

EVERY CONNECTION COUNTS



SOLUTION GUIDE

SENSORS FOR THERMAL MANAGEMENT/ LIQUID COOLING

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Efficient cooling starts with reliable sensing. In liquid-cooling environments, system intelligence depends on the quality of the data flowing through every loop. TE Connectivity sensors deliver real-time pressure, temperature and liquid level insight at all critical points—CDUs, pumps, cold plates, and tubing—so you can spot issues early, optimize performance, and scale with confidence.

From hyperscale data centers to high-density AI clusters, TE sensors transform liquid-cooling systems into data-driven assets. No guesswork. No blind spots. Just reliable, actionable insight that keeps your operation efficient, protected, and future-ready.

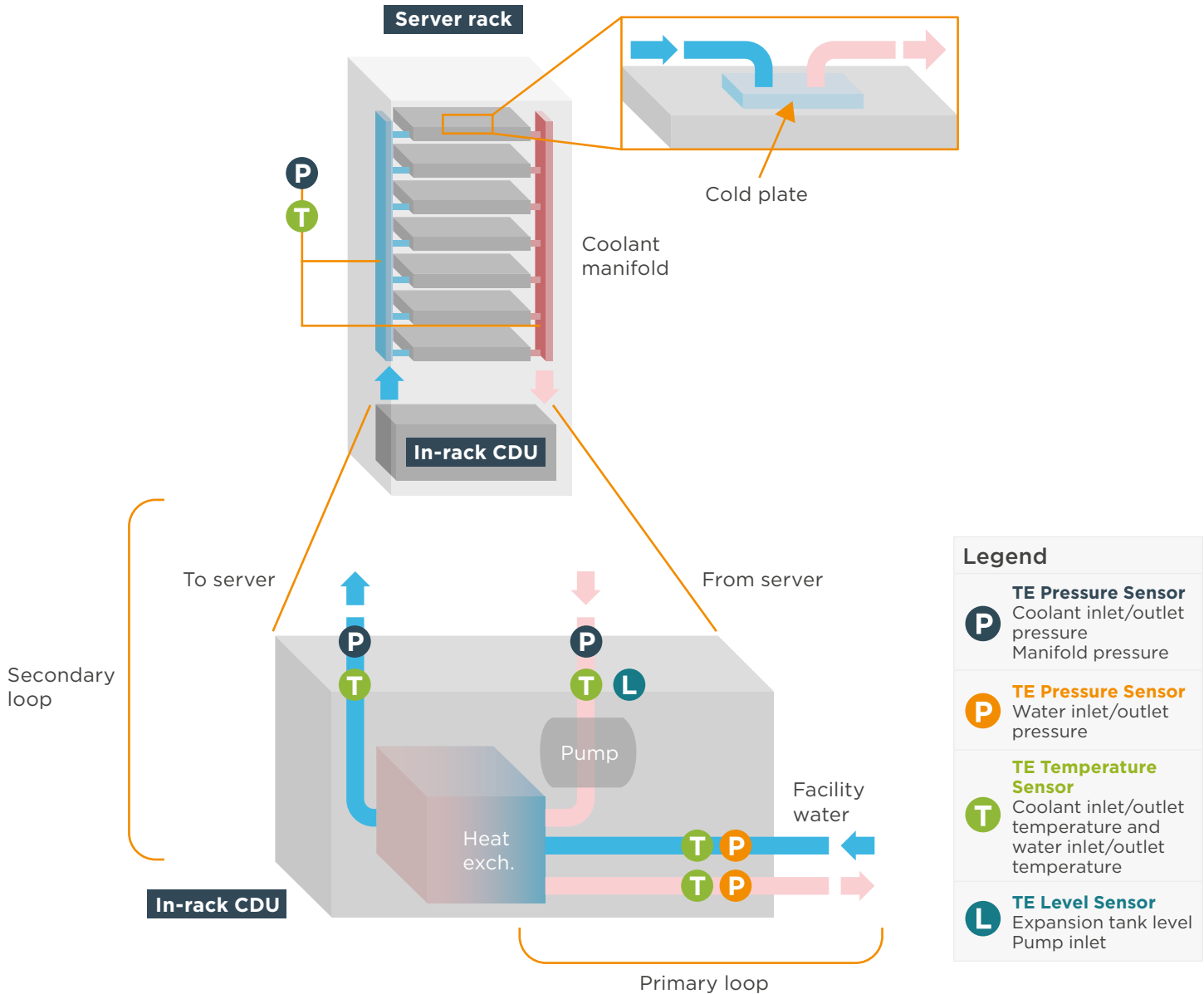
TE Connectivity's liquid-cooling sensor portfolio includes a wide variety of pressure transducers such as the [U5300/U5200 series](#), [U7100 series](#), [M5200 series](#), and finally the [M3200 series](#). For temperature monitoring TE provides multiple [RTD and NTC temperature probe options with the TRP100/TRN100 series](#). Also, in CDUs, monitoring the level of liquids in the system in an error free way is essential which can be achieved with level switches such as [LL-01 series](#) and the [LL-10 series](#) based on robust solid-state ultrasonic technology.

TE Sensors are engineered to deliver accurate, real-time insight across demanding cooling environments. Designed for current and next-generation data-center and industrial applications, these sensors combine high-precision measurement, compact integration, and rugged durability to keep your liquid-cooling systems operating with less complexity and greater reliability.

Key Advantages at a Glance

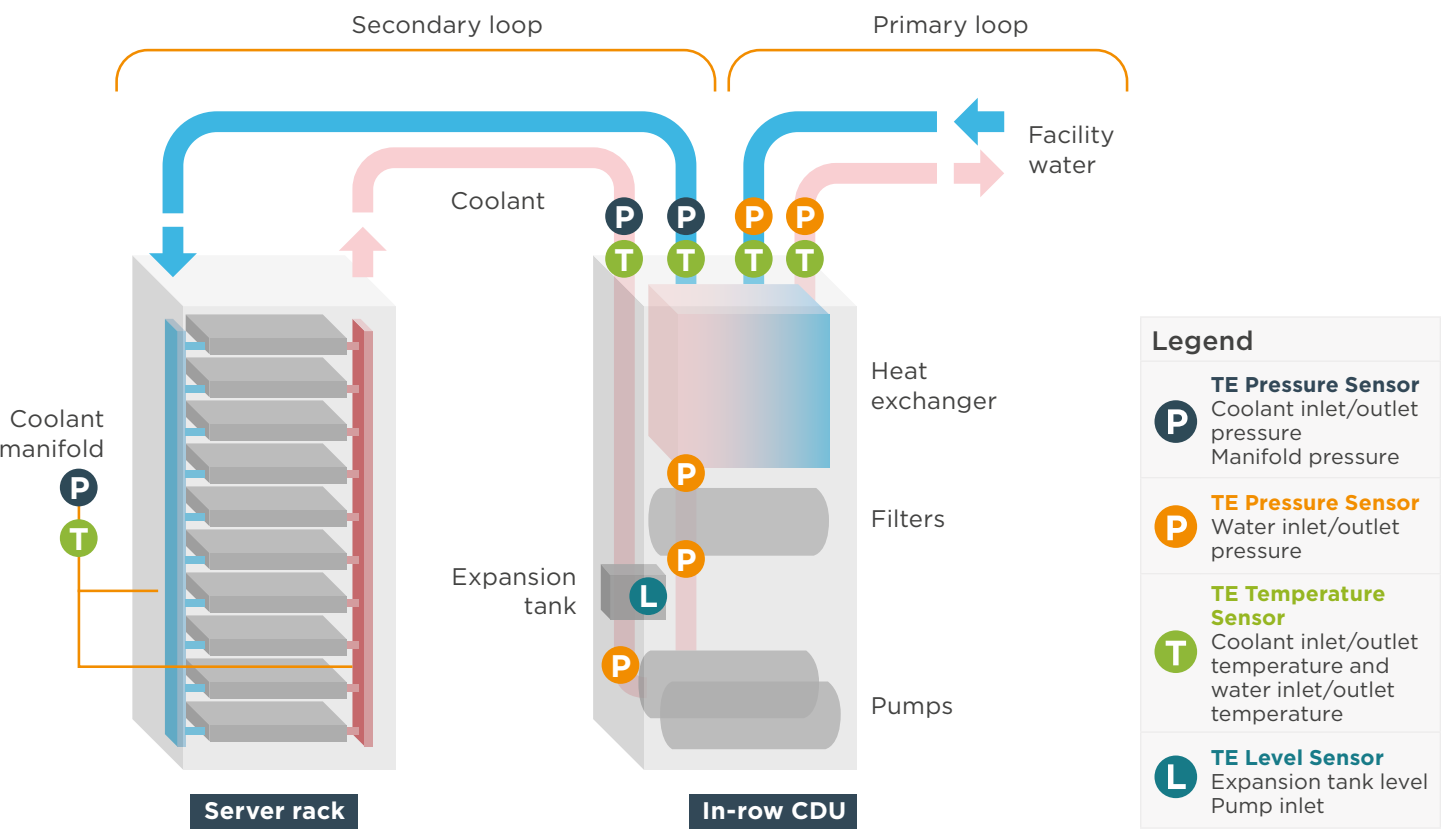
- Real-Time Thermal & Pressure Visibility
- Compact Form Factor
- Scalable for Current and Next-Gen Architectures
- Energy-Efficient & Sustainable Performance
- Proven, Rugged Sensor Technology

IN-RACK CDU ARCHITECTURE



- Figure 1:** Sensors used in the coolant and water loop of liquid to liquid CDUs (in-rack architecture)
Primary loop: Facility water supply to the CDU's heat exchanger
Secondary loop (TCS loop): Control loop of coolant to the server rack

IN-ROW CDU ARCHITECTURE



• **Figure 2:** Sensors used in the coolant and water loop of liquid to liquid CDUs (in-row architecture)
Primary loop: Facility water supply to the CDU’s heat exchanger
Secondary loop (TCS loop): Control loop of coolant to the server rack

	Sensor	Application	Key Product Features	Why Choose This Sensor?
Pressure	 U5300/U5200 Series Pressure Transducer	• Data Centers / Liquid Cooling • Thermal Management Systems • Industrial Process Control and Monitoring • Advanced HVAC Systems	• Highest Accuracy & Best Stability over time and temperature • Compact & Configurable • Analog output including 4-20mA options • Rugged construction and design using 316L Stainless Steel • UL Certified	• Supports precise control in critical cooling loops • Multiple output options speeds integration across diverse platforms • Reduces downtime in harsh environments • Enhances long term reliability • Fast & Flexible Delivery
Pressure	 U7100 Pressure Transducer	• Data Centers / Liquid Cooling • CDU to cold plate pressure monitoring • Filter inlet/outlet tracking for maintenance • Serve cooling system efficiency monitoring • Data center thermal management systems	• Low profile solution for tight spaces • Good accuracy and stability • Wide operating temperature range • Durability in harsh media • Rugged construction and design using 316L Stainless Steel • UL Certified	• Fits easily into constrained installations • Ensures reliable performance in harsh conditions • Delivers consistent system efficiency • Reduces service interruptions • Supports broad platform standardization
Pressure	 M5200 Pressure Transducer	• Data Centers / Liquid Cooling • Industrial process control and monitoring • Refrigeration systems	• Good accuracy and stability • Compact outline • Options for either 17-4 PH or 316L stainless steel • Variety of pressure ports and electrical configurations • Heavy industrial CE and UL approval	• Optimized for reliability and cost • Highly stable over time due to TE's Microfused™ technology • Ensures reliable performance in harsh conditions • Reliable accuracy across wide temperatures

	Sensor	Application	Key Product Features	Why Choose This Sensor?
Pressure	 <u>M3200 Pressure Transducer</u>	• Data Centers / Liquid Cooling • Energy and water management • General pressure measurements	• Good accuracy and stability • One-piece 17-4 PH stainless steel construction • CE compliant	• Highly stable over time due to TE's Microfused™ technology • All-metal, weld-free design ensures durability in harsh media • Compact and easy to integrate into tight industrial spaces • Flexible output and configuration options for seamless OEM integration • Competitive cost solution
Temperature	 <u>TRP100/ TRN100</u>	• Data Centers / Liquid Cooling • Industrial Process Control • Air Conditioning Systems	• High Accuracy & Stability • Rugged & Reliable • Configurable Sensor Options • Application Ready Design • Designed using 316L Stainless Steel	• Reduces field failures in harsh environments • Supports broad system compatibility • Speeds installation and maintenance
Level	 <u>LL-01 Series Ultrasonic Liquid Level Sensor</u>	• Data Centers / Liquid Cooling • Pump Protection • Storage Tanks • Coolant Reservoirs • Chillers	• Proven Ultrasonic Technology • High pressure up to 250 PSIG • Input 5 to 30 VDC • Output: Relay output, 0.5 amp SPST (normally open), Normally closed relay • No moving parts, easy to install • Designed using 316L Stainless Steel	• Minimizes maintenance and failure risk • Fits easily into tight cooling assemblies • Improves operational reliability in aerated liquids as compared to optical sensing solutions • Flexible Configuration Options • Digital filter techniques enhance performance
Level	 <u>LL-10 Series Ultrasonic Liquid Level Sensor</u>	• Data Centers / Liquid Cooling • Pump Protection • Storage Tanks • Coolant Reservoirs • Chillers	• Solid State Float™ technology for reliable operation • Input 5 to 30 VDC • Output: Relay output, 1 amp SPDT (normally open) and Power Loop output, 4 – 20 mA • No moving parts, easy to install • Designed using 316L Stainless Steel	• Flexible Configuration Options • Digital filter techniques enhance performance • Minimizes maintenance and failure risk • Fits easily into tight cooling assemblies • Improves operational reliability in aerated liquids as compared to optical sensing solutions

TURN COOLING INTO A DATA-DRIVEN ADVANTAGE

With accurate sensing at every critical point, TE transforms liquid-cooling loops into intelligent systems that improve uptime, control, and performance that equates to energy savings costs.

Have a unique challenge? We have you covered.

Discover how TE Connectivity's sensing solutions can transform your Thermal Management and Liquid Cooling applications. Our seasoned technical experts are only a click away. Click 'Connect with an Expert' to schedule a meeting. Access an invaluable reservoir of knowledge and experience and let us help you make the most informed decision for your project. Together, let's redefine the future of Thermal Management and Liquid Cooling in Data Centers.

Connect With Us

We make it easy to connect with our experts and are ready to provide all the support you need. Visit te.com/support to chat with a Product Information Specialist.

te.com/sensors

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TE Connectivity manufactures device components, which are available for sale only to device manufacturers, who are responsible for the development of the finished medical device or solution. TE does not itself develop finished devices or medical solutions. Device manufacturers customers are solely responsible for evaluating whether TE Connectivity's components are appropriate for incorporation into their finished devices and for assuring the safety and effectiveness of their devices

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