Electric blanket/duvet Remote Control

Product Specifications v0.06

General description

The Remote Control system is based on two Remote Controls, one for each side of the blanket, and one Base Unit, directly connected to the mains and the blanket.

Key features

- TWO remote controls, one for each side, corresponding side shown by GRAPHIC on the remote control body.
- Remote & Receiver separation activation distance is at least 30 meters (in open air)
- LCD DISPLAY to provide feedback to the user
  - 12 hours display mode, without AM/PM symbols.
  - TIMER setting
  - HEAT setting
  - BOOST mode
  - LOCK mode
  - LCD backlight, with 30" auto-off feature
  - Quartz crystal oscillator for accurate timekeeping.
- FOUR pushbuttons
  - MODE button for ON / MODE selection
  - BOOST button for Fast-heat feature
  - (+) and (-) buttons for temperature adjust
- REMOTE CONTROL Battery operated
  - 3 x AAA (or 2 x AA T.B.D.) size Alkaline batteries – battery life : about 6 months
  - The 3 sets of batteries are to be vacuumed, thus ensuring the battery life is maintained during packaging.
- BASE UNIT supplied by mains
  - A.C. voltage range 190-250 Vac 50Hz
- RADIO FREQUENCY remote transmission
  - Transmission frequency 433.92MHz
  - Transmission power (T.B.D.) mW, corresponding to (T.B.D., 30) meters in open air
  - Receiver shall respond within a 300milli-sec after receiving signal from the remote.

- Periodic transmission of settings every (T.B.D., 15) minutes

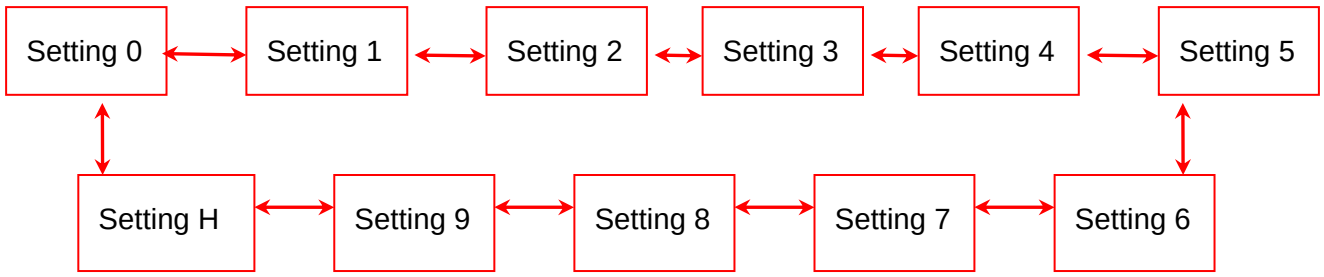
- TEN heat settings : 0 1 2 3 4 5 6 7 8 9 H
- When the Remote Control is ON and UNLOCKED, pressing (+) or (-) buttons will adjust the heat setting from 0 up to H.

  When the controller has been set to the maximum setting (setting H), pressing the (+) button again, heat setting reverts back to setting 0.

  While, if the controller has been set to the minimum setting (setting 0), pressing the (-) button again, heat setting is set to maximum (setting H).

  Refer to the figure below for more information.

Heat Setting Adjustment



- THREE timer settings : 1H 3H 12H
- BOOST feature : quickly heats the blanket for 30', then return to the selected heat setting.
- GREEN LED flashing when blanket is heating (0.3s ON / 3s OFF)
- COMMAND CONFIRMATION: The receiver shall be able to detect and respond to signals being received at a slow fast rate.
  - **Slow Rate:** The receiver shall beep at every received command
  - **Fast Rate:** The receiver shall beep at the end of the last command
- THERMAL PROTECTION on the BASE unit, by a thermistor located inside the housing:
  - Shut OFF the blanket when inside temperature rise above 65°C (T.B.D.)
  - Turn ON again the blanket when inside temperature fall below 55°C (T.B.D.)
- ADDITIONAL FEATURES
  - AUTO-LOCK (child lock) enable / disable switch
  - CLOCK SET pushbutton for clock adjustment
  - AUTO-LEARNING feature for remote control replacement

REMOTE CONTROL

Each time the settings are changed, the Remote Control will send the current settings to the Base Unit; it will also send periodically the current settings in order to recover from some abnormal condition, such as power failure.

Keyboard operation mode

Each time the settings are changed, the Remote Control send a “command” to the Base Unit.

In order to avoid a continuous “beep” when the keys are pressed very fast, e.g. when the user pass quickly from heat setting 3 to heat setting 8, the Remote Control will delay the transmission of the settings by a fixed time, which will be determined by test (range of delay from 0.1” to 1.0”).

Thus, the following will be the real timing behaviour:

Heat setting **3**
➔ push once the **(+)** key, heat setting change to **4**
➔ ➔ delay by software (fixed, selected by tests, in the range 0.1” to 1.0”)
➔ ➔ ➔ transmission delay (about 0.1”)
➔ ➔ ➔ ➔ base unit confirm with a single BEEP

Heat setting **3**
➔ push the **(+)** key, heat setting change to **4**
➔ ➔ delay by software started
➔ ➔ ➔ push the **(+)** key, heat setting change to **5**
➔ ➔ ➔ ➔ delay by software restarted
➔ ➔ ➔ ➔ push the **(+)** key, heat setting change to **6**
➔ ➔ ➔ ➔ ➔ ➔ delay by software restarted
➔ ➔ ➔ ➔ ➔ ➔ ➔ push the **(+)** key, heat setting change to **7**
➔ ➔ ➔ ➔ ➔ ➔ ➔ ➔ delay by software (fixed, selected by tests, in the range 0.1” to 1.0”)
➔ ➔ ➔ ➔ ➔ ➔ ➔ ➔ ➔ transmission delay (about 0.1”)
➔ ➔ ➔ ➔ ➔ ➔ ➔ ➔ ➔ ➔ base unit confirm with a single BEEP

The same apply for fast repeated pressures of the MODE pushbutton.

AUTO-LOCK feature

The AUTO-LOCK feature may be enabled/disabled via a switch located in the bottom of the Remote Control: by acting on this switch the AUTOLOCK function is immediately activated or deactivated and the corresponding LOCK icon shown the selected status.

AUTO-LOCK switch OFF

AUTO-LOCK function disabled

When AUTO-LOCK is disabled (see figure) the keyboard is always enabled, so the user can press any button with immediate response.

AUTO-LOCK switch ON

AUTO-LOCK function enabled

When AUTO-LOCK is enabled (see figure) the keyboard is locked to prevent the settings being change accidentally.

Operation in AUTO-LOCK mode

When the AUTO-LOCK is enabled, the Remote Control automatically LOCK the keyboard 30 seconds after the last pushbutton is pressed, thus preventing the settings being changed accidentally.

When the Remote Control is **LOCKED**, the display show the LOCK status with the **LOCK** / **KEY** icon, together with all other information.

To UNLOCK the Remote Control keyboard, press and hold the **MODE** button for **2** seconds: the **LOCK** / **KEY** icon disappears, the display backlight turns ON and the display shows the actual settings (heat temperature setting and timer setting).

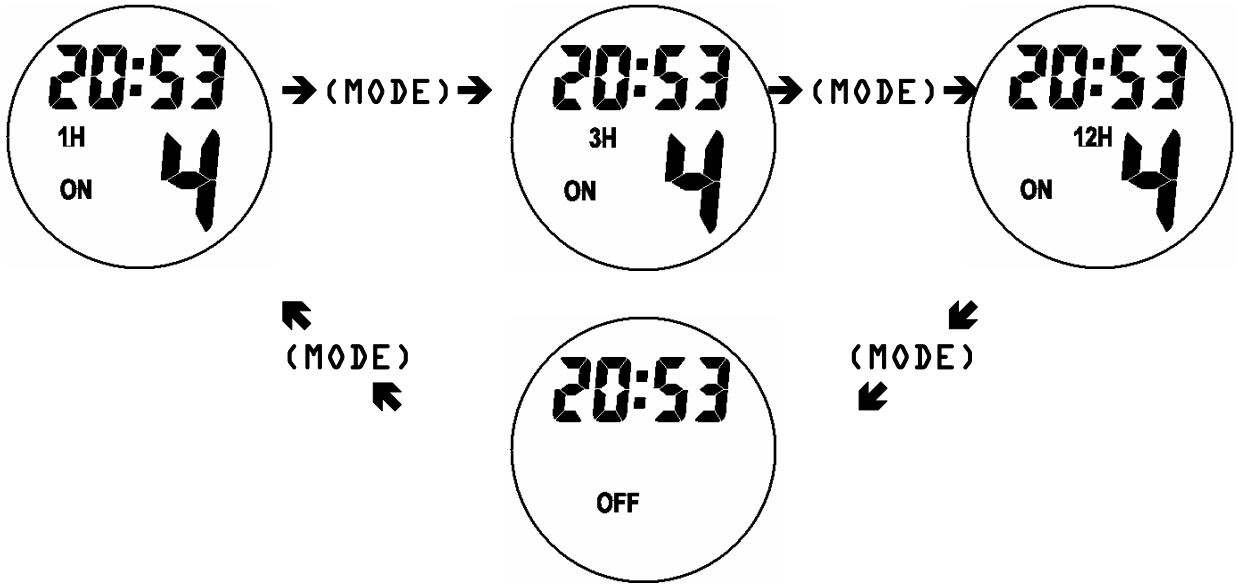
The keyboard get enabled, so settings can be changed.

Then, 30 seconds after the last pushbutton is pressed, the display backlight is turned off, the LOCK icon appears and the keyboard get locked again.

SETTING the AUTO-OFF TIMER

Press the **MODE** button to cycle through the three timer settings available and the OFF status: the timer setting change in sequence to 1 hour, then 3 hours, then 12 hours, then OFF, then 1 hour again and so on.

The timer will restart each time the MODE button is pressed; e.g. if the timer is changed from 3H to 12H after 2 ½ hours from start, the blanket will heat for 12 hour more. (total 14 ½ hours).



HEAT temperature setting

When the Remote Control is turned ON, the display default to show the last heat setting before it was switched off.

When the Remote Control is ON and UNLOCKED, press (+) or (–) buttons to adjust the selected heat setting from 0 up to 9.

When the Remote Control is set to OFF, it keeps in memory the last setting, and it shows this setting when it is turned ON again.

BOOST mode

Press the BOOST button to start the FAST HEAT feature: the blanket will heat to H level for 30 minutes, then return to the selected heat setting.

When BOOST is active, the display show heat temperature H.

The BOOST function is not automatically activated at start-up.

CLOCK adjustment

The time of the clock may be adjusted by pressing the CLOCK SET pushbutton, located on the bottom of the Remote Control; when the CLOCK SET function is activated, the display shows

Press **(+)** or **(-)** button to change the time, press **MODE** to select the hours or minutes digits.

Once the clock is set, press again the **CLOCK SET** pushbutton to confirm the operation and the display will return in normal operation mode.

BATTERY LOW signal

When the battery voltage is low, the BATTERY icon will flash.

This is an early warning on battery exhausted.

In this condition, the blanket is still working, but the battery should be replaced as soon as possible.

When the battery voltage is very low and the battery is exhausted, the BATTERY icon will be on fixed, thus indicating that the battery must be replaced.

In this condition, the blanket is switched OFF.

The battery must be replaced to restart correct blanket operation.

BASE UNIT

The Base Unit provide power to the blanket; it should be located on the floor, under the bed.

The Base unit controls different temperatures on either side of the blanket; it has 3 separated cords, one must be connected to the Mains, the others respectively to the Left side and to the Right side of the blanket.

When the Base Unit is properly connected to the mains and the switch is ON, a GREEN LED will light on.

There are two RED LED, one for each side of the bed; in case of an alarm, the corresponding LED will flash to signal the code of the alarm.

LED flashes	Possible cause	Corrective action
2	Blanket disconnected or Cord broken	Connect the blanket or Inspect the blanket connection cord
3	Blanket malfunction	Refer to customer assistance

On receipt of some “command” from remote controls, the buzzer of the base unit will “beep” to give feedback to the user.

In case of repeated commands, the buzzer will not be activated.

AUTO-learning feature

The Base unit is programmed in factory to receive “commands” only from the associated remote controls.

In case of replacement of a remote control, this auto-learning procedure must be followed:

1. Turn OFF the BASE UNIT.
2. Turn ON the BASE UNIT.
3. Push simultaneously the buttons MODE and BOOST on the remote control of the RIGHT side – the base unit acknowledge with a multiple BEEP.
4. Push simultaneously the buttons MODE and BOOST on the remote control of the LEFT side – the base unit acknowledge with a multiple BEEP.

All the above procedure must be completed within ONE MINUTE; after this time the BASE unit is not allowed to receive “configuration” commands.

In case the procedure fails, it should be repeated from the beginning

After the procedure succeed, the base unit knows the “names” of its associated remote controls and will execute commands issued by these units only.

NOTES

It must be noted that:

1) Simultaneous pushbutton pressure on remote controls

Because the TWO remote controls share the same transmission channel, in case that a pushbutton is pressed simultaneously on both remote controls, the receiver will not be able to correctly decode the incoming signal, and then will not act according to the command and will not give feedback (by buzzer).

The user will probably perceive an incorrect behaviour of the system (because of no buzzer signal) and push again the pushbutton with better results.

The built-in repeated transmission strategy will in any case repeat the transmission every few minutes, thus effectively changing the operation of the blanket according to the current remote control settings.

2) Transmission refresh

The built-in repeated transmission strategy will repeat the transmission every 15 minutes.

In case the transmission fails for any reason (battery exhausted, remote control out of range, etc.), the blanket will automatically switch off after 2 missed transmission refresh, with a maximum delay of 31 minutes.

3) Mains power failure

In case of mains power failure, the base unit will be switched OFF and remains OFF when power comes on again.

The built-in repeated transmission strategy will in any case repeat the transmission every few minutes, thus effectively restarting the operation of the blanket according to the current remote control settings.