

# **Installation Manual v1.2**

1. Installation Guidelines	2
2. Contents of your ezyheat.com kit	2
3. Important Do's & Don'ts	3
Do's	3
Don'ts	3
4. Tools and Materials required	4
5. Before Commencing - Measuring Resistance	4
6. Prepare the Subfloor for Installation of Heating Mat	5
7. Locate the Thermostat	6
8. Heating Mats Installation	6
9. Floor Installation	9
10. Thermostat Installation	10
11. 10 Year Limited Warranty	11
Appendix A. Product Technical Data	13
Appendix B. Standard LCD Thermostat Guide	14
Appendix C. Optional WIFI LCD Setup	18
Appendix D. Trouble Shooting – FAQ	22

# **Important Safety and Installation Information**

PLEASE READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION. FAILURE TO DO SO MAY CAUSE PERSONAL AND /OR PROPERTY DAMAGE AND WILL VOID THE WARRANTY.

WARNING: TO PREVENT FIRE, ELECTRICAL SHOCK, PERSONAL INJURY AND /OR PROPERTY DAMAGE, THE ELECRICAL INSTALLATION MUST BE PERFORMED BY A QUALIFIED PERSON WHO IS FAMILIAR WITH CONSTRUCTION AND OPERATION OF THE SYSTEM, AS WELL AS THE RISKS INVOLVED.

## 1. Installation Guidelines

Installation of your underfloor heating kit must be in accordance with all applicable AS/NZ Standards & Building codes.

If using thermostats other than those provided by ezyheat.com be sure the total Amps of the heating mats installed do not exceed the max Amp rating of the thermostat, larger installation may require multiple thermostats, sensors, dedicated circuits, circuit breakers etc.

# 2. Contents of your ezyheat.com kit

Your kit will contain the following contents, where any contents are missing please contact <a href="mike@ezyheat.com">mike@ezyheat.com</a>.

- 1 x Floor heating kit (red mesh, blue cable).
- 1 x External thermostat sensor.
- 1 x LCD thermostat & guide (WIFI optional).
- 1 x Installation guide.
- 1 x Installation cable tester.



## 3. Important Do's & Don'ts

#### Do's

- ✓ Do read these instructions carefully before beginning work.
- ✓ Do ensure the floor surfice is free of nails, screws or other sharp objects which may damage the cable.
- ✓ Do use flexible adhesives and grout
- ✓ Do test the cable before tiling.
- ✓ Do be careful not to damage or dislodge the cable during tiling.
- ✓ **Do** ensure the cable is spaced no closer than 50mm between loops.
- Do try to protect the cable with cardboard or carpet during tiling.
- ✓ Do wait at least 7 days before turning on the system after floor tiling.
- ✓ Do read the separate installation and operating instructions for the thermostat (if applicable).
- ✓ Do ensure the joint between the cold tails and heating cable is beneath the tiles

#### Don'ts

- × Don't place tools or stacks of tiles on top of cable.
- × Don't place the heating mat under the location of any fixed furniture (this causes heat buildup that could damage the cable and void warranty).
- × **Don't** place cable closer than 100mm near any pipes.
- × **Don't** turn on the heating mat/cable while it is rolled up or still on the drum.
- Don't overlap, cross over, fold, cut, splice, shorten, or modify.
   If heating cable in the mat is damaged, the complete mat must be replaced.
- × **Don't** cross the sensor wire over the cold wire or heating cable.
- x Don't bend the portion of the cable where cold wire and heating cable are factory connected.
- × Don't use the cable mat on walls or ceilings.
- × **Don't** staples to secure heating cable to the subfloor.
- × Don't install the mats and cable over expansion joints.
- × Don't install the mat upside down.
- × Don't allow the wires to cross or touch.
- × **Don't** cut tiles over the heating cable.

## 4. Tools and Materials required.

You will require the following items to install and test the floor heating system:

- Ezyheat.com heating mats, correctly sized and selected see selection guide on ezyheat.com for guidance on measuring and sizing.
- External floor sensor and thermostat.
- Digital muti-meter or ohmmeter to perform resistance testing of the floor heating cable.
- Scissors-to cut the fiberglass (red) mesh.
- Measuring tape & pencil to measure and mark on the subfloor location of mats as well as any fixtures, obstacles etc.
- Chisel with hammer to create a groove in the subfloor for the installation of cold tail lead and sensor if required.
- Wire strippers & screwdriver to prepare and connect the cold lead and power to the thermostat (power should be connected by a qualified electrician in accordance with AS/NZ3000).
- Other materials to secure the ezyheat.com mats to the floor as required.

# 5. Before Commencing - Measuring Resistance

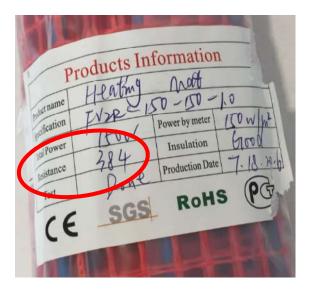
Before commencing, unpack the contents of your ezyheat.com kit to ensure all the components are supplied (see section 2).

Perform an insulation and resistance test to ensure the cable has not been damaged during delivery, a digital multimeter (or ohmmeter) with alligator clips (or equivalent testing leads) is needed.



Its good practice to perform a resistance and insulation test of the ezyheat.com heating mat prior to installation (out of box), after installation on floor surface and after the floor surface (tile) is installed.

The value of resistance should be close to the value printed on the label before unpacking the heating mat (see picture here).



## 6. Prepare the Subfloor for Installation of Heating Mat

The subfloor must be dry, smooth, and clean prior to mats installation.

Thoroughly sweep and/or vacuum the floor to remove any dirt, dust and debris that may damage the cable and interfere with installation. Make sure there are no nails, screws or other sharp objects that may damage the cable.

If the floor is uneven, consider using a floor levelling compound.

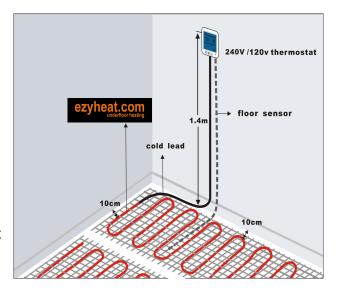
Using your measuring tape and pencil/marker, draw the outline of the mats layout on the floor, including all obstacles, fixed furniture, fixture, floor drains, etc. For ease of installation draw arrows pointing the direction of mat runs across the floor.

Ezyheat.com underfloor heating can be laid above the subfloor either in screed or directly under tiles. When using in a bathroom application the underfloor heating is laid above the water proof membrane, be careful not to penetrate the membrane when fixing the underfloor heating mat to the subfloor.

## 7. Locate the Thermostat

Select an appropriate position for the wall mounted thermostat, this should be in accordance with local electrical installation rules as this position is where the power will be supplied to your thermostat and heating mat.

This location should be easy to reach and accessible. This position will be where the cold tail (blue/grey/black) cable is recessed into the wall to meet the back of your thermostat and be the starting position of your cable mat.



Make a small hole in this location on the wall to route your heating cable and external thermostat cable from the floor.

## 8. Heating Mats Installation

From the position at the base of the wall under the thermostat location, route the blue cable up the wall along with the external thermostat cable. It may be useful to have a conduit installed in the wall prior to any wall coverings.

Pull the cable through the opening in wall and connect the Installation cable tester (black box) to the cables (red connects to brown/red – active, black/blue





connects to blue - neutral, green connects to green - earth).

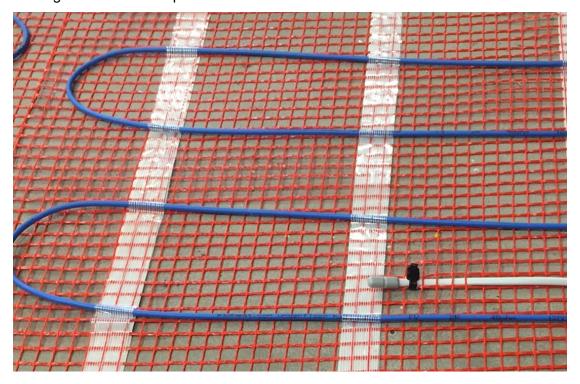
Turn the tester on, a red light will illuminate, if the alarm sounds then the cable has been compromised by either short or loss of circuit or damage to the circuit.

From the same position at the base of the wall under the thermostat location commence rolling out the cable and mat (red mesh and blue cable). The mesh should be located with the blue cable facing up.

If required, chisel some of your subfloor to recess the cold tail joint into the floor.

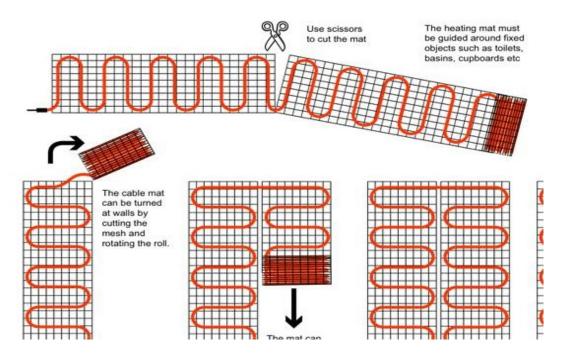


Locate the external sensor between one of the coils of the heating mat as per this picture (white cable between blue cables), do not overlap the external sensor with the heating cable as the temperature measure will be inconsistent.



Start rolling out the first section of the mat in the direction of your outline (per step 6).

Avoid any obstacles on the floor by cutting the red mesh (be careful not to cut the blue cable). Also cut the red mesh to change direction of the mat. Keep the mat approx. 100mm away from the walls.



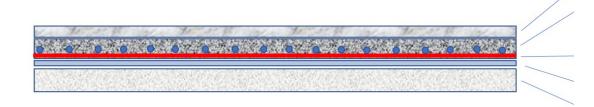
The adhesive backing (white strips) can be used to secure the mat to the subfloor, if required use tape or plugs (nylon anchors) to secure to the floor, do not staple, cut or damage the blue cable, remember securing to the floor is only required to keep the mat in position while the tiles or flooring is laid on top of the mat.



Once installation is complete, perform another insulation and resistance tests to confirm the mat is not damaged.

## 9. Floor Installation

Ezyheat.com underfloor heating can be placed under tile either in screed or directly under the tile in glue.



When applied directly under tile, be sure to build the glue up to ensure a consistent level finish and cover all the cable mat and cold tail, use a flexible tile adhesive and grout.

When applied in screed, be sure to have a consistent mortar (screed) bed covering the heating mat to allow for a level finish.

Ezyheat.com also has systems suitable for under wood and laminate – check with your floor manufacturer when applying to wood or laminate floors.

Using self-leveling compound (optional for all flooring systems). This method can be used for all types of flooring to build up the surface for a consistent level finish.

During the laying of the tile, be sure not to damage the cable with the trowel or any other tool.

Allow at least one week for the floor to cure before making electrical connections and switching on the underfloor heating.

## 10. Thermostat Installation

The connection of power to the thermostat should be undertaken by a qualified electrician in accordance with AS3000 and relevant industry codes.



On the back of the thermostat there are 6 connections as follows.

- 1 active connection to heating mat (red/brown)
- 2 neutral connection to heating mat (blue/black)
- 3 neutral connection to power
- 4 active connection to power
- 5 brown connection to external thermostat sensor
- 6 blue connection to external thermostat sensor cable

To attach the thermostat to wall, either silicon directly to wall tiles or detach the back of the thermostat and screw to the wall.



**WARNING:** Power supply to the thermostat must be turned off prior to making any electrical connections.

The total maximum current connected to the thermostat should not exceed16 AMPS.

After all the electrical work is complete, power up and test the system.

## 11. 10 Year Limited Warranty

For a period of 10 years from the date of purchase and subject to the conditions, limitations, and exclusions in this guide, ezyheat.com warrants that its heating mats, heating cable, thermostat will be free from defects in material, design and workmanship.

ezyheat.com reserves the right to make changes to the products design and pricing, as well discontinue them without obligation to replace or upgrade any existing products with new ones.

In order for the warranty to apply, products must be installed in accordance with this version of the ezyheat.com installation guidelines, electrical connections are to be made by a qualified licensed electrician in accordance with all applicable local and national electric and building codes and only for the purposes designated by ezyheat.com. This warranty shall apply only to products that have been properly stored, handled and tested for defects before during and after installation.

ezyheat.com does not warrant:

- Any products other than ezyheat.com supplied products.
- Product failures caused by other malfunctioning or defective products from other manufactures.
- Products damaged during installation, including, but not limited to cuts, kinks, scratches etc.
- System or products failures associated with defective flooring, subflooring or other building materials in the system.
- Damage to products from using inappropriate, incompatible or worn out tools.
- Damage from exposure to corrosive or otherwise incompatible chemicals
- Damage from a disaster, such as fire, wind, lightning, flooding, etc.

All reports of product failure must be accompanied by proof of purchase, original resistance measurement records and believed reason for failure along with the defective product, at owner's expense. Upon receipt of the products. Within a reasonable time period, ezyheat.com will conduct product testing and inspection. If the conditions of this warranty are met and the product is proved to be defective,

ezyheat.com will provide a replacement product free of charge.

ezyheat.com does not warrant the finished floor coverings, it's costs and the costs associated with removing or replacing it.

ezyheat.com warrants that the heat output in watts of its product is as stated on product labeling, or in the absence of such, in this installation manual, ezyheat.com disclaims all warranties as to the temperature level that the product, or the system in which it is installed, may produce.

ezyheat.com shall not be liable for any injuries, losses or damages whether direct, indirect, consequential or incidental, including, but not limited to damages from lost profits or sales, personal injuries, property damage and other losses arising from use or inability to use its products and the purchaser agrees that no other remedy shall be available to it.

## **Appendix A. Product Technical Data**



Technical Data Sheet: Under Tile/Concrete Floor Heating Mat Kit

Product Code: EZY-MA 150

Cable Type: Twin Copper Alloy Conductor

Voltage Rating: 220v-240v Power Rating: 150w/ psqm

Product Warranty: Heating Mat 12 years, Thermostat 10 years

Electrical Requirements: All electrical connections must be completed by

licensed electrician as per the AS/NZS 3000:2006 wiring rules

### Each kit contains:

1 x heating mat - blue heating cable, red fibreglass mesh

1 x LCD touch screen thermostat (black or white) with user guide

1 x external temperature sensor

1 x cable matt installation tester

1 x installation manual



Product	SQM	Mat size	Watts	KW	Amps	Voltage	Running Cost per h
EZY-MA 150-0.5	0.5	1.0 x 0.5m	75	0.08	0.31	240v	\$0.02
EZY-MA 150-1.0	1.0	2.0 x 0.5m	150	0.15	0.63	240v	\$0.03
EZY-MA 150-1.5	1.5	3.0 x 0.5m	225	0.23	0.94	240v	\$0.05
EZY-MA 150-2.0	2.0	4.0 x 0.5m	300	0.30	1.25	240v	\$0.07
EZY-MA 150-2.5	2.5	5.0 x 0.5m	375	0.38	1.56	240v	\$0.08
EZY-MA 150-3.0	3.0	6.0 x 0.5m	450	0.45	1.88	240v	\$0.10
EZY-MA 150-3.5	3.5	$7.0 \times 0.5 m$	525	0.53	2.19	240v	\$0.12
							40.40

## **Appendix B. Standard LCD Thermostat Guide**

# **Touch Screen Heating Thermostat Manual**



## **Product Summary**

This new design heating thermostat aims at market demand, it has large LCD display. Easy operation, complete functions. It can be control motorized ball valve, motorized valve, thermal valve, solenoid valve, heater, electric heating film, electric heating carbon crystal. It is used for floor heating.

## **Technical Data**

- Power Supply: AC200~240V, 50/60HZ
- Load Current: 3A(Water Heating); 12A/16A(Electric Heating)
- ♦ Accuracy: ±0.5°C
- ❖ Set-point Temperature Range: 5°C 60°C
- Limit Temperature Range: 5-99°C
- ❖ Consumption: <0.3W</p>
- Temperature Sensor: NTC
- Size: 86\*86\*17mm (H\*W\*D)

## **Features**

- ❖ Large LCD touch screen with blue backlight display and double temperature display mode
- Time display (minutes, hours, weeks)
- ❖ 6 period programmable controlling temperature setting
- Internal and external temperature sensor for choice
- Room temperature display precision is 0.5,inner precision is 0.1
- Setting temperature meet user's demand of room temperature
- Memory function when power failure, protect your setting from power failure
- Room temperature automatically calibration function

## **Button description**

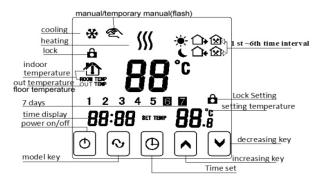
NO.	signal	Description				
1		on / off				
2	₹.	Mode key:switch over auto/manual time interval control and temporary manual,long press enter into time interval setting function				
3	(T)	Time setting:hours,minutes,weeks setting.				
4	^	Higher temperature setting, in Advanced Settings press♠ for parameter increased,in time setting press♠ for time increased				
5	>	Lower temperature setting, in Advanced Settings press ♥for parameter decreased ,in time setting press ♥ for time decreased				

## Function and display

- "2"manual control(temporary manual control when flashing, auto control when no this sign display);
- "(((," it is heating:

- "X" open anti-freezing function;
- "get up in morning,the first time interval; "Q" go out in morning,the second time interval;
- "Ivi" back home at noon, the third time interval; "Ivi" go out at noon, the fourth time interval;
- "1" back home at night, the fifth time interval; "1" sleep at night, the sixth time interval;

#### **Operation diagram**



### Time and time interval setting

#### 1)Time setting

Press time key"(♣"), time zone display minute, hour, week, press key"♠"or"▶"to adjust time.

#### 2) Time interval temperature auto control setting

First step,select time interval first,press "?" for 3 sec, screen display"LooP"(cycle control),then press "A",screen display"12345"(Monday to Friday control mode); press "A" for 2 times,screen display"12345"(Monday to Saturday control mode); press "A" for 3 times,screen display"12345.

Second step, time interval time and temperature setting, when screen display "12345" or "12345" or "12345" or "12345". The interval time interval temperature setting, press "\(\mathbb{C}\)" enter into time interval time setting, press "\(\mathbb{A}\)" or "\(\mathbb{V}\)" to adjust and save automatically. Note: when auto control "\(\mathbb{C}\)" will disappear, if need re-set temperature when auto control, can press "\(\mathbb{A}\)" or "\(\mathbb{V}\)" to adjust.

#### 3)Modify interval time control setting

Press"\C" first, then press "\C" switch to the time option to modify time of time interval.

## Time interval programming

Press menu key"\C",can enter into time interval setting,then press time key"\C"can enter into interval time setting.

Period		Icon Default Period Time		Default Period Temperature	
	1	- <u>`</u>	06:00	20°C	
Working Day	2	1.	08:00	15°C	
	3	15/1,	11:30	15°C	
	4	1⁄21.	12:30	15°C	
	5	1,	17:30	22°C	
	6		22:00	15°C	
Weekend	1	- 📜	08:00	22°C	
	2		23:00	15°C	

#### Note:

- 1,The factory default temperature value of time interval 3 and 4 are the same as period 2,please modify default temperature when it's necessary.
- 2,Setting temperature is "00", this time interval is shutdown.
- 3, View out temperature value (floor temperature)
- (1)touch screen version:when internal control temperature and external limit temperature(high temperature protection),under power on state, press time key not move first, then press on/off key together to switch and view external temperature (this time measure temperature display zone displays OUT TEMP temperature value), press time key to display room temperature;
- (2)Button version: when internal control temperature and external limit temperature(high temperature protection), under power on state, press mode key not move first, then press on/off key together to switch and view external temperature (this time measure temperature display zone displays OUT TEMP temperature value), press mode key to display room temperature;

#### Advanced Setting(suggestion:operated by technician)

(1)Touch screen version(HY03H-1,HY03H-2,HY03H-3 series):under power off state, first press "(\bar{\textsigma}", then press "(\bar{\textsigma}")" enter into advanced setting.

(2)Button version(HY-2B03H,HY-02B07H,HY-02B09H series):under power off state, first press "♥", then press "(↑" enter into advanced setting

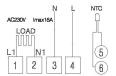
No.	Symbols	Setting Item	Parameter Setting Function	Factory Default
1	SEN	Sensor control option	0:internal sensor 1:external sensor 2:internal control temperature, external limit temperature	0:internal sensor
2	OSV	Limit temperature value of external sensor	5-99°C	42°C
3	dIF	Return difference of limit temperature value of external sensor	1-9°C	2°C
4	SVH	Set upper limit temperature value	5-99°C	35°C
5	SVL	Set lower limit temperature value	5-99°C	5°C
6	AdJ	Measure temperature	Measure temperature,check and calibration	0.5°C precision Calibration
7	FrE	Anti-freezing function	00:anti-freezing function shut down 01:anti-freezing function open	00:anti-freezing function shut down
8	POn	Power on memory	00:Power on no need memory 01:Power on need memory	00:Power on no need memory
9	FAC	Factory default	08:just display,no other meaning 00:Restore factory default	08

Note:hysteresis (return temperature) description:the factory default of external sensor limit temperature(OSV) set as 42°C, external sensor limit temperature hysteresis(dIF) set as 2,when temperature up to 44°C,relay stop output,when temperature drops to 40°C,relay output again and heating.(operation when room temperature lower than setting temperature)

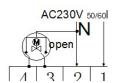
#### Sensor fault hint

Please select internal, external sensor working mode correctly. If it is choose wrong or sensor is fault (breakdown), LCD interface will display "Err", temperature controller stops heating until fault is eliminated. Special Hint: installation cable Please select: water heating selects 1.5-2.5 mm2 rigid line; electric heating select above 2.5 mm2 rigid line.

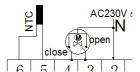
## Power wiring diagram



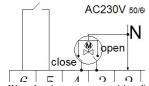
Electric heating wiring diagram



Water heating no external sensor wiring diagram (do not connect terminal "close 4" of electric valve)



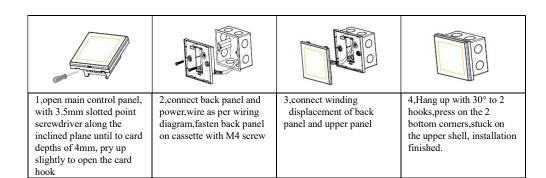
Water heating wiring diagram (do not connect terminal "close 4" of electric valve)

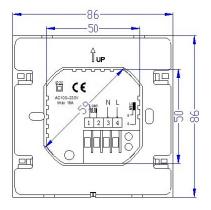


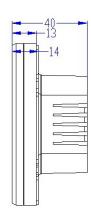
Water heating no contact wiring diagram (do not connect terminal "close 4" of electric valve)

#### Installation

Warning:please wiring right strictly according to the wiring diagram,do not make water,mud and other debris into the thermostat,otherwise it will cause thermostat damage!



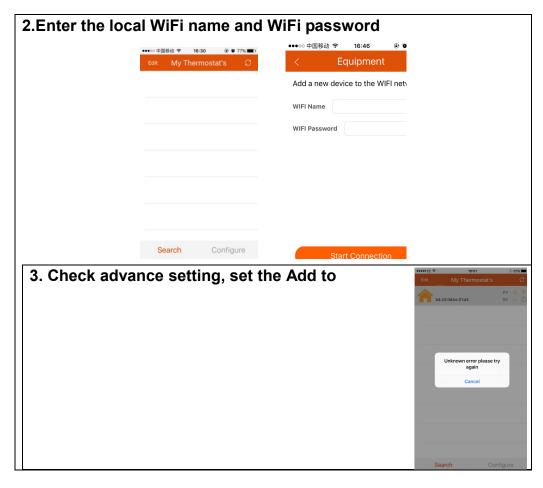


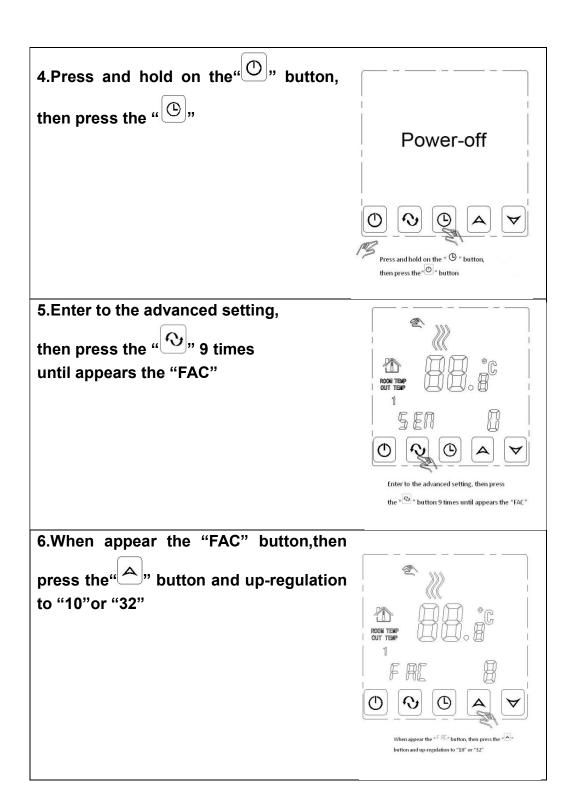


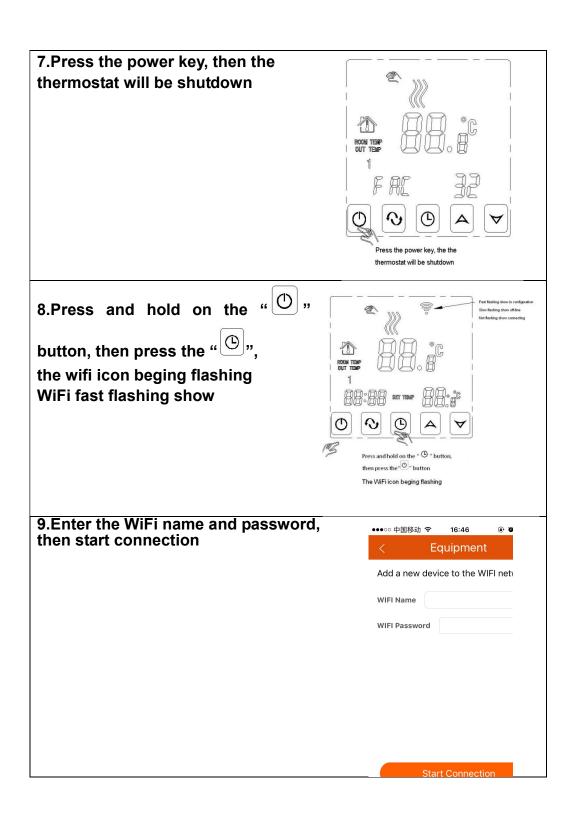
# Appendix C. Optional WIFI LCD Setup

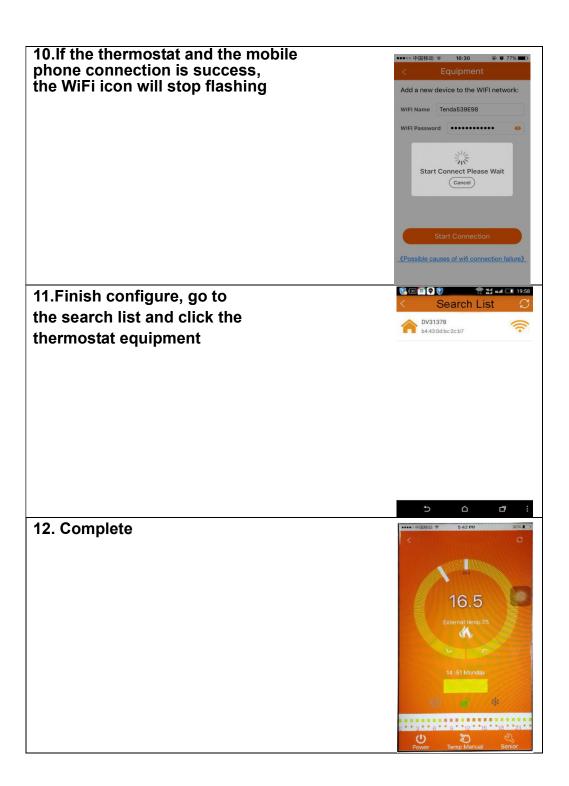
WIFI application and configuration.











# Appendix D. Trouble Shooting – FAQ

- Q1. What should I do if the cable mat is too long for my room?
- A1-1. Firstly, it is not advisable to cut or shorten the heating cable, where possible return the cable mat and exchange this for the correct size.
- A1-2. If the cable mat is too long, the cut the blue cable away from the red mesh and coil the cable over a smaller area, be sure not to overlay the cable and try to keep a small gap to avoid excessive heat buildup.



- Q2. Can I install multiple mats connected to the one thermostat?
- A2. Yes, you can install multiple mats in parallel to the same thermostat controller, be sure not to exceed the 16AMP rated current of the controller, alternatively you may require the installation of a contactor.
- Q3. I have installed the mat and my electrical connections, however I cannot seem to get my heating mat to warm the floor?
- A3-1. Have your electrician double check the electrical connections at the back of the controller and test the power circuit, circuit breaker to ensure power is to the controller.
- A3-2. When first using the heating mat the period of time for the heating mat to warm will take longer, the speed at which the heat reaches the surface will depend on the size and type of your flooring and installation method.
- A3-3. If you are reading the thermostat be sure that it has been configured for the external temperature sensor, the default setting is for ambient temperature as opposed to floor temperature, change the setting on the thermostat to read the external sensor which is in the floor. See advanced settings on the controller guide option 1.
- Q4. Do I need a separate electrical circuit?
- A4. Per AS/NZ 3000 heating systems require a dedicated circuit, please consult your electrician before installing the heating mat to appropriately size the heating circuit.

Q5. What size will my electrical circuit be?

A5. Depending on the size of the heating mat selected will determine the size of the current load, see product technical data for size and power output, please consult your electrician before installing the heating mat to appropriately size the heating circuit.

Q6. Can I install the heating mat in the shower?

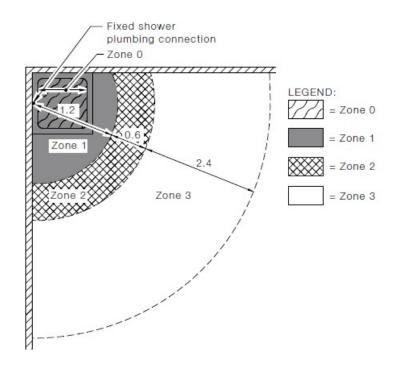
A4. Per AS/NZ 3000-2007 section 6.2.4.5 (b) underfloor heating systems can be installed under shower areas in zone 1,2,3. Note the cold tail (end of heating mat) and thermostat need to be installed away from the shower in accordance with Zone 2 rules i.e.; out of reach.

Please check with your electrician before installing under a shower area.

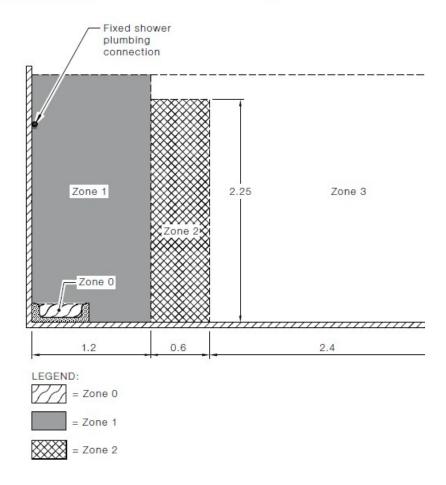
## 6.2.4.5 Other electrical equipment

The following conditions shall apply to the installation of a other electrical equipment in classified zones:

- (a) Zone 0 Appliances and other electrical equipment insta shall be—
  - designed and constructed specifically for use in a bawater container; and
  - (ii) provided with the required degree of protection; and
  - (iii) supplied—
    - (A) from a source located outside Zone 0; and
    - (B) at a nominal voltage not exceeding 12 V a.c. of free d.c.; and
    - (C) as an SELV or a PELV system, in acc Clause 7.5.
- (b) Zones 1, 2 and 3 Appliances and other electrical equips in Zones 1, 2 and 3 shall be provided with at least the re-



AS/NZS 3000:2007



# 4.10 ELECTRIC HEATING CABLES FOR FLOORS AND CEIL TRACE HEATING APPLICATIONS

#### 4.10.1 General

Cables for electric heating systems in floors and ceilings heating applications shall be of a type specifically designed purpose. The heating equipment shall be installed in accordant the manufacturer's instructions.

NOTE: In New Zealand, additional requirements for underfloor heating cables are detailed in NZS 6110.

#### 4.10.2 Heating cables

Heating cables shall be so installed that they-

- (a) are not in contact with flammable materials; and
- (b) where designed to be embedded-
  - are completely and adequately embedded in the subs are intended to heat; and
  - (ii) do not suffer any detrimental effect because of

AS / NZ 3000 - 2007 extract