USER MANUAL

Programmable Ramp/Soak Digital Temperature Controller
Model : DTC8500

Version: 1.1 – 01/08/2015

English

www.ratek.com.au

60 Wadhurst Dve, Boronia, Victoria 3155, Australia - P: +613 9887 2161 - F: +613 9887 2163 - E: sales@ratek.com.au

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Errors and omissions excepted.

Thank you

Thank you for purchasing a Ratek product.

This User Manual will assist you in the correct installation and operation of the Programmable Digital Temperature Controller, as well as explain the safety requirements for its use.

Important: Please read the contents of this User Manual before unpacking and operating the product.

Unpacking and Checking

Once you have read these instructions in full and understand the installation and safety requirements including those for unpacking the carton, please carefully open the packing and slowly remove the product. Carefully inspect the condition of the product to ensure it has not been damaged in transit. Any damage should be reported immediately to the responsible carrier. If the product is damaged in any way, re-pack the product into the supplied packaging and notify the responsible carrier immediately.

Important: Do not operate the equipment if it has been damaged in any way. Any failures resulting through the use of a damaged product will not be covered by the product warranty.

Carton Contents

Ensure that you have received all items outlined below before proceeding. If you have not received all components in the supplied carton, please re-pack the carton and notify a Ratek Service representative immediately. Contact details are provided in the section of this User Manual titled “Ratek Service Contact Information”

- **DTC8500 Ratek Programmable Digital Temperature Controller**
- **User Manual**

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Intended Use

This Digital Temperature Controller is intended for the purpose of controlling a heating device with a PT100 temperature sensor return output. Such devices may include dry block heaters, heating mantles or hot-plates. The use of the heating device should be in accordance with any operating instructions supplied.

Suitable Environments For The Digital Temperature Controller

The Digital Temperature Controller is intended for use in a clean laboratory environment only where adequate ventilation, a good power supply and provisions for routine cleaning are available. The Digital Temperature Controller should not be used outdoors or in dirty, dusty, steamy, humid or windy environments. The acceptable operating conditions are outlined further in this User Manual.

General Operation

- The Digital Temperature Controller is mounted onto a suitable sturdy bench with adequate ventilation.
- The Digital Temperature Controller is plugged into an appropriate power source. It is powered by an alternating current power supply with protective earth and with the appropriate receptacle, rated voltage and frequency for the country of its intended use. Further details on power requirements are outlined in this User Manual.
- A mains powered heating device with compatible PT100 sensor is plugged into the rear of the DTC unit.
- The Digital Temperature Controller is operated via a combination of front and rear panel buttons and switches consisting of a power switch, temperature control buttons and menu buttons. These controls allow the operator to set a required temperature as well as over and under temperature alarm set points..
- The Digital Temperature Controller should be operated strictly in accordance with the Operating Instructions outlined further in this User Manual.

Operator Responsibility – Safety Considerations

When operated in strict accordance with this User Manual, plus routine cleaning and maintenance being carried out, the product shall provide safe operation for the operator. The operator should be aware of the following before installing and operating the product :

Conditions of Operation

***Note:** The term "operator" referred to in this User Manual is the primary person who has been tasked to install, maintain and train in the usage of this equipment. Other personnel shall be referred to as "Users".

- The operator shall be aware that the protection provided by the equipment may be impaired if the equipment is used with accessories not provided or recommended by the manufacturer, is modified in any way or is used in a manner not specified by the manufacturer.
- The operator is responsible for ensuring all users of the product are qualified to do so, and are well versed in common safety concepts. The product should only be operated by an adult who has read and understood this User Manual provided in the appropriate language in its entirety.
- Any user must be informed by the responsible operator of any potential hazards that may arise through the use of this equipment in the course of their work, including any local environmental hazards not related directly to the Digital Temperature Controller. They should also be able to demonstrate that they understand any preventative safety measures in operation prior to operating the equipment.
- The operator shall agree to accept responsibility for the use of the equipment in accordance with this User Manual, and be fully aware that the equipment is designed for commercial use.
- It is assumed that the user and operator have had experience in a commercial environment, and had appropriate training in how to perform their work safely in accordance with any local operational health and safety regulations. The operator and all users should be well versed in local emergency procedures as per the workplace safety regulations in effect.
- Avoid any direct impact with any surface of the equipment, including the casing, switches or control panel.
- **Important:** Do not use any sharp or pointed metal objects anywhere near the equipment, in particular the control panel.
- Avoid using the equipment near any other vibrating equipment or source of excessive vibration.
- Ensure the equipment is cleaned and maintained in accordance with this User Manual.

- Ensure that all original safety warning labels are in an adequate, legible condition and are firmly affixed to the equipment before using the product.
- Plug the equipment directly into a wall power outlet. Do not plug the equipment into a multi-socket adapter of any kind.
- The equipment is intended for operation in a controlled electromagnetic environment. Avoid the use of transmitting devices (e.g. cellular or mobile telephones) near the equipment whilst operating. A minimum distance of 2 Metres from the product is recommended for any transmitting device.
- **Important:** The equipment must only be installed and operated in **well ventilated areas**. The unit is not intended for use in explosive atmospheres, in confined spaces or inside any other piece of laboratory equipment such as humidity cabinets or incubators.
- The allowed operating environment must be between 5° Celsius and 40° Celsius ambient air temperature. Be aware that the ambient air temperature around the device being controlled will limit the minimum controllable device temperature. The ambient air temperature must be at least 7° Celsius lower than the desired controllable device temperature.
- The maximum allowed relative humidity of the operating environment is 80%.
- The equipment should not be stored in direct sunlight, near chemicals, or other contaminants.
- If any of these safety recommendations cannot be achieved or the equipment has been damaged in any way, the equipment should not be installed or operated.
- **Important :** If you have any concerns or questions relating to operator or user safety, please contact the appropriate Ratek Customer Service department before installing and operating the unit. Contact details are provided in this User Manual.

Safety Labels And Markings

The equipment is provided with safety caution labels. An explanation of each caution label is provided below. It is the responsibility of the operator and user to fully understand the meaning of these warning labels prior to operating the equipment.

Very Important: Particular care should be taken when working near the heating device. At all times during operation be careful working near the heating device to avoid possible burns or scalds. Always wear safety glasses and gloves.

Caution Labels	Definition
 **Colours:** Black on a yellow background	The Digital Temperature Controller is powered by an alternating current power supply sufficient to cause harm if contact with the electrical supply is made. Under no circumstances should any part of the equipment be opened, un-screwed, loosened or disassembled whilst power is applied to the unit. Only authorized service agents are permitted to remove covers. This label is fitted by the manufacturer and must not be removed under any circumstances.

Preparation

You must take the time to familiarize yourself completely with the following operating procedures before installing or operating the Digital Temperature Controller in order to achieve the best performance and maximum attainable user safety.

Identification of Controls & Functions

The figure below indicates all key controls and components of the Digital Temperature Controller with their corresponding numerical element labeled.

CONTROLS & INDICATORS

	Description
1.	Heating Element Indicator
2.	Current Temperature/Parameter Display
3.	Over-Temperature Alarm Indicator
4.	Under-Temperature Alarm Indicator
5.	Programmed Ramp Increase Indicator
6.	Programmed Ramp Decrease Indicator
7.	Set Temperature/Parameter Display
8.	Program - Running Indicator
9.	Program - Holdback Mode Indicator
10.	Menu Button
11.	Up Button
12.	Down Button
13.	Page Button
14.	Mains Power Cable
15.	Mains Power Switch
16.	PT100 Sensor Input
17.	Device Mains Power Output

Figure 1

Safety Warnings

Throughout this User Manual, specific warnings will be supplied which relate to the current operation being referred to. These warnings are supplied in addition to the main warning labels affixed to the product and the key points outlined in the section of this User Manual titled 'Operator Responsibility – Safety Considerations'.

A graphical symbol as pictured below will be used next to each warning with accompanying text, the danger level for each is described below :

CAUTION
Indicates a possibly dangerous situation which may result in serious injury or threat to life as a result of scalding or burns if the situation is not avoided.

CAUTION
Indicates a possibly highly dangerous situation which may result in serious injury or threat to life as a result of electric shock if the situation is not avoided.

CAUTION
Indicates a possibly harmful situation which may result in injury or damage to product or property if the situation is not avoided.

Safety Recommendations

The following safety recommendations must be followed to prevent damage or injury. In addition to these safety recommendations, it is assumed that the user and operator have had experience in a commercial environment, and had appropriate training in how to perform their work safely in accordance with any local operational health and safety regulations. The operator and all users should be well versed in local emergency procedures as per the workplace safety regulations in effect.

CAUTION
If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

CAUTION
The equipment must only be used with a protective earth power socket. The earth contact provides protection to the user and the equipment. If you do not have a protective earth power socket, or you are unsure as to whether you have a protective earth power socket, **do not** connect the equipment. In such cases you should consult your workplace administrator or electrical maintenance staff to determine if a protective earth power socket is available.

A surge protected power outlet is strongly recommended as it provides some protection for the equipment in areas of poor electrical quality as well as providing some protection against lightning strikes. The equipment should be operated on a good, reliable supply of power at all times.

Note: The Digital Temperature Controller should not be operated on the same electrical circuit as other high voltage household appliances such as fridges, clothes dryers, washing machines or other continuous operation high voltage devices. These types of devices can create power fluctuations that are undesirable for electrically sensitive equipment. Consult your workplace administrator or electrical maintenance staff if you are unsure.

CAUTION
Always work well away from the heating device. At no point should the user, operator, animal or any other perishable object be situated directly beneath the Digital Temperature Controller or heating device.

- **ALWAYS** wear protective eyewear when working with hot liquids.
- **ALWAYS** place the heating device and Digital Temperature Controller on a strong, even, dry, flat heat-proof surface which is made of inflammable material.
- **ALWAYS** turn off the mains power switch when the unit is not in operation and turn off the mains power supply at the outlet.
- **ALWAYS** turn off the mains power switch and unplug the equipment from the mains power supply outlet before moving the equipment.
- **ALWAYS** operate the Digital Temperature Controller in a well ventilated area with adequate clearance around the Digital Temperature Controller as indicated.
- **ALWAYS** be careful of steam if working with evaporative media and avoid making contact.
- **NEVER operate the Digital Temperature Controller without a heating device attached.**
- **NEVER** operate the equipment if you believe it is damaged in any way.
- **NEVER** operate the Digital Temperature Controller if the mains power supply cable is damaged in any way
- **NEVER** use any sharp or metal objects near the Digital Temperature Controller control panel.
- **NEVER** lift the Digital Temperature Controller if you have an existing injury that impairs your ability to lift.

Preparation & Installation

The Digital Temperature Controller should be installed and operated in strict accordance with the following instructions.

CAUTION
The Digital Temperature Controller is not for use in explosive atmospheres as there is a risk of fire, explosion, burns or scalding present under these conditions.

CAUTION
Be careful when lifting and observe your local operational health and safety requirements for lifting before unpacking the carton.

Unpacking and Installing

- Carefully remove all packaging material from the Digital Temperature Controller, as well as the supplied User Manual and any other supplied accessories.

- Carefully inspect the Digital Temperature Controller, mains power lead and all packaging for any signs of damage. If any signs of damage are present, **do not** install or operate the equipment. Contact the supplier of your equipment if you have a received a damaged product.

- Ensure that there is a minimum unobstructed distance of 300 millimetres between the left, right and rear panels of the Digital Temperature Controller and any other object or wall.

- Ensure that there is a suitable mains power supply outlet within reach of the supplied mains power lead without placing any strain whatsoever on the lead, socket or plug. The Digital Temperature Controller should not be plugged into any double-adapter, power board, or power point splitter of any kind but instead directly into a correctly earthed wall mounted power socket.

- Ensure that there is a minimum unobstructed distance of 1 metre in front of the Digital Temperature Controller to allow adequate room for the user to maintain a safe operating distance of 300 millimetres.

CAUTION
The Digital Temperature Controller is designed for the purpose of controlling a heating device.

The contents of the heating device is the sole responsibility of the user or operator, and the use of corrosive, flammable, combustible, hazardous, environmentally unsafe or otherwise dangerous materials is done so at the risk and liability of the user or operator.

ALWAYS be 100% sure of the contents of your containers, the expected behavior once heated and the applicable safety measures that should be employed when handling such substances.

Switching On The Digital Temperature Controller

- Once you are ready to begin heating, switch the Mains Power Switch to the position marked with a vertical line.

- If the last set temperature is greater than the current device temperature, the Heating Element Indicator will light green and either flash to indicate intermittent heating or remain lit constantly to indicate constant heating.

Operating Instructions

Operating Modes

The DTC8500 features 2 main operating modes allowing the user to either set and maintain a single temperature, or to run advanced temperature ramping via user definable profiles.

- To operate and maintain a single temperature, refer to the section of this User Manual titled "Operating a Single Static Temperature".
- To enter and run a program with more than one set point or temperature ramp, refer to the section of this User Manual titled "Operating a Ramping Profile".

CAUTION
If the temperature of the device is critical to your application, ensure the Digital Temperature Controller is left for at least 10 minutes to stabilize after the temperature has reached the set-point before you use the device. Temperature stability is affected by ambient temperature, position of any containers and the heating medium. All of these factors should be considered to achieve best results.

Operating a Single Static Temperature

- The Current Temperature/Parameter Display indicates the current device temperature in the device.
- By default, the Set Temperature/Parameter Display indicates the desired set temperature.
- If the unit has just been powered on, the default operating mode is Static, indicated as StAt in the operating mode menu.
- If the unit has been operated in another mode, first change the operating mode as below :
  - Press the mode button until nodE is displayed in the Current Temperature/Parameter Display.
  - Press the down arrow until StAt is displayed in the Set Temperature/Parameter Display.
  - **Hold the mode button for 5 seconds then release to commit the changes to the operating mode.** The current and set temperatures will now be displayed.
- To adjust the set temperature press the up arrow or down arrow to increase or decrease the temperature accordingly.
- If the set temperature is greater than the current device temperature, the Heating Element Indicator will light up and either flash to indicate intermittent heating or remain lit constantly to indicate constant heating.
- Once the device temperature nears the set point, the temperature control circuit will start to intermittently engage the element to reduce the rate of heating.
- **Note:** It is normal for the temperature to exceed the set point slightly whilst the temperature in the device stabilizes. The device temperature will drop back down to the set temperature and then the proportional temperature control will attempt to maintain the set temperature.

Operating a Ramping Profile

The DTC8500 has the ability to store up to 9 "Profiles". A profile is a collection of temperature set-points and/or

dwell (idle) periods that you wish the controller to achieve during unattended operation. For example, you may wish the temperature controller to reach 37° operation, hold this temperature for one hour and then ramp the temperature up over the next 30 minutes to 50° and then hold that temperature for 2 hours. The 37° and 50° targets are referred to as "Program Segments".

Each profile may contain multiple segments, however the 9 profiles are broken into 3 types, each of which has a different segment storage capacity as below. You should choose an appropriate profile number based on the maximum number of segments your profile will require.

Profile Numbers	Maximum Number of Segments
1 thru 4	16
5 thru 7	32
8 and 9	64

- To configure and store a profile, first determine the most suitable profile number based on the table above.

- For each "Segment" you wish to program, you will be prompted to configure the following parameters (depending on the segment type (SGTY) not all parameters will be applicable).

  Hb.bd - The holdback band in °C. If the holdback feature is enabled and the current temperature falls outside the band of the desired temperature (deviation from the set point), the unit will enter holdback mode until the current temperature is back inside the holdback band.

  St.SP - The starting set point temperature for the profile in °C. This can only be configured for segment zero (0). This temperature will serve as the initial set point value for the profile and ramping will be calculated relative to this set point. To ensure the actual device temperature matches the starting temperature of the profile, before running the profile set the desired starting set point in static mode and allow the device to stabilise.

  rnP.u - The unit of measurement for the ramp rate :

  HH.nn - Hours & Minutes

  nn.SS - Minutes & Seconds

  In1 n - °C Per Minute

  1Hr - °C Per Hour

  dLL.u - The unit of measurement for the dwell period :

  HH.nn - Hours & Minutes

  nn.SS - Minutes & Seconds

  SG.no – The segment number to assign to the current parameters :
  Profiles 1 thru 4 : 0 – 15 (16 segments)

  Profiles 5 thru 7 : 0 – 31 (32 segments)

  Profiles 8 and 9 : 0 – 63 (64 segments)

  SG.tY – The segment type. For a traditional ramp/dwell scenario, this parameter is most commonly set to Ramp or Dwell. The available segment types are :

rAnP - Perform a ramp to the temperature set at tG.SP

dLL - Dwell at the current set point for the period set at dLL.t

JunP - Jump to a segment specified at SEG in the same profile

End - End the profile

F.SP - The final set point to end the profile on for an "end" type segment. This temperature will be maintained indefinitely at the end of the program until the controller is returned to static mode or the profile is re-run.

CYCL - For "end" type segments, enter the number of times the profile should be repeated/cycled.

tG.SP - The target set point in °C for a "ramp" type segment.

rt.rr - Time duration or ramp rate for a "ramp" type segment, entered in units specified at rnP.u

P2.EY - Always set to 0000

HbtY - The holdback type indicates how the controller should react if the current temperature is not in line with the desired ramp. For example, the heating required to achieve a certain ramp rate in the current device may not be achievable :

oFF - Do not use holdback. The unit will ignore any temperature lag

Lo - Hold the profile if the current temperature falls below the desired set point by more than the holdback band at Hb.bd

Hi - Hold the profile if the current temperature deviates above the desired set point by more than the holdback band at Hb.bd

bAnd - Hold the profile if the current temperature deviates above or below the desired set point by more than the holdback band at Hb.bd

dLL.t – The dwell time for a "dwell" type segment, entered in units specified at dLL.u

SEG - The segment number to jump to for a "jump" type segment

CYCL - Repeat number of cycles for the "jump" and "end" segment types.

F.SP - The final set point for the "end" segment

- **Note:** To assist in the setup of your profile, it is recommended that you first record all applicable parameters above for each segment that you wish to program (either on paper or in a spreadsheet) and then simulate what the profile should achieve. Once you have established the correct profile parameters, they can then be entered into the controller and tested.

- Once you are ready to enter the profile parameters :

- Press ▬ until ProF is displayed in the Current Temperature/Parameter Display.
- Press ▲ or ▼ to select the desired profile number that you wish to edit.
- Press ☰ to begin cycling through the profile parameters above.
- Use ▲ or ▼ to adjust the value for each parameter you wish to edit.
- Press ☰ to proceed through all applicable parameters above.
- Once a complete segment has been entered, you may proceed to the next segment by selecting SG.no and entering the segment number you wish to edit. Pressing ☰ then allows you to configure parameters for the selected segment.

  Note: Press ☰ + ▲ simultaneously to move backwards through the profile parameters.

- Once you finished entering your profile parameters, push ▬ to exit the profile menu and return to the normal static operating mode.

To Run a Program

Important: Test the profile you have programmed by running it completely before performing a live run.

- Whilst in static mode, press ☰ to select the profile number and segment from which you wish to start running. For example, to run profile 1 from the beginning, enter "P1.00" which represents profile 1, segment 0. To start profile 2 from the beginning, enter "P2.00" and so forth. To start from mid-way through the profile, enter the segment number after the decimal point. For example "P2.03" to start from segment 3 of profile 2.
- Press ▬ until nodE is displayed in the Current Temperature/Parameter Display.
- Press ▼ until run is displayed in the Set Temperature/Parameter Display.
- **Hold ▬ for 5 seconds then release to commit the changes to the operating mode.** The Program – Running Indicator will now light and the selected profile will commence running.
- The set temperature will automatically vary in accordance with your programmed profile and the controller will attempt to match the actual temperature.
- Once the profile has ended, press ▲ + ▼ simultaneously to restore the controller to static operating mode.

To End the Program

- Press ▬ until nodE is displayed in the Current Temperature/Parameter Display.
- Press ▼ until StAt is displayed in the Set Temperature/Parameter Display.
- **Hold ▬ for 5 seconds then release to commit the changes to the operating mode.** The current and set temperatures will now be displayed in static mode.

Important – Do **NOT** set the operating mode to oFF as you will be locked out of the menu system. The off mode is used for service only. Use the StAt mode for manual operation. In the case where you have accidentally set

the mode to oFF and the controls cannot be accessed, press ▲ + ▼ simultaneously to restore the controller to static operating mode.

Important: Once the program has ended, if the Program – Running Indicator and Program – Hold Mode Indicator are flashing simultaneously, press ▲ and ▼ together to return the controller back to static operating mode.

Setting the Over and Under Temperature Alarms

The DTC8500 is equipped with an over-temperature audible and visible alarm, as well as a visible under-temperature alarm. Both alarms are configurable by the user.

The alarms are configured as deviation alarms whereby they operate relative to the desired set point. If the current temperature deviates from the set temperature by the margin configured by the user, the alarm will activate.

***Note:** The under temperature alarm will only activate once the current temperature has reached the initial desired set point, this is by design.

To configure the alarm set points :

- Press ☰ repeatedly until ASP2 is displayed in the Current Temperature/Parameter Display.
- Press ▲ or ▼ to set the desired deviation for the over-temperature alarm.

  Important : The over-temperature alarm should be entered as a **positive** value.
- Press ☰ repeatedly until ASP3 is displayed in the Current Temperature/Parameter Display.
- Press ▲ or ▼ to set the desired deviation for the under-temperature alarm.

  Important : The under temperature alarm should be entered as a **negative** value.
- Press ☰ to exit the menu. The current and set temperatures will be displayed.

Switching Off The Digital Temperature Controller

- Switch the Mains Power Switch to the position marked with a circle. The Power On/Off indicator will go dark.

CAUTION
Although the heating system may now be inactive, the residual heat in the heating element may be sufficient to cause serious burns or scalding.

The residual device temperature may also be sufficient to cause burns or scalding.

Unplug the Digital Temperature Controller from the mains power supply outlet.

Storing & Relocating

CAUTION
Be careful when lifting and observe your local operational health and safety requirements for lifting before relocating the Digital Temperature Controller. Ensure the heating device is disconnected before relocating.

The Digital Temperature Controller should be stored out of direct sunlight at an ambient temperature below 30° Celsius in a clean and dry location which meets the environmental conditions required as detailed in the technical

specifications of this User Manual.

- Turn off the Mains Power Switch by setting it to the position marked with a circle.
- Unplug the equipment from the mains power supply outlet.
- Ensure all parts of the Digital Temperature Controller are clean and dry to avoid the potential for corrosion.
- Ensure the Digital Temperature Controller is stored in a clean and dry location away from potential damage by accidental knocks and bumps.

Routine Cleaning And Maintenance

To maintain the Digital Temperature Controller in good, safe working order and ensure maximum product lifespan, regular cleaning and general maintenance is required. The Digital Temperature Controller should be cleaned at least once every month for a unit being used on a daily basis, for infrequently used Digital Temperature Controllers a cleaning frequency of once every 3 months is recommended.

Cleaning

CAUTION
Do not use abrasive cleaners or solvents on the Digital Temperature Controller as these may break down certain components of it's construction, reducing it's life and potentially creating a hazardous situation. Use only a mild household detergent or laboratory sterilization agent when cleaning the Digital Temperature Controller.

CAUTION
If the Digital Temperature Controller has been used with any dangerous, chemical or biological substances it should be decontaminated prior to cleaning. Decontaminate the Digital Temperature Controller using a decontamination procedure appropriate to the contaminant, however in all cases ensure the following :

- No decontamination or cleaning agents are used which could cause a hazardous situation to arise as a result of a reaction with parts of the Digital Temperature Controller or with any materials contained in it. For example, substances that may compromise the integrity or function of electrical insulation, electrical components or steel components.
- Ratek are consulted prior to decontamination or cleaning being undertaken if there is any doubt about the compatibility of decontamination or cleaning agents with parts of the Digital Temperature Controller or with any materials contained in it.

CAUTION
When cleaning the unit, only use a damp sponge. **Do not use a sodden wet sponge.** Do not make any part of the control panel, any exposed control or receptacle or any part of the Digital Temperature Controller excessively wet. If these receptacles and controls remain wet once electrical power is restored they can create a hazardous situation sufficient to cause serious injury or risk to life due to electrical shock. Always ensure the unit and in particular all controls and switches are completely dry before restoring electrical power.

- Turn off the Mains Power Switch
- Unplug the equipment from the mains power supply outlet.
- Using a mild detergent and damp sponge, clean around all surfaces.
- Once the Digital Temperature Controller is clean, use a soft dry cloth to dry all surfaces of the Digital Temperature Controller paying particular attention to any controls or switches.

- Once cleaning has been completed, it may be re-installed and operated in accordance with this User Manual.

CAUTION
If any controls or switches are found to be loose or in poor condition, do not operate the equipment. Loose or damaged electrical controls and connections create a hazardous situation sufficient to cause serious injury or risk to life. Refer the equipment to an authorized service technician for repair.

Technical Specifications

Temperature Controller	Digital PID with fuzzy logic
Temperature Sensor Input	RTD PT100 3 wire
Display Resolution	0.1°C
Temperature Control Range	0°C to 450.0°C
Safety Features	- Over-temp cut-out - Over-current protection
Mains Power Connection	240V / 50 Hz
Replaceable Fuse Type	F250V/10AL, M205 miniature glass type. Internal fuse holder requires technician to replace.
Maximum Heating Power	2,300 Watts
Total Operating Wattage	2,400 Watts
Environmental Conditions	Suitable for use according to IEC 61010-1 standard as follows : - Indoor use - Altitude up to 2,000 Metres - Temperature 5° Celsius to 40° Celsius (Ambient temperature will limit the minimum achievable device temperature) - Maximum relative humidity 80 % for temperatures up to 31° Celsius decreasing linearly to 50 % relative humidity at 40° Celsius - MAINS supply voltage fluctuations up to ±10 % of the nominal voltage Over-voltage Category – II Pollution Degree – 2

Disposal

At end of life, this equipment should be disposed of in an environmentally friendly way. This equipment cannot be disposed of with other general waste, but instead taken to your local or regional waste collection facility for recycling and/or suitable treatment procedure.

For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or your nearest commercial recycling centre.

EMC Conformity

AS/NZS CISPR 14.1:2010 Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus – Emission. This forms the basis of compliance to the requirements of the Electromagnetic Compatibility Framework ('C TICK').

Ratek Service Contact Information

Ratek are here to assist you in getting the most from your Digital Temperature Controller. Our friendly staff can you assist you at any stage of the product lifecycle.

If you have any concerns or questions regarding the operation of your Digital Temperature Controller, please contact us.

Contact Us

Ratek Instruments Pty Ltd
60 Wadhurst Dve
Boronia
Victoria 3155
Australia
Telephone : 613 9887 2161
Fax : 613 9887 2163
Email: sales@ratek.com.au
Web: www.ratek.com.au

Troubleshooting

The Digital Temperature Controller provides a simple-to-operate user interface when used in conjunction with this User Manual.

If at any stage you experience abnormal operation (anything other than that described in this Operating Manual) this may indicate a fault condition. If the Digital Temperature Controller fails to operate, this may also indicate a fault condition.

Fault conditions must be referred to an authorized service technician immediately and the equipment should be unplugged from the mains power supply socket.

Make a written note of any abnormal operation and contact Ratek using the contact details provided in the section of this User Manual titled "Ratek Service Contact Information" if you believe your equipment is exhibiting a fault condition.

Warranty Conditions

This Ratek product is covered by a 3 year parts and 12 months labour return-to-base warranty effective from the date of purchase. The product is manufactured in Melbourne, Australia.

The warranty is offered by Ratek Instruments Pty. Ltd. located at 60 Wadhurst Drive, Boronia, Victoria, Australia 3155, phone number +613 9887 2161.

- This warranty covers the repair or replacement of any parts or components found to be defective, subject to the service options listed below.
- The warranty is a return-to-base warranty, meaning the product must be returned to Ratek Instruments or an authorised Ratek agent for service at the discretion of Ratek Instruments. Where practical an on-site repair may be carried out at the discretion of Ratek Instruments.
- This warranty excludes any defect resulting from misuse, neglect, accidental damage, improper voltage, operation of the product outside the acceptable operating conditions as indicated in these operating instructions or any alteration which affects the performance of the equipment.
- It does not extend to any costs associated with delivery of the product to or from Ratek Instruments or an authorised Ratek agent, damage, or loss incurred during transport.
- This warranty is in addition to any Statutory regulations and provisions implied by the Trade Practices Act and any relevant State or Federal Government obligations, applicable only when purchased within Australia.

- The product may be replaced within the warranty period at the discretion of Ratek Instruments, however repair will be the normal course of action.
- For a period of 3 years from date of purchase, replacement parts will be supplied at no charge and the original components returned to the repairer. These replacement parts may be installed by an approved service agent with prior written agreement from Ratek Instruments.
- For a period of 12 months from date of purchase, service labour and repairs will be carried out at no charge by an approved repairer or Ratek Instruments at the discretion of Ratek Instruments.
- The limit of liability shall extend to the repair of the product only, all other compensation claims are excluded from this guarantee.
- The warranty does not extend to claims of suitability where the product does not deliver the intended function or fails to operate.
- No claims of suitability are made in relation to the product by Ratek Instruments. Any claim of suitability lies with the operator.
- The product is used at the risk of the operator. Any loss or damage caused to any item used with the product including but not limited to biological samples, tubes, racks, accessories, flasks, containers or the contents of such containers caused by the malfunction of the product or the failure of the product to function is not covered by this warranty.
- Proof of purchase is required for all warranty repairs.

DOA Product

Any claim under this warranty must be made within 7 days of the date of purchase of the product. To make a claim under the Warranty, you must present the product, together with proof of purchase or issue, to the store where you purchased the product from. If the product is defective and does meet the Warranty, you will be provided with a replacement product, or where that is not possible, a refund. Ratek Instruments will pay your reasonable, direct expenses of claiming under this Warranty. You may submit details and proof of your expense claim to Ratek Instruments for consideration.

This Warranty is provided in addition to other rights and remedies you have under law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Return & Repair Procedures

The product is engineered from quality components designed to give long trouble-free operation. In the event that a technical problem has occurred that requires servicing by a Ratek Service agent, please follow these steps before returning the unit :

- Contact the supplier from where the equipment was purchased. If this is not possible, please contact Ratek Instruments either via email to service@ratek.com.au, or phone on +613 9887 2161 during business hours AEST. You may be referred to a local repair agent for service.
- Clean the unit thoroughly in accordance with this Operating Manual. If necessary, decontaminate the unit to ensure safety for the service technicians.
- Pack the unit into it's original packaging with the supplied mains power lead and use all original protective inserts. If the original packaging is not available, the unit must be packed with extreme care to ensure a safe journey. "Fragile" and "This Way Up" labels should be applied to the carton in a prominent location. No liability for a unit damaged in transit will be accepted. Use only reputable carrier services.
- Provide a full and complete fault description and your return contact details in the package and return the product as advised by the service representative.