Creating a Better Future, FineTek Sensing the World

AI Server Liquid Cooling Sensing Measurement Solution

FineTek

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In AI cooling system applications within the AI supply chain, servers are the core equipment driving artificial intelligence computing. Their performance directly affects the processing speed, accuracy of AI algorithms, and overall system stability. The entire AI server industry encompasses a complete structure—from upstream hardware research and development and manufacturing to midstream server assembly and OEM services, and downstream software and data services.

Current mainstream AI server configurations often adopt a high-density rack-mounted design, with each rack housing multiple server chassis. These chassis integrate high-power components such as GPUs, CPUs, memory, power modules, and cooling systems. As the scale of AI models continues to expand, the heat power density of servers has significantly increased, and traditional air cooling is no longer sufficient to meet cooling demands. As a result, liquid cooling systems have gradually become a critical element in AI server design. To ensure the stable operation of the cooling system, liquid level monitoring has become especially important. Optical liquid level switches are an ideal choice to achieve this, as they can immediately issue an alert when coolant levels are low, effectively preventing system overheating and equipment damage.

AI Server Liquid Cooling Measurement and Multi-Point Sensing Application

Liquid Level Sensing: Applicable to coolant tanks, CDU (Cooling Distribution Units), or branch pipe systems, providing real-time monitoring of coolant level changes. It prevents cooling failure caused by excessively low liquid levels and triggers maintenance or system protection mechanisms through alarm outputs.

Flow Sensing: Installed in the primary supply and return pipelines of the cooling circuit, flow sensing detects the flow rate and circulation status of the coolant. When flow anomalies occur, it can immediately trigger an alarm, preventing reduced cooling efficiency caused by blockages, pump failures, or air bubbles.

Temperature Sensing: Deployed at the inlet and outlet of the CDU, near heat exchangers and key components within the server racks, temperature sensing continuously monitors both coolant and ambient temperatures. It helps optimize thermal management and dynamically adjust fan and pump operations.

Leak Detection: Applicable to high-risk areas such as cooling pipe junctions, the bottom of the server, and inside the CDU. Once a coolant leak is detected, an immediate alert is issued, helping quickly locate and address the issue, reducing the risk of server damage and downtime.

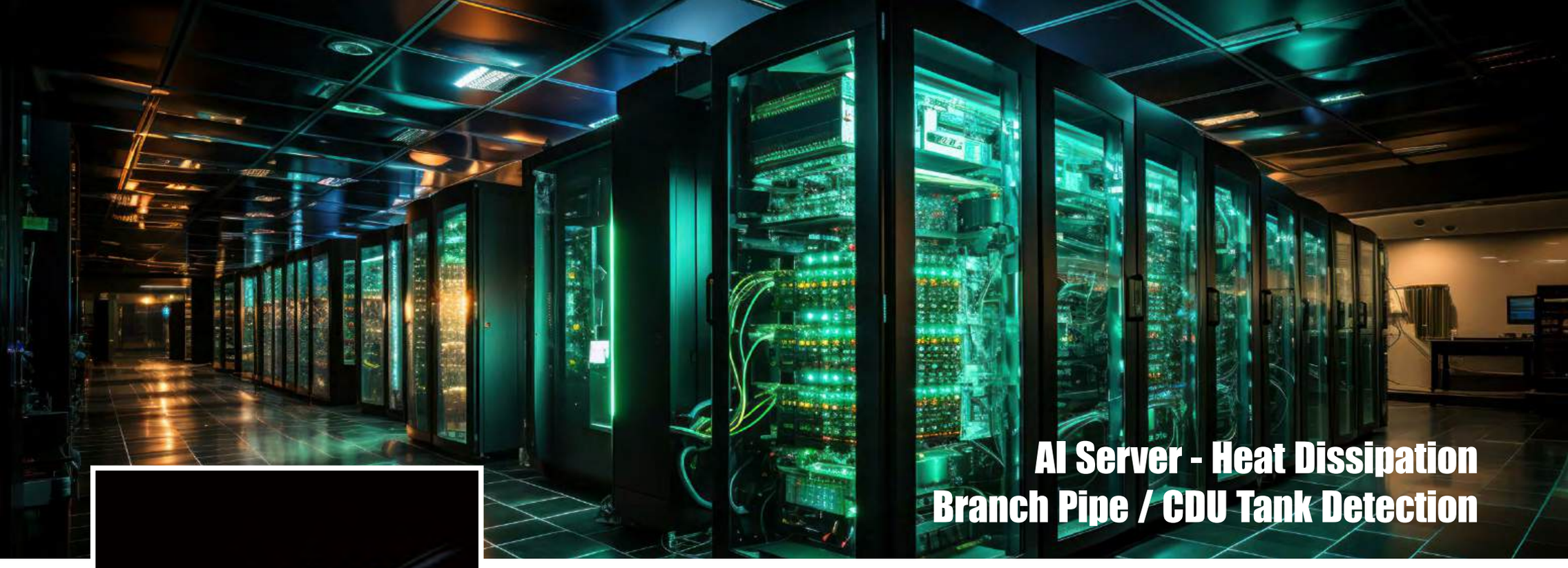
AI Server - Base Leak Detection

SDL Liquid Leak Detector

Introduction:
Using the principle of light reflection for detection, it employs infrared emitting components, infrared receiving components, and prisms. It can also detect leaks on stainless steel plates, plastic plates, or wooden surfaces. The device is compact, with a fast response time, high sensitivity, and it quickly recovers after being wiped clean following contact with liquid.

Advantages:
Optical systems can measure various types of liquids and are not affected by external ambient light.

Specifications:
1. Power Supply: 12~24VDC
2. Output Type: Three-wire NPN/PNP
3. Current Consumption: Max. 30mA
4. Operating Temperature: -20~80°C
5. Protection Rating: IP67
6. Connection Method: Lead type, 3-wire cable, length 2m
7. Material: Body: PFA, Cable: PFA coated, Mounting Base: PFA



AI Server - Heat Dissipation
Branch Pipe / CDU Tank Detection

SDX Optical Liquid Level Switch

Introduction:
Optical Liquid Level Switch is a high-precision, mechanical wear-free liquid level detection component, widely used in liquid cooling systems that require high stability and reliability. The core detection principle of this device is based on total internal reflection, enabling it to provide real-time liquid level alerts at critical moments, effectively preventing overheating or liquid leakage risks.

Advantages:
Simple, compact, durable, easy to install and clean, optical detection, LED status indication.

Specifications:
1. Power Supply: 10~28VDC
2. Output Type: Three-wire NPN/PNP
3. Current Consumption: <25mA
4. Operating Temperature: -20~100°C
5. Protection Rating: IP67
6. Connection Diameter: 3/8″ or 1/2″ , PT/PF
7. Operating Pressure: < 60 bar

AI Server - Cooling Pipeline Detection

EPT Thermal Mass Flow Meter

Introduction:
When the fluid comes into contact with the heated probe, it carries away the heat from the probe. By measuring the temperature change caused by the heat transfer, the flow velocity is determined. This is then converted into a 4-20mA current output, allowing simultaneous measurement of both temperature and flow rate.

Advantages:
A single sensor has both flow rate and temperature measurement functions. It can also detect liquids with impurities, as it has no mechanical structure.

Specifications:
1. Power Supply: 12~32VDC
2. Output Signal: 4~20mA, RS-485
3. Current Consumption: <100mA @24V
4. Temperature Measurement Range: -25~150°C
5. Protection Rating: IP68/IP69K
6. Connection Diameter: 1/4" or 1/2" PF quick connect
7. Operating Pressure: 100 bar

AI Server - Cooling Pipeline Detection

ECX8 Pressure Transmitter

Introduction:
Used with gases or liquids compatible with the contact materials, suitable for most pressure measurement applications. It converts the pressure within various defined ranges into a 4~20mA current output.

Advantages:
Compact in size, making it suitable for installation in spaces with limited room. The pressure connection fittings can be selected to match the connection requirements on-site.

Specifications:
1. Power Supply: 10~30VDC
2. Analog Output: 4~20mA
3. Accuracy: ±0.25% F.S.
4. Pressure Range: 05bar, 0~10bar
5. ** wetted materials:** SUS316L
6. Electrical Interface: M12 or Packard Metri-Pack 3
7. Operating Temperature: -40°C~85°C

AI Server - Cooling Pipeline Detection or Immersion Cooling Liquid Equipment

GPX8 Digital Communication Temperature Detector

Introduction:
The PT1000 RTD is encapsulated in a metal probe and filled with ceramic resin to allow it to be placed at the location to be measured. The PT1000 uses an RTD chip to collect temperature data, which is then converted into readable data by the MCU and transmitted via RS485. This enables users to monitor and record temperature changes.

Advantages:
Compact in size, making it suitable for installation in spaces with limited room. It offers high accuracy and fast response speed, enabling quick and precise temperature measurements.

Specifications:
1. Power Supply: 24 VDC ± 20%
2. Measuring Temperature: 0~100°C
3. Communication Interface: RS485 (Default 57600, 8-N-1)
4. Operating Temperature: -20 ~ 85°C
5. Protection Rating: IP67
6. Material: Housing: SUS304; Probe: SUS304
7. Process Connection: 1/4" PT

AI Server - Single-Phase Immersion Cooling Liquid Equipment

FDX Metal Mini Float Switch

Introduction:
The metal mini float switch is a simple and highly reliable liquid level detection component, especially suitable for single-phase immersion cooling systems. It provides stable and long-lasting liquid level detection functionality. The core component uses a reed switch, which does not require an external power source, making it ideal for energy-efficient and high-safety applications.

Specifications:
1. Maximum Voltage: 240Vac / 200Vdc
2. Contact Capacity: 50W / SPST
3. Maximum Current: 1A
4. Pressure Resistance: 10~30 kg/cm²
5. Operating Temperature: -20~120°C
6. Applicable Specific Gravity: 0.6~0.8

Advantages:
CP The most cost-effective and best-value control component.

EPU2 Integrated Clamp-on Ultrasonic Flow Meter

Introduction:
The installation process does not require cutting the pipeline or interrupting server operation, effectively avoiding the losses caused by system downtime. Its advanced ultrasonic technology can accurately measure the flow rate of cooling water under different temperatures and pressures, ensuring that the server operates within the optimal temperature range. This helps improve operational efficiency and extends the service life.

Advantages:
Simple to operate and easy to use, with support for both horizontal and vertical displays, accommodating a variety of installation angles.

Specifications:
1. Power Supply: 24Vdc @ 200mA
2. Medium Temperature: 0~60°C
3. Accuracy: ±2.0% (0.5m/s~5.0m/s)
4. Analog Output: 4~20mA, maximum load 500Ω
5. Communication Interface: RS-485 (Modbus) / IO-LINK (Hardware)
6. Protection Rating: IP65
7. Buttons: 5 keys for operation
8. Panel Display: 320x240 pixels QVGA IPS
9. Enclosure Material: Aluminum Alloy
10. Response Time: 0.5s/1.0s/2.5s/5s/10s/30s/60s
11. I/O Connector: M12-6pin

FineTek

The Best Solution for your Cooling process

FineTek Co., Ltd.

No.16, Tzuchiang St., Tucheng Industrial Park, New Taipei City 236, Taiwan R.O.C.

Tel: (886) 2 2269 6789 Email: info@fine-tek.com

Shanghai 86 21 6490 7260
Singapore 65 64526340
Indonesia 62 (021) 2958 1688
USA 1 909 598 2488
Germany 49 (0)4185 8083 12

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