



RAPT Temperature Controller KL22927 Instruction Manual



KegLand Distribution PTY LTD



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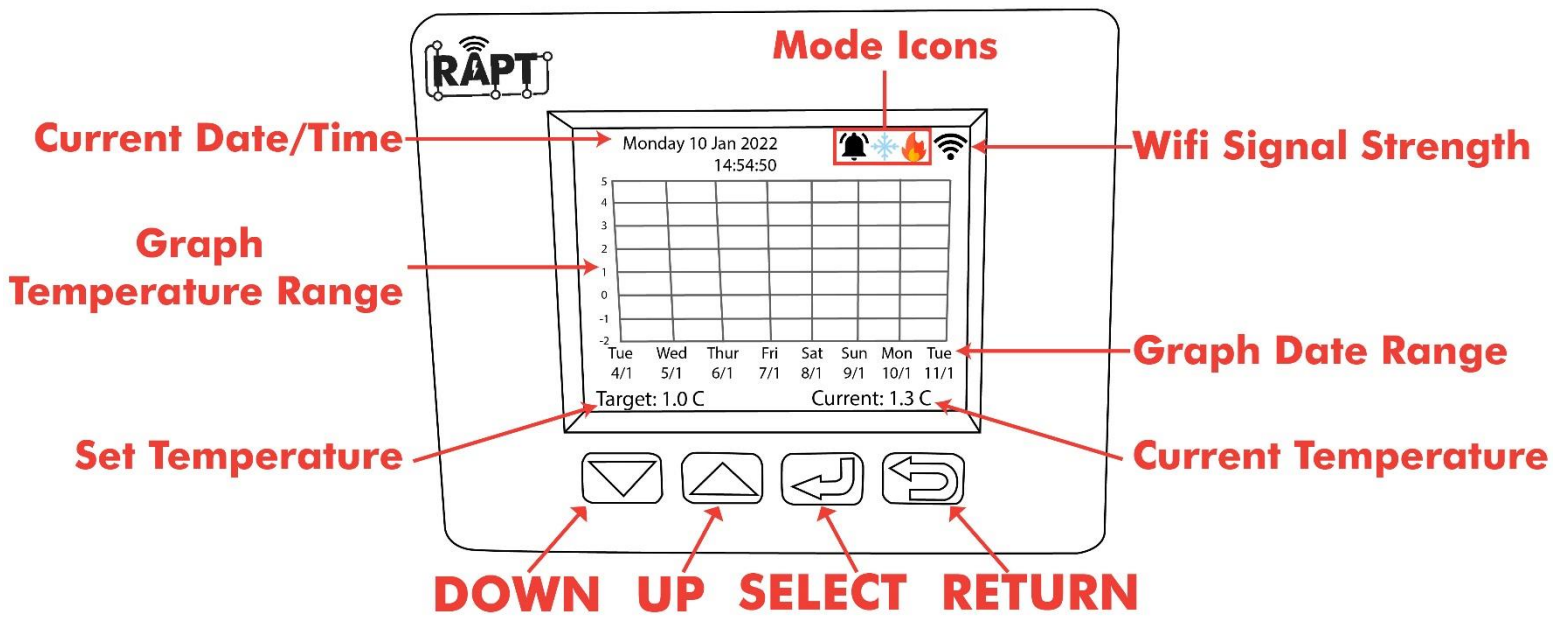
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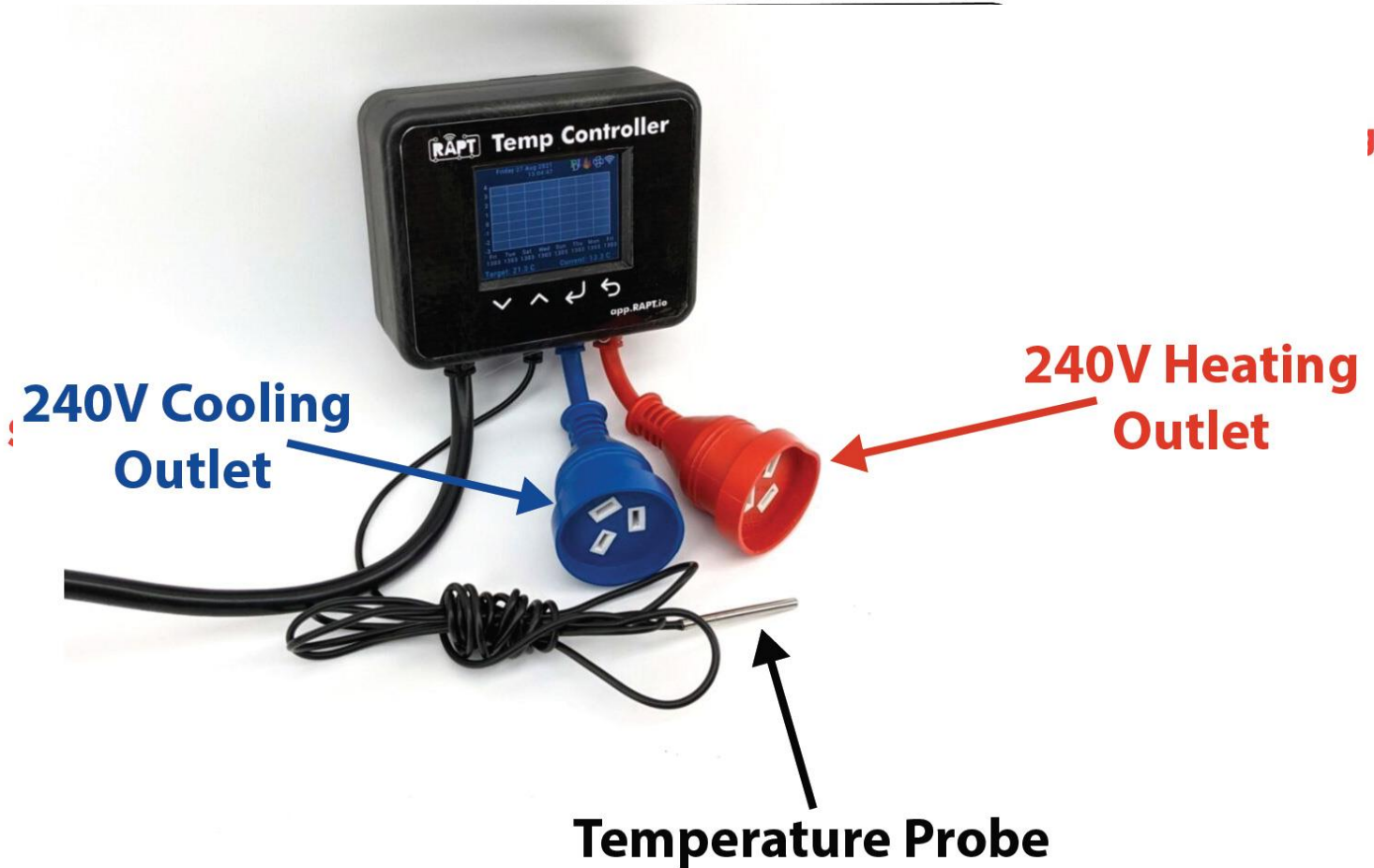
DISPLAY LEGENDS

Display Legend – Graph Enabled



Display Legend – Graph Disabled

The display on the RAPT Temperature controller will display a graph of temperature vs time by default. If instead you prefer a numerical old school interface this can be easily changed by unselecting the **Show graph** checkbox in the **Settings**. This will show an interface like the following:





REGISTERING YOUR DEVICE

The Wi-Fi connectivity of the RAPT Temperature Controller allows you to monitor, track and start a complex temperature profile involving multiple steps remotely through the RAPT Portal. In order to fully utilise the capabilities of this device you should connect your RAPT Temperature Controller to your Wi-Fi network and register it to your RAPT account at <https://app.rapt.io>

This will allow you to track and monitor your fermentation in real time remotely without needing to walk over to your temperature controller. It also allows you to setup and send complex fermentation profiles involving multiple steps to your RAPT Temperature Controller which will then automatically run through this profile and adjust the set temperature as required.

In order to have access to this Wi-Fi functionality you will need to sign up for a RAPT Account, connect your RAPT Temperature Controller to your home Wi-Fi network and register your device on your account on the RAPT Portal by following the instructions below:

1. Sign up for a RAPT Account

To utilise the Wi-Fi connectivity of the RAPT Temperature Controller you will need to sign up for an account on the RAPT portal. This will allow you to create custom fermentation profiles, track and monitor your fermentation temperature and heating/cooling utilisation etc.

1. sign up for an account on the RAPT portal.

<https://app.rapt.io/>

2. Once signed up log in to your account on the RAPT website.

2. Connect your RAPT Temperature Controller to your Home Wi-Fi Network

1. On your smart phone or tablet, open your Wi-Fi settings and connect to the KegLand RAPT Wi-Fi Access Point using the Wi-Fi name and password displayed on the RAPT Temperature Controller.
2. Your smart phone or tablet should provide a prompt to sign into the network of your RAPT Temperature Controller when you connect to its Wi-Fi Network. Clicking on this prompt will open the RAPT Captive Portal.

If you are not prompted to sign into the network of your RAPT Temperature controller by your smart phone or tablet then open your Wi-Fi settings and select the RAPT Wi-Fi Network again to open the RAPT Captive Portal

3. Select your Wi-Fi network, enter your Wi-Fi password and select **Jon**. This will connect your RAPT Temperature controller to your Wi-Fi network.

If your RAPT Temperature controller has been successfully connected to your Wi-Fi network then a Wi-Fi symbol will be present on the top left-hand corner of the RAPT Temperature Controllers display.



3. Register your RAPT Temperature Controller to your Account on the RAPT Cloud

1. Once your RAPT Temperature Controller is connected to your Wi-Fi network you will then need to register your device with your RAPT account. When prompted on the screen, press select (↵) to enter the main menu then select **Register Device**.
2. Follow the prompts on the display of your RAPT Temperature Controller. Log in to your account on the RAPT Portal and select **Add new Device**
3. Select **RAPT Temperature Controller** and input the MAC Address and Validation Code displayed on your RAPT Temperature Controller when prompted.

Congratulations! Your RAPT Temperature Controller is connected to Wi-Fi and registered to your RAPT Account and can now be controlled through the RAPT Portal.

REMOTE OPERATION VIA THE RAPT PORTAL

Setting the Target Temperature

At the home screen of the RAPT Temperature Controller press the Up or Down arrow to adjust the **Target** value on the bottom left of the display. The **Target** value displayed will be the set point for the device.

The RAPT Temperature controller will then automatically turn on/off the heating and/or cooling devices plugged into the outlets as required.

The temperature set point can also be set through the RAPT Portal or a profile session can be started from the RAPT Portal which will automatically begin the profile you have created.

Setting up a Temperature Profile

Once you have registered your temperature controller on the RAPT Portal you can then log telemetry from the device and set up complex temperature profiles involving multiple steps.

To setup a temperature profile on the RAPT Portal, select **Profiles** and then **Create New Profile**. Then add your temperature profile steps such as primary fermentation, diacetyl rest, dry hop, cold crash etc.

Starting a Temperature Profile

Once you have made your temperature profile, either select **Send Profile to Device** from the profile or **Start Profile Session** on the Dashboard to send the profile to your RAPT Temperature Controller.

Saving a Temperature Profile on the RAPT Temperature Controller

Temperature profiles are automatically stored on the RAPT Temperature Controller once the profile session has been started from the RAPT Portal and profile session has been started on the device from the RAPT Portal.



Note: You can not make a Temperature Profile on the RAPT Temperature Controller itself. It must be made and started from the RAPT Portal first and then it will be automatically stored on the device to be started manually in the future.

If you make any changes to the temperature profile on the RAPT Portal the RAPT Temperature Controller will check for any updates and apply these changes automatically when the profile is started manually through the controller.

OPERATION INSTRUCTIONS

1. Sign up for an account on the RAPT Portal.
2. Connect your RAPT Temperature Controller to your Wi-Fi network.
3. Register your device on your account on the RAPT Portal.
4. Insert the temperature probe into the thermowell of your fermentation vessel.
5. Plug your **heating** device into the **red** 240V outlet on the RAPT Temperature Controller and plug your **cooling** device into the **blue** 240V outlet on the RAPT Temperature Controller.
6. Set your target temperature on the RAPT Temperature Controller manually or through the RAPT Portal. Alternatively, you can begin a Fermentation profile on the RAPT Portal.



MANUAL OPERATION

If you do not intend to connect your device to the RAPT Portal and hence do not want to utilise the Wi-Fi functionality you can operate the controller completely manually via the buttons on the display.

To remove the prompts requesting you to register your device to the RAPT Portal you will need to disable the Wi-Fi in the settings. To do this press select (↵) to enter the menu, then select **Settings**, then navigate using the arrows to the **Disable Wi-Fi** setting. Press select (↵) to disable the Wi-Fi and the controller will then restart automatically.

If you decide you don't want to register your RAPT Temperature Controller to the RAPT portal and hence not use the Wi-Fi functionality of the controller you will in turn lose a lot of the functionality of the controller which is offered through the RAPT Portal. This includes features such as setting up complex temperature profiles which are run automatically and logging past temperature profiles.

Setting the Target Temperature

At the home screen press the up or down arrows to adjust the target temperature. The temperature controller will then automatically send power to the heating or cooling terminals to power on your heating or cooling device to maintain this target temperature.

Important: Make sure you have plugged your heating device such as a heat wrap into the red outlet and your cooling device such as your Temperature Controller into the blue outlet.

Starting a Saved Temperature Profile

Temperature profiles which have been saved on the temperature controller can be manually started without the need to log in to the RAPT portal. You will need to use the RAPT Portal to initially store the temperature profile on the temperature controller. For instructions on how to store a temperature profile on the device refer to [Storing a Temperature Profile on the RAPT Temperature Controller](#).

Once your Temperature profile is stored on the device simply press select (↵) to enter the menu and navigate to **Start profile**. Then select your desired profile which will display a graph of the steps in the profile. Then press select again to start the profile. Your device will then automatically restart and begin the temperature profile.

To stop running the temperature profile press select (↵) to enter the menu and then select **Profile control**. Then navigate using the arrows to the stop button (⏹) and press select (↵) to stop the profile.

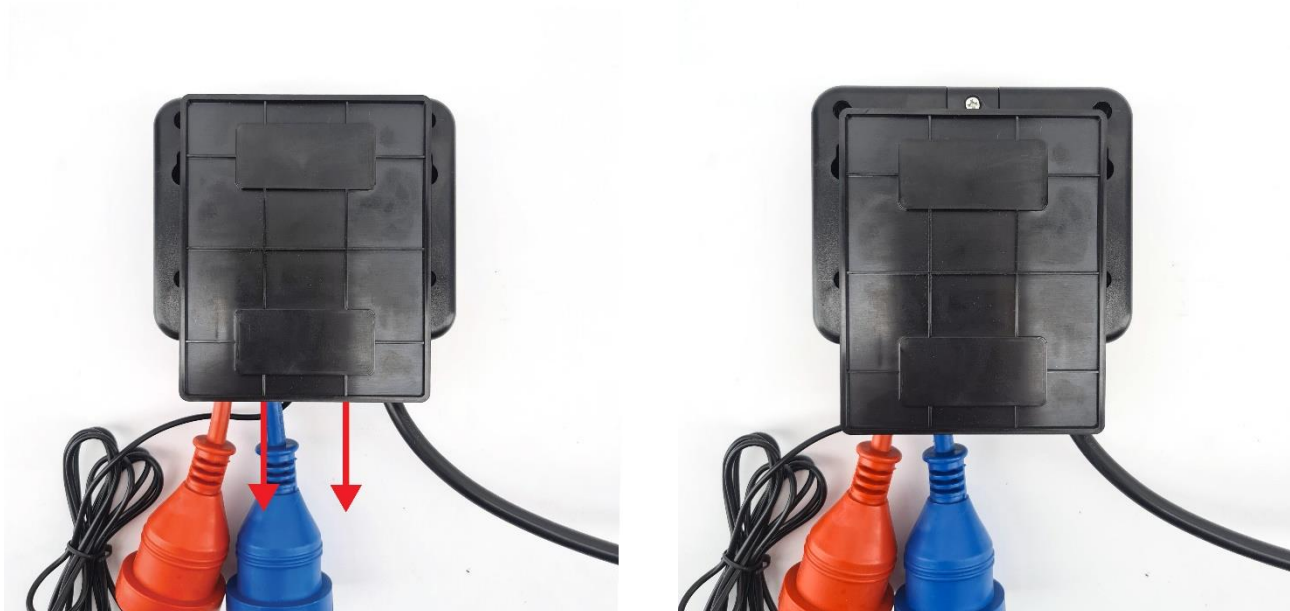
MOUNTING YOUR RAPT TEMPERATURE CONTROLLER INTO YOUR BREWERY

The RAPT Temperature Controller offers a number of different mounting options offering the versatility to be able to change how the controller is mounted depending on what you are using the controller for.

The controller is provided as standard with a mounting plate which is installed onto the controller out of the box. This mounting plate can be removed if you would instead prefer to mount the controller onto the wall for example.

Removing the Mounting Plate

To remove the mounting plate, slide the mounting plate down towards the bottom of the controller.



Wall Mounting Option 1

If you prefer to mount the RAPT temperature controller to your wall however you did not want to damage the wall by screwing into it you can attach the mounting plate to the wall using strong double-sided tape and then slide the RAPT temperature controller onto the mounting plate to secure it.

Wall Mounting Option 2

Screw two screws into the wall using the following template as a guide. Then simply hook the controller onto the screws using the mounting points provided on the back of the controller.

[RAPT Temperature Controller Drill Mounting Template](#)

Wall Mounting Option 3

Unscrew the hanging hook and rotate it 180 degrees, retighten and attach the controller to the wall using this hanging hook. This can be mounted to your wall using a screw or hanging the controller onto a hook which is already mounted on your wall for example.



Wall Mounting Option 4

Another option for mounting the RAPT Temperature Controller onto a wall is to drill a screw through the recessed holes below the front face plate which continue all the way through to the two mounting holes at the back of the controller.

These holes can be identified by running your finger along the face plate in the area shown below. You can then either peel away the face plate and use an 8G x 60mm countersunk screw or you can drill straight through the face plate using an 8G x 60mm or 10G x 60mm countersunk screw as shown below:



This is designed for an 8G screw, however 10G will also work but it will sit a little proud on the face of the controller.

Vertical Bench/Panel Mounting

WARNING: Ensure the temperature controller is unplugged from the wall socket before changing the orientation of the cables.

If you want to neatly mount the RAPT Temperature controller vertically onto your bench or into a custom designed cabinet/panel for example, the orientation of the cables can be quickly and easily rearranged. To achieve this, undo the 4 screws which hold the front and back housings together and then pull the two housings apart.



Unscrew the two screws which hold the slotted blanking plate to the housing and remove the slotted blanking plate.



Move the cable glands to the back of the unit and secure in place with the slotted blanking plate, then secure the slotted blanking plate to the housing using the two screws. Then reassemble the front and back housings and secure with screws.



You can then custom design your own panel or cabinet to mount this temperature controller into with the outlets and wiring now exiting out the back of the controller allowing for a very neat mounting arrangement.







Alternatively, if you want to mount this on your bench top or on top of your Temperature Controller you can use the mounting plate as a stand to keep the temperature controller in an upright position. Simply slide the temperature controller housing onto the guides on the mounting plate as shown to the right.





DISPLAY ICON LEGEND

DISPLAY ICON LEGEND

ICON	MODE	FUNCTION
	On	Bluetooth On
	On	Cooling Relay On
	On with countdown overlay	Cooling Relay Start Delay
	On	Heating Relay On
	On with countdown overlay	Heating Relay Start Delay
	On	Alarm

MENUS

Register Device

This option will only be available when the RAPT Temperature Controller is not registered to the RAPT Portal (app.rapt.io)

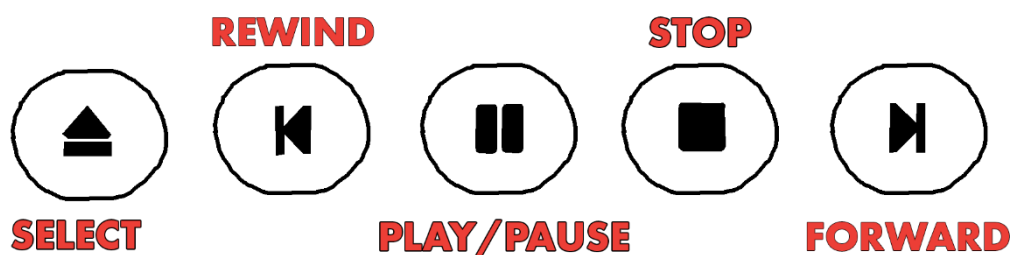
Please refer to [Page 8](#) for full step by step instructions on registering your RAPT Temperature Controller

Start Profile/Profile Control

The selections available in this menu will change depending on:

- 1: If there are any profiles stored on the RAPT Temperature Controller
- 2: If there is an active profile running
- 3: If there is no profile running

In this menu you can manually select and start any profiles that are stored in the device. The RAPT Temperature Controller will automatically detect and download any changes to stored profiles before starting the profile.



Settings

The advanced settings should not need to be adjusted out of the box unless necessary. For more advanced users the RAPT Temperature controller has an advanced settings menu that can be adjusted allowing further instructions to be given to the controller such as different cooling start delay times, tighter temperature hysteresis settings and more frequent telemetry frequencies.

To change any of the advanced settings enter the **Menu** by pressing select (↵). Once in the menu navigate to **Settings** and press select (↵).

Navigate to the advanced setting you need to adjust and press select (↵) on this setting. Then use the Up or Down arrow to adjust the set value for the setting.

SETTING	PARAMETER
Temperature Sensor	Built-In or select any Bonded Bluetooth RAPT Pill
Show Graph	Toggles display between the graph or a numerical display
Unit System	Toggles between metric or imperial data
Zoom Level	Select the date range displayed on the graph
Cooling Hysteresis	Sets the cooling hysteresis (Range 0.5°C-10°C, default 2°C)
Heating Hysteresis	Sets the heating hysteresis (Range 0.5°C-10°C, default 2°C)
Compressor Cooldown	Sets the minimum compressor delay (Range 2°C-5°C, default 5 minutes)
Mode Switch Delay	Sets the minimum mode switch delay (Range 2-30 minutes, default 15 minutes)
Cooler Enabled	Toggles cooling on or off (when unchecked, the cooling will not operate irrespective of other settings)
Heater Enabled	Toggles heating on or off (when unchecked, the heating will not operate irrespective of other settings)
Bluetooth Enabled	Toggles Bluetooth functionality on or off
Allowed Sensor Diff.	This sets the allowed temperature differential between the built in probe and the current setpoint (when using a Bluetooth device for temperature control) (Default 5°C)
Sensor Timeout	Sets the timeout if a Bluetooth device drops out (reverts to internal probe)
Sounds Enabled	Toggles device sounds on or off
2 Point Calibration	Enters Calibration mode for the temp. probe (Refer to CALIBRATION section)
NTC beta	Enter the NTC Beta of an external temp. probe. The default is



	3950
NTC Ref. Temperature	Enter the NTC Ref. Temperature of an external temp. probe. The default is 298.2
NTC Ref. Resistance	Enter the NTC Ref. Resistance of an external temp. probe. The default is 100000
Relay Cycle Time	Sets the allowed cycle time for PID heating (Range 30-3600 seconds, default 120 seconds)
PID Heating	Toggles PID heating on or off (recommended for advanced users only)
PID P Coefficient	Enter desired proportional PID coefficient
PID I Coefficient	Enter desired integral PID coefficient
PID D Coefficient	Enter desired derivative PID coefficient
Forget WiFi Config	Forgets existing WiFi config
Disable WiFi	Disables WiFi (if you wish to not use the RAPT Portal)
Clear Registration	Clears RAPT Portal registration (see Troubleshooting)
Low Temp. Alarm	This is the temperature below which an alarm will sound (default -10°C)
High Temp. Alarm	This is the temperature above which an alarm will sound (default 50°C)
Check For OTA Update	Manually check and download any available firmware updates

SETTING	DEFAULT	MIN	MAX
Cooling Hysteresis	1.0°C	0°C	10.0°C
Heating Hysteresis	1.0°C	0°C	10.0°C
Compressor Delay	5.0 min	2.0 min	10.0 min
Mode Switch Delay	15.0 min	2.0 min	10.0 min
Allowed Sensor Diff	5.0°C	1.0°C	50.0°C
Set Temperature	20.0°C	-5.0°C	60.0°C
Cooling Enabled	ON	OFF	ON
Heating Enabled	ON	OFF	ON
PID Cycle Time (Heating)	120 sec	30 sec	3600 sec
PID P Coefficient (Heating)			
PID I Coefficient (Cooling)			
PID Cycle Time (Cooling)	120 sec	30 sec	3600 sec
PID P Coefficient (Cooling)			
PID I Coefficient (Cooling)			
High Temp Alarm	120°C	-20.0°C	120.0°C
Low Temp Alarm	-10°C	-20.0°C	120.0°C

NOTE: The device will alarm if the Min/Max values are exceeded.



Bluetooth

Bluetooth needs to first be enabled in the Settings menu (above).

In this menu you will see a list of compatible Bluetooth enabled RAPT devices.

To **Bond** a Bluetooth enabled RAPT devices, use the arrow buttons to scroll to select the device. Choose Select (↵) to Bond the device, or Return to cancel.

Once Bonded, the device will be visible in the Bonded section of the Bluetooth Menu. To Unbond, select the device with the navigation arrows and choose Select (↵) to Unbond, or Return to cancel.

Once the device is Bonded, it can be selected in the Settings menu option as one of the available **Temperature Sensors**. Once selected in this menu, temperature control will be ceded to the selected Bluetooth enabled RAPT device, rather than the internal temperature probe. In addition, when the Graph Disabled Display Mode is selected, the current gravity will be displayed. The temperature of the internal probe will also be displayed.

NOTE: It is completely normal for there to be a temperature variance between the Temperature Controller probe and the Bluetooth enabled RAPT device. This is because the Bluetooth device is measuring the temperature of the fermentation (typically), and the attached probe is measuring the air temperature of (typically) the Temperature Controller. This difference will be greater when there is active heating or cooling.

The **Allowed Sensor Differential** sets the allowed temperature differential between the desired *setpoint* and the *current* temperature. Cooling and Heating is disabled temporarily if this differential is exceeded. The default differential setting is 5°C. This value is suitable for typical use.

This differential can be altered in the Settings Menu. If the temperature differential is exceeded, the RAPT Temperature Controller will suspend heating and cooling until the differential is reduced. The legend DIFF OVERRIDE will also be displayed when the display is in Graph Disabled Mode.

The RAPT Temperature Controller will suspend active cooling or heating and resume as needed – no intervention is required. Once the differential is reduced then heating and cooling will continue as normal.

Diagnostics

The Diagnostics menu contains information about the RAPT Temperature Controller. This includes such information as current firmware version, Wi-Fi network and signal strength, MAC address and IP address of the device.

About

The About menu contains information specific to the firmware and software of the RAPT Temperature Controller and associated devices, including but not limited to copyright information, acknowledgment of open source properties used, legal information etc.



UPDATING FIRMWARE

Your RAPT Temperature Controller will automatically check for and install firmware updates when turned on and connected to a Wi-Fi network.

To check the firmware version on your RAPT Temperature controller, press select (↵) to enter the menu and then navigate to **diagnostics**.

To manually update the firmware in the event that this is not up to date, navigate to **settings** and then navigate to **Check for OTA Update**. Your device will then automatically download and update the most current available firmware.

TEMPERATURE PROBE CALIBRATION

If you have replaced the temperature probe for any reason or require greater accuracy the NTC temperature probe can be quickly calibrated:

1. Enter the menu by pressing Select (↵)
2. Use the Up or Down arrows to navigate to **Settings** and press Select (↵)
3. Use the Up or Down arrows to navigate to **2-point calibration** and press Select (↵)

Once in the 2-point calibration mode set up two glasses of water. Ice water to one glass and add hot water to the second glass.

Calibration Point 1

Insert the temperature probe of the RAPT Temperature Controller into the glass of ice water while simultaneously measuring the temperature of the ice water using a calibrated external thermometer such as a digital instant read thermometer (KL23320). Wait for the temperature reading on both the RAPT Temperature Controller and the external calibrated thermometer to stabilise as much as possible.

Then adjust the temperature shown on the RAPT Temperature Controller to match the temperature measured on the external calibrated thermometer.

Press Select (↵) to lock in this calibration point 1 and move on to calibration point 2.

Calibration Point 2

Insert the temperature probe of the RAPT Temperature Controller into the glass of hot water while simultaneously measuring the temperature of the hot water using a calibrated external thermometer. Wait for the temperature reading on both the RAPT Temperature Controller and the external calibrated thermometer to stabilise as much as possible.

Then adjust the temperature shown on the RAPT Temperature Controller to match the temperature measured on the external calibrated thermometer.

Press Select (↵) to lock in this calibration point 2.

Once both calibration points have been set the NTC temperature probe has been calibrated.





TROUBLESHOOTING REGISTRATION AND TELEMTRY

The default setting for telemetry is 60 minutes. As a result, you will not see telemetry in the RAPT Portal right away.

Should the telemetry data not appear, then you may need to re-register your RAPT Temperature Controller with the RAPT Portal.

No telemetry is displayed on the RAPT Portal

If you are experiencing issues receiving telemetry or sending a profile to your RAPT Temperature Controller from the RAPT portal then you should first check that your RAPT Temperature controller is connected to your Wi-Fi network.

Determine whether your RAPT Temperature Controller is connected to Wi-Fi and check the signal strength

To check your controller is connected to your Wi-Fi network with good signal strength press 'Select' and navigate to the **Settings** and then **Diagnostics**.

The Wi-Fi strength will be displayed in this Diagnostics menu and the Wi-Fi network which the controller is connected to will be shown next to wifi AP.

Signal strength is represented on a scale of 0 to -100dbm

Signal Strength (dBm)	What it means
0 to -30dBm	Maximum signal
-50dBm	Excellent signal
-67dBm	Good, reliable signal
-70dBm	Ok, not a strong signal
-80dBm	Poor, unreliable signal
-90dBm	Unusable

Re-register your RAPT Temperature Controller

If your RAPT Temperature Controller is still not sending telemetry to the RAPT Portal or you are unable to remotely start a profile despite being connected to Wi-Fi with a good, reliable signal strength then you may need to re-register your RAPT Temperature Controller to your account. To re-register your BrewZilla controller do not delete the device from the RAPT Portal, instead follow the steps below:

1. Go to the **settings** menu on your RAPT Temperature Controller.
2. Navigate to **clear registration** and press select (↵).
3. Register your device to your RAPT account according to the instructions on page 3.



If you are unable to sign up an account or your RAPT Fermentation Fridge or RAPT portal displays an error please forward as many visual pieces of supporting information and a detailed description of the error to beer@kegland.com.au

WARRANTY (AUSTRALIA)

The RAPT Temperature Controller comes with a 12-month Warranty when sold in Australia.

Warranty does not cover product failure as a result of installation or operating procedure not in accordance with installation and operating guidelines as described in the instruction manual.

To lodge a warranty claim in Australia please forward as many visual pieces of supporting information and a detailed description of your issue to beer@kegland.com.au

If you purchased your unit from an international distributor, you will be required to go through their warranty claims process.

For a full terms and conditions, please visit our website here -> [Terms & Conditions](#)