CHEMcell™ Temperature Control Module

CLS-1200-2CH

For Serial Number:

OPERATIONS MANUAL

3800 North Mill Road • Vineland, NJ 08360 • USA

Tel: 1-800-843-1794 • Fax: 1-800-922-4361

Web: www.cglifesciences.com

Rev. A

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General Description

The CG Life Sciences CHEMcell Temperature Control Module has an easy to read digital display with a ramp to set point feature. A 120VAC outlet for connection of the heater cord from either CLS-1200-250 or CLS-1200-300 Tray. Two 5vdc connections are provided for CLS-1200-FH, Filter Vent heaters.

Specifications:

- Digital PID Controller
- RTD connection (Mini-type plug)
- 120VAC Power Outlet
- Two 5Vdc outlets
- Dimensions: (L x W x H; 7 ¾ x 5 ⅜ x 3 ⅜)
- Operating Temperature: 0° – 50°C
- Electrical Rating: 120VAC, 50/60Hz, 10 Amps, 1200 Watts

Features:

- ✓ Brushed Stainless Steel Housing
- ✓ Easily change set-point temperature
- ✓ Over temperature Flashing Red LED indicator
- ✓ Accommodates 20L or 50L Tray heaters

Additional Products (Purchased Separately):

- ➢ CLS-1200-100, Chemcell Base unit
- ➢ CLS-1200-250, 20-liter Tray
- ➢ CLS-1200-300, 50-liter Tray
- ➢ CLS-1200-GMM, Gas Mixing Module
- ➢ CLS-1200-FH, Vent Filter Heater
- ➢ CLS-1200-AP, Air Pump Kit complete
- ➢ CLS-1200-RTD, Chemcell RTD Pt100 (*One is included with each Tray*)

Unpacking Instructions

Unpack the CHEMcell Temperature Control Module carefully. Read all Instructions before using. Be certain to retain any warranty information, all packing material and operations manual(s). Record the serial number, located on the bottom of the unit for future reference.

Example: Serial Number

Any damage claims must be initiated with the delivering carrier within five (5) days of receipt of the product.

CAUTION ***This unit must only be connected to the correct voltage source (Grounded 120VAC @50/60Hz.)***

CLS-1200-2CH, Temperature Control Module

FRONT VIEW

REAR VIEW

SET-UP Guide (refer to Fig. 1, 2 & 3)

1. Place Controller on a flat stable surface.
2. Ensure adequate space around controller.
3. Plug Controller into suitable electrical outlet.
4. Place Vent Heater (if applicable) over Vent Filter and connect end to 'Filter Vent Heater' outlet on Front of Controller. Note- Position of Vent Heater.
5. Insert RTD (Pt100 Sensor) plug into RTD receptacle.
6. Plug Tray Heater cord into Power Outlet rated at 1200 watts

CAUTION DO NOT USE TRAY HEATER WITHOUT A CULTURE BAG IN PLACE

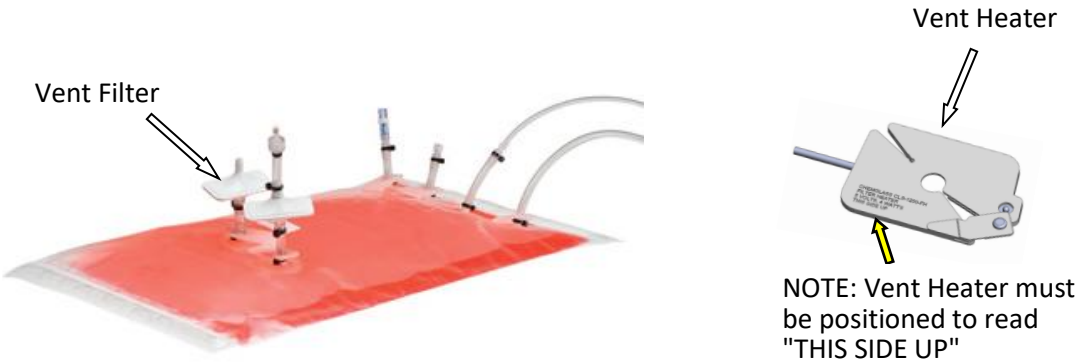


Figure 1 – Cell Culture Bag /Vent Heater

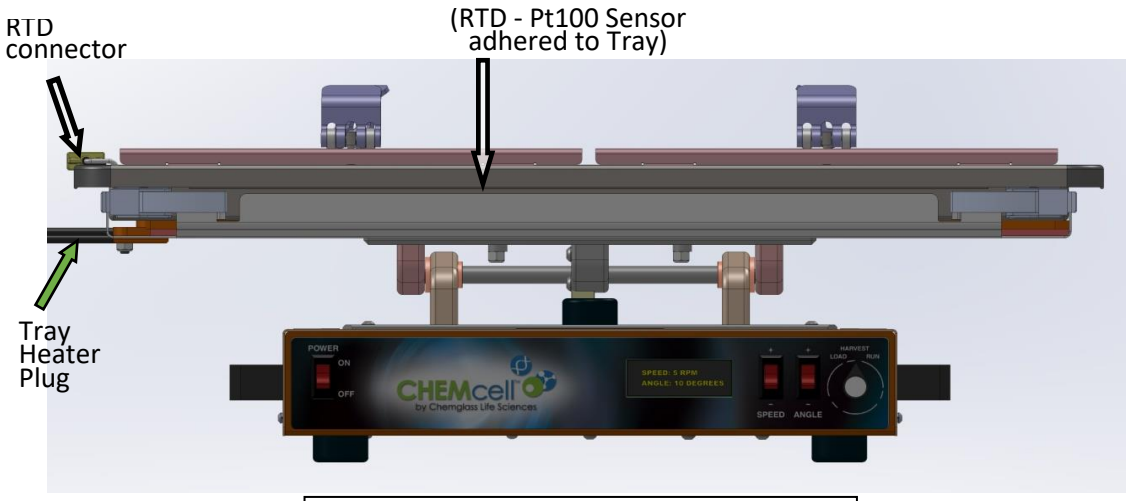


Figure 2 – Tray attached to Chemcell Base

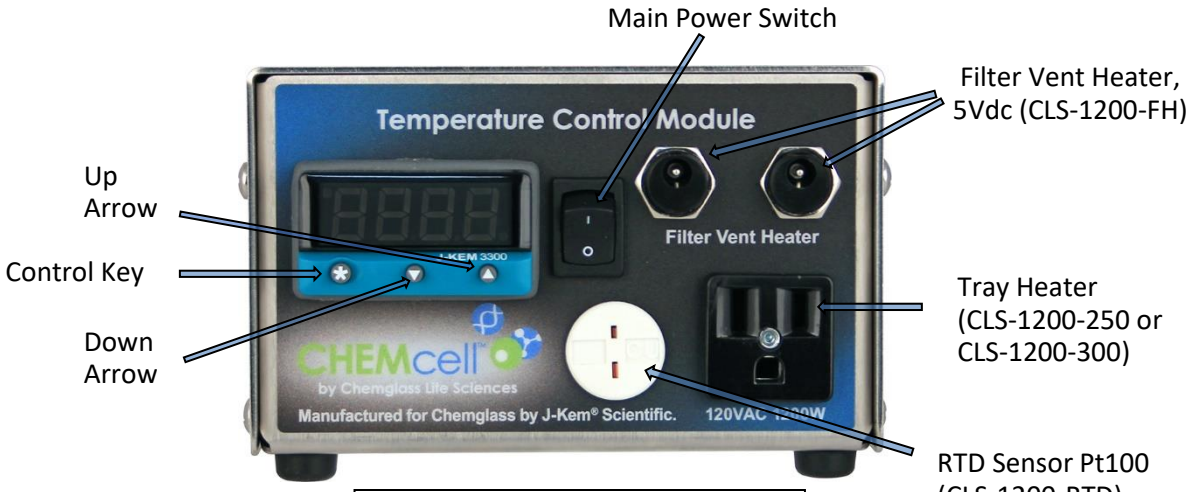


Figure 3 – Temp. Control Module

Operating Instructions (refer to Fig. 3)

NOTE: An offset temperature value has been added to this controller in a best effort to match the tray size and RTD sensor used. The offset value compensates for the temperature difference between the tray surface and the interior of a culture bag. See table below on next page.

1. Once all connections have been verified turn on the Controller via main power switch.
2. If a setpoint temperature value other than 37.0°C is required, then refer to the 'Quick Reference Guide' below to change setpoint temperature – the default value is 37.0°C.
3. The Controller will display the as measured temperature from the RTD sensor.
4. The unit will provide power to the Tray Heater which will heat the cell culture bag. Depending on the type and size culture bags used and the tray size it may take an hour or more to reach the setpoint temperature.

Quick Reference Guide – *Entering Setpoint Temperature Value and Adjusting the Displayed Temperature Value* (see Fig. 3)

❖ Entering Setpoint Temperature Value: [Default Setpoint is 37.0°C]

1) Press and hold the Control Key
2) While holding in the Control Key, press the Up Arrow to increase or the Down Arrow to decrease the Setpoint Temperature value.
   When the desired Setpoint value is displayed, release the Control Key to load the Setpoint Temperature into memory. The display will now indicate the actual measured temperature. To verify the loaded Setpoint temperature, press the Control Key to display value.

❖ Changing the Displayed Temperature to correspond to an alternate measured or anticipated temperature variation (i.e. adjusting the displayed temperature value by offsetting or changing the "zero" value to match an offset or known temperature):

1) Press and hold both Up and Down Arrow keys at same time.
2) Once "**tune**" is shown in the display, the keys may be released.
3) Press the Down key once, "**LEVL**" is displayed.
4) While pressing and holding the Control Key, press the Up key until the display reads "**3**", then release the Control key.
5) Press the Up key until the display reads "**zero**". The display will alternate between a numeric value* and "zero". *This is the zero offset value. Press and hold the Control key, then press either the Up or Down key to enter a revised value. By changing this value, the displayed temperature will change accordingly. *Example: If the displayed temperature shows 40.5°C but the actual temperature is 40.0°C, then a change of -0.5 should be added here.*
6) The adjusted value will be saved by pressing both the Up and Down Arrow keys simultaneously and then releasing once the measured temperature is displayed. Or, if no other keys are pressed for about 60 seconds the changes will be saved and the new measured temperature will be displayed.

The following table indicates an offset already added to this controller

Serial Number	Initial Zero Value	Offset Added to Zero Value (Tray compensation)	New Adjusted Zero Value

Autotuning (refer to Fig. 3)

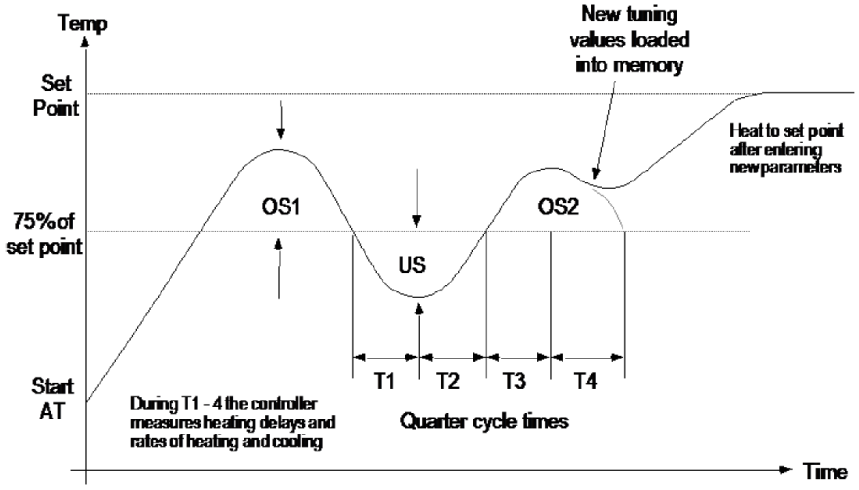
- Autotune is feature built into the temperature controller that automatically calculates the tuning parameters (i.e. delay times, heating efficiency, heating load, etc.) for any type heater. After the autotune procedure is complete and the tuning parameters are selected, the controller automatically loads them into its memory for current and future use.

Autotuning Procedure.

- ❖ In most cases if the over temperature protection circuit is active, it must be inactivated before starting this procedure.

1. Set the equipment up in the exact configuration it will be used. Ensure all connections to the Temperature Control Module.
2. Turn controller on an enter the desired set point temperature. If the set point isn't at least 30°C above ambient, then skip this procedure and go to the next procedure, 'Autotuning the Controller for Very Fine Control'.
3. Press and hold in both the ↑ and ↓ buttons (for 3 seconds) on the front of the temperature meter until the word "**tunE**" appears in the display then release both buttons.
4. Press the ↑ button (5 times) until "**CyC.t**" appears in the display (if you go past this setting, press the ↓ button until you get back to it).
5. First, hold in the '∗' button, while holding in the '∗' button press the ↓ button. Continue to hold both buttons in until the display reads "**A --**", or "**A ##**" where "**##**" is some number.
6. Release the '*' button and press the ↓ button until "**tunE**" once again appears in the display.
7. Press and hold the '∗' button and "**tunE**" will change to "**off**" to indicate that autotune is currently off.
8. While holding in the '*' button, press the ↑ button to change the display to "**on**", then release both buttons.
9. Press and hold both the ↑ and ↓ buttons (for 3 seconds) until the temperature appears in the display. The controller is now in its autotune mode. While in autotune the display alternates between "**tunE**" (for autotune) and the process temperature. When the autotune sequence is done (this may take in excess of an hour) the controller stops displaying "**tunE**" and only displays the process temperature. [To abort autotune manually, repeat steps 3, 8 and 9 except in step 8, press the ↓ button until "**off**" is displayed].

The autotune sequence.
During autotune the controller heats to 75% of the set point temperature, where it oscillates for several cycles before loading the new tuning parameters. After the tuning parameters are loaded it heats to the set point temperature. Tuning below the set point prevents any damage that might occur from overheating.



Autotuning the Controller for Very Fine Control.

In the majority of cases, the procedure above results in stable temperature control with any heater. A second version of the autotune routine is available and can be used when the heater is already at or close to the set point, is being tuned at a temperature close to room temperature, or for very fine control in demanding situations. If stable temperature control doesn't result after performing the first autotune routine, the procedure below should be performed. Before performing the 'fine tune' autotune procedure, the 'regular' autotune procedure that precedes this should normally be performed.

- ❖ In most cases if the over temperature protection circuit is active, it must be inactivated before starting this procedure.

1. Set the equipment up in the exact configuration it will be used. Ensure all connections to the Temperature Control Module.
2. Turn controller on an enter the desired set point temperature. If the set point isn't at least 30°C above ambient, then skip this procedure and go to the next procedure, 'Autotuning the Controller for Very Fine Control'.
3. Press and hold in both the ↑ and ↓ buttons (for 3 seconds) on the front of the temperature meter until the word "**tunE**" appears in the display then release both buttons.
4. Press the ↑ button (5 times) until "**CyC.t**" appears in the display (if you go past this setting, press the ↓ button until you get back to it).
5. First hold in the '*' button, while holding in the '*' button press the ↓ button. Continue to hold both buttons in until the display reads "**A --**", or "**A ##**" where "**##**" is some number.
6. Release the '*' button and press the ↓ button until "**tunE**" once again appears in the display.
7. Press and hold the '*' button and "**tunE**" will change to "**off**" to indicate that autotune is currently off.
8. While holding in the '*' button, press the ↑ button to change the display to "**At.SP**", and release both buttons.
9. Press and hold both the ↑ and ↓ buttons (for 3 seconds) until the temperature appears in the display. The controller is now in its autotune mode. While in autotune the display alternates between "**tunE**" (for autotune) and the process temperature. When the autotune sequence is done (this may take in excess of an hour) the controller stops displaying "**tunE**" and only displays the process temperature. [To abort autotune manually, repeat steps 3, 8 and 9 except in step 8, press the ↓ button until "**off**" is displayed].

Autotune Errors. The most frequent reason for autotune errors is that the over temperature protection circuit turns heating off during autotune which results in a "**tunE**" "**FAiL**" message in the temperature meter. During autotune it's not unusual for the reaction temperature to exceed the set point by enough to trigger the over temperature protection circuit. In this case, the over temperature protection circuit must be inactivated before the autotune procedure is tried again (see Section 3.3).

To remove the "**tunE**" "**FAiL**" message, turn the controller off for 10 seconds. Try the procedure titled "Autotuning the Controller for Very Fine Control". If autotune continues to fail, call and discuss your application with one of our engineers.

Over-Temperature Protection Circuit

Note: This controller is shipped with the over temperature protection circuit option turned ON. If you want to turn this option off follow the procedure below.

- The temperature controller is equipped with an over-temperature protection circuit that turns off heating any time the temperature read-out goes 10°C above the entered setpoint. When the temperature cools below the 10°C threshold, the circuit is reset and the controller returns to operating normally. An over-temperature condition is indicated by the display blinking the message '**-AL-**'. The over-temperature feature acts to help prevent accidents in situations where something has gone wrong, or the controller is having difficulty maintaining temperature control.

There may be situations where it's desirable to disable the over temperature protection circuit (for example, if the controller is often used as a digital thermometer). The two procedures below give directions on disabling and re-enabling the over temperature circuit. In reality, the over-temperature alarm can't be turned off because it's hard-wired in the controller, but what you can do is program an over-temperature condition so high (i.e., 999.9° C) that it has the effect of disabling the alarm. What you'll do in the procedure to deactivate the over temperature circuit is enter the number of degrees that the reaction temperature must exceed the set point to cause the over-temperature circuit to come on. If you enter a small number such as 10° C (which is the factory default) the alarm will turn off heating when the reaction exceeds the set point by 10° C. If you enter a large number such as 999.9° C you'll, for all practical purposes, turn the over-temperature circuit off since with this setting the reaction must exceed the set point by 999.9° C before the alarm would come on.

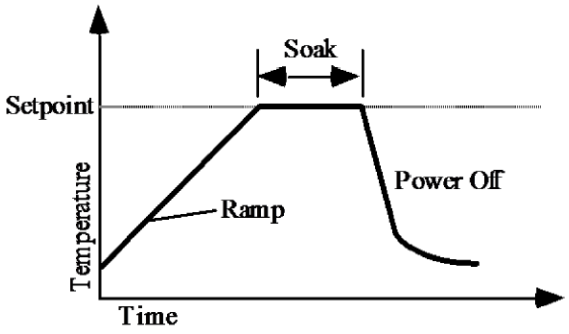
	Procedure to DEACTIVATE Over Temp Alarm		**Procedure to RE-ACTIVATE Over Temp Alarm**
1	Press and hold in both the ↑ and ↓ keys on the front of the temperature meter until the word "**tunE**" appears in the display, then release both keys. This places the controller in programming mode.	1	Press and hold in both the ↑ and ↓ keys on the front of the temperature meter until the word "**tunE**" appears in the display, then release both keys. This places the controller in programming mode.
2	Press the ↑ key until "**SEt.2**" appears in the display, and release all keys.	2	Press the ↑ key until "**SEt.2**" appears in the display, then release all keys.
3	Press and hold in the * key. When the * key is held in, the display shows the number of degrees that the set point must be exceeded by to cause the over-temperature alarm to activate. To effectively disable the over-temperature alarm, while holding in the '*' key, press the ↑ key until a very large value, like 100, is entered.. When you're done, let go of all the keys. Whatever number you entered at this point is the number of degrees that the reaction temperature must exceed the set point before the alarm comes on.	3	Press and hold in the * key. While holding in the * key, press the ↓ key until the display shows **10.0**, then release both keys.
4	To return to normal temperature display, press and hold in both the ↑ and ↓ keys (about 3 seconds) until the temperature appears in the display.	4	To return to normal temperature display, press and hold in both the ↑ and ▲↓ keys (about 3 seconds) until the temperature appears in the display.

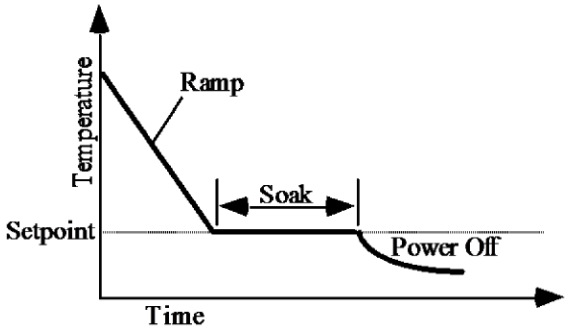
- ***The Temperature Control Module, Heater (Tray), and RTD sensor form a closed loop feedback system. When the controller is connected to a heater, the feedback loop should not be broken at any point.***

Ramp and Soak Features

Ramp-to-Setpoint & Soak Feature. A new feature of J-KEM's controllers called 'Ramp-To-Setpoint' allows you to enter a specific heating rate (e.g., heat to 120° C at a rate of 5° C/Hour), a second feature called 'Soak' then lets you specify how long to stay at that temperature before turning off.

Examples of Program Ramps





The controller is shipped with the Ramp-to-Setpoint feature OFF, the user must specifically turn Ramp-to-Setpoint ON. When Ramp-to-Setpoint is OFF, the controller heats to the entered setpoint at the fastest rate possible. When Ramp-to-Setpoint is ON, the controller heats at the user entered ramp rate.
The Ramp-to-Setpoint feature and its associated parameters are turned on and set in the controller's programming mode. The parameters of importance are:

SPrr **SetPoint Ramp Rate. Allowable Values: 0 to 9990 deg/Hr.**
This specifies the desired rate of heating (cooling). Note, this parameter specifies the *desired* rate of heating (cooling), but in cases of extremely high ramp rates the reaction will not actually heat faster than the power of the heater will allow.

SPrn **SetPoint Ramp Run. Allowable Values: ON, OFF, Hold**
This parameter turns the Ramp-to-Setpoint feature ON or OFF. During an active run, if this parameter is set to 'Hold', the setpoint ramp stops and *holds* at its' current value. This continues until the parameter is set to ON or OFF. When set to OFF, the values in SetPoint Ramp Rate and Soak Time are ignored.

SoAK **Soak Time. Allowable Values: "- -", 0 to 1440 min.**
This specifies the amount of time to *soak* at the setpoint after the setpoint temperature ramp is complete. A setting of **"- -"** causes the controller to remain at the final setpoint indefinitely. A numeric value causes the controller to stay at the setpoint for the entered time and then turn power to the heater off after the time expires.

Important Points to Know

While the Ramp-to-Setpoint feature in activated, the display alternates between the current reaction temperature and the word "**SPr**" to indicate that a "SetPoint Ramp" is active.

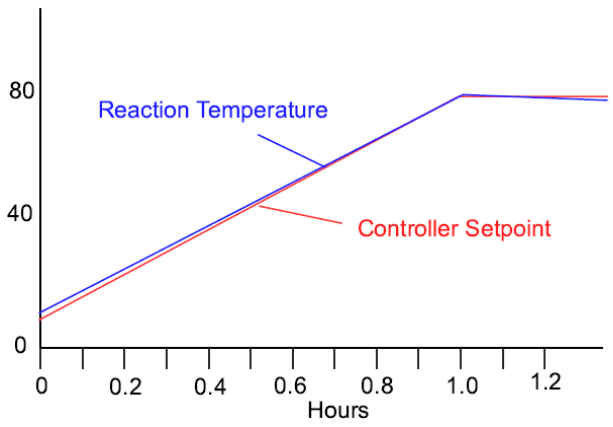
Once the Ramp-to-Setpoint feature is activated in programming mode, it remains on until it's deactivated in programming mode. The Ramp-to-Setpoint feature remains activated even when power is turned off, and then turned back on.

Setting a ramp rate in the digital controller does not guarantee that the reaction itself will ramp at the entered value, since the rate of heating is dependent on the power of the heater. Setting a ramp rate in the controller only guarantees that the controller's setpoint will be changed at the entered rate. For the reaction temperature to increase temperature at the specified rate, the heater must have sufficient power to heat at the entered rate. This is a critically important point, the user must understand that the electronic setpoint in the controller will ramp at the entered rate, but the controller cannot *force* a heater to heat a reaction faster than it's capable of doing. For example, see the plots below.

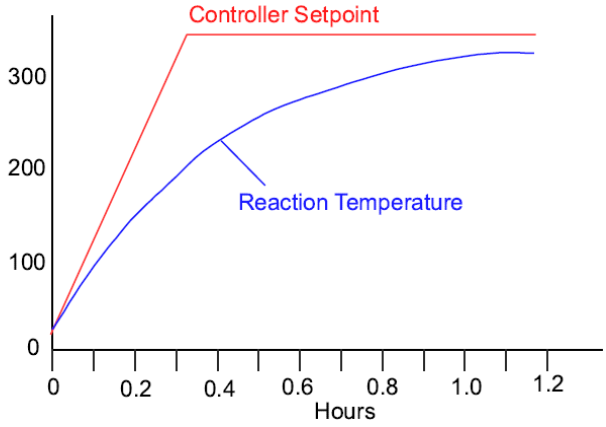
Plot 1 – This plot uses a heating mantle to ramp temperature in reaction from 20 to 80C in 60 minutes. The reaction temperature closely matches the setpoint of the controller because heating mantles have enough power to heat a typical reaction at the modest heating rate of 1 degree per minute.

Plot 2 – In this example, the ramp rate is set to 600 C/ hour, or 10 C per minute. The controller ramps the setpoint at the requested rate, but the reaction temperature does not match the ramp, because the heater does not have enough power to heat the reaction as such a high rate. **Every time** the reaction temperature does not match the entered ramp rate, it's because the heater has insufficient power to heat at the requested rate. The only solution to this situation is 1) use a more powerful heater, or 2) lower the ramp rate to a value that does not exceed the heaters maximum heating rate. The controller has no influence over a heater that has insufficient power to heat at the entered ramp rate.

Plot 1



Plot 2



Activating & Programming the Ramp-to-Setpoint Feature

1.	Press and hold in both the ▲ and ▼ keys on the front of the temperature meter until the word "**tunE**" appears in the display, then release both keys.
2.	Press the ▲ key (8 times) until the word "**SPrr**" appears in the display. This is where the ramp rate in units of degrees/hour. First hold in the '*' key, then while holding in the *' key press the ▼ or ▲ key until the desired ramp rate appears in the display, then let go of all the keys. Units are in degrees/hour.
3.	Press the ▲ key once and the word "**SPrn**" will appear in the display. This function turns the ramping feature ON, OFF, or to Hold. First hold in the '*' key, then while holding in the *' key press the ▼ or ▲ key until the desired setting appears in the display, then let go of all the keys.
4.	Press the ▲ key once and the word "**SoaK**" will appear in the display. This is where the soak time is set in units of Minutes. A soak time of ' -- ' means to 'soak forever' (this setting is one below '0'). First hold in the '*' key, then while holding in the *' key press the ▼ or ▲ key until the desired time appears in the display, then let go of all the keys. If a soak time is set, the controller display will alternate between showing the current reaction temperature and the word "**StoP**" when the soak time has expired to indicate that power has been turned off.
5.	To exit programming mode, press and hold in both the ▼ and ▲ keys until the temperature appears in the display, then release both keys.

Deactivating the Ramp-to-Setpoint Feature

1.	Press and hold in both the ▲ and ▼ keys on the front of the temperature meter until the word "**tunE**" appears in the display, then release both keys.
2.	Press the ▲ key (9 times) until the word "**SPrn**" appears in the display. This function turns the ramping feature ON and OFF. First hold in the '*' key, then while holding in the *' key press the ▼ or ▲ key until OFF appears in the display, then let go of all the keys.
3.	To exit programming mode, press and hold in both the ▲ and ▼ keys until the temperature appears in the display, then release both keys.

Troubleshooting

Problem	Cause	Corrective Action
The controller does not come on.	Internal 2 amp fuse has blown.	Not user serviceable. Have qualified electrician replace.
	Circuit breaker on back has tripped.	Allow to cool, then reset circuit breaker.
The controller comes on, but does not heat.	The heater is broken.	To verify that the controller is functioning properly, enter a set point of 100º C. Plug a light into the outlet of the controller, then wait 1 minute. If the light comes on the controller is working properly.
Controller blinks: "**inPt**" "**FAiL**"	The temperature sensor is unplugged, excessively corroded or broken.	Clean or replace broken sensor.
"**-AL-**"	The process temperature is hotter than the alarm temperature.	Correct the over temperature condition.
"**PArk**"	Controller has been placed in "**Park**" mode.	1. Hold in both the ↑ and ↓ keys on the front of the J-KEM temperature meter until "**tunE**" appears in the display. 2. First hold in the "∗" key, then while holding in the "∗" key press the ↓ key until "**oFF**" appears. 3. Hold in the ↑ and ↓ keys until the temperature appears in the display.
"**tunE**" "**FAiL**"	Autotune routine failed.	Turn off controller for 10 seconds. See Autotune section

Resetting Controller to Factory Default Settings

J-KEM manufactures the most technically advanced temperature controller available and should give you consistently flawless control. If you have difficulty with your controller, a good place to start to correct the problem is by loading the original factory settings. If you still have difficulty with your controller, our Engineering department will help you resolve the problem. The factory settings of a J-KEM controller are: 0.1° C resolution, PID control with tuning parameters for a heating mantle, thermocouple type to match the thermocouple originally installed on the controller, high temperature alarm turned on, and a thermocouple offset entered at the time of original calibration.

1.	Press and hold in both the ↓ and ↑ keys on the front of the temperature meter until the word "**tunE**" appears in the display, then release both keys.
2.	Press the ↓ key until "**LEVL**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until "**3**" appears in the display. Let go of all the keys.
3.	Press the ↑ key until "**rSEt**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the word "**All**" appears in the display. Let go of all the keys.
4.	Press and hold in both the ↓ and ↑ keys until the word "**inPt**" appears in the display, then release both keys. The value that needs to be entered depends of the type of thermocouple receptacle your controller was shipped with. Determine the thermocouple type below. **Color of thermocouple receptacle (Fig 1; # 7)** — **Value to enter:** Blue (type T) — "**tc t**" Yellow (type K) — "**tc Ec**" Black (type J) — "**tc J**" First hold in the '*' key, then while holding in the '*' key press the ↑ key until the value from the table above appears in the display. Let go of all the keys. **NOTE:** Many of the patterns for this parameter look similar, be careful to select the exact pattern shown above.
5.	Press the ↑ key once and "unit" will appear in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**°C**" appears in the display,. Let go of all the keys.
6.	Press the ↑ key once and the word "**SP1.d**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**SSd**" appears in the display. Let go of all the keys.
7.	Press in both the ↓ and ↑ keys until the temperature appears in the display (the word "**PArk**" also appears), and release both keys.
8.	Press and hold in both the ↓ and ↑ keys on the front of the temperature meter until the word "**tunE**" appears in the display, then release both keys.
9.	Press the ↑ key once and the word "**bAnd**" will appear in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**10**" appears in the display. Let go of all the keys.
10.	Press the ↑ key once and the word "**int.t**" will appear in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**10**" appears in the display. Let go of all the keys.
11.	Press the ↑ key once and the word "**dEr.t**" will appear in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**50**" appears in the display. Let go of all the keys.
12.	Press the ↑ key once and the word "**dAC**" will appear in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**3.0**" appears in the display. Let go of all the keys.
13.	Press the ↑ key once and the word "**CyC.t**" will appear in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the value "**30**" appears in the display. Let go of all the keys.
14.	Press the ↓ key until the word "**LEVL**" appears in the display.
15.	First hold in the '*' key, then while holding in the '*' key press the ↑ key until "**2**" appears in the display. Let go of all the keys.
16.	Press the ↑ key until "**SP2.A**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↑ key until the word "**Dvhi**" appears in the display. Let go of all the keys.
17.	Press the ↑ key until "**diSP**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↓ or ↑ key until the value "**0.1°**" appears in the display. Let go of all the keys.
18.	Press the ↑ key until "**Lo.SC**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key hold in the ↓ key until the number in the display stops changing (this will be "**0**" or "**-50**" or "**-199.9**" depending on thermocouple type). Let go of all the keys.
19.	Press the ↓ key until the word "**LEVL**" appears in the display.
20.	First hold in the '*' key, then while holding in the '*' key press the ↑ key until "**3**" appears in the display. Let go of all the keys.
21.	Press the ↑ key until "**ZEro**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↓ or ↑ key until the value _____ appears in the display. Let go of all the keys.
22.	Press the ↓ key until the word "**LEVL**" appears in the display.
23.	First hold in the '*' key, then while holding in the '*' key press the ↓ key until "**1**" appears in the display. Let go of all the keys.
24.	Press the ↑ key until "**SEt.2**" appears in the display. Next, hold in the '*' key, then while holding in the '*' key press the ↓ or ↑ keys until the value 10.0 is entered.
25.	Press and hold in both the ↓ and ↑ keys until the temperature appears in the display, then release both keys. The word "**PArk**" in the display will go away when a set point is entered.

Service/Maintenance

In the event that a problem develops with your CGLS product, **DO NOT** attempt to perform any service on the unit without first contacting the CGLS Customer Service Department at 1-800-843-1794. **Unauthorized servicing may void the warranty.** CGLS will supply information on minor repairs upon request. In any correspondence to CGLS concerning this unit, please include the catalog number (CLS-1200-2CH) and the serial number, which may be found on the bottom of the unit.

<u>WARNING:</u> POTENTIAL SHOCK HAZARD EXISTS WHEN TOP COVER IS REMOVED.
DISCONNECT POWER CORD BEFORE SERVICING.

1. *Contact CGLS for troubleshooting assistance.*

Preventive Maintenance Suggestions

1. *Periodically check connection of Pt100 sensor for corrosion, clean if necessary.*
2. *Cleaning - keep the instrument dry and clean. The unit must be powered off and unplugged before cleaning. Do not use abrasive cleaning agents. The exterior should be wiped with a damp cloth with water and 70% alcohol if needed. Ensure unit is completely dry before plugging in and turning on.*
3. *Periodically check power cords for any tears or cracks, replace if necessary.*

CGLS WARRANTY AND LIMITATION OF LIABILITY

Chemglass, Chemglass Life Sciences, Warranty and Limitation of Liability

Warranty:

Chemglass, Inc. guarantees this unit against defects in material and workmanship for a period of one year from the date of purchase. If the unit should malfunction, it must be returned for evaluation. If the unit is determined to have a defect in materials or workmanship, then it will be repaired or replaced at no charge. Tampering with the unit or damage resulting from excessive current, heat, moisture, vibration, corrosive materials, or misuse will void this warranty. Programming changes or reconfigurations are not covered under warranty. CGLS shall not be responsible to the original purchaser or any other party or parties for bodily or property loss, damages, or injuries of any kind or nature through either direct or indirect use of the product.

Return Authorization:

CGLS must authorize any return of product. Please contact a customer service representative via the correspondence listed below to obtain a Return Merchandise Authorization (RMA) number. The purchaser is responsible for all packing and shipping to CGLS. If the equipment or material came in contact or was proximate to any biological organism, toxic or corrosive material, or any agent reasonably deemed to be potentially harmful, it must be cleaned and decontaminated prior to receipt by CGLS. The purchaser is obligated to disclose fully in writing, the cleaning and decontamination method. We reserve the right not to accept any unauthorized or potentially harmful shipment.

Correspondence:
Chemglass Life Sciences
3800 North Mill Rd.
Vineland, NJ 08360
USA

Phone: 800-843-1794
Email: customer-service@cglifesciences.com
Web: www.cglifesciences.com