SERVICE MANUAL

Dia Pro Tıbbi Ürünler Sanayi ve Ticaret A.Ş.
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Item: Gel Gard Incubator

Model: K37-24

Version No.:V1.0

Drawing up description

Based on R & D personnel's design principles and accumulated experiences, the manual is prepared for easily maintenance and quickly check products' failure to solve quality problems on site and after-sales maintenance.

Contents

Chapter 1 Introduction

1. Introduction

MK-24 is an incubator integrated with micro process technology and PID control technology special used for gel-card in 37℃ incubation.

Features:

1). LED display, temperature and time can be set
2). 2 independent incubation zones carry 12 Gel cards with self-timing function of each zone. Make sample process more rapid and efficient.
3). Constant heating for 6 column / 8 column gel-card.

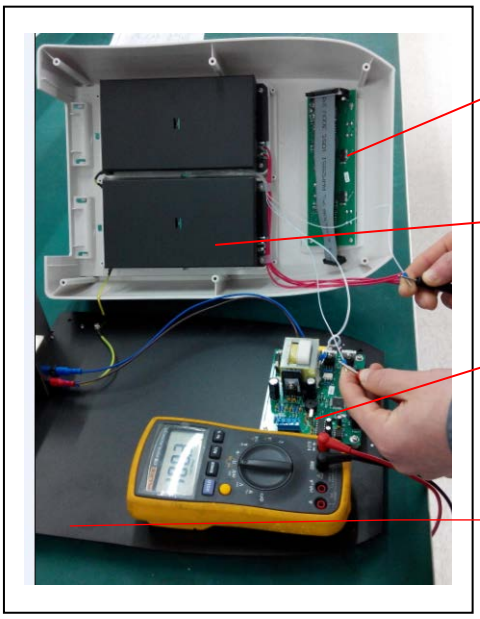
4). Micro process technology control time and temperature, good temperature linear, small fluctuations
5). Timer：1～99min59s

6) Automatically lifting after opening lid for easy take out
7). Safety use and reliable performance. Self clocking and alarm reminder
8). Appearance is concise and easy, transparent cover make the experiment process all in sight

Chapter 2 Product structure

1）Overall view

2）Inner view



Chapter 3 Installation and Maintenance

1. Normal working conditions

Environment temperature：5°C~30°C

Relative humidity：≤70%

Power:AC220V or AC110

Put in a flat place

2. Installation method

a)Read the user manual before installation

b)Confirm the installation conditions. Check if the instruction conditions complies the request.

C)Install the gel-card, request：Heating plate surface and gel-card surface should be clean.(you can wipe with alcohol)

d)Start up the instrument, make sure the display conditions and buttons normal

e)Power on the instrument and check the heating button and display is normal.

3. Daily maintenance and use

a) Before connecting the power, make sure the input voltage is same as instrument request and the load rating of socket is higher than instrument requirements

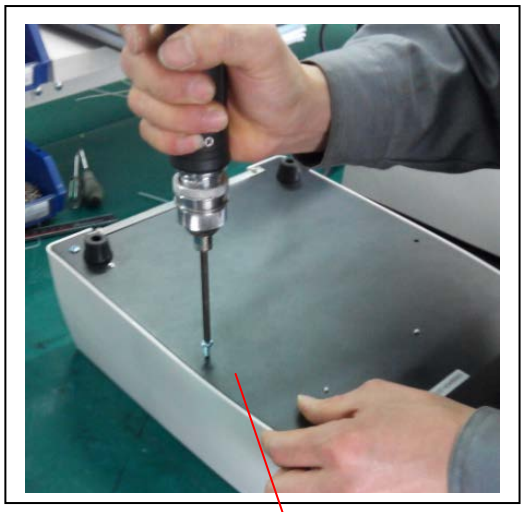
b) The instrument should be put in a place with low humidity, less dust and away from direct sunshine, water and other strong light source. It should be well ventilated, far away from corrosive gases and strong magnetic, heat gas and other hot source.

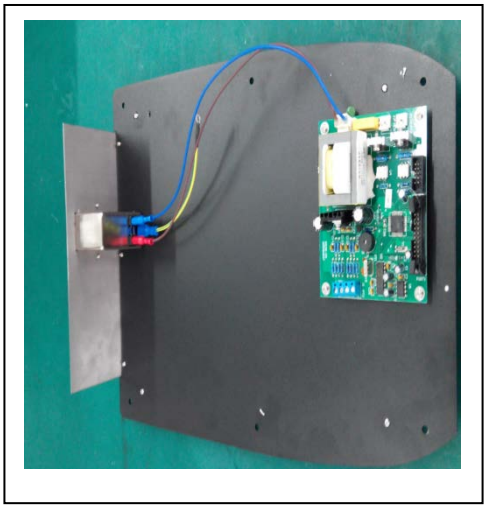
C) When installing the gel-card, the heating block and gel-card surface should be dry and clean.

d) Clean the unit and heating block's surface periodically to ensure the good connection between gel-card and heating blocks

4. Disassembly step

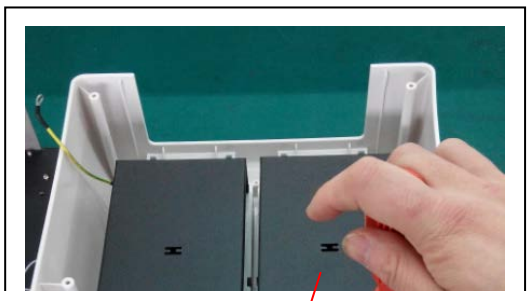
a) Remove the screw fixed on the bottom plate with cross screw driver. Open the out-shell and take out lead terminal then out shell.

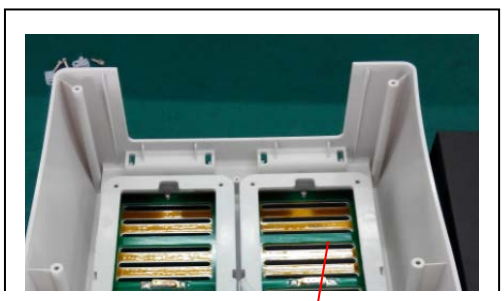




Bottom plate

b) Take out the fixed plate for aluminum heating plate with cross screw driver. Then take out the aluminum heating plate. (This step can apply for aluminum heating plate change, temperature sensor change and heating film change.)

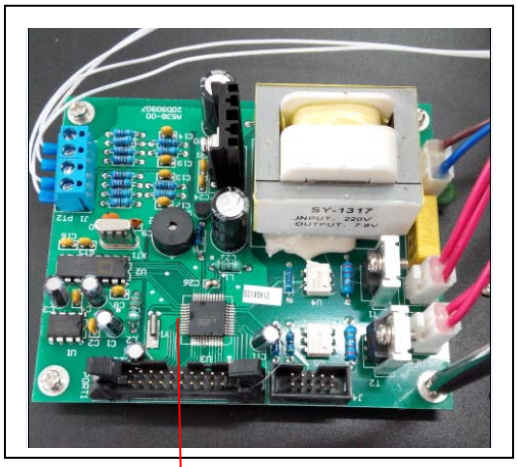




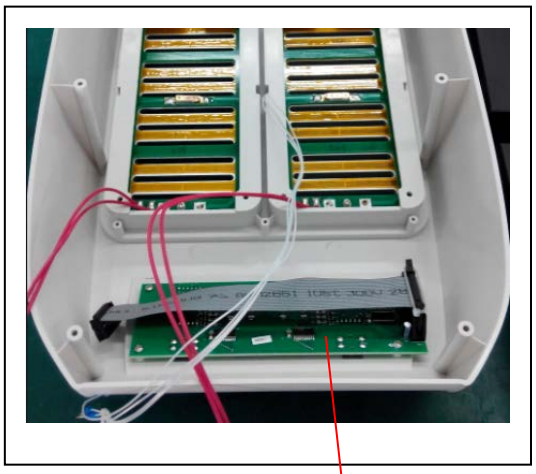
Fixing plate for aluminum heating plate

Heating element

c) Remove the screw which fixed on the control board with cross screw driver to change the control board. Same way to remove the screw which fixed display board and out shell to take out the display board.



Control board



Display board

Chapter 4 Common problems and troubleshooting

1. No power on instrument

Failure ： No display when power on and no “di” sound

Possible Causes：1). Power connect failure or fuse broken

2). Single-pole switch broken

3). Control board failure

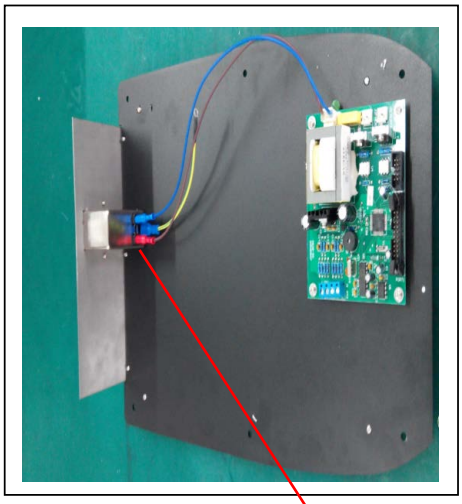
Trouble shooting:

1). ①Check over the external power supply good or not for ensure the instrument input power.

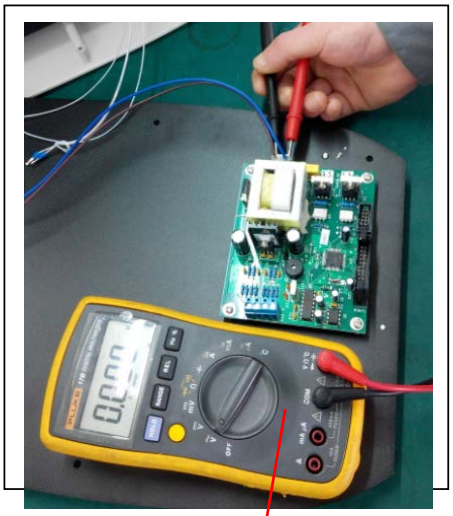
②Take out fuse, check it broken or not with multimeter resistance shift. Check the both side of fuse.

2) Open the single-pole switch at “one” shift. Check it conduct or not with multimeter resistance shift. If not, then single-pole switch is failed.

3) Power on the instrument with normal voltage. Check the null line and fire line voltage is same or not with multimeter AC shift.



Power socket



Measure voltage

2. Abnormal display and situation when

Failure 1：Abnormal display of display board

Possible causes 1). Missing codes caused by poor soldering on PCB leads

2). Missing codes caused by cable failure

3). Missing codes caused by PCB failure

Trouble shooting:

1). Take out the control board, check if there is poor soldering or over soldering on cable base, If ye, try to re-solder it . Then power on the instrument to see problem solved or not.

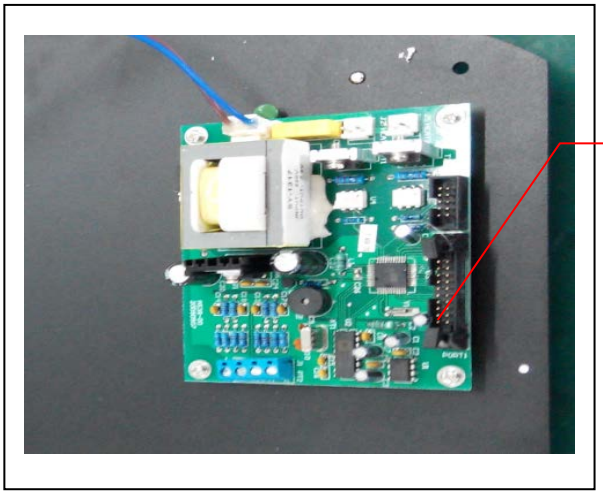
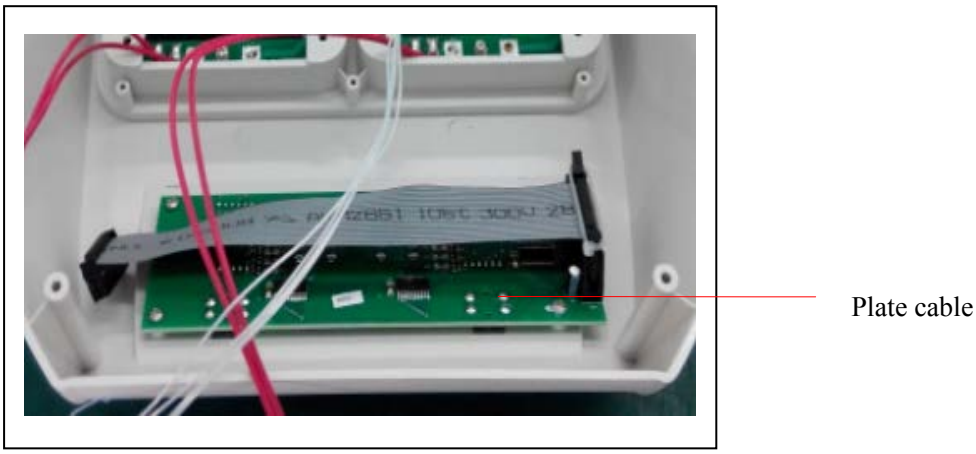
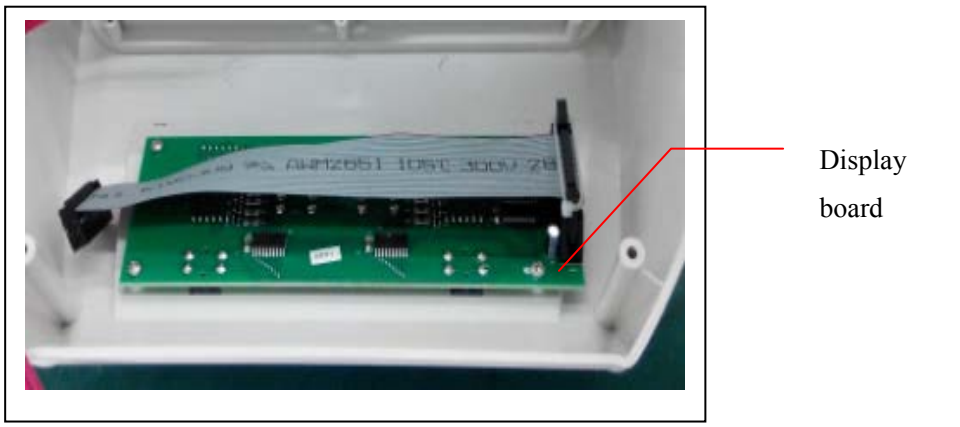


Plate cable base

2). Change one new flat cable to check if the problem still exist.



3). Take out the display board, check if there is poor soldering or over soldering on every element. If there is problem, should be handle that. If both control board and flat cable without problem, then it is display board broken. It should be change or back to factory for repair.



Failure 2 : Button failure

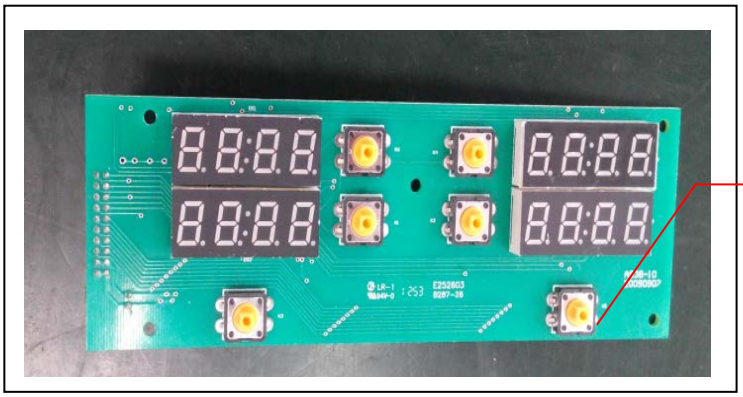
Possible causes 1). Poor soldering or button failure on display board

2). Flat cable connect failure.

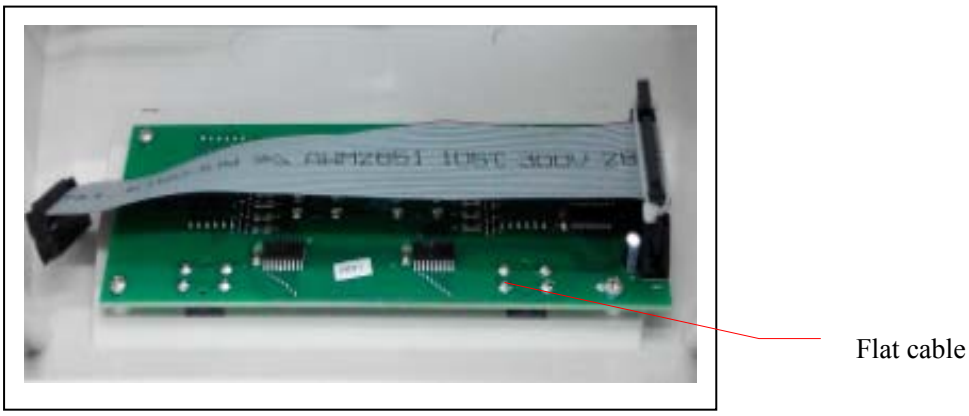
3). Control board failure.

Trouble shooting:

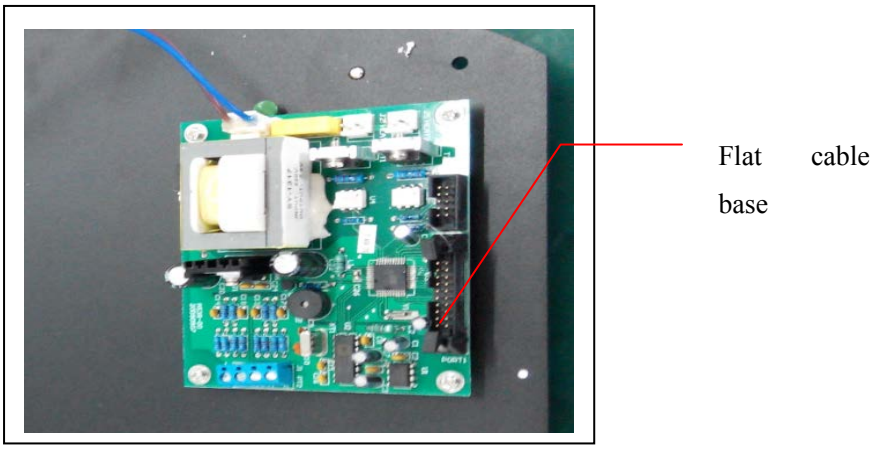
1). Check if there is poor soldering of button in display board, if so, please fix it.



2). Button is failure due to the poor cable contact. Should change flat cable



3). Issue caused by control board poor circuit. Should change control board.



3. Beeper is abnormal

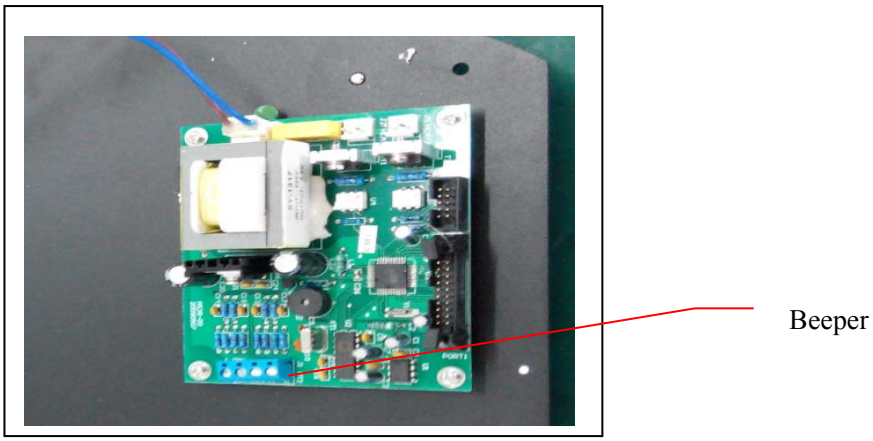
Possible causes 1). Beeper failure

2). PCB failure

Trouble shooting:

1). Check control board, measure the output voltage of two pin of buzzer is 5V or not, if not then control board is bad. Change or repair it.

2). If control board is good, then change the Beeper.



4. Open circuit or short circuit alarm on temperature display

Fault: "OPEN" "SHOR" alarm in the temperature display

Possible causes：

① "OPEn" show in the left area for temperature and alarm. It may caused by open circuit of left area.

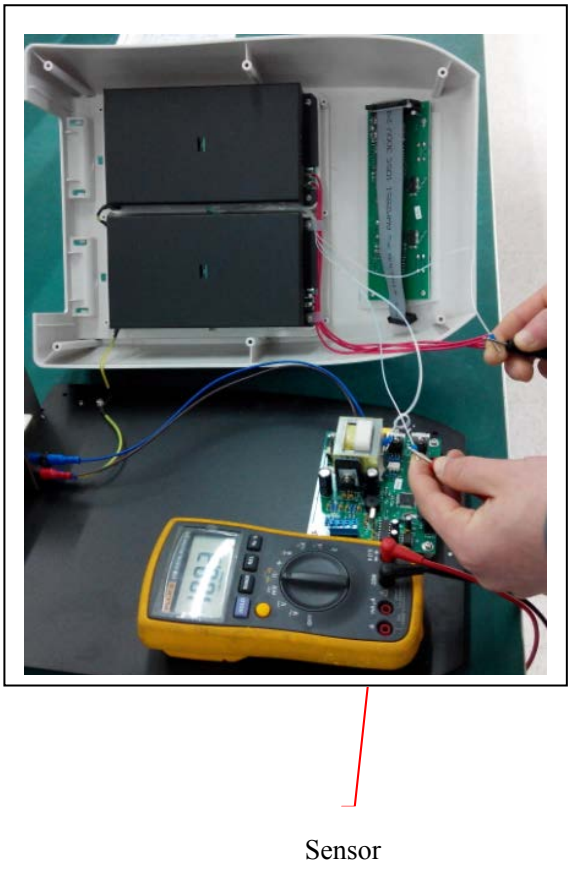
② "OPEn" show in the right area for temperature and alarm. It may caused by open circuit of right area.

③ "SHOr" show in the left area for temperature and alarm. It may caused by short circuit of left area.

④ "SHOr" show in the right area for temperature and alarm. It may caused by short circuit of right area.

Solution:

It need to change the sensor if there is open circuit or short circuit, when measure the resistance of sensor is not between 103Ω --115Ω with multimeter resistance shift.



5. Temperature alarm

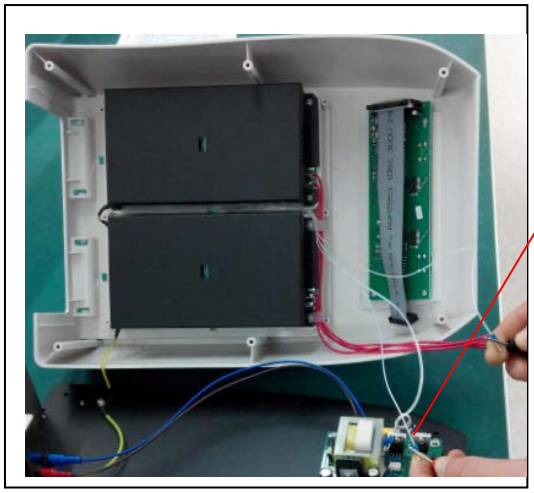
Fault 1: Display "hhhh" with "du..." sound alarm

Possible reason : 1). Sensor is abnormal

2). Control board is abnormal

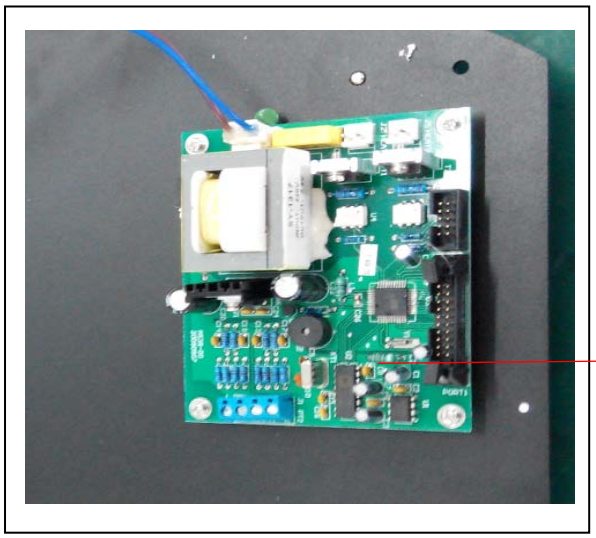
Solution：

1). It need to change sensor if measure the resistance of sensor with multimeter is not between 103Ω -115Ω.



measure the resistance of sensor

2). It need to change the control board or back for factory repair if the sensor is good.



Control board

Failure : Disply " " with "du..." alarm

Possible reason：1). Sensor installation abnormal

2). Terminal or Terminal base of sensor lead is abnormal

3). Control board is abnormal

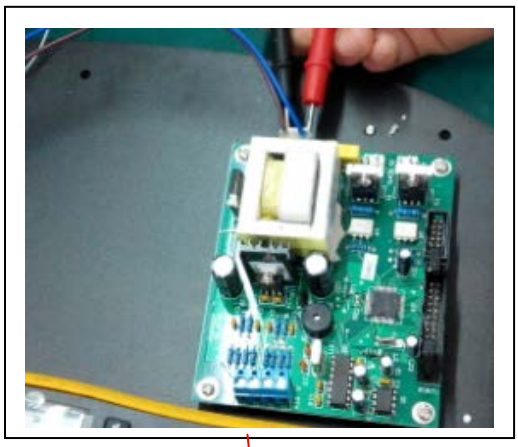
Solution:

1). It need to take out the sensor and re-install it if the temperature has a big fluctuate when shake the one side of sensor lead with hand

2). It need to re-weld or re-connect lead and terminal if the lead terminal of sensor has loose or poor soldering.

3). It need to change the control board or back for factory repair if above items without problem.

Install position of



Base of sensor lead

Failure 3: Instrument can not heating up.

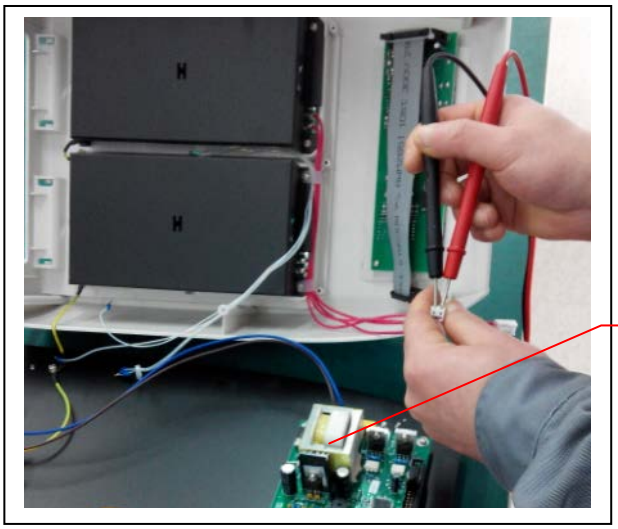
Possible reason：1). Lead of heating film is abnormal

2). Heating film or temperature protection switch is abnormal

3). Control board is abnormal.

Solution：

1）. Open the out-shell and check if there is loose or poor soldering on lead terminal or lead terminal base of heating film,if so then need to re-weld it.



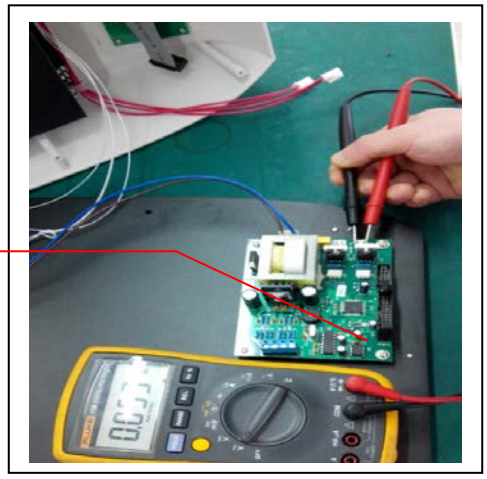
Lead of heating film is red one

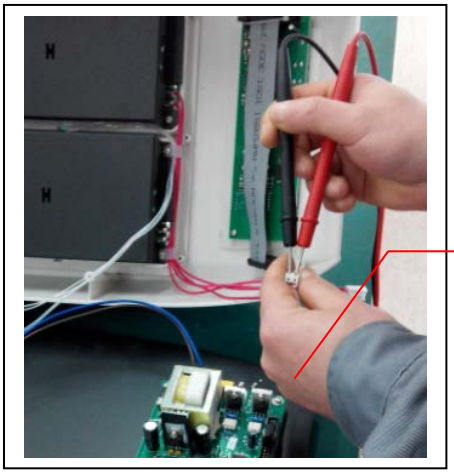
2). ① Take out the lead of heating film and power on the instrument with normal voltage. Measure the voltage of both side of lead base of heating film on control board with multimeter AC shift. If value is normal voltage AC220V or AC110V. Then heating element is bad.

②Measure the resistance of heating film with multimeter resistance shift.(Resistance range:461~537.8Ω in 220V,115.2~134.4Ω in 110V) If test value is not in this range, then it is caused by heating film bad and need to change.

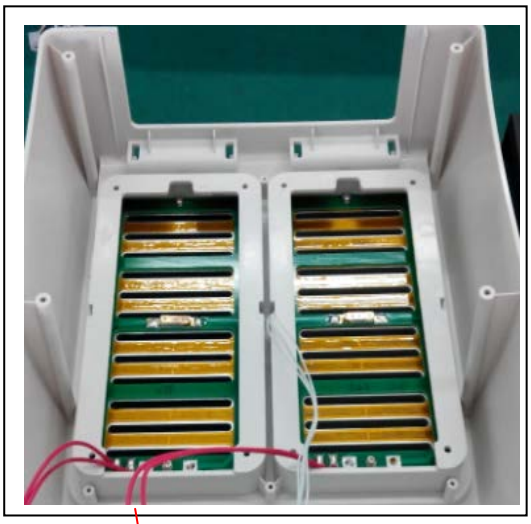
If the test value is in the right range. Then measure the temperature protection switch conduct or not. If not, then it need to change the temperature protection switch.

Lead terminal of heating film





Resistance value of heating



Temperature protection switch

3). It need to change the control board, if voltage is abnormal in both side of lead base.