

GPU Emulator 160

Liquid Cooling Commissioning Load Bank Solution

Product Name: PowerLoad GPU Emulator 160

Model Reference: LCLB 160



OVERVIEW

The PowerLoad GPU Emulator 160, model reference LCLB 160, is a compact liquid cooled rack level GPU simulator load bank developed for data centre commissioning and testing. The unit is designed for indoor operation and is used to simulate controlled IT and GPU rack heat loads during commissioning, validation and performance testing.

The GPU Emulator 160 connects into existing liquid cooling infrastructure, allowing test teams to apply a controlled heat load while monitoring the performance of the cooling system. This supports testing of cooling capacity, system stability and site readiness before live IT equipment is installed or brought into operation.

This datasheet provides the key information required for planning, installation and project review, including unit capacity, control interfaces, electrical connections, hydraulic details and physical dimensions.

SYSTEM OVERVIEW AND SPECIFICATIONS

The PowerLoad GPU Emulator 160 (model reference LCLB 160) consists of up to 160 kW resistive liquid cooled load designed for operation indoors to simulate IT rack operation. The standard layout comprises a total of 160 kW of water cooled load configured in a server rack format for maximum compatibility with existing data centre infrastructure. The unit fully replicates any GPU server operation up to 160 kW. PowerLoad believes this is the only CE marked load bank with Solid State Switching fully manufactured in the UK.

KEY FEATURES

- Up to maximum 160 kW water cooled load on a 0 to 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

SOLID STATE SWITCHES (SSR)

Features:

- PWM zero cross switching
- Optical isolation between input and output
- Fast switching < 25 ms at 50 Hz, 16.7 at 60 Hz
- No moving parts for 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 50 Hz 16.7 at 60 Hz	
Turn-Off Time	< 25 ms at 50 Hz 16.7 at 60 Hz	
Load Voltage (AC)	24–480 VAC	Output side
Load Current	231 A	
Power Supply	UK / EU: 415 VAC, 50 Hz, 4 x 63 A 3P+E USA: 480 VAC, 60 Hz, 3 phase, final connection type TBC.	Input side. USA site supply to be confirmed.
Supply Current	UK / EU: 231 A total load current shown for current configuration. USA: approx. 192 A line current at 480 V, 3 phase for 160 kW.	USA value calculated at 480 V, 3 phase. Engineering to confirm final rating.
USA Electrical Version	480 VAC, 60 Hz, 3 phase. Connector format TBC.	Use UL listed components and final site connection type where required.
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	

MECHANICAL & ENVIRONMENTAL

Parameter	Value
Operating Temp.	0 °C to +90 °C / 32 °F to 194 °F
Storage Temp.	0 °C to +85 °C / 32 °F to 185 °F
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	250 W

TECHNICAL SPECIFICATIONS

Parameter	Value
Load Bank Capacity (kW / BTU/h)	160 kW / 545,913 BTU/h
Step Load Increment (kW)	Solid state switches, 0 to 160 kW
Inlet / Outlet Temperature (°C / °F)	Min Inlet 14 °C / 57 °F / Maximum Inlet 35 °C / 95 °F. Maximum Outlet 50 °C / 122 °F
Max Liquid Capacity (kW / BTU/h)	160 kW / 545,913 BTU/h
Hydronic Flow Rate (LPM / GPM)	Minimum Flow Rate 70 LPM / 19 GPM, Maximum Flow Rate 400 LPM / 106 GPM
Allowable Pressure Drop (kPa / psi)	100 kPa / 15 psi, adjustable
Pipe Size (mm / in)	50 mm or 2"
FD 83 Connection Size (mm / in)	50 mm or 2"
Power Connection Type (Socket/Amps rating)	UK / EU: 4 × 63 A 3P+E. USA: 480 VAC, 60 Hz, 3P+G connector type TBC.
Dimensions of Load Bank (L × W × H)	L = 1650 mm (Inc pipework) x W = 600 mm x H = 1930 mm (To the floor) / 65 x 24 x 76 in
Weight Dry / Full of PG25	590 kg / 714 kg / 1,301 lb / 1,574 lb
Flow Meter Make / Model	IFM / SA5000
Pressure Sensor Make / Model	IFM / PT5404
Temperature Sensor Make / Model	IFM / TM5411
Control Interface (Modbus/BACnet)	RJ45 Ethernet over IP web browser Network connection to each load bank, simultaneous operation.
Master / Slave Control Logic	Master Only in each 160 kW load bank
Delta T Range	8 to 16 °C / 14 to 29 °F
Filling Capacity	120 L / 32 US gal

PROTECTIONS

- Overcurrent protection: external fast acting semiconductor fuse or MCB.
- Overtemperature protection: 90 °C / 194 °F on Heat Sink.
- Overpressure protection: 6 bar / 87 psi PRV.

CONTROLS AND CONNECTIVITY

- Control System Interface: User friendly colour controller with network connectivity and comprehensive monitoring capabilities.
- The user friendly LCD colour 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, overtemperature, 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.

ELECTRICAL INTEGRATION

- The system includes 4 no. 3P+E 415 VAC 63A plug flying lead connections for simple 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.
- USA version: 480 VAC, 60 Hz, 3 phase supply with final connector type, cable arrangement and site plug format to be confirmed against project requirements.
- 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 labelled and secured to prevent accidental disconnection during operation.
- For USA projects, the power distribution system is to be configured to relevant USA electrical codes and project site requirements where applicable, including UL component requirements where specified.

HYDRAULIC ARRANGEMENT

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

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.

USA version can be configured for North American chilled water infrastructure and project specific connection requirements.

CONSTRUCTION AND FINISH

The PowerLoad LCLB 160 is constructed using heavy gauge steel with a Charcoal RAL colour 9011 powder coated finish. It is engineered for continuous indoor operation in data centre environments. The sturdy welded frame and heavy duty casters provide mobility without compromising durability or operational life. The powder coated finish with stainless steel impact protection frame provides 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.