MHP-100 A/S Manual

☑ mat

☑ regulator

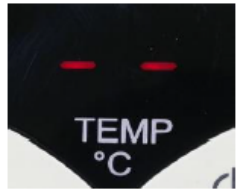
AS-20130401

Nuga Medical Customer Support Team

MHP100 product specifications

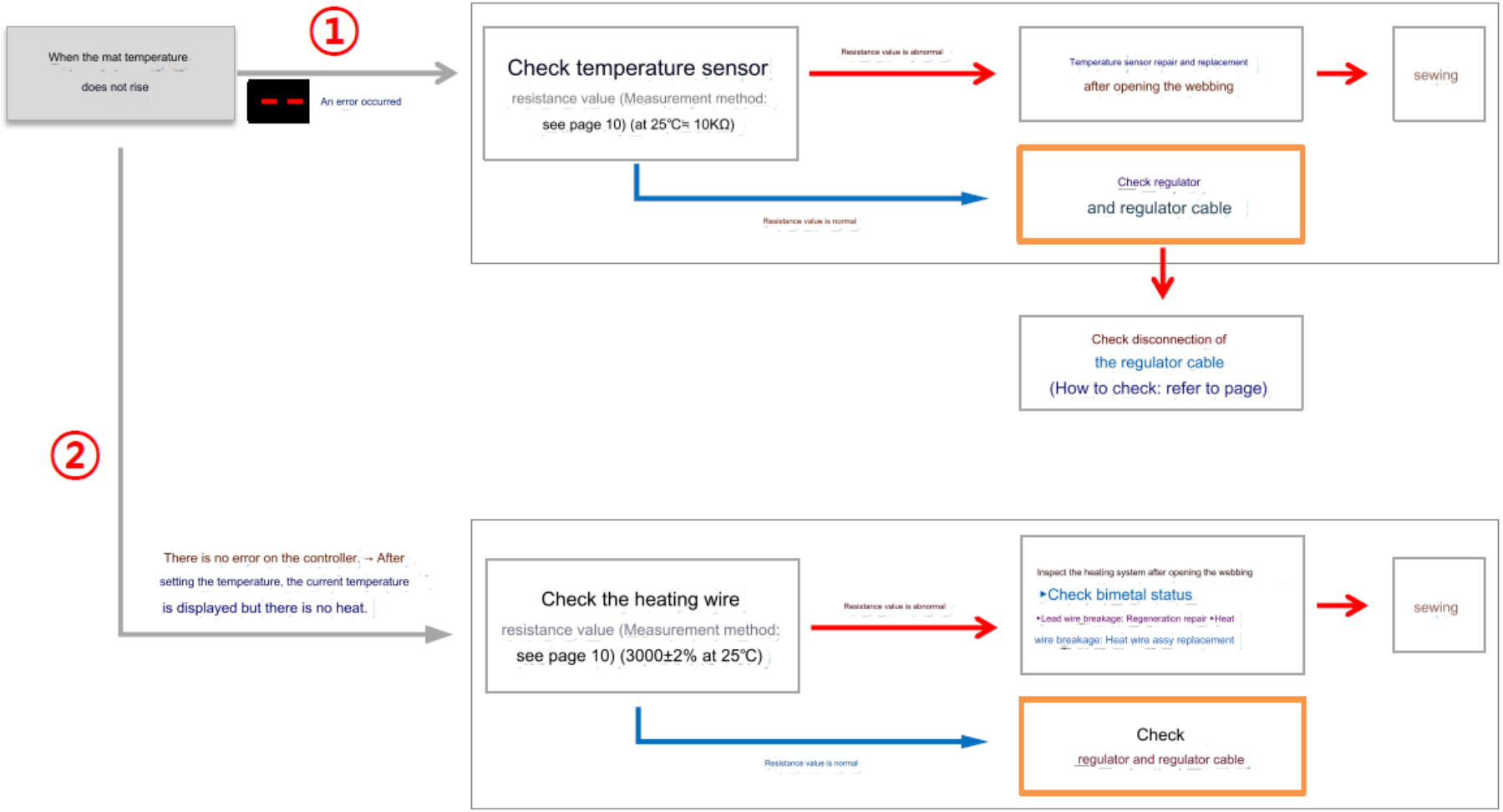
	division	standard	note
Indication	Total product length	580 (W) * 760 (D) * 15 (H)	
	Product weight	3.3kg / 1SET	
	Total product power consumption	MAX 150W ± 15%.	
	electrical rating	AC220V / 50Hz/ 60Hz	
	Manufacturing license number	No. 1478	
	Item License Number	10-769	
Specifications	thermic rays	220V/165W/320Ω±10%	
	temperature Senser	10kΩ	
	Protector	100℃ ± 5℃× 3	

MHP-100 Error Code and Action

mark	Abnormal contents	cause	Confirmation details	action
	Temperature sensor disconnection	Error due to non-detection of the mat's temperature sensor (temperature sensor system disconnection)	1. Controller-Mat: Check connection status 2. Regulator cable: Red-brown single wire (continuity test) 3. Disconnection of the temperature sensor system in the mat 4. Mat connector pin (5 pins): Check soldering area	1. Regulator-Mat: Reconnection 2. Connect broken wire or replace cable ASSY 3. Connect lead wire or replace temperature sensor 4. Check soldering area
	Temperature sensor short circuit	Temperature sensor cable CIRCUIT-SHORT	Temperature sensor defective	Temperature sensor replacement (requires sewing)
	Heating element overheating	When the temperature sensor detects a temperature above 86°C	1. Actual mat temperature overheating 2. In case of temperature detection error due to temperature sensor error	1. Check the cause of overheating and take action 2. Abnormal after measuring temperature sensor resistance value case replacement
 On the regulator Display temperature is normal > mat heating is poor	Poor fever	The regulator is normal Heat on the mat If it doesn't work	1. Hot wire disconnection 2. Bimetal lead wire disconnection 3. Bimetal defect (low occurrence rate)	1. After removing the mat, visually check the hot wire breakage area >> Replace the hot wire ASSY 2. Separate the mat and check for disconnection >> Solder the lead wire (connection) 3. Replace the bimetal

How to check when the mat has poor heating

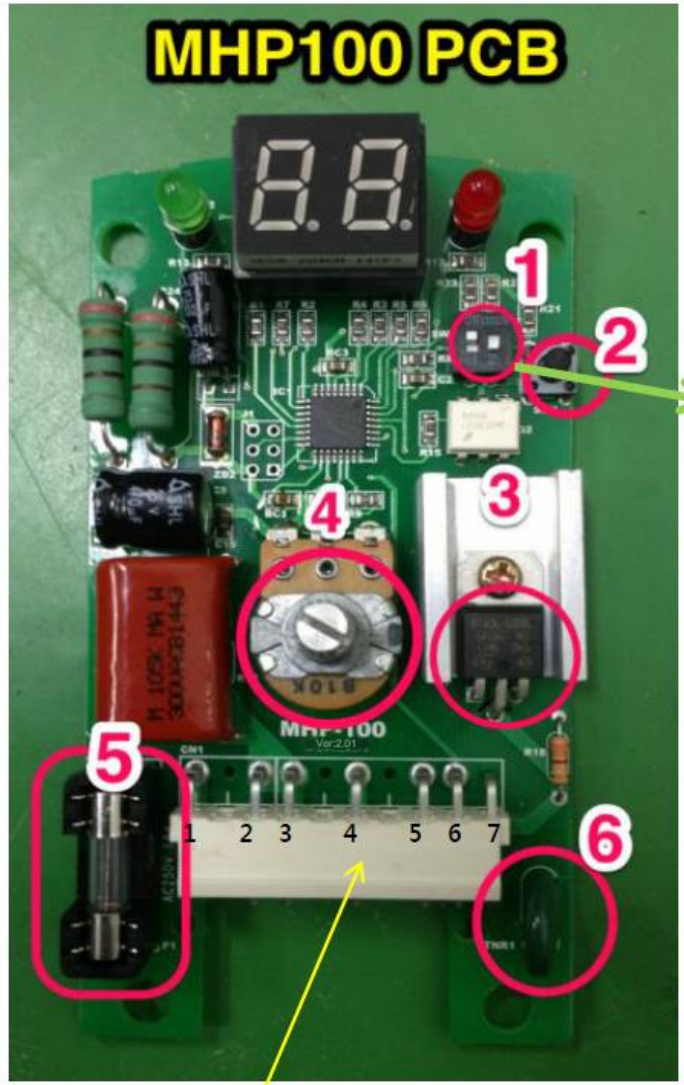
Temperature sensor system regeneration repair method Bimetal system regeneration repair method



Regulator inspection and repair

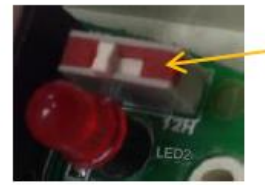
Malfunction symptoms	Checklist	Action taken
Even after pressing the power button The controller does not power on. The power lamp (green) does not light up. 	- Check the power plug and outlet connection status.	- Plug the power cord into the outlet correctly.
	- Check fuse disconnection	- Replace the fuse. See page 6 * If the fuse continues to disconnect even after replacement, replace it with another mat and test. If the same symptom occurs, replace the PCB.
	- Check AC110/220V measurement on terminals 1 and 2 See page 6	Power cable disconnection → Replace cable A'SSY.
	- Check DC5V measurement across ZD1	- If 5V is measured, replace the power LED. (54, RED) - If measurement is not performed, replace the PCB.
The mat does not work. (Heater LED does not light up.)	- Check the connection status of the mat (If the sensor is disconnected, the heater does not operate.)	- Test by replacing the cable and see if the heater works. If not, replace a mat that works normally and test it. I'll try it. If it does not operate properly after replacing the mat, replace the PCB.
Temperature control is not possible.	- Check variable resistance status (Check for damage in one direction check if it keeps running)	- Replace the variable resistor. - Replace the PCB.

MHP100 controller PCB main parts



1-2: 110/220V power input
3-4: Heated wire power supply
5-6: Temperature sensor

① Time setting Dip Switch: 6 to 12 hour settings.
② Power Tact Switch: ITS1105(H 8mm)
③ AC 220V output control TRIAC: BTA 06 6000B
④ Heating Pad temperature control V-Resistor: 10kΩ, 160, 210
⑤ Power FUSE: 250V 1.5A
⑥ Overcurrent protection Varistor: 10D471 (100 470V)



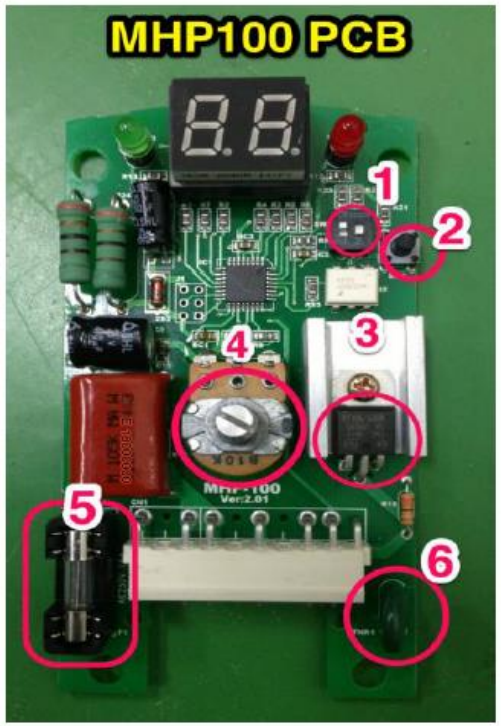
Currently, the shape of the time control switch has been changed to 8H (left) and 12H (right).

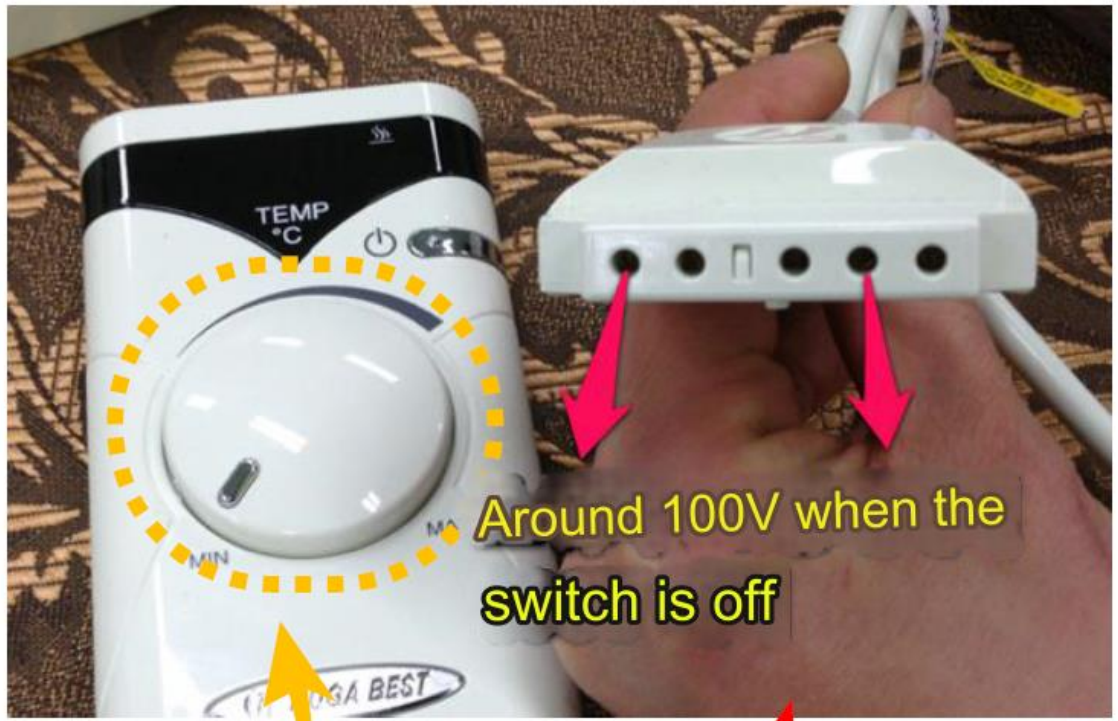
① Time adjustment according to Dip Switch settings

S/W 1	S/W 2	Hour
ON	ON	6Hr
ON	OFF	8Hr
OFF	ON	9Hr
OFF	OFF	12Hr

※ Set to 8 hours when the product is shipped.

Malfunction symptoms according to MHP100 controller PCB parts

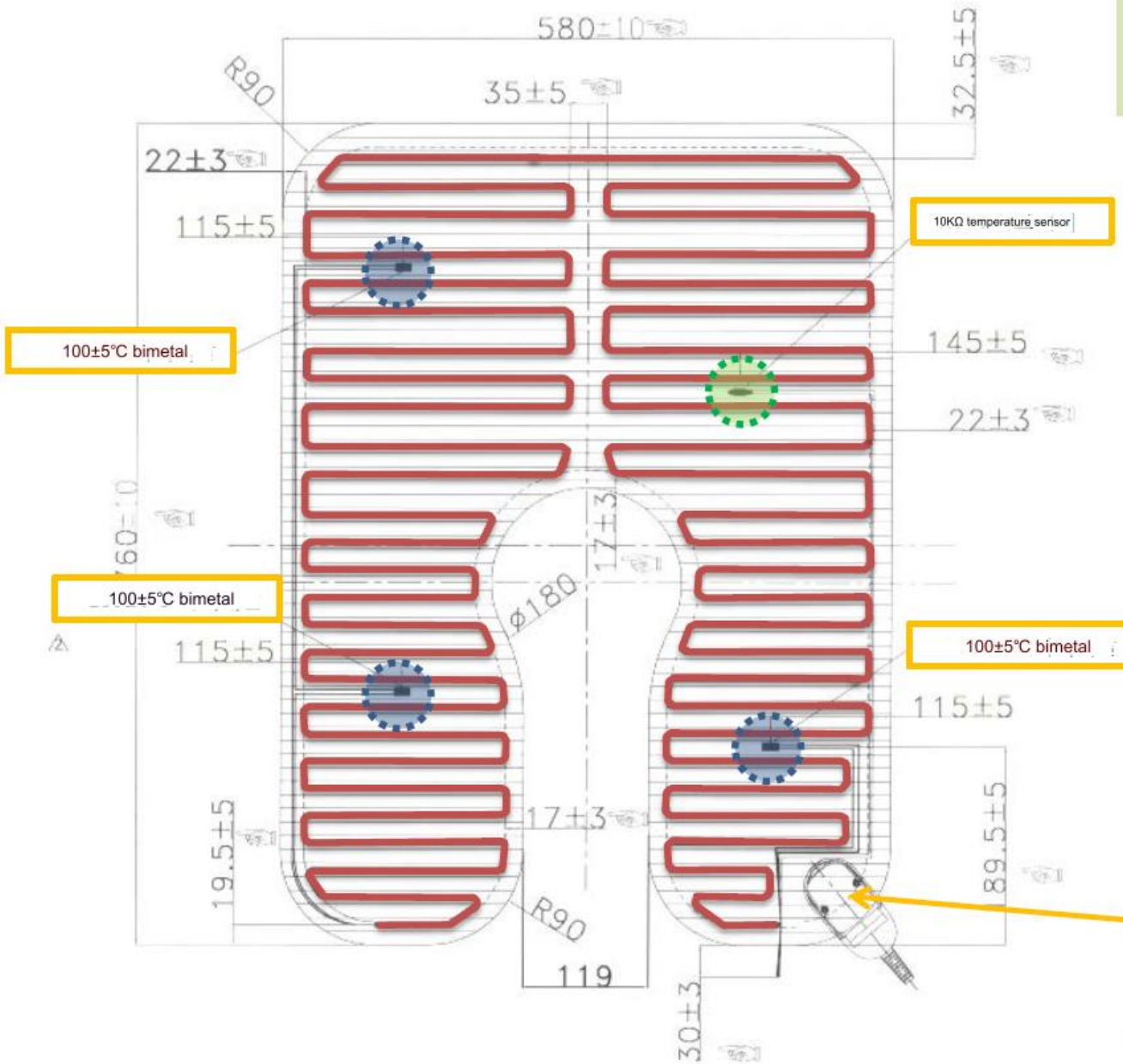


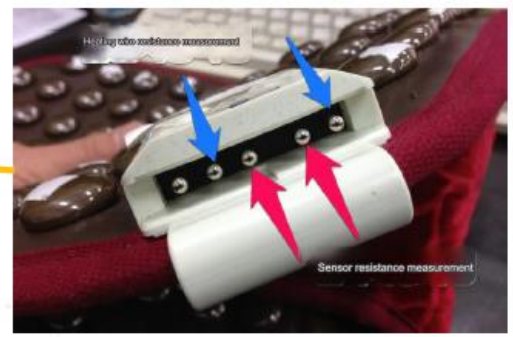


number	Part Name	function	Malfunction symptoms	Diagnosis method	Action method
2	TACT S/W	ON/OFF	ON/OFF does not work well.	You have to press it hard to turn it on/off.	switch replacement
3	Triac	Output control according to temperature setting	Temperature control is not possible. (Example) > It is set to 40 degrees, but the temperature continues to rise. > The mat heats up even when the switch is turned off.	Even when the switch is OFF, the voltage is checked to be around 100V between terminals 1 to 4 of the connector.	Triac replacement
4	VR	Setting temperature control	The correct temperature setting is not possible.	Lightly tap the area around the temperature control knob (yellow dotted line in the picture above) to change the temperature.	VR cleaning (using high pressure air) or replacement
5	Fuse	Overcurrent blocking (2A)	The controller does not turn on.	Check for blown fuse in the controller PCB.	Fuse replacement

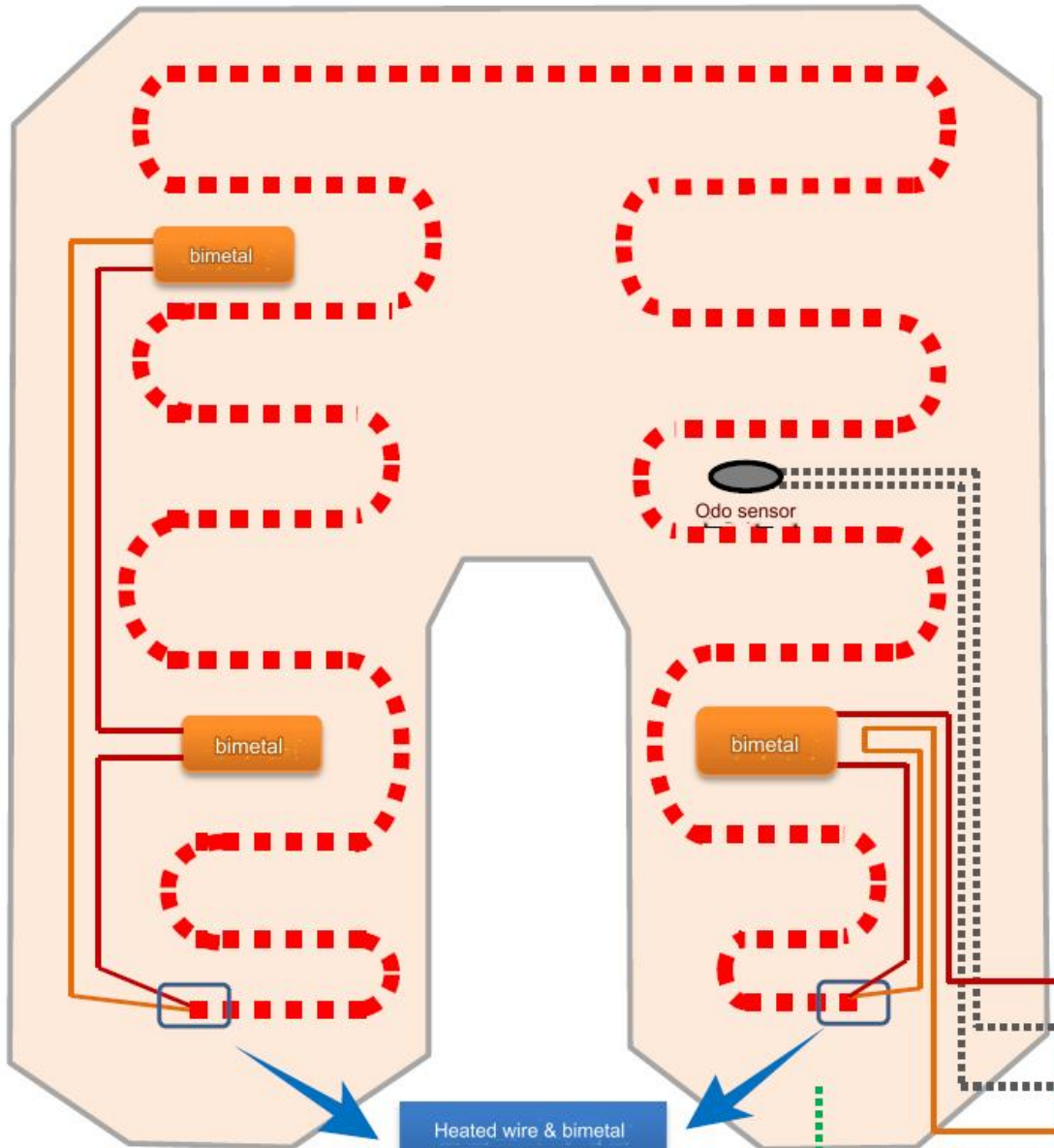
MHP100 heating wire, temperature sensor, bimetal layout

1. Heating Wire : AC 220V
   150W ± 15%.
   297Ω ± 10%.
2. Protector : 100℃ ± 5%
3. Temperature Sensor : 10kΩ



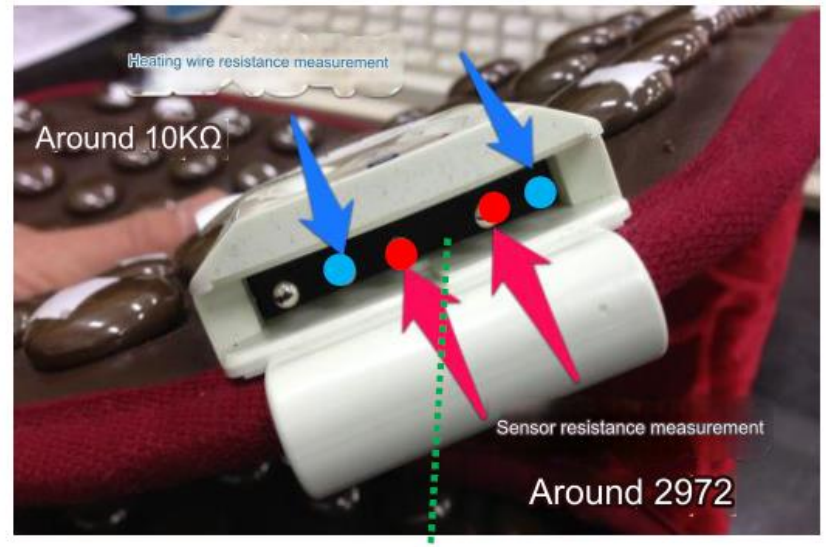


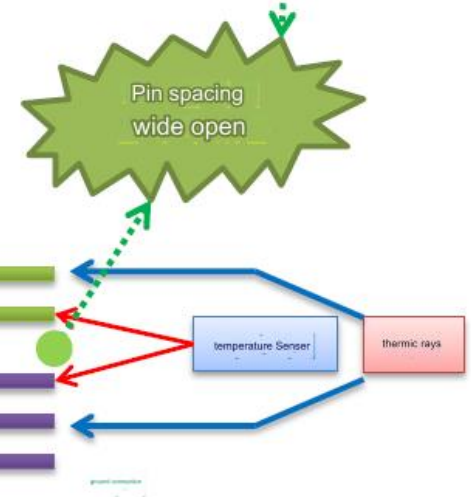
MHP100 mat heating system diagram



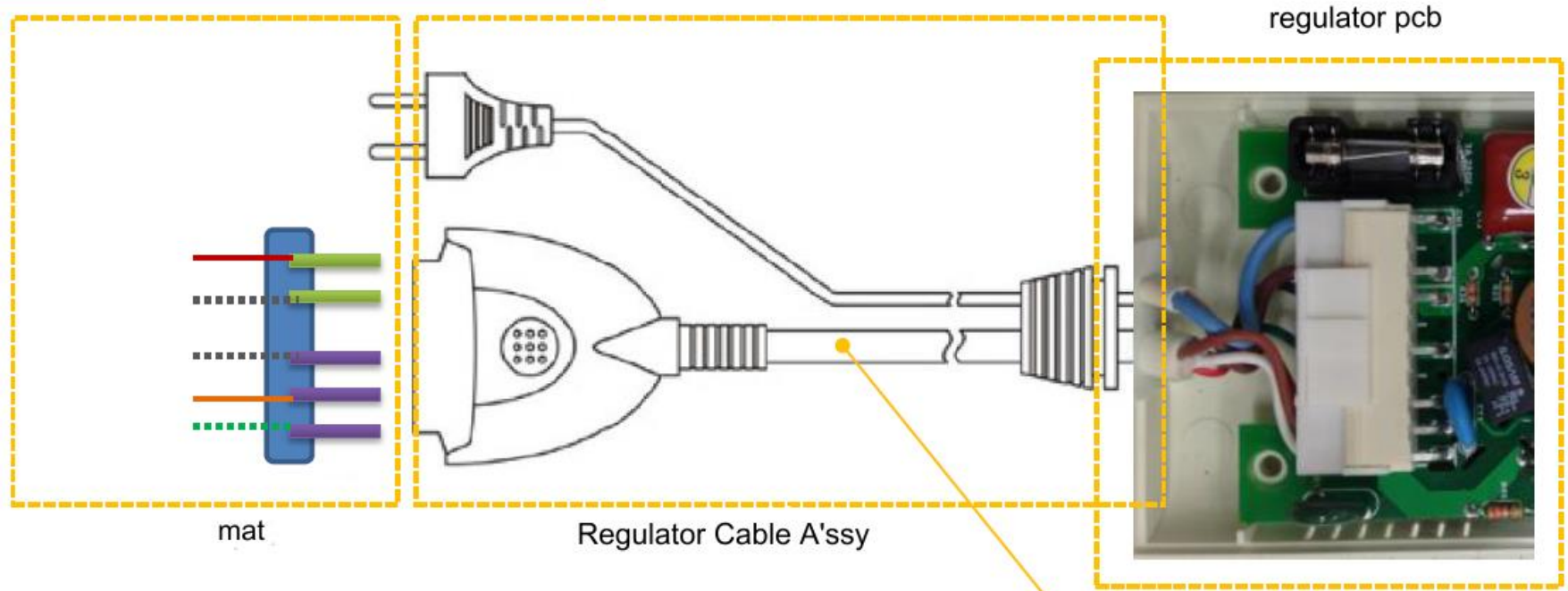
Temperature sensor resistance: around 10KΩ (based on 25℃)

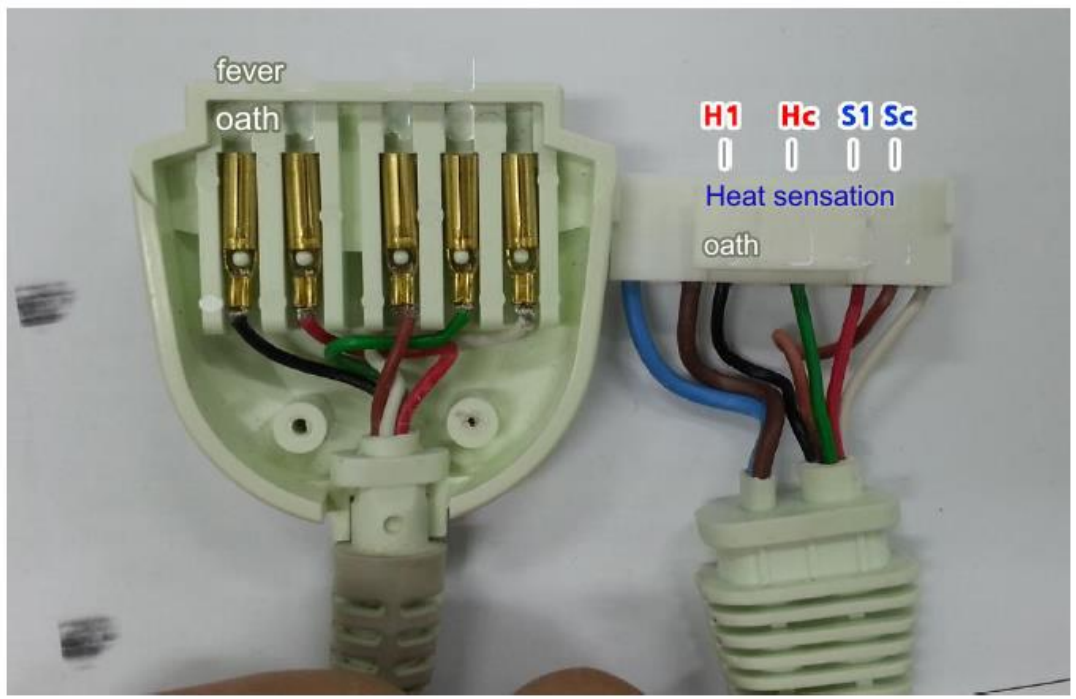
Heating resistance: around 2972





MHP100 Mat-Regulator Schematic

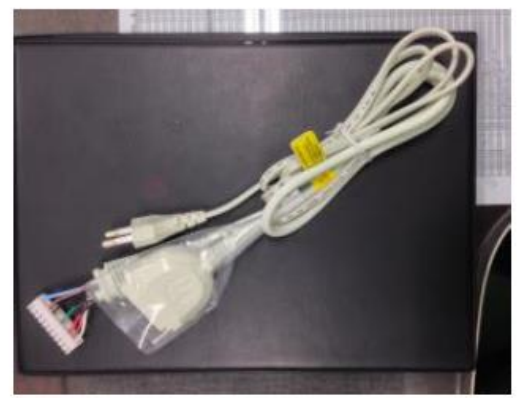




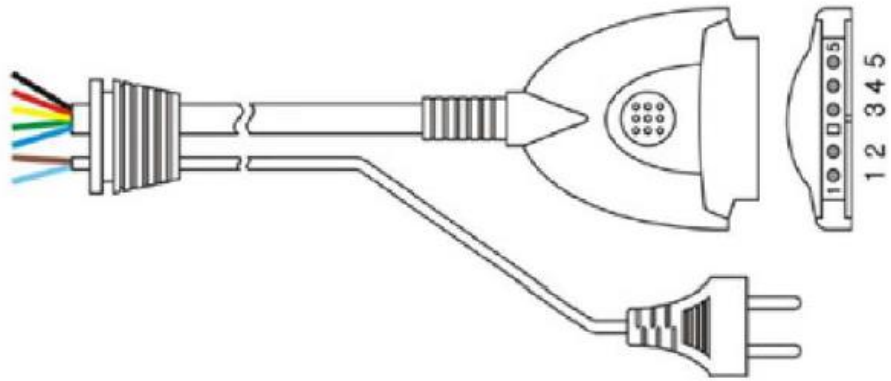
When the black or green cable of the controller cable is disconnected

→ the same phenomenon as symptom number 2 on page 4 appears..

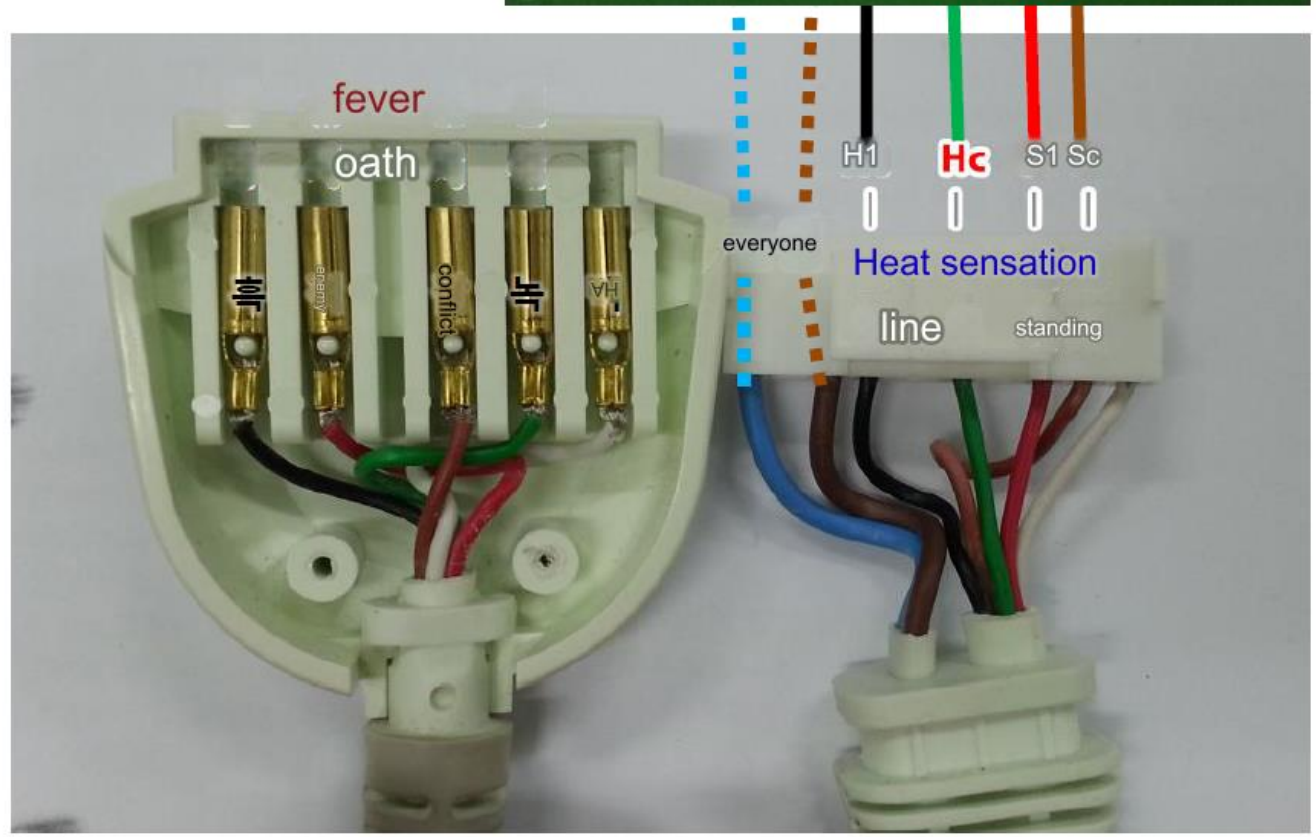
When the red or brown cable of the controller cable is disconnected → the same phenomenon as symptom number 1 on page 4 appears.



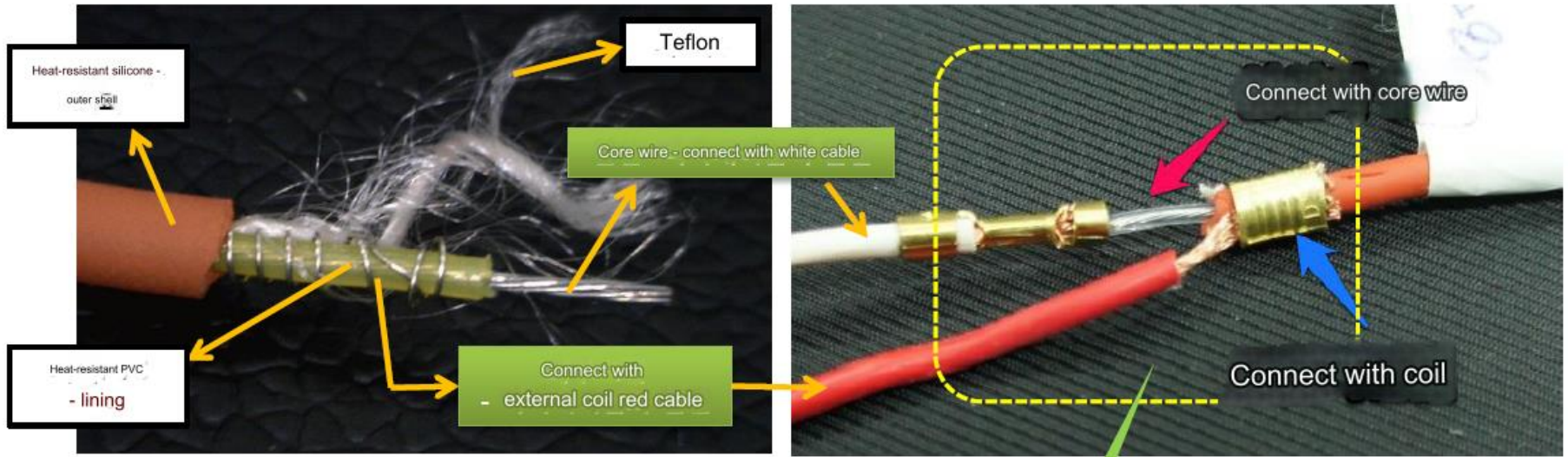
MHP100 regulator terminal layout

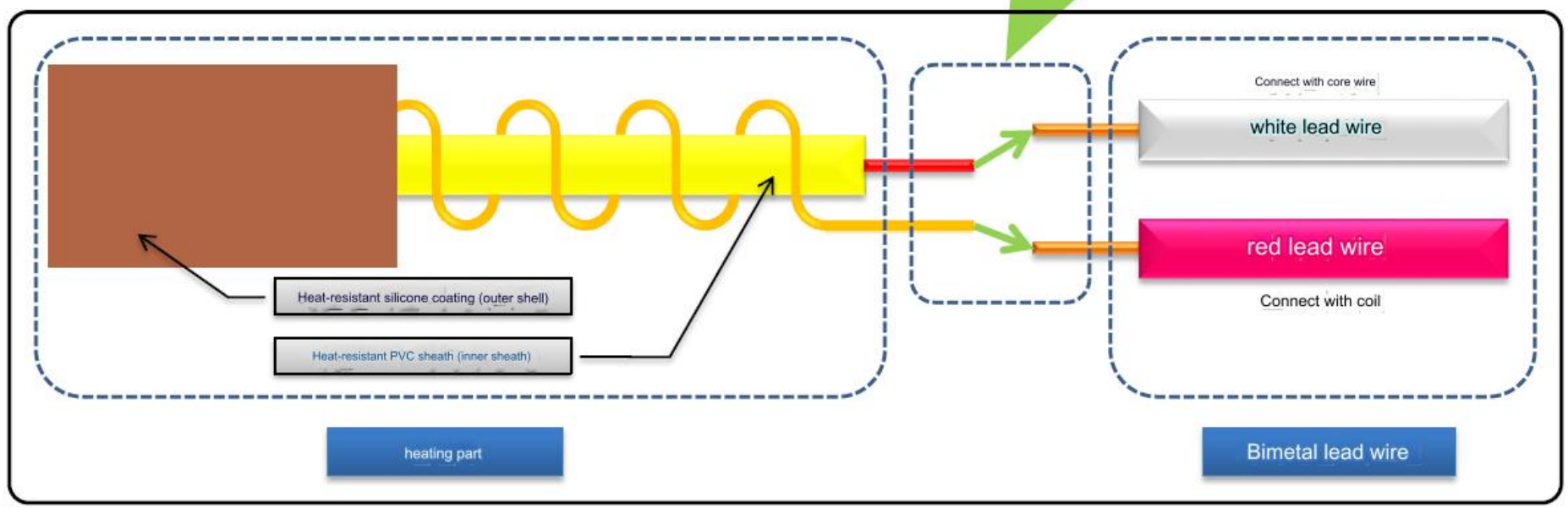


1	thermic rays
2	temperature Senser
3	temperature Senser
4	thermic rays
5	

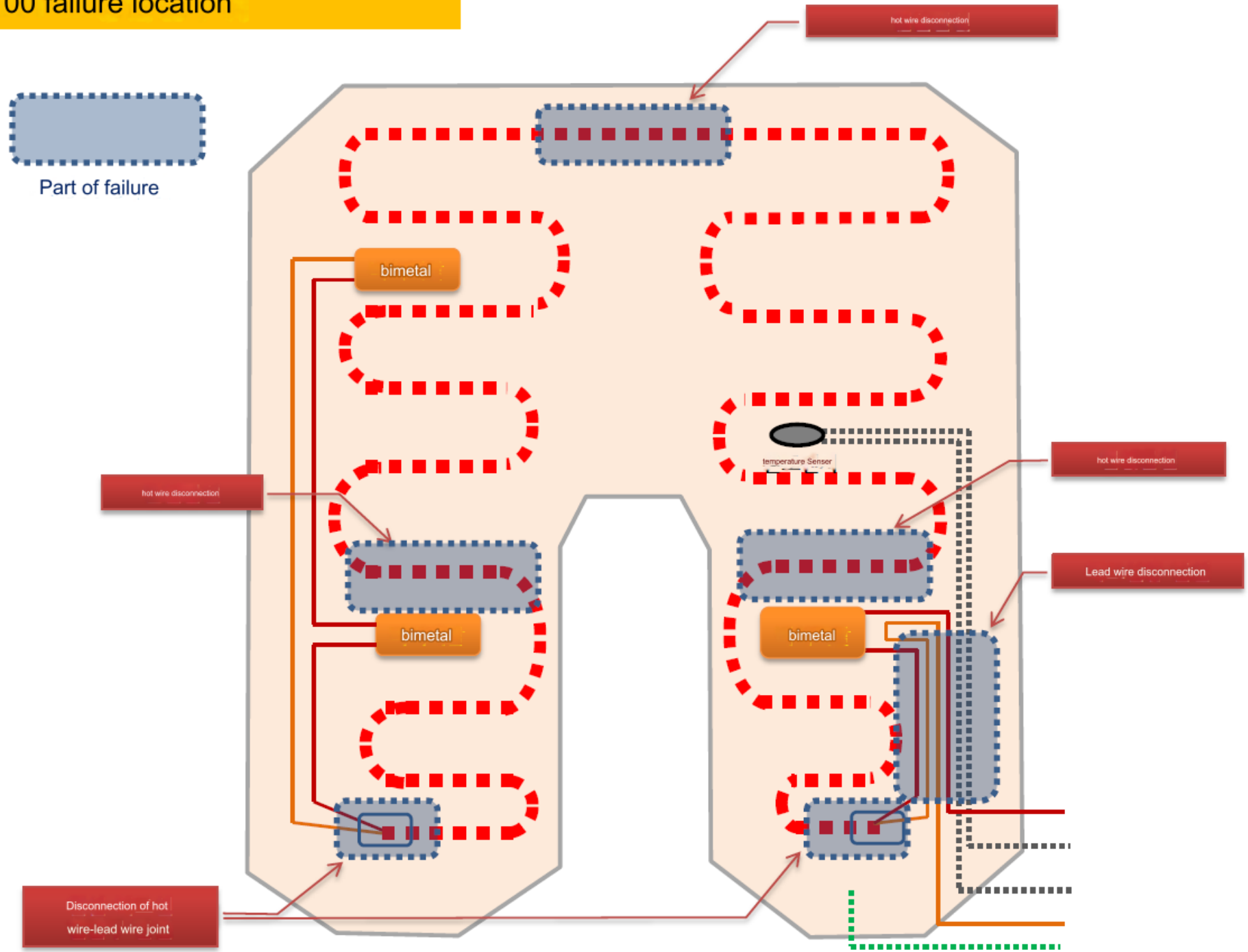


MHP100 heated wire & bimetal lead wire wiring detailed diagram

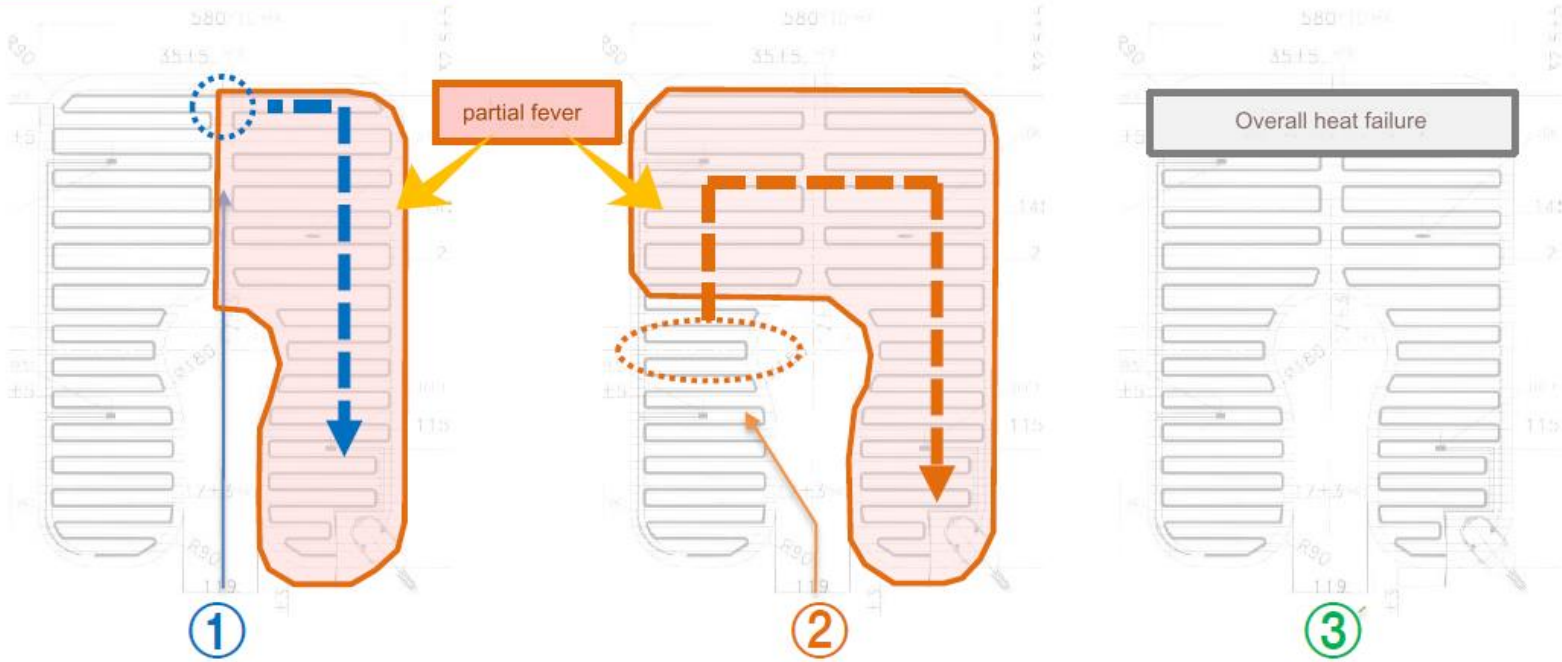




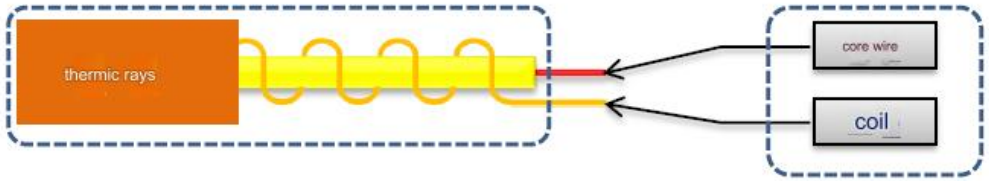
MHP100 failure location



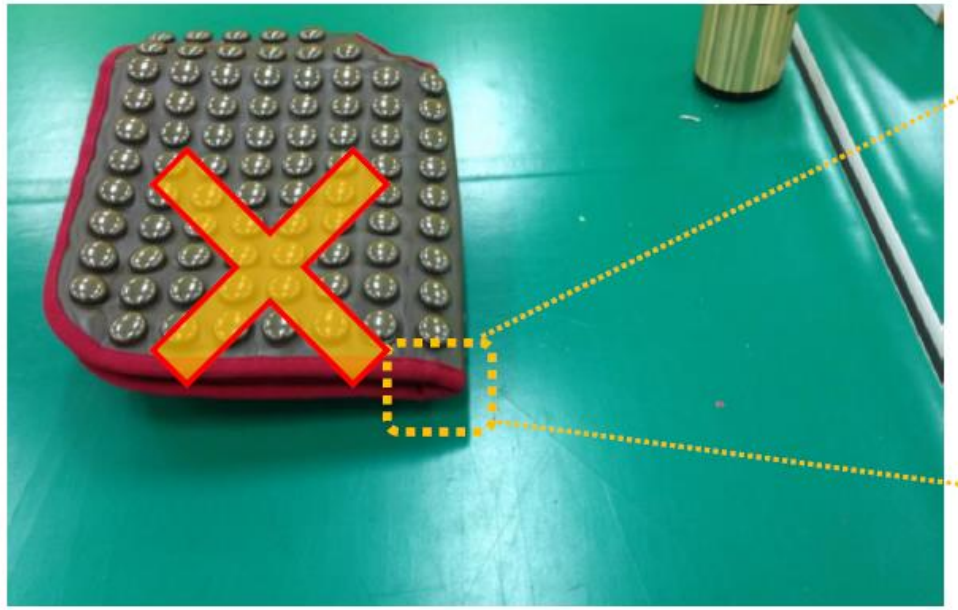
Symptoms of MHP100 heating wire disconnection

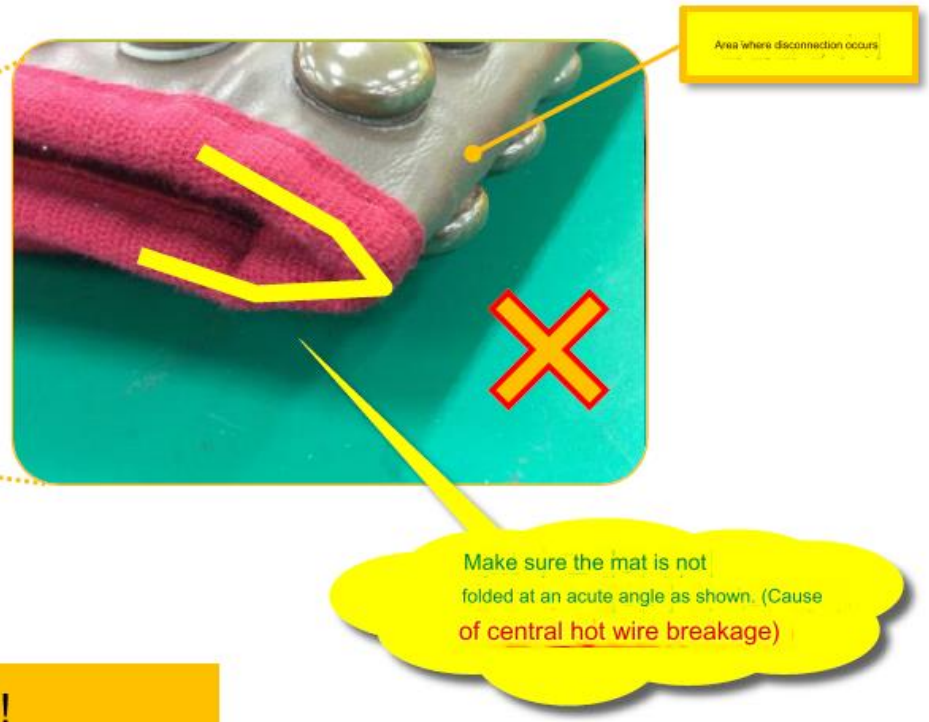


	①	②	③
Symptom	Before the disconnection part (mat 1/2) heated. Heating resistance value: Measured at approximately 150 yaw.	Before the disconnected part (3/4 of the mat) was heated. Heating wire resistance value: Measured at approximately 200 yaw.	Poor heat generation throughout the mat
cause	1. Hot wire disconnection in part (1) ▸ As the core wire and coil stick together (short circuit), In case of disconnection	1. Hot wire disconnection in part (2) ▸ When the core wire and coil are attached (short-circuited) and disconnected	1. Disconnection of heating wire ▸ When the coil and core wire are not attached 2. Lead wire disconnection ▸ Bimetal and temperature sensor lead wire 3. Regulator failure



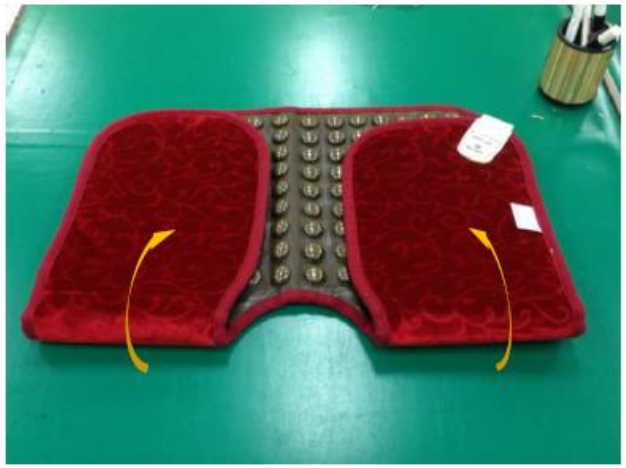
Precautions when using MHP100 product (1)





It is best to unfold and store the product after use!!!!

If you have to fold it...

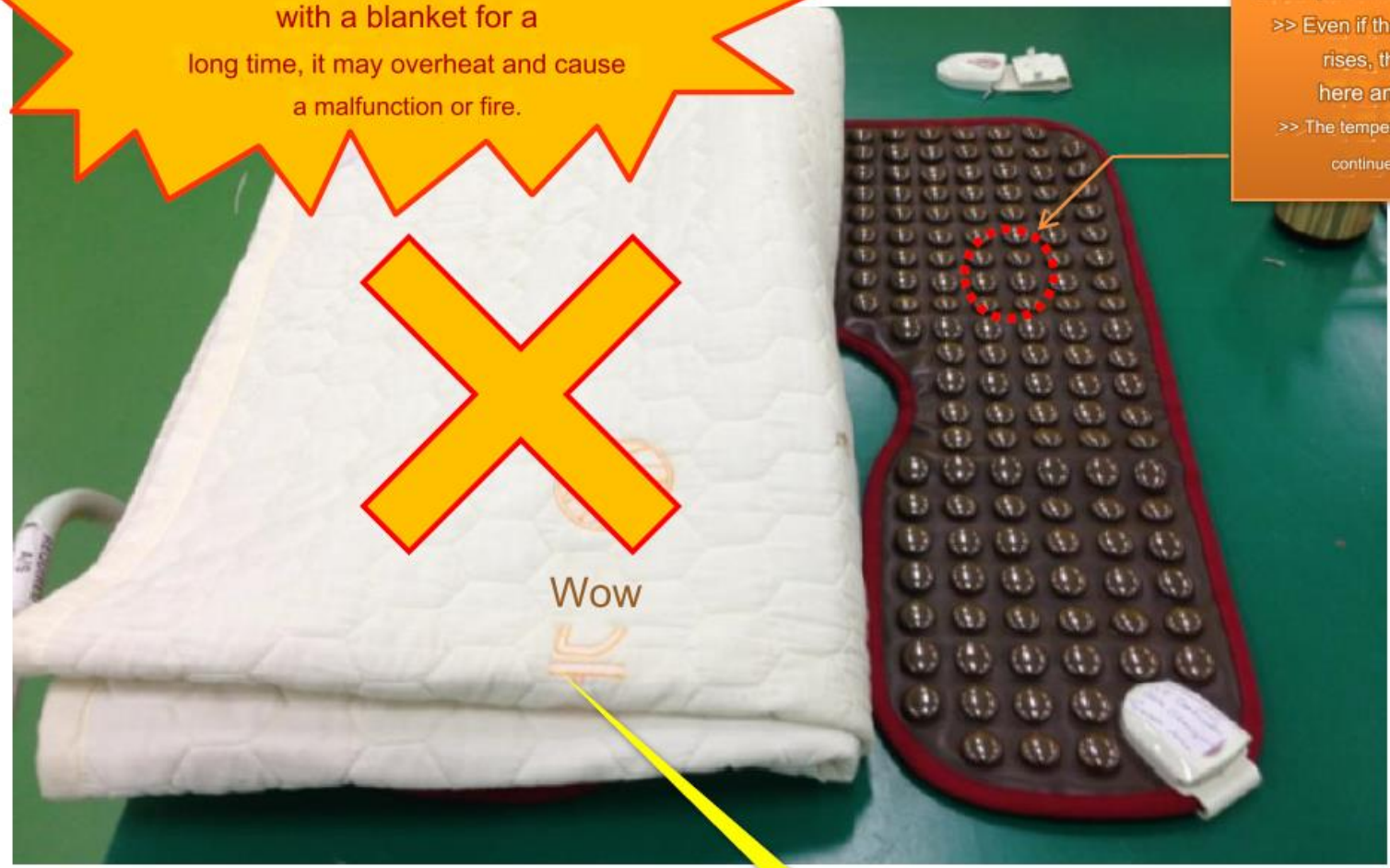


Let the turbanium touch each other...

Fold the folded part so that it forms a round shape.

Precautions when using MHP100 product (2)

If you leave the product covered with a blanket for a long time, it may overheat and cause a malfunction or fire.



The temperature of the product is measured here.
>> Even if the temperature of the mat on the other side rises, the controller measures the temperature here and continues heating without stopping.
>> The temperature of the area where the blanket is covered continues to rise and there is a possibility of overheating.

Wow

Do not use the product while covered with a blanket.

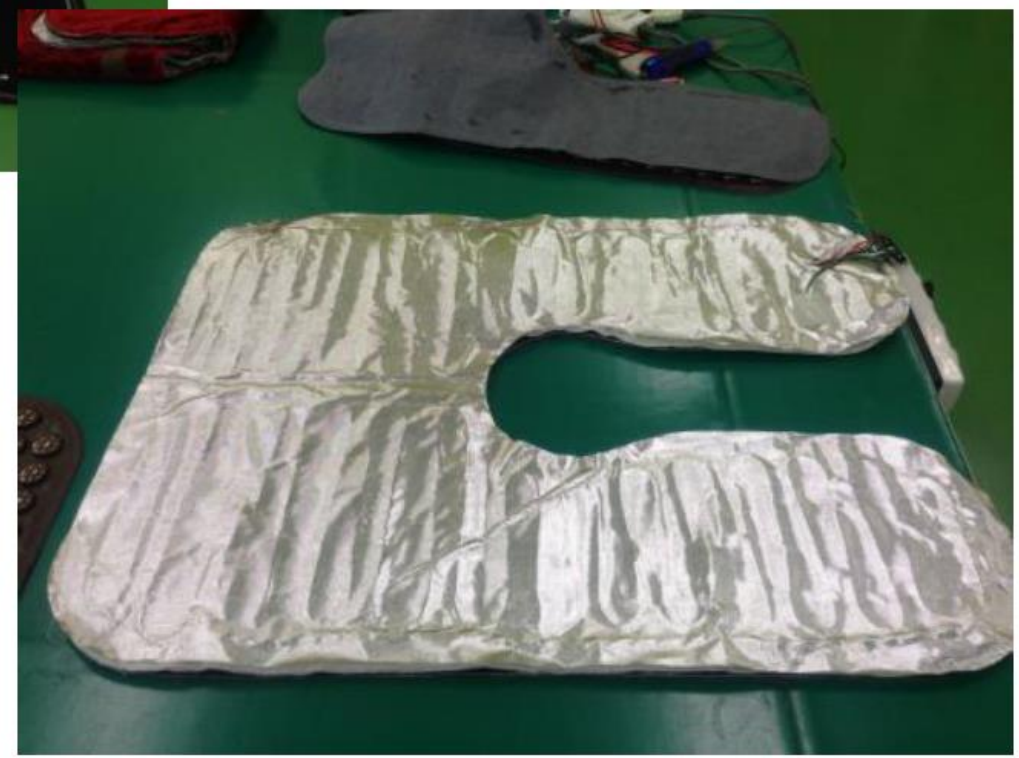
How to replace MHP-100 heated ASSY

mat

MHP100 heating plate ASSY replacement order (1)

◀ To replace the heating wire, separate it into the bottom plate, heating wire ASSY, and turbanium fabric (3 PCS).

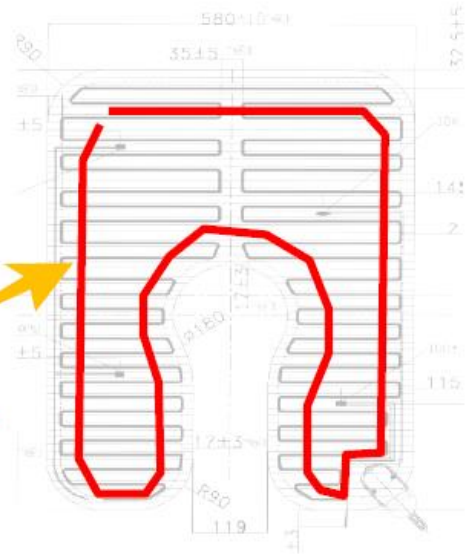
Place the heated ASSY to be replaced on the bottom plate. ▶



MHP100 heating plate ASSY replacement sequence (2)

◀ It is treated with hot melt to attach the bottom plate and hot wire ASSY.

◀ Apply hot melt to the inside of the seam along the border of the product.



Process inside the seam line along the border of the product.

MHP100 heating plate ASSY replacement sequence (3)

◀ Cut the scrap portion of the heated ASSY to fit the fabric.

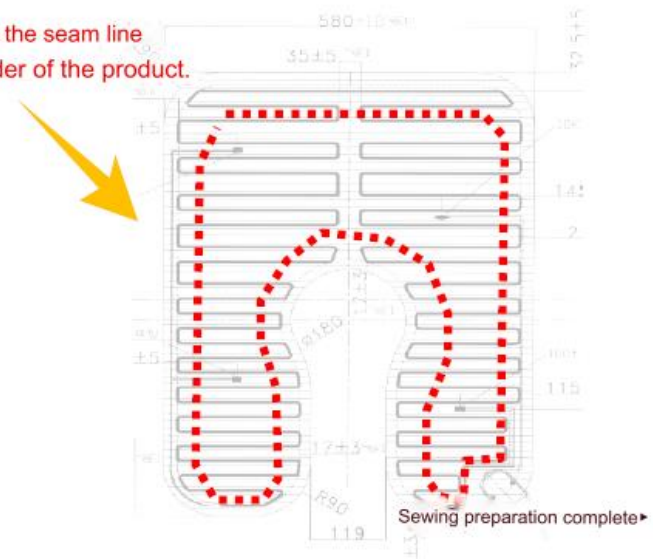
The size of the heated ASSY is slightly larger than that of the existing product, so it must be cut.

→ At this time, be careful not to damage the heating and lead wires!!

Be careful not to damage the heating and lead wires!!

Apply hot melt to the inside of the seam along the border of the product. ▾

Process inside the seam line along the border of the product.



1. When the upper (center) part of the mat's heating wire is disconnected.

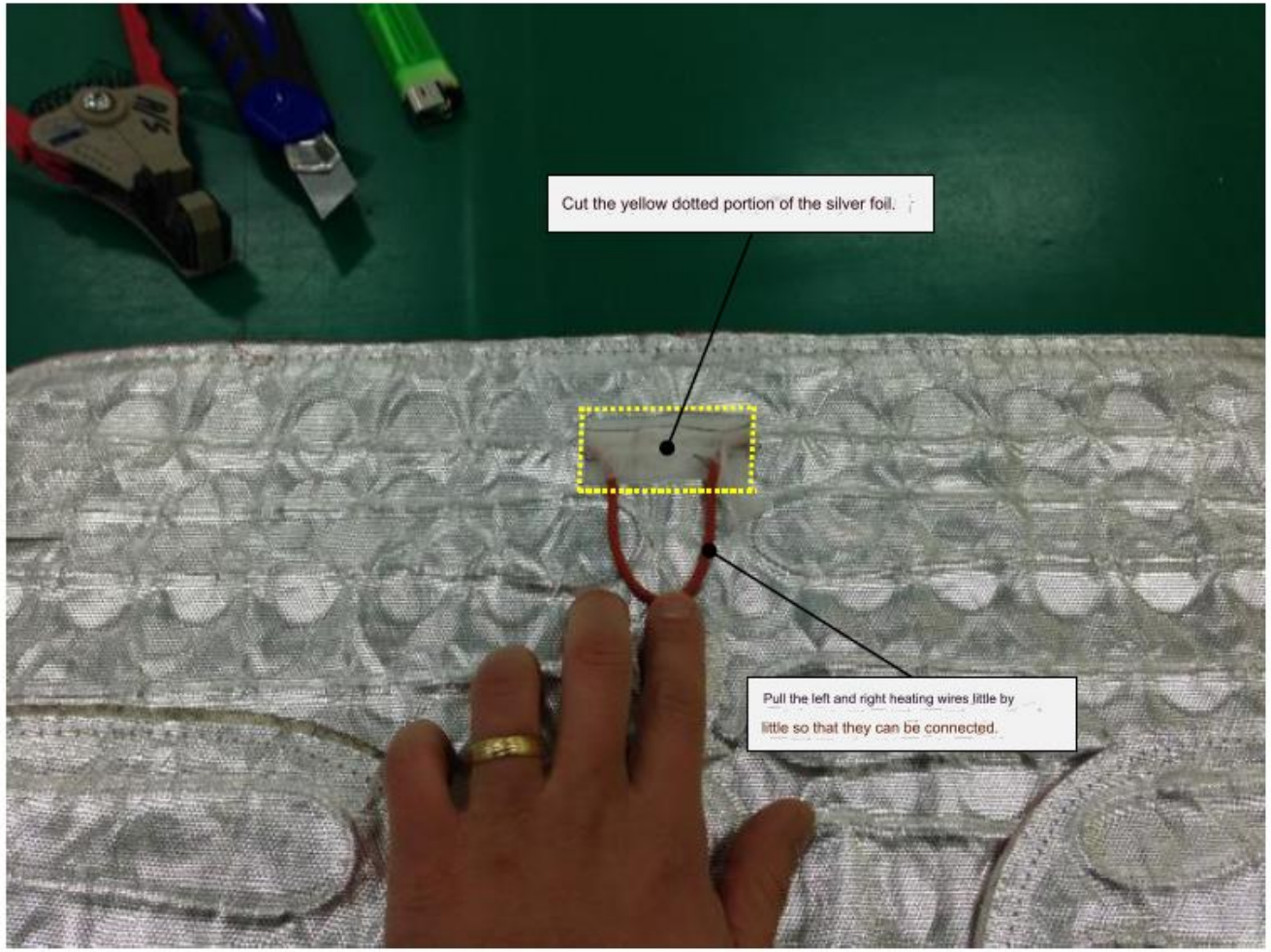
Measures to take in case of MHP100 hot wire breakage

1. Pull the left/right heating wire toward the center to repair the disconnected part of the heating wire.

For the left part, pull the heating wire toward the center in the same way.

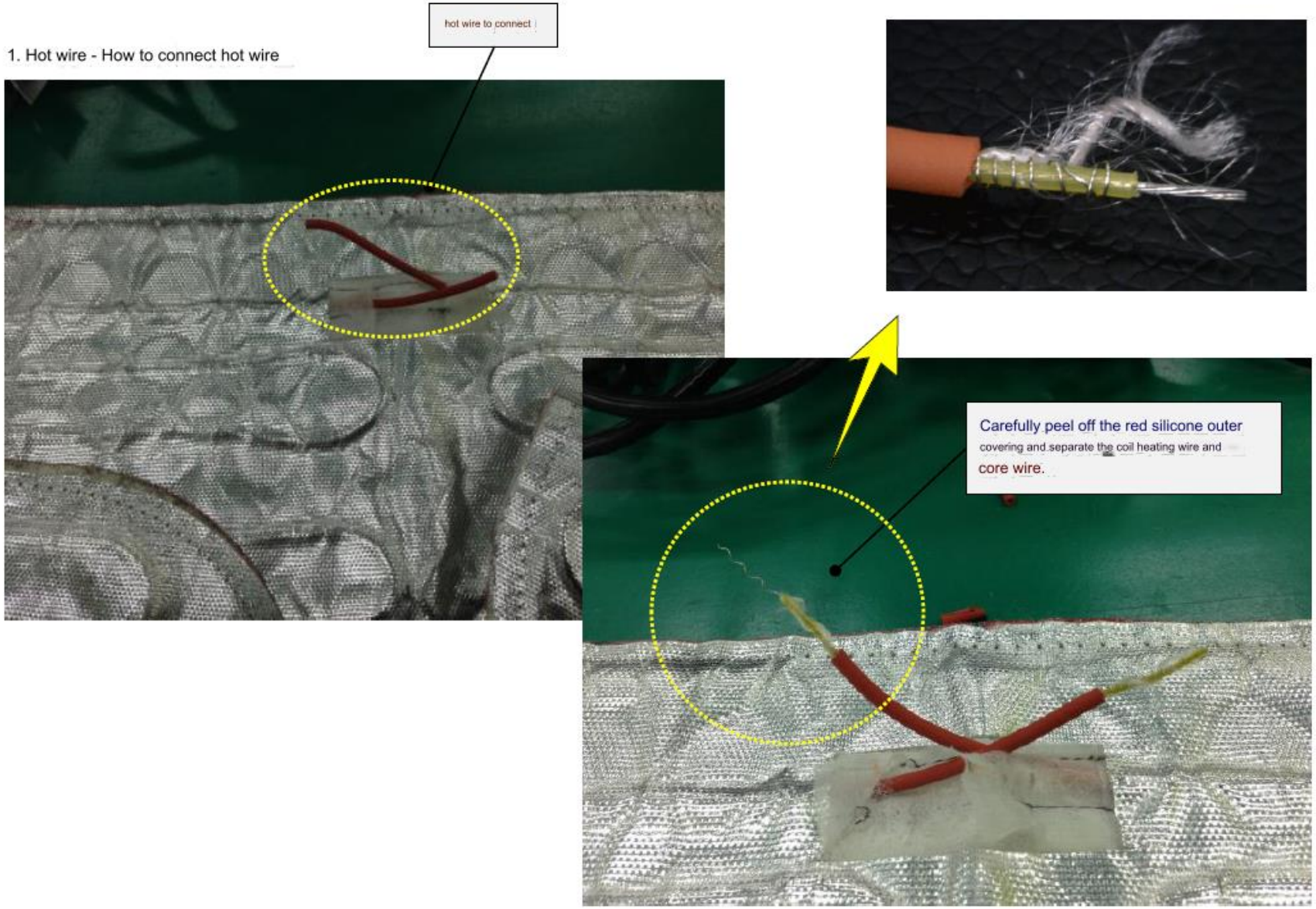
Measures to take in case of MHP100 hot wire breakage

1. Pull the left/right heating wire toward the center to repair the disconnected part of the heating wire.



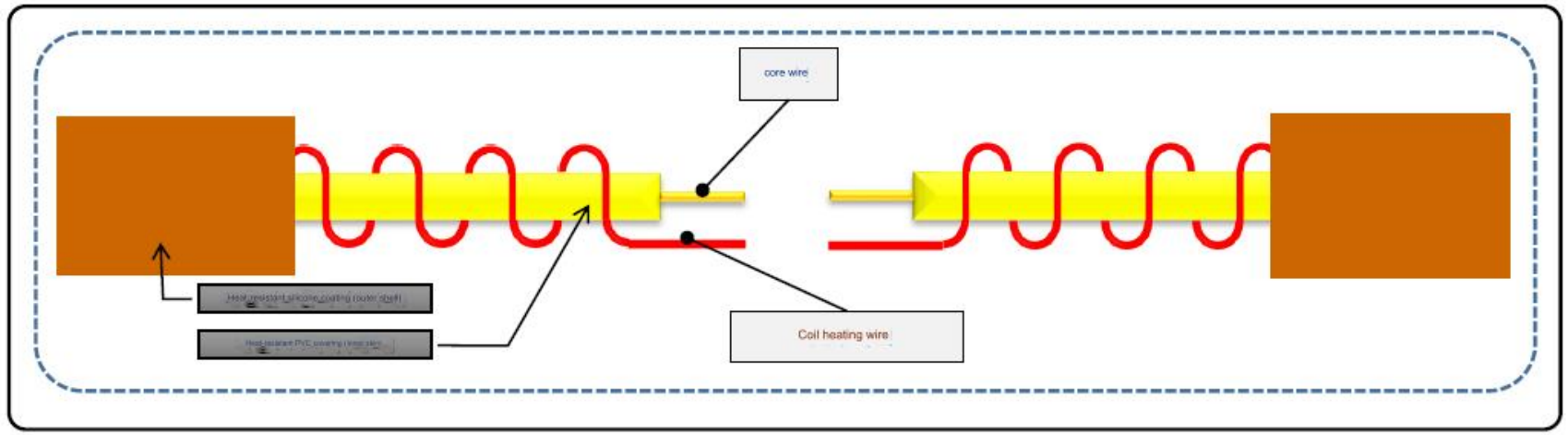
Measures to take in case of MHP100 hot wire breakage

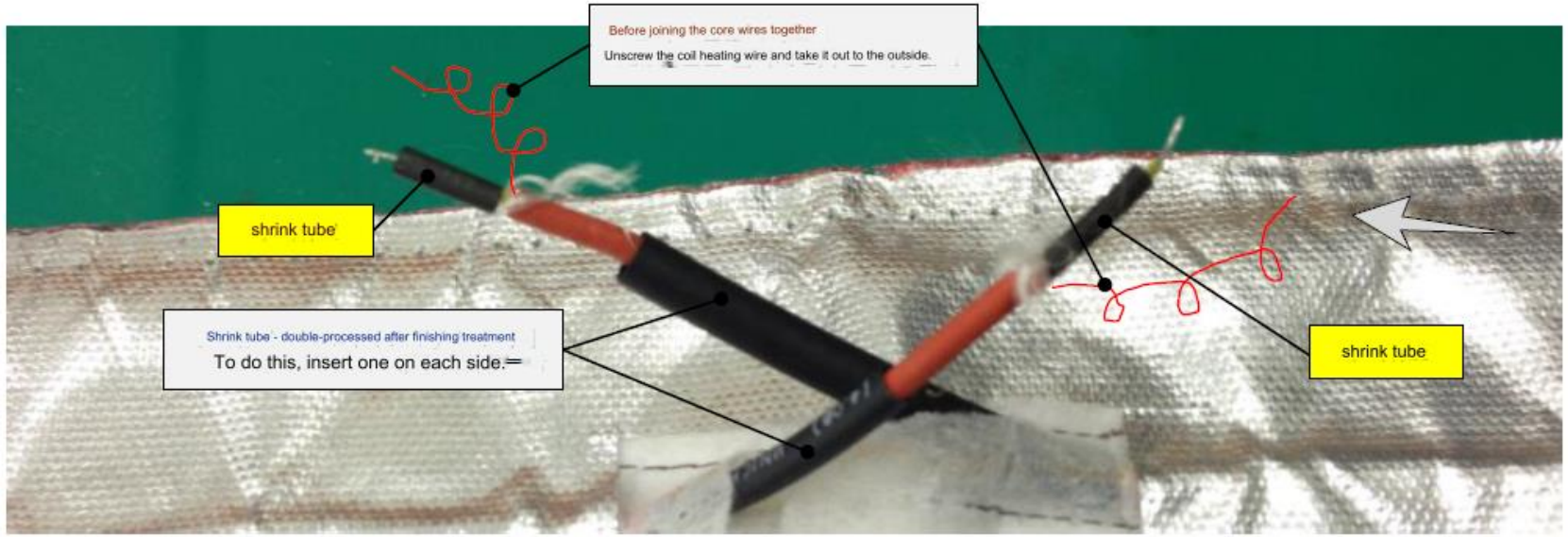
1. Hot wire - How to connect hot wire



Measures to take in case of MHP100 hot wire breakage

1. Hot wire - hot wire connection details



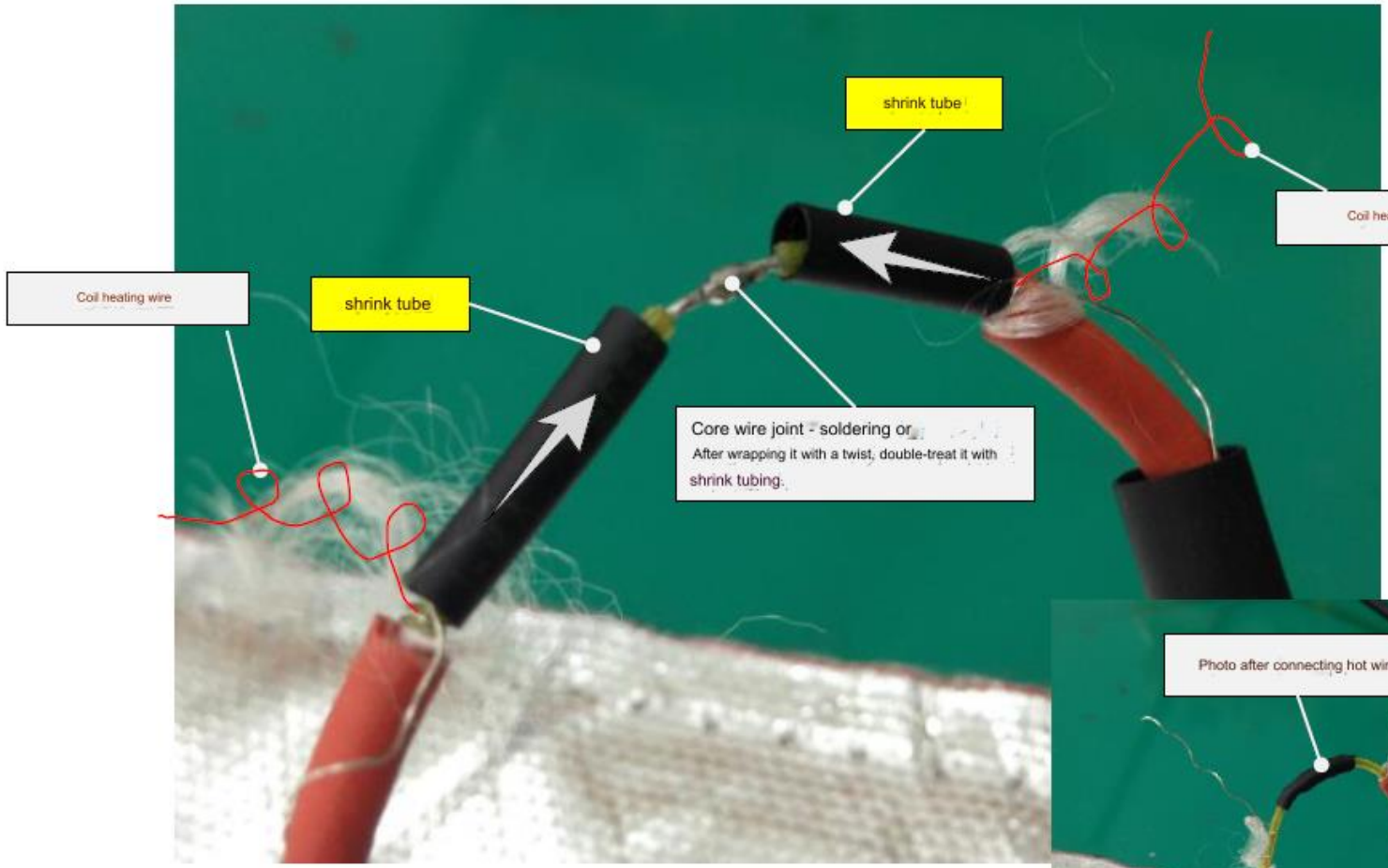


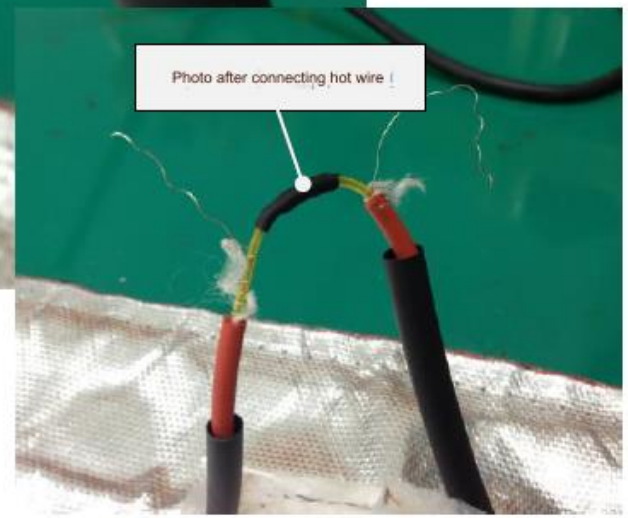
Before connecting the hot wire, insert the shrink tube in advance.

Measures to take in case of MHP100 hot wire breakage

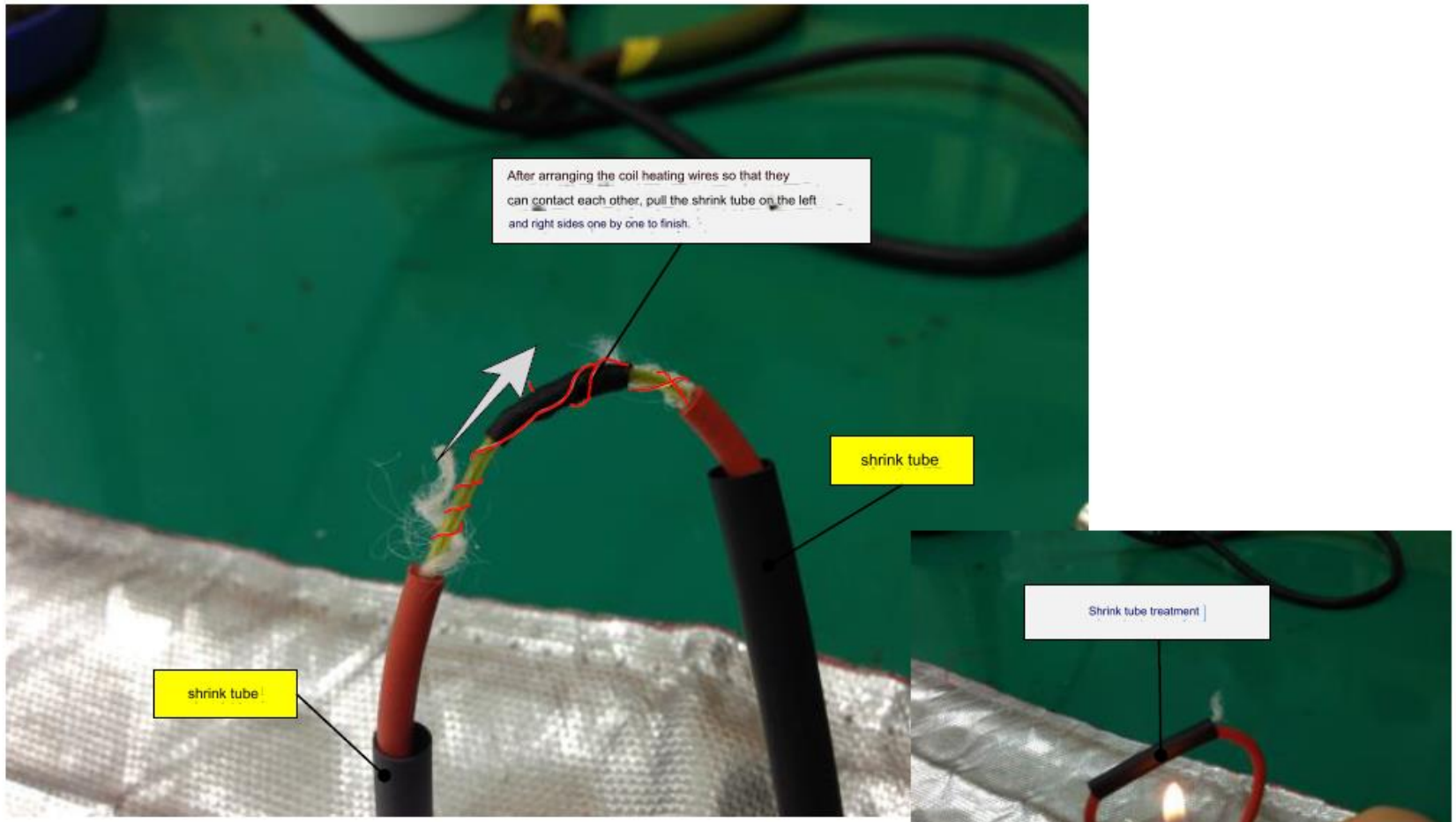
1. Detailed diagram of hot wire (core wire-core wire) connection

To connect the core wires, use weak soldering or twist them with a twist, and then pull the shrink tube on both sides to complete the double closure.



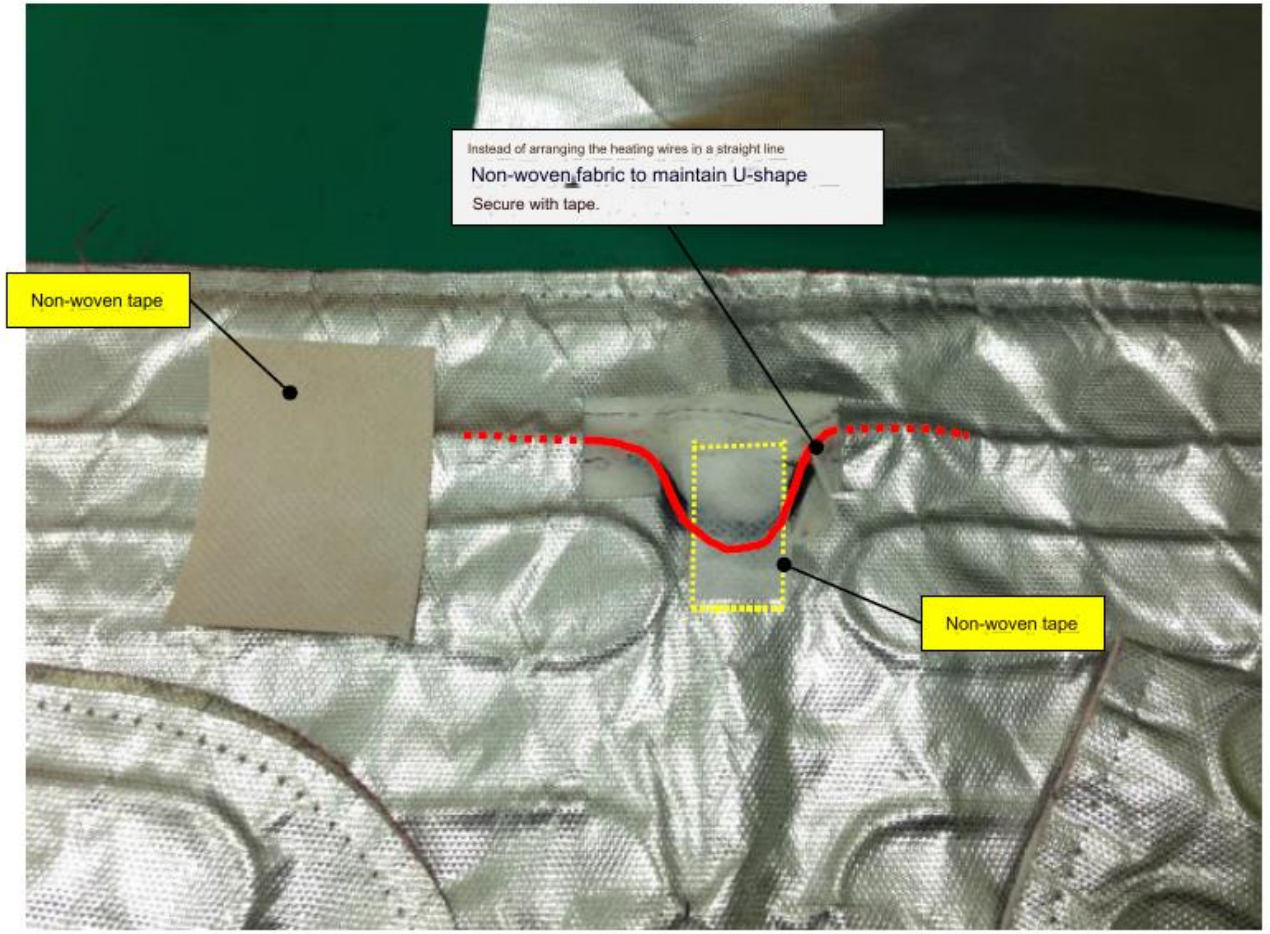


1. Detailed diagram of heating wire (COIL-COIL) connection

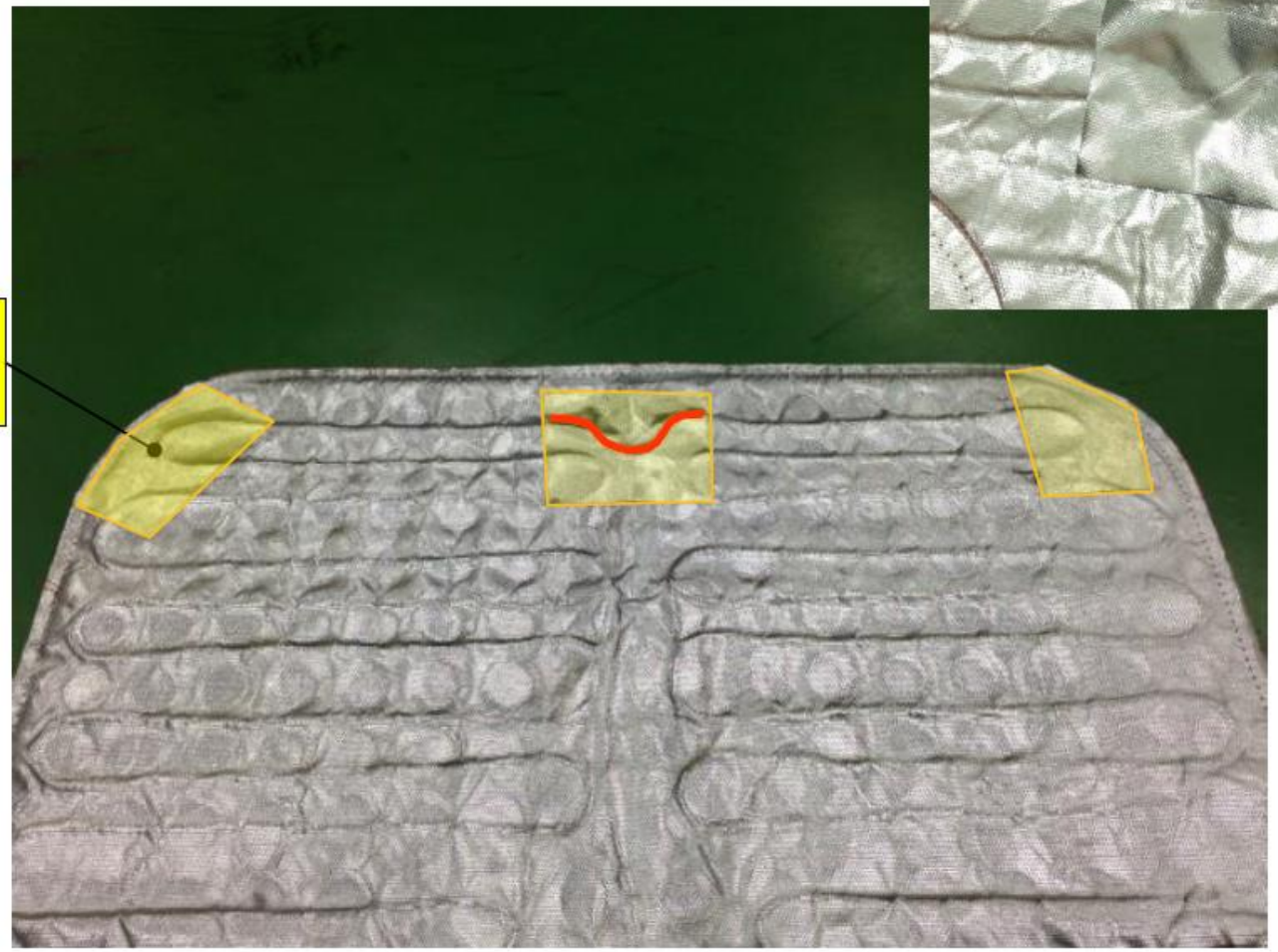


Measures to take in case of MHP100 hot wire breakage

1. Finishing the hot wire connection



1. Glass fiber finishing



Measures to take in case of MHP100 hot wire breakage

1. After finishing, measure the resistance value of the hot wire