

CoolTrain™

Go with the smart flow

Ready-built valve trains for direct-to-chip
liquid cooling in data centers



Level up your liquid cooling with CoolTrain™

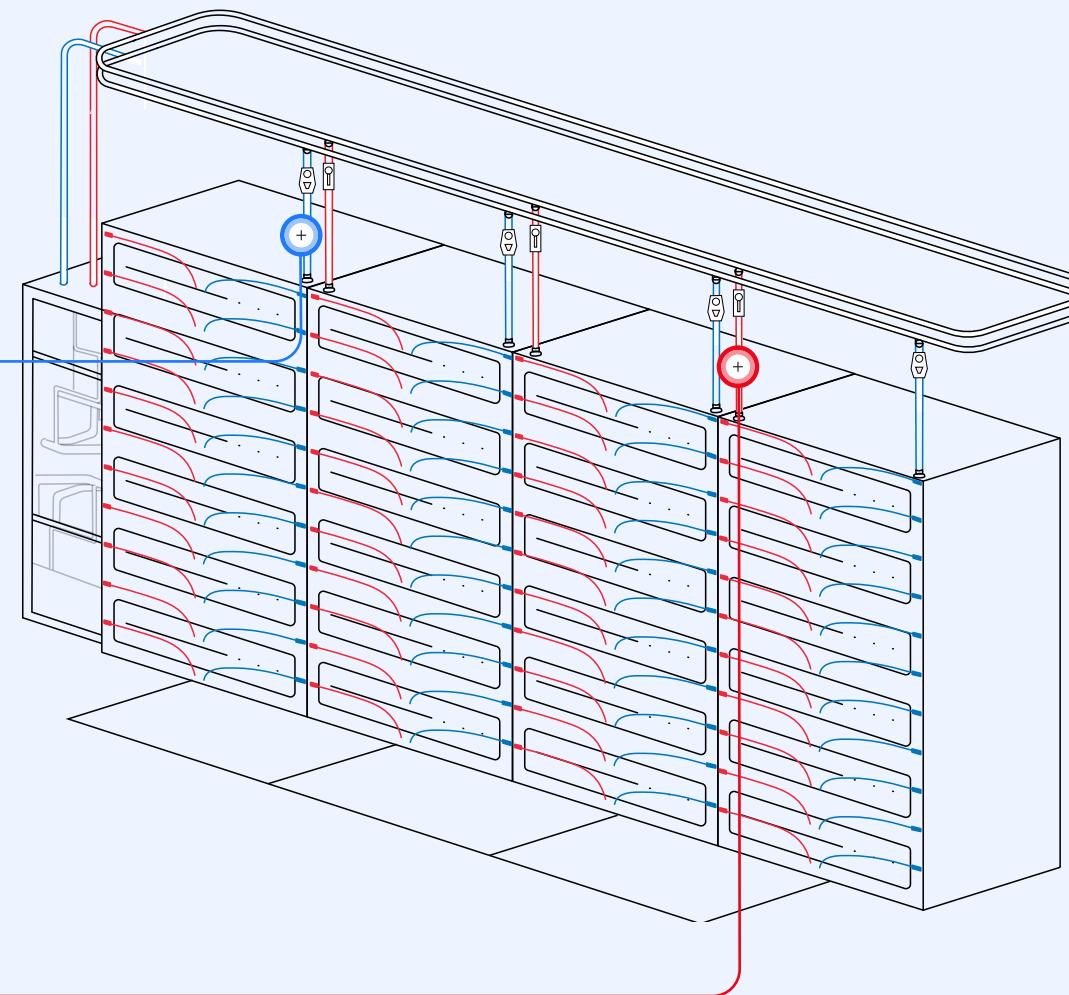
Liquid cooling is essential for managing high-density computing environments required for AI workloads but its reliability and energy efficiency depend on a consistent and optimized coolant flow.

With Danfoss CoolTrain™, you can level up your liquid cooling systems with ready-built valve trains. This plug-n-play solution built to your custom specifications connects your TCS loop and server racks and enable modular, scalable, and staged deployment.

Danfoss provides a customizable solution that accelerates deployment and reduces risk of leaks and downtime as well as enabling optional telemetry for real-time monitoring. From engineering to installation and operation, CoolTrain™ ensures a smart flow.

Understanding the CoolTrain™ solution →

CoolTrain™ serves as the physical connection between the Technology Cooling System (TCS) and server racks in data centers. This plug-n-play solution provides dynamic hydronic balancing to maintain an optimal flow, even when rack loads change and cause fluctuating pressure conditions.



CoolTrain™ components

Built on proven tech

1. Danfoss Hansen® FD83 Quick Disconnect Coupling

Industry-preferred interlockable couplings engineered for full-flow performance and easy service. FD83 couplings use a patented dual-interlock safety mechanism that prevents accidental disconnection or spills, ensuring consistently reliable, leak-free operation.

2. Danfoss AB-QM 4.0 PICV valve

Delivers precise, pressure-independent flow control up to 83 LPM | 22 GPM for liquid-cooled racks, ensuring thermal stability by automatically compensating for dynamic IT loads. Constructed from corrosion-resistant materials with proven chemical compatibility, it optimizes CDU efficiency and mitigates thermal risks. This enhances overall system reliability and contributes to superior power and water usage effectiveness (PUE / WUE).

3. NovoCon® S digital actuator

Enhances the AB-QM valve by providing intelligent control and seamless integration into your DCIM or BMS via BACnet or Modbus. It delivers real-time telemetry on flow, temperature, and system diagnostics, enabling remote optimization and predictive maintenance. This ensures maximum cooling efficiency and operational resilience for your data center.

4. EHW194 Boston® Royal by Danfoss hoses (incl. hose fittings and clamps)

These non-conductive hoses offer high flexibility with torsional strain and kink resistance to simplify routing in tight spaces, and ease installation and maintenance.

5. Danfoss AMZ112 – Motorized Isolation ball valve

Enables reliable coolant shut-off for service and maintenance, operating on 24V DC with 3-point signal control. For operational safety, it includes a manual override clutch, an auxiliary switch for position feedback, and a secure M12 connector for plug-and-play installation. Maintenance-free.

6. 90° Swiveling adapters

Made in solid 304SS, this 90-degree swivel adapter enables stress-free hose routing. The swivel feature prevents unnecessary pull on the elbow to prevent kinks in space-constrained rack environments.

7. Velcro tape

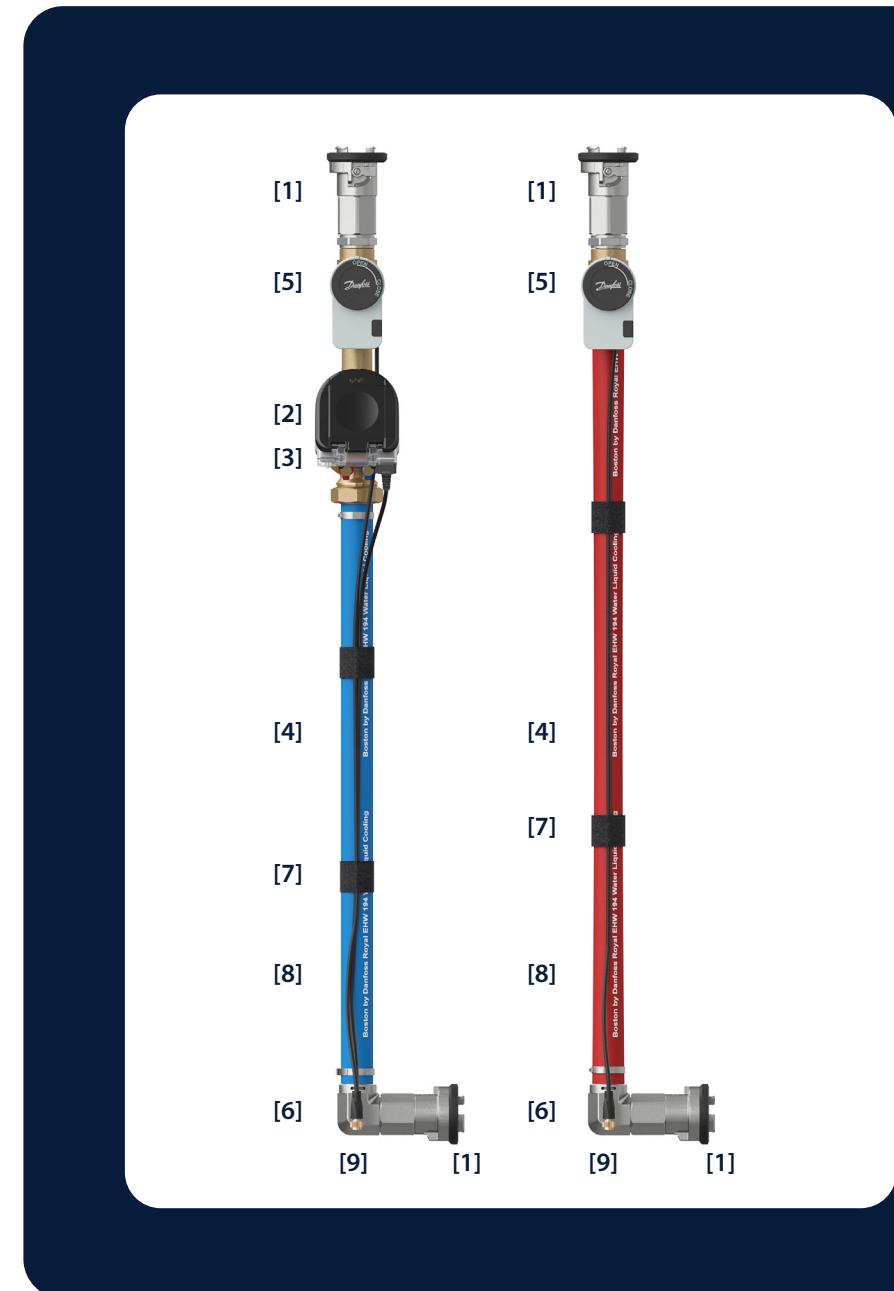
Effectively guides the actuator cables to the server rack.

8. Supply/Return labels (not pictured)

Product labels can be customized according to needs.

9. Cable connectors

The actuator cables are 5 meters | 16.4 feet long and equipped with standard M12 connectors, customizable to specific requirements.



Benefits

How CoolTrain™ gives you a smarter flow

Quality and compliance



Proven components ensure reliable performance, system up-time and compliance standards

CoolTrain™ integrates industry standards, quality components, rigorously proven in the field for over two decades. Corrosion-resistant materials ensure compatibility with all approved liquid cooling fluids.

Pressure tested for leakage-free performance and cleaned to ISO 4406 standards

Every CoolTrain™ is pressure tested after assembly to ensure leakage-free performance and cleaned to ISO 4406 standards. This prevents blockages and protects cold plates to ensure optimized chip cooling and maximum system uptime.

Planning and development



Cut time, costs, and risks with a customized, pre-assembled solution

CoolTrain™ is a modular solution, delivered pre-assembled and customized for your data centers. This delivery model cuts costs, risks, and project time through accelerated design and installation processes, simplified project management, a minimized need for on-site labor, and a faster project handover.

Wet shipment prevents contamination and fast-tracks installation

CoolTrain™ is delivered pre-filled with DOWFROST™ LC25 coolant and securely sealed. This prevents contamination and significantly reduces on-site flushing time, ensuring a rapid, reliable, and clean installation.

Operation and optimization



Continuous flow control maximizes PUE and WUE

CoolTrain's pressure-independent control valve ensures a precise, stable flow that automatically adapts to dynamic IT loads. It maximizes efficiency by reducing power and water use, leading to improved PUE and WUE metrics.

Optional telemetric solution enables predictive maintenance

Adding optional digital actuators allows CoolTrain™ to feed your facility management system (DCIM) telemetric data on flow, actuator position, remaining lifetime, alarms, and more. This in turn enables remote monitoring, predictive maintenance, and accurate energy consumption insights.



Customization options

FD83 Couplings

Regular or paired with a swivel adapter

EHW194 Boston Royal flexible hoses®

Customizable length, or choose from standard lengths: 2/3/3.5/4 meter | 82/118/138/158"

AMZ 112 Isolation ball valves

Standard in return train, optional in supply train.

Alternative shut-off function for supply train:

NovoCon® S or AME 120 NLX-1 actuator on AB-QM valve.

Product labels and cable connectors

Project Specific

Actuator options for AB-QM PICV (to order separately)

NovoCon® S - modulating, digital (BACnet/Modbus)

NovoCon® S cable assortment

AME 120 NLX-1 - modulating, UL certified



Proven coolant compatibility

Corrosion resistance: Built with materials that resist corrosion, ensuring reliability with glycol mixes.

Certified compatibility: Materials in contact with coolant meet standards or pass compatibility tests for safe operation.

Durable components: PICV and isolation ball valves made from DZR material, positively tested with coolant suppliers like Castrol and DoW.

Flushed and wet filled: Delivered with PG25 glycol, continuously monitored for chemical stability and consistent performance.



Let's level up liquid cooling – more solutions for data centers

Discover more tech, insights, knowhow, and simulation services to build efficient and reliable liquid cooling systems for data centers. With Danfoss, data center owners, designers, and developers get integral components and co-development opportunities for almost the entire ecosystem.

Scan or click the QR code to learn more.



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