SALUS

Digital Room Thermostat

Instruction Manual
Model No RT500

WARRANTY
2
YEARS

CE

PRODUCT COMPLIANCE

This product complies with the essential requirements of the following EC Directives:

- **Electro-Magnetic Compatibility directive 2004/108/EC**
- **Low Voltage Directive 2006/95/EEC**
- **EC Marking directive 93/68/EEC**

SAFETY INFORMATION

These instructions are applicable to the Salus Controls model stated on the front cover of this manual only, and must not be used with any other make or model.

These instructions are intended to apply in the United Kingdom only, and should be followed along with any other statutory obligations.

This accessory must be fitted by a Competent person, and installation must comply with the guidance provided in the current editions of BS7671 (IEE Wiring Regulations) and Part 'P' of the Building Regulations. Failure to comply with the requirements of these publications could lead to prosecution.

Always isolate the AC Mains supply before opening or removing the unit from the wall or wall box.

When fitting batteries don't mix old and new batteries together. Do not use rechargable batteries.

Please leave these instructions with the end user where they should be kept in a safe place for future reference.

INTRODUCTION

A programmable thermostat is a device that combines the functions of both a room thermostat and heating controller into a single unit. The programmable thermostat is used to switch the heating system in your home on and off as needed. It works by controlling the temperature according to a series of programmed settings that take effect at different times of the day.

The RT500 from Salus Controls is a stylish and accurate 5/2 or 7 day programmable electronic thermostat with a large, easy to read Liquid Crystal Display (LCD). This programmable thermostat has been specifically designed to be used Volt Free.

Features
- **Volt free contacts**
- **5/2 or 7 day programming flexibility**
- **Built-in start up programming for quick installation**
- **Frost protection**
- **Large, easy to read LCD with blue backlight**
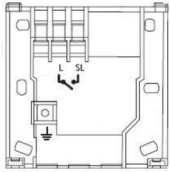- **Burner on symbol**
- **User friendly**
- **Stylish casing**

INSTALLATION

Please read the important safety information at the start of this manual before you begin to install the thermostat.

The ideal position to locate the RT500 thermostat is about 1.5m above floor level, in a location where the thermostat is accessible, reasonably lit and free from extremes of temperature and draughts. Do not mount the thermostat on an outside wall, above a radiator or in a location where it may be subjected to direct sunlight.

The electrical connections to the RT500 are made to the supplied industry standard backplate. This simplifies installation, as no connections are made to the controller itself. Connection details are shown below - no Earth connection is required for the correct and safe operation of the RT500, but a parking terminal is provided to connect an Earth wire if one is present.

Backplate Connections

Terminal	Description	Backplate
L	Mains Live	
SL	Switched Live (Normally Open Contact)	
⏚	Earth Parking (no electrical connection)	

After installing the backplate in a suitable location, wiring connections can be made as shown above. The following criteria apply to the installation:

- The incoming AC mains supply should be 230V AC and fused at 5 amps.
- Optimum cable size for installation is 1.5 mm²; wiring colours should be in accordance with the current requirements of the IEE Wiring Regulations.
- Cable entry should be from the rear of the backplate.
- All wiring connections should be securely made, and be firmly gripped beneath the square brass washer on each terminal.

The RT500 requires two 'AA' alkaline batteries to function correctly. Ensure that the batteries are inserted correctly, paying careful attention to the polarity markings on the battery and next to the battery holders.

Do not restore the mains supply to the system until all associated items are fully installed.

NOTE: All electrical installation work should be carried out by a suitably qualified Electrician or other competent person. If you are not sure how to install this thermostat consult either with a qualified electrician, heating engineer or your boiler / heating system supplier for advice on how to continue.

Do not remove or refit the RT500 onto the backplate without the mains supply to the system being isolated.

JUMPER SETTINGS

Changes to the jumper settings should only be made by the Engineer carrying out the installation or other qualified person.

The installer should select the jumper position required if changes need to be made to the factory default settings. These jumpers are found on the rear of the thermostat.

Jumper	Function	Default
Temperature Span	Movable jumper for ± 0.5 ºC or ± 1.0 ºC span.	± 0.5 ºC span
Program Type	Movable jumper for 5-2 or 7 individual days programming.	5-2

AFTER INSTALLATION

After completing installation and powering up the RT500 for the first time the thermostat will behave in the following way:

All the indicators on the display and the backlight will be turned on for two seconds. After two seconds, the RT500 will then operate in Normal mode (Normal mode is when the thermostat is displaying the room temperature).

The following table shows the settings of the RT500 digital thermostat after Power on:

Function	Status After Reset or Power On
Operation Mode	Normal mode
Room Temperature	22.0 °C, updated within 5 seconds
°C indicator	On
Clock	12:00
AM/PM indicator	AM
Day of Week indicator	M
Programme	Default factory setting
Set Point Temperature	Default factory setting
Programme Number indicator	1
SET indicator	Off
PROG indicator	Off
Frost Protection indicator	Off
Heat indicator	Off
Low-Battery Warning indicator	Off, updated within 5 seconds
Output Relay	Off

After Power on, the thermostat will operate in Normal mode

• The set point temperature is reset to the default setting
• The room temperature display is updated within 5 seconds
• The control process starts
• The programme number is updated to indicate the running program

If the Reset Button is pressed, the RT500 will behave in the same way as described above, except that any previously saved user settings stored in the internal memory will be deleted and overwritten with the default settings, and all control settings will be returned to default values.

USER INTERFACE AND CONTROLS

The status and operation of the RT500 is clearly shown on the large backlit Liquid Crystal Display (LCD).

This display allows the user a clear indication of the current room temperature, and the status of the heating system.

There are few user controls for the RT500, making this thermostat very easy to operate. These controls are shown below, along with a description of each of their functions.

USER CONTROL FUNCTION SUMMARY

Key / Operation	Symbol	Functions
UP key	$\wedge$	Increases the selected setting
DOWN key	$\vee$	Decreases the selected setting
BACKLIGHT / FROST key	☀/❄	Manually turns on the LCD backlight for 5 seconds, or activates / deactivates Frost Protection
SELECT key	SELECT	Selects a clock or programme setting
SET key	SET	Sets a clock or programme setting
RESET button	RESET	Resets the programmable thermostat to default (original factory) settings

OPERATION

The RT500 is configured and adjusted by the use of a minimal number of user controls, and an intuitive user interface.

The backlit Liquid Crystal Display (LCD) gives a highly visible, easily readable indication of the programmable thermostat status.

RT500 INSTRUCTION MANUAL   **9**

SETTING THE TIME

Press and hold SET and SELECT when the RT500 is in Normal mode for three seconds to enter the Clock setting mode. Release both keys and the display will look like the image below:

The Time and Day are displayed along with a SET indicator, with all other indicators cleared from the display. The hour part of the time is flashing to indicate that it is the currently selected item and is ready to be adjusted.

• Press the UP or DOWN keys to increase or decrease the 'hour' setting – the selected item will stop flashing while a key is pressed, and will resume flashing when you release the key.

• Press the SELECT key to select the 'minutes' section of the time. Set the minutes in the same way as the hour by using the UP and DOWN keys.

• Press SELECT again to select the Day, and again change the setting with the UP and DOWN keys.

• Press the SET key to confirm the new time and day settings. This will store the changes and return the RT500 to Normal mode.

The RT500 will also return to Normal mode (and save the clock settings) if no keys are pressed for more than 15 seconds.

PROGRAMMING THE RT500

The RT500 offers great versatility with its programming options, allowing the user to programme the unit to operate on a 5/2 or 7 day control cycle. The programmable thermostat has a default set of Programmes that have been designed to meet the needs of most users. If these default programmes are not suitable for your particular situation, reprogramming the RT500 with your own settings is a very straightforward operation.

Selection of the default programming mode (5/2 or 7 day) is made by changing the jumper setting on the rear of the RT500, as previously described within the Installation section of this manual.

5/2 Day Mode

5/2 day mode is the default programming mode for the RT500. With this mode selected, five different sets of time and set point temperatures can be set for Weekdays or Weekends.

To review or change a programme, press the SET key when the RT500 is in **Normal** mode. This will change the unit status to Programme Setting mode.

The LCD display will display programme number 1 and SET PROG, with all other indicators cleared. The weekdays will be flashing to indicate they are the selected item and are ready to be adjusted:

Press the UP or DOWN key to select the programme set for either Weekday or Weekend to be reviewed or adjusted. Pressing the SET key at any time when in programming mode will return the RT500 into **Normal** mode.

Press the SELECT key to confirm the Weekday or Weekend selection. Once this is set, the 'Hour' will flash to indicate that it is the selected item and is the next item to be adjusted:

Press the UP or DOWN key to adjust the hour setting to the desired value, and confirm your selection by pressing the SELECT key.

Pressing the SELECT key allows you to step through each of the items to be reviewed or adjusted within the programmes in the following sequence:

Programme	Function Sequence		
1	Hour	Minutes	Set point temperature
2	Hour	Minutes	Set point temperature
3	Hour	Minutes	Set point temperature
4	Hour	Minutes	Set point temperature
5	Hour	Minutes	Set point temperature

...before then allowing you to cycle back to Programme 1. Pressing the SET key at any time will confirm the setting and return to the programme set selection.

7 Day Mode

The RT500 also offers a 7 day programming mode, which allows you to programme five different sets of time and set point temperatures for each day of the week to give a total of 35 separate programme settings.

To review or change a programme, press the SET key when the RT500 is in Normal mode. This will change the unit status to Programme Setting mode.

The LCD display will display programme number 1 and SET PROG, with all other indicators cleared. The weekdays will be flashing to indicate they are the selected item and are ready to be adjusted.

Press the UP or DOWN key to change the display to indicate the single day you want to programme:

Pressing the SET key at any time when in programming mode will return the RT500 into Normal mode. Press the SELECT key to confirm the Day selection. Once this is set, the 'Hour' will flash to indicate that it is the selected item and is the next item to be adjusted:

Press the UP or DOWN key to adjust the hour setting to the desired value, and confirm your selection by pressing the SELECT key.

Pressing the SELECT key allows you to step through each of the items to be reviewed or adjusted within the programmes in the following sequence:

Programme	Function Sequence		
1	Hour	Minutes	Set point temperature
2	Hour	Minutes	Set point temperature
3	Hour	Minutes	Set point temperature
4	Hour	Minutes	Set point temperature
5	Hour	Minutes	Set point temperature

...before then allowing you to cycle back to Programme 1. Pressing the SET key at any time will confirm the setting and return to the programme set selection. Each programme for all the other days of the week is set in exactly the same way – just repeat the steps shown above, after entering programming mode and selecting the day you want to programme.
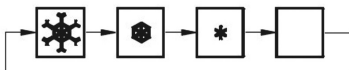
Regardless of which programming mode the RT500 is set for (5/2 or 7 day), not pressing any keys for 15 seconds will automatically save any programming changes and exit to Normal mode. You can also review or change programme settings when Frost Protection is enabled.

FROST PROTECTION

To enable the Frost Protection mode, press and hold the BACKLIGHT / FROST button for three seconds with the RT500 in _Normal_ mode. Once Frost Protection is enabled, the set point temperature is automatically set to 5°C to provide protection from the risk of freezing.
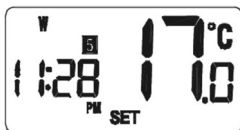

Whenever Frost Protection is activated, the Frost Protection indicator will flash in the sequence shown below:

While Frost Protection is activated, it will override any programme settings until the mode is changed. To turn off Frost Protection mode, press and hold the BACKLIGHT / FROST button for three seconds.

Reviewing Set Point Temperature

You can view the set point temperature at any time by pressing either the UP or DOWN key.

When any programme is running, the LCD display will show the programme set point temperature with the SET indicator displayed:

When operating in Frost Protection mode, the LCD display will show a reading of 5 °C and also display the Frost Protection indicator:

When operating in Temporary Override mode, the LCD display will show the temporary set point temperature:

To exit from the set point review, press any key except the UP or DOWN keys, or don't press any keys for approximately four seconds – either of these actions will return the RT500 to Normal mode.

Temporary Override

It is possible to temporarily override the current set temperature of the RT500. There are two ways to do this:

• While reviewing set point temperature: Pressing the UP or DOWN key while reviewing the set point temperature will increase or decrease the set point temperature in 0.5 °C steps.

• In **Normal** mode: press and hold either the UP or DOWN key to display the set point temperature. After two seconds, the RT500 will enter Temporary Override mode and allow increase or decrease of the set point temperature. If the key is released within two seconds then you will only be able to review the set point temperature.

Once in Temporary Override mode, the clock and day are displayed, along with the SET indicator; all other indicators are cleared from the display. The set point temperature will flash to indicate that it can be changed:

Pressing the UP or DOWN key will increase or decrease the set point temperature in 0.5 °C steps - the set point temperature can be adjusted within a set range or 10 °C to 35 °C.

You can press SET at any time to confirm the new Temporary Override setting and return to **Normal** mode, or press no keys at all and wait approximately four seconds.

Temporary Override mode remains active until the clock or programme settings are adjusted, Frost Protection is activated or the next programme time / temperature set point is reached.

OTHER FUNCTIONS AND CONTROLS

Backlight

The backlight of the RT500 is switched on automatically whenever any of the keys are pressed. The backlight will remain illuminated for approximately 5 seconds after the last key press, except if you are changing the set point temperature – in this case, the backlight will remain illuminated throughout the setting change process.

The backlight will not illuminate if the RT500 battery is low.

Battery Status

The RT500 checks the battery voltage frequently during normal operation. If the battery voltage is sensed as being low (this is normally when the battery voltage falls to a level of around 2.6V), the low battery indicator ▭ will be displayed on the screen.

Although the programmable thermostat will continue to operate normally at this stage, you should replace the batteries as soon as possible to prevent any possible operating problems.

Reset Button

The Reset Button is provided as a way to restore the programmable thermostat to its default factory settings. **Pressing this button will delete any previously entered settings.**

Sleep Mode

By pressing both the UP and DOWN keys together, the RT500 will enter SLEEP mode. In this mode, all the RT500 functions will be paused to save battery power.

While in SLEEP mode:

• The LCD display will be blank.
• All output from the thermostat will be turned off immediately.
• The clock will continue to run in the background.

Press any key to wake up the RT500 and cancel SLEEP mode.

ENERGY TIP

One way to set and use your room thermostat is to find the lowest temperature setting that you are comfortable with, and then leave it set at this temperature. You can do this by setting the room thermostat to a low temperature, (for example 17 °C) and then increasing the setting by one degree each day until you are comfortable with the room temperature - you won't have to adjust the thermostat further, as adjustment above this setting will waste energy - a 1 °C increase in temperature is equal to 3% of your heating costs.

MAINTENANCE

The RT500 programmable thermostat requires no special maintenance. Periodically, the outer casing can be wiped clean using a dry cloth (please DO NOT use solvents, polishes, detergents or abrasive cleaners, as these can damage the thermostat).

There are no user serviceable parts within the unit; any servicing or repairs should only be carried out by Salus Controls or their appointed agents.

Should the RT500 programmable thermostat fail to function correctly, check:

- **The batteries are the correct type, fitted correctly and are not exhausted - fit new batteries if in doubt.**

- **The RT500 temperature has been set correctly.**

- **Heating system is switched on.**

WARRANTY

Salus Controls warrants that this product will be free from any defect in materials or workmanship, and shall perform in accordance with its specification, for a period of two years from the date of purchase. Salus Controls sole liability for breach of this warranty will be (at its option) to repair or replace the defective product.

PRODUCT SPECIFICATION

Model:	**RT500**
Type:	**Electronic programmable thermostat, designed for volt free heating applications.**

Programming

Programming Modes:	**User selectable for 5/2 or 7 day option**
Number of Programmes:	**Five (5) user programmes plus factory default programme.**
Override Facility:	**User selectable programme override facility.**

Default Programmes

Programme	Output	Weekday	Weekend
1	ON	6:00 AM	6:00 AM
	TEMP	21 ºC	21 ºC
2	ON	8:00 AM	8:00 AM
	TEMP	17 ºC	21 ºC
3	ON	4:00 PM	4:00 PM
	TEMP	21 ºC	21 ºC
4	ON	6:00 PM	6:00 PM
	TEMP	21 ºC	21 ºC
5	ON	10:00 PM	10:00 PM
	TEMP	17 ºC	17 ºC

Temperature

Scale:	**Celsius**
Range:	**5 ºC to 35 ºC**
Resolution:	**0.5 ºC**
Tolerance:	**Less than ± 0.5 ºC at 25 ºC**
Display Range:	**5.0 ºC to 45.0 ºC**
Display Resolution:	**0.5 ºC**

Clock

Accuracy:	**± 1 minute per month**
Display:	**12 hour**

Frost Protection

Setting:	**5 ºC**

Switching

Switching Voltage:	**230V AC, 50Hz**
Switching Current:	**8A resistive, 3A inductive**
Contact Type:	**Single Pole Single Throw (SPST)**

Power Source

Power Source:	**2 x AA alkaline batteries**
	(Don't use rechargeable batteries)
Battery Life:	**Approximately 1 year**

Temperature

SRange:	**10 ºC to 35 ºC**
Accuracy:	**± 0.5 ºC at 25 ºC**

Environment

Operating Temperature:	**0 ºC to + 50 ºC**
Storage Temperature:	**- 20 ºC to + 55 ºC**

RT500 Warranty

Salus Controls warrants that this product will be free from any defect in materials or workmanship, and shall perform in accordance with its specification, for a period of two years from the date of purchase. Salus Controls sole liability for breach of this warranty will be (at its option) to repair or replace the defective product.

Customer Name: ....

Customer Address: ....

...

Post Code: .... Tel No: ....

Email: ....

Engineers Company: ....

Tel No: ....

Email: ....

Intallation Date: ....

Engineers Name: ....

Engineers Signature: ....

www.salus-tech.com

Sales: Email: sales@salus-tech.com Tel: 01226 323961
Technical: Email: tech@salus-tech.com Tel: 01226 323961

Salus Controls plc, Salus House, Dodworth Business Park South,
Whinby Road, Dodworth, Barnsley S75 3SP