Drug Stability Test Chamber

KD-150/250/400/500 (LCD display)

Instruction Manual

Manufacturer: Kenton Apparatus Limited
Factory Add: No.2 Hualong Road, Renhe Town Alley Baiyun District Canton China
Ph: 0086-020-36246586 36247961
Website: www.kentonchina.com
Emial: kenton@kentonchina.com
Official Accounts:

Safety and warning signs , label explication

● “Warning” symbol

⚠ warning

It will cause serious harm or fatal accident if not complying with warning

● “Attention” symbol

⚠ attention

It will cause injury ,equipment damage and the loss of relative property if not comply with attention

■ The meaning of symbols：

⃠ prohibiting

● must follow

■ Symbols on equipment

~ AC

⏚ protective conductor thermal

| power is connected

○ power is disconnected

⚠ warning, attention, caution and danger

Safety operation and Preventive action

warning

⃠	Do not place this equipment outdoors. if it exposed in the rain, it may cause creepage and electric shock.
❗	Only professional person have qualification to install this equipment. If not, it may cause electric shock or fire.
❗	Should place this equipment on the firm ground in case of tumble. If not, it may cause injury because it capsizes.
⃠	Do not place equipment in humid environment or a place with dripping water. Otherwise it may cause creepage or electric shock
⃠	Do not place equipment near flammable materials and volatile substance. Otherwise it may cause explosion or fire.
⃠	Do not place equipment in the area where surrounded by acidic or corrosive gas, Otherwise it may cause creepage or electric shock
⏚	Please use power supply socket with protective conductor terminal in case electric shock. If power socket without protective conductor terminal, it is necessary to install it by licensed technician.
⃠	Do not connect protective conductor terminal through gas, water pipe, telephone line or lighting arrester which will cause electric shock.
❗	Please use specified power supply. If not, it may cause electric shock or fire.
⃠	Do not put volatile and inflammable substances in the inner chamber of equipment if it cannot be sealed, or it may cause explosion or fire.
⃠	Do not insert nail or wire and similar metal objects into any inlet or outlet of equipment, or it may cause electric shock or injury
❗	Please operate this equipment in safe area if it stores any toxic ,harmful and radioactive substances, or it may do harm to human and environment.
❗	Make sure to cut off power supply before maintaining equipment in case it causes electric shock or injury .

Safety operation and Preventive measure

⚠ warning

⃠	Do not touch any electric components or switch with wet hand, or it may cause electric shock
❗	Make sure wear mask when maintaining the equipment to prevent any harmful drug substance and airborne particle.
⃠	Do not splash water onto the equipment, or it may cause electric shock or short circuit .
⃠	Do not place container which is filled of water on the top of equipment, or it may cause creepage or electric shock.
⃠	Do not drag, twine or bind power cord. Do not damage power plug, or it may cause electric shock or fire hazard.
⃠	Do not use loose power plug, or it may cause fire or electric shock
⃠	Do not dismantle, repair or refit equipment without authorization and guidance from our company.It may cause fire or injury due to the improper handling.
❗	Please unplug the power if equipment is malfunctioning. It may cause fire or electric shock if it continues.
❗	Press power plug instead of pulling the power cord when you want to unplug the power from power socket, or it may cause electric shock or fire hazard because of short circuit.
❗	Should unplug the power before moving equipments. Do not damage power cord. Damaged cord may cause electric shock or fire.
❗	Should unplug power plug if it's not used for long period, or it may lead to electric shock, leakage or fire because of wear and tear of insulator.
❗	Keep out of reach of children and the door unsealed if the equipment is not supervised or not used for a long period.
❗	Should inform authorized technician when you dispose the equipment. Should dismount the equipment door to prevent suffocation and such accident.
⃠	Keep out of reach of children with the wrapping plastic.

Safety operation and Preventive measure

⚠ Attention

❗	Please clean the dust on the power plug and then insert it into power socket properly, or it may cause over-heating or strike sparks
❗	Check temperature, humidity, segment and timing and other setting value when reboot the equipment after been short circuited or cut off by power supply. Otherwise may cause damage lost of products stored inside.
❗	Please place equipment in ventilative and dry place if not used for long period after purchase, or it may lead to equipment malfunctioning when use.
❗	Should arrange proper carrying-tools or qualified person when moving equipments. Prevent tumbling when moving equipment, it may cause damage of equipment or human injury.
❗	Ensure enough space when moving equipment. If you need to carry it to the second or higher floors, make sure the elevator has enough space for the equipment and working personal.
⃠	Do not put acidic, alkaline or corrosive substance in the inner chamber if the container is not sealed. Otherwise it will cause corrosion or damage to the components of equipment.

Instruction(Application,Working principle,Technical parameters)

Application

- ALLIGENT-KD **Drug stability test chamber** is used for evaluation of drug failure, accelerated testing and long-term trials, pharmaceutical GMP certification by pharmaceutical companies, which is ideal equipment for pharmaceutical stability testing .

performance

Drug stability test chamber transfers actual temperature and actual humidity detected from temp. and humidity sensor into signal .through the microcomputer control to heater, compressor, humidifier towards required temperature , humidity and light intension

technical parameters

1、 Volume：150L 250L 400L 500L;

2、 Temp. range ： 0～65C;(with humidity6～50C);

3、 Temp fluctuation ： ±0.5C(10C～40C);

4、 Temp uniform ： ±1C(10C～40C);

5、 Humidity range ： 40-95%RH(10C～40C);

6、 Humidity fluctuation ： ±2%;

7、 Power voltage ： 220V/50Hz;

8、 Input power：1250W（150L） 1400W（250L） 1550W（400L） 1650W（500L）;

9、 Working ambient ： ambient temp 10~30C relative humidity70% below ;

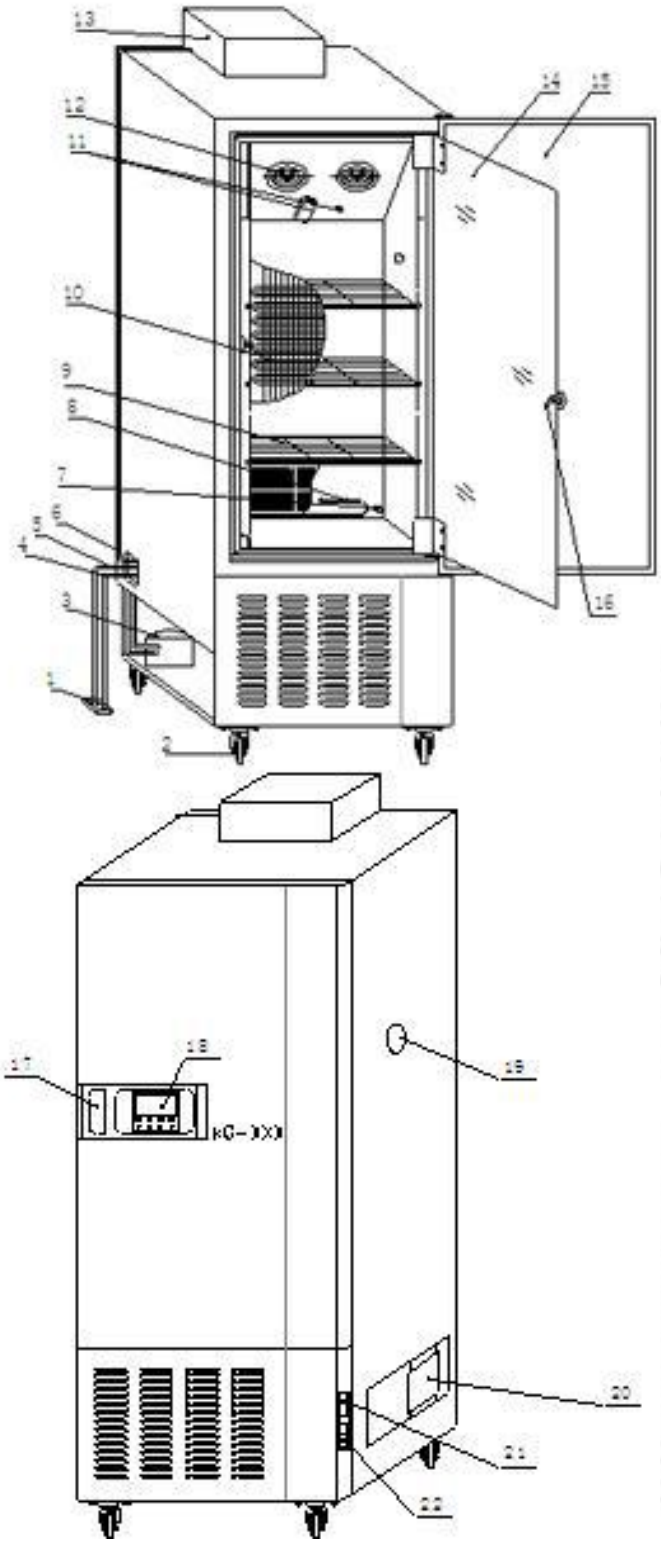
10、 refrigeration：R134;

11、 Equipment class：class I

Notice ： this equipment has low temperature auto-defrost function ,it is normal if there is fluctuation when low temperature auto-defrost

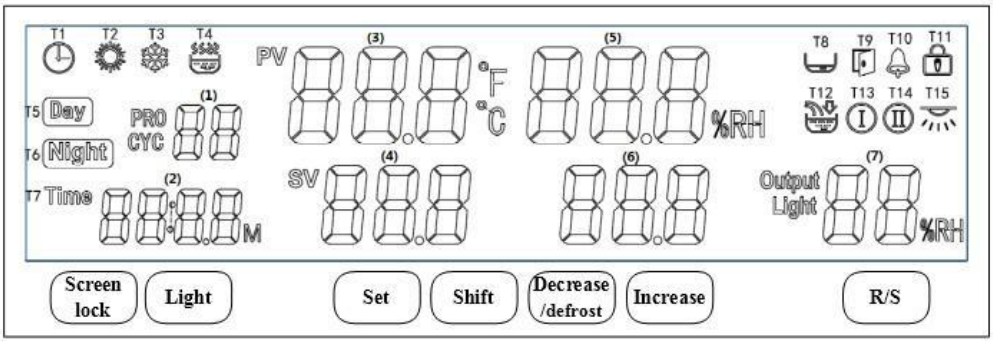
Structure

Parts



1. Storage water tank
2. Wheel
3. Compressor part
4. Outlet pipe
5. Overflow pipe
6. Inlet pipe
7. Water switch
8. Humidifier
9. Mesh board
10. Evaporator
11. Temperature and humidity sensor
12. Axial fan
13. Water tank
14. Glass door
15. Outer door
16. Internal door button
17. Door handle
18. Controller
19. Test hole
20. Control panel
21. Power supply switch

Panel instruction



Symbol definition

T1: appointment: its twinkling means the controller enter into appointment mode, meanwhile, the (2) area displays appointment time (count down).

T2: heat: its lightening means heater working.

T3: refrigeration: its lightening means air compressor working.

T4: humidity: its lightening means humidifier working.

T5: daytime: its lightening means the machine is in daytime mode.

T6: night: its lightening means the machine is in night mode.

T7: timer: its twinkling means the timer working, meanwhile, the (2) area displays setting time(count down).

T8: lack of water: its lightening means lack of water, its twinkling means low-level water alarm.

T9: door open: its lightening means the door is open

T10: alarm: its lightening means temperature or humidity alarm; its twinkling means low-temperature or high-temperature protection.

T11: screen lock: its lightening means screen is locked, one can not change any setting value before unlock it.

T12: watering: its lightening means water pump working.

T13: defrosting: its lightening means the defrosting system working.

T14: valve: its lightening means valve working.

T15: illumination/sterilization: its lightening means lamp working, its twinkling means UV lamp working.

Display window

(1)Area: cycle/segment

(2)Area: timer or setting time

(3)Area: current temperature value

(4)Area: temperature setting value

(5)Area: current humidity value

(6)Area: humidity setting value

(7)Area: illumination or heating output power

Button definition

Screen lock: in normal mode, one can press on this button for 2 seconds to lock or unlock the screen.

Light: in normal mode, one can click on this button to switch on/off the lamp.

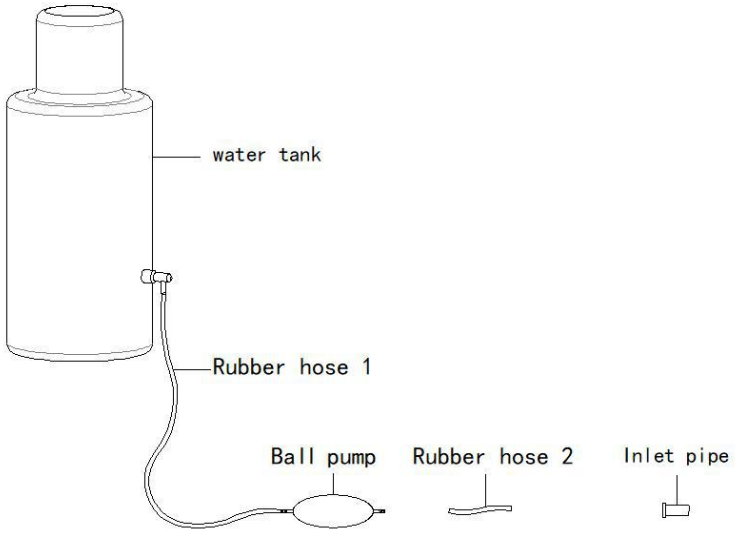
Set: in normal mode, one can click on this button to set value of temperature, humidity, illumination and others; or press on this button for 3 seconds to enter into inner parameters.

Shift: in setting mode, one can click on this button to shift digit position; in normal mode, one can click on this button to shift daytime or night mode; in programmable mode, one can click on this button to inquire cycles and segments.

Decrease/defrost: in setting mode, one can click on this button to decrease setting value; in normal mode, one can press on this button for several seconds to activate defrosting function.
Increase: in setting mode, one can click on this button to increase setting value
R/S: in normal mode, one can click or press on this button to start or stop the controller running.

Preparation before operation

When equipment running in the first time ,please operate according to following
1.take off the baffles
2.Clean the cavity wall with gauze which is soaked by alcohol and then use dry cloth to wipe-dry
3.Put the baffles into inner chamber according to your experiment of requirement
4.Put water tank on the top of equipment before use ,then insert water pipe into water inlet and overflow which in the left of equipment (refer to component picture) ,and put storage water tank under the overflow pipe and water outlet for spare use
5.Pour enough pure water into water tank
6.**Before the equipment is energized, the air in the rubber tube should be discharged first. The steps are as follows: Connect the water tank with the rubber tube 1, the ball pump and the rubber tube 2, and unscrew the water supply switch of the water tank. At this time, the air and water in the pipe will flow out together. If not, squeeze the ball pump until the air and water in the pipe flow out smoothly, and the other port of the rubber tube 2 can be connected to the water inlet interface of the equipment. Note: If the air is not effectively discharged, water may not enter the tank, resulting in abnormal humidification.**



⚠ **notice ： don’t use NaCl or other Halide solution to clean equipment ,or it will cause rust**

Operation and usage

1. After power on, (3) area displays “PS”, (5) area displays “V01”, the buzzer beeps, and then ,after 2 seconds, the controller will enter into normal mode.

2. Setting values: after clicking on set button in normal mode, symbols “TIME”and“SV” twinkle, one can modify the setting value (digit position twinkling), by shift, decrease, increase buttons, and one can shift to next group value by another clicking on set button. After modification, one can press on set button for 1 seconds to quit setting mode, the setting value will be saved automatically.

In programmable mode, segment value position twinkles after clicking on the set button. In this time, one can modify the segment number by decrease or increase button, and inquire setting value of time, humidity, temperature, and illumination in every segment.

In day/night mode, after clicking on set button, “DAY” symbol will twinkle, then, one can choose daytime or night mode by decrease or increase button, after another click on set button, one can inquire and modify every value of current mode, by increase and decrease buttons.

3. **Setting of cycles and segments:** in programmable mode or day/night mode, when the controller is in stop situation, after pressing on “set” button for 3 seconds, the (1) area displays “Lc”, the (2) area displays “0”, users can adjust the password to 3 by increase/decrease buttons, so that the controller enters cycle and segment setting mode. PRO----total program number, CYC----total cycle number.

4. fault reminder:

Temperature alarm：symbol“℃”flashes quickly when upper deviation occurs，symbol“℃”flashes slowly when lower deviation occurs;

Humidity alarm: symbol“**%RH**”flashes quickly when upper deviation occurs，symbol“**%RH**”flashes slowly when lower deviation occurs;

If the (3) area displays “---”,user should check the sensor and controller.

Inner technical parameters

In normal mode, press on set button for 3 seconds, the (1) area will display “Lc”,users can input right code and click on the set button one more time to enter different inner parameters. After adjusting the value of parameters, please do remember to press on the set button for another 3 seconds to quit setting mode.the value adjusted will be saved automatically.

parameter-1

symbol	name	function	（range） factory value
Lc	password	when“**Lc=9**”,this parameter group can be inquired and adjusted.	0
U1	Running mode	0：constant value mode； 1：day/night mode, 99 cycles； 2：program mode, 1~30 segments，0~99	(0～2) 0
U2	Power down protection	0：no operation； 1：begin with the first segment； 2: restart from the power down time	(0～2) 0
U3	Timer adjust	Modification value=【display value（s）-real value（秒）】***10** ÷ real value（m）。	(-999～999) 0
U4	Timing unit	1：minute 0~9999； 2：hour 0~9999	(1～2) 1
U5	Timing temperature point	When U5= display temperature-setting temperature, timer starts to work	(0～10.0℃) 0
U6	Timing humidity point	When U6= display temperature-setting temperature, timer starts to work	(0～50.0%) 0
U7	【**R/S**】time	Press on the【**R/S**】for U7 time to run/stop	(0～10s) 0
U8	Lock screen time	Lock screen time, 0 means unlock	(0～300s) 0
U9	Reminder time (stop)	The buzzer beeps for U9 seconds when running stop. **0 means buzzer beeps continuously**	(0～300s) 0
UA	Illumination time	Illumination time, 0 means manual operation	(0～9999min) 0
Ub	address	Communication address	(1～16) 1

parameter-2

symbol	name	function	（range） factory value
Lc	password	when“**Lc=103**”,this parameter group can be inquired and adjusted.	0
TH	Temperature upper deviation alarm	when“display value＞set value+**TH**”, upper alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(0～20.0℃) 5.0

TL	Temperature lower deviation alarm	when "display value＜set value+**TH**", lower alarm occurs, heating and humidity cut down User can click on any button to stop	(-50.0～0℃) 0
Tb	Zero adjust(low temperature	**Tb** = real temperature − display temperature	(-99.9～99.9℃) 0
TA	Full adjust(high temperature)	**TA** = 1000＊（ real temperature − display temperature）÷display temperature	(-999～999) 0
TP	Proportional band	Adjustment of proportional function.	(0.1～50.0) 8.0
TI	Integration time	Adjustment of integration function	(1～2000s) 500
TD	Differential time	Adjustment of differential function.	(0～2000s) 200
TT	Heat period	Heating control period	(1～60s) 5
Tc	Low temperature cutoff	Heating cutoff point.	(-2.0～0℃) -0.5
To	Heat power	Heating max power percentage	(0～100%) 100

parameter -**3**

symbol	**name**	**function**	**（range） factory value**
Lc	password	when "**Lc=203**",this parameter group can be inquired and adjusted.	0
HH	Humidity upper deviation alarm	when "display value＞set value+**TH**", upper alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(0～50. 0%) 20. 0
HL	Humidity lower deviation alarm	when "display value＜set value+**TH**", lower alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(-50. 0～0%) 0
Hb	Zero adjust(low humidity)	**Tb** = real humidity − display humidity	(-99.9～99.9%) 0
HA	Full adjust(high humidity)	**TA** = **1000** ＊（ real humidity − display humidity）÷display humidity	(-999～999) 0

HP	Proportional band	Adjustment of proportional function.	(0.0～90.0) 10.0
HI	Integration time	Adjustment of integration function	(1～999s) 200
Hd	Differential time	Adjustment of differential function.	(0～999s) 30
HT	Heat period	Heating control period	(0～60s) 5
Hc	Low temperature cutoff	humidity cutoff point.	(-50.0～50.0%) 0.0
Ho	humidity power	Humidity max power percentage	(0～100%) 100

parameter -4

symbol	name	**function**	**(range) factory value**
Lc	password	"**Lc=209**" this parameter group can be inquired and adjusted.	0
P1	Illumination control	0：no illumination； 1：3 levels； 2：4 levels； 3：5 levels； 4：6 levels； 5：10 levels	(0～5) 4
P2	Humidity set	0：no humidity；1：humidity display only；2：humidity can be controlled。	(0～2) 2

appointing set -**5**

symbol	name	function	**(range) factory value**
Lc	password	When"**Lc=36**" this parameter group can be inquired and adjusted.	0
AP	Appointing set	0：shut off appointing fuction； 1：start appointing fuction	(0～1) 0
T_	Appointing time	When AP=1, the timer can be set.	(0～9999min) 0

Routine using and maintenance

⃠ please keep upright when moving this equipment

Do not frequently modify the set values during process, to avoid overload because compressor starts frequently , or it will affect life of use

❗ The equipment is equipped with power switch and circuit breaker ,if there is something wrong with this equipment during process, please cut off the power and check the control circuit , and then check the other parts. (See wiring diagram)

❗ Be sure to shut the inner door, and then close the outer door. If the inner door is not fully closed, even if the outer door is closed, the device may not be able to reach maximum performance. Please close the door carefully to avoid damaging silicone door seal.

❗ Do not use corrosive solution to wipe the exterior surfaces in order to maintain the appearance of the equipment, keep the chamber clean, use a dry cloth or alcohol to wipe.

❗ If set the equipment aside, keep the chamber dry, and cut off the power supply.

❗ In order to ensure uniform temperature, you should often check the axial fan. During experiment, for good circulation, samples should not be crowded

Do not touch temperature probe, in case of temperature is out of control.

❗ Make sure the shelf is fixed, or it could damage the cultures.

⃠ Do not lean against or press the glass in case injury person.

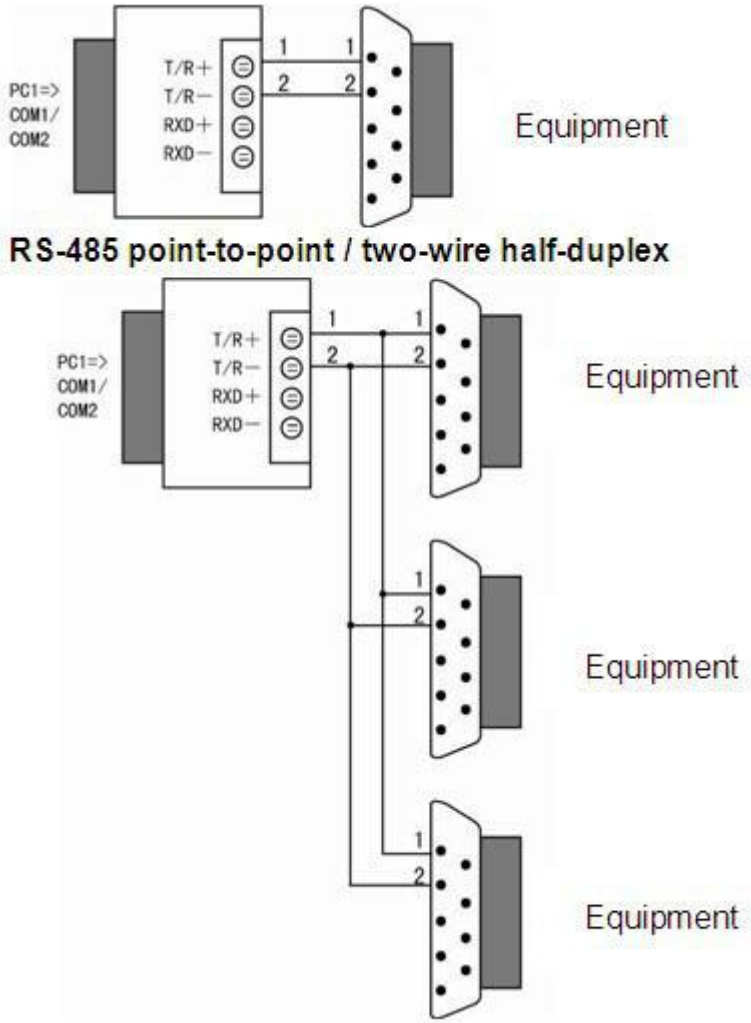
⃠ Do not lean against the doors, in case injury person or damage door or damage equipment.

❗ When equipment fails to work, please ask professional technician or the factory sales department for help. Please don’t do anything by yourself.

Optional-using

RS-232/RS-485 instructions for use of the converter

- In order to proceed with data communication between the different standard serial interface to the computer, an external device or smart instrument, must provide conversion of standard serial interface. The converter is compatible with RS-232, RS-485 standard, capable of converting single-ended RS-232 signal to a balanced differential RS-485 signals.(it can connect 16 controller of this series together at the same time)



Trouble shooting

(1)Trouble shooting

Trouble	handling
Sensor failure warning	·Heating sensor abnormal, please check heating sensor (model:PT100) ·Humidity sensor abnormal, please check humidity sensor
Temp. can't reach setting value	·Please check heating tube
Humidity can't reach setting value	·Please check water level, water level should cover half of the heating tube. ·Please check humidity heating tube.
Screen displays nothing	·Please check if socket is 220V ·Please check if power is connected ·Please check if power switch, if it is tripping operation, please check wring layout.

(2)trouble shooting

1.when temp. sensor is abnormally, it displays: Temp. abnormal. PLS replace temp. sensor

2.when humidity sensor is abnormally, it displays :99% or 0%, PLS replace Humidity sensor.

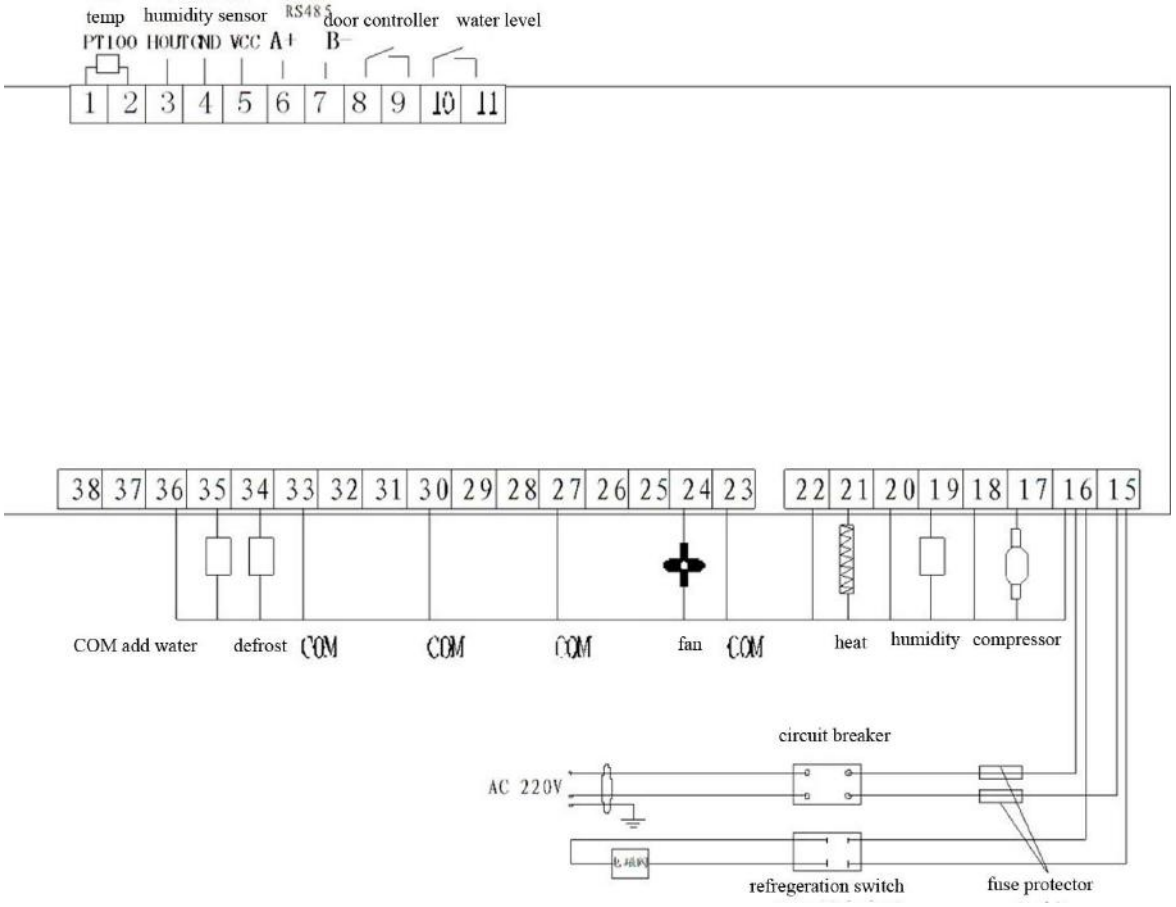
3.Water level signal has been open circuit in 5 minute, prompt system of adding water failure, screen displays: no water, please add water. Please check water system.

Specification

Name	KD Series-Drug stability test chamber			
Model	KD-150	KD-250	KD-400	KD-500
Exterior Dimension	650×680×1410	650×740×1730	745×930×1700	895×930×1700
Interior Dimension	508×389×757	508×449×1088	601×639×1052	750×639×1052
Volume	138L	236L	392L	500L
Shell	Cold-roll steel sheets with powder coat treatment			
Inner shell	SUS304 mirror stainless steel			
Door	With heating preservation design			
inner door	Tempered glass (5mm)			
Shelf	Carbon steel with chromeplate			
Heating preservation system	Polystyrene foam			
Cooling system	R134a(without fluorine), environmental protection, energy saving			
Heating system	Adopt high efficient heating tube			
Fan	Axial flow fan			
Humidity System	Electric heating, humidify stable			
Temp. sensor	Sumsung Temp. sensor PT100			
Humidity sensor	Cybersen humidity sensor			
Display	LCD(Liquid Crystal Display),Chinese/English Display			
Warning system	Temp. & humidity upper limit warning with prompt; Temp. & humidity sensor failure warning with prompt			
Optional Accessories	Switch port ,Portable printer,			

Note: Kenton may change product design and specification without notice.

Wiring layout



KD Series-Drug stability test chamber

Packing List

No.	Name	Quantity	Note
1	Finish product	1	
2	Manual	1	
3	Shelf	3(150L) 4(250L) 4(400L) 4(500L)	
4	Storage water tank	1	
5	Water tank	1	
6	Inlet pipe	1	
7	Outlet pipe	1	