

Specification for Programmable Temperature and Humidity Test Chamber



Model: KMH-408L

Manufacturer: KOMEG Technology Ind Co.,Ltd

I .Product Overview

Able to accurately simulate a wide range of complicated natural environments, and is suitable for reliability test in industrial products. Meet GB5170.2.3.5.6-95 standard requirements of environmental testing equipment and test methods for the basic parameters of electric and electronic products under the condition of humidity, low temperature, high temperature, and constant heat.

II .Application

Applicable to environmental adaptability and reliability test in such industrial units as electronics, electrical appliance, battery, plastics, food, paper product, vehicle, metal, chemistry, building material, research institution, inspection and quarantine bureau, university etc..

III .Features

- GB-2423. 1-89(IEC68-2-1)Test A: Low Temperature Test
- GB-2423. 2-89(IEC68-2-2)Test B: High Temperature Test
- GJB360. 8-87(MIL-STD. 202F) High Temperature Life Test
- GBJI50. 3(MIL-STD-810D) High Temperature Test
- GJBI50. 4(MIL-STD-810D) Low Temperature Test
- GB2423. 3-93(IEC68-2-3)Test Ca: Constant Heat Test
- GB2423. 4-93(IEC68-2—30)Test Db: Damp Heat Alternative Test
- GJBI50. 9-93(MIL-STD-810D) Damp Heat Test

1. Energy conservation	Bypass mode to adjust cooling capacity to achieve a constant temperature and humidity effectively
2. Easy Operation	※Using company owned brand KOMEG KM-3166 LCD touch screen controller with PID control parameters setting ※Flexible approach for data collection and recording
3. High reliability	※Key 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. Chamber

















1.1 Workspace volume	IW 700× IH 750 × ID 800 mm
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1.2 Exterior size	IW 980× IH 1940× ID 1740mm
2. Temperature	
2.3 Temperature range	-40 ~ 180 °C
2.4 Temp Deviation	±2.0°C
2.5 Temp Constancy	±0.5°C
2.6 Temp Uniformity	±2.0°C
2.7 Ramping and soaking rate	+20°C ↓ -40°C within 60 min(no-load) -40°C ↑ +100°C within 45 min(no-load)
3. Humidity	
3.1 Humidity range	20%R.H. ~ 98%R.H
3.2 Control range	<p>The graph plots Relative humidity (%RH) on the y-axis (0 to 100) against Temperature (°C) on the x-axis (0 to 100). A shaded pink region indicates the control range, which starts at 20% RH at 20°C and rises to 98% RH at 85°C.</p>
3.3 Humidity deviation	±2% RH
3.4 Humidity uniformity	3.0% RH
3.5 Humidity deviation	±2.0% RH
V、 Chamber Structure	
Overall structure and chamber was composed of three parts as below. Insulation box, separate refrigeration units, and electrical control cabinet.	
1. Insulation box	<ul style="list-style-type: none"> ※ wall material: high-quality carbon steel with static color spray ※ inner wall material: SUS304 # matte stainless steel plate ※ Insulation materials: rigid polyurethane foam insulation layer + glass fiber.
2. Door	Heating wire was installed at the door frames to prevent condensation at low temperatures.
3. Observation window	With 2 sets 470 × 570mm (width × height) observation window, multi-hollow electric insulation coated glass prevent condensation effectively
4. Cable port	Φ 50mm*2 located on both sides(each*1) with rubber stopper and plastic cover

5. Lighting device	11W/AC220V *1 located on observation window
6. Water outlet hole	Available for drain the condensate water
7. Sample holder	Two layers of stainless steel sample holder.
8. Mobile Casters	Mobile Casters *4 with foot cups
9. Electric control box	Total power circuit breaker, over-temperature protection.
10. Water supply system	Water pump automatic supply

VI、 Air-conditioning system

1. Control mode	Forced ventilation loops design, balance temperature & humidity control system (BTHC).
2. Air conditioning device	Top-mounted diffuser to ensure uniformity of temperature and humidity Long axis centrifugal fan, evaporators, heaters, humidifiers was installed on air conditioning box
3. Heating	Quality nickel-chromium alloy wire electric heaters, Non-contact control mode (SRR).
4. Cooling	Sine wave pattern aluminum finned copper tube air heat exchanger (air-cooled)
5. Water supply	Inner water supply mode
6. Humidifier	Basin heated humidification Stainless steel sheathed heater Heater control: non-contact period, such as pulse width modulation, SSR (solid state relay) Water level control devices, anti-dry unit heater
7. Compressor	Tecumseh brand Compressor 
8. Throttling device	Thermal expansion valve & Capillary  
9. Refrigerant	R404a Environmental friendly high temperature level of refrigerant









	Part	Brand	Remarks
10. Parts and its Brand	Compressor	Tecumseh	Hermetic piston comp with low noise
	Oil Splitter	ALCO,AC&R,ESK	 
	Evaporator(plate)	DANFOSS	
	Pressure relay	DANFOSS, RANCO	 
	Condenser(plate)	DANFOSS	
	Drying screening program	DANFOSS, SPORLAN	 
	Capillary	KOMEG	
	Expansion valve	DANFOSS,SPORLAN	 
	Solenoid valve	SAGINOMIYA, CASTEL	 
	Exhaust gas pressure regulating valve	SAGINOMIYA	
	Condensing pressure regulating valve	SAGINOMIYA DANFOSS	 
11. Refrigeration Technology	Note: Two options listed is for alternate choice and backup purpose		
	※ 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 to ensure condensate water drain through pipe freely at the rear of the chamber.		
VII、 Control System			
1. Curve recording function	Pt100		

<p>2. Controller</p>	<p>KOMEG brand KM-3166 LCD Touch screen controller with PID control parameters setting</p> 
<p>3. Display</p>	<p>Temperature and humidity settings (SV) Actual (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, 7-inch TFT display screen.</p>
<p>4. Resolution</p>	<p>Temperature: + 0.01 °C; Humidity: + 0.1%; Time: 1min</p>
<p>5. Setting range</p>	<p>Temperature can be adjusted based on the working temp of the equipment(the upper limit +5 °C, the lower limit -5 °C)</p>
<p>6. Running mode</p>	<p>programmable running ,constant running and booking boot</p>
<p>7. Setting mode</p>	<p>Touch mode input</p>
<p>8. Communication interface</p>	<p>Data collection when connected to a computer Can be used as monitoring and remote control system, Multiple machines synchronization control available.</p>
<p>9. U disk Memory card</p>	<p>1G-8G available</p>
<p>10. Data collection</p>	<p>RAM with battery protection settings, data can be saved, maximum historical data memory storage is 90 days (when the sampling time is 1min)</p>
<p>11. Power off memory</p>	<p>Power recovery mode can be set as hot start, cold start and stop.</p>
<p>12. Pre-set function</p>	<p>boot time can be set freely and machine runs automatically when turning on power</p>
<p>13. Software environment</p>	<p>Windows2000 or Windows XP</p>

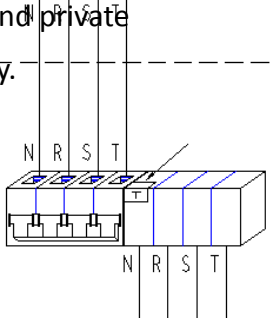
14. Network Connection	Can be connected to Ethernet, remote control function, data collection, can simultaneously control multiple machines.
15. Date and Time	Fault alarm and causes handling prompts, power protection, the lower limit temperature protection, timer function (automatic start and automatic stop running), self-diagnostic function.

VIII. Electrical control system

1. Power distribution Control cabinet	<ul style="list-style-type: none"> ※ Cooling fan ※ Switchboard ※ Specimens terminal ※ RS-485 physical interface (if purchase centralized monitoring software) ※ The total power leakage circuit breaker.
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	Parts	Brand	Remarks
2. Parts and its Brand	Controller	KOMEG	KM-3166 LCD touch s
	Wire protection switch	Schneider	
	AC contactor	Fuji, Schneider	
	Thermal relay	Schneider	
	phase sequence relay	Fuji ,CROUZET	
	Time Relay	Panasonic	
	AC contactor	Schneider	
	Solid State Relays	Carlo Gavazzi	
	Temperature fuse	EMERSON,MICROTEMP	
	Note: Two options listed is for alternate choice and backup purpose		

<p>3. Protection System</p>	<p>3.1 Cooling System:</p> <ul style="list-style-type: none"> ※ Compressor overpressure protection ※ Compressor motor overheating protection ※ Compressor motor over current protection ※ Condenser fan overheating protection <p>3.2 Laboratory</p> <ul style="list-style-type: none"> ※ Adjustable over-temperature protection --- over temperature protection mode 1 ※ Test space temperature fuse --- over temperature protection mode 2 ※ Air conditioning channel limit over temperature --- over temperature protection mode 3 ※ Controller set over temperature shutdown alarm --- over temperature protection mode 4 ※ Fan motor overheating. <p>3.3 Other</p> <ul style="list-style-type: none"> ※ The total power phase sequence and phase loss protection; ※ leakage protection; ※ Load short-circuit protection.
<p>4. Alarm</p>	<p>Equipment stops running and sends audible alarm when the above protection appears, meanwhile, fault, causes and solutions will be displayed on the screen.</p>
<p>IX、 Installation</p>	

<p>1. Power</p>	<p>※AC380V\pm0% , 50Hz\pm1Hz,3 phase 4 wires +Ground Wires ※Power cable is connected to the air switch in control box ※Total Power \sim8 kW, 10A; ※Voltage permitted: AC (1\pm10%) 380V ※Frequency permitted: (1\pm1%) 50Hz ※Resistance of ground wire less than 4Ω TN-S mode or TT mode for power supply ※Must be equipped with an independent and private air or power switch used by this device only.</p> 
<p>2. Water Supply</p>	<p>※ Humidification water: water or deionizer water Maximum consumption: 7L / h ※ When using RO systems, water supply requirements are Water pressure 0.2MPa, pipe line DN10 Maximum Consumption: 7L / h. water flow</p>
<p>3. Surrounding environment</p>	<p>5 \sim 35$^{\circ}$C , Humidity\leq85%R.H</p>
<p>4. Air quality</p>	<p>No high concentrations of dust or corrosive gases</p>
<p>5. Installation environment</p>	<p>※distance from the wall to both sides and rear of chamber more than 800mm, to the front more than 1500mm. Provide independent power distribution switchgear and humidification condensate drains, and external power connector device is necessary ※ground level, well-ventilated , non- flammable, explosive, corrosive gases and dust ※No strong electromagnetic radiation nearby ※With floor drain (less than 2 meters from the refrigeration unit) ※venue floor load capacity : not less than800kg/m² ※leave adequate space for maintenance</p>
<p>6. Ground wire</p>	<p>Grounding resistance less than 4Ω , grounding bolts located at the base of the cabinet.</p>
<p>7. Drainage</p>	<p>Drain hole installed at the base of the housing</p>

8. Cable port	ϕ 50, ϕ 80, ϕ 100, ϕ 120mm cable port, location and number can be customized according to user requirements if chamber body structure allows.
9. Equipment storage	※When the device does not work, the ambient temperature should be maintained within 0 ~ 45 °C ※When the ambient temperature is below 0 °C, the water remaining in the device should be drained to avoid water pipes freezing and broken
10. Centralized monitoring	For remote centralized monitoring, need another PC (Windows 2000/XP operating systems, a COM port and a USB port); Equipped with RS-485/RS-232 converter and a communication cable 25m.
X. Technical Documentation	
1. Technical Documentation	※Product certificate*1 ※Operation Manual*1 ※Maintenance Manual* (Refrigeration & electric schematic diagram)