



东莞市环仪仪器科技有限公司  
DONGGUAN HUANYI INSTRUMENT TECHNOLOGY CO., LTD.

## **HYH-408D Temperature & Humidity Test Chamber**

### **Operating Manual**

Survive on quality

Development in good faith

Efficiency by management

## Contents

I . Performance Specifications.....	1
II . System Structure.....	1
III. Machine Requirements.....	5
IV . Machine Installation Location and Method.....	6
V . Machine Power Configuration and Installation Method.....	7
VI. Precautions before Use.....	9
VII. Operating Procedures.....	10
VIII. Precautions for Operation.....	11
IX. Maintenance Precautions and Methods: .....	12
X . Fault Instance.....	15
Fault Corresponding Table.....	16
Factory Certificate.....	17
Attached Controller Theory	

## I .Performance Specifications

1. Model number: HYH-408D
2. Temperature range:  $-70^{\circ}\text{C}\sim 150^{\circ}\text{C}$
3. Humidity range: 10%RH~98%RH
4. Temperature accuracy:  $\pm 0.5^{\circ}\text{C}$
5. Temperature uniformity:  $\pm 2^{\circ}\text{C}$
6. Temperature fluctuation:  $\pm 0.5^{\circ}\text{C}$
7. Humidity uniformity:  $\pm 3\% \text{R}\cdot\text{H}$
8. Humidity accuracy:  $\pm 2.5\% \text{RH}$
9. Temperature rise and fall rate: From (RT~100°C), <25min, (when no load, ambient temperature +25°C)The average temperature rise is 1~3°C per minute  
From (RT~-40°C), ≤60min, (no load, ambient temperature +25°C)Cooling down an average of 0.8~1.2°C per minute
10. Overall size: [W 1100 ×H1950 ×D1740 mm subject to actual object](#)
11. Internal size:W800×H850×D600mm
12. Weight: 400KG
13. Power supply: AC380V 50HZ

## II . System Structure

### 1. Refrigeration system: Multi stage automatic load capacity adjustment technology.

- a. Compressor: Tecumseh compressor imported from France
- b. Refrigerant: Environmental friendly refrigerant b.R-410A
- c. Condenser: Air-cooled condenser
- d. Evaporator: Efficient multi section finned evaporator (fin thickened type)
- e. Attachment: Desiccant, Refrigerant Flow Window, Repair Valve, High Voltage Protection Switch
- f. Expansion system: Freezing system with capillary capacity control
- g. Cooling auxiliary components: Electromagnetic valve ("Egret Palace" in Japan); Filter (DANFOSS); Pressure controller (DANFOSS); Stop valve (CASTEL, Italy); Refrigeration accessories such as oil separator (ALCO in Europe and America) are all imported.

### 2. Electronic system (security protection system)

- a. Two sets of zero crossing gate fluid power controllers (one set for temperature and one set for humidity)
- b. 2 sets of air burning prevention switches
- c. 1 set of water shortage protection switch
- d. Compressor high-pressure protection switch
- e. Compressor overheat protection switch
- f. Compressor over-current protection switch
- g. 2 ceramic E-16 fast fuses
- h. Fuseless switch protection

Line fuses and fully sheathed terminals

### 3. Air duct system

- a. Adopting a 60W extended stainless steel shaft core made from Taiwan
- b. Multi-wing stainless steel heating tube, accelerating heat and humidity circulation

### 4. Heating system: Ceramic stainless steel electric heating tube

### 5. Humidification system: UL type stainless steel humidification pipe

**6. Sensing and temperature measurement system:** Two stainless steel SUR # 304 Pt100 tubes are used, and the wet and dry bulb comparison input is used for temperature measurement and humidity measurement through A/D conversion

## **7. Waterway system**

- a. 1 built-in stainless steel water tank 15L
- b. Automatic water supply device (pumping water from the lower layer to the upper layer)
- c. Water shortage indication alarm. Short term water shortage alarm indication, long-term water shortage shutdown
- d. Water filtration

**8. The control system adopts the Songhua temperature and humidity control system**, with adjustable backlight and programmable temperature and humidity control. It has 120 sets of programs with 1200 memory segments, each segment is 99Hour59Min, and can be divided and set arbitrarily. It also comes with multiple sets of PID control function.

### **a. Controller specifications:**

Temperature setting value: Resolution of temperature setting area in constant value mode:

temperature  $\pm 0.1$ , humidity  $\pm 0.1\%$  R.H

Humidity setting value: humidity setting area in constant value mode

Switch button: When not running, switch to the curve screen. When running, first switch to the detailed monitoring screen of the fixed value, and then switch to the curve screen

Run/Stop: Start and stop device buttons

T-AT/H-AT: PID setting button for temperature/humidity

Output power: Display the current temperature/humidity PID control output percentage

Run/Stop: Start and stop device buttons

T-AT/H-AT: PID setting button for temperature/humidity

Output power: Display the current temperature/humidity PID control output percentage

Output status: Internal output point display: red indicates output ON, gray indicates output OFF

Status display: displays the current operating mode and status

Time display: Display the current date and time. Click on the time display box to enter black screen protection (any time display box on the screen can be clicked to enter black screen protection)

Running time: The time from device startup to current operation

### **b. Screen display function:**

Query: Query History Curve Time

Download: Download the graph to the USB flash drive memory



: Select the curve to show or hide (pink: temperature PV, red: temperature SV, black: humidity PV, blue: humidity SV)

Sampling time: Unit of time for curve data sampling (30S, 60S, 90S, 120S, 150S, 180S, 30

Unit: s

Curve range: Change the Y-axis display range of the curve (60, 100, 200, 160, 320) Unit: °C

Curve time: Change the display range of the X-axis time of the curve (1, 4, 8, 16, 20, 32, 42, etc.)

Unit: hours

Y-axis: temperature range display

X-axis: time range display

Data: Press the data button to access historical data

Clear: Press the clear button to clear historical data

01-10

07:57: Refers to 7:57 on January 10th

Time: sampling time

Humidity PV/SV: Display the actual/set humidity value of the current sampling

Temperature PV/SV: Display the actual/set temperature value of the current sampling

### **C. Program capacity and control functions:**

Operation mode: Select the operation mode (cannot be changed during operation). If only a single temperature/humidity operating value is needed, if multiple temperature/humidity operating programs are needed.

Power outage reset: Automatic start mode after power outage during operation

Stop: After an incoming call, the system automatically enters a stop state,

Cold start: After an incoming call, the system automatically starts and the time is reset to run,

Hot start: The system automatically starts after an incoming call, and runs on a cumulative timer before the power outage

Fault recovery: After recovering the fault, it is necessary to manually start the system (cold start: manually start the system and time it again),

Hot start: manually start the system to run before power outage and accumulate timing operation

Lock: OFF: Close lock ON: Open lock

(After unlocking, an unlock dialog box pops up when performing page operations)

Backlight time: automatic screen saver time, in seconds (20-32000 seconds can be set)

(Enter black screen protection after the time has passed)

**9. Chamber material:**

- a. Inner material: SUS stainless steel plate
- b. Outer material: High-quality carbon steel plate
- c. Insulation material: polyurethane hard foam+glass wool

### III. Machine Requirements

This part is the responsibility of the Buyer and must be prepared before the equipment is used!

Power:	<input type="checkbox"/> AC	220V	1 $\phi$	3W50/60HZ	MAX	A
	<input type="checkbox"/> AC	220V	3 $\phi$	4W50/60HZ	MAX	A
	<input checked="" type="checkbox"/> AC	380V	3 $\phi$	5W50/60HZ	MAX	A

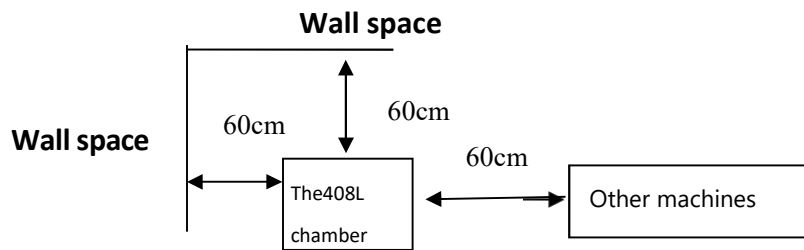
\* Note: To ensure the performance of the equipment voltage frequency variation range: voltage  $\pm$  5%; Frequency  $\pm$  1%!

Humidification water: must use pure water or distilled water (the first reserve must be more than 20L) or conductivity of 10 $\mu$ s/cm below the water quality.

\* Note: Try to ensure that this water source is as pure and clean as possible! No use of groundwater!

## IV. Machine Installation Site and Installation Method

1. The placement location should consider the heat dissipation efficiency and ease of inspection and maintenance of the machine
2. The bottom of the machine is a refrigeration system with high heat, so during installation, there should be a minimum distance of 60 centimeters or more between the body and the wall or any other machine for ventilation and smooth operation. As shown in the figure:



3. Install and adjust the four horizontal feet at the bottom of the fuselage on a flat and vibration free ground to balance the fuselage, facilitate drainage of the inner chamber and prevent abnormal noise (please use a level to check)
4. Do not expose this machine to direct sunlight and maintain indoor air circulation.
5. Please place the machine body in a separate space and not in public places or near flammable, explosive, or perishable chemicals to avoid fire and personal injury in the event of a malfunction
6. The supply circuit and drainage pipeline should be as short as possible
7. Please avoid setting in dirty and dusty areas The ambient temperature and humidity should be maintained between 10 °C and 30 °C; Only between 70 ± 10% RH can the machine achieve the best and most stable operation, which may result in slow cooling speed or inability to meet the requirements of low temperature, and unstable temperature and humidity control
8. No debris should be placed on the top of the fuselage to prevent heavy objects from falling and causing personal injury or property damage
9. When carrying, do not hold the electric box, wires, or motor as the driving force support point to prevent damage, looseness, or accidental failure of the electric box appliances
10. The maximum inclination of the furnace body should be below 30 ° angle, and the furnace body must be firmly fixed to prevent it from falling, crushing, damaging or smashing human body and property
11. When the positioned machine needs to be moved again, please retract the four horizontal feet of the body and move them, then adjust the balance to avoid damaging the machine



## V . Machine Power Supply Configuration and Installation Method

Please follow the following method for power distribution, pay attention to the power capacity, and do not use multiple machines with one external power supply at the same time to avoid voltage drop, affecting machine performance, and even causing malfunction and shutdown.

Please use a dedicated circuit

### 1. According to the power wiring in the specification table

√	1 ∅ 2W220VAC	√	50HZ
	3 ∅ 3W200VAC		60HZ
	3 ∅ 5W380VAC		
	3 ∅ 4W380VAC		

### 2. Applicable power cable diameter: (cable length less than 4m)

	2.0~2.5m m <sup>2</sup>		8.0~10.0m m <sup>2</sup>
	3.5~4.0 m m <sup>2</sup>		14~16 m m <sup>2</sup>
√	5.5~6.0m m <sup>2</sup>		22~25m m <sup>2</sup>

3. If it is a three-phase power supply, please pay attention to the under phase protection (If it is determined that the three-phase power supply is powered but the machine does not act, the machine may be in reverse phase, and only two adjacent power lines need to be exchanged)

4. If you connect the grounding wire to the water pipe, the water pipe must be a grounded metal pipe (not all metal pipes),

All can be effectively grounded.

5. The power supply for the test sample should be connected to the TS signal port on the left side of the machine (load<MAX 5 A). If the load exceeds this limit, please connect another power supply. Otherwise, our company will not be responsible for any faults caused by this!

6. Be careful not to damage the wiring during installation! Do not connect the grounding wire to the gas pipe.

7. Before configuring the power supply, please check whether the machine is damaged during transportation, whether the power cord is damaged, whether the body is deformed, whether the air supply cycle is intact, and whether the inner chamber is kept clean

8. The power cord configuration of the machine: black is the zero line, yellow and green are the ground wires, and the other colors are all live wires

9. The fluctuation amplitude of the power supply voltage input to the machine must not exceed the allowable range, and the grounding wire must be in good condition, otherwise it will affect the performance of the machine

10. Please be sure to configure appropriate safety devices according to the power level of the machine, in order to safely cut off the power supply in case of machine failure, in order to avoid fire and personal injury accidents
  11. Please ensure that the machine is positioned in a safe space before wiring, and ensure that the wiring is consistent with the rated current and voltage of the machine, otherwise electric shock and accidents may occur
  12. Wiring operators should be professional to avoid damaging the machine and burning components due to incorrect wiring and incorrect power input
  13. Please confirm whether the input power supply is disconnected before wiring to avoid electric shock
  14. If the machine has a three-phase motor, it is necessary to check whether its steering is correct when connecting to the power supply. If the single-phase motor has already been adjusted for its steering before leaving the factory, when replacing it, it is necessary to confirm whether its steering is correct to avoid affecting the machine's performance
  15. After wiring is completed, input a matching power supply while ensuring that there are no faults in the machine control electrical appliances
- Before powering on, all electrical box covers must be installed properly, otherwise there is a risk of electric shock and fire
16. Non dedicated personnel are not allowed to carry out maintenance and inspection on this machine, and must carry out disassembly and inspection in case of power outage to avoid electric shock and fire
  17. It is not allowed to remove the electrical box, electrical box doors, body side panels, and some safety protection devices for work. This method is dangerous and the machine is in a dangerous operating state
  18. The main power switch on the control panel should be operated as frequently as possible. When stopping, simply turn off the temperature switch and user power switch

## VI. Precautions before Use

a. Confirmation of power cord and grounding wire:

Is the power cord properly connected according to specifications and confirmed to be grounded?

b. Confirmation of wet and dry bulb over-temperature protector:

The temperature set point of the over-temperature protector=temperature set point+(20-30 °C).

c. Confirmation of water supply:

Is the water volume in the water tank sufficient?

Is the water tank cover properly closed?

Is the drainage switch reset?

d. Confirmation of drainage pipes:

Is the drainage pipe properly connected?

e. Confirmation of wet ball test cloth:

Is it clean? Clean once a month and replace with a new test cloth every three months

Is the placement position correct? Place at the front of the humidity sensor

Is the water level of the water supply tank normal?

Is it wet? There is water in the water supply tank and the water level is normal, but the test cloth cannot be wetted. Please replace it with a new test cloth immediately

f. Confirmation of humidifier water level:

Is the water level normal? [After the humidifier supplies water for three to five minutes, check whether the water level in the water level control box is normal.]

Is the humidifier water clean? The water tray of the humidifier should be regularly drained and cleaned with a brush to maintain cleanliness

g. Check if the setting of the temperature ball over-temperature gas protection switch is correct.

Subject to the markings on the physical object

h. Confirmation of drainage pipes:

Is the drainage pipe properly connected?

**\*Note:** When only measuring temperature, the test cloth should be removed. If the test cloth operates under high temperatures above 85, it should be replaced before the next operation, otherwise it may not be able to absorb water anymore. When replacing a new test cloth, wash your hands first, otherwise it may cause the test cloth to malfunction and become unable to absorb water. (When testing the packaging of cloth, it is all sterilized.)

※ After confirming the above items, place the fixed foot down and secure it properly.

## VII. Operational Procedures

1. Turn on the user's power switch, then turn on the fuse free switch [NFB] of the main power supply, and then press the temperature and humidity meter switch

After the temperature and humidity meter displays a normal screen, the program setting curve to be executed can be pre programmed to facilitate smooth setting work

3. The set values of temperature, humidity, and time should comply with the requirements of the product being tested by the user

4. The setting of various functions of the temperature and humidity meter must be operated by dedicated personnel or according to the instructions of the temperature and humidity meter

After setting each menu, the machine door must be closed tightly before it can operate normally

6. When operating the machine initially, be sure to pay attention to the direction of rotation of the running motor and the direction of rotation of the three-phase motor

7. Press the operation switch of the controller to operate the machine according to the set temperature and humidity

When the temperature and humidity meet the user's product requirements and require shutdown, the temperature and humidity meter switch of the controller must be turned off before the product can be removed and placed

9. For the use of program settings and constant value control, please refer to the controller operating instructions. For specific operation of the temperature and humidity meter, please refer to the manual of the temperature and humidity meter

10. This machine is equipped with a window observation light. If you want to check the situation inside the chamber, please press the [LIGHT] observation light switch, and the light inside the chamber will immediately light up.

11. If a malfunction occurs, the display screen of this machine will display the fault location, and the buzzer will sound. After the malfunction is resolved, please press the 【 REST 】 button (reset switch) on the screen, and then restart the testing machine.

## VIII. Precautions for Operation

1. It is absolutely prohibited to heat or test the machine for explosive and combustible Corrosive substance. Otherwise, it may cause unnecessary losses or the machine may not be able to test it
2. The amount of test material placed should not affect the airflow circulation of the test chamber, otherwise it will affect the performance of the machine
3. When using, the door should be tightly closed, otherwise the temperature and humidity may leak out and the performance area may not be reached
4. Designate personnel to operate this machine to avoid early damage
5. This machine is equipped with a testing hole on the left side, which can be connected to the testing circuit inside the chamber. It also comes with a TS signal power interface, which can be connected to the test material power supply inside the chamber, with a maximum current of 5A
6. When observing changes in the chamber during testing, you can turn on the light switch inside the chamber and observe the changes in the test material inside the chamber through the window.
7. If the machine is operating below 0 °C, it should be avoided to open the internal door as much as possible, because opening the door hard during low temperatures can easily cause ice sealing in the internal evaporator and other parts, especially the lower the temperature, the more severe the condition. If it must be opened, the time should be minimized as much as possible.
8. When completing low-temperature operation, it is necessary to set a temperature condition of 60 °C for drying treatment for about half an hour, and then open the chamber door to avoid affecting the measurement time of the next operating condition, freezing of the evaporator, or damage to the test object. (If the machine malfunctions due to not actually drying at 60 °C, even if it is within the warranty period, it is still due to human negligence, and our company will not provide free service.).
9. During operation, do not open the chamber door unless absolutely necessary, as it may result in the following adverse consequences:

High temperature and humidity rushing out of the chamber... very dangerous!

The inside of the compartment door remains hot... causing injury!

High temperature air may trigger a fire alarm and cause incorrect action!

Door opening method: When opening the door, the operator must move backwards along the direction of the door opening to prevent a large amount of hot air from gushing out of the machine and injuring people

10. Please note that the machine must be safely and reliably grounded to avoid Electrostatic induction!
11. Circuit circuit breakers and temperature over temperature protectors provide testing products for this machine and safety protection for operators. Therefore, please check regularly.
12. The correct device is a wet bulb test cloth, which can measure the correct relative humidity.
13. During operation, please do not check with your hands to avoid danger caused by electric shock or fan injury. Therefore, please stop the operation first, turn off the power, and then repair.
14. Non personnel are not allowed to carry out maintenance and inspection on this machine. During maintenance and inspection, dedicated personnel should be responsible, and there should be monitoring personnel to prevent unauthorized personnel from turning on or off the machine, resulting in electric shock and personal injury
15. Please read the controller manual and related instructions carefully before operating this machine.

## **IX. Maintenance Precautions and Methods**

- a. The radiator (condenser) of the refrigeration unit should be regularly maintained and kept clean. Dust sticking to the condenser can cause the high-pressure switch of the compressor to trip and cause false alarms. The condenser should be regularly maintained every month, and a vacuum cleaner should be used to remove the dust attached to the condenser's heat dissipation mesh. After starting up, a hard brush should be used to brush or a high-pressure nozzle should be used to blow away the dust.
- b. When opening or closing doors or taking test items from the furnace, do not let the items come into contact with the adhesive edge on the door to prevent damage to the adhesive edge and shorten its lifespan
- b. The ground around and at the bottom of the fuselage should be kept clean at all times to prevent a large amount of dust from being sucked into the unit, causing accidents and

reducing performance

- c. The refrigeration system is the core of this machine. Please inspect all copper pipes once a year for any leakage or snow, as well as all horn joints and welding ports. If there is any oil leakage, please notify our company or directly handle it
- d. The high current contacts of the distribution board should be cleaned and maintained at least once a year in the distribution room. Loose contacts can put the entire equipment in a dangerous working state, ranging from burning components to fire, alarm, and personal injury. When cleaning, use a vacuum cleaner to remove indoor dust.
- e. The humidifier and water tray should be regularly cleaned to avoid scale formation and affect the emission of steam. Generally, after completing a test and cleaning once, the scale should be promptly removed, which is beneficial for the lifespan of the humidifier pipe and ensures smooth water flow. When cleaning, use a copper brush to wash and rinse with water.
- f. Wet cloth for dry and wet balls should be checked regularly. When the surface of the test cloth is not clean or hard, or after controlling at a high temperature of 85 °C or above, before continuing with temperature and humidity control. After inspection, if there is any non absorbent material, please replace it. This is related to the accuracy of moisture measurement. The test cloth is usually replaced every three months. When replacing, a clean cloth should be used to wipe the temperature sensor. When replacing a new test cloth, wash your hands first and then clean the sink.
- g. Inspection and adjustment of wet bulb water level: The water level in the water storage tank should not be too high. If it is too high, it will overflow the water storage tank or if it is too low, it will cause the wet bulb test cloth to absorb water abnormally, which will affect the accuracy of the wet bulb. Keep the water level at about six minutes full. The adjustment of the water level in the water tank can adjust the height of the water tank [adjust the screws on both sides]
- h. Please do not adjust the setting values of the two over-temperature protectors in the distribution chamber casually. They have been adjusted before leaving the factory. This protection switch is used to protect the heating and humidification pipes from air burning and water shortage alarms. Set point=temperature set point+20 °C~30 °C
- i. When the machine is running, the set point of the over-temperature protector temperature on the panel=temperature set point+15 °C~20 °C. When the temperature inside the test

chamber rises to the set point of the over-temperature protector, the power supply to the heater will stop, and the [Over HEAT] over-temperature warning light will light up, but the fan will still be running. If it runs for a long time and is under the supervision of a person, do not necessarily check the over-temperature protector before operation to ensure that it is properly set.

j. Inspection and maintenance of waterways

The water pipe in the waterway is a device that is prone to blockage and leakage. Please regularly check for any signs of water leakage or blockage. If any, please promptly eliminate or notify our company. The water storage inside the humidifier should be replaced once a month to ensure clean water quality and smooth water flow.

k. When the test product time is up and the product is taken, it must be in the off state and the staff must wear dry, anti electric, and temperature resistant gloves to take and place the product

l. Cleaning and maintenance of the inside and outside of the chamber

Before operating the machine, internal impurities (substances) should be removed.

The distribution room should be cleaned at least once a year. When cleaning, please use a vacuum cleaner to remove indoor dust. The exterior of the chamber must be cleaned at least once a year, and should be wiped with soap and water during cleaning.

m. If the machine is modified without our company's consent during use and causes losses, our company will not be responsible

n. Our company is not responsible for any consequences caused by not following the precautions and requirements in the manual



## X . Fault Instance

Fault situation	Reason	Treatment
Turn on the power and the machine does not operate	Lack of phase; abnormal power supply	Check and power on again
	Controller has no output	Check if the controller PC board is working
	Control power fuse burnt out	Check the cause and replace the insurance
	Misoperation of safety protection device	Check safety protection measures and manually reset
Unable to cool down or slow cooling down	The refrigeration compressor is broken	Update or send for repair
	Snow leakage	Notify our company or invite professional personnel for repair
	The air motor does not rotate or reverses	Check for reasons or updates
	The electromagnetic switch of the compressor is broken	Check for reason updates
	Dust adhered to the condenser	Blow clean the high-pressure nozzle
	Poor heat dissipation of the unit	Poor installation position, reposition installation
Temperature cannot be achieved or out of control	Temperature over-temperature protection action	Reset
	Temperature SSR damage	Check and replace
	The temperature electric heating tube is damaged	Check and replace
	Temperature contactor faulty	Check and replace
	Refrigeration system malfunction	Notify our company or invite professional personnel for repair
Humidity cannot be achieved or out of control	Humidity SSR damage	Check and replace
	The humidity heating tube is damaged	Check and replace
	Wet cloth does not absorb water well	Renewal

	The water level in the water pan is too high or too low	Adjusting the water level
	The humidity contactor is faulty	Check the cause and replace it with a new one
	Temperature over humidity protection action	Reset
Controller unable to control	The button has no effect	Notify our company
	No power input	Check and power on again
	I/O board not working	Loosening and reinserting the wiring harness
	No display on the control panel	Check the power supply or notify the company

## Fault Corresponding Table

Alarm point 2: Compressor overload alarm point 8: Panel over-temperature protection

Alarm point 3: Phase sequence protection

Alarm point 4: Heating, air burning, dry burning

Alarm point 5: Water tank is short of water

Alarm point 6: Compressor over-pressure

Alarm point 7: humidified air burning dry burning

## Factory Certificate

Product name: Temperature and Humidity Test Chamber

Model: HYH-408D

No. : 240731-1

Date: 2024-07

Inspection result: Qualified

Inspector: Fu Deng

Reviewer: Deng Hongyan

Welcome to use our company's products. Our company will bring convenience to your work with excellent quality and efficient service. Satisfying you is our greatest wish!

Dongguan Huanyu Instrument Technology Co., LTD



**东莞市环仪仪器科技有限公司**  
**HUANYI INSTRUMENTS CO.,LTD**

Ph: +86-0769-83482055 83127258

Fax: +86-0769-83482056 #816

<http://www.huanyi-group.com>

Email: [dg@huanyi-group.com](mailto:dg@huanyi-group.com)

Address: Building 2, No. 3, Longkeng Xingye Road, Dongkeng Town,  
Dongguan City