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SHANDONG LINGGONG NEW ENERGY TECHNOLOGY CO., LTD.



BEIJING LINGGONG TECHNOLOGY CO.,LTD.

Focused On Automotive Test Temperature Control
Energy Storage Temperature Control
Chiller For Semiconductor Temperature Control



 **ISO9001:2015**
Quality System Certification

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Company Profile



Founded in 2014,LINGGONG TECH is a professional enterprise in designing, R&D, manufacturing and sales of temperature control products in new energy fields.LINGGONG is located in the Economic Development Zone, Qihe County, Dezhou City,Shandong Province,China.It is founded in Beijing, setting up a wholly owned subsidiary in Shandong in 2017 and establishing research operation center in Shanghai. The manufacturing base covers an area of 51000m² and has over 280 staff. There are more than twenty after-sales centers nationwide and five offices in Beijing, Shanghai, Guangzhou,Wuhan, Chongqing.

We provide various of products, such as EV liquid cooling test machine,battery freon direct cooling test machine,energy storage temperature control unit,power station temperature control unit, vehicle on-board temperature control unit, environmental reliability chamber,industrial refrigerating products etc.

They are widely used for new energy vehicle manufacturing, new energy vehicle motor / control unit / battery / powertrain test fields, electric-chemical energy storage cabinet manufacturing, semi-conductor manufacturing, precision instruments manufacturing field,relevant research institutions,university institutions, national quality inspection and test institutions,etc. LINGGONG has the capability to providing satisfying products for customers’ needs and has earned high reputation among customers.

Line with the concept of “pursuing the best usage experience” ,we are always looking forward to developing advanced new energy temperature control technology and to promoting the new energy temperature control technology.

Qualifications



Enterprise Culture
self-confidence,integrity,diligence,
innovation



Enterprise Concept
pursuing the best usage experience



Development Mission
energy conversation, environment
protection,common progress,
mutual creation and mutual benefit



Enterprise Goal
create nationwide first-class and
marketing worldwide refrigerating
technology brand

Main Cooperative Clients



Automobile Test Temperature Control Pruduct

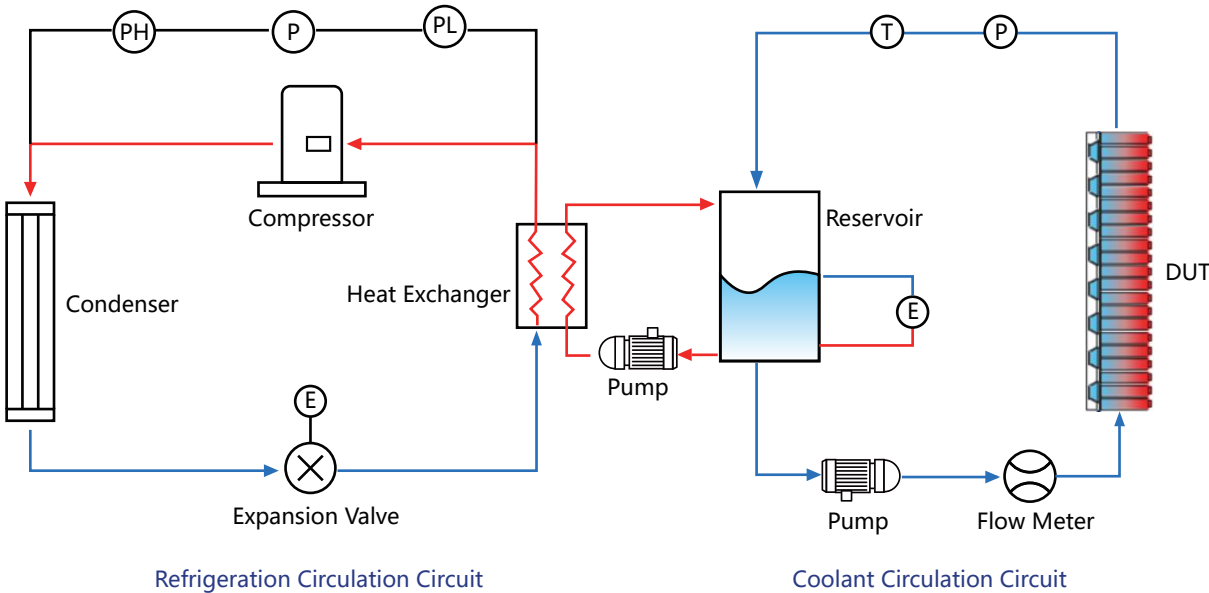
EV Liquid Cooling Test Machine

With the progress in new energy vehicle industry, the requirements to the temperature control test technology have been put forward. In order to adapt to the new requirements for the temperature control test, on the basis of simulating different work conditions of new energy vehicle on-board liquid cooling system, the EV liquid cooling test machine specially developed by Linggong, can not only test the high-temperature and low-temperature tolerance, reliability and performance parameters, as well as have the heat dissipation efficiency, flow resistance, pressure drop, press proof test function, but also increase other optional function like multi-channel temperature control, high-precision flow control, pressure-pulse control, constant power control, etc.

Application

The EV Liquid cooling testing machine series is used for conducting performance testing in the field of new energy vehicle, EV motors, motor controllers, battery cells, modules, packs, etc. The unit outputs coolant with certain temperature range and flowrate range to cool and heat the DUT through refrigeration and heating functions, as a result of simulating various working conditions to test the performance parameters of the DUT, like high/low temperature startup experiments for motors, pressure resistance experiments, flow resistance experiments, and battery tests including high temperature durability experiments and low temperature durability experiments.

Working Principle Diagram



Basic Function Introduction

- (1) Use PLC control system with touched LCD to monitor real-time operation state and to display setting values and real-time operation parameters.
- (2) Can not only support fixed temperature setting, but also support variable temperature setting.
- (3) In-built curve display function, displaying pre-setting temperature, flow, pressure values etc.
- (4) Can choose circulation mode including constant pressure mode and constant flow circulation mode. Under the constant pressure mode, the minimum accuracy is up to 2kPa. Under the constant flow mode, the minimum accuracy is up to 0.1L/min.
- (5) Support multi-control mode switch function, like temperature circulation mode, pressure circulation mode, flow circulation mode, sine-wave circulation mode.
- (6) In-built alarm function which engineers can inquire for getting fault information to make timely maintenance and handling.
- (7) Support RS485, CAN, Ethernet etc. to communicate with host computers, dynamometer, charging and discharging tester, BMS, etc. as well as support USB data storage.
- (8) Support single channel, multi-channel type. The flow, pressure and temperature for each channel can be adjusted independently.

Product Naming Convention

Eg: LGTPS-WC07LN40H12C2A02-MR01

Description:

| | | | | | | | | | | | | | |
|----|-----|---|---|-----|------|------|----|-----|---|---|---|----|--|
| LG | TPS | - | W | C07 | LN40 | H120 | C2 | A02 | - | M | R | 01 | 01: series no |
| | | | | | | | | | | | | | R: coolant recycle |
| | | | | | | | | | | | | | M: communication protocol Modbus RS485 |
| | | | | | | | | | | | | | A02: temperature tolerance $\pm 0.2^{\circ}\text{C}$ |
| | | | | | | | | | | | | | C2: channels 2 |
| | | | | | | | | | | | | | H12: designed high temperature 120°C |
| | | | | | | | | | | | | | LN40: designed low temperature -40°C |
| | | | | | | | | | | | | | C7: cooling capacity 7.5kW |
| | | | | | | | | | | | | | W: water cooling A: air cooling |
| | | | | | | | | | | | | | TPS: test platform system |
| | | | | | | | | | | | | | LG: company name |

(a)EV Motor/MCU Liquid Cooling Test Machine



The EV motor/MCU liquid cooling test machine is a professional testing equipment designed specifically for thermal and fluid dynamics test of motors and motor control units in new energy vehicles. It can adjust various parameters according to the testing requirements of the driven motor, and conduct thermal tests on the motor and the control unit under low temperature and high temperature conditions.

In view of the different cooling forms of new energy vehicles’ motor, the series of new energy vehicle motor cooling test machines are divided into “Oil-cooled” and “Water-cooled” types, used for testing oil-cooled motor and water-cooled motor respectively.

“Oil-cooled” type uses automatic transmission fluid (Dexron-III, Dexron-VI, Mercon V, Mercon VI, ZF) as the circulating medium for testing the oil-cooled driven motor. The cooled automatic transmission fluid can be directly pumped into the motor to realize the cooling of the motor. This way of cooling effect is good, with the feature of high precision temperature control and the motor air gap not flooding.

“Water-cooled” type uses deionized water or glycol solution as the circulating medium for testing water-cooled driven motor, according to the motor test requirements, the cooling medium can be pumped into the motor cooling water jacket or cooling water pipe, to achieve the motor temperature control.

Main Features

- -40℃ ~ 120℃ of the temperature control range.
- Use high-low temperature resistance magnetic pump, with the advantage of low noise,high flow rate and low risk of leakage.
- Have remote communication function,supporting RS485,CAN and Ethernet communication.
- Energy conversation: precise refrigerating control, adjustable cooling capacity based on needs.

Optional Function

- Pressure pulse cycle control, supporting sine wave or square wave.
- The cooling capacity and heating power can be adjusted.
- Automotic filling for coolant function.
- Automotic coolant recovery function.

Product Parameters

| Motor High-low Temperature High-normal Temperature Cooling Test Machine | | | |
|---|--------------------------------|--------------------------------|---------------------------------|
| Model | LGTPS-WC25LP5 H120C1A05MR01 | LGTPS-WC25LP5 H130C1A05MR01 | LGTPS-WC25LN40 H120C1A05MR01 |
| Cooling Capacity(kW) | 25 | 25 | 25 |
| Temperature Range(℃) | 5~120 | 5~130 | -40~120 |
| Temperature Control Accuracy (℃) | ±0.5 | ±0.5 | ±0.5 |
| Average Heating / Cooling Rate (℃/min) | 5 | 5 | 5 |
| Flow Range(L/min) | 1~40 | 1~30 & 0.5~10 | 1~40 |
| Pressure Range(kPa) | 0-400 | 0-400 | 0-400 |
| Pressure Control Accuracy (kPa) | ±5 | ±5 | ±5 |
| Heating Power (kW) | 16.5 | 16.5 | 16.5 |
| Water Tank Volume(L) | 10+30 | 50 | 10+30 |
| Outline Dimensions(mm) (W*D*H) | 900*1800*1900 | 1000*1950*1900 | 900*1800*1900 |
| Channels With Temp Ranges | one with one | one with one | one with one |
| Cooling Type | water-cooling | water-cooling | water-cooling |
| RS485/CAN/Ethernet | ✓ | ✓ | ✓ |
| PLC Control System | ✓ | ✓ | ✓ |
| Noise (dB) | ≤75 | ≤75 | ≤75 |
| Power Supply | AC380/50Hz | AC380/50Hz | AC380/50Hz |
| Remarks | | oil-cooled type | |

More models can be customized according to requirements.

Multi-channel types are available according to customer's needs.

Motor High-normal Temperature ||| High-normal Temperature Cooling Test Machine

| Model | LGTPS-WC30LP30 H120C1A05MR01 | LGTPS-WC30LP30 H130C1A05MR01 | LGTPS-WC80LN40 H120C1A05MR01 |
|---------------------------------------|---------------------------------|---------------------------------|---|
| Cooling Capacity(kW) | 30 | 30 | 80 |
| Temperature Range(°C) | 30~120 | 30~130 | -40~120 |
| Temperature Control Accuracy (°C) | ±0.5 | ±0.5 | ±0.5 |
| Average Heating/Cooling Rate (°C/min) | 5 | 5 | 5 |
| Flow Range(L/min) | 1~40 | 1~40 | 1~60 |
| Pressure Range(kPa) | 0~400 | 0~400 | 0~400 |
| Pressure Control Accuracy (kPa) | ±5 | ±5 | ±5 |
| Heating Power (kW) | 16.5 | 16.5 | 40 |
| Water Tank Volume(L) | 10+30 | 60 | 50 |
| Outline Dimensions(mm) (W*D*H) | 900*1600*1900 | 1000*1950*1900 | 1600*2800*2300 |
| Channels With Temp Ranges | one with one | one with one | one with one |
| Cooling Type | water-cooling | water-cooling | water-cooling |
| RS485/CAN/Ethernet | ✓ | ✓ | ✓ |
| PLC Control System | ✓ | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 | ≤80 |
| Power Supply | AC380/50Hz | AC380/50Hz | AC380/50Hz |
| Remarks | | oil-cooled type | high low temperature screw type 30KW@-40°C |

More models can be customized according to requirements.

Multi-channel types are available according to customer's needs.

MCU High-low Temperature |||High-normal Temperature Cooling Test Machine

| Model | LGTPS-AC2LP5 H85C1A05MR01 | LGTPS-AC5LP5 H85C1A05MR01 | LGTPS-A/WC10LN40 H100C1A05MR01 |
|---------------------------------------|------------------------------|------------------------------|-----------------------------------|
| Cooling Capacity(kW) | 2 | 5 | 10 |
| Temperature Range(°C) | 5~85 | 5~85 | -40~100 |
| Temperature Control Accuracy (°C) | ±0.5 | ±0.5 | ±0.5 |
| Average Heating/cooling Rate (°C/min) | 3 | 3 | 5 |
| Flow Range(L/min) | 1~20 | 1~20 | 1~30 |
| Pressure Range(kPa) | 0-300 | 0-300 | 0-300 |
| Pressure Control Accuracy (kPa) | ±5 | ±5 | ±5 |
| Heating Power (kW) | 3 | 6 | 10.5 |
| Water Tank Volume(L) | 20 | 30 | 10+30 |
| Outline Dimensions(mm) (W*D*H) | 500*640*850 | 600*1015*1200 | 900*1800*1900 |
| Channels With Temp Ranges | one with one | one with one | one with one |
| Cooling Type | air cooling | air cooling | air cooling/water-cooling |
| RS485/CAN/Ethernet | ✓ | ✓ | ✓ |
| PLC Control System | ✓ | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 | ≤75 |
| Power Supply | AC380/50Hz | AC380/50Hz | AC380/50Hz |
| Remarks | | | |

More models can be customized according to requirements.

Multi-channel types are available according to customer's needs.

| MCU High-low Temperature Cooling Test Machine | | |
|---|---------------------------------|---------------------------------|
| Model | LGTPS-WC25LN40 H120C1A05MR01 | LGTPS-WC25LN40 H120C3A05MR01 |
| Cooling Capacity(kW) | 25 | 25 |
| Temperature Range(°C) | -40~100 | -40~100 |
| Temperature Control Accuracy (°C) | ±0.5 | ±0.5 |
| Average Heating/Cooling Rate (°C/min) | 5 | 5 |
| Flow Range(L/min) | 1~30 | 1~30 |
| Pressure Range(kPa) | 0-300 | 0-300 |
| Pressure Control Accuracy (kPa) | ±5 | ±5 |
| Heating Power (kW) | 16.5 | 16.5 |
| Water Tank Volume(L) | 10+30 | 20+30 |
| Outline Dimensions(mm) (W*D*H) | 900*1800*1900 | 1000*2000*1900 |
| Channels With Temp Ranges | one with one | three with one |
| Cooling Type | water-cooling | water-cooling |
| RS485/CAN/Ethernet | ✓ | ✓ |
| PLC Control System | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 |
| Power Supply | AC380/50Hz | AC380/50Hz |
| Remarks | | |

More models can be customized according to requirements.
Multi-channel types are available according to customer's needs.

(b) Battery Liquid Cooling Test Machine



The battery liquid cooling test machine is specifically designed for thermal and fluid dynamics test of the liquid cooled battery pack. They are equipped with various high-performance sensors according to the requirements of liquid cooled battery pack performance test, which can test the flow rate, pressure, temperature, and sealing of the liquid cooled battery pack. It can also provide temperature simulation, pressure simulation, flow simulation, etc.at the full temperature range for the battery pack. The product supports communication modes such as CAN,RS485 and Ethernet, and supports communication with the upper computer,charging and discharging test machine.

The battery liquid cooling test machine is equipped with heaters and refrigeration units, and adopts a multi-PID control mode, which can simulate various working conditions of the battery pack in actual operation to test the reliability and stability of the battery pack.

Main Features

- -40°C ~ 85°C of the temperature control range.
- Use high-low temperature resistance magnetic pump, with the advantage of low noise,high flow rate and low risk of leakage.
- Have remote communication function, supporting RS485,CAN and Ethernet communication.
- Energy conversation: precise refrigerating control, can adjustable cooling capacity based on needs.

Product Parameters

| Battery Liquid Cooling Test Machine | | |
|--------------------------------------|------------------------------|----------------------------------|
| Model | LGTPS-AC2LP5 H85C1A05MR01 | LGTPS-A/WC10LN40 H85C3A05MR01 |
| Cooling Capacity(kW) | 2 | 10 |
| Temperature Range(℃) | 5~85 | -40~85 |
| Temperature Control Accuracy (℃) | ±0.5 | ±0.5 |
| Average Heating/Cooling Rate (℃/min) | 3 | 5 |
| Flow Range(L/min) | 1~20 | 1~30 |
| Pressure Range(kPa) | 0-300 | 0-300 |
| Pressure Control Accuracy (kPa) | ±5 | ±5 |
| Heating Power (kW) | 3 | 10.5 |
| Water Tank Volume(L) | 20 | 10+30 |
| Outline Dimensions(mm)(W*D*H) | 500*640*850 | 1000*2000*1900 |
| Channels With Temp Ranges | one with one | three with one |
| Cooling Type | water-cooling | air cooling/water-cooling |
| RS485/CAN/Ethernet | ✓ | ✓ |
| PLC Control System | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 |
| Power Supply | AC380/50Hz | AC380/50Hz |
| Remarks | | |

More models can be customized according to requirements.
Multi-channel types are available according to customer's needs.

| Battery Liquid Cooling Test Machine | | | |
|--------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Model | LGTPS-A/WC15LN40 H85C1A05MR01 | LGTPS-A/WC30LN40 H85C2A05MR01 | LGTPS-A/WC15LN40 H85C1A05MR01 |
| Cooling Capacity(kW) | 15 | 30 | 15 |
| Temperature Range(℃) | -40~85 | -40~85 | -40~85 |
| Temperature Control Accuracy (℃) | ±0.5 | ±0.5 | ±0.5 |
| Average Heating/Cooling Rate (℃/min) | 5 | 5 | 5 |
| Flow Range(L/min) | 1~30 | 1~30 | 1~20 |
| Pressure Range(kPa) | 0-300 | 0-300 | 50-350 |
| Pressure Control Accuracy (kPa) | ±5 | ±5 | ±5 |
| Heating Power (kW) | 10.5 | 10.5*2 | 10.5 |
| Water Tank Volume(L) | 10+30 | (10+30)*2 | 10+30 |
| Outline Dimensions(mm)(W*D*H) | 900*1800*1900 | 1050*2400*2000 | 900*1800*1900 |
| Channels With Temp Ranges | one with one | two with two | one with one |
| Cooling Type | air cooling/water-cooling | water-cooling | water-cooling |
| RS485/CAN/Ethernet | ✓ | ✓ | ✓ |
| PLC Control System | ✓ | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 | ≤75 |
| Power Supply | AC380/50Hz | AC380/50Hz | AC380/50Hz |
| Remarks | | | |

More models can be customized according to requirements.
Multi-channel types are available according to customer's needs.

Battery Freon Direct Cooling Test Machine



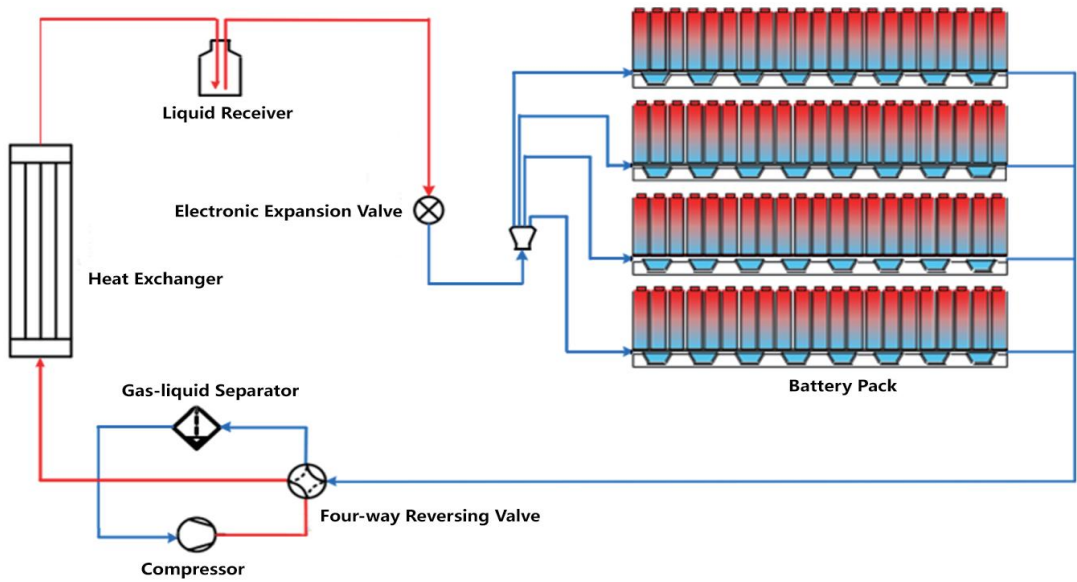
The battery freon direct cooling test machine is currently mainly used in the new energy battery industry, which can directly cool and heat the battery cells or module or PACK during charging and discharging test. Compared to currently natural cooling type like air cooling and liquid cooling, direct cooling systems are suitable cooling methods that do not require secondary heat exchange. They have high heat exchange efficiency, wide temperature range, and simple equipment structure, ensuring that the battery operates in an efficient environment.

Adopting a vortex refrigeration compressor unit and variable frequency pressure regulation refrigeration technology, it is mainly used for thermal test of the on-board thermal management system of new energy vehicles. It can adjust the fluorine pressure and flow rate under various working conditions according to the testing requirements of the thermal management system of new energy vehicles, and conduct fluorine direct cooling thermal tests on the vehicle thermal management system from low temperature to high temperature.

Application

The battery freon direct cooling test machine is used for battery and liquid-cooling plate tests, like temperature control experiments to test heat dissipation and temperature raising variables, cooling efficiency experiments to test the cooling efficiency with Freon refrigerant on heat emission of battery, high temperature durability experiments and low temperature durability experiments,etc.

Working Principle Diagram



Product Naming Convention

Eg: LGTPS-FC07L01H05C1A05-MR01

Description:

| | | | | | | | | | | | | | |
|----|-----|---|---|-----|------|-----|----|-----|---|---|---|----|--|
| LG | TPS | - | F | C07 | LP10 | H05 | C1 | A05 | - | M | R | 01 | 01: series no |
| | | | | | | | | | | | | | R: coolant recycle |
| | | | | | | | | | | | | | M: communication protocolModbus RS485 |
| | | | | | | | | | | | | | A05: temperature tolerance $\pm 0.5^{\circ}\text{C}$ |
| | | | | | | | | | | | | | C1: channels 1 |
| | | | | | | | | | | | | | H05: designed high temperature 50°C |
| | | | | | | | | | | | | | LP10: designed low temperature 10°C |
| | | | | | | | | | | | | | C7: cooling capacity 7.5 kW |
| | | | | | | | | | | | | | F: freon direct cooling type |
| | | | | | | | | | | | | | TPS: test platform system |
| | | | | | | | | | | | | | LG: company name |

Main Features

- Ultra large display screen displaying real-time data changes of monitoring equipment,like control pressure,overheating degree (battery outlet temperature), subcooling degree (the front temperature of expansion valve),inlet and outlet discharge pressure and suction pressure,discharge temperature and suction temperature.
- Support curve enquiry, historical record enquiry and data export.
- Remote communication function,supporting RS485, CAN communication, and Ethernet communication.
- Electrical accessories of international brand to ensure electrical operation safety.

- Have both direct cooling and direct heating functions, meeting the testing needs of batteries under various working conditions.
- Equipped with refrigerant mass flow rate display.
- Use variable frequency compressor with well-known brand to ensure machine' s reliability and energy conversation.

Product Parameters

| Direct Cooling And Direct Heating Test Machine | | |
|---|--------------------|--------------------|
| Model | LGTPS-FC05LN40C2~4 | LGTPS-FC10LN40C2~4 |
| Cooling Capacity(kW) | 5 | 10 |
| Suction Pressure Control Accuracy(kPa) | ±30 | ±30 |
| Condensing Pressure Control Accuracy (kPa) | ±50 | ±50 |
| Pressure Measurement Resolution (kPa) | 0.1 | 0.1 |
| Temperature Measurement Resolution(°C) | 0.1 | 0.1 |
| Subcooling Degree(The Front Temperature Of Expansion Valve)(°C) | 0~6 | 0~6 |
| Overheating Degree(Battery Outlet Temperature)(°C) | 0~5 | 0~5 |
| Cooling Type | air cooling | air cooling |
| RS485/CAN/Ethernet | ✓ | ✓ |
| PLC Control System | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 |
| Power Supply | AC380V/50Hz | AC380V/50Hz |

More models can be customized according to requirements.

| Direct Cooling And Direct Heating Test Machine | | |
|---|--------------------|--------------------|
| Model | LGTPS-FC15LN40C2~4 | LGTPS-FC20LN40C2~4 |
| Cooling Capacity(kW) | 15 | 20 |
| Suction Pressure Control Accuracy(kPa) | ±30 | ±30 |
| Condensing Pressure Control Accuracy (kPa) | ±50 | ±50 |
| Pressure Measurement Resolution (kPa) | 0.1 | 0.1 |
| Temperature Measurement Resolution(°C) | 0.1 | 0.1 |
| Subcooling Degree(The Front Temperature Of Expansion Valve)(°C) | 0~6 | 0~6 |
| Overheating Degree(Battery Outlet Temperature)(°C) | 0~5 | 0~5 |
| Cooling Type | air cooling | air cooling |
| RS485/CAN/Ethernet | ✓ | ✓ |
| PLC Control System | ✓ | ✓ |
| Noise(dB) | ≤75 | ≤75 |
| Power Supply | AC380V/50Hz | AC380V/50Hz |

More models can be customized according to requirements.