Supmea

Energy Storage and Liquid Cooling Industry Solutions

Committed to process automation solutions

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DIRECTORY

Supmea Co., Ltd., founded in 2006, is a National High-Tech Enterprise specializing in R&D, manufacturing, sales, and service of process automation instruments. With a workforce of nearly 500 employees, the company is headquartered in Hangzhou Qiantang District – a hub integrating a national-level economic-technological development zone, university town, and cross-border e-commerce zone. Its Jiaxing Technology Park in Zhejiang features industry-leading facilities including an electromagnetic flowmeter calibration system, a 1,500 ㎡ laboratory, and two world-class SMT assembly lines.

Supmea's product portfolio spans temperature, pressure, flow, level, and analytical instrumentation, deployed across water/wastewater, energy/power, chemical, life sciences, and food/beverage industries. The company maintains over 40 domestic offices in China and has established overseas branches, offices, and warehouses, serving more than 700,000 enterprise clients across 139 countries and regions globally.

Qualifications and Honors

Honors

National High-Tech Enterprise | Memberofthe National T C124 Technical Committeefor Measurementand Controlof Automation | Zhejiang Province Specializedand Innovative Enterprise | ISO9001 Quality Management System Certification

Explosion-proof Certificate

Smart Pressure Transmitters (Intrinsic Safety) | Radar Level Meters (Explosion- Proof) | Vortex Flowmeters (Intrinsic Safety) | Thermocouples (Explosion- Proof)

Patent Certificate

PH Controller | Fully Automated Calibration Device for PH Controllers | Sampling Circuitfor Solution Resistivity Measurement | Ultrasonic Liquid Level Detection Method | Digital Pressure Gauge(P6) | PH Controller(6.0) | Isolation Conversion Circuit

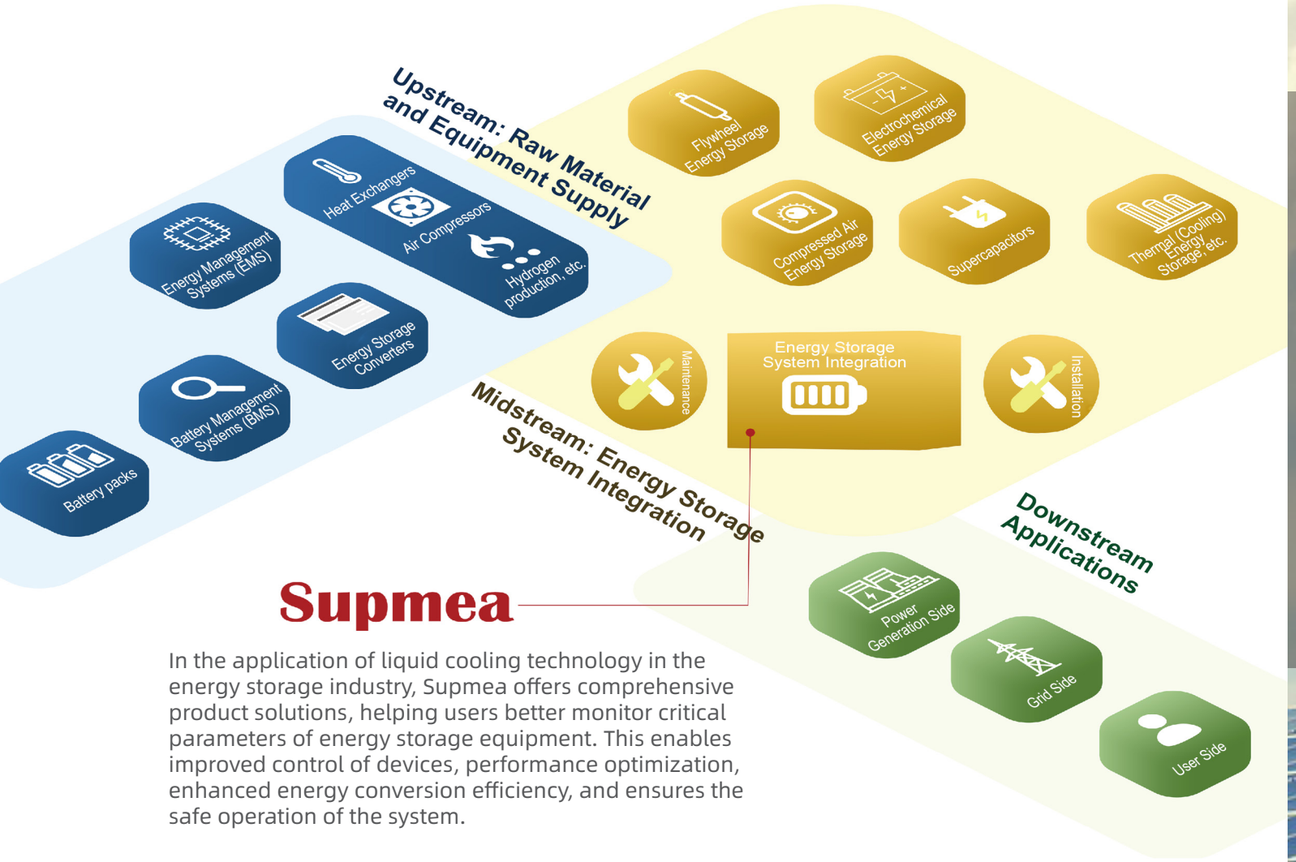
Trademark

China | Russia | Philippines | Korea | Malaysia | United States of America(USA) | Thailand | Singapore | Vietnam

CE Certificate

Electromagnetic Flowmeters | Radar Level Meters | Vortex Flowmeters | Conductivity Meters | Temperature Transmitter Modules | Isolators | PH Controllers

Supmea & Energy Storage Industry



Supmea

In the application of liquid cooling technology in the energy storage industry, Supmea offers comprehensive product solutions, helping users better monitor critical parameters of energy storage equipment. This enables improved control of devices, performance optimization, enhanced energy conversion efficiency, and ensures the safe operation of the system.

Amid the rapid transformation of energy structures and continuous innovation in energy storage technologies, the energy storage industry is pioneering a new chapter in the future. Its impact spans various areas, including energy supply, grid stability, renewable energy integration, electric transportation, and sustainable development.

Building an efficient cooling system significantly enhances the performance and efficiency of energy storage systems, extends equipment lifespan, ensures system safety and stability, optimizes energy conversion efficiency, and supports the integration of sustainable energy. This, in turn, drives the high-quality development of the energy storage industry.

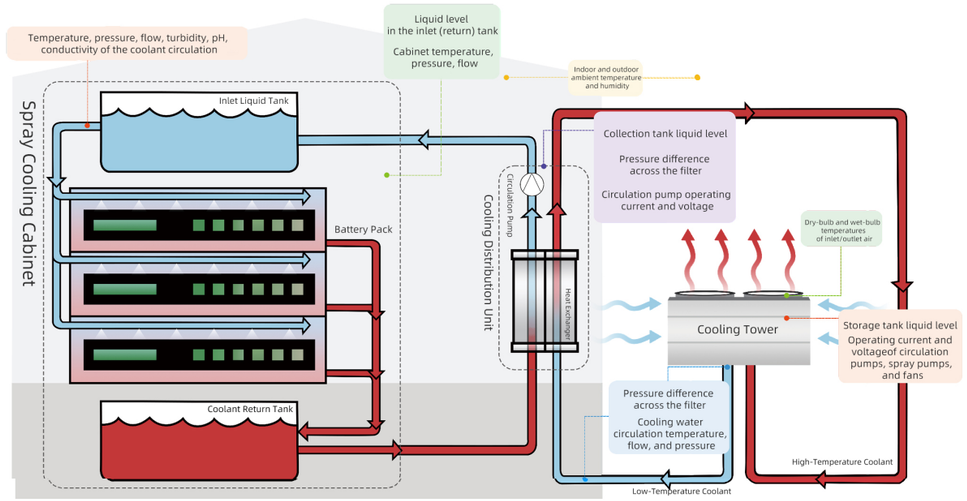
Supmea's process automation solutions encompass a wide range of instruments, including temperature, pressure, flow, level, analytical, and display/control series. These solutions are extensively and deeply applied in the energy storage industry, particularly in liquid cooling systems.

Through innovative technologies and applications, Supmea injects intelligence and efficiency into the energy storage sector, helping to advance progress and development in the energy field.

Application Scenario

Spray Direct Liquid Cooling

Spray cooling is a type of direct-contact liquid cooling designed for precise spraying on chip-level components. Using gravity or system pressure, the coolant is directly sprayed onto heat-generating components or thermally conductive elements connected to them. This method achieves 100% liquid cooling and features a structurally revolutionary design superior to immersion cooling. However, its energy-saving performance is less efficient compared to immersion cooling and shares similar limitations with the latter.

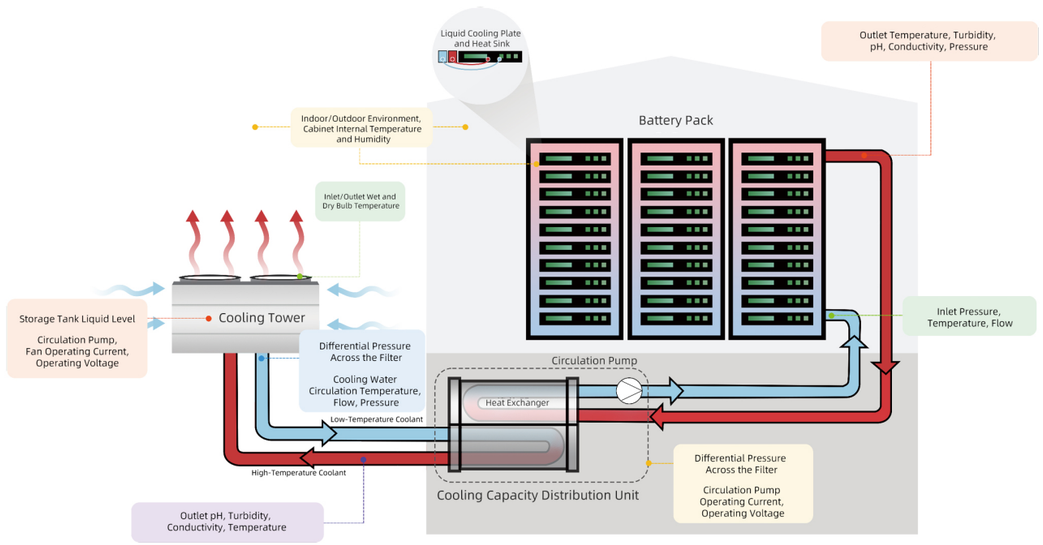


Parameter

Measurement Parameters	Detection Points	Recommended Products	Details (Page Number)
Temperature & Humidity	Outdoor, Indoor Environment	SUP-TH800 Temperature & Humidity Transmitter	14
Liquid Level	Primary Side Cooling Tower Storage Tank, Secondary Side Cooling Distribution Unit, Collection Tank, Secondary Side Cabinet Inlet (Return) Liquid Tank	WSU200 Integrated Ultrasonic Liquid Level Meter SUP-ULS-B Split Ultrasonic Liquid Level Meter	-
Operating Voltage	Primary Side Cooling Tower Circulation Pump, Spray Pump, Fan, Secondary Side Cooling Distribution Unit Circulation Pump	SUP-DJU AC Voltage Transmitter	-
Operating Current	Primary Side Cooling Tower Circulation Pump, Spray Pump, Fan, Secondary Side Cooling Distribution Unit Circulation Pump	SUP-DJI Current Transmitter	-
(Front and Rear) Pressure Difference	Primary Side Cooling Water Circulation Filter, Secondary Side Cooling Distribution Unit Filter	SUP-6100 Compact Differential Pressure Transmitter	-
Temperature	Primary Side Cooling Tower Inlet/Outlet Dry and Wet Bulb, Primary Side Cooling Water Circulation Cabinet Interior, Secondary Side Refrigerant Circulation	SUP-WZPK Armor-plated Resistance Thermometer SUP-PX202 Integrated Digital Temperature Transmitter	14
Flow	Primary Side Cooling Water Circulation Cabinet Interior, Secondary Side Refrigerant Circulation	FMC400 Electromagnetic Flow Meter LWGY-SUP Turbine Flow Meter	15/16
Pressure	Primary Side Cooling Water Circulation Cabinet Interior, Secondary Side Refrigerant Circulation	SUP-P300 Diffused Silicon Pressure Transmitter	18
Turbidity	Secondary Side Refrigerant Circulation	SUP-PTU550 In-line Turbidity Online Analyzer	17
pH	Secondary Side Refrigerant Circulation	SUP-PH5100 pH Pure Water Electrode SUP-PH8001pH Digital pH Electrode SUP-7003 pH Pure Water Electrode	17
Conductivity	Secondary Side Refrigerant Circulation	SUP-TDS-7001 Conductivity Stainless Steel Electrode SUP-TDS-8001 Conductivity Digital Electrode	18

Cold Plate Liquid Cooling

Cold plate liquid cooling is currently the most mature non-contact liquid cooling technology in the industry. This technology uses a liquid cooling plate (usually made of heat-conductive metals such as copper or aluminum to form a sealed cavity) to indirectly transfer the heat from the heating components to the coolant enclosed in the circulation pipeline, thus achieving an efficient heat dissipation form. Supmea can assist users in monitoring and optimizing parameters such as temperature, flow, pressure, and liquid level, ensuring the reliable automated operation of equipment.



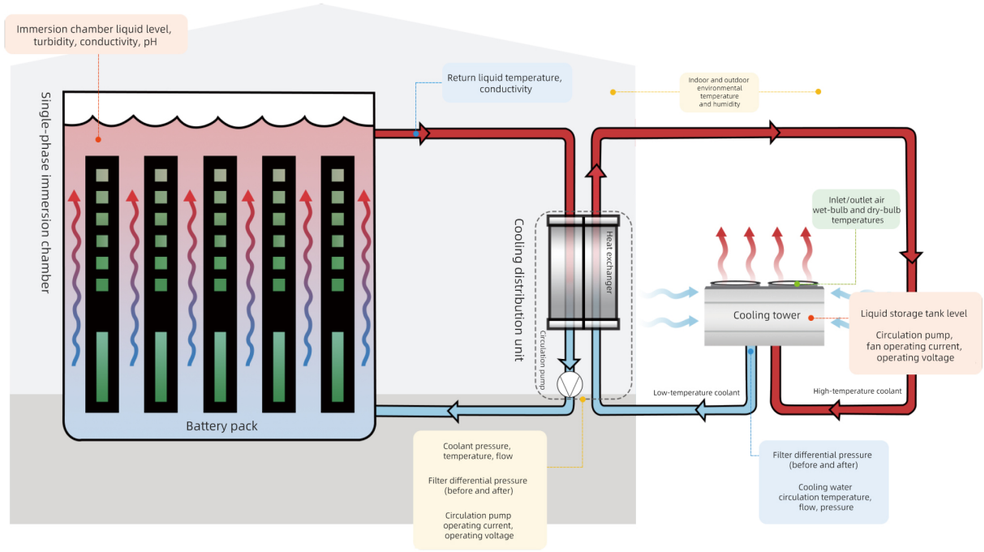
Parameter

Measurement Parameters	Detection Points	Recommended Products	Details (Page Number)
Temperature and Humidity	Outdoor, Indoor Environment, Cabinet Interior	SUP-TH800 Temperature and Humidity Transmitter	14
Liquid Level	Primary Side Cooling Tower Storage Tank	WSU200 Integrated Ultrasonic Level Meter SUP-ULS-B Split Ultrasonic Level Meter	-
Operating Voltage	Primary Side Cooling Tower Circulation Pump, Fan, Secondary Side Cooling Capacity Distribution Unit Circulation Pump	SUP-DJU AC Voltage Transmitter	-
Operating Current	Primary Side Cooling Tower Circulation Pump, Fan, Secondary Side Cooling Capacity Distribution Unit Circulation Pump	SUP-DJI Current Transmitter	-
(Differential) Pressure	Primary Side Cooling Water Circulation Filter, Secondary Side Cooling Capacity Distribution Unit Filter	SUP-6100 Compact Differential Pressure Transmitter	-
Temperature	Primary Side Cooling Tower Inlet/Outlet Wet and Dry Bulb, Primary Side Cooling Water Circulation Heat Exchanger Outlet, Cabinet Inlet, Cabinet Outlet	SUP-WZPK Armored Thermocouple，SUP-PX202 Integrated Digital Display Temperature Transmitter	-
Flow	Primary Side Cooling Water Circulation, Cabinet Inlet, Cabinet Outlet	FMC400 Electromagnetic Flowmeter， LWGY-SUP Turbine Flowmeter	15/16
Pressure	Primary Side Cooling Water Circulation, Cabinet Inlet, Cabinet Outlet	SUP-P300 Diffusion Silicon Pressure Transmitter	18
Turbidity	Heat Exchanger Outlet, Cabinet Outlet	SUP-PTU550 Online Turbidity Analyzer	17
pH	Heat Exchanger Outlet, Cabinet Outlet	SUP-PH5100 DH Pure Water pH Electrode SUP-PH8001pH Digital pH Electrode SUP-7003 Pure Water pH Electrode	17
Conductivity	Heat Exchanger Outlet, Cabinet Outlet	SUP-TDS-7001 Stainless Steel Conductivity Electrode SUP-TDS-8001 Digital Conductivity Electrode	18

Immersion Liquid Cooling (Single-phase)

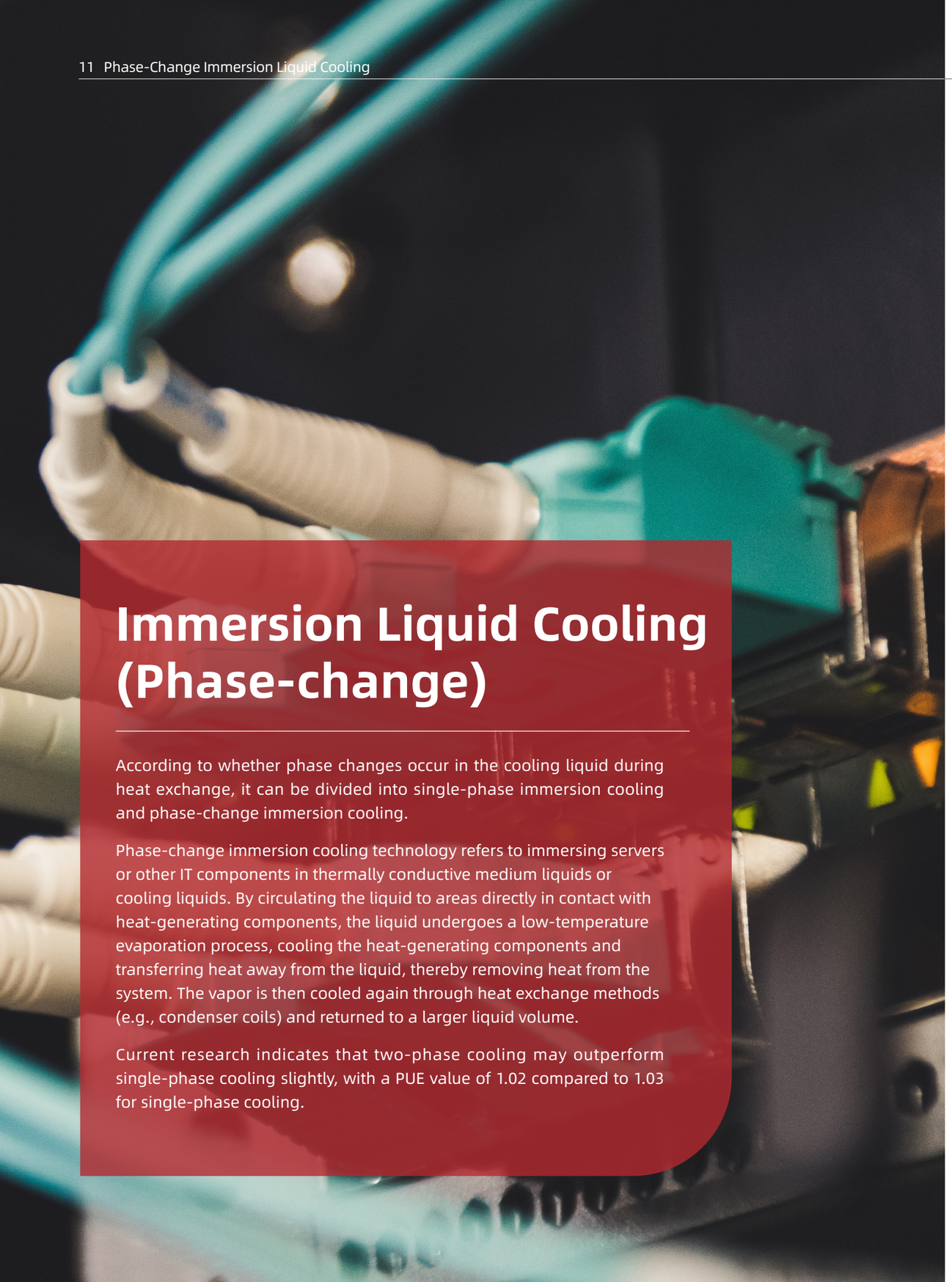
In the heat exchange process, based on whether the coolant undergoes a phase change, it can be categorized into two types: single-phase immersion cooling and phase-change immersion cooling. Servers or other IT components are submerged in a heat-conducting medium or coolant: the coolant remains in liquid form and does not boil or freeze. After coming into contact with the heated components, the coolant transfers heat to the cooling circuit through a heat exchanger. This technology, known as single-phase immersion cooling, achieves 100% liquid cooling and offers superior energy-saving performance.

Typically, maintenance requirements for single-phase immersion cooling solutions are much lower, and any adjustments are easier to access and maintain.



Parameter

Measurement Parameters	Measurement Points	Recommended Products	Details (Page Number)
Temperature and humidity	Outdoor and indoor environments	SUP-TH800 Temperature and Humidity Transmitter	14
Liquid level	Primary side cooling tower storage tank, secondary side immersion chamber	WSU200 Integrated Ultrasonic Level Meter SUP-ULS-B Split Ultrasonic Level Meter	-
Operating voltage	Primary side cooling tower circulation pump, fan, secondary side cooling distribution unit circulation pump	SUP-DJU AC Voltage Transmitter	-
Operating current	Primary side cooling tower circulation pump, fan, secondary side cooling distribution unit circulation pump	SUP-DJI Current Transmitter	-
Differential pressure (before and after)	Primary side cooling water circulation filter, secondary side cooling distribution unit filter	SUP-6100 Compact Differential Pressure Transmitter	-
Temperature	Primary side cooling tower inlet/outlet air wet-bulb and dry-bulb temperatures, primary side cooling water circulation, secondary side coolant circulation, secondary side cooling distribution unit return liquid	SUP-WZPK Armored RTD，SUP-PX202 Integrated Digital Temperature Transmitter	14
Flow	Primary side cooling water circulation secondary side coolant circulation	FMC400 Electromagnetic Flow Meter LWGY-SUP Turbine Flow Meter	15/16
Pressure	Primary side cooling water circulation Secondary side coolant circulation	SUP-P300 Diffused Silicon Pressure Transmitter	18
Turbidity	Secondary side immersion chamber	SUP-PTU550 Inline Turbidity Analyzer	18
pH	Secondary side immersion chamber	SUP-PH5100 pH Pure Water Electrode SUP-PH8001 pH Digital Electrode SUP-7003 pH Pure Water Electrode	17
Conductivity	Heat exchanger outlet liquid, secondary side cooling distribution unit return liquid	SUP-TDS-7001 Conductivity Stainless Steel Electrode SUP-TDS-8001 Conductivity Digital Electrode	18

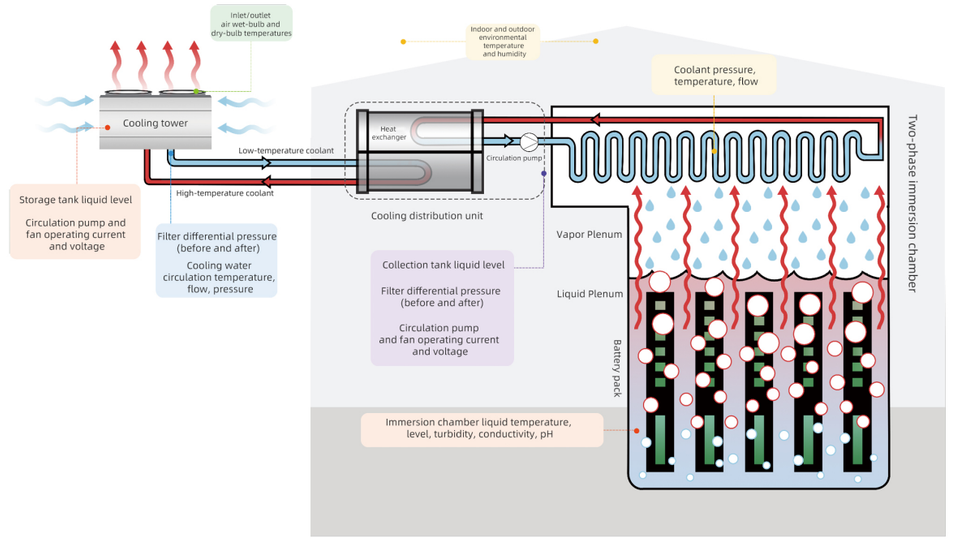


Immersion Liquid Cooling (Phase-change)

According to whether phase changes occur in the cooling liquid during heat exchange, it can be divided into single-phase immersion cooling and phase-change immersion cooling.

Phase-change immersion cooling technology refers to immersing servers or other IT components in thermally conductive medium liquids or cooling liquids. By circulating the liquid to areas directly in contact with heat-generating components, the liquid undergoes a low-temperature evaporation process, cooling the heat-generating components and transferring heat away from the liquid, thereby removing heat from the system. The vapor is then cooled again through heat exchange methods (e.g., condenser coils) and returned to a larger liquid volume.

Current research indicates that two-phase cooling may outperform single-phase cooling slightly, with a PUE value of 1.02 compared to 1.03 for single-phase cooling.



Parameter

Measurement Parameters	Measurement Points	Recommended Products	Details (Page Number)
Temperature and humidity	Outdoor and indoor environments	SUP-TH800 Temperature and Humidity Transmitter	14
Liquid level	Primary side cooling tower storage tank, secondary side immersion chamber	WSU200 Integrated Ultrasonic Level Meter, SUP-ULS-B Split Ultrasonic Level Meter	-
Operating voltage	Primary side cooling tower circulation pump, fan, secondary side cooling distribution unit circulation pump	SUP-DJU AC Voltage Transmitter	-
Operating current	Primary side cooling tower circulation pump, fan, secondary side cooling distribution unit circulation pump	SUP-DJI Current Transmitter	-
Differential pressure (before and after)	Primary side cooling water circulation filter, secondary side cooling distribution unit filter	SUP-6100 Compact Differential Pressure Transmitter	-
Temperature	Primary side cooling tower inlet/outlet air wet-bulb and dry-bulb temperatures, primary side cooling water circulation, secondary side coolant circulation, secondary side cooling distribution unit return liquid	SUP-WZPK Armored RTD, SUP-PX202 Integrated Digital Temperature Transmitter	14
Flow	Primary side cooling water circulation, secondary side coolant circulation	FMC400 Electromagnetic Flow Meter, LWGY-SUP Turbine Flow Meter	15/16
Pressure	Primary side cooling water circulation, secondary side coolant circulation	SUP-P300 Diffused Silicon Pressure Transmitter	18
Turbidity	Secondary side immersion chamber	SUP-PTU550 Inline Turbidity Analyzer	17
pH	Secondary side immersion chamber	SUP-PH5100 pH Pure Water Electrode, SUP-PH8001 pH Digital Electrode, SUP-7003 pH Pure Water Electrode	17
Conductivity	Heat exchanger outlet liquid, secondary side cooling distribution unit return liquid	SUP-TDS-7001 Conductivity Stainless Steel Electrode SUP-TDS-8001 Conductivity Digital Electrode	18

Product Recommendation

Temperature Series

Environmental Temperature and Humidity Monitoring

SUP-TH800

Suitable for environmental temperature and humidity measurement in main and auxiliary rooms

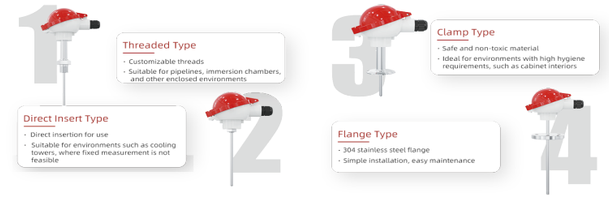
- IP63 protection rating, resistant to dew spray and dust;
- application range up to -20° C ~ 60° C (with display version) / 0-100% RH;
- Multiple probe options, including adjustable threads, sealed threads, and mounting brackets, flexible to meet on-site installation needs;
- RS485 interface, standard ModbusRTU, supports real-time data monitoring and display, historical data export, and data comparison queries.

With Display Version　　Without Display Version

SUP-WZPK

It meets the temperature measurement requirements in multiple operating conditions of liquid cooling.

- Integrated junction box structure, IP65 rating, efficient waterproofing, and protection against condensation to safeguard internal circuits;
- Stainless steel armor, resistant to temperature, vibration, and interference, with fast thermal response;
- German imported JUMO chip, Class A accuracy guarantee, precise and rapid temperature measurement, more reliable than the SUP-WRNK armored thermocouple;
- Paired with a temperature transmitter module, it provides a stable 4-20mA signal output, ensuring reliable remote transmission without delays.



SUP-PX202 Integrated Digital Temperature Transmitter can be used in combination with.

Flow Series

Circulating Water Flow Measurement

FMC400

Monitors the cooling fluid supply flow to meet the heat dissipation requirements of components

- Easy installation with built-in grounding electrode;
- Convenient operation with reverse flow indication;
- Precise measurement, 100% device calibration;
- Safe operation with independent wiring chamber;
- Smart diagnostics, equipped with air pipe detection technology.

Integrated Electromagnetic Flow Meter

parameter	
Model	FMC400 Electromagnetic Flow Meter
Instrument Diameter (mm)	DN10~DN2000 Optional
Nominal Pressure (MPa)	DN10~DN250: PN<1.6MPa DN300~DN1000: PN<1.0MPa Note: For individual specifications, refer to the nameplate (high pressure customization available)
Accuracy Grade	±0.5%
Range Ratio	1:10 Customizable
Body Material	Sensor: Carbon Steel (SS optional) Converter: Standard Die-cast Aluminum
Environmental Conditions	Storage Temperature: -20℃ ~+55℃ Ambient Temperature : -10℃ ~+55℃
Signal Output	4~20mA/Pulse Frequency
Communication Output	RS485、MODBUS Protocol
Working Power Supply	100VAC~240VAC/50(60)Hz; 20VDC~28VDC
Protection Level	IP65
Installation Method	Flange / Clamp / Thread

Secondary Side Refrigerant Circulation Flow Monitoring

LWGY-SUP

Used for measuring pure water, fluorinated liquids, ethylene glycol, propylene glycol

- Integrated precision-forged turbine core, accurate flow rate sensing, no false readings at low flow rates;
- Impeller made of duplex steel, body made of 304 stainless steel, offering corrosion and heat resistance;
- Upgraded SMART display, effectively filters noise interference, automatically eliminates small signals, supports switching between multiple units such as cubic meters, kilograms, and liters, accurate measurement of both instantaneous and cumulative flow;
- DN25~DN300 optional.

Turbine Electromagnetic Flow Meter

LWGY-B On-Site Display Type

Displays instantaneous/cumulative flow on-site, outputs 4-20mA standard signal, powered by 24VDC. RS485 or HART communication can be customized.

Thread connection Flange connection Clamp connection

LWGY-N Pulse Output Type

Three-wire pulse signal output, high-level 28V, low-level ≤0.8V signal transmission distance ≤500 meters, powered by 24VDC.

Thread connection Hirschmann connector/ Clamp connection

Liquid Analysis Series

Continuous pH Monitoring of Circulating Cooling Medium

pH-5100

Suitable for high-temperature pure water measurement applications

- Measurement Range：0~14pH；
- Temperature Range：0~130° C；
- Pressure Resistance：0.4MPa；
- Reference Type：Ag/AgCl；
- Shell Material: Glass；
- Electrode Interface：VP、S8M、K2, etc；
- Salt Bridge: OPEN, non-liquid junction salt bridge；
- Installation Thread：PG13.5。

pH-7003

Quick response, strong anti-pollution ability

- Measurement Range：2~12pH；
- Temperature Range：5~80° C；
- Pressure Resistance：0.6MPa；
- Reference Type：Ag/AgCl；
- Temperature Compensation Type：NTC10K、PT100、PT1000；
- Shell Material：PPS；
- Salt Bridge: Ring-shaped PTFE salt bridge；
- Installation Thread: Upper and lower 3/4 NPT pipe thread.

UP-PH6.5

Suitable for use with our company's pH electrodes

- Power Supply：100~240VAC，24VDC (optional);
- Power Consumption: Maximum 6W;
- Electrical Interface: M12*1.5 cable gland 1, M16*1.5 cable gland *2;
- Operating Temperature: 0-60 ° C, Relative Humidity: 10%-85% (non-condensing);
- Communication Output: Isolated, RS485 output, Modbus-RTU communication protocol；
- Supporting upper computer software, can support data leveling and communication for up to 32 controllers, enabling comprehensive data management.

CDU Primary Side Closed Loop Medium Turbidity Measurement

SUP-PTU550

Ultra-low turbidity detection limit, high precision measurement

- 0~20/100NTU low-range turbidity：2% or ± 0.02NTU (whichever is larger)；
- 0~2000NTUhigh-range turbidity：10% or ±0.5NTU (whichever is larger)；
- Based on Fommazin primary standard solution at 25° C；
- Third-generation laser light source technology, no external measurement probe required；
- Built-in RS485 Modbus communication, centralized remote monitoring；
- Data transmission, enabling automated control；
- Wall-mounted installation, simple and convenient, minimal manual maintenance required.

Liquid Analysis Series

Continuous Monitoring of Conductivity in Cooling Medium

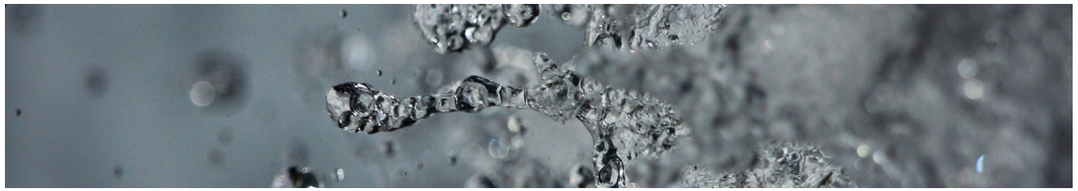
TDS-7001

Full metal housing，IP68 high protection

- Electrode constant: 0.01/0.1/1.0;
- Temperature range：5~80° C；
- Pressure resistance：5MPa；
- Reference type：Ag/AgCl；
- Temperature compensation type: NTC10K, PT100, PT1000;
- Housing material：PPS；
- Salt bridge: Annular PTFE salt bridge；
- Installation thread: 3/4 NPT pipe thread at both ends.

Paired with the highly interference-resistant conductivity meter SUP-TDS210-B for conductivity measurement

Optional SUP-TDS-8001 digital conductivity electrode



Pressure Series

Measurement of Supply and Return Pressure in Cooling Pipeline

SUP-P300

Compact structure, easy to install

- Italian HESMANN connector, flame-retardant and pressure-resistant, meets the IP65 waterproof level application requirements；
- Range: -0.1MPa...0~10kPa...60MPa selectable, response time ≤ 10ms (current, voltage output pressure)；
- 316L stainless steel isolation diaphragm structure, strong anti-interference, long-term stability ±0.2%FS/year；
- Three-proof lining, anti-falling off, anti-edge removal, anti-leakage.

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