

Specification for Battery Explosion Proof Temperature & Humidity Chamber



Model: KET-408LFAO(Air cooling)

Manufacturer: Guangdong KOMEG Industrial Co.,Ltd

I . Product Overview

It can accurately simulates a wide range of complicated natural environmental conditions, such as high temperature, low temperature, heat damp, etc.

II . Application

Reliability test of electrical, electronic, mechanical products, parts and materials under the conditions of high and low temperature test.

III. Standards

- UNECE Regulation No. 100
- UN38.3 38.3 Standards for shipping lithium batteries, either alone or as part of a device
- UL1642 Standard for Lithium Batteries
- UL2580 General guidelines for batteries in electric vehicles
- IEC60068-2-1 Test A: Low Temperature Test
- IEC60068-2-2 Test B: High Temperature Test
- MIL-STD-202F High Temperature Life Test
- MIL-STD-810D High Temperature Test
- MIL-STD-810D Low Temperature Test
- IEC60068-2-3 Test Ca: Constant Heat Test
- IEC60068-2-30 Test Db: Damp Heat Alternative Test
- MIL-STD-810D Damp Heat Test

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| Energy saving design | Cooling balance technology which can save 30% power consumption against normal BTHC mode |
| Easy operation | Self design English interface KOMEG KM-5166 LCD touch screen controller with PID control parameters setting Easy for data collection and recording |
| High reliability | Main parts are imported, ensuring the service life and high reliability Efficient oil separator to ensure the service life of the compressor |

IV. Main Technical Parameters

1. Temperature & humidity range

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| Temperature range | -40°C to +150°C |
| Temp Deviation | ≅ ± 2.0°C |
| Temp Fluctuation | ± 0.5°C |
| Temp Uniformity | ≅ 2.0°C (empty load) |
| Ramp rate | Heating up rate: +25°C to +100°C, average 3°C/minute. Cooling rate: +25°C to -40°C, average 1°C/minute. |
| Load situation | No load |
| Noise | ≤ 68DB |

The temperature humidity performance is in accordance with IEC 60068-3-5 standards.

V. Chamber Structure

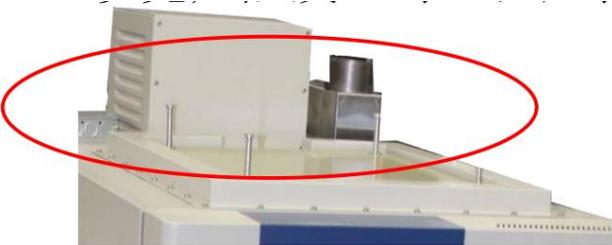
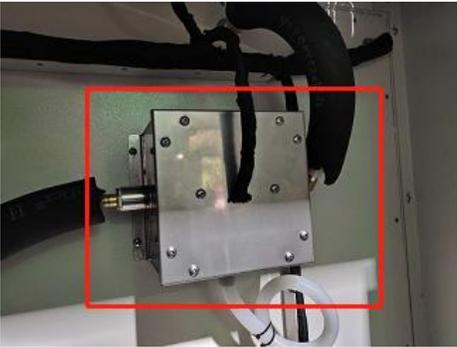
Structural features

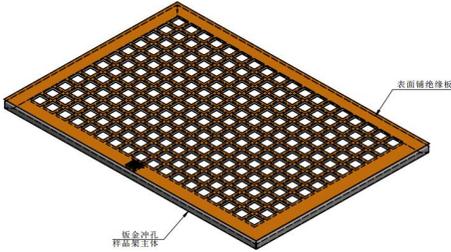
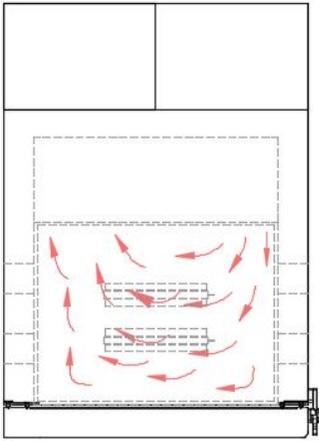
1) The test chamber has a strong explosion -proof structure strength and pressure release function. Our device is equipped with a pressure port of the design area (see 5.1 explanation for details). The main body of the equipment is a overall box explosion -proof structure, which can ensure the strength and rigidity of the inner box. Under low temperature test conditions, long -term use, etc., do not cause box deformation or collapse.

2) The test chamber consists of three parts: the main box of thermal insulation (including heating system, air -conditioning box and air duct system), refrigeration unit, electrical control system (electrical control cabinet)

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| Chamber size | Workspace volume: W800 × H 850× D 600mm Exterior size: W1000 x H 1755 x D 1360mm |
| Main body materials | External body material: high-quality cold steel with static powder coating Inner material: SUS304 # matte stainless steel plate Insulation materials: 100mm thickness PU, fire retardant level: B2 |
| Door | Open the door with a full size, open to the left, heating wire inside the door frame to prevent condensation at low temperature, with anti-explosion chain. Inside door-open mechanism for safety |

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| <p>Observation window</p> | <p>Anti-explosion glass view window with stainless steel grid, multi-layer vacuum glasses, inner layer 19mm thickness, exterior layer with protection film and automatic defrosting function.</p>  |
| <p>Lighting device</p> | <p>Anti explosion room light, specially configured workspace light bulb protects it from being damaged</p>  |
| <p>Heater</p> | <p>Sheathed Ni-Cr electrical heater, SSR control, over-temp protection switch.</p>  |
| <p>Blower</p> | <p>Non spark blower, specially treated for preventing spark</p>  |

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| <p>Pressure balance port</p> | <p>Anti explosion pressure balance port on the top, it will be activated once the inner pressure is over safety value.</p>  |
| <p>Smoke sensor</p> | <p>Detects smoke and shuts down the chamber, includes an alarm and light and turn on the ventilation system automatically</p>  |
| <p>Cable port</p> | <p>Φ50mm x 2pcs on the left and right side, with silicone seal</p>  |
| <p>Chamber Sealing</p> | <p>1) The door seal of the chamber door uses a special high -low and low temperature silicone rubber sealing strip. Do not condense or freeze at low temperature The door frame anti -exposed electric heat device is used to prevent the external dew from frosting; at the same time, a convenient and disassembly design is adopted to facilitate later maintenance.</p> <p>2) Pressure balance system (balance tube) In the normal pressure state, the pressure balance system works automatically, balance internal and external pressure</p> |
| <p>Chamber drainage</p> | <p>A good drainage design at the bottom of the test chamber, flowing</p> |

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| | along the drainage outlet |
| Chamber base | Move the foot wheel with the foot cup 4 (convenient positioning and adjustment level) |
| 3-color tower light | <p>1pcs 3-color tower light</p>  |
| Isolating paint | <p>Double layer stainless steel Isolating paint for sample holder, bear 30kg/layer</p>  |
| VI. Air regulation system | |
| Features | <p>Adjustment and control: Force, temperature and humidity type; independent cold and heat -end PID regulation, heat and cold can be continuously adjusted, avoiding energy waste caused by the cooling and heating volume hedging</p> <p>This machine is a horizontal air supply method (the circular giving wind is as follows)</p>  <p>循环风向示意 (俯视)</p> |
| Air circulation | High -power fan driven by external motors with stainless steel shaft, external way of fan motor; |

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| | The air is driven by the motor. It is fully flowing through the heater and the cooling evaporator to be heated/cooled to the test space. |
| Fan motor | Low -voltage asynchronous high temperature resistant long shaft motor  |
| Temperature sensor | 1) Temperature sensor: Equipment temperature main control sensor in the same type |
| Over temperature protection system | Adopts a meticulous ultra -temperature protection system for a three -level redundant design to achieve the prevention of the cause All kinds of losses caused by super temperature. 1) Common danger of ultra -temperature is: *Sample damage *In severe cases of fire or burning equipment *The device heater is damaged, and the customer's field owner's power is escaped, resulting in a large -scale power outage 2) The cause of the ultra -temperature *Sensor faults of the main controller/high temperature that is not allowed to control abnormalities *Insufficient temperature control and protection of redundant design, one of which is abnormal *Improper operation of personnel (such as the wrong temperature value) |
| Cooling system | |
| Working mode | Mechanical refrigeration Intelligent refrigeration control: PID control the output refrigeration volume or PID control heater according to the temperature and load requirements in the box (the refrigeration does not heat, heating does not refrigerate). |
| Compressor | Copeland or Tecumseh compressors |
| Refrigerant | Eco friendly R404A ,R23 |
| Condenser | Air cooling condenser High -efficiency copper tube fins -type compulsory conversion hot -cold coagulator |

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| Evaporator | <p>High -efficiency multi -segmentation with water film wing tablets evaporator Copper tube evaporator</p> |
| Auxiliary device | <p>High -precision expansion valves, solenoid valves, oil separators, desiccants, etc. are imported from the original internationally famous brand</p>  |
| Refrigeration Technology | <p>Nitrogen welding, two-stage rotary vane vacuum pump, ensure that the internal cooling system clean and reliable. Water tray located at the bottom of the compressor</p> |

VII. Control System

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| Temp. & Humidity sensor | <p>PT100 temperature sensor, VAISALA capacitive humidity sensor</p> |
| Controller | <p>KOMEG Technical Programmable KM-5166 TFT Touch Screen Controller with PID control</p>  |

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| Display function | Temp.& humidity Setting (SV) Practical (PV) value can be displayed directly Execution of the program can display numbers, paragraphs, remaining time and cycles, running time display, Program editing and graphic curve display, Fixed or program operation status display, Resolution: 800x480, 7-inch TFT display screen. |
| Display resolution | Temperature: 0.01 °C; Humidity: 0.1% |
| Operating mode | Programmable running, fix running |
| Program capacity | Max 50 programs, max 30 steps per program, 999 cycles |
| Interface | Can be connected to the computer display curve, data acquisition; Can be used as monitoring and remote control system; Can do more than one machine synchronization control; USB, RS-485,RS232 and Ethernet. Test data & graph can be downloaded by USB flash drive |
| External signal terminal |  |
| Power off memory | Power recovery mode can be set as hot start, cold start and stop |
| Pre-set function | Boot time can be set freely and machine runs automatically when turning on power |
| Network Connection | Can be connected to Ethernet via professional software, Remote control & assistance function and data collection can be achieved through network, Multi machine can be controlled simultaneously |
| Function | Fault alarm and cause handling prompts, power failure protection, the temperature upper and lower limit protection, timer function (automatic start and automatic stop running), self-diagnostic function. |
| Panel switch | with emergency stop switch  |

VIII. Electrical Control System

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| Control cabinet | Emergency stop switch Power switch Over-temperature protection |
| Protection System | Heater protection switch if no water Heater over-current circuit breaker Circulating fan over-current overload protection Compressor high voltage protection switch Compressor overheat protection switch Compressor over-current protection switch Over-voltage under-phase protection switch Circuit Breakers Leakage switch Controller noise isolation protection Zero-crossing gate fluid power controller |
| Alarm indicator | Equipment stops running and sends audible alarm when the above protection appears, meanwhile, fault, causes and solutions will be displayed on the screen. |

IX. Installment Condition

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| Ambient temp. and humidity | 25°C, 85%RH |
| Power supply | 1. Connect 380V AC ($\pm 10\%$) Three -phase+zero line+protection ground line, ground resistance $\leq 4\Omega$; 2. Power frequency: $50 \pm 0.5\text{Hz}$ 3. Power consumption : 7.5KW 4. Power current: 18A |
| Grounding | Grounding resistance $\leq 4\Omega$ |
| Water Drainage | 1) Leave a drainage connector below the chamber It can be equipped with a drainage and extension of the drainage of $\phi 10$ inner diameter (guided condensed water outflow of the box) 2) There must be drainage floor drain in the customer on site |

P.S.

1. Please equip the above power demanded to the terminal box of the machine control, user must prepare an exclusively no-fuse switch for the machine.
2. Please confirm whether it can enter the door or access elevators.

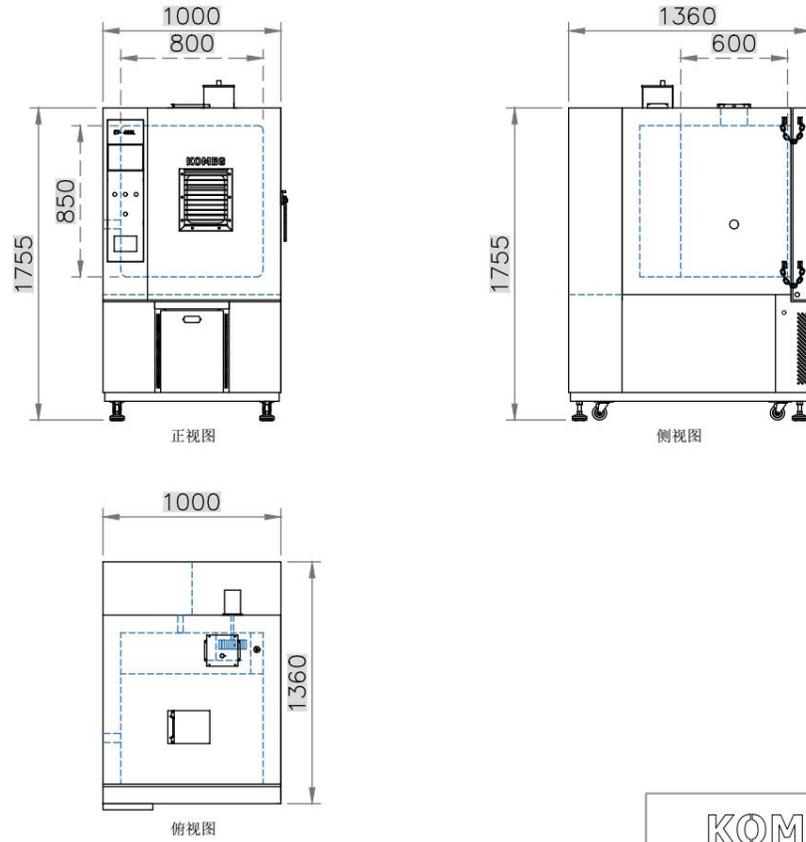
Main components list

| Item | Brand | Remarks |
|----------------------------------|-------------------|--|
| Compressor | Copeland / Bitzer |    |
| Pressure switch | DANFOSS |  |
| Condenser | Yongqiang |  |
| Evaporator | Yongqiang |  |
| Drier filter | DANFOSS |  |
| Capillary tube | KOMEG |  |
| Expansion valve | DANFOSS/ABB |  |
| Magnetic valve | DANFOSS/ABB |  |
| Controller | KOMEG |  |
| Residual current circuit breaker | ABB/Delix |   |
| AC contactor | ABB/Delix |   |
| Thermorelay | ABB/Delix |   |
| Phase sequence relay | Carlo Gavazzi |  |

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| Intermediate relay | Omron/ABB |  |
| AC relay | Delix/ABB |  |
| Solid-state relay | Carlo Gavazzi |  |

3D drawing

此图仅供参考，如有变更将另行通知



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|---|--|---------------------------------|---------------|--|
|  科明环境仪器工业有限公司 | | | 估价三视图: | |
| | | | 电池高低温试验箱 | |
| 日期: 21-04-7 | | | 型号: ET系列(标准化) | |
| 单位: mm | | | 图号: 210407001 | |
| 误差: ±5% | | | 比例: 版次: 00 | |
| 绘图: | | 审核: | | |
| 估价组 | | D:\JY-21\21-04-07\210407001.dwg | | |