Your Trusted Partner for AI and HPC Data Center Services!

AI and HPC workloads are pushing data centers beyond traditional cooling and power limits. Compu Dynamics delivers end-to-end design, build, and operational support services to ensure your data center achieves maximum performance, reliability, and scalability. With expertise in high-density power solutions and advanced liquid cooling technologies, we help you overcome operational challenges, streamline vendor management, and maintain optimal system efficiency.

Expertise
Proven success in designing, installing, and maintaining advanced mechanical systems, liquid cooling, high-density power distribution, and network infrastructure for mission-critical data centers.

Experience
15+ large-scale row- and rack-based liquid cooling deployments nationwide, leveraging cutting-edge technologies to create tailored AI/HPC solutions.

Execution
Delivering industry-leading project management combined with the capabilities of a self-performing contractor, providing end-to-end services to ensure on-time completion and reliable operations.

Solving the Industry's Biggest Challenges.

Liquid cooling adoption and maintenance introduces a new set of complexities for AI and HPC driven data centers, such as:

- **Multiple equipment manufacturers** provide differing service offerings, which create inconsistencies in support.

- **Varied service contracts and SLAs** make managing access, response times, and maintenance schedules disjointed.

- **Drastically different pricing structures** from each equipment manufacturer.

- **Access control and vendor coordination** add complexity to navigating multi-vendor service logistics.

- **Inconsistent SLAs from different vendors,** which can lead to unexpected downtime.

Compu Dynamics simplifies liquid cooling installation, integration, and servicing with comprehensive, full-life cycle solutions. We serve as your single point of contact for seamless coordination and ensure that your infrastructure operates at peak efficiency.

CompuDynamics
UPTIME IN NO TIME

703-796-6070 | info@compu-dynamics.com

Liquid Cooling Infrastructure Expertise

We provide a single point of contact for all AI and HPC liquid cooling needs, covering design, procurement, installation, commissioning, and long-term maintenance.

- **Coolant Distribution Units** (CDUs): In-Rack and Floor-Mounted CDUs
- **Rear Door Heat Exchangers** (RDHx)
- **Direct-to-Chip Cooling**
- **Immersion Cooling**
- **Piping, Fittings, and Hoses** - design, fabrication, and installation of ultra-clean piping systems
- **Headers**
- **In-Rack Manifolds** (installation and maintenance)
- **Coolant and fluid management**

Comprehensive AI and HPC Data Center Services

We provide comprehensive solutions for every stage of your AI-driven data center, from planning and design to deployment and long-term maintenance, ensuring seamless integration and peak performance.

Design and Build Services

Strategic Support
- Design consultation for power and cooling capacity planning.
- Collaboration to identify the best solutions and develop a detailed scope of work.
- Providing comprehensive design schematics, permit documents, and product specifications.
- Vendor-neutral support for supplier comparisons and selection.

White Space Integration
- High-density power distribution systems, from switchgear to rack.
- Busway or RPP and whip installations.
- Water/cooling infrastructure.
- Network/low-voltage structured cabling.
- Equipment placement.
- End-to-end project management and oversight.

Professional Services

- Data center build-out and retrofit consultation.
- Equipment evaluation and selection consulting.
- Infrastructure deployment and expansion project management for coordinated delivery, installation, and commissioning.
- On-site staffing for cooling system oversight.
- Pre-install validation (site walks) to ensure infrastructure readiness before deployment.
- Installation and startup services.
- Commissioning and testing.
- Transition to production, including handoff training and documentation.

Preventative Maintenance and Emergency Services

- Regular system inspections for early detection of potential failures and inefficiencies.
- Leak detection and remediation to prevent catastrophic cooling failures.
- Vendor coordination and management to oversee multi-vendor maintenance.
- Fluid sampling and analysis to ensure ultra-clean coolant.
- Service record management for documented maintenance and compliance audits.
- Coolant and fluid non-conformance remediation and corrective actions.
- 24/7 First Responder support for emergency diagnostics and repairs.
- On-site Smart Hands services for troubleshooting and infrastructure recovery.
- Packaged Maintenance Services.

Effortless Data Center Maintenance with Pre-Packaged CompuCare Options

Compu Dynamics simplifies data center operations with pre-packaged maintenance service options designed for seamless, worry-free support. With decades of experience, we cover every critical aspect of your infrastructure's life cycle—ensuring maximum uptime, efficiency, and reliability. From routine maintenance to full-scale operational management, our expert solutions streamline your daily operations, reduce risk, and keep your facility running at peak performance. **Let us handle the maintenance, so you can focus on your business.**

CompuCare Basic

- Preventative Maintenance
- Coolant/Fluid sampling and analysis
- Service Record Maintenance
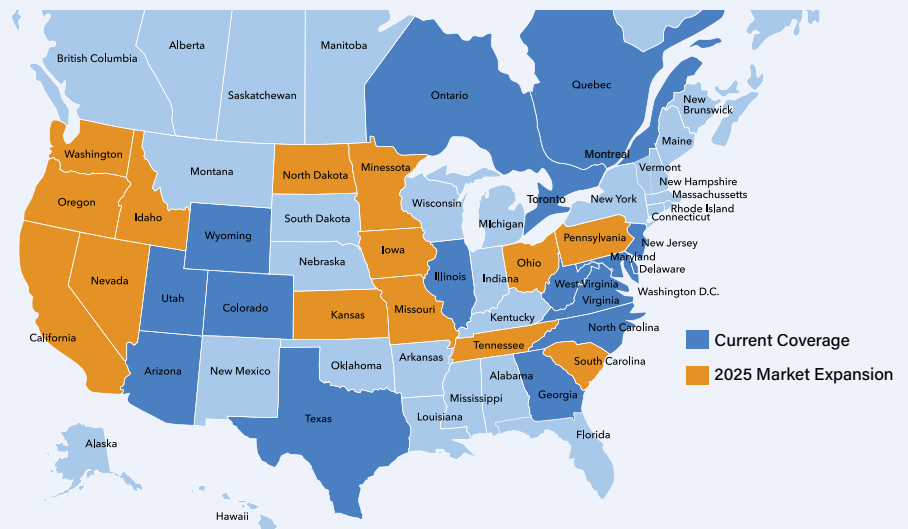- Prearranged Time and Materials agreement

CompuCare Plus

- Everything in Basic. And:
- Warranty labor support
- Coolant/Fluid non-conformance remediation
- Help Desk/Tech Support
- Next Business Day Onsite Response

CompuCare Premier

- Everything in Plus. And:
- Dedicated Customer Success Manager
- 4-Hour Onsite Response SLA 24/7/365

Comprehensive North American Coverage: Where You Need Us, When You Need Us.

Compu Dynamics provides top-tier data center construction and operations solutions across North America, leveraging self-perform capabilities and a vast network of top-notch partners. This ensures rapid scalability, expertise, and efficiency in every project, from new AI infrastructure builds and hyperscale cloud deployments to legacy data center modernizations, delivering seamless execution in all key markets.

Legend:
- Current Coverage
- 2025 Market Expansion

Industry leading partner ecosystem:

At Compu Dynamics, we stand by our commitments, ensuring you enjoy peace of mind knowing your project is in capable hands. We are one of the top VARs and certified service partners for many leading manufacturers. This means we can not only install and service their products, but also **procure them for you at a substantially lower cost.**

Schneider Electric · submer · Starline (A brand of legrand) · nVent · VERTIV · STULZ · CoolIT systems · motivair

RITTAL · DCX · flex · pwrq · jetcool · CORNING · COMMSCOPE · USystems (A brand of legrand)

Key Considerations for a Successful Liquid Cooling Deployment

Deploying liquid cooling in a data center requires careful planning and strategic execution to ensure optimal performance, reliability, and scalability. From power density and infrastructure materials to fluid flow dynamics and system integration, every aspect must be evaluated to support both current and future operational demands. Addressing these considerations upfront helps minimize risks, streamline deployment, and maximize efficiency in high-density environments.

✓ **Power and Density:**
- Rack power densities (day one and future)
- Total POD power density (day one and future)
- CDU selection (matching capacity and POD density)
- CDU redundancy (N+1 or N+?)
- Spare CDU loop taps for future expansion

✓ **Infrastructure and Materials:**
- Piping material selection
- Drip pans and leak detection
- Building supports: Will the ceiling grid support new overhead piping? Will the raised floor support rack weight and/or CDU?

✓ **Fluid Flow and Cooling:**
- At the chip level: target fluid flow rate and operating temperatures
- In-rack manifolds: port-quantity / size / fitting type and flow control devices
- Secondary POD piping location (overhead or bottom)
- Secondary loop redundancy (isolation and bypass)
- Primary and secondary loop filtration.

✓ **System Integration and Maintenance:**
- BMS integration and auxiliary sensors (temperature, flow, pressure, leak detection)
- System validation, commissioning, operation, maintenance, and repair

Built for Scale.
Engineered for Performance.

Compu Dynamics is redefining how data center infrastructure is built, optimized, and maintained. Whether constructing new state-of-the-art facilities or retrofitting legacy sites, we provide the expertise, adaptability, and technology necessary to meet the growing demands of AI and high-performance computing.

Let's power the future together.

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