PhaseFlow™

REFRIGERANT-BASED PLATFORM FOR HEAT REJECTION.

UP TO 25% LESS ENERGY. WATERLESS. OPTIONAL CO2.

LENNOX

DATA CENTER SOLUTIONS

INTRODUCING PHASEFLOW™

A modular cooling platform from Lennox®, built for AI and high-density data centers.

PhaseFlow™ operates in the heat rejection loop, providing a refrigerant-based platform that removes heat from the process fluid used to cool data center chips.

1. Condenser / Gas Cooler
2. Refrigeration Skid
3. Heat Exchanger / Pump Skid
4. Manifold Skid



THE COOLING SOLUTION

RETHINKING HEAT REJECTION FOR THE AI ERA



OUR APPROACH

Unlike conventional approaches that rely on facility water infrastructure, PhaseFlow™ uses a refrigerant-based architecture that decouples facility heat rejection from load-side fluid requirements. It is waterless in most configurations.

This enables operators to support a wide range of cooling strategies, from traditional air-cooled environments to advanced liquid-cooled deployments, using a common facility platform.

Designed for high-density computing environments, PhaseFlow™ supports multiple supply temperatures, operates across diverse climate conditions, and scales modularly as capacity requirements evolve.

ADVANTAGES

The result is a cooling solution that improves efficiency, minimizes water dependence, offers an all-natural CO_2 refrigerant loop, simplifies infrastructure, and provides the flexibility needed to accommodate future changes in compute density, cooling technologies, and operational requirements.



THE PHASEFLOW™ DIFFERENCE

UP TO 25% LESS ENERGY

Direct refrigerant delivery to CDUs eliminates the facility water loop, reducing energy consumption by 10-25%* versus conventional air- and water-cooled chiller architectures.

- Refrigerant-to-refrigerant heat transfer eliminates several inefficiencies associated with traditional chilled-water architectures.
- Reduces cooling energy consumption compared with conventional air-cooled and water-cooled chiller systems.
- More power allocated to compute.
- Additional efficiency improvements when paired with two-phase direct liquid-to-chip cooling architectures.

*Independent modeling by Syska Hennessy Group, using Phoenix BIN weather data, demonstrated 10% to 25% lower energy consumption compared with conventional chiller-based cooling approaches, depending on the chiller configuration.



WATERLESS

Efficient cooling with zero operational water use.

- Waterless, air-cooled configuration with zero operational water consumption.
- Optional low-water adiabatic configuration for additional energy efficiency.
- Removes the need for a water treatment plant, lowering operational and maintenance costs.



REFRIGERANT-FLEXIBLE

Select from CO_2 and lower-GWP refrigerant options.

- Choose from all-natural CO_2 and low GWP HFO /HFC refrigerant options.
- Enables alignment with lower-GWP refrigerant regulations and evolving sustainability objectives.





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THE PHASEFLOW™ DIFFERENCE

FUTURE-READY

Supports air and liquid chip-cooling loops, including single-phase and two-phase approaches. Handles a wide range of liquid supply and return temperatures to accommodate increasing rack densities.

- A single refrigerant-based facility loop supports air and single- and two-phase direct liquid-to-chip cooling strategies.
- Multiple supply temperatures from a single loop accommodate, for example, both 35°C air-cooling and 45°C liquid-cooling setups.
- Integrated free cooling improves efficiency at lower ambient temperatures.
- Adapts to future AI, high-density, and quantum computing requirements without redesigning the cooling plant, with temperatures as low as 10°C.

SCALABLE AND RESILIENT

Modular architecture with minimum N+1 redundancy, concurrent maintainability, and automated failover.

- Provides baseline N+1 redundancy with concurrent maintainability.
- Enables modules to be isolated and serviced while cooling remains operational.
- Configurable for higher-redundancy architectures, including N+X and 2N.
- Modular construction supports fault isolation and simplified maintenance.
- Capacity and redundancy can scale as facility requirements evolve.

THE PHASEFLOW™ DIFFERENCE

SITE-OPTIMIZED

Backed by more than 130 years of Lennox thermal expertise, with configurations tailored to customer requirements and operating objectives.

- Scale capacity as site demand grows through a modular skid-to-plant architecture.
- Configure one refrigerant-based facility loop for air cooling, liquid chip cooling, or mixed loads.
- Support single-phase and two-phase approaches, multiple supply setpoints, and broad liquid temperature ranges.
- Tailor redundancy and heat-rejection options to site, load, climate, and operational requirements.



THE LENNOX ADVANTAGE

Lennox combines decades of heat-transfer expertise, deep refrigerant engineering experience, custom system design capabilities, digital twin commissioning, and proven manufacturing execution.

See PhaseFlow™ live at the Lennox Customer Innovation Center in Atlanta, GA. Book your session today.

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