

User Manual

B Series, Ampoule Furnace , valid for TLP – 1109 - AF

09/14/2026

TLP-1109-AFP
TLP-1109-AFH

AMPOULE FURNACE



User Manual

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Warranty

Product introduction

Teraleader Inc. warrants this product to be free from defects in material and workmanship for a period of 1 year from date of shipment. Teraleader, Inc. warrants the following items for 90 days from the date of shipment: probes, cables, and documentation. During the warranty period, we will, at our option, either repair or replace any product that proves to be defective. To exercise this warranty, write or call your local Teraleader representative, or contact Teraleader headquarters in Korea, Deajeon. You will be given prompt assistance and return instructions. Send the product, transportation prepaid, to the indicated service facility. Repairs will be made and the product returned, transportation prepaid. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days.

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Be sure to read the "Safety information" before using the product, and use the product correctly

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User's Manual NOTICE

Product introduction

- Thank you for purchasing TERALEADER, INC. products. This user's manual explains the functions of the product, precautions, how to install and use it. Please read the user's manual carefully beforehand. In addition, please make it available for the end user and keep it where you can view it any time.

This manual is intended for those who have a basic understanding of the basic principles of electrical and electronic equipment, knowledge of the equipment (system) to which this product applies, and knowledge of computers and communication.

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User's Manual NOTICE

Safety information

- Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured. The instrument and accessories must be used in accordance with its specifications and operating instructions or the safety of the equipment may be impaired.
- Do not exceed the maximum signal levels of the instruments and accessories, as defined in the specifications and operating information, and as shown on the instrument or test fixture panels, or switching card. When fuses are used in a product, replace with same type and rating for continued protection against fire hazard. Chassis connections must only be used as shield connections for measuring circuits, NOT as safety earth ground connections. If you are using a test fixture, keep the lid closed while power is applied to the device under test. Safe operation requires the use of a lid interlock.
- If a  screw is present, connect it to safety earth ground using the wire recommended in the user documentation.
- The  symbol on an instrument indicates that the user should refer to the operating instructions located in the manual.
- The  symbol on an instrument shows that it can source or measure 1000 volts or more, including the combined effect of normal and common mode voltages. Use standard safety precautions to avoid personal contact with these voltages.
- The  symbol indicates a connection terminal to the equipment frame.
- The **WARNING** heading in a manual explains dangers that might result in personal injury or death. Always read the associated information very carefully before performing the indicated procedure.
- The **CAUTION** heading in a manual explains hazards that could damage the instrument. Such damage may invalidate the warranty. Instrumentation and accessories shall not be connected to humans.

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INSTALLATION

CAUTIONS

- Do not use it outdoors.
- Use it in the ambient temperature and humidity ranges indicated in the instruction manual.
- Use it in locations where corrosive gases (especially harmful gases, ammonia, etc.) and flammable gases are not generated.
- Use it in places where vibrations and impacts are not directly applied to product body. - use it in places without liquids, oils, chemicals, steam, dust, salt, iron, etc. (pollution degree 1 or 2).
- Avoid places where large inductive interference, static electricity, magnetic noise are generated. - avoid places with heat accumulation caused by direct sunlight, radiant heat, etc.
- Use it in places with elevation below 2000 m.

USAGE

- Please do not wipe the product with organic solvents such as alcohol, benzene, etc. (wipe it with neutral detergents).
- When water enters, short circuit or fire may occur, so please inspect the product carefully.
- Use the input signal line away from power line and load line to avoid the influence of inductive noise.
- Input signal line and output signal line should be separated from each other. If separation is not possible, use shield wires for input signal line.
- When there is a lot of noise from the power, we recommend to use insulation transformer and noise filter. Please install the noise filter to a grounded panel or structure, etc. and make the wiring of noise filter output and product power supply terminal as short as possible.

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INSTALLATION

QUALITY ASSURANCE CONDITIONS OF THIS PRODUCT

- The warranty period of this product is one year from its date of purchase. This product will be repaired free of charge in the event of malfunction occurring under normal use conditions set forth in this manual.
- Repairs due to breakdown occurring after the expiration of the warranty period of the product will be charged according to the standard determined by the company.
- In the following cases, even if the breakdowns occur within the warranty period, they will be charged.
 - Breakdowns due to user's fault - Breakdowns due to natural disaster.
 - Breakdowns due to movements after installation.
 - Breakdowns due to arbitrary product change or damage.
 - Breakdowns due to power supply abnormality (such as power instability).
 - If A/S is required due to breakdowns, please contact the place of purchase, or our sales department.

QUALITY ASSURANCE

- We do not assume any warranty or liability with respect to this product, except as stipulated in our quality assurance conditions
- We are not responsible for any direct or indirect damages suffered by users or third parties due to unforeseeable defects or natural disasters.

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INSTALLATION

Operating requirements

- Use the Ampoule Furnace within the required operating power voltage ranges to provide the most accurate measurements and safe instrument operation

Requirements	
Characteristic	Description
Power Source voltage	220V AC, 50/60Hz, 500W
Powering	Always connect the Ampoule Furnace to AC power using the power cord that shipped with the device

Input signal requirements

- Keep the input signals within allowed limits to ensure the most accurate measurements and prevent damage to device. Make sure that input signals are within the following requirements

Maximum Input	
Input	Description
Temperature	R.T ~ 800°C(1hour) (optional 1050°C)

1. Getting acquainted with your device

1-1. Front panel summary

The front panel of the Ampoule Furnace is shown in Figure 1. The following information should be reviewed before operating the device.



Figure 1. Front panel of Ampoule Furnace

Front Description		
①	FURNACE	Entrance of furnace
②	TEMPERATURE CONTROLLER	Set and Hold a desired temperature
③	POWER	Power on/off
④	MOTOR SWITCH	Rotation on/off
⑤	MOTOR CONNECTOR	Connect the motor for operation
⑥	FOOT	Enhance device setup

1. Getting acquainted with your device

1-2. Ampoule Module summary

The Ampoule Module is shown in Figure 2. The following information should be reviewed before operating the device.

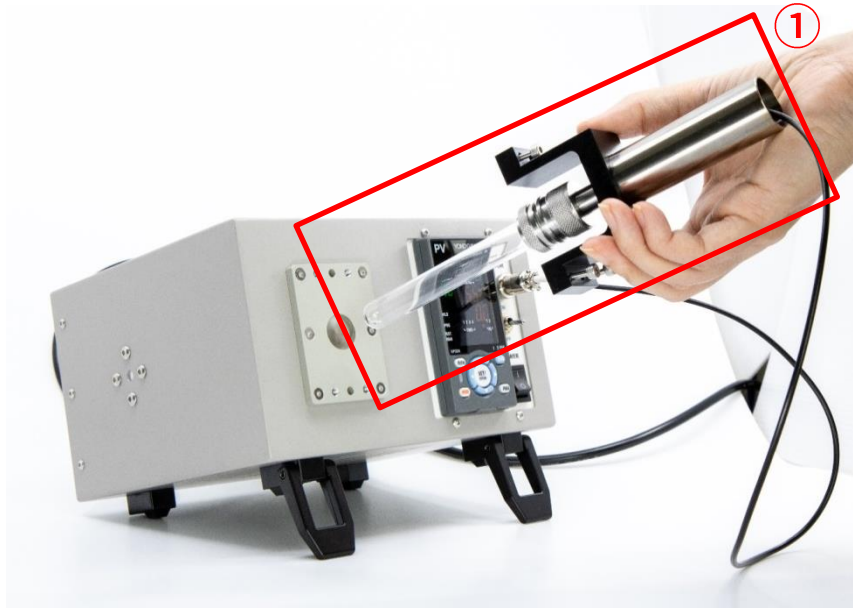


Figure 2. Ampoule Module

Front Description		
①	AMPOULE MODULE	Ampoule Module is a container for Sample Placement and heat-treatment with rotation. Additionally, it is possible to change the Ampoule Module according to the desired function. (Vacuum, Gas flow)

1. Getting acquainted with your device

1-3. Rear panel summary

The rear panel of the Ampoule Furnace is shown in Figure 3. The following abbreviated information should be reviewed before operating the device.

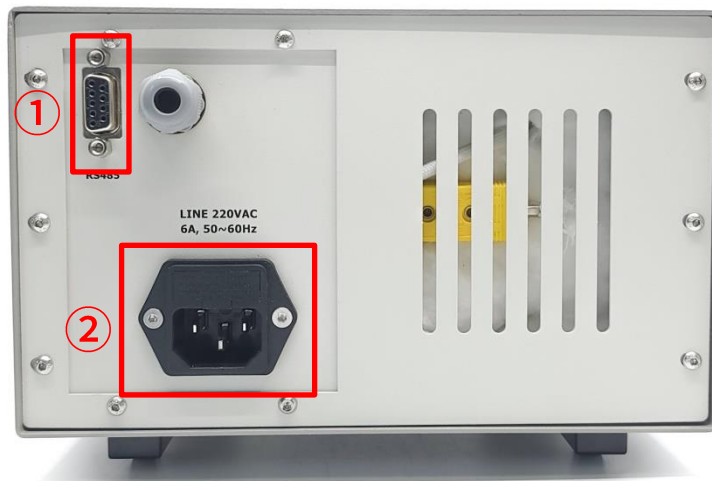


Figure 3. Rear panel of Ampoule Furnace

Rear panel Description		
①	RS485 port	RS485 communication-enabled port
②	MAIN POWER	Connector for AC 115-volt power cable

2. Operate Ampoule Furnace

2-1. Assemble Quartz

Procedure of Assembling the Ampoule Module

①



Insert **the quartz- O-ring(AN109)** on the outer side of the Ampoule and push it all the way as shown in the image on the left.

*For sealing purposes

②



Insert the nut on the outer side of the Ampoule and push it all the way as shown in the image on the left.

2. Operate Ampoule Furnace

2-1. Assemble Quartz

Procedure of Assembling the Ampoule Module

③

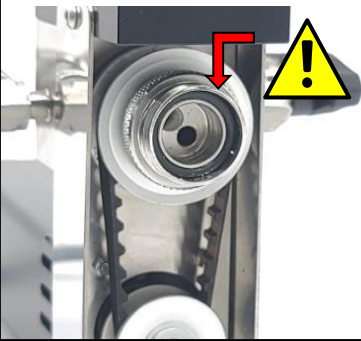
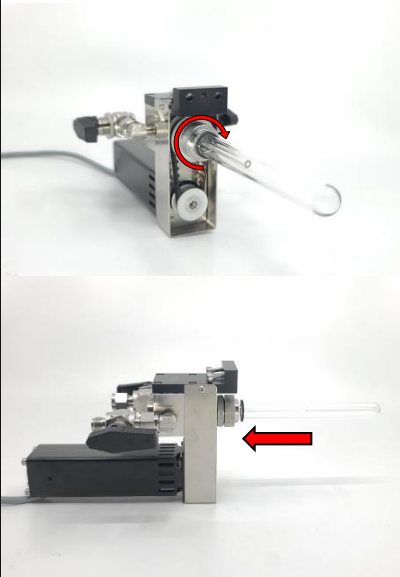


Insert **the inner O-ring(AN013)** on the outer side of the Ampoule and push it until it reaches the nut as shown in the image on the left

*For fixing the nut.

2. Operate Ampoule Furnace

2-1. Assemble Quartz

Procedure of Assembling the Ampoule Module		
④		Before joining the Ampoule with the Module, Make sure that it is equipped with the inner O-ring(AN015) inside
⑤		Insert SAMPLE into the Ampoule, then join the Ampoule to the Module with the nut. * Make sure to join all the way to the end.
⑥		Place the Ampoule Module into the Furnace, and tighten the bolts with a 3mm Hex Wrench. *For safety reasons, Make sure to tighten the bolts

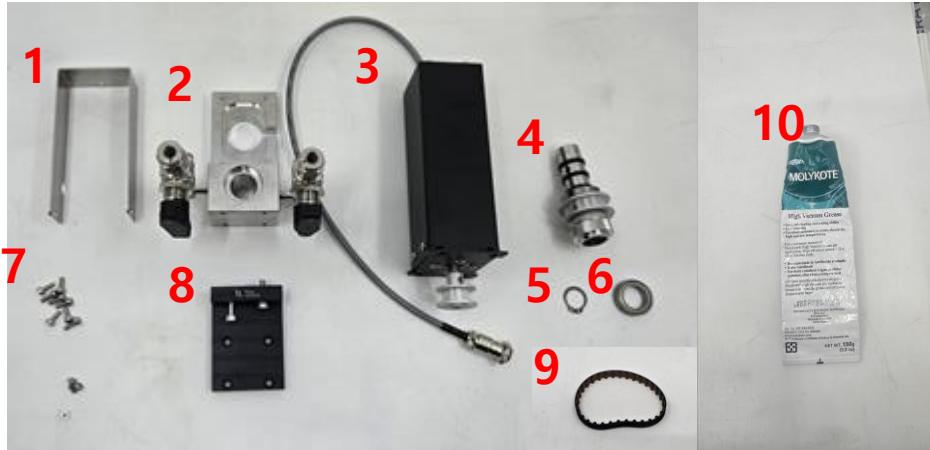
2. Operate Ampoule Furnace

2-2. Operate Ampoule Furnace

Procedure of Operating the Ampoule Furnace		
①		Remove the Ampoule from by using a 3mm Hex Wrench
②		Separate the Ampoule from the Module and Insert Sample into the Ampoule, then reassemble them * Refer to 12~14 pages
③		Replace the Ampoule into the Furnace and Join it with bolts
④		Set the Target Temperature (SV) and Press R1 button for 3 sec to operate (Selection between Vacuum type and Rotary type is available)
⑤		When the experiment is finished, Press RST button for 3 sec to stop operation
⑥		After ensuring that both Motor and Vacuum are OFF/CLOSE, Remove the Ampoule

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly



Parts List	
1	Stainless Steel Outer Cover
2	Main Body and Valves
3	Motor
4	Rotary Assembly (including Lower Bearing and Quad Rings)
5	Snap Ring
6	Bearing
7	M3 Socket Head Screws (8 mm) / M3 Low-Profile Screws (5 mm), Stainless Steel
8	Aluminum Mounting Block for Main Body
9	Timing Belt
10	Vacuum Grease

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Cleaning and Preparation for Ampoule Module Assembly

1



After cleaning, apply a sufficient amount of vacuum grease to all three Quad Rings as shown in the image. Make sure that each Quad Ring is evenly lubricated to ensure smooth installation and rotation.

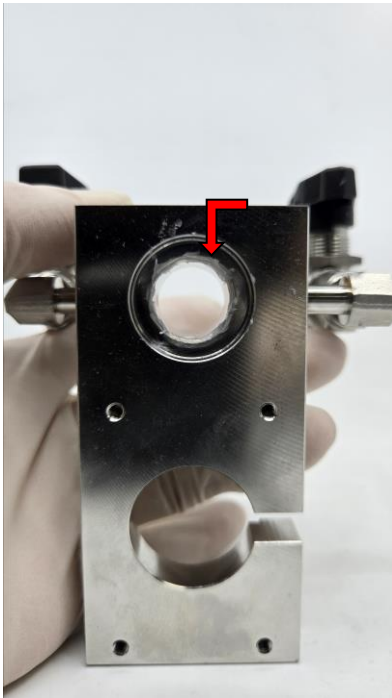
CAUTION: When cleaning the rotary assembly, do not allow alcohol to enter the bearing. Clean the upper and lower sides separately. When using an ultrasonic cleaner, do not fully immerse the bearing assembly.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

2



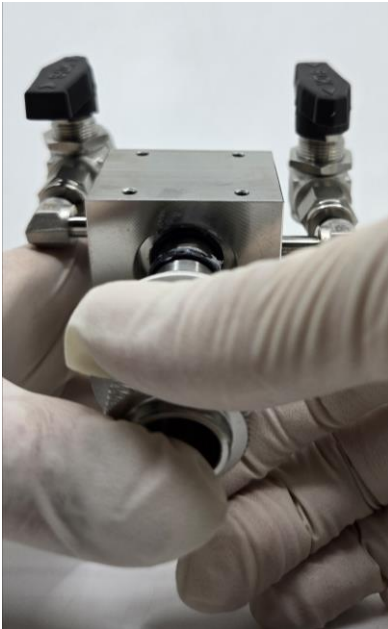
Apply vacuum grease to the inner surface of the lower opening of the Main Body before inserting the Rotary Assembly.

This helps protect the Quad Rings during insertion and provides proper lubrication for smooth assembly.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

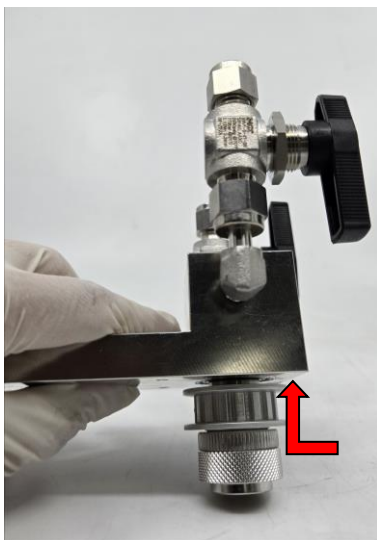
3		<p>Carefully insert the Rotary Assembly into the Main Body. If necessary, use a suitable tool to gently press the assembly into position. Be careful not to damage the Quad Rings during insertion.</p>
4		<p>Keep the Rotary Assembly aligned with the Main Body and insert it slowly. If necessary, gently rotate the assembly from side to side while inserting it.</p> <p>CAUTION: When the upper Quad Ring reaches the Main Body, apply gentle and steady pressure and insert the assembly very slowly to prevent damage to the Quad Ring.</p>

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

5



Make sure that the lower bearing of the Rotary Assembly is fully inserted into the Main Body.

6

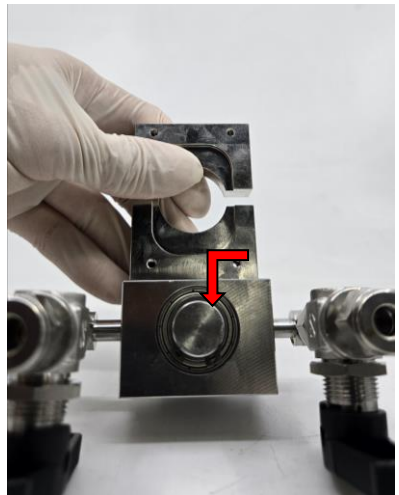


Install the upper Bearing onto the Rotary Assembly as shown in the image.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

7		<p>Using snap ring tools, install the Snap Ring into the groove above the Rotary Assembly.</p>
8		<p>Make sure that the Snap Ring is fully seated in the groove as shown in the image.</p> <p>CAUTION: Verify that the Snap Ring is securely seated before proceeding to the next step.</p>

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module



Insert the Motor into the upper section of the Main Body as shown in the image.



IMPORTANT: Rotate the Motor approximately 90° during installation to allow the Timing Belt to be installed in the next step.

9

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

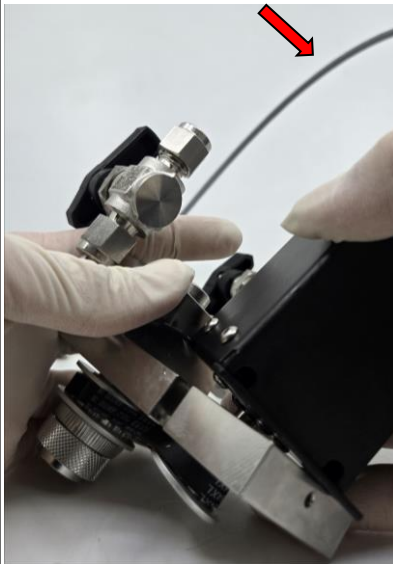
Procedure for Assembling the Ampoule Module

10



Install the Timing Belt onto both pulleys while keeping the Motor in the position shown in the image.

11



After installing the Timing Belt, rotate the Motor 90° to its final position.

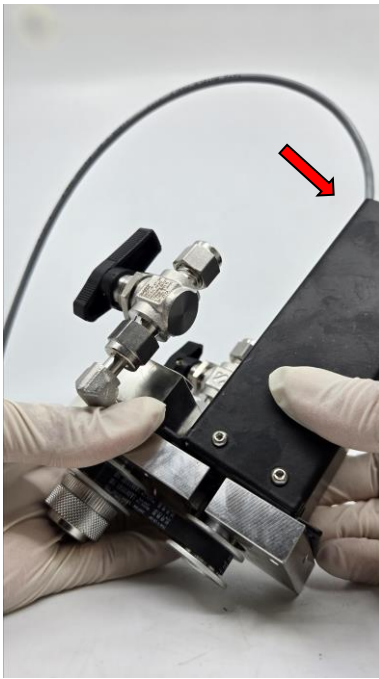
Make sure that the motor cable is oriented to the left as shown in the image.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

12



Make sure that the Motor is in the correct position and that the motor cable is oriented as shown in the image.

13



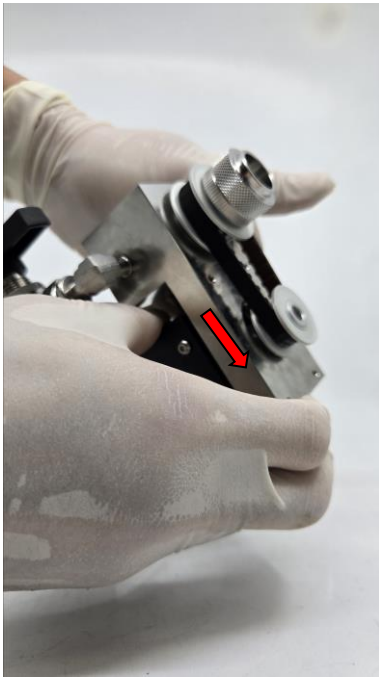
Install the four M3 × 8 mm socket head screws. Do not fully tighten the screws at this stage. Leave them slightly loose so that the Timing Belt tension can be adjusted in the next step.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

14



Press the Motor firmly downward to apply tension to the Timing Belt. While maintaining the Motor position, evenly tighten all four mounting screws..

15



Check the Timing Belt tension by hand after tightening the screws.

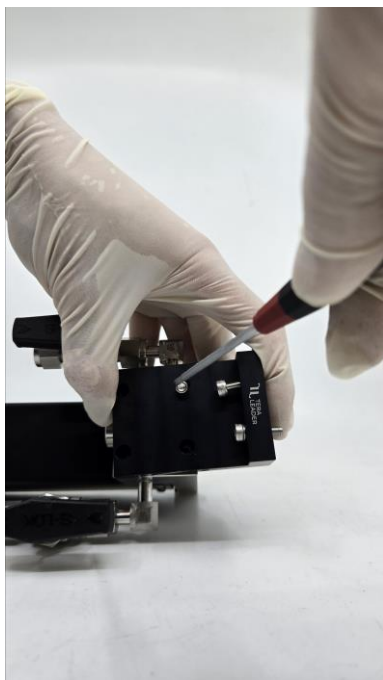
CAUTION: Make sure that the Timing Belt is not loose. Insufficient belt tension may prevent proper rotation.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

16



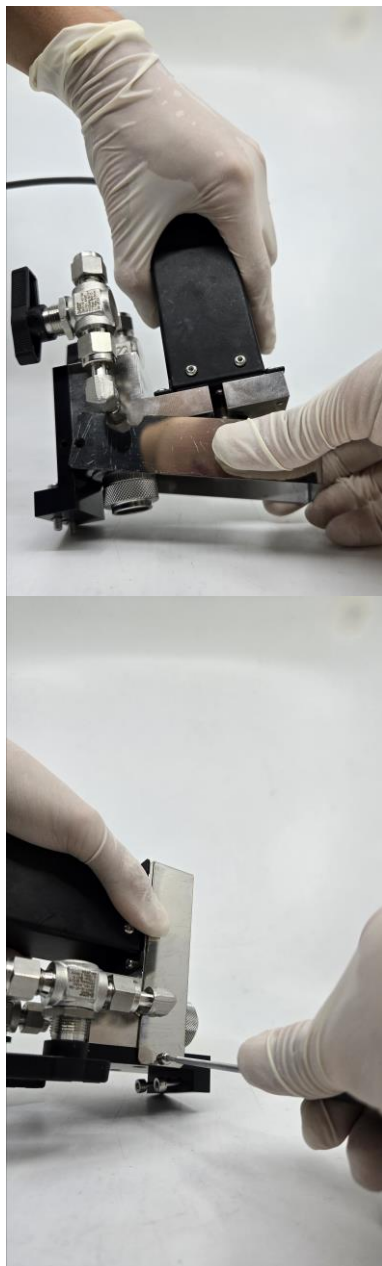
Secure the Main Body to the Aluminum Mounting Block using four M3 × 8 mm socket head screws.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

17



Securely fasten the Stainless Steel Outer Cover with the M3 low-profile screws as shown in the images. Make sure that the cover is properly aligned before fully tightening the screws.

2. Operate Ampoule Furnace

2-3. Ampoule Module Assembly

Procedure for Assembling the Ampoule Module

18



Check that the O-ring (AN015) is correctly installed in the Ampoule connection port.

The O-ring is normally retained in position. If it has been removed or has come loose, reinstall it as shown in the image.

IMPORTANT: Make sure that the O-ring is properly seated before installing the Ampoule.

Disassembly Procedure

For disassembly, follow the assembly procedure in reverse order, starting from Step 17.

Step 18 is for reference only and is not part of the disassembly procedure.

3. SP580

3-1. SP580 User Manual



Description	
①	PV Display : Parameter name
②	SV Setting : Parameter Value Setting
③	Lights on during EVENT occurs
④	Set pattern and Operate
⑤	Register parameter settings and Apply parameters
⑥	Change decimal point / Press when Pattern End

Control Keys		
①		Apply the desired temperature pattern value to P1 or P2
②		Press P1 or P2 button for 2 sec to run
③	-	Verify if the temperature runs at the set value
④		Press RST button for 2 sec to stop

* PV: Present Value, SV: Set Value

3. SP580

3-2. Pattern Setting Method

Procedure of Pattern Setting		
①	SET	Press SET button for 3 seconds
②	PROG	Press SET button once on PROG screen. (navigate to the pattern setting screen)
③	PTNO	The parameter to set where Pattern value is applied (Pattern Number) Set PTNO to 1 or 2 using ▲▼ buttons, then press SET button
④	n.LC	The settable operations in LC(LINK CODE) are arranged in the order of 'RST', 'HOLD', 'PTN1' and 'PTN2'. Set LINK CODE using ▲▼ buttons, and Press SET button When the pattern runs stop, RST : Shift to RESET(STOP). HOLD : Runs to SP of Last Segment until press RST button PTN1 : Infinite Repeat when current Pattern is 'PTN1' PTN2 : Infinite Repeat when current Pattern is 'PTN2'
⑤	n.SSP	The parameter to set SP (Start Set Point) when Program starts run Set Temperature starting point, and Press SET button RST : Change the digit number ▲▼ : Increase/Decrease the number
⑥	n.SP1	The parameter to set TSP (Target Set Point) in Segment 1 Set the initial target temperature to increase, and Press SET button
⑦	n.TM1	Set Running time of Segment 1, and Press SET button (Setting ranges of 'TM1' are OFF, 1~99.59 sec. It displays HH.MM or MM.SS by setting TMU parameter of 'PROG') ※ IMPORTANT: For the final segment, set TM to 0.00, then press the ▼ button once more until OFF is displayed.
⑧	n.TS1	The parameter to set whether using of TS (Time signal) in Segment 1 As It is an irrelevant function, Set it to OFF and Press SET button
⑨	SET	To return to the Operation Display, Press and hold SET button for 3 seconds

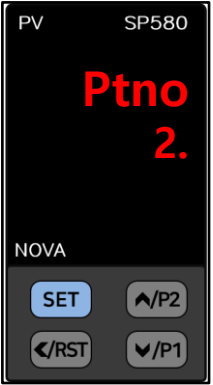
REPEAT

* If an incorrect setting has been made, Press SET button for 3 sec, then reconfigure from the beginning

3. SP580

3-3. Example of Pattern Setting

Example) Set Pattern to PTNO.2, and starting from Room temperature of 27°C, Increase the temperature to 50°C over 5 minutes, and then maintain it for 3 minutes.

Sequence of Example			
			
1. Press SET for 3 sec	2. Press SET once.	3. Press ▲ then SET	4. Set LC to RST
			
5. Set SP to 27°C	6. Set TSP1 to 50°C	7. Set TM to 5 min	8. Set TS to OFF
			
9. Set TSP2 to 50°C	10. Set TM2 to 3 min	11. Set TS2 to OFF	

* SP: Start Set point TSP: Target Set Point TM: Running Time

3. SP580

3-3. Example of Pattern Setting

Example) Set Pattern to PTNO.2, and starting from Room temperature of 27°C, Increase the temperature to 50°C over 5 minutes, and then maintain it for 3 minutes.

Sequence of Example			
			
12. Set SP3 to 0°C	Important! 13. Set TM3 off	14. Set TS2 to OFF	15. Press SET for 3sec

* SP: Start Set point TSP: Target Set Point TM: Running Time

3. SP580

3-4. Set Communication Group(G.COM)



Procedure of setting up Communication Group		
①	SET	Press SET button for 3 seconds
②	STUP	Press ▼ button, and then press SET button in STUP display
③	PWD	Press ▼ button twice to display “PWD”, and press SET button
④	G.COM	Press ▼ button eight times to display “G.COM”, and press SET button
⑤	ADDR	Press SET button five times to display “ADDR”, and set Communication Address for controller from 1 to 99 using ▲,▼ buttons
⑥	SET	Press SET button to apply the entered address
⑦	SET	To return to the Operation Display, Press SET button for 3 seconds

Specifications are subject to change without notice.

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