



Sterling Power Products

THERM : Air Conditioner Range

Handbook

THERM2800



www.sterling-power.com
www.sterling-power-usa.com
Warranty (2 years return to factory)





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Sterling use of language You'll note throughout the reading of this manual that a lot of the text may be considered cordial and more friendly than perhaps is the norm for technical manuals. We have attempted to balance accessible writing with technical accuracy. We believe this will allow it to be most easily read and understood- as some overly technical manuals can be opaque, unreadable and painfully boring to installers- who may then just end up ignoring them entirely.

Manual preface Please take your time to read and fully understand the contents of this Handbook. These guidelines are developed with your safety and the products performance in mind and failure to follow or understand these guidelines may lead to voiding the product warranty or even leading to damage or injury for you or your setup.

If you are unsure of any step or guideline then please consider reaching out to Sterling via our web contact form or our phone service and we shall offer our support.

THERM Air Conditioning Summary This item is an air conditioning/thermal control unit designed to fit on the roof of motorhomes or boats. It is also designed to operate on either 12V or 24V batteries - and this is dictated by model. Do not use a 12V unit on a 24V battery bank and vice-versa. Double check your model now before continuing.

How to use this manual This manual must be read throughout before installing this electronic device. Do not lose these instructions - keep them safe. The most up to date instructions can be found on sterling-power.com. Please refer to the latest instruction manual before contacting Sterling. At Sterling, we endeavour to include all of the product information that we can think of into the manual.

To easily browse the manual, you'll find 'chapters' or rough page summaries at the top of each page and at the bottom right of each page. Then, down the left hand side of each page you will find individual sections of each page- followed by the actual paragraph writing to the right of each section. If you are looking for explicit information and don't know where to find it, flick through until the bottom right 'section' lines up with what you want to find, scan the left hand summary to find the relevant area- then read to the right.

Being safe Installation of the electronic device must be carried out by qualified and trained personnel only. The personnel must be familiar with the locally accepted guidelines and safety measures. Your safety is Sterling's top priority. Please follow all precautions to keep yourself safe. If you believe your unit requires repair then please contact Sterling or your distributor. Do not attempt to service the unit yourself.



SAFETY AND LEGAL LEGAL GUIDELINES

Warranty and Terms

Your 100 % satisfaction is our goal. We realise that every customer and circumstance is unique. If you have a problem, question, or comment please do not hesitate to contact us. We welcome you to contact us even after the warranty and return time has passed.

Each product manufactured by Sterling Power comes with at least a 2 year limited factory warranty. Certain Products have a warranty period of time greater than 2 years. Each product is guaranteed against defects in material or workmanship from the date of purchase. At our discretion, we will repair or replace free of charge any defects in material or workmanship that fall within the warranty period of the Sterling Power product. The following conditions do apply:

- The original receipt or proof of purchase must be submitted to claim warranty. If proof cannot be located a warranty is calculated from the date of manufacture.
- Our warranty covers manufacture and material defects. Damages caused by abuse, neglect, accident, alterations and improper use are not covered under our warranty.
- Warranty is null and void if damage occurs due to negligent repairs.
- Customer is responsible for inbound shipping costs of the product to Sterling Power either in the USA or England.
- Sterling Power will ship the repaired or warranty replacement product back to the purchaser at their cost.

If your order was damaged in transit or arrives with an error, please contact us ASAP so we may take care of the matter promptly and at no expense to you. This only applies for shipping which was undertaken by our company and does not apply for shipping organised by yourself. Please do not throw out any shipping or packaging materials. All returns for any reason will require a proof of purchase with the purchase date. The proof of purchase must be sent with the returned shipment. If you have no proof of purchase call the vendor who supplied you and acquire the appropriate documentation.

To make a claim under warranty, call our customer care check telephone numbers on www.sterling-power.com or www.sterling-power-usa.com. We will make the best effort to repair or replace the product, if found to be defective within the terms of the warranty. Sterling Power will ship the repaired or warranty replacement product back to the purchaser, if purchased from us.

Please review the documentation included with your purchase. Our warranty only covers orders purchased from Sterling Power. We cannot accept warranty claims from any other Sterling Power distributor. Purchase or other acceptance of the product shall be on the condition and agreement that Sterling Power USA LLC and Sterling Power LTD shall not be liable for incidental or consequential damages of any kind. Some states may not allow the exclusion or limitation of consequential damages, so, the above limitations may not apply to you. Additionally, Sterling Power USA and Sterling Power LTD neither assumes nor authorizes any person for any obligation or liability in connection with the sale of this product. This warranty is made in lieu of all other obligations or liabilities. This warranty provides you specific legal rights and you may also have other rights, which vary from state to state. This warranty is in lieu of all other, expressed or implied.

Copyright and Plagiarism

Copyright © 2024 Sterling Power. All rights reserved. Reproduction, transfer, distribution or storage of part or all of the contents of this document is strictly prohibited. If you wish to use all of this document, or excerpts from it, Sterling Power must be contacted.

Liability

Sterling Power can not accept liability for:

- consequential damage due to use of this device
- possible errors in the manuals and the results thereof

Device Modification

Please do not modify the device unless you have been instructed to do so by Sterling Power directly. Product modification shall be done at Sterling when needed. Warranty shall be voided if personal attempts are made to modify the device without Sterling's approval.

Installation Laws

The installer and the user are liable for ensuring the item is properly and legally installed and suitable for use in whatever territories and conditions it is expected to operate in. Improper use of the item, improper understanding of the item, improper installation of the item etcetera do not reflect on Sterling or make Sterling liable.



STERLING
POWER

SAFETY AND LEGAL SAFETY GUIDELINES

Product Guidelines

Your Sterling Power product should only be utilised for its designated purpose. If you do not feel capable to install an AC item correctly - DO NOT. If there are any doubts about the install - get it professionally installed.

Ensure that the mains supply and battery leads are disconnected before transporting or moving the unit. No liability can be accepted for damage in transit once equipment has been unpackaged. Store the product in a dry environment, between -20°C to 60°C .

Transport and Storage

Refer to the battery manufacturer's manual for information on transportation, stowage, charge rates, recharging and battery disposal for your batteries. Sterling cannot be considered an authority on your batteries.

General Maintenance

The device must be switched off during maintenance and all cables removed from the direct feed to or from the unit. It must also be protected against unexpected switching off. Remove battery connections and ensure unit is off. If repair is required, only use original parts. Unauthorised attempts to repair Sterling units will lead to the warranty being voided. Only someone with adequate understanding of electronics and the unit itself should attempt a repair. Ensure your connections are good and clean and aim to protect your unit from humidity and water ingress. All contacts should be checked intermittently. Damage that occurs from improperly maintained contacts are at fault of the user.

Safety Precautions

Electrical appliances can be heavy. Please do not lift heavy units unassisted. Ensure that your product is correct for your system, voltage thresholds are crucial. Orientation is not critical to unit function, however may affect water ingress rating. Install device in a well ventilated space for cooling purposes. Do not expose the unit to snow, rain, water, spray, condensation, pollution etc, unless it is a waterproof unit. If it is a waterproof unit, only expose it to situations it is correctly rated for. Do not cover or obstruct the ventilation. Device connects to common negative. Common negatives must be earthed. In case of fire, use fire extinguisher equipment suitable for electrical fires. Avoid all possibilities of reverse polarity or short circuiting. Check cabling and connections frequently and ensure the connections are sufficient. Always protect DC cabling with the appropriate fusing. Ensure the unit is adequately and safely mounted to prevent displacement and damage. Always use a professional to install electrical products. Ensure the product is correctly set up for your battery. Keep out of reach of children

WARNING : Do NOT remove the panelling to inspect the internals unless expressly told to by Sterling. This is not a product designed to be user-serviced.

WARNING : Do NOT use the device in situations where there is danger of gas / dust / vapour explosions, or around potentially flammable produce.

The THERM is a heavy unit. Do not install alone, and do not install if you do not feel comfortable with the full install process. Do not lift unassisted.



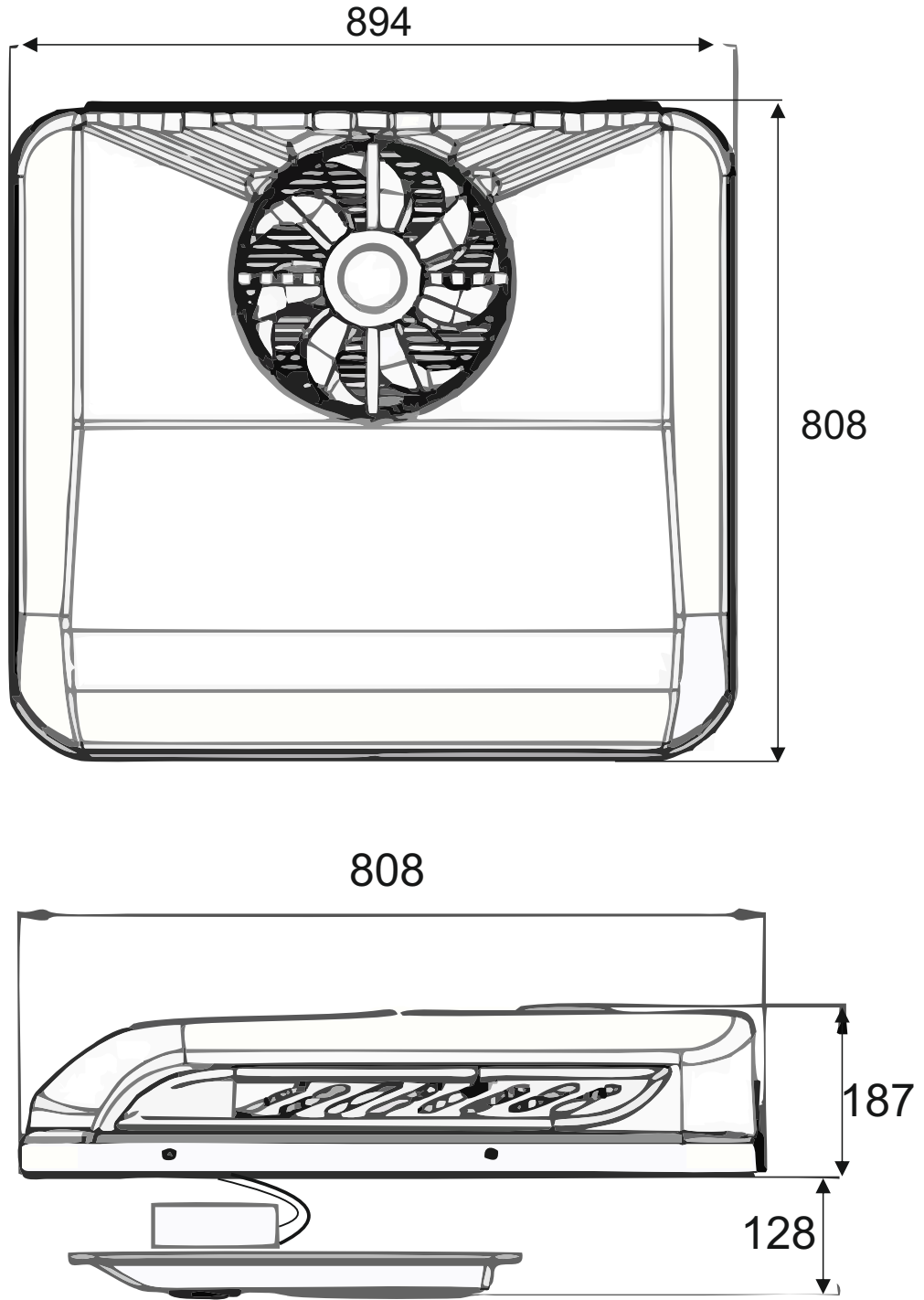
SPECIFICATIONS FOOTPRINT AND SPEC SHEET

Specifications and technical data

Rated Cooling Capacity	600W-2800W / 9660BTU	
Operating Voltage	DC - 12V	DC - 24V
Current draw	35A-65A	20A-40A
Power	300W-960W	
Volume of air moved	450m3/h	
Operating modes	Fan mode / Eco mode / Hi-Power mode	
Noise	<60 dBa	
Refrigerant	R134A---600g	
Dimensions(mm)	894*808*187	
Air outlet plate height	40mm	
Weight	28kg	
Intended use	General use, designed to fit into common vehicle skylights as found on caravans and motorhomes, but can be used anywhere that can meet the requirements.	
Minimum skylight	330*330mm	
Maximum skylight	400*400mm	
Integrated protections	Low voltage and high voltage protection for the DC circuit, automatically detects coolant leaks.	
Minimum recommended battery capacity	Minimum ~180Ah at 12V, 100Ah at 24V.	
General battery advice	<p>Recommended to not run off of your starter battery, to insulate you against accidentally discharging the battery and not being able to get back in motion.</p> <p>LiFePO4 leisure batteries are recommended due to their high cycle life and full depth of discharge capabilities.</p> <p>Ensure your charge system is suitable for Lithium batteries. Ensure that if you make modifications to the cable that the contacts are sound throughout. LiFePO4 recommended due to their repeated depth of discharge, so long the battery is managed correctly by a capable BMS.</p>	

SPECIFICATIONS FOOTPRINT AND SPEC SHEET

Dimensions (mm)



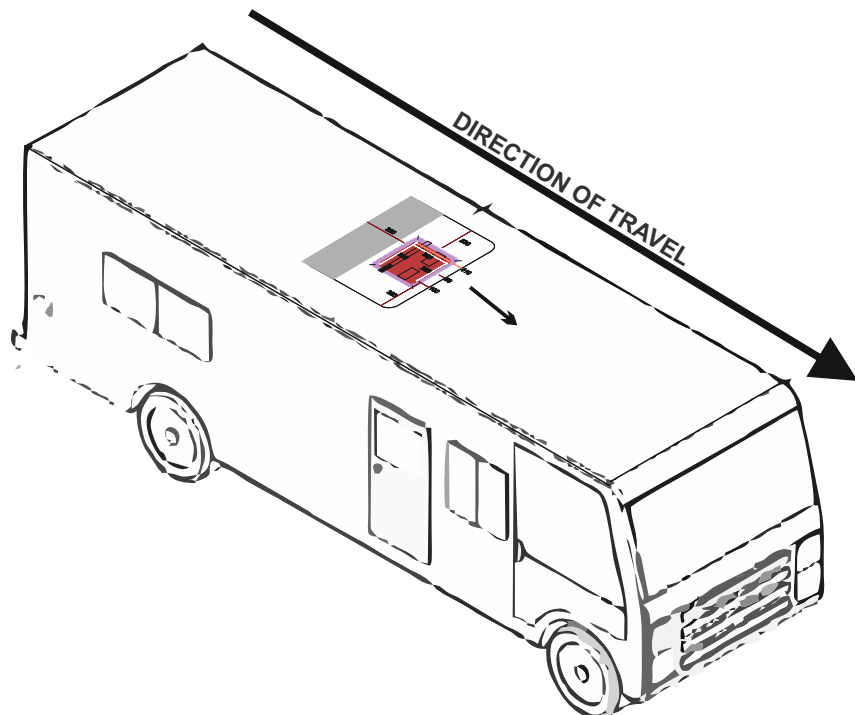
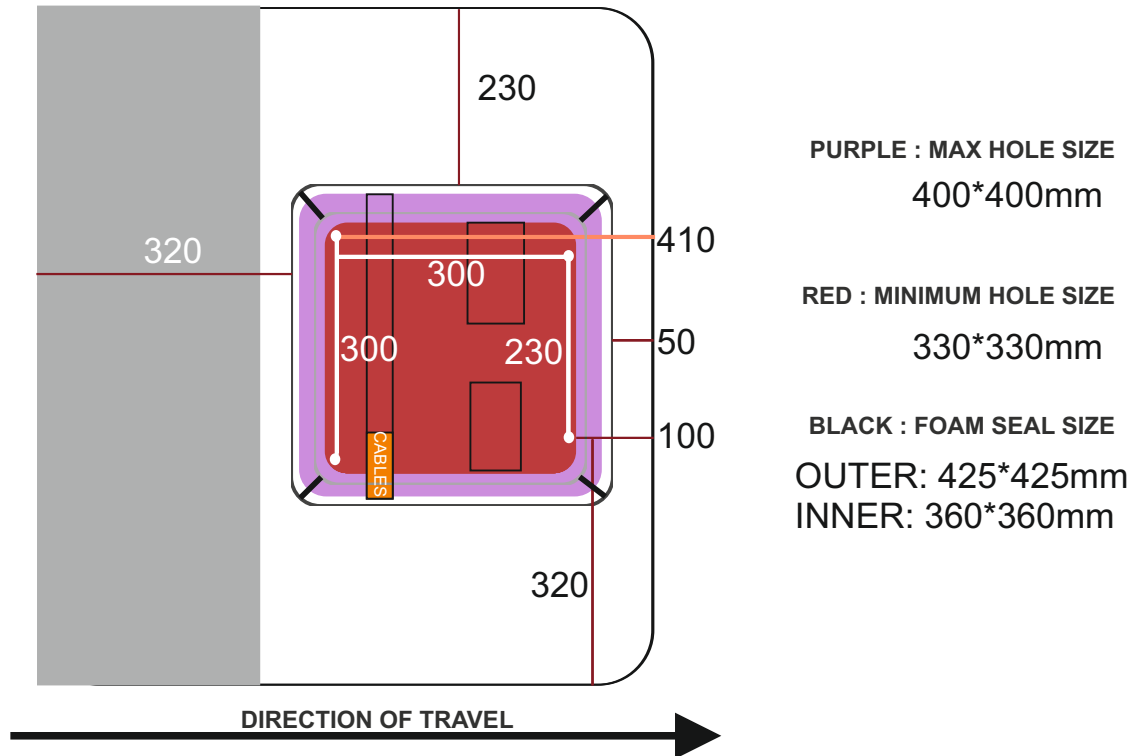
SPECIFICATIONS ROOF/SKYLIGHT VENTILATION

Skylight measurements

The intended skylight measurements/ventilation duct for the THERM2800 is a range between
 MIN : 330 * 330
 MAX : 400*400

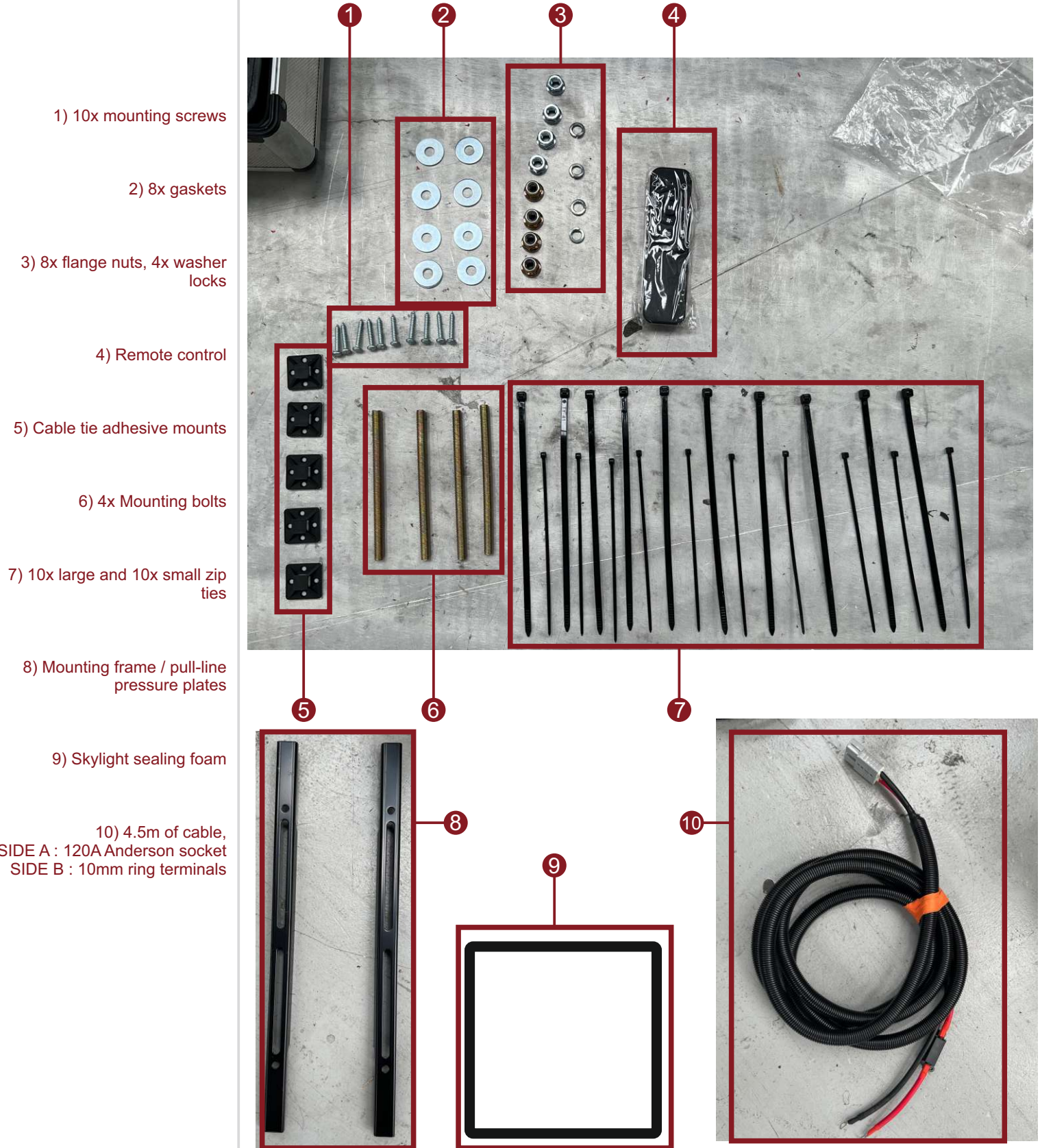
The 'smooth' front of the THERM2800 (where the logo is) should face the direction of travel.

If your skylight hole does not fit within that range, the skylight will need a frame constructed to limit it to the above range, or additional space will need to be cut in order to make it fit.



FIRST OPENING ITEM INVENTORY

Contents of the 2800: When you open up the Therm 2800 for the first time, you'll be welcomed with almost everything (apart from tools) that you'll need to undertake the install, as photographed on our steel worktable. I'll list everything (apart from the fairly obvious massive air conditioning unit, and its associated panel) for easy confirmation.



1) 10x mounting screws

2) 8x gaskets

3) 8x flange nuts, 4x washer locks

4) Remote control

5) Cable tie adhesive mounts

6) 4x Mounting bolts

7) 10x large and 10x small zip ties

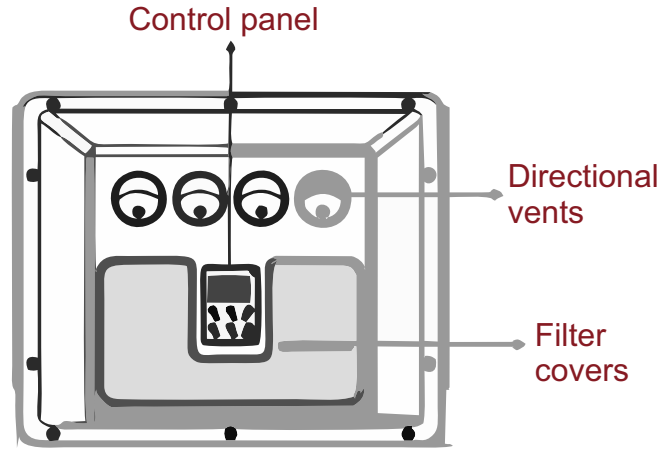
8) Mounting frame / pull-line pressure plates

9) Skylight sealing foam

10) 4.5m of cable,
SIDE A : 120A Anderson socket
SIDE B : 10mm ring terminals

FIRST OPENING CONTROL BREAKDOWN

Interior control/filter panel



Control panel and remote controls

1) Infra-red receiver for remote

2) Screen display
Displays the current events

3) Toggle operating modes (remote) Or select them directly (Auto, Cool, Eco, Fan).

4) ON/OFF power switch

5) Toggles through the various fan speeds

6) Air con targets 26°C (Optional heater needed)

7) Adjust the 'target temperature'

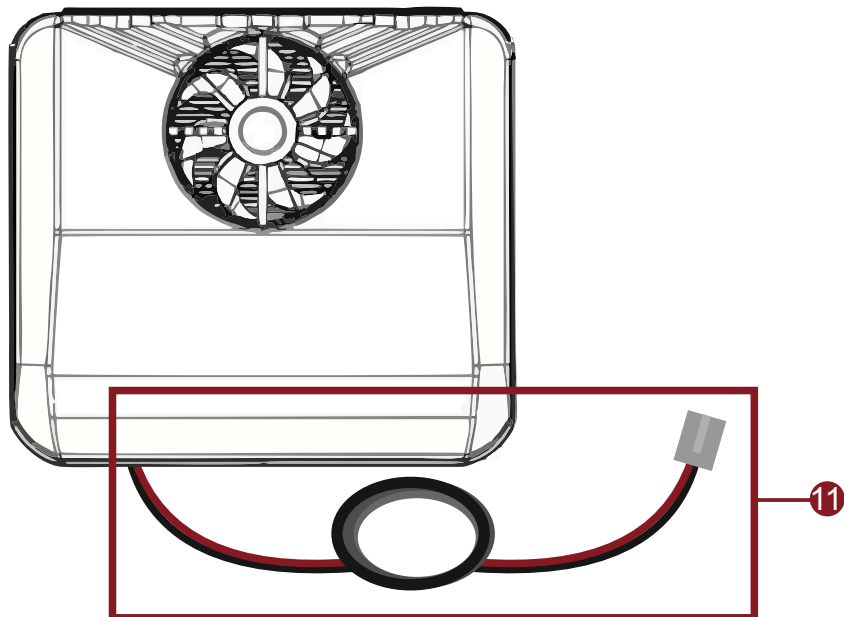
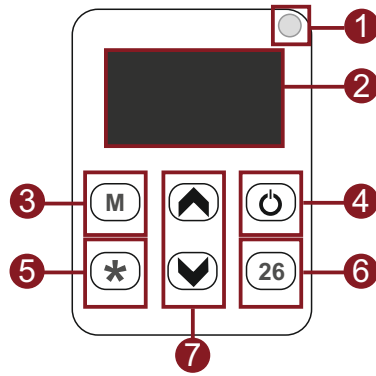
8) Run air-con on a limited time setting (0.5Hrs to 10Hrs configurable with the T- and T+ buttons)

9) Toggles between max and min temperatures (0°C and 20°C)

10) Displays battery DC voltage on the control panel screen

11) 4.5m power cable with 120A Anderson socket

(For connecting to the other battery power lead on the previous page)



INSTALL BEGINNING THE INSTALLATION

Installation Intro

The THERM2800 was designed with a **360mm*360mm/14"*14"** ideal base in mind. This took some consideration as we wanted to ensure it would be suitable in the broadest range of installs. We're aware that the common UK market is 400mm*400mm, but we're also aware that this is not always the case in all of our markets- and it's often easier to fill excess space than it is to perhaps cut new space.

Check your skylight dimensions (if you have one!)

With that in mind- take those measurements and go measure your skylight. It may be worth drawing up a brief diagram of how everything is going to fit, as it is going to be frustrating for you if you embark on the install and realise that you need additional materials and have to cancel the install.

If your skylight is 360mm*360mm, this is going to be about as simple as it can be. If it is larger, you may need to fill some of that frame with structurally sound material. Timber or metals are all valid, so long as you trust that the install is going to be safe and sound to support the weight of the unit until you move on to the next vehicle (and hopefully bring us with you!).

If your skylight is smaller- or, very possibly, you don't have a skylight and you're just in a box, this hole will need to be cut. Also- this is designed to fit on the roof of your install, ie gravity pulling it flatly down. Inverted installs and vertical installs (like on a window) are against the operating limits of this item - and will just be a bit silly.

Installation begin

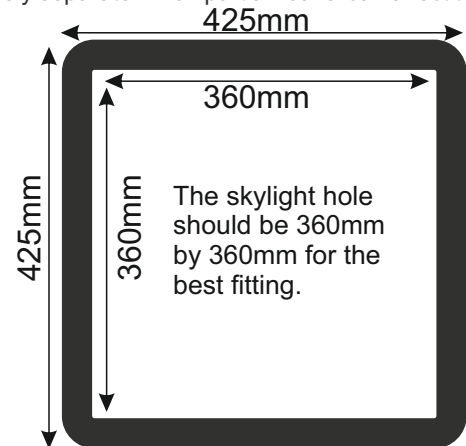
Once we know we can install the item... So, let's.

1) Clean the installation area

Clean the surroundings on both the inside and outside of the install cut area. This is vital for a number of reasons- Ensuring adhesion, ensuring there are no breaks to the seal, ensuring nothing is going to deteriorate the install over time are all things we need to be sure of. There's no reason to install something twice.

2) Apply sealing/mount foam

Once we're certain the install area is sound, we need to apply the sealing foam around the hole. The purpose of this is to give the air conditioning unit a stable and supportive base- but, more importantly, to ensure that each environment (the inside and the outside) are kept entirely separate. Even partial 'leaks' can affect the ability for us to control and dictate the temperature inside.



2) NOTE 1

You may want to reinforce the adhesion already on the underside of the foam with something like a silicone adhesive. There are more powerful adhesives on the market, but if you do ever decide to replace the install you do not want the removal of the foam to be a messy and destructive job. Silicone tends to offer great air-sealing and is removable fairly easily if needed.

2) NOTE 2

Do not allow the skylight foam to be wrinkled or to raise off the seal- this will affect waterproofing, and nobody wants to be dripped on.

Wait until foam secure in place

Once it is in position- wait until it is secured in place. Adhesive, if added, may take time to set. Now's a great time to get that well earned cup of tea. You'll need the strength for the next step.

3) Position the air conditioning unit onto the mounting foam

This next part is fairly simple- but we do not advise you to do so alone due to the weight of the item. You will need to manoeuvre the air conditioning unit into position, dropping the under-body onto the hole so that the cables feed through and the padded area is clearly accessible from below. This is towards the 'front' of the unit.

I should also note that you should **direct the aerodynamically curved part of the air-con (IE where our logo is) towards the front of the vehicle/vessel**, that curve is to allow ease of airflow over our unit while you are driving. On the economical side, this ensures your Miles Per Gallon (MPG) is minimally affected.. On the logical side, it ensures you're not putting way undue stress on the install whenever you're in motion.

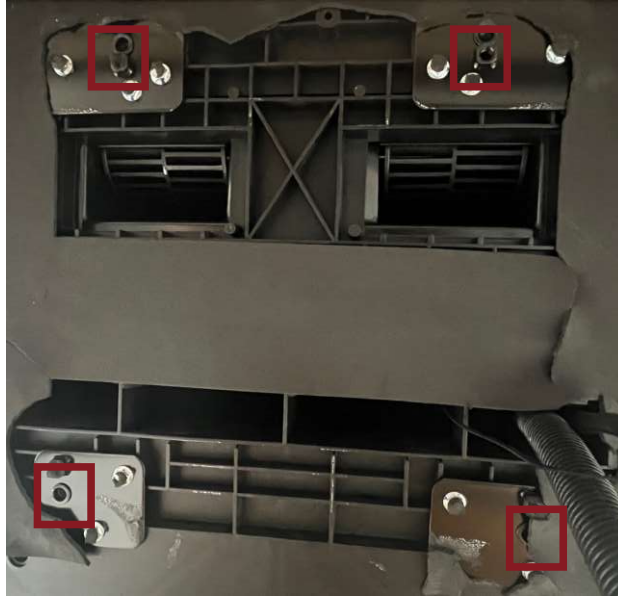
Don't dismiss your helper yet, as you may need to adjust the precise orientation for the next step.

INSTALL SECURING THE INSTALL

4) Adjust air-con position until all four bolt positions are clearly accessible and in-line

With the air-conditioning unit largely in place, it needs to be secured. You will need the mounting brackets (item number 8 from the packing list) and the bolts (item numbers 3 and 6). You may also need to have your helper move the unit to make sure that all the upcoming bolt-holes are accessible (which we will locate next).

Hopefully the Air-con is in the right place and, from the inside looking up, you'll see something like this.



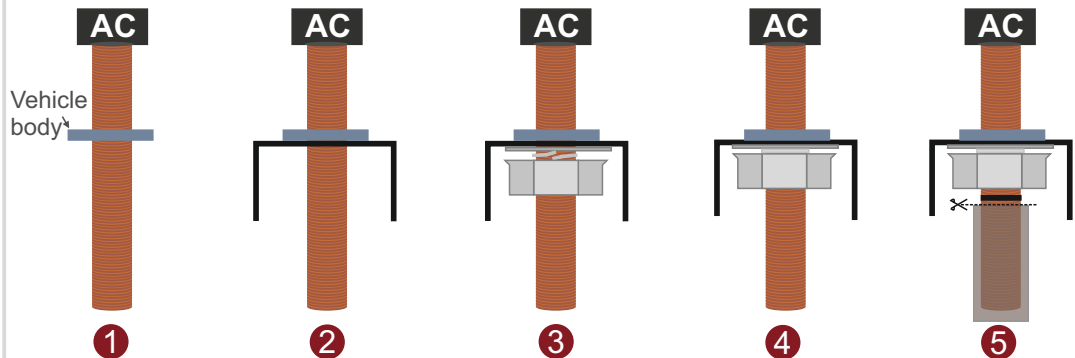
Highlighted with red squares are the four locations where the bolt-holes for the inside mounting plate are located. You'll need to remove some of the foam protective padding to gain access to them, but the above image should help guide you.

Once located, ensure that all four are accessible and lined up with the shape of your mounting hole- and insert the four brass screw-rods, turning clockwise until they reach the end of their housing (IE- stop turning. If they seem to stall on the ascent, give it a slight bit of movement side to side while turning and it should continue turning). These post positions can, to a degree, be moved if you move the plates in which they sit- but we wouldn't generally advise this.

Once all four are in place, we need to start adding the two plates (item 8 in the packing list)- which, at a glance, may not be an obvious process and will require a bit of coordination to get right.

There may be some variations in what works specifically for your install

- 1) Ensure and verify that the bolt is secure into the AC housing, and cannot be further tightened (within reason)
- 2) Apply the mounting brackets, with the flat side pressing against the vehicle body.
- 3) Apply a washer, the turn-lock, and the silver nut until 'snug' by hand
- 4) Tighten the nut with a 13mm spanner until it can no longer be (reasonably) hand tightened.
- 5) If you have too much excess bolt for your install- trim to fit.



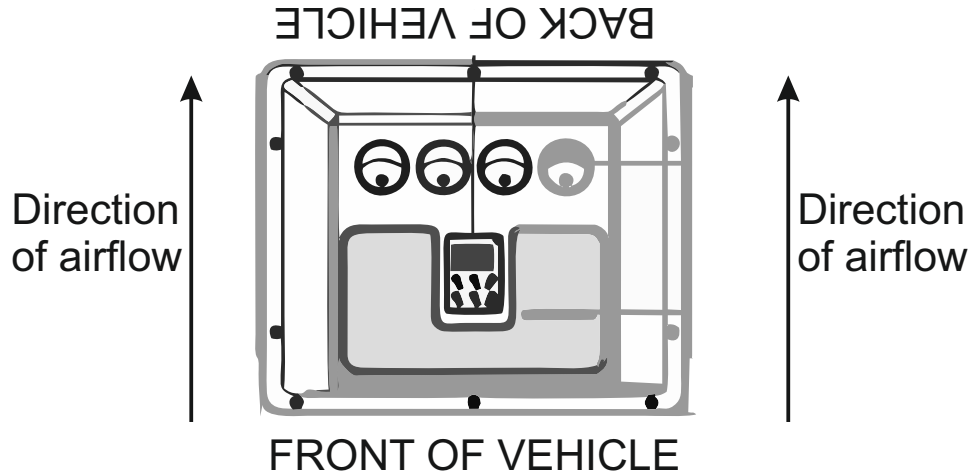
INSTALL FINISHING INSTALL AND OPERATIONS

Mounting the control panel

We're most of the way there. Route the power cables down roughly the path you want them to take (that decision is entirely yours...) and go get the control panel. You'll see that the control panel has two free contacts, as does the air conditioning unit on the roof. These will need bonding together before you mount the panel fully.

Panel orientation

The panel, for best efficacy, should face this orientation :



Panel mounting

The screws (item 1 of the packing list) can now be used to secure this panel in place on the roof, keeping the install clean and giving you capability to soon use it!

DC cable routing

The DC cable will now need to start being routed, however is feasible, towards your battery bank. You'll have another set of cable in the box (item 10 of the packing list) with the receiving side 120A Anderson socket and another 4.5 meters of cable, and it's that receiving set that you'll be using to connect to your batteries or your power circuit.

It's advisable that you connect the red and black free cables (with the ring terminals on-) to your batteries before connecting the Anderson socket up. The red goes to the positive terminal, and the black goes to the negative terminal.

Notes regarding 12V or 24V batteries

If you're using the 24V variant (or if you're using the 12V item and you have 6V batteries) be sure to recall that your positive and negative connection needs to go across the whole bank, rather than just one battery.

Letting the refrigerant settle

Once you've got everything installed- don't connect the power cables yet. Leave the AC alone for 1-4 hours to let the refrigerant settle, and then connect the Anderson sockets together.

You now (hopefully) have power. You can power the AC on and off using the respective buttons on both the remote and the panel, and adjust the temperature to your comfort.

Operating the unit

The THERM2800 is a relatively simple unit to use and understand. The control panel screen will give you an update on all currently relevant settings.

Adjusting fan speed

Fan speed can be adjusted up and down by using the relevant buttons, either on the control panel or on the remote.

Adjusting temperature

Temperature, too, can be adjusted up and down via the remote or on the control panel itself. (T+, T-)

Modes

There are various operating modes, toggled by repeatedly pressing the M button (which simultaneously stands for Mode and for Menu).

COOL

COOL is the high power cooling mode, symbolised by a snowflake.

ECO

ECO is a low-powered cooling mode, symbolised by the 'ECO' symbol on the screen being lit.

SLEEP

SLEEP runs peacefully- ensuring the noise of the fan doesn't keep you awake

HEAT

HEAT mode, symbolised by the sun, is not currently available. We're working on finalising the project-

FAN ONLY

FAN ONLY, symbolised by the fan, is neither cooling or heating- just air-flow.

ERRORS ERROR CODES AND DESCRIPTIONS

Additional commands	There are various other commands possible via the Therm Air Conditioning unit, which I'll outline below.
DC Voltage Check	You can check your DC battery voltage by pressing either M on the control panel or V on the remote.
Adjusting settings/alarms	To adjust the alarm settings- Hold M for five seconds. You'll be able to press M repeatedly to toggle through the settings in order of (Low voltage disconnect, High voltage disconnect, Temperature targets). These settings can be adjusted using the T+ and T- buttons on the remote.
Changing from F to C	To toggle from Fahrenheit to Celsius (and back again), hold the control panel fan button for five seconds.
Setting a timer	Pressing timer on the remote will allow you to set a 0.5Hr to 10Hr operating cycle, which will turn off when finished.
Factory reset	<p>With the air conditioning unit turned off, press and hold the power button for six seconds to restore all settings back to default.</p> <p>The default settings are as follows-</p> <p>UNDER VOLTAGE ERROR - 10.5V / 21.5V</p> <p>UNDER VOLTAGE RECOVER - 12.0V / 25V</p> <p>COOLING MODE</p> <p>FAN SPEED THREE</p> <p>TARGET TEMP : 24'C</p>
Error codes	<p>Sometimes errors happen- the below list of error codes should help you identify what the error is - and might give you an idea of how to resolve them.</p> <p>If an unknown error pops up, or you're unsure how to resolve it, please be in touch.</p> <p>E1 Unit over-temperature issue, likely blocked cooling</p> <p>E2 Compressor torque failure</p> <p>E3 Overcurrent failure</p> <p>E5 Under-voltage (Low DC voltage)</p> <p>E6 Condenser fan fault (blockage likely)</p> <p>E7 Compressor over-worked, exceeding power limit</p> <p>E9 Compressor over-temperature protection</p> <p>EA Communication error (between control panel and AC main body)</p> <p>EC Controller self check failure (internal issue or EMF)</p> <p>F0 Phase issue (U)</p> <p>F1 Phase issue (V)</p> <p>F3 Phase issue (W)</p> <p>F4 Pressure fault (Likely leak or sealant failure)</p> <p>F5 Ambient temperature sensor fault</p> <p>F6 Evaporator core sensor fault</p>



NOTES **NOTES**



UK
CA

CE

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Warranty (2 years return to factory)