature, and overpressure conditions. An internal/external control power switch is provided, along with notification for remote mode and dual Ethernet connections. The integrated power meter displays AC 3-phase voltage and current, power (kW), frequency, and power factor.

- The system includes 4 no. 3P+N+E 415 vac 63A plug flying lead connections are provided for simply power integration to site GPU points. Each module is protected by dedicated short circuit power protection. Clear indicator lamps and an emergency stop button are included for operational safety.

- The power distribution system is designed to comply with all relevant EU and UK electrical codes and standards, including CE requirements. All connections are clearly labeled and secured to prevent accidental disconnection during operation.

LOAD BANK HYDRAULIC ARRANGEMENTS

The LCLB 160 liquid cooled load modules feature a common internal manifold with NPS 2" (DN50) flow and return connections. The unit is equipped with a pressure relief safety valve, manual air vent, and manual drain point for complete system maintenance. The hydraulic system is designed to operate with standard European and UK chilled water systems and can accommodate various water quality parameters while maintaining thermal performance.

CONSTRUCTION AND FINISH

The Powerload LCLB 160 is constructed using heavy gauge steel with a Charcoal colour powder coated finish. It is engineered for continuous indoor operation in data center environments. The sturdy welded frame and heavy-duty casters provide easy mobility without compromising durability or operational life. The high-quality powder coated finish with stainless steel impact protection frame ensures both aesthetic appeal and functional protection in industrial settings.

Initial Commissioning

Easily simulate progressive load increases to verify cooling system performance and stability under controlled conditions

Thermal testing

Conduct comprehensive heat load tests to identify potential cooling system weaknesses before production deployment

Performance Validation

Verify cooling capacity meets design specifications across various load profiles and environmental conditions

Ongoing Certification

Maintain regulatory compliance with periodic testing and documentation of cooling system performance.