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Manual Issue No. IM-RT500RF-002

Instruction Manual



Programmable  
THERMOSTAT

for Model No. RT500RF

Thank you for purchasing this Salus product  
- if installing for someone else, please ensure that  
the instructions are handed to the householder.

**Warning** - Please read this manual prior to  
installation or use.

**Shock Hazard** 

This unit must be installed by a competent person,  
in accordance with BS 7671 (the IEE Wiring  
Regulations), or other relevant national regulations  
and codes of good practice.

**Always isolate the AC Mains supply before  
installing this unit.**



**PRIOR TO INSTALLING PLEASE READ THE INSTALLATION GUIDE**

**INTRODUCTION**

This thermostat can replace most common residential thermostats and is designed to be used with electric, gas or oil heating control systems.

Unlike ordinary single unit design thermostats, this is a new type of thermostat separating the operational functions into two units. The Receiver serves for wiring connections and heat on/off control. The Control Centre serves as user interface and temperature sensing/control. The two units are linked by Radio Frequency.

The RT500RF is easily installed using the Industry Standard back plate supplied (for mounting purposes only as no wiring is required when installing the control centre). The back plate can be mounted directly to the wall surface.

**Switches/Jumpers:**

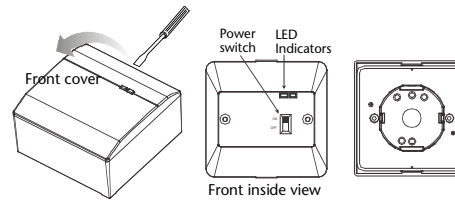
The installer should select the jumper positions required if changing from the factory presets. These jumpers are found on the rear of the unit.

Jumpers	Function
Span	1 moveable Jumper for selecting temperature span of +/-0.5°C (factory default setting) or 1.0°C
Program	1 Jumper for 5-2 (factory default setting) or 7 day programming.
1,2,3,4,5	5 removable Jumpers for altering the RF address code when used in conjunction with the receivers corresponding dip switch.

**The reset button must be pressed after changing jumper positions**

**Wiring the Receiver for the RT500RF**

- 1) Remember to Isolate AC mains supply, note this must be 230V AC and fused at 13 amps max.
- 2) Select a suitable indoor location free from water and moisture.
- 3) The receiver should not be shielded from the RF signal in any way, follow 'Testing the RF Transmission' section of this manual before deciding on a final location for the receiver and control centre units.
- 4) To access the wiring terminals carefully prize off the front cover from the top middle of the receiver with a flat head screw driver and remove the 2 screws underneath as illustrated in the diagram.

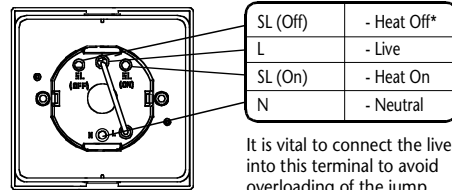


**Receiver On/Off switch and LED's**

On removing the front cover you will note there is an On/Off switch and 2 LED's. The switch allows you to turn off the Receiver if necessary to prevent it calling for heat. The left LED illuminates red when the switch is in On position and the unit is receiving power. The other LED illuminates green when the receiver unit is calling for heat upon receiving a heat call transmission from the Control Centre.

### WIRING DIAGRAM FOR 230V APPLICATION

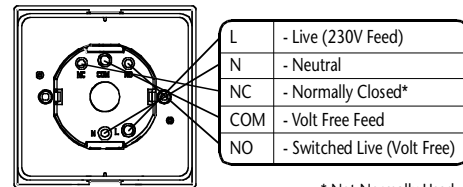
The unit is default 230V, if volt free application is required you must remove link & follow wiring diagram for volt free application.



It is vital to connect the live into this terminal to avoid overloading of the jump wire.

### WIRING DIAGRAM FOR VOLT FREE APPLICATION (Remove Link!!!)

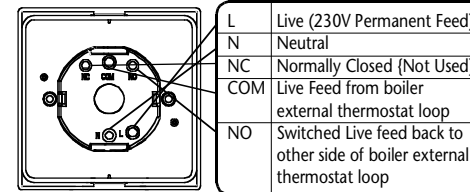
The unit still requires a 230V feed for V.F. applications



\* Not Normally Used

### WIRING INTO THE EXTERNAL THERMOSTAT LOOP OF A BOILER (Remove Link on Receiver & External Thermostat Link on Boiler!!!)

The unit still requires a 230V Permanent Live feed



### Multiple Thermostat Installations

**Please note, if using more than one RT500RF in the same installation, be sure that there is at least a 1 metre gap between receiver units to avoid RF interference.**

When installing multiple thermostats you should ensure that you assign different address codes for each RT500RF following the 'RF Address Code Setting' section of this manual. Each RT500RF should be introduced to the installation one at a time with all other receiver units switched off, also make sure that the batteries are removed from all other Control Centres. Install each unit following the 'TESTING THE RF TRANSMISSION' section of this manual. Once you are happy with the operation of one unit you may install the next. Once all RT500RFs are installed, if one unit then seems to function abnormally, try changing the address code of the control centre & its corresponding receiver again taking care that the new code given is different to all others in the installation.

The control centre sends RF On/Off signals every 10 min to ensure the receiver is in the correct state. If for some reason the 1st RF signal is interrupted you may notice the control centre has started/stopped calling for heat but the receiver hasn't switched. Simply wait 10 minutes until the next RF signal is transmitted and the receiver unit should switch.

### RF Address Code Setting

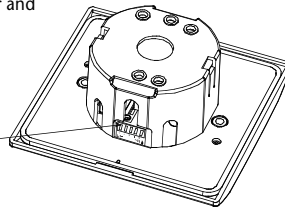
If there is another user nearby, e.g. in the next house, your receiver may be fault triggered by their transmitter. You may select a different RF address code to prevent this. The receiver can only respond to RF transmissions with the same address code setting as its own address code.

1. To adjust address code of Receiver, simply push up one or more of the 5 dip switch levers. The levers are numbered 1 to 5 from left to right.
2. To adjust address code of Control Centre, remove one or more of the jumper caps located on the back of the unit, labeled 1,2,3,4,5.
3. You must press reset on the control centre after altering the address code.

#### Caution :

1. Address code of Control Centre must be the same as address code of Receiver. For any jumper cap removal of address code # in Control Centre, the same address code # of Receiver must be put to the UP position.
2. Disconnect AC power and remove batteries prior to adjusting address code.

Address Code Dip  
Switch Leavers.



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### TESTING THE RF TRANSMISSION

It is important to site the Receiver and Control Centre in locations where the RF signal cannot be interrupted. The receiving range between Control Centre and Receiver is 60M in open area. Many factors can affect the RF transmission, shortening the operating distance e.g. shielding by thick walls, foil back plasterboard, metal objects such as filing cabinets, general RF interference etc. However, the range is enough for most household applications.

It is advisable to test the RF transmission from the intended Control Centre location to the Receiver location before fixing the Control Centre to the wall.

1. Press UP button until the set-point temperature is higher than room temperature by a few degrees.
2. Wait for a few seconds. The animated flame (heat call indicator) should appear on the bottom left of the LCD on the control centre.
3. Check the green LED on the receiver unit. It should be illuminated.
4. Press Down button to adjust the set-point temperature to be lower than room temperature. Wait for a few seconds. The animated flame (heat call indicator) should disappear and the green LED should switch off.
5. If at step 3 the LED is not illuminated, press RESET and try to place the Control Centre closer to the Receiver, repeating steps 1 to 4.
6. Alternatively you can try and alter the address code following the 'RF Address Code Setting' section of this manual, then repeat steps 1 to 4.

Note that the RESET button on the Control Centre should be pressed after altering the address code.

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**Following table is the setting of the thermostat after reset or Power on:**

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

After reset or power on, the thermostat will operate in Normal mode. Setpoint temperature is reset to default setting. Room temperature is updated in 5 seconds and the control process starts. Program Number is updated to indicate the running program.

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## User Guide

Key	Function
↑	Increase Setpoint Temperature
↓	Decrease Setpoint Temperature
BL/FROST	Turn on backlight for 5 seconds, activate/de-activate Frost Protection
SET	Key for Clock/Program settings
SELECT	Key for Clock/Program settings
RESET	System reset

**This product requires 2 x AA size Alkaline batteries.**

### Initial Power Up or Reset

- After power up or **RESET** is pressed, the thermostat is reset.
- During system reset, all LCD segments are turned on for 2 seconds after which the Control Centre is initialized.
- Once initialized the following display is shown.
- The default Program Set-point temperatures are set after reset. Same for both 5-2 and 7 days program.



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### Default Programme

Program	Weekday (M to F)	Weekend (SA to SU)
1	Time: 6:00am Setpoint Temp: 21°C	Time: 6:00am Setpoint Temp: 21°C
2	Time: 8:00am Setpoint Temp: 17°C	Time: 8:00am Setpoint Temp: 21°C
3	Time: 4:00pm Setpoint Temp: 21°C	Time: 4:00pm Setpoint Temp: 21°C
4	Time: 6:00pm Setpoint Temp: 21°C	Time: 6:00pm Setpoint Temp: 21°C
5	Time: 10:00pm Setpoint Temp: 17°C	Time: 10:00pm Setpoint Temp: 17°C

### Clock Setting Mode:

- Press and hold **SET** and **SELECT** in Normal mode for 3 seconds to enter Clock setting mode.

Clock, Day-of-Week, and "SET" are displayed. All other indicators are cleared. "Hour" is flashing to indicate that it is the selected item to be adjusted.



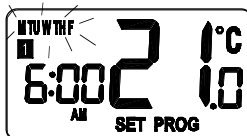
- Release **SET** and **SELECT**, press **▲** or **▼** to increase or decrease the "hour" respectively.
- Press and release **SELECT**, press **▲** or **▼** to increase or decrease the "minute" respectively.
- Press and release **SELECT**, press **▲** or **▼** to cycle the Day of Week from "M" to "SU".
- Press and release **SELECT** to allow change of "hour" again.
- Press and hold **▲** or **▼** for 2 seconds to enter fast advance in 4Hz.
- Selected item will stop flashing when a key is pressed. The selected item will flash again once the key is released.
- Press **SET** at any time to confirm the setting and return to normal mode.
- The Control Centre will return to normal mode after 15 seconds if no keys are pressed, Clock is also updated with the latest setting.

### Program Setting Mode:

#### 5-2 days program selected

- 5 different sets of Time and Setpoint temperature can be set for Weekday or Weekend.
- To review or change program, press **SET** in Normal mode to enter Program Setting mode. Program 1 of the Weekday, and "SET PROC" are displayed. All other indicators are cleared. "Weekday" is flashing to indicate that it is the selected item to be adjusted.

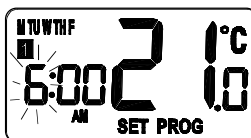
- Press **▲** or **▼** to select the program set for Weekday / Weekend to be reviewed or adjusted.



- Press **SET** at any time during program set, this will immediately return to Normal mode.

Press **SELECT** at any time to confirm the selection. "Hour" is flashing to indicate that it is the selected item to be adjusted.

Press **SELECT** at any time to confirm the selection. "Hour" is flashing to indicate that it is the selected item to be adjusted.



- Press **SELECT** to select the items to be reviewed or adjusted with the below sequences.
  - (Program 1) "hour" → "minute" → Setpoint temp
  - (Program 2) "hour" → "minute" → Setpoint temp
  - (Program 3) "hour" → "minute" → Setpoint temp
  - (Program 4) "hour" → "minute" → Setpoint temp
  - (Program 5) "hour" → "minute" → Setpoint temp and then cycle back to (Program 1)
- Press **SET** at any time to confirm the setting and return for program set selection.

## 7 days program selected

- 5 different sets of Time and Setpoint temperature can be set for each Day of Week. Total 35 settings.
- To review or change program, press **SET** in Normal mode to enter Program Setting mode. Program 1 of Monday, and "SET PROG" are displayed. All other indicators are cleared. "Day of Week" is flashing to indicate that it is the selected item to be adjusted.

- Press **▲** or **▼** to select the program set for Day of Week to be reviewed or adjusted.



- Press **SET** at any time during program set and selection will immediately return to Normal mode.
- Press **SELECT** at any time to confirm the selection. "Hour" is flashing to indicate that it is the selected item to be adjusted.



- Press "Set" to confirm at anytime to return.

### 5-2 or 7 days program

- The PROG indicator is displayed accordingly to indicate the program number.
- Selected item will be flashing and can be adjusted by  $\uparrow$  or  $\downarrow$  key. Program time is changed in 10 minutes steps. Setpoint temperature range is 10°C - 35°C in steps of 0.5°C.
- Press and hold  $\uparrow$  or  $\downarrow$  for 2 seconds to enter fast advance in 4Hz.
- Selected item will stop flashing when a key is pressed. The selected item will flash again once the key is released.
- Control centre will return to normal mode after 15 seconds if no keys are pressed, Program settings are stored.

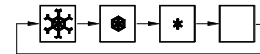
Program review/changes are allowed even when Frost Protection is enabled.

### Frost Protection:

- Press and hold  $\square$  [BL/FROST] in Normal mode for 3 seconds to activate the Frost Protection.

The Setpoint temperature is automatically set to 5°C to prevent frosting.

Whenever the Frost Protection is activated, the Frost Protection indicator is animated with the below sequence in 4Hz.

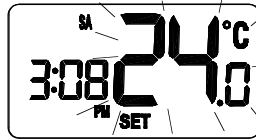


Press  $\square$  [BL/FROST] for 3 seconds to de-activate the Frost Protection, the Frost Protection indicator is turned off.

### Temporary Override:

- Press  $\uparrow$  or  $\downarrow$  when reviewing Setpoint Temperature to enter Manual Override mode, the Setpoint Temperature is increased or decreased by 0.5°C accordingly.
- In Normal mode, press and hold  $\uparrow$  or  $\downarrow$  to display the Setpoint temperature. After 2 seconds, the Thermostat will enter Manual Override mode and start fast advance in 4Hz. If buttons are released within 2 seconds without entering Manual Override mode, this is treated as reviewing Setpoint Temperature only.

- Clock, Day-of-Week, and "SET" are displayed. All other indicators are cleared. The Setpoint temperature is flashing to indicate that it can be changed now.



- Release and press  $\uparrow$  or  $\downarrow$  again to increase or decrease the manual override Setpoint temperature by 0.5°C respectively.
- Hold  $\uparrow$  or  $\downarrow$  for another 2 seconds to enter fast advance in 4Hz.
- The setting range is 10°C - 35°C in steps of 0.5°C.
- Setpoint Temperature will stop flashing when a key is pressed, then flashes again once the key is released.
- Press  $\text{SET}$  at any time to confirm the setting and return to normal mode.
- Thermostat will return to normal mode after 3-4 seconds if no key is pressed.

Temporary override remains active until clock or program setting are adjusted, Frost protection is activated or the next program time / temperature set-point is reached.

### Reviewing Setpoint Temperature:

- Press  $\uparrow$  or  $\downarrow$  to review the Setpoint temperature.

When any program is running, the LCD will show the program Setpoint temperature with the "SET" indicator displayed.



When operating in Frost protection mode, the LCD will show 5°C with the Frost Protection indicator displayed.



When operating in Temporary Override mode, the LCD will show the temporary Setpoint temperature



- Press any key except  $\uparrow$  or  $\downarrow$  or wait 3-4 seconds without key press to return to normal mode, room temperature will be displayed.

### LCD Backlight:

- LCD backlight is activated when **BL/FROST** or any key is pressed. The backlight will automatically turn off in 5 seconds after all keys are released.
- LCD backlight will not operate when battery is low.
- LCD backlight is illuminated throughout the Clock, Program, and Temporary Override Temperature settings.

### Low-Battery Detection:

Battery voltage is sampled every minute. When the battery voltage drops to a certain level, the Low-Battery warning indicator appears.



- The control centre functions normally during battery low. However, user must change the batteries as soon as possible before they are so weak that normal operation cannot be assured.
- Battery voltage is determined as "low" when it is less than or equal to 2.6V. It is determined as normal when it is higher than or equal to 2.8V, i.e. Low-Battery indicator must come out when battery voltage is  $\leq 2.6V$ , and must be turned off when battery voltage is  $\geq 2.8V$ .
- Battery voltage is only sampled in Normal mode and when LCD backlight is turned off.

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### Sleep Mode:

- Press and hold **▲** and **▼** in Normal mode for 3 seconds simultaneously to enter the Sleep mode.
- All the functions will be paused to save battery power.
- The whole LCD will be blank.
- Output will be turned off immediately.
- Press any key to wake up the unit.
- Clock is continuously running in background.

### Specification

Switch Rating	: Volt free selectable 230V AC 1.6 (8)A max
Power Supply	: 2 x AA size Alkaline batteries
Operating Temperature	: 0°C - 50°C
Temperature Setting Range	: 5°C - 35°C in 0.5°C steps
Storage Conditions	: -20°C - 55°C to 90% RH/non condensing
Frost Protection Temperature	: 5°C
Battery Low Warning	: 2.6 - 2.8V
Temperature Control Accuracy	: +/- 0.5°C at 25°C
Operating Humidity	: 0 to 90% RH/non condensing
Time Display	: 12 hour/24 hour
Clock Accuracy	: +/- 1 min/month
Protection	: Auto cut off at over 35°C
Memory	: Memory hold up: 5 minutes
Back Light	: EL Panel blue colour
Agency Approval	: CE
Micro disconnection on operation	: Type 1.B control action
Rated Impulse Voltage	: 4kV

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