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Service Manual

(Model : BS-06/11/21/31)

JEIO TECH
〔주〕제이오 텍

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2. Dismantle and Inspection

1. Service

1-1. Temperature

Classification	Symptom	Cause
Temperature	1-1-1 Temp doesn't increase	Heater malfunction
Check point	1. After setting 50℃ and then press Start Button to operate the unit. 2. Check the Heater temp itself. (Be careful heater is very hot.) 3. Measure resistance checking positive terminal of heater using of the multi meter. → If resistance doesn't measure, it is a malfunction	
Solution	- Replace a heater. 1. "**2-1-7. Heater dismantle" Reference** 2. Assembly is in reverse dismantle. (Heater should be checked resistance for inferiority.)	

Classification	Symptom	Cause
Temperature	1-1-1 Temp doesn't increase	Power Relay Malfunction
Check point	1. Press the Start Button to operate the unit, Measure Voltage of Output terminal using of the multi meter. → If Voltage doesn't measure, it is a malfunction	
Solution	- Replace the Relay. 1. "**2-1-5. Power relay Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Temperature	1-1-1 Temp doesn’t increase	Heater SSR Malfunction
Check point	1. Set the SV value higher than PV, Press the Start Button. 2. Check the HEAT LED is lightning on Display. (No Flickering, Lightning) 3. Check Terminal Resistance using of the Multi meter. (Resistance MODE) → If resistance doesn’t measure, it is a malfunction.	
Solution	- Replace the Heater SSR. 1. “**2-1-5. Solid state relay Dismantle**” **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Temperature	1-1-1. Temp doesn’t increase	Main control board
Check point	1. Set the SV value higher than PV, Press the Start Button. 2. Check the HEAT LED is lightning on Display. (No Flickering, Lightning) 3. Check Heater connector Voltage of PCB using of the Multi meter. (AC MODE) → If Voltage doesn’t measure, it is a malfunction.	
Solution	- Replace the PCB. 1. “**2-1-5. Main control board Dismantle**” **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Temperature	1-1-1 Temp doesn't increase	Wire from heating parts disconnection
Check point	1. Check the wire from Heater to SSR. 2. Check the end terminal connection of the wire. → If connection is not good, it is disconnection	
Solution	- If it is disconnection, replace the wire. 1. Replace the wire. 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Temperature	1-1-2 Temp trembling	Main control board Malfunction
Check point	1. Operate the unit after changing Set Temperature. → If it keeps trembling, Main control board Malfunction.	
Solution	- Replace the Main control board. 1. "**2-1-5. Main control board Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

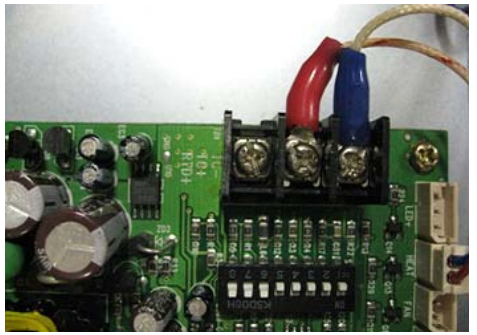
Classification	Symptom	Cause
Temperature	1-1-2 Temp trembling	Temp Sensor connection inferiority
Check point	1. Check the temp sensor terminal bolts of PCB. → If bolts are loosen, it cause disconnection inferiority.	
Solution	- Tighten the temp sensor terminal bolts of Main control board. 1. "**2-1-5. Main control board dismantle**" Reference 2. Tighten the temp sensor terminal bolts of Main control board	

	3. Assembly is in reverse dismantle.

Classification	Symptom	Cause
Temperature	1-1-3 Variation Cause	Main control board Malfunction
Check point	1. Replace the Main control board to check the situation. → If Variation is not caused, it is PCB Malfunction.	
Solution	- Replace the Main control board. 1. "**2-1-5. Main control board Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Temperature	1-1-3 Variation Cause	BIAS Value modification
Check point	1. Measure temp of the inner chamber using of A exterior temp detector installed in the middle. → If displayed temp and the temp detector value are different, Modify BIAS Value..	
Solution	- BIAS Value Modification - 1. Install A exterior temp detector verified inner chamber. 2. After setting the temp value, Wait for the temp that is stabilized.(About 2hours over) 3. Measure the temp detector installed inner chamber. 4. Press Temp Button six times to modify the Bias value. 5. Modify the BIAS value to set the temp is equal to the temp detector. And then press the ENTER Button to restore the value. 6. Modify the temp value.	

Classification	Symptom	Cause
Temperature	1-1-3 Variation Cause	Measurement Inferiority
Check point	1. Check the temp detector position. → If the temp detector is not in the middle position, It's a malfunction.	
Solution	- Measuring position change. 1. The sensor of temp detector positioned in the middle of inner chamber. 2. Fixture and the sensor of temp detector should be intervals minimum 15mm. (Standard Test Guide Reference)	

Classification	Symptom	Cause
Temperature	1-1-4 Temp trembling	Temp Sensor connection inferiority
Check point	1. Check the temp sensor terminal bolts of Main control board. → If bolts are loosen, it cause disconnection inferiority.	
Solution	- Tighten the temp sensor terminal bolts of Main control board. 1. "**2-1-5. Main control board Dismantle**" **Reference** 2. Tighten the temp sensor terminal bolts of Main control board. 3. Assembly is in reverse dismantle.	

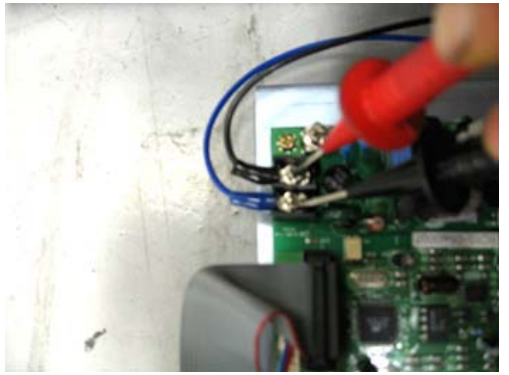
Classification	Symptom	Cause
Temperature	1-1-4 Temp keeps rising	Main control board Malfunction
Check point	1. Replace the Main control board to check the symptom. → If Variation is not caused, it is Main control board Malfunction.	
Solution	- Replace the Main control board. 1. "**2-1-5. Main control board Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Temperature	1-1-4 Temp keeps rising	Heat SSR(Solid state relay) Malfunction
Check point	1. Separate the Input SSR of Harness. 2. Measure resistance checking SSR output using of the multi meter. (Resistance MODE) → If resistance measure, it is SSR malfunction	
Solution	- Replace the SSR (Solid state relay). 1. "**2-1-5. Solid state relay Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

1-2. Power

Classification	Symptom	Cause
Power	1-2-1 No Power	Fuse disconnection
Check point	1. Check the Fuse using of the multi meter. → If Resistance is not measured, Fuse disconnection.	
Solution	- Replace the Fuse. 1. "**2-1-1. Fuse Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Power	1-2-1 No Power	Switch Malfunction
Check point	1. Measure output terminals No.2,5, When turning on the Main power. → If Power is not measured, Switch Malfunction	
Solution	- Replace the Switch. 1. "**2-1-5. Power switch Dismantle**" **Reference** 2. Separate Switch wiring. (When assembling, location is a caution.) 3. Pull out the parts which are involved in the Switch upper & bottom from the panel. 4. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Power	1-2-1 No Power	Main control board Malfunction
Check point	1. Check Voltage from output terminal of AC in Main control board. → If Voltage is measured without Power, Main control board Malfunction.	
Solution	- Replace the Main control board . 1. "**2-1-5. Main control board Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Power	1-2-1 No Power	Laboratory power Malfunction
Check point	1. Check the electricity of socket with multi meter. → If power doesn't measure or value is lower or higher, Laboratory power Malfunction.	
Solution	-Make Power of Laboratory stabilization.	

Classification	Symptom	Cause
Power	1-2-1 No Power	Power code line disconnection inferiority
Check point	1. Check between Fuse holder and Soldering part of power code line. → If Soldering part is separated, disconnection inferiority	
Solution	- Replace the Power Code line. 1. "**2-1-1. Fuse dismantle" Reference** 2. "**2-1-5. Power switch dismantle" Reference** 3. After soldering between Main cord and fuse holder, Tube it with Shirking tube. 4. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Power	1-2-2 Power shut off during operation	Main control board Malfunction
Check point	1. Turn on the Main power Switch. 2. Set the SV value 50°C, Press the Start Button to operate. 3. Check AC Voltage from heater output terminal in Main control board. → If Voltage is not measured, Main control board Malfunction. 4. Check DC Voltage from Relay output terminal in Main control board. → If Voltage is not measured, Main control board Malfunction.	
Solution	- Replace the Main control board. 1. "**2-1-5. Main control board Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Power	1-2-2 Power shut off during operation	Over current
Check point	1. Check the fuse and then replace it. 2. Check an electric current both ground terminal and Wire using of the multi meter. (Check the polar terminal of Wiring) 3. Check Heater leakage. → 1. If fuse is down, replace it. If heater is not leakage and 2. If current Ground terminal and wire doesn't apply current during measurement, It's Over current.	
Solution	- Over current is possible, but check shot circuit for all wires and electric parts.	

Classification	Symptom	Cause
Power	1-2-2 Power shut off during operation.	Electric capacity over in Multi outlet
Check point	1. Check an electric outlet capacity connected the unit. 2. Check total units connected the multi electric outlet. → If total units connected the multi electric outlet is over than the outlet capacity, multi electric outlet malfunction.	
Solution	- Use the multi electric outlet under capacity.	

Classification	Symptom	Cause
Power	1-2-2 Power shut off after turning on	Heater leakage
Check point	1. Check the fuse. 2. Separate the heater terminal and wire. 3. Measure Resistance both the heater terminal and heater exterior. → If fuse is down and heater resistance is measured, Heater leakage.	
Solution	- Replace the heater. 1. "**2-1-7. Heater Dismantle**" **Reference** 2. Assembly is in reverse dismantle. (Heater should be checked resistance for inferiority.)	

Classification	Symptom	Cause
Power	1-2-2 Power shut off during operation.	Wiring insulation malfunction
Check point	1. Check the fuse. 2. If fuse is down, replace it. 3. Check Resistance both ground wire and Main plug using of the multi meter. → If resistance is measured, it is short circuit.	
Solution	- Replace the wire. 1. "**2-1-1. Fuse Dismantle**" **Reference** 2. Assembly is in reverse dismantle.	

Classification	Symptom	Cause
Power	1-2-3 Power shut off after turning on	Electric capacity over in Multi outlet
Check point	1. Check the fuse. 2. Check an electric outlet capacity connected the unit. 3. Check total units connected the multi electric outlet. → If total units connected the multi electric outlet is over than the outlet capacity, multi electric outlet malfunction.	
Solution	- Use the multi electric outlet under capacity.	

1-3. DISPLAY BOARD

Classification	Symptom	Cause
DISPLAY	1-3-1. Push buttons error	Display board error
Check	1. Disconnect Display board from the panel, test pushing all buttons one by one → If you don't detect any reaction from button, the Display board is out of order	
Solution	- Replace the Display board 1. Refer to "**2-1-5. Main control board disassembly**" 2. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
DISPLAY	1-3-1. Push buttons error	Assembly error on Display board
Check	1. Check Display board is installed firmly. 2. Disconnect Display board from the panel, test pushing all buttons one by one. → If all buttons works good, while there is some space on installing the Display board, this means assembly error	
Solution	- Replace the Display board 1. Refer to "**2-1-5. Main control board disassembly**" 2. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
DISPLAY	1-3-2. Display error	Main control board error
Check	1. Disassemble the Harness on the Display board, and reassemble correctly. 2. Replace a new display board → If you still notice display error, the Main PCB is out of order	
Solution	- Replace the Display board 1. Refer to "**2-1-5. Main control board disassembly**" 2. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
DISPLAY	1-3-2. Display error	Temp. sensor error
Check	1. Replace a new Temp. Sensor. → If display is OK, the previous Sensor is out of order	
Solution	- Replace a new Temp. sensor 1. Refer to "**2-1-7. Temp. sensor disassembly**" 2. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
DISPLAY	1-3-2. Display error	Temp. sensor contact error
Check	1. Check the bolts of Temp. Sensor on the Main control board. → If you detect bolting is loose, contact error	
Solution	- Fasten the blots of Temp. Sensor on the Main control board. 1. Refer to "**2-1-5. Main control board disassembly**" 2. Fasten Temp. Sensor terminal on the Main control board	

	3. The assembly is reverse order of disjointing

Classification	Symptom	Cause
DISPLAY	1-3-3. O/T error	O/T error
Check	1. O/T LED is ON with buzzer while operating the unit. 2. Check whether Over temp. limit is set by 15% higher than SV. 3. Check if there is not enough water in the Bath	
Solution	1. Set Over temp. limit higher than (SV) by 15% . 2. Fill water in the Bath.	

Classification	Symptom	Cause
DISPLAY	1-3-3. O/T error	Main control board error, Transformer error
Check	1. O/T still alarms even Over temp. limit set is 15% higher than SV.	
Solution	- Replace a new Main control board - Replace a new Transformer 1. Refer to “**2-1-5. Main control board disassembly**” 2. Refer to “**2-1-5. Transformer** disassembly” 3. The assembly is reverse order of disjointing	

1-4. Shaking

Classification	Symptom	Cause
Shaking	1-4-1. Noise while shaking	Tray balance error
Check	1. Remove Tray from the bath 2. Check Tray balance.	
Solution	- Remove Tray from bath, make it balance. 1. Refer to "**2-1-6. Tray disassembly**" 2. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
Shaking	1-4-1. Noise while shaking	Crank Joint assembly error, Roller wear
Check	1. Check Crank bolt are loosen. 2. Remove Tray 3. Check Roller wear	
Solution	− Check Crank joint parts, if found any loosen, fasten again. 1. Refer to "**2-1-2. Shaking unit disassembly**" − When Roller replacement is needed, replace 4 set all together. 2. Refer to "**2-1-6. Tray disassembly**" 3. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
Shaking	1-4-2. Shaking does not work	Main control board, Motor error
Check	1. Replace a new Main control board to check the cause 2. Check after replacing Main control board.	
Solution	- Replace a new Main control board 1. Refer to "**2-1-5. Main control board disassembly**" - Replace a new Motor 2. Refer to "**2-1-4. Motor disassembly**" 3. The assembly is reverse order of disjointing	

Classification	Symptom	Cause
Shaking	1-4-1. RPM control error	Main control board error
Check	1. Replace a new Main control board to find the cause → If RPM control is OK, the old Main control board is error	
Solution	- Replace a new Main control board 1. Refer to "**2-1-5. Main control board disassembly**" 2. The assembly is reverse order of disjointing	

1-5. Current leakage

Classification	Symptom	Cause
Leakage	1-5-1. circuit breaker activates	Heater
Check	Step 1. Check out fuses. => If fuses are out of order, current leakage happens. Step 2. Taking out wiring of heater. Then, measure resistance between terminal and surface of heater with resistance meter. => If resistance measures, current leakage happens.	
Solution	- Replace Heater. 1. Refer to "**2-1-7. Heater disassemble**" 2. Assemble vice versa. (Resistance of heating element must be checked with resistance meter before assembling.)	

Classification	Symptom	Cause
Leakage	circuit breaker activates	Insulation of wire
Check	Step 1. Check out fuses. Step 2. Replace fuses if it is out of order. Step 3. Measure resistance between main plug and earth resistance meter. → If resistance measures, insulation of wire is out of order.	
Solution	- Replace wires	

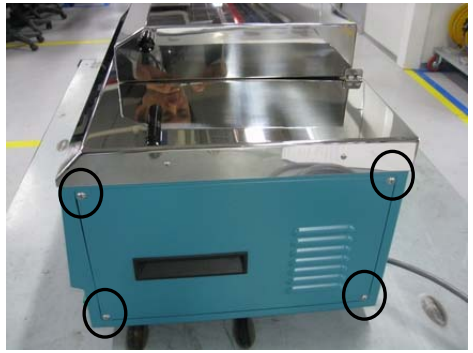
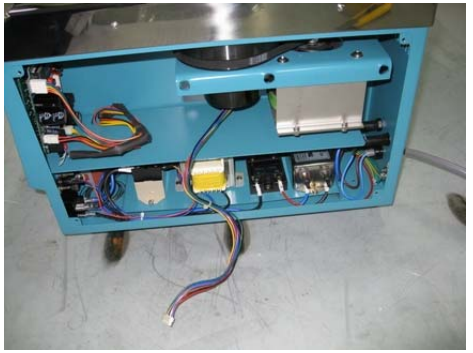
2. Dismantle & Inspection

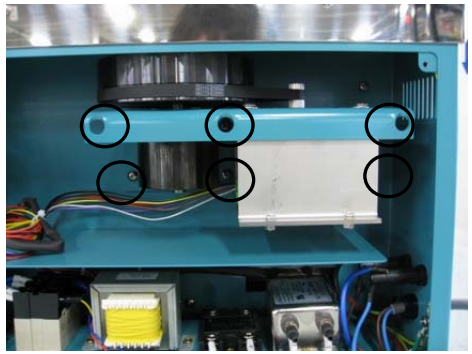
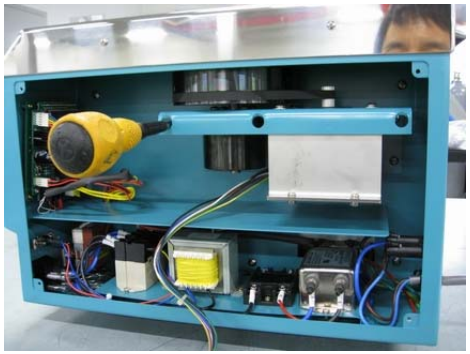
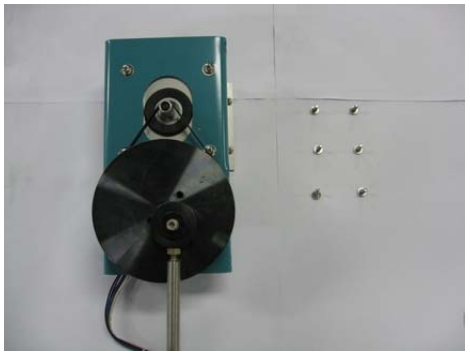
2-1. Dismantle

2-1-1. “Fuse, Drain valve Dismantle”

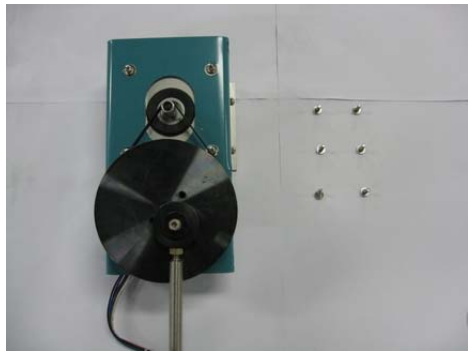
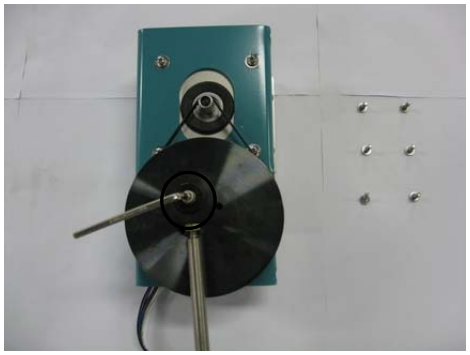
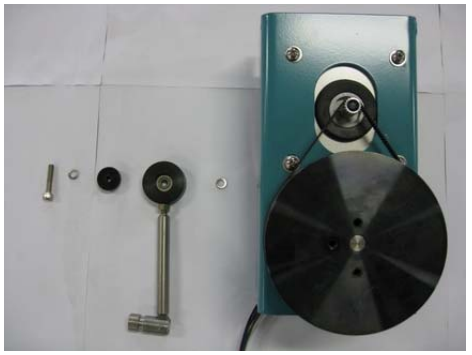
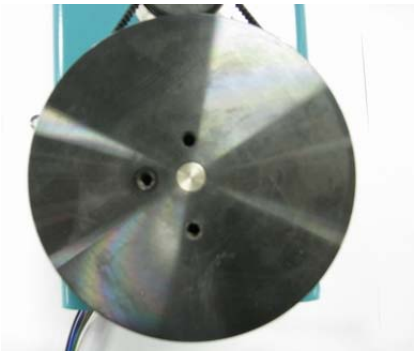
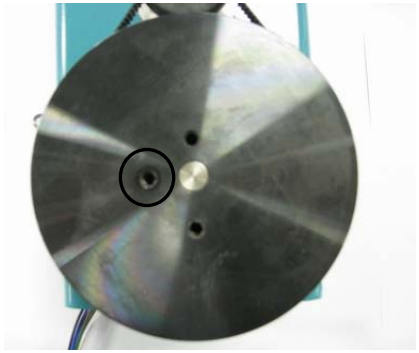
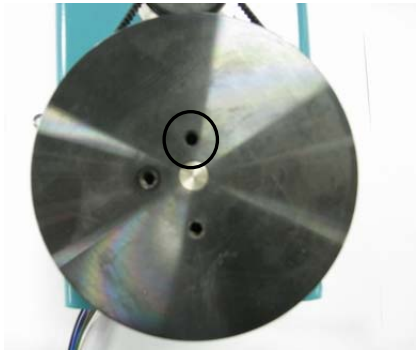
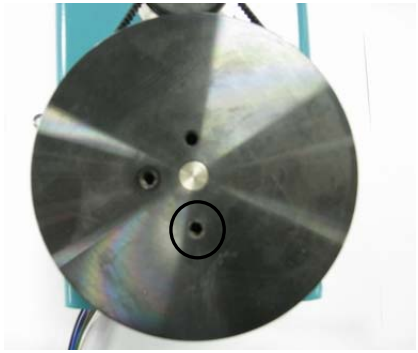
			
1. Remove the unit packing.	2. Fuse holder is positioned in the left lower part on the unit back side.	3. Turn the Fuse hold to Anti clock wise using of (-) Driver. **“Fuse”** is separated.	4. “Drain valve” is positioned in the right lower part on the unit back side.
			
5. When turning Drain valve up to Anti Clock wise, **“Drain valve”**is separated.	6. Complete separation. (When assembling, a rubber ring should be put together.		

2-1-2. “Shaking Unit Dismantle”

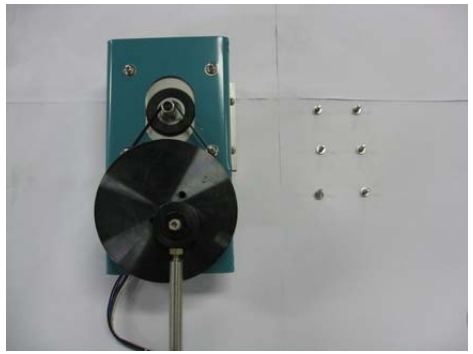
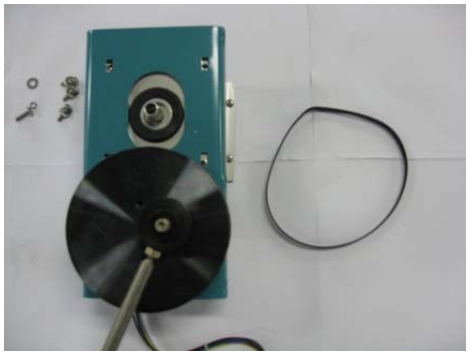
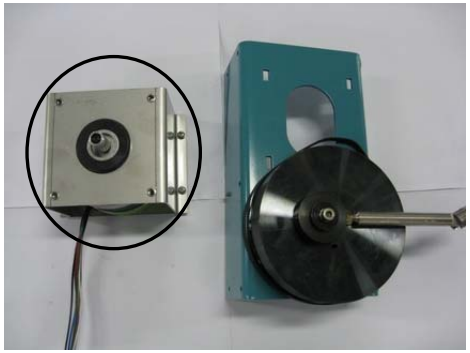
			
1. Open the Cover as upper picture.	2. Crank bolt is shown on the right inner side of Bath. Turn the bolt to Anti clock to separate.	3. Upper left side is a picture of Crank bolt separation. Remove the grey pipe shown the right side.	4. The right side panel indicated a black circle is a Side cover.
			
5. Loosen M4 4ea bolts using of (+) Driver.	6. Dismantle the Side cover.	7. Remove a wire connecting to the Motor from a Controller.	8. A picture for removing the Motor wire.

			
9. Remove 6EA bolt fixed the Shaking unit using of (+) driver.	10. Loosen bolts for upper part as upper picture. (Caution-Heavy)	11. A picture for separating the **“Shaking unit”**. (M4 bolt-M4 Spring Washer-M4 Washer)	

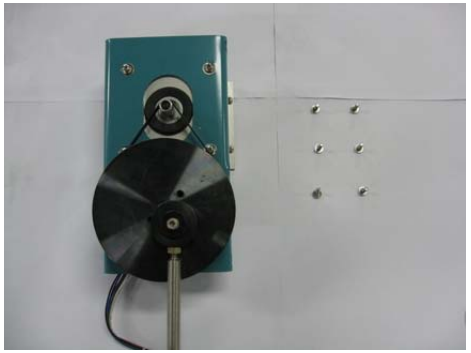
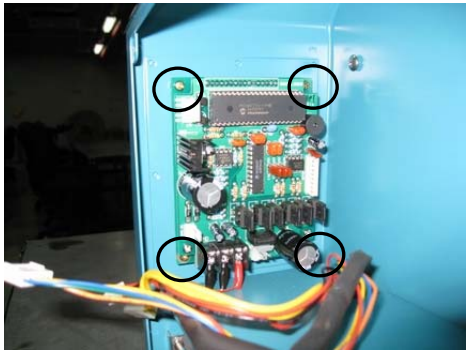
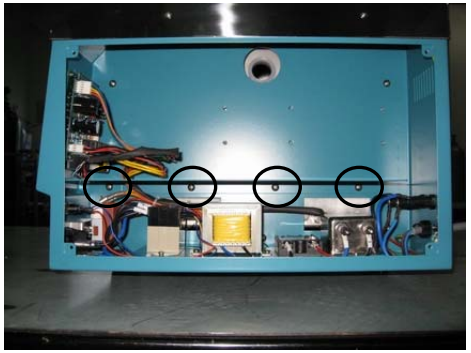
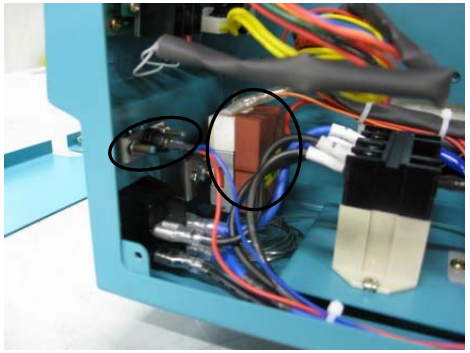
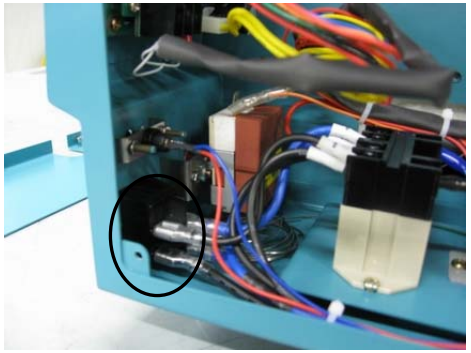
2-1-3. “Amplitude Modification”

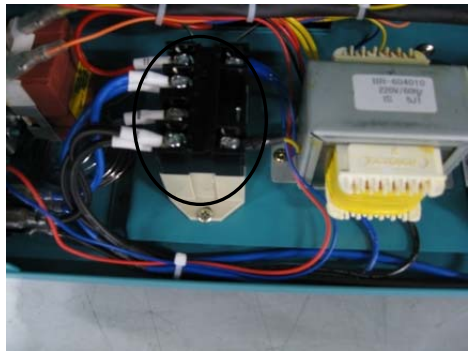
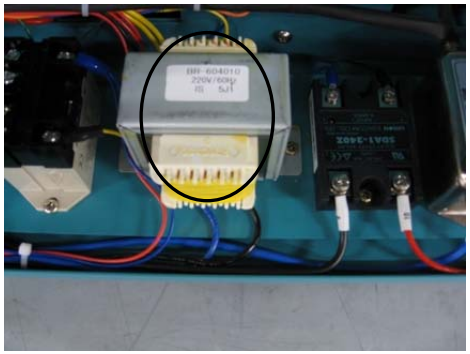
			
1. **2-1-2** After **“Shaking Unit Dismantle”** works, make progress.	2. Loosen M5 Wrench bolt (which is fixed Crank wheel) using of M4 wrench.	3. Separate parts as upper picture. (From left, M5 wrench bolt- M5 Spring washer- Crank bolt- Crank load- M5 Spring washer)	4. A picture of Zoom out of Fly wheel.
			
5. If using amplitude 30mm, Fix it as a picture.(Black circle)	6. If using amplitude 25mm, Fix it as a picture.(Black circle)	7. If using amplitude 35mm, Fix it as a picture.(Black circle)	

2-1-4. “Timing belt & Motor disassembly”

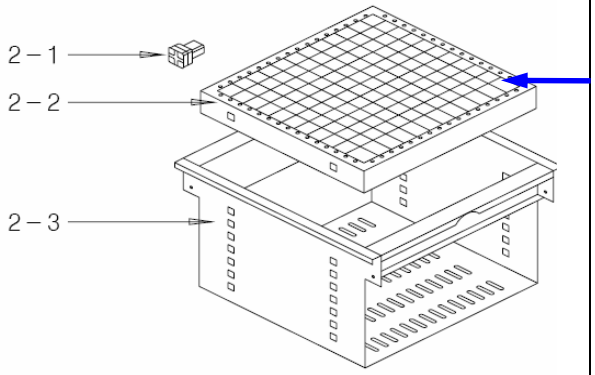
			
1. You can proceed after **2-1-2 “Shaking Unit disassembly”**	2. Release M4 bolt 4ea by (+) driver	3. Check all parts (M4 blot- M4 spring washer- M4 flat washer)	4. Remove **“Timing belt”**
			
5. When reassembling Timing belt(proper tension should be kept, 5mm when pushing fingers.	6. you can remove as above.	7. Release M4 bolt 4ea to remove **“Motor”**	8. The pic shows the opposite side

2-1-5. “Main control board, Start/Stop switch, Temperature regulator, Power switch, Power relay, Transformer, Solid state relay, Noise filter disassembly”

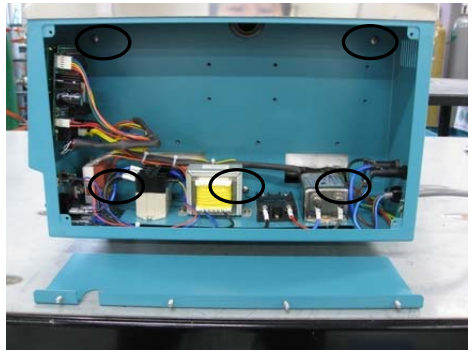
			
1. You can proceed after **2-1-2 “Shaking Unit disassembly”**	2. You can see the electric arrangement parts	3. Disconnect all wires to Main control board	4. Release M3 bolt 4ea to remove **“Main control board”**
			
5. Release M4 bolt 4ea by (+)driver	6. As shown above, open it	7. Release M3 nut x 2ea by 5.5mm vox driver to separate **“Start/Stop switch” and “Temperature regulator”**	8. Remove **“Power switch”** by using (-) driver

			
9. After disconnecting all wires , Release M4 bolt 2ea to remove **“Power relay”**	10. Release M4 bolt 2ea to remove **“Transformer”**	11. Release M4 bolt 2ea to remove **“Solid state relay”** after disconnecting all wires	12. Release M4 bolt 2ea and disconnect all wires to remove **“Noise filter”**
			
13.Now you can check Fuse hold	14. when reassembling, keep the initial arrangement		

2-1-6. Tray disassemble and Spring wire rack adjust

<table>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td>1. Open the lid.</td><td>2. Screw of crank can be seen at the right of the bath.</td><td>3. Take out screw for crank.</td><td>4. Separate tray carefully.</td></tr>
<tr><td>  </td><td>  </td><td> 
</td><td>  </td></tr>
<tr><td>5. Tray separation completion</td><td>Note) Roller can be replaced if it is worn out with (-) crew driver.</td><td>7. Take out Arrow(2-1) with (-) screw diver or by hand. A layer of spring wire rack (2-2) can be separated when 4 of Arrows are taken out.</td><td>8. Reposition a lay of spring wire rack and fasten 4 of Arrows .</td></tr>
</table>

2-1-7. “Bath disassemble” – Be careful of damage of Housing cover.
“Heater, Temp. sensor, Temperature regulator disassemble”

			
1. Separate tray. **Refer to 2-1-6. Spring wire rack disassemble”**	2. Top view after separation of tray.	3. Loose 2 of screw at the right part.	4. Loose 2 of screw at the left side. - Housing cover를 can be separated..
			
5. Disassemble Shaking unit and electric board. Take out 4 screws at the right side to separate control box. **2-1-2. Refer to “Shaking Unit disassemble”**	6. Heater can be separated to take out only nut 2 of nut.	7. Temp.sensor can be separated when nut is loosen.	8. Temperature regulator can be separated when nut and screws are loosened..

2-1-8. “Tools

From left,

Long nose, nipper, 17mm spanner, 16mm spanner, 14mm spanner, M5.5 vox screw driver, M7 vox screw driver, (+) screw driver, M4 L wrench