NEXT-GENERATION INFRASTRUCTURE

Deep Cryogenic

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ENGINEERING THE NEXT GENERATION OF DATA CENTRE COOLING

An energy-efficient cooling system engineered to reduce energy load, stabilize thermal performance, and scale with next-generation data demands.

EMBEDDING THERMAL INTELLIGENCE DIRECTLY INTO HYPERSCALE INFRASTRUCTURE.

Purpose-built to support the thermal challenges of AI-era workloads with intelligent control, advanced heat transfer, and unmatched energy efficiency.

COOLING IS NO LONGER A SYSTEM. IT IS INFRASTRUCTURE.

THERMAL EXCELLENCE
Consistent performance.
Reliable thermal stability.

ENERGY EFFICIENCY
Reduce energy load.
Lower operational costs.

BUILT TO SCALE
Designed for hyperscale.
Ready for the future.

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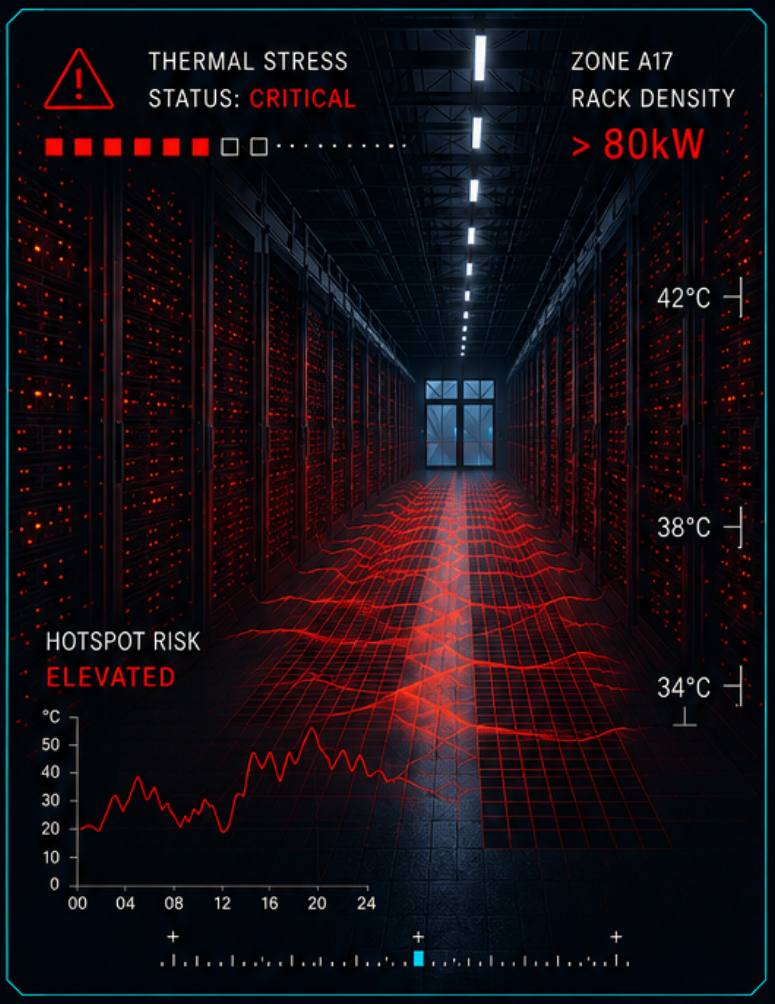
THERMAL LIMITS ARE BEING REACHED

AI workloads, rack densities, and power demands are accelerating beyond the capabilities of traditional cooling systems.



RAPID RISE IN HEAT DENSITY

Modern racks exceed 30kW and are rapidly approaching 100kW+ deployment levels.

LIMITS OF AIR COOLING

Conventional air-based cooling systems struggle to maintain stable thermal conditions at hyperscale density.

THERMAL INSTABILITY RISKS

Hotspots, throttling, thermal stress, and hardware degradation increasingly threaten uptime reliability.

ESCALATING ENERGY COSTS

Cooling infrastructure can account for 30–50% of total facility energy consumption.

2.5X
Increase in rack power density (2018–2024)

>100kw
Next-generation racks entering deployment

30–50%
Facility energy consumed by cooling

1.8°C
Average inlet temperature rise in mature facilities

COOLING IS NO LONGER A SYSTEM. IT IS INFRASTRUCTURE.

The next era of AI infrastructure requires thermal systems designed as core infrastructure—engineered for scale, efficiency, resilience, and operational continuity.

NEXT-GENERATION INFRASTRUCTURE

INTEGRATED THERMAL MANAGEMENT SYSTEM

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A unified architecture purpose-built to deliver intelligent thermal control, maximum efficiency, and uncompromised performance at scale.

INTEGRATED THERMAL ARCHITECTURE

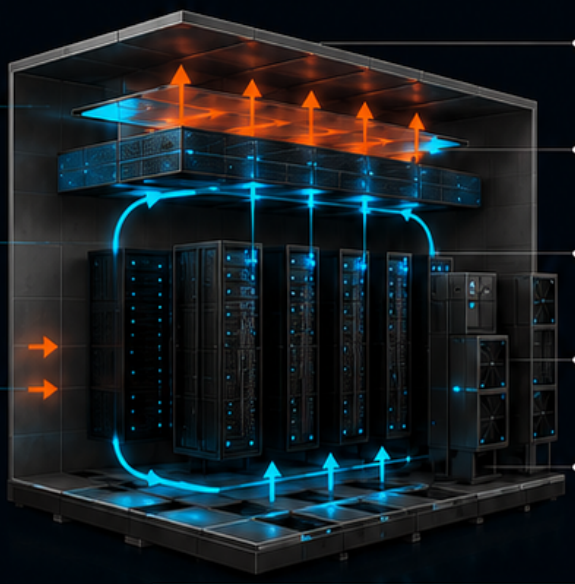
INPUT SOURCES

IT LOAD HEAT
Heat generated by IT equipment

AMBIENT AIR
External air for infiltration control

COOLANT SUPPLY
Closed-loop coolant input

POWER INPUT
Energy to operate the system



- **THERMAL ENVELOPE** — High-performance insulation minimises heat ingress
- **AIRFLOW MANAGEMENT** — Optimised airflow pathways ensure efficient heat removal
- **HEAT ABSORPTION LAYER** — Captures heat at the source for faster transfer
- **COOLING DISTRIBUTION** — Delivers cooled air precisely where it is needed
- **INTELLIGENT CONTROL** — Real-time monitoring and adaptive control for optimal performance

OUTPUT BENEFITS

STABLE THERMAL PERFORMANCE
Consistent, reliable temperatures

MAXIMISED ENERGY EFFICIENCY
Lower PUE and reduced cooling energy

HIGHER SYSTEM AVAILABILITY
Reduced risk of thermal events and downtime

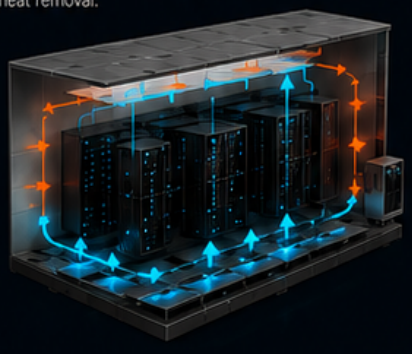
SCALABLE INFRASTRUCTURE READINESS
Designed for future expansion

INTELLIGENT CONTROL LAYER

Real-time monitoring, adaptive optimisation, and dynamic thermal control.

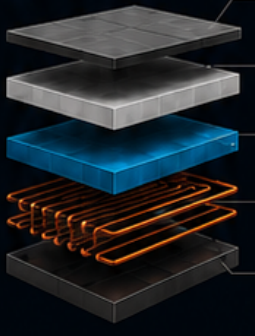
01. AIRFLOW PATHWAY

Engineered airflow management ensures consistent, efficient, and targeted heat removal.



02. THERMAL LAYER CUTAWAY

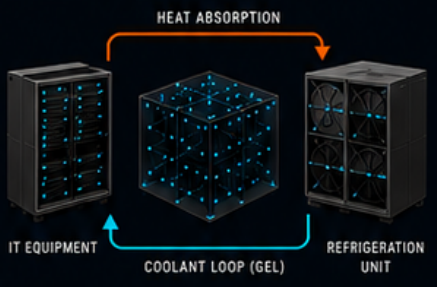
Multi-layered thermal architecture designed for maximum heat transfer and system protection.



- **Protective Top Layer** — Durable surface protection
- **Insulation Layer** — Reduces external heat ingress
- **Thermal Transfer Layer** — High-capacity heat absorption
- **Cooling Interface** — Efficient heat transfer medium
- **Support Layer** — Structural integrity and stability

03. CLOSED-LOOP COOLING (REFRIGERATION SYSTEM)

Dedicated refrigeration system cools the active cooling gel which absorbs heat from IT equipment efficiently.



SYSTEM FLOW SEQUENCE

01 Servers generate heat at rack level.

02 Thermal layers absorb and stabilise the thermal load.

03 Engineered airflow pathways redirect remaining heat efficiently.

04 CRAC systems remove residual thermal energy.

05 Conditioned airflow is redistributed through stabilised circulation pathways.

STRATEGIC POSITIONING

Delivers advanced thermal efficiency gains while avoiding the operational complexity and infrastructure burden associated with traditional liquid cooling systems.

NEXT-GENERATION INFRASTRUCTURE

BENCHMARK VS. CONVENTIONAL COOLING SYSTEMS

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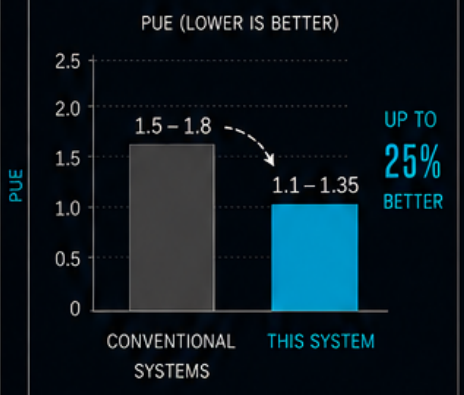
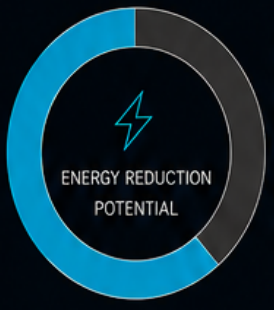
Real-world performance. Measurable infrastructure impact.
Engineered for efficiency, stability, and future scalability.

METRIC	CONVENTIONAL SYSTEMS	THIS SYSTEM
PUE (Typical)	1.5 – 1.8 typical	1.1 – 1.35 projected
Cooling Energy Load	30–50% of total energy	Reduced by 20–40%
Mechanical Dependency	Fully dependent	Reduced up to 35%
Temperature Stability	±3–5°C variation	±1–2°C variation
Peak Load Handling	Requires oversizing	Thermal buffering
Renewable Integration	Minimal	10–25% contribution
Thermal Stability	High variation	Stable & consistent
Scalability	Limited by airflow	Built to scale
System Availability	Typical	99.99%
Maintenance Complexity	High	Low

01. PUE COMPARISON



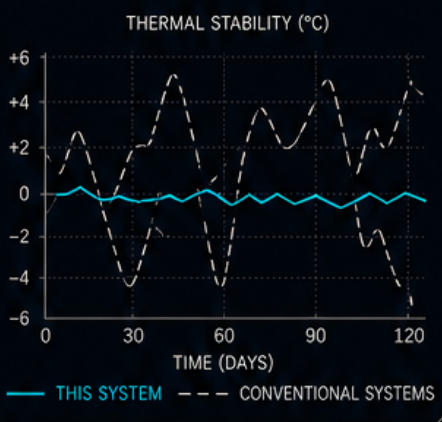
02. ENERGY REDUCTION POTENTIAL



30–50%
LESS COOLING ENERGY USE

Lower operational costs.
Higher infrastructure efficiency.

03. PERFORMANCE OVER TIME



ENGINEERED FOR SUPERIOR PERFORMANCE.
DESIGNED FOR A MORE EFFICIENT FUTURE.

Our integrated thermal architecture delivers measurable improvements in efficiency, stability, and scalability across infrastructure environments.

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FINANCIAL IMPACT

Designed to deliver measurable financial returns through lower operating costs, reduced energy consumption, and long-term infrastructure resilience.

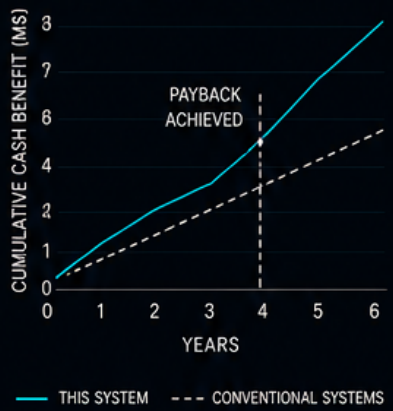
METRIC	PERFORMANCE	DRIVER
PAYBACK PERIOD	2 – 4 YEARS	OPEX savings + energy reduction
ANNUAL OPEX REDUCTION	20 – 35%	Lower compressor runtime
LIFECYCLE COST REDUCTION	25 – 40% OVER 10 YEARS	Extended equipment lifecycle

COST EFFICIENCY DRIVERS

- Reduced compressor runtime
- Lower total energy consumption
- Fewer maintenance interventions
- Extended equipment lifecycle

ROI OVER TIME

[ROI GRAPH]



ANNUAL COST SAVINGS

[COST SAVINGS CHART]

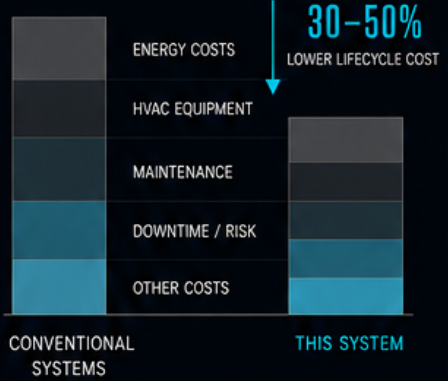
TOTAL ANNUAL SAVINGS

30 – 50%

OF TOTAL COOLING COSTS

LIFECYCLE COST COMPARISON

[LIFECYCLE SAVINGS INFOGRAPHIC]



FINANCIAL SUMMARY

Payback in 2–4 years • 20–35% annual OPEX reduction • 25–40% lifecycle cost savings over 10 years

Lower costs.
Higher efficiency.
Stronger returns.

NEXT-GENERATION INFRASTRUCTURE

BUILT-IN SYSTEM RESILIENCE

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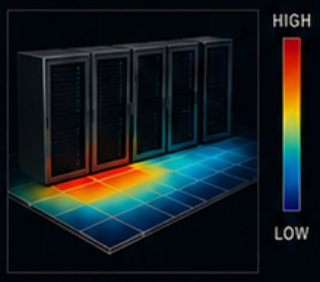
Engineered to maintain thermal stability, reduce operational risk, and ensure continuous performance across hyperscale infrastructure environments.

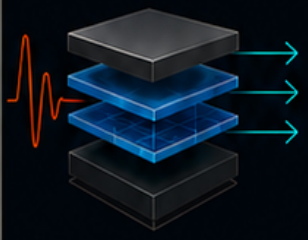
HOTSPOT PREVENTION

Active and passive thermal strategies maintain stable temperature distribution and reduce hotspot formation across critical IT environments.



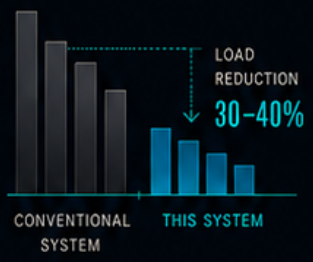
THERMAL BUFFERING

Integrated thermal mass and active cooling gel buffering absorb transient thermal spikes and stabilize system performance.



MECHANICAL LOAD REDUCTION

Optimized thermal management reduces HVAC runtime stress and lowers dependence on conventional mechanical cooling systems.



UPTIME CONSISTENCY

Stable operating temperatures improve uptime reliability and support continuous mission-critical performance.

DEPLOYMENT MODEL

EPC INTEGRATION

Full Engineering, Procurement, and Construction support for turnkey infrastructure deployment.

END-TO-END DELIVERY.
ONE ACCOUNTABLE PARTNER.

RETROFIT COMPATIBILITY

Designed for seamless integration into existing data centre infrastructure with minimal operational disruption.

UPGRADE WITHOUT DISRUPTION.

SCALABLE DEPLOYMENT

Modular architecture supports phased deployment and future infrastructure expansion.

BUILT TO SCALE WITH YOUR GROWTH.

RESILIENT BY DESIGN. DEPLOYED WITH CONFIDENCE.

Our integrated thermal architecture enhances reliability, simplifies deployment, and supports long-term operational resilience for mission-critical environments.

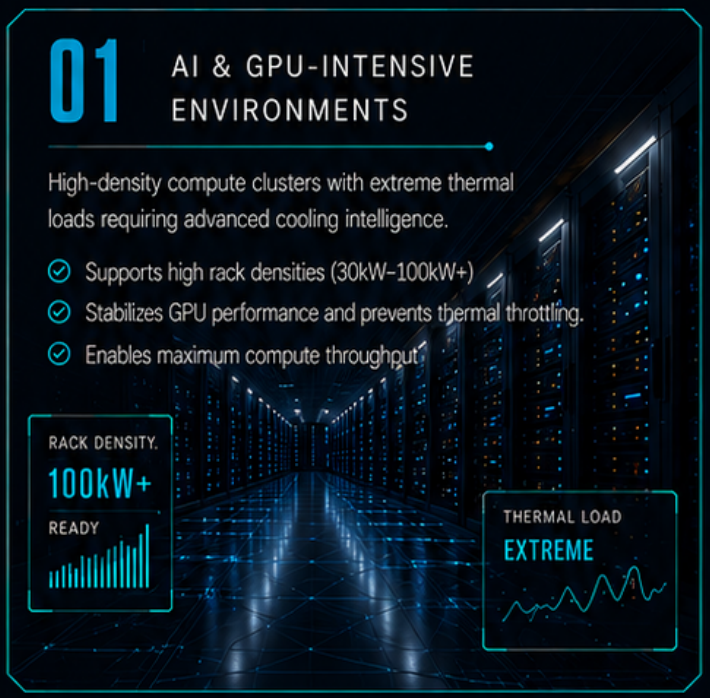
APPLICATION AREAS

Versatile. Scalable. Engineered for the world's most demanding digital infrastructure environments.

01 AI & GPU-INTENSIVE ENVIRONMENTS

High-density compute clusters with extreme thermal loads requiring advanced cooling intelligence.

- Supports high rack densities (30kW–100kW+)
- Stabilizes GPU performance and prevents thermal throttling.
- Enables maximum compute throughput



02 HYPERSCALE DATA CENTRES

Designed for scale, efficiency, and operational consistency across massive deployments.

- Reduces PUE and energy consumption
- Supports standardized modular deployment
- Ensures long-term reliability and uptime

03 EDGE FACILITIES

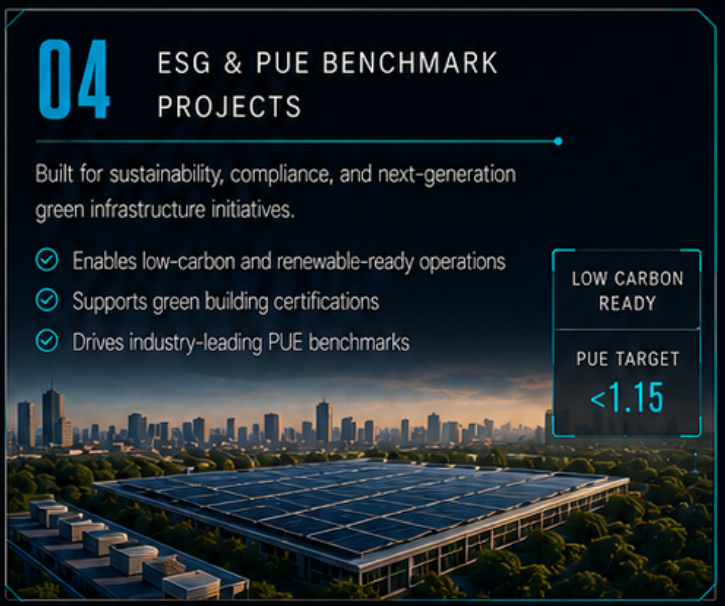
Compact, reliable, and efficient thermal management for distributed edge infrastructure.

- Optimized for small-footprint environments
- Passive-active hybrid design for energy efficiency
- Ensures reliability in remote and harsh conditions

04 ESG & PUE BENCHMARK PROJECTS

Built for sustainability, compliance, and next-generation green infrastructure initiatives.

- Enables low-carbon and renewable-ready operations
- Supports green building certifications
- Drives industry-leading PUE benchmarks



ENGINEERED FOR ANY ENVIRONMENT. BUILT FOR EVERY CHALLENGE.

From high-density AI clusters to distributed edge sites, our thermal architecture adapts to your infrastructure — today and for the future.

NEXT-GENERATION INFRASTRUCTURE

READY TO REDEFINE COOLING?

The next evolution of data centres lies in embedding thermal intelligence into infrastructure—not adding it later.

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Our integrated thermal architecture delivers measurable performance, operational resilience, and long-term infrastructure value—at every scale.

THERMAL INTELLIGENCE

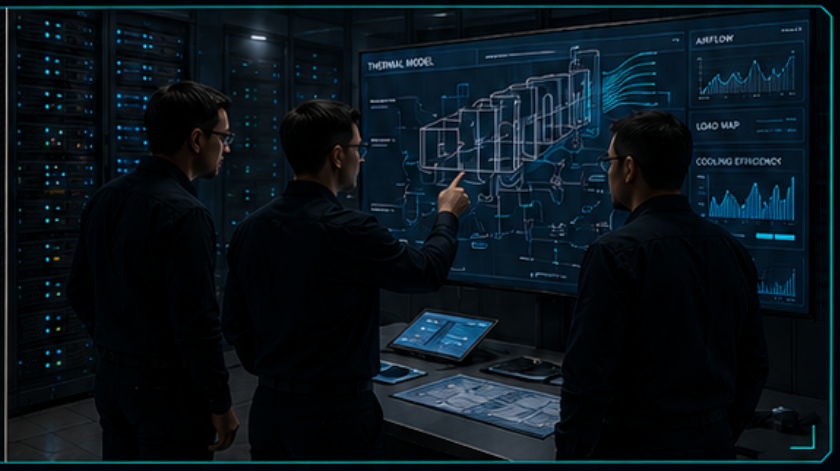
ENERGY OPTIMISED

SCALABLE ARCHITECTURE

MISSION CRITICAL RELIABILITY

SCHEDULE A TECHNICAL CONSULTATION

Speak with our engineering experts to explore how our thermal architecture can optimize your data centre performance, efficiency, and future scalability.



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