

NAUTILUS 250

250KW Resistive Water Cooled Load Bank

Description

The Simplex Nautilus-250 is a water-cooled load bank designed expressly for data-center chiller commissioning and testing applications. The Nautilus-250 is a compact, portable product featuring infinite power and water flow control for precise temperature rise setting versus applied power. The Nautilus is fully networkable for control of single or multiple units from a remote station.

Using a PLC with touchscreen HMI, integrated with temperature sensors and flow transducers and controlling an electrically operated water proportioning valve, the Nautilus allows the operator to select precise power levels, versus water temperature rise versus water flow rates. Power level is infinitely controllable over a 0-250kw range.

Multiple Nautilus Load Banks can be controlled from a single operator HMI. Software is available for control from a Windows- based PC, for data acquisition and for full testing automation.

Features

The load bank is a completely self-contained, freestanding unit, which includes all resistive load elements, load control, load element branch circuit fuse protection, main load bus and terminals, valves and fittings, control power supply, malfunction detection system.

Control System: PLC control with 8-inch color TFT touchscreen HMI. Screen is configured for local or remote operation. Remote requires 120v power source.

Control Function: Master control on-off button; keypad entry of load values, apply and remove buttons; controller calculates reduced voltage load values automatically, applying actual requested load value for the applied voltage up to the reduced voltage capacity of the load bank. **Water Flow Control:** Either full on or thermostatic control. Thermostatic control is either manual or to a temperature rise preset. Operator interface is a screen based vernier valve control with displays of valve position,

flow rate, temp in, temp out, temp rise. Automatic thermostatic control allows operator to enter value of temp rise. Controller then adjusts flow rate to maintain that rise. Controller inhibits over temperature, greater than 180°F outlet temp. **Displays:** AC 3-phase voltage and current, frequency, kilowatts. **Alarms:** high outlet temp, low flow, high pressure **Messages:** normal operation, valve open, valve closed. **Water Flow Control Messages:** water inlet temp, water outlet temp, overall temp rise, main manifold water flow rate, valve position in percent of open.

Capacity: 250 kW

Voltage: 480vAC, 3-phase, 3-wire

Frequency: 60 Hertz

Load Steps: Infinitely variable via digital control, comprised of circuits as follows -
kW: 0-25 – 25 – 50-50-50-50

Duty Cycle: Continuous

Ambient Temperature: 52°C

Control Power: External, via power inlet and power cord to 120v 15A outlet

Cooling Requirements: Fresh water; Nominal 125 GPM supply yields approx. 12.5°F rise at full power; Flow rate is infinitely variable to a max temp rise not to exceed 180°F outlet -
 $KW = GPM \times Temp. Rise (F) \times .16$
 $GPM = KW / (Temp. Rise \times .16)$
 $Temp. Rise (F) = KW / (GPM \times .16)$

Weight: Approximately 1600 lbs full of water, 900 lbs dry



Water Connection: 2-inch, water inlet and water outlet. Quick disconnect couplings, shutoff ball valves.

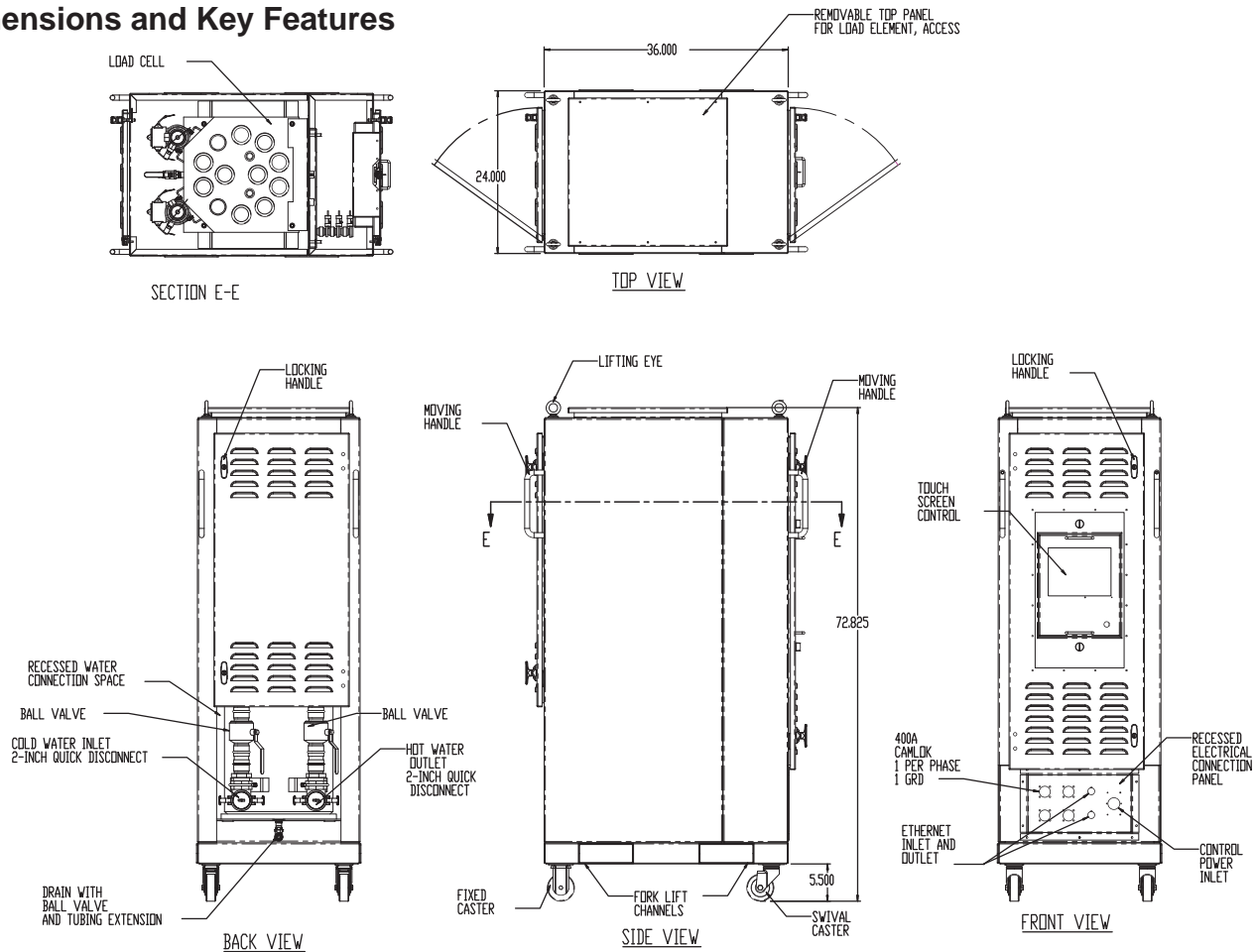
Enclosure: Environmental type 1 freestanding, indoor, portable enclosure. Aluminum frame clad with aluminum panels and doors. Front power connections. Rear water connections. Casters, forklift pads, lifting eyes. Powder coated white cabinet, blue doors. 72H x 24W x 36D

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SIMPLEX®

Dimensions and Key Features



Load Cell

1 x 250 kW load, consisting of heavy-gauge, steel housing, load elements, control valves and sensors as described below

Load Elements

Immersion type, tubular construction, stainless steel or Incolloy sheathed, chromium-alloy conductor. Screw-plug mounting.

Load Control

Triac and Branch circuit contactors, each 25 kw or 50 kW circuit.

Element Circuit Protection

Branch circuit fuses, each 50 kW branch circuit or each step.

Power Wiring

150°C insulated; color-coded and numbered, XLP insulation

Control Wiring

90°C, color-coded and numbered

Power Connection

Cam-Type connectors, 1 x 4/0 (400A) per phase and 1 x ground. Bulk-head mount connectors installed on front.

System Protection

Sensors: Protection for High water temperature; Low water flow; High pressure. Alarm and shutdown upon failure detection

Sensors

Main manifold flow transducer, 4-20mA; inlet water temp thermocouple, exhaust water temp thermocouple; cell pressure.

Enclosure

Type 1 indoor freestanding. Approx 24" W x 72" H x 36" D.

Water flow control

Equipped with main inlet and outlet shutoff ball valves, pressure relief valve. Motorized gate valve on inlet for water flow control.