



Technical Specifications

Temperature and Humidity Testing Chamber

Item No.: **KMH-1000S (Air Cool)**

Company: **KOMEG Technical Ind Co., Ltd**

Issued By: **Engineering Department**



1. Application and Specimen Restriction

- 1.1 Application This series of products are used for reliability testing for industrial products. It offers high accuracy and wide range of temperature and humidity, which meet for GB5170.1.2.5.18-2017 Environmental testing, including Cold, Dry heat, Damp heat steady state, Damp heat cyclic, etc.
Standards exceed the above listed may cause sample, device or human damage.
- 1.2 Sample Restriction Corrosive substance
Biological substance
Strong magnetic emitting resource substance
Flammable, Explosive, Volatile substance
- 1.3 Sample Requirement You should use the testing chamber based on following principals in order to get real and effective data:
Loading weight in each cubic meet should not exceed 80Kgs.
Loading volume should not exceed 1/5 of the total inner chamber volume
The sample cross section on the wind flowing direction should not exceed 1/3 of the total chamber, to ensure air flow fluently.

2. Volume and Dimension

- 2.1 Useful Volume About 1000 Liters
- 2.2 Inner Dimension W1000 mm*H1000 mm*D1000 mm
- 2.3 Outer Dimension About W1200 mm*H2035 mm*D2015 mm(Not including the protruding part)
Tips: For external dimensions, please confirm the three views according to the final design!
- 2.4 Coverage About 2.5m²

3. Main Characteristics

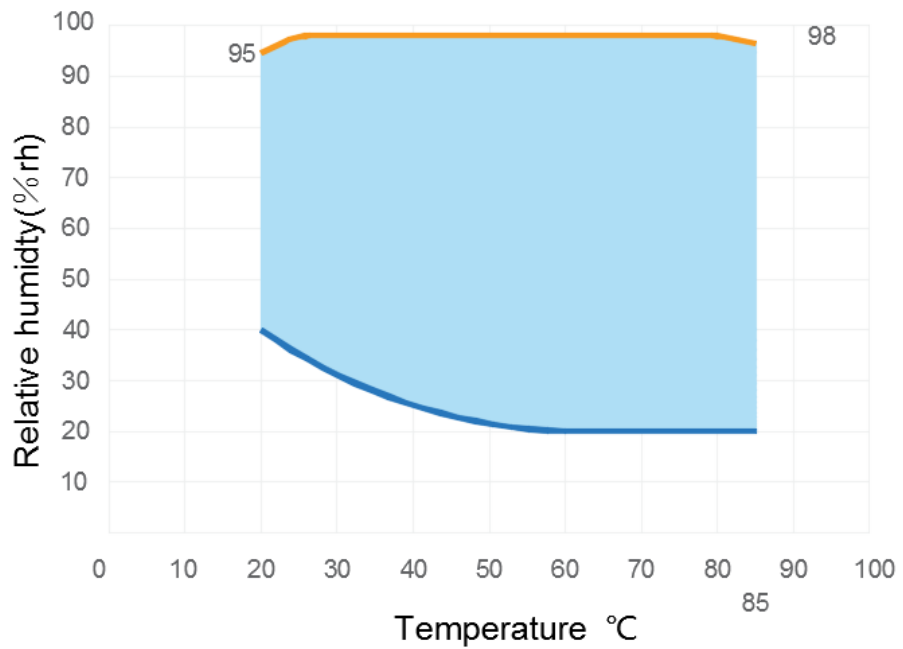
- 3.1 Testing Conditions Device cooling method: Air Cool
All values will be measured at ambient temperature of 25°C, and sensors will be placed at air outlet inside the chamber.

3.2 Temperature Range	-70°C ~ +150°C
3.3 Temperature Fluctuation	±0.5°C
3.4 Temperature Uniformity	≅ 2.0°C
3.5 Temperature Deviation	≅ ±2.0°C
3.6 Temperature Ramp Rate	-70°C ~ +100°C, Average about 60min (Load 300W LED light)
	+20°C ~ -70°C, Average about 80min (Load 300W LED light)

3.7 Load situation Load 300W LED light

3.8 Humidity Range 20~98%R.H

3.9 Temperature and Humidity chart



3.10 Humidity Deviation ±3.0% RH (>75%RH)

±5.0% RH (≤75%RH)

3.11 Humidity Uniformity ±3.0% RH (No Load)

3.12 Humidity Fluctuation ±2.0%RH

3.13 Noise	≦ 75(dB) 1 meter distance from the door
3.14 Standards	GB-2423.1-2008(IEC68-2-1)Test A: Cold Test
Complied	GB-2423.2-2008(IEC68-2-2)Test B: Dry Heat Test GJB360.8-2009(MIL-STD.202F) Heat Aging Test GJB150.3-2009 (MIL-STD-810D) high temperature test method. GJB150.4-2009 (MIL-STD-810D) low temperature test method. GB2423.3-2008 (IEC68-2-3) Test Ca: Constant damp heat test method. GB2423.4-2008 (IEC68-2-30) Test Db: Alternating damp heat test method. GJB150.9-2009(MIL-STD-810D) Damp heat test chamber technical conditions

4. Construction

4.1 Construction	The chamber is made of three main parts: Temperature Isolation chamber, refrigerant system and explosion-proof electric control system
4.2 Outside Construction	Anodize spray painting plate outside, with isolation material in the middle, and SUS304 stainless steel inside.
4.3 Outside Material	High quality cold cooled plate with static spray painting. Komeg Standard color.
4.4 Inside Material	SUS304 stainless steel plate, full weld-jointing inside
4.5 Isolation	100mm Hard PU foam isolation, Fire resistance grade B2
4.6 Door	Full size door, open to left side. Sealed by silicone stripe on the frame. Heating wires are installed at the door frames to prevent condensation at low temperatures
4.7 Observation Window	Observation Windows on the door, with dimension (W 460*H 560mm), with multi-layers hollow glasses painted with electric heating layers to avoid condensation
4.8 Control Panel	Temperature and Humidity touch screen Controller, start, emergency stop, buzzer on the front control panel
4.9 Refrigerant System	Including Compressor System, water collecting and drainage system, heat releasing system, electric control system and humidity system
4.10 Explosion proof Electric cabinet	Electric Distributor Heat releasing fan

- Main Power leakage breaker
- 4.11 Standard One Testing Hole on each side with Diameter 50mm with silicone lid
- Equipment 2 Sample Holders, each capacity 30 Kgs
- 1 Observation Window Light 24VDC LED light, on/off controlled on controller.
- 4 moving Casters with fixing goblets on each

5. Air Conditioning System

- 5.1 Characteristic Adjusting and Controlling: Force air circulation air conditioning; Separate cooling and heating system with PID continuous control, to avoid energy consumption by cooling and heating over shot.
- 5.2 Air Circulation High efficiency fan driven by stainless axis and motor fixed outside.
The air is driven by air to flow over heater and condenser.
When the air is cooled or heated to certain temperature, it will be driven into the chamber to heat or cool the samples.
- 5.3 Fan Motor Long Axis Low Voltage and High Temperature Resistance Induction Motor



- 5.4 Centrifugal Blower Multi-wings centrifugal blowers with aluminum alloy blades



- 5.5 Heater Armored high quality heater with SSR control and separate over temperature protector.
Heater temperature rises up after power on.
When air flow over the heater, air temperature will rises up and transfer heat to inside chamber and heat the samples.
Heating power will be controlled by PID accurately and output through solid relay



5.6 Cooling

Direct Cooling

Refrigerant system offers sufficient low temperature coolant, so the temperature on the heat exchanger will be lower than surrounding air. Heat in the surrounding air will be absorbed by heat exchanger and transferred out of the chamber. In this way, the air will be cooled.

Cooling power will be controlled by PID accurately, and output through Solenoid-valve.

5.7 Humidifier

Stainless Steel electric heating humidifier offers moisture inside the chamber through cooper pipes. Filter, heater, pressure switch and safety valves are equipped for the steam generator. Liquid water is heated to be high pressure saturated steam, and jetted into the chamber, to increase humidity inside. Humidifying power is controlled by PID accurately, and output through cooper pipe solenoid-valve.

5.8 Dehumidifier

This is realized by dehumidifying pipe plate. Refrigerant system offers sufficient low temperature coolant, so the temperature on the heat exchanger will be lower than dew point of surrounding air. Moisture will condense on surface of the heat exchanger. In this way the waters will be distilled from the air and reduce the moisture in the air.

Dehumidifying is controlled by PID accurately and controlled through solenoid-valve.

6. Refrigerant System

6.1 Characteristic This device is Cascade compression refrigeration

The following 2 system configurations are available:

Traditional heat balance system

Energy-saving cold output system

<p>* Adopt traditional refrigeration control method Simple and reliable, the energy consumption will be greater When it is constant: the refrigeration compressor maintains a constant cooling output + heating output capacity and heater heating balance each other to achieve temperature balance. At certain temperature points, the relative energy consumption will be greater.</p>	<p>PID will control solenoid-valve and heater on/off to adjust cooling or heating capacity according to temperature and loading requirements and status inside the chamber(Only cooling or only heating will be activated to get temperature balance). In Low temperature conditions, heater will not work. Temperature will be balanced by PID controlling of solenoid-valves. This can save about half of power consumption.</p>
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6.2 Refrigerant Environment friendly R404a & R23

6.3 Cooling Air cool condenser

Method

6.4 Compressor Copeland or Tecumseh compressor



6.5 Air Cooling Air cool high efficiency cooper fin type heat exchanger.

Condenser



6.6 Evaporator High efficiency multi-stage fin type evaporator.



6.7 Auxiliary Parts

All parts, such as High Accuracy expansion valve, Solenoid-valve, Oil filter, drier, etc, are all top brands from all over the world.



6.8 Refrigerant Technology

We use automatic protection method in refrigerant system designing.
 We have unique technology to prevent compressor over heat.
 We joint weld the pipes with nitrogen protection to ensure pipes clean inside.
 Before fill refrigerant, we vacuum the pipes with high grade vacuum pump to remove the air inside, to ensure inside moisture is removed.
 We have water collecting plate under the compressor, to ensure the condensing water from compressor will be collected and drained out.

7. Control System

7.1 Characteristic

Adjust and control: Force circulation humidity adjustment; PID adjusts Cooling and heating end separately. Both heating and cooling capacity can be adjusted continuously, to avoid energy consumption by counteracting of cooling and heating.

7.2 Controller

Komeg 7 inch touch screen controller. KM-5166 OS cooling output version



7.3 Display

Temperature and Humidity Set Value(SV) and Practice Value(PV) display
 Program No, stage, remaining time, cycling numbers and running time will be displayed on the LCD
 Program and chart will be displayed on the LCD
 Fix and program mode will be displayed on the LCD
 Display is 7 inch LED screen

7.4 Resolution

Temperature: + 0.01°C; Humidity: + 0.1%; Time: 0.01min .

7.5 Setting Range

Temperature Setting Range: -100~200 °C (Not Operation range) ;

Limitation is adjustable according to device working range(Up range+5°C, Down Range-5°C);

Humidity Range:0~100 %RH。

7.6 Program Capacity

Fix Value Running Time can be set to be 99 Hours 59 Minutes, or set to be no time limitation;

Program max capacity is 50 groups

Each group Max steps: 30 steps;

Max cycling times: 999 times

7.7 Communication interface

USB, RS-232, RS-485 and WLAN(optional)

The ports can be connected to computer for testing status displaying, and testing data collecting.

It can be remote controlling and monitoring system.

One computer can control multiple devices

* Equipped with host computer software, remote monitoring and debugging can be achieved through Ethernet or LAN.

8. Safety Devices

8.1 Over Temp. Protection

Separate adjustable electric over-temperature protection device

8.2 Refrigerant System

Compressor overload and overheating, high pressure protection, motor overcurrent protection, compressor oil pressure protection, water pressure protection

8.3 Circulation Blower

Over heat relay, over loading protection

* Interlocked with heater, fan failure heater will not work!

8.4 Heater

Air circulation channel over temperature protection



8.5 Humidity System

Heater over temperature protection, water supplying protection, water drainage protection

8.6 General Power supply

Phase Sequence protection, phase lack protection, electricity leakage protection, over loading and shortcut protection

8.7 Control

Curren Over load and shortcut protection

8.8 Alarms When above protection activity appears, the device will stop running, appear sound and light alarm, the defective reason and resolving methods will be appears on the screen.

Equipment ground: Safe and reliable grounding device

9. Surrounding Environment

- 9.1 Environment Condition
1. Ambient Temperature: 5°C-35°C;
 2. Humidity: No higher than 85%R.H
 3. Air pressure: 80kPa~106kPa
 - 4.Flat and no vibration floor;
 - 5.Good air circulation, no direct sunshine or other direct heat resource radiation;
 - 6.No strong air flow on the device;
 - 7.No Strong magnetic field around;
 8. No high concentration dust or corrosion substance.

- 9.2 Power Specification
1. Power Supply 380V AC(±10%)
3 phases + Grounding. Grounding resistance ≤4Ω;
 - 2.Power Supply Frequency: 50±0.5Hz

9.3 Grounding Resistance ≤ 4Ω.

9.4 Drainage Port φ10 Plug and Play soft silicone pipe drain water out of the chamber

- 9.5 Power Cable
- 1.Standard Power cable is 3 meters
 2. Customer shall prepare on separate No-fuse switch for the device.

10. Main Material List

Refrigerant Compressor Copeland or Tecumseh

Condenser Yongqiang or Aotaihua

Evaporator Yongqiang or jiangche

Dry Filter DANFOSS



Expansion Valve	DANFOSS	
Solenoid Valve	Sporland or Saginomiya	 
Touch Screen	Komeg	
Breaker	Schneider	
AC Contact	Schneider	
Heat Relay	Schneider	
Sequence Relay	Carlo Gavazzi	
Inter-media Relay	Omron or Carlo Gavazzi	 
Solid Relay	Carlo Gavazzi	

11. Outline Drawing

