



Technical Specifications

Temperature and Humidity Testing Chamber

Item No.: **KMH-150R (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 Corrosive substance
Restriction Biological substance
 Strong magnetic emitting resource substance
 Flammable, Explosive, Volatile substance
- 1.3 Sample You should use the testing chamber based on following principals in order to get
Requirement 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

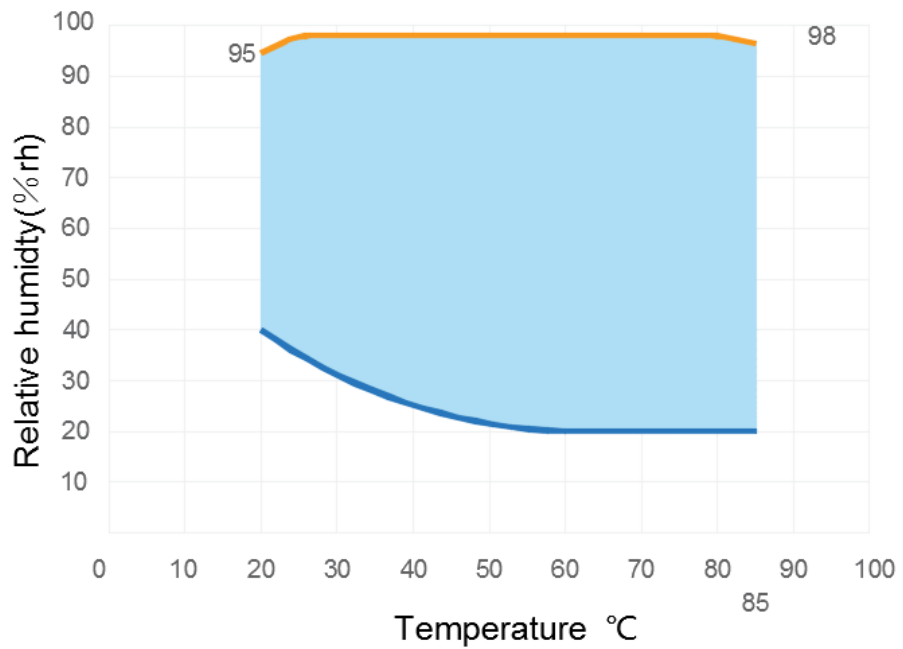
- 2.1 Useful Volume About 150 Liters
- 2.2 Inner W600 mm*H600 mm*D460 mm
Dimension
- 2.3 Outer About W800 mm*H1715 mm*D1230 mm(Not including the protruding part)
Dimension Tips: For external dimensions, please confirm the three views according to the final design!
- 2.4 Coverage About 1.2m²

3. Main Characteristics

- 3.1 Testing Device cooling method: Air Cool
Conditions 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	-20°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	-20°C ~ +100°C, Average 3°C/min (No Loading) +20°C ~ -20°C, Average 1°C/min (No Loading)

- 3.7 Load situation No load
- 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 210*H 270mm), 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

We use intellectual cooling control: 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 to save energy.

Traditional Control Methods	Our Control Method
<p>1. On/off of cooling compressor(High temperature fluctuation, effect compressor lifespan. Not popular nowadays)</p> <p>2. Cooling compressor constantly on+heating to get temperature balance. (Both compressor and heater will be on, high energy consumption.</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).</p> <p>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>

6.2 Refrigerant Environment friendly R404a

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℃ ; Humidity: + 0.1%; Time: 0.01min 。
- 7.5 Setting Range Temperature Setting Range: -100~200 ℃ (**Not Operation range**) ;
 Limitation is adjustable according to device working range (Up range +5℃, Down Range -5℃);
 Humidity Range: 0~100 %RH。
- 7.6 Program Capacity Fix Value Running Time can be set to be 9999 Hours 59 Minutes, or set to be no time limitation;
 Program max capacity is 269 groups and 13450 steps;
 Each group Max steps: 50 steps;
 Max cycling times: 32000 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.
- 7.8 Control Switch 1) Emergency Stop Switch
 2) Power On Switch

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;
Power switch uses 4P + 40A air switch
 - 2.Power Supply Frequency: 50±0.5Hz
 3. Max power consumption: 5 KW
 4. Max current: 13A
- 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	
Evaporator	Yongqiang	
Dry Filter	DANFOSS	
Capillary	KOMEGB	
Expansion Valve	DANFOSS	
Solenoid Valve	Sporland or Saginomiya	 
Touch Screen	Komeg	
Breaker	Schneider	
AC Contact	Schneider	
Heat Relay	Schneider	
Sequence Relay	Carlo Gawazzi	
Inter-media Relay	Omron or Carlo Gawazzi	 
Solid Relay	Carlo Gawazzi	

11. Outline Drawing

