Maintenance Manual

VCC R5



Original Instructions 2024

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Welcome to Adande® Refrigeration

1 What is the Adande® System?

Adande® is a new method of cold storage developed as a series of refrigerated drawers that offer storage temperature flexibility in 1ºF increments between –8ºF and 59ºF.

Each refrigerated drawer:-

- Provides stable temperature storage
- A removable container to act as temporary cool and safe product storage.
- Gives full plan area access providing space efficient storage.
- Is easily cleaned or replaced.

2 Adande® Technology Explained

Adande® uses standard technology and refrigeration parts but in a completely new and patented way.

A dedicated fridge engine supplies refrigerant to an evaporator coil assembly. The evaporator coil assembly then supplies cooling to the insulated container and is sized to maintain up to 88lb of product at any set point temperature, in the range of -8ºF to 59ºF.



Figure 1: Adande® VCC

ADANDE VCC Series				
Model	VCC R5 V3			
Region	**USA**			
Electrical Specifications				
The Adande VCC is configured for the appropriate electrical supply and supplied with a fixed cord set for the appropriate region.				
Rating	120V 60Hz 240W (2 amps per module)			
Cord Set	Type SJT 3 x 14 AWG rated 300V, 60°C, VW1 Fitted with a NEMA 5-15P and an IEC 60320 C19 Coupler 1.8m – 3.0m (5.9 – 9.8 ft) in length			
Environmental				
Operating Temperature	15°C – 38°C (60°F – 100°F)			
Noise	70 dB Max			
Altitude	Maximum operating altitude 6560 ft. (2000m)			
Mechanical				
Dimensions – module only	**Model**	**Height**	**Width**	**Depth**
	VCC	785mm	450mm	800mm
Module weight without counterbalance weights	119lbs (67kg)			
Counterbalance weights in castor base	71lbs (32.5kg)			
Refrigerant	R290 - Volume = 80g (2.8oz)			
	Pressure		**HI Side**	**LO Side**
	Operating		179 psi	3.9 psi
	Design (max)		277 psi	85 psi

4 Safety Symbols

The following safety symbols are used upon the product and throughout the product documentation.

Meaning / Description	Symbol
Dangerous Voltage Electrical warning symbol To indicate hazards arising from High voltages.	
Protective Earth (Ground) To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.	
Warning/Caution An appropriate safety instruction should be followed or caution to a potential hazard exists.	
Disposal of Hazardous Waste The product contains hazardous waste which is harmful to the environment. Dispose of properly in accordance with US Federal or Local Regulations. Flammable refrigerant used.	
Do Not Pressure Wash Do Not Pressure Wash the Modules.	
Heavy This product is heavy and reference should be made to the safety instructions for provisions of lifting and moving.	
Flammable Gas Risk of fire or explosion, the product contains flammable refrigerant R290 (Propane).	

5 Safety Requirements

Please observe the following safety requirements:



DANGER – Risk of Fire or Explosion. Flammable Refrigerant Used. To be repaired Only by Adande Trained Service Personnel. Do Not Puncture Refrigerant Tubing.



CAUTION – Risk of Fire or Explosion. Flammable Refrigerant Used. Consult Adande Operations/Maintenance Manuals Before Attempting to Install or Service this Product. All Safety Precautions Must Be Followed.



CAUTION - Risk of Fire or Explosion. Dispose Of Properly In Accordance With US Federal Or Local Regulations. Flammable Refrigerant Used.



CAUTION - Risk of Fire or Explosion Due To Puncture Of Refrigerant Tubing; Follow Handling Instructions Carefully. Flammable Refrigerant Used.



CAUTION – Components Parts Shall Be Replaced With Like Components Described in This Manual. Servicing Shall by Done Only By Adande Authorised Personnel.

6 Top Tips

The following list of tips is designed to help quickly diagnose faults.

- POWER LEADS: 

  Check the power lead is firmly plugged-in at both ends. Operators can run the castor wheels over the cables. Un-plug from the Mains then check the power leads for damage and replace as necessary.

- DRAWER SWITCH: The evaporator fans should run continually when the drawer is closed; check the fan light on the controller. If there is no fan light it could mean that the drawer switch has failed and needs replacing.

- EVAPORATOR FANS: Open the drawer and remove the insulated container. Operate the drawer switch at the rear of the cabinet and make sure the evaporator fans are running (the fans are located in the centre of the lid). If the fans are not running and the drawer switch is working (see above), then the 12Vdc power supply could have failed. With the drawer closed and drawer switch operated, check 12 volt output from power supply to fans and seal heater.

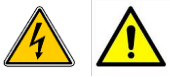
- TEMPERATURE PROBES: If the unit has just been switched on let it run for 5 minutes. Check and see if the T1 temperature probe reading is sensible. Then check to see the T2 evaporator temperature (T2 reading should be 39.2°F to 46.4°F cooler than T1). Replace temperature probes that are not giving sensible readings.

- DEFROST HEATER: 

  Allow the controller to return to the normal screen. Then perform a manual defrost (refer to chapter 7.2 LAE or 9.2 Carel). Let the defrost run for about 5 minutes, checking T2 as above during this time should show rising temperature. To fully investigate defrost and draining un-plug the unit from the mains. Open the drawer and remove the insulated bin. Then unscrew 8 fixings to gently lower the white plastic lid diffuser inside the cabinet. Lowering the diffuser will expose the drain tray and defrost heater. Check that the heater is warm and that the condensation / melt-water is draining efficiently.

- DRAINAGE:

  Following on from the defrost heater above. Ensure that the drain tray is correctly angled to the drain spigot and that no water is leaking over the edges of the drain tray.

- CONTROLLER: 

  Make sure the controller is calling for cooling (lower the T1 set point if required). Check that the condenser fan is blowing and that the compressor is running. If the condenser fan or compressor are not running check with a suitable meter on the electrical outputs of the controller. Un-plug the unit from the mains while removing covers from the units. To gain access to the controller Remove the front panel to access the controller.

- **SEALS**: The Adande seals are uniquely fitted with an internal heater wire fed from a 12 volt DC supply. Check that the seals are clean and not damaged. Check for frosting / condensation on the bin rim; either of which could indicate either a failed seal heater or failed power supply.

DANGER – RISK OF FIRE OR EXPLOSION: 

The refrigeration system contains flammable gas. Care must be taken when gaining acess to the fridge engine compartment.

- **GAS LEAKS**: 

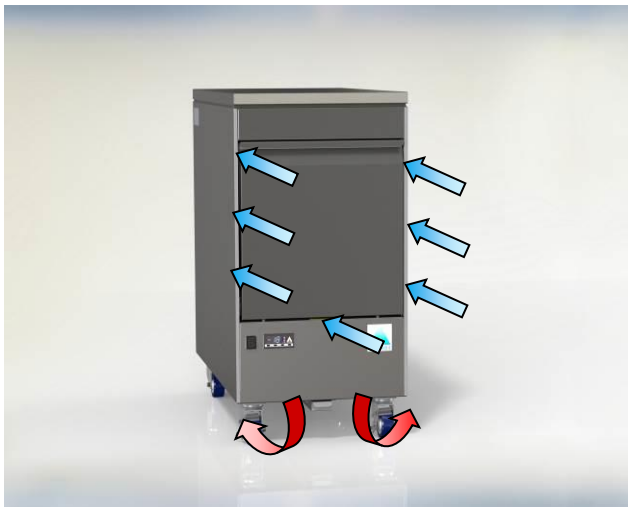
  The refrigeration system uses flammable refrigerant R290 and shall be repaired only by trained Service personnel. The refrigerant tubing shall not be punctured in any circumstance. It is most unlikely that an Adande unit will suffer from a gas leak because units are leak tested in the factory with helium. The smaller helium molecule finds leaks far more readily than the larger R290 molecule. The helium is 'sniffed' using an incredibly sensitive leak detector.

- **CAUTION – RISK OF FIRE OR EXPLOSION:** Dispose of property in accordance with Federal or local regulations.

- **HOT TAPS**: Are NEVER required. Schrader access fittings are provided on the high and low sides of the system (remove the push fit insulated cap on the suction side).

- **SEALS**: The Adande horizontal magnetic seal is just like any other refrigeration seal except that it slides apart instead of being torn apart. The seal is also up and out of harms way so should not get damaged like conventional door seals. Sometimes condensation or icing can be found on the rim of the bin. This may be caused by a failed seal heater (or 12V power supply). Refer to the maintenance manual or call Adande.

- **CONDENSER AIR:** The air for the condenser is drawn in around the drawer front, it then flows around the insulated bin and through the condenser, before being discharged via the condenser fan and grille. This air passage cleans the dirt/grease laden air before it reaches the condenser to prevent it blocking. The dirt and grease generally collects around the drawer front and down the sides of the bin, both easily cleanable by the operator. <u>The worktop must always be properly fitted or the condenser will not get adequate airflow.</u>



7. Operating The Adande® Controls - LAE

An Adande® is configured with a master power switch located beside the Temperature controls. See *Figure 2* below.

On/Off Switch



Figure 2: Adande® Display Control Panel

The Adande® temperature control system allows you to set and control the drawer within a temperature range of -8°F (-22°C) and 59°F (15°C).
Temperature accuracy in the drawer will be maintained within ±3.6°F of the set point.

7.1 The Display Temperature Controls

The set-point is factory set, however should you need to adjust the temperature set point, *please follow the procedure below*:

- First unlock the keypad by quickly tapping the unlock/scroll button twice (), the light next to the unlock symbol () will illuminate signifying that the keypad is now unlocked.
- Tap the unlock/scroll button () to display SP (set point) code, then tap the unlock/scroll button once more, to display the current set point of the unit
- To adjust the set point simply either press the **+** () or **–** () button until the desired set point is displayed. The unit is now set with the new set point.
- The display panel will automatically lock after 1 minute of inactivity.



Display Control Keys	
Increase Temperature	
Cancel	
Unlock/Scroll	
Manual Defrost	
Decrease Temperature	
Controller Unlock Symbol	

7.2 Defrost

The refrigeration system automatically defrosts 4 times a day. If there is excessive ice build-up this may indicate a fault with the defrost heater. A manual defrost can be used as an indirect check for the defrost heater. If required, first unlock the keypad by tapping the unlock/scroll button twice. Then press and hold the manual defrost button until **dEF** is displayed. Check the defrost temperature probe is steadily rising in temperature; the cut-out temperature is set to 53°F (11°C). If a faulty defrost heater is suspected a further check to rule out a controller issue is recommended. Use a multi meter to check the voltage from the controller to the defrost heater. **The defrost heater when operating correctly should draw 0.65 amps.**

8 Error Codes LAE

8.1 Drawer Open Alarm

If the drawer is open for more than 3 minutes, the Drawer Open alarm will be triggered, an audible alarm will sound and "DO" will flash on the display panel, if the drawer is still not closed after an additional 3 minutes then "HI" will be displayed.

If the DO alarm continues to sound even with container in place and the drawer shut, this may indicate a fault with the switch.

NOTE: THERE IS NO COOLING TO THE INSULATED CONTAINER WHEN THE DRAWER IS OPEN.

8.2 Probe Error Alarm

If display reads **"E1"** or **"E2"**, a temperature probe has failed and should be replaced. Please refer to chapter 25 for detailed instructions.

The Adande® drawer will operate with a 10 minute on / 10 minute off cycle in the event of an **"E1"** failure. This will help to maintain the stored product at a safe temperature, but precise temperature control will be lost. **"E2"** will only affect defrosts, and these will be timed to maintain operation of the unit.

8.3 Temperature Alarm

The **"HI"** temperature alarm is a general alarm indicating the drawer temperature has exceeded its set point by 12ºF. The cause should be investigated as soon as possible. The alarm can also be triggered if the Adande® drawer has recently been turned on loaded with warm product or left open for a long period of time.

The **"LO"** temperature alarm is a general alarm indicating that the drawer temperature has fallen below its set point by 12ºF The cause should be investigated as soon as possible. The alarm can also be triggered if the Adande® drawer's temperature set point has recently been increased.

9. Operating the Adande® Controls - Carel



The Adande® temperature control system allows you to set and control the drawer within a temperature range of -8°F (-22°C) and 59°F (15°C).
Temperature accuracy in the drawer will be maintained within ±3.6°F of the set point.

9.1 The Display Temperature Controls

The set-point is factory set, however should you need to adjust the temperature set point, *please follow the procedure below:*

Procedure

To navigate the menu tree, use the following buttons:

- UP and DOWN to navigate the menu and set the values;
- PRG to enter the menu items and save the changes made;
- Select the menu item or ESC to return to the previous branch.

Example of how to set parameter St (set point):



1. Wait for the standard display to be shown;



2. Press PRG to enter display active actuators/functions mode



3. Press PRG 3 s to access actuator/ function direct activation mode



4. Press PRG to enter programming mode; the UP and DOWN buttons will flash and the first category of parameters dir (=direct functions) will be displayed;



5. Press DOWN until reaching the parameter category Ctl (=control)



6. Press PRG to display the first menu item: St (=set point). Press PRG to display the parameter value



7. Press UP/DOWN to modify the value



8. Press PRG to save the setting and return to the menu

Caution: if the PRG button is not pressed, the new setting will not be saved.



9. Press UP/DOWN to select ESC and press PRG to return to the parameter categories;



10. Press DOWN to move to the next category and follow steps 6 to 9 to set the other parameters;



11. Once the settings have been made, to exit the categories select ESC and press PRG.

Notice: if no button is pressed, after 20 seconds the terminal will automatically return to the standard display.

9.2 Defrost 

The refrigeration system automatically defrosts 4 times a day. If there is excessive ice build-up this may indicate a fault with the defrost heater. A manual defrost can be used as an indirect check for the defrost heater. If required, first unlock the keypad by tapping the unlock/scroll button twice. Then press and hold the manual defrost button until **dEF** is displayed. Check the defrost temperature probe is steadily rising in temperature; the cut-out temperature is set to 46.4°F (8°C). If a faulty defrost heater is suspected a further check to rule out a controller issue is recommended. Use a multi meter to check the voltage from the controller to the defrost heater. **The defrost heater when operating correctly should draw 0.65 amps.**

10 Error Codes Carel

10.1 Drawer Open Alarm

If the drawer is open for more than 3 minutes, the Drawer Open alarm will be triggered, an audible alarm will sound and "**DOR**" will flash on the display panel, if the drawer is still not closed after an additional 3 minutes then "HI" will be displayed.

If the DOR alarm continues to sound even with container in place and the drawer shut, this may indicate a fault with the switch.

NOTE: THERE IS NO COOLING TO THE INSULATED CONTAINER WHEN THE DRAWER IS OPEN.

10.2 Probe Error Alarm

If display reads **"E1"** or **"E2"**, a temperature probe has failed and should be replaced. Please refer to chapter 24 for detailed instructions.

The Adande® drawer will operate with a 10 minute on / 10 minute off cycle in the event of an **"E1"** failure. This will help to maintain the stored product at a safe temperature, but precise temperature control will be lost. **"E2"** will only affect defrosts, and these will be timed to maintain operation of the unit.

10.3 Temperature Alarm

The **"HI"** temperature alarm is a general alarm indicating the drawer temperature has exceeded its set point by 12°F. The cause should be investigated as soon as possible. The alarm can also be triggered if the Adande® drawer has recently been turned on loaded with warm product or left open for a long period of time.

The **"LO"** temperature alarm is a general alarm indicating that the drawer temperature has fallen below its set point by 12°F The cause should be investigated as soon as possible. The alarm can also be triggered if the Adande® drawer's temperature set point has recently been increased.

11 Display Panel and On/Off Switch Replacement - LAE

WARNING: To replace a faulty display panel first isolate from the mains power supply by unplugging the unit, then remove the front panel, *(refer to chapter 18)*.Next unplug the data ribbon from the back of the controller *(figure 3b)* and the back of the display itself *(figure 3a)*, then using a flat head screw driver depress the plastic lugs on the display and push the faulty display out of the front grill panel.*(figure 3c/3d)*
Push the new display into the front grill and click into position *(figure 3e)*, finally refit the data ribbon into the back of the controller and display panel.



Figure 3a

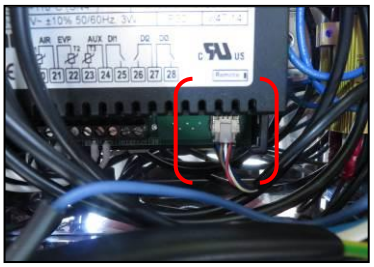


Figure 3b



Figure 3c

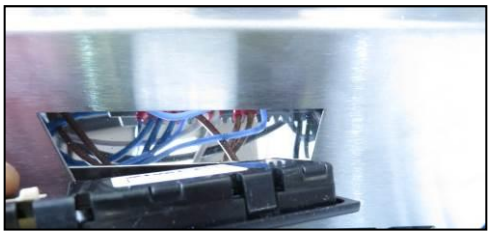


Figure 3d



Figure 3e

WARNING: To replace a faulty On/Off switch first isolate the mains power then remove the front panel, *(refer to chapter 18)*. Remove the 4 wires from the back of the switch *(figure 4)*. Using a flat head screwdriver depress the plastic lugs to remove the faulty switch *(figure 4a)*.

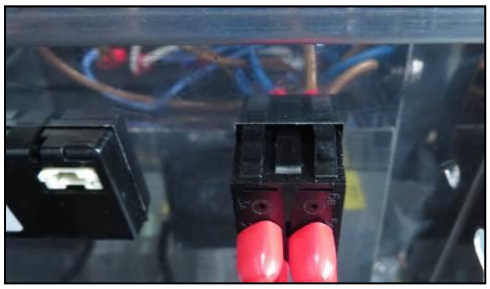


Figure 4

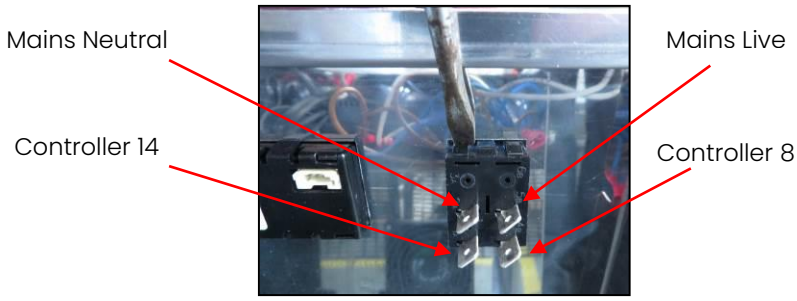


Figure 4a

Parts No.	Description
106344	Controller Display (LAE TU5S-B)
106408	Controller Ribbon Cable 2m (BD1-28 to Display)
106392	Switch DPST Integral Guard With Cover

12 Display Panel Replacement - Carel

WARNING: To replace a faulty display panel first isolate from the mains power supply by unplugging the unit, then remove the front panel, *(refer to chapter 18)*. To remove the display, using your fingers depress the plastic lugs located on the rear of the display and push out of the front panel *(figure 5a)* Next unplug the data ribbon from the back of the controller and the back of the display itself *(figure 5b)*, Connect the ribbon cable to the new display then simply push into the panel *(figure 5c)* until it clicks and its sitting flush.



Figure 5a



Figure 5b



Figure 5c

Parts No.	Description
109130	Carel Display IJFHSA0N00S0296
109131	Carel link cable BX0PZC4000150
106392	Switch DPST Integral Guard With Cover

13 Electrical Connection

The Adande® drawer should be connected to a 120V, single phase, 60 Hz, standard socket outlet supply. The drawer is connected to the mains supply with a detachable supply lead, one end of which is fitted with a standard 16 amp plug. The other end of the supply lead, fitted with an appliance plug, which is connected to the Adande® drawer as shown in *figure 6* below. When replacing a mains lead ensure the P clips are secured back into position, this will prevent the leads being pulled out accidently.

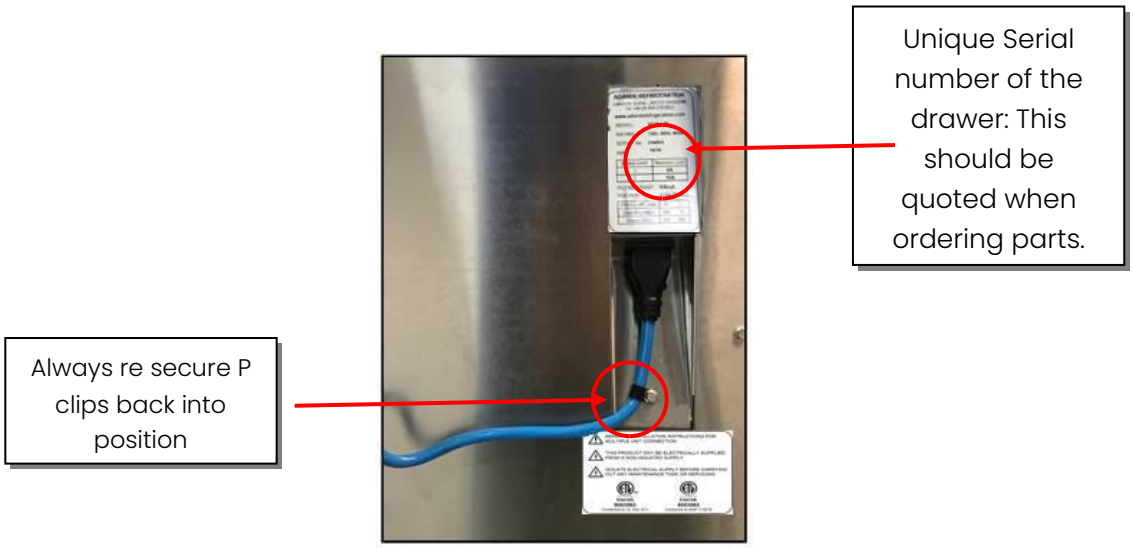


Figure 6

WARNING: DO NOT REMOVE ACCESS PANELS WITH THE ELECTRICAL SUPPLY CONNECTED.

Parts No.	Description
106429	Mains Supply Cord 2m 15A, US Plug To C19 Socket
106430	Mains inlet C20 16A Snap Fit Socket

14 Location and Stability

It is important that the Adande® unit is installed and maintained on a flat, clean and **level surface** to ensure correct operation.

The room should be dry and sufficiently ventilated.

Optimum performance is obtained at ambient temperatures between 60°F (15°C) and 100°F (38°C).

The air outlet grill MUST be kept clear at all times to maintain optimum performance.

The Adande® unit is mounted on castors. The front two castors should have their brakes ON during normal use as in *figure 7a*.

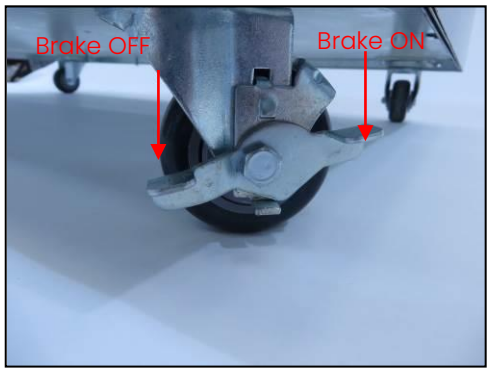


Figure 7a: Lockable Castor

CAUTION: THE INSULATED CONTAINER SHOULD BE UNLOADED BEFORE MOVING

The Adande® unit must be installed and operated in a minimum area of $2m^2$ as shown in *figure 7b*.

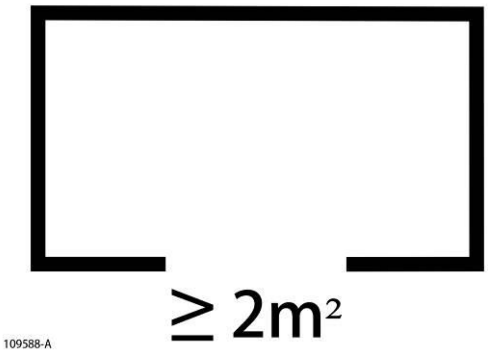


Figure 7b: Minimal Operation Area

15 Insulated Container Removal

CAUTION: For many of the maintenance procedures the insulated container will need to be removed to allow for access. To remove the insulated container, first pull the drawer out fully so that the rear edge of the container clears the front, and the runners are fully extended. Then as the photo below shows *(figure 8)* lift the container vertically up to remove, the container should be fully emptied before removing.

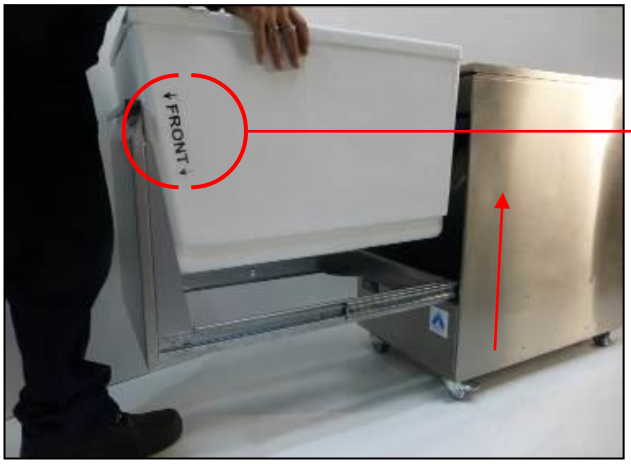


Figure 8

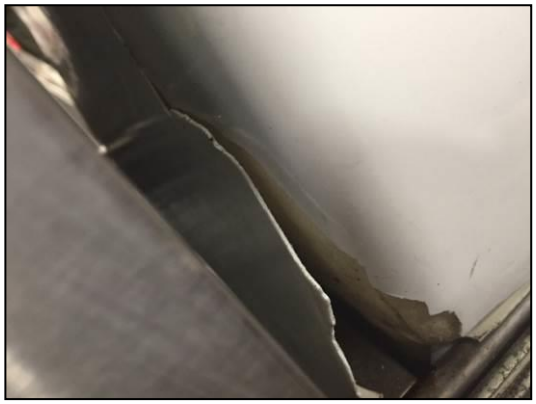


Figure 8a

The insulated container will only fit with the recess of the plastic to the front of the drawer; this is also indicated with a "*FRONT*" sticker as shown in *figure 8a*

It is important that the container is kept in good condition, if the container is damaged especially along the top edge this will dramatically affect the performance of the unit and cause excessive icing. In this case the container should be replaced. Below are some examples of badly damaged containers.





Parts No.	Description
109288	Insulated Container

16 Worktop Removal

CAUTION: If working on the top unit it may be preferable to remove the worktop and panel fire enclosure to gain access to the electrical components and the fridge engine compartment.

WARNING: The refrigeration system uses flammable refrigerant R290 and the tubing shall not be punctured in any circumstance.

To remove the worktop, first remove the 2 x Screw Hex M5 x 8 Flanged bolts from the rear of the drawer, lift the rear of the worktop and push slightly forward to slide over and clear from the front retaining slots *(Figure 9)*. Replacement is the reverse of the removal procedure.

NOTE: CORRECT LIFTING PROCEDURES SHOULD BE FOLLOWED



Figure 9: Worktop removal

17 Condensate Tray

The drain tray located at the front of the drawer should be checked regularly and emptied if necessary. To empty simply pull out the tray as shown in the picture below.



18 Front panel removal

NOTE: POWER MUST BE ISOLATED BEFORE REMOVING ANY PANELS

To remove the front panel first remove the insulated container. This panel is also sealed on with silicone, and will need to be cut to remove the panel. When replacing fresh silicone must be applied when refitting.

Then remove the 2 off M5 Br. Zn. Pd. Bolts, pull the panel forward and lift to remove as shown below in *figure 10a* and *10b.*

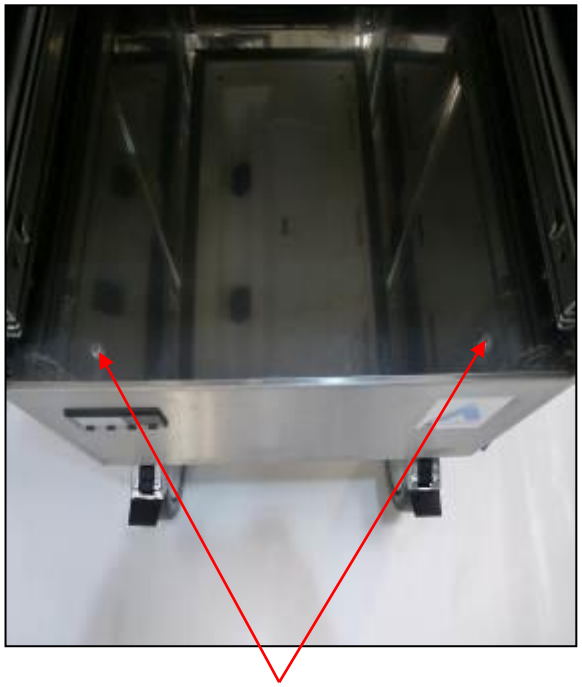


Figure 10a
2 Off M5 Br.Zn.Pd. Bolt



Figure 10b: Front Panel Removal

Parts No.	Description
109282	Panel front access spot weld assembly

19 Rear Panel Removal

The rear panel of the unit may require removal to gain access to the drain pipe or assist in diffuser and heated seal replacements. To remove the back panel, first remove the worktop then remove all 8 off M5 Br. Zn. Pd. bolts as shown in *figure 11* below.



Figure 11: Rear panel removal

Parts No.	Description
109277	Rear Panel

20 Drawer Front Removal

To remove the drawer front you will need to remove the two M5 countersink screws as shown in *figure 12a* below.

Once these fixings are removed the drawer front will now clip off, upwards then forwards, as shown below in *figure 12b*.



Figure 12a: Removing the two screws

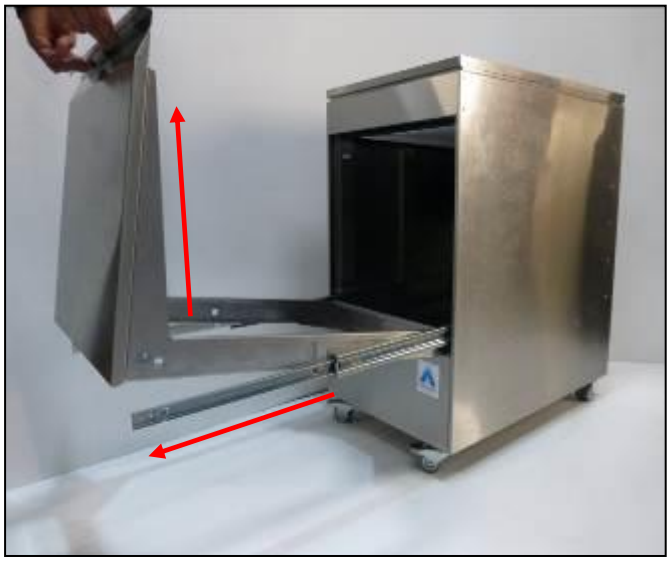


Figure 12b: Removing the drawer front

NOTE: WHEN REPLACING DRAWER FRONT LOCTITE SHOULD BE USED ON THE SCREWS



21 Drawer Switch Replacement

If the drawer switch has failed the display panel may alarm "DO" and the light next to the fan symbol on the display panel will not illuminate when the drawer is shut. To directly check the operation of the switch, remove the container and position a magnet in front of the switch, the 12V fans should run. The switch is located at the rear of the cabinet at the top RH side as pictured in *figure 13c* and is activated by a magnet set in the plastic of the container. To replace the drawer switch, remove the insulated container and remove the nut from the insulated container side *(figure 13c)*. Remove the rear panel (refer to chapter 19) and pull the switch. Remove the wires from the Wago connection block *(figure 13b),* the drawer switch wires are wired into position 2 *(figure 13b).* Fit the wires of the new switch, the wires on the switch do not have a defined polarity, then position into the chassis *(figure 13a)* and secure it with the second nut, from the insulated container side *(figure 13c)*.

NOTE: TO FUNCTION CORRECTLY THE BARREL OF THE SWITCH MUST SIT FLUSH WITH THE OUTSIDE SURFACE OF THE NUT AS PICTURED IN FIGURE 13C

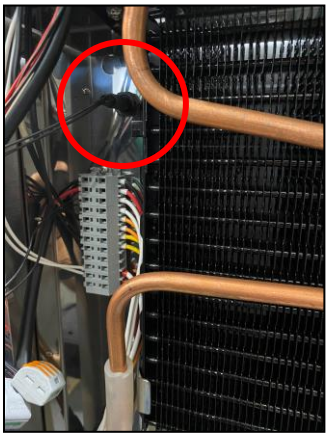


Figure 13a

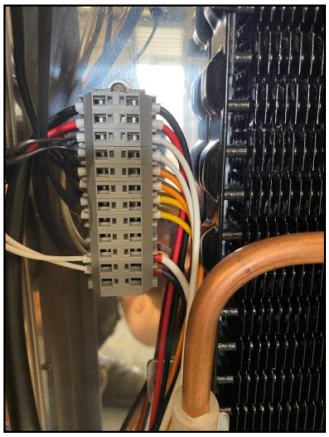
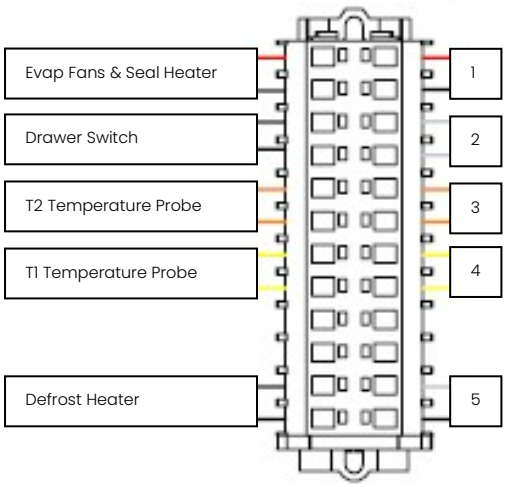


Figure 13b



Wago Block	
1	To 12v Switch Mode Power Supply
2	To Terminals 24 & 25 on Controller
3	To Terminals 21 & 22 on Controller
4	To Terminals 20 & 21 on Controller
5	To Terminal 5 & Neutral on Controller



Figure 13c: Drawer switch mounted in the chassis

Parts No.	Description
108131	Reed switch threaded barrel – H

22 Removing the Diffuser

For many of the procedures the diffuser will need to be removed, for instance when replacing a temperature probe, evaporator fan, defrost heater or evaporator coil.

To remove the diffuser first remove the insulated container. Next remove the 4 x Pozi M5 x 16 ST/ST screws securing the diffuser in position. The fans mounted in the diffuser will be connected to the unit via 4 wires, there is enough slack on these wires built into the design to allow the diffuser to be lowed. It is important that the slack on the wires is pulled back through to the fridge engine compartment.

NOTE: THE DIFFUSER WILL BE CONNECTED TO THE UNIT BY THE EVAPORATOR FAN WIRES

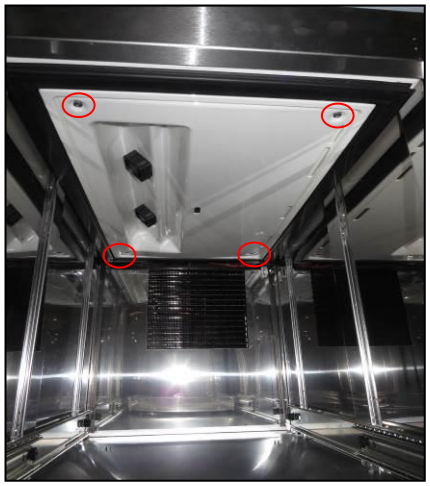


Figure 14: Lid Diffuser

Ensure that the diffuser is secured back into position so it does not sag and catch the container. The rubber fastenings located in the insulated lid are designed to seal against the plastic when tightened down so ensure the screws are fully inserted.

Parts No.	Description
103799	Diffuser
104783	Diffuser Assy (evap fans inc)
106868	Screw Pozi M5 x 16 ST/ST (Diffuser Screw)
106603	Rubber Nut M4 - Short Grip

23 Evaporator Fan Replacement

To replace an evaporator fan, first remove the worktop and unclip the fan wires from the cable tidy clip as shown in *figure 15d* now drop down the diffuser as shown in chapter 22, cut the wires close to the faulty fan leaving long tails, these will be used to pull through the wires of the new fan. Next remove the faulty fan and fit the new fan ensuring all 4 screws are tight and the wires are correctly orientated, and cable tied into position as shown *in figure 15b*. Attach the new fan wires to the old ones and use them to pull through the hole in the lid. The old fan wires now need to be disconnected from the Wago lever blocks as shown in *figure 15c*, fit the new fan, and tidy up the slack wires back into the cable clip as shown in *figure 15d.*



Figure 15a: Evaporator fans

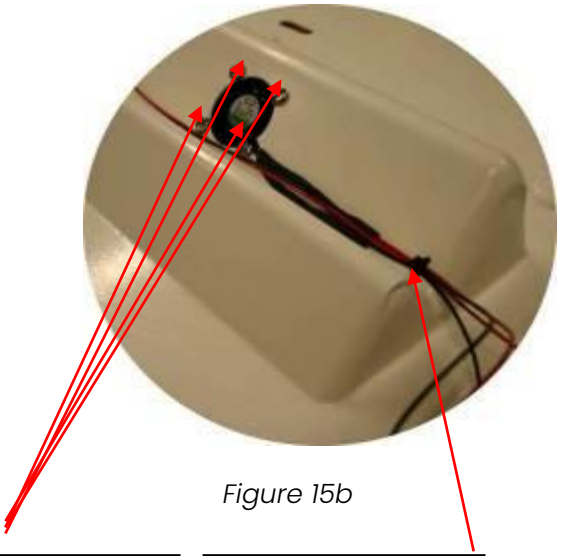


Figure 15b

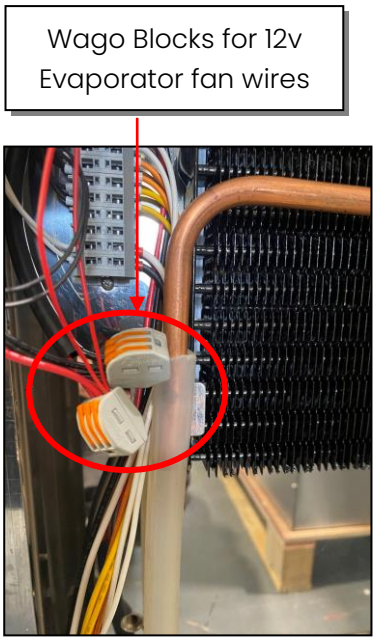


Figure 15c: connection blocks



Figure 15d: Cable clip

Parts No.	Description
106483	Evaporator Fan
109601	Screw pozi pan self-tap AB No.8 x 1/4" ST/ST (Fan Screws)
104783	Diffuser Assy (evap fans inc)
107088	Terminal block, 3 way, lever locking (WAGO)

24 Defrost Heater Removal and Replacement

WARNING – Do not use mechanical devices or other means to accelerate the defrosting process other than those recommended by the manufacturer.

To indirectly check if the defrost heater has failed force the unit into a manual defrost, check the T2 defrost probes temperature, it should steadily rise in temperature, the cut out temperature is 53°F The defrost heater should draw 0.65 amps when working correctly.

To replace the defrost heater first remove the rear panel and carefully pull the drain pipe off the back of the defrost heater tray (*figure 16a*). To gain access to the defrost heater remove the insulated container and drop the diffuser down as shown in chapter 22.

Remove the two M4 x 10 Pozi-Pan screws and two M5 x 12 bolts and associated sealing washers, then remove the blanking plate at the back, drop down the defrost heater and remove. Cut the wires from the old heater and use to pull the wires from the new heater through into the fridge engine compartment and wire into the connection block (bottom 2) as shown in *figure 16b.*

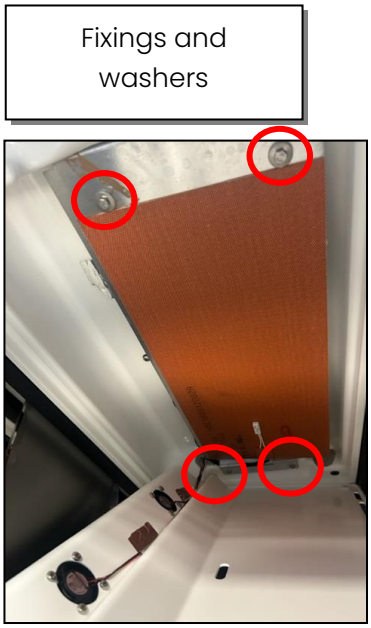


Figure 16a

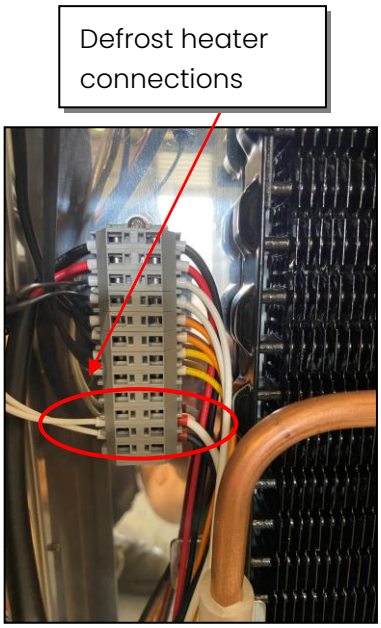


Figure 16b

When replacing the drain tray take care not to bend the tray or the unit may not drain correctly, ensure all sealing washers are on the fixing bolts. Replace drain tray and make sure the silicone sleeve and copper drain butt up securely against the drain tray spigot.
Replace the refrigeration putty.

Parts No.	Description
103936	Drain pipe silicone 600mm(10mm ID)
103936	Drain pipe silicone 100mm(10mm ID)
104310	Drain pipe copper
102082	M5 x 12 ST/ST Hex Head
103491	Washer bonded
109310	Defrost heater assembly

25 Evaporator Temperature Probes Replacement

If the display panel shows an E1 (T1 air probe) or E2 (T2 defrost probe) error message or the probe reads a value that doesn't match this means that a temperature probe has failed and needs to be replaced.

To replace a faulty temperature probe the insulated container, diffuser and drain tray will need to be removed to gain access to the evaporator coil. Remove the P-Clips holding the probes in place and the refrigeration putty from wire penetration in the lid.

Disconnect the faulty probe from the electrical connection block T2 in position 3 T1 position 4 as pictured in *figure 17c* and use the old wires to pull the new probe wires through the lid hole. Connect the new probe wires to the electrical block, (T2 = Orange, T1 = Yellow) replace the P-Clips and refrigeration putty, as shown in *figure 17b*.

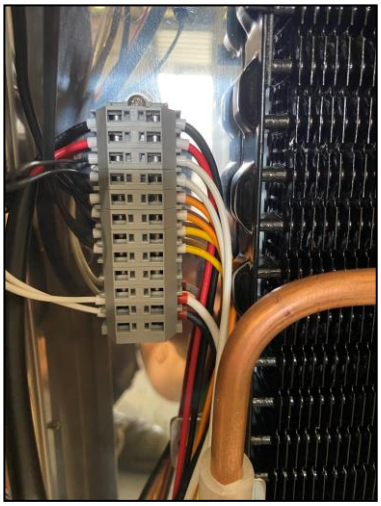


Figure 17a

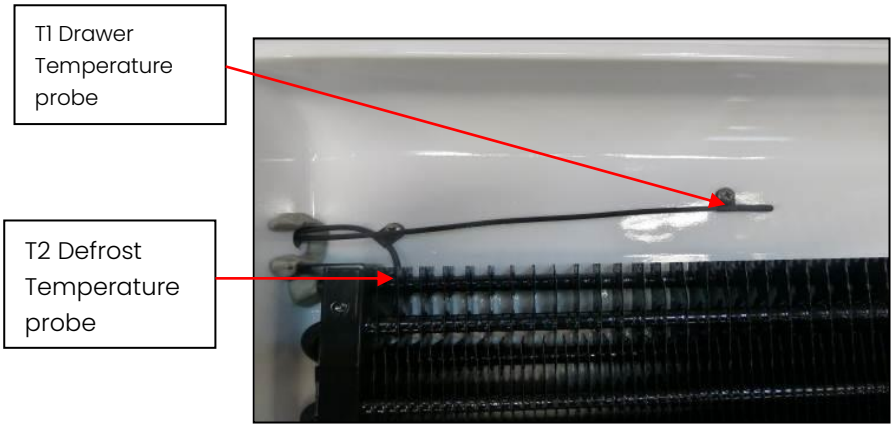


Figure 17b

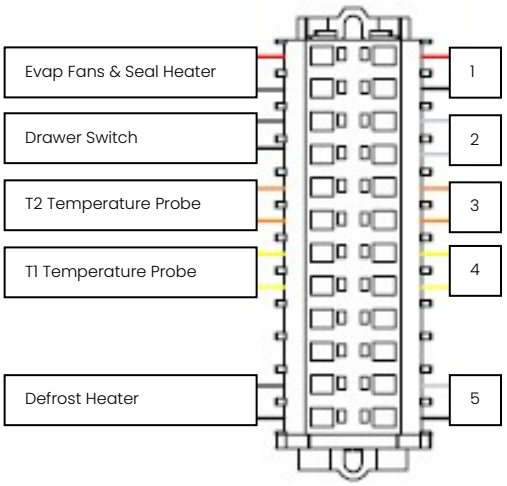


Figure 17c

Wago Block	
1	To 12v Switch Mode Power Supply
2	To Terminals 24 & 25 on Controller
3	To Terminals 21 & 22 on Controller
4	To Terminals 20 & 21 on Controller
5	To Terminal 5 & Neutral on Controller

Parts No.	Description
103063	Temperature Probe
102093	P Clip H1P (To Secure Temperature Probes)

26 Heated Seal Replacement

The seal condition is imperative to the performance of the unit, if the seal is damaged the unit will struggle to maintain its temperature and there is a risk of excessive icing on the evaporator coil. To replace the seal first remove the worktop to gain access to the bullet terminals *(figure 18)*. Then with the power turned off simply pull the two seal wires out of their associated bullet terminals.

NOTE: Be sure to replace and secure the worktop in position before fitting a new seal, this will retain the floating lid. Failure to do so may damage the refrigeration circuit.

Pull the faulty seal out of the retaining channel in the lid. Fit the new seal by first pushing the seal into corners of the retaining channel for alignment. After the seal has been replaced remove the worktop once again and connect the new seal wires into two bullet terminals, be sure to re secure any loose wires into the wiring clip *(Figure 18).*

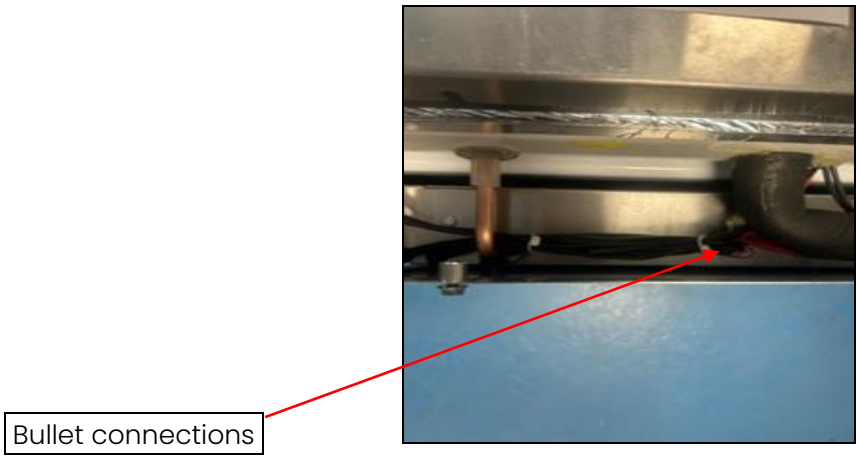


Figure 18

Lid height adjustment is not required, the VCC unit utilises a self-adjusting 'floating' system. The lid should automatically return to the correct position once the drawer is shut. The ensure the system is working correctly, with the work top in place manually push the lid assembly up at the front and back, the lid should freely move up and drop back down in the slots *(figure 18b)* If the lid does not return to its original position the lid support pins can be checked for wear by removing the worktop *(figure 18c).* The pins are threaded so can easily be replaced.

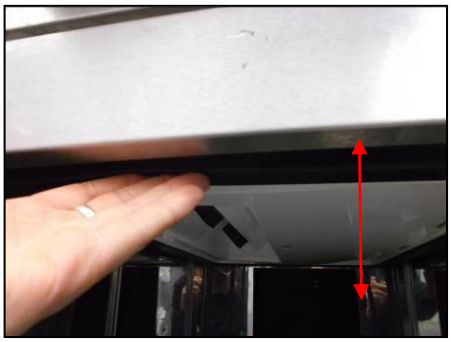


Figure 18b



Figure 18c

Parts No.	Description
103865	Drawer seal
103896	Lid assembly
104130	Pin lid support

27 Runner Replacement

To replace a drawer runner the Insulated container and drawer front will need to be removed to gain access.
The runner can now be removed from the drawer, extend the runner slightly, and with a firm grip twist the runner toward the middle of the drawer this will allow the front of the runner to be lifted clearing the front fastenings, pull the runner forward to clear the rear fixing. See figures below.



Figure 19: Twist runner



Figure 19a: Lift and pull forward



Figure 19b

Replacing the runner is the reverse of the removal procedure, engage the rear lancing of the runner in the back vertical wall support and push horizontally to fully engage the rear lancing, engage the middle and front lancing's in their associated vertical wall supports and press down on the runner sharply, it should engage in the front vertical wall support with a 'CLICK', you should not now be able to lift the front of the runner vertically.

Fit the drawer front assembly in the same way by engaging the rear fixing first with a horizontal motion then engage the front 2 lancing's and press down fully engaging both, ensure the hole in the front of the runner lines up with the hole in the container support, and refit the M5 X 8 countersink screws.

If required, the runner can be lightly greased with food grade grease.

Parts No.	Description
104741	RH Drawer runner
104740	LH Drawer runner

28 Condenser Fan Replacement

WARNING: ensure the mains power has been isolated before replacing the condenser fan.

To replace the condenser fan first remove the insulated container, next the chamber base panel will need to be removed by removing 4 off M5 Br. Zn. Pd. Bolts, as shown below in *figure 20*.



Figure 20: Base panel fixings (4 off)

Once these have been removed cut the silicone sealer on the front panel, the base will now slide forward revealing the condenser fan. Remove the four fixing screws and remove the fan *(figure 21)* and disconnect the wires. Reverse this to replace the fan and re-connecting the wires, and re-apply fresh silicone sealer.



Figure 21: Condenser Fan mounting

Parts No.	Description
107589	Condenser fan

29 Electrical System - LAE

WARNING: When replacing any components within the main control compartment ensure the mains power has been isolated before carrying out any work.

29.1 Access

The controller is located behind the front Panel, to remove this and gain access to the controller see chapter 18.

29.2 Fuse Holders

The electrical system is protected by 2 separate fuses, a 8-amp fuse which is located in a dedicated fuse holder situated between the main controller and 12v transformer and a 2-amp fuse which is located in a dedicated fuse holder situated on the left of the 12v transformer as seen in *figure 22a.*
If the 8-amp fuse fails, there will be no power to the unit. If the 2-amp fuse fails there will be no power to the 12v transformer, resulting in no output to the evaporator fans or drawer seal..

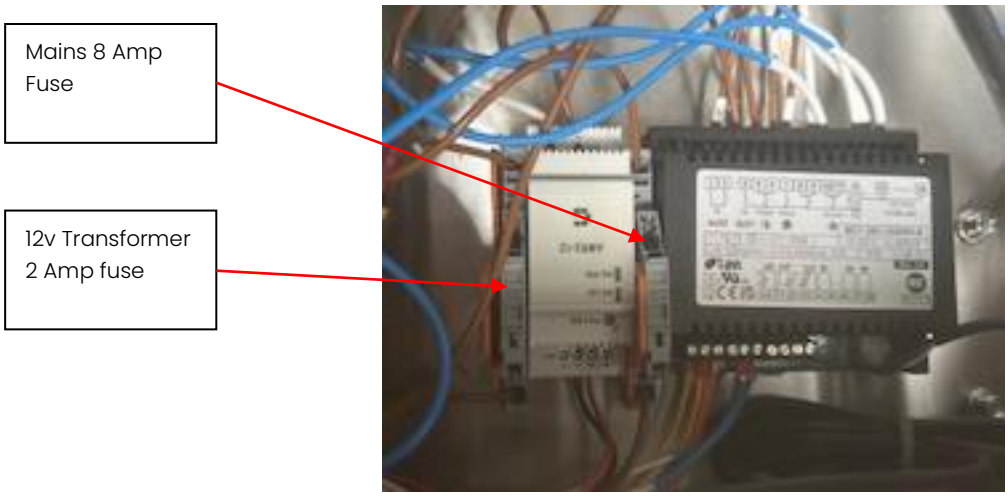


Figure 22a

To replace the fuse simply pull up the latch on the top of the fuse holder *(figure 22b)* Unclip the side of the holder to reveal the fuse carriage *(figure 22c)*. Ensure the carriage is firmly clicked back into position.

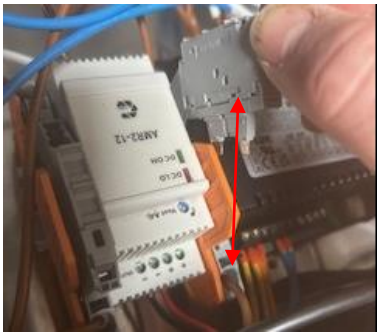


Figure 22b

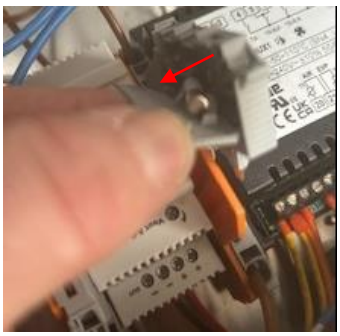


Figure 22c

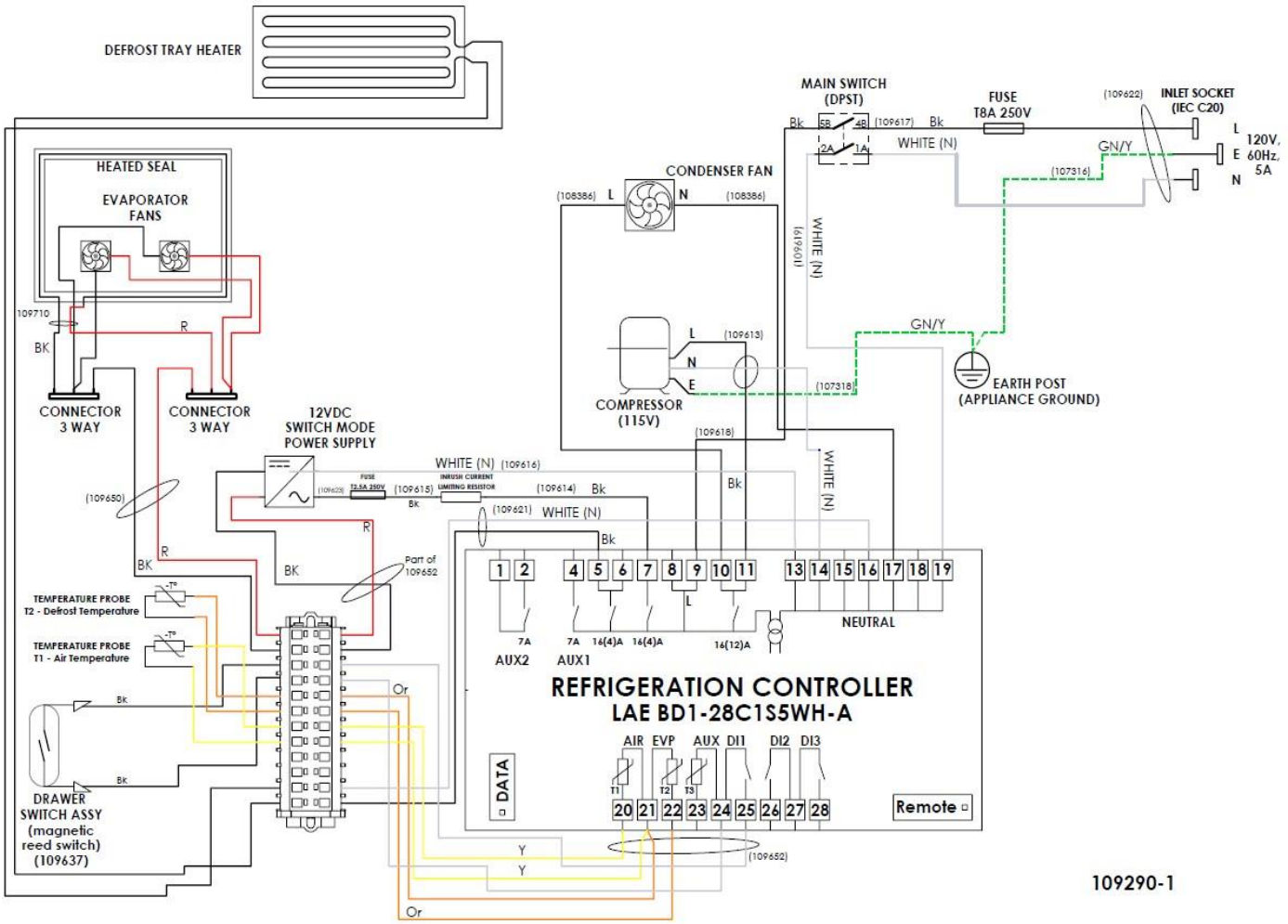
Parts No.	Description
107168	Fuse Holder
107178	Fuse Holder End Plate

29.3 Electrical Control System

If replacing items connected to the Adande Controller then please refer to the tables below.

Refrigeration Controller	
20	Drawer temperature probe
21	Temperature probe common
22	Defrost temperature probe
24	Drawer switch
25	Drawer switch
5	Defrost heater
7	Resistor/12v power supply live
8	Switch live
10	Compressor
11	Condenser
13	Neutral
14	Neutral
15	Neutral
16	Neutral
17	Neutral
18	Neutral
19	Neutral

29.4 Wiring diagram



29.5 Settings for Controller - LAE

R290 controller settings

The Settings menu is accessed by scrolling to PSD then using the **+** button increase the value to +12 then press the centre button to enter the menu.

Code	Setting	Description	Code	Setting	Description
SPL	-8	Minimum limit for SP setting	ATI	TI	Probe used for temperature alarm detection
SPH	59	Maximum limit for SP setting	ATD	60	Delay before alarm temperature warning
SP	38	Set point	ACC	0	Condenser periodic cleaning
C-H	REF	Refrigeration or Heating control mode	IISM	NON	Switchover mode to second parameter set
HY0	1	Thermostat OFF - ON differential	IISL		Minimum limit for IISP setting
HY1	1	Thermostat ON - OFF differential	...		...
CRT	5	Compressor rest time	EPT		Eco pull-down time
CTI	10	Compressor run time with TI failure	SB	NO	Stand-by button enabling
CT2	10	Compressor off time with TI failure	DSM	STP	Door switch input mode
DFM	TIM	Defrost start mode	DAD	3	Delay before door open alarm warning
DFT	5	Time interval between defrosts	CSD	NO	Compressor stop delay after door has opened
DFB	Yes	Defrost timer backup	DIO	DOR	DII digital input operation
DLI	53	Defrost end temperature	DIA	OPN	DII digital input activation
DTO	25	Maximum defrost duration	D2O	NON	DI2 digital input operation
DTY	ELE	Defrost type	D2A		DI2 digital input activation
DSO	OFF	Defrost start optimization	D3O	NON	DI3 digital input operation
SOD	0	Start optimization delay	D3A	OPN	DI3 digital input activation
DPD	6	Evaporator pump down	LSM	NON	Light control mode
DRN	6	Pause after defrost	LSA		Light activation
DDM	DEF	Defrost display mode	OAI	NON	AUX 1 output operation
DDY	30	Display delay	OA2	NON	AUX 2 output operation
FID	NO	Fans active during defrost	2CD		Auxiliar compressor start delay
FDD	23	Evaporator fan re-start after defrost	OSI	0	Probe TI offset
FTO	5	Maximum evaporator fan stop after defrost	T2	YES	Probe T2 enabling
FCM	NON	Fan mode during thermostatic control	OS2	0	Probe T2 offset
FDT	-3	Evaporator-Air temp difference for fans to turn off	T3	NON	Auxiliary probe T3 operation
FDH	5	Temperature differential for fan re-start	OS3		Probe T3 offset
FTI	30	Fan stop delay after compressor stop	AHM	NON	Operation in case of high condenser alarm
FT2	3	Timed fan stop	AHT	140	Condensation temperature alarm
FT3	1	Timed fan run	TLD	1	Delay for minimum temperature
ATM	REL	Alarm threshold management	TDS	TI	Selects the temperature probe to be displayed
ALA		Low temperature alarm threshold	AVG		The relative weight of T2 on TI
AHA		High temperature alarm threshold	SCL	°F	Readout scale
ALR	-12	Low temperature alarm differential	SIM	100	Display slowdown
AHR	12	High temperature alarm differential	ADR	1	BD1-28 address for PC communication

30 Electrical System Carel IJFSSA4RO2S0299 & 340 Controller



WARNING: When replacing any components within the main control compartment ensure the mains power has been isolated before carrying out any work.

30.1 Access

The controller is located behind the front Panel, to remove this and gain access to the controller see chapter 18.

30.2 Fuse Holder

The electrical system is protected by 2 separate fuses, a 8-amp fuse which is located in a dedicated fuse holder situated between the main controller and 12v transformer and a 2-amp fuse which is located in a dedicated fuse holder situated on the left of the 12v transformer as seen in *figure 23a.*
If the 8-amp fuse fails, there will be no power to the unit. If the 2-amp fuse fails there will be no power to the 12v transformer, resulting in no output to the evaporator fans or drawer seal..

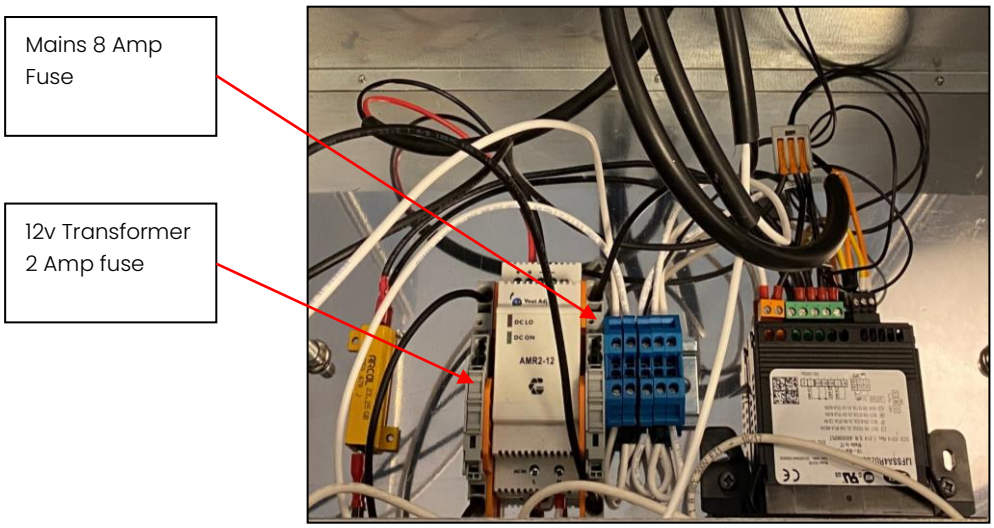


Figure 23a

To replace the fuse simply pull up the latch on the top of the fuse holder *(figure 23b)* Unclip the side of the holder to reveal the fuse carriage *(figure 23c)*. Ensure the carriage is firmly clicked back into position.

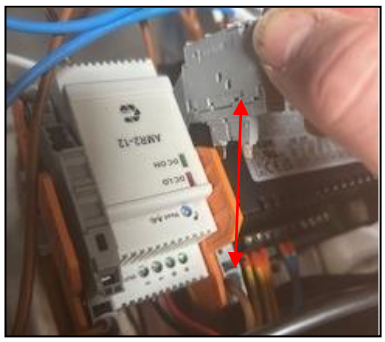


Figure 23b

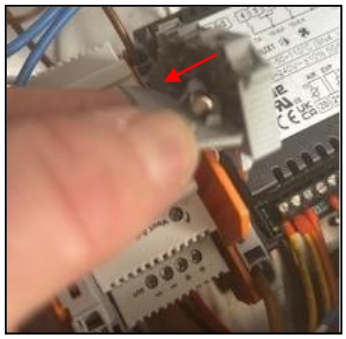


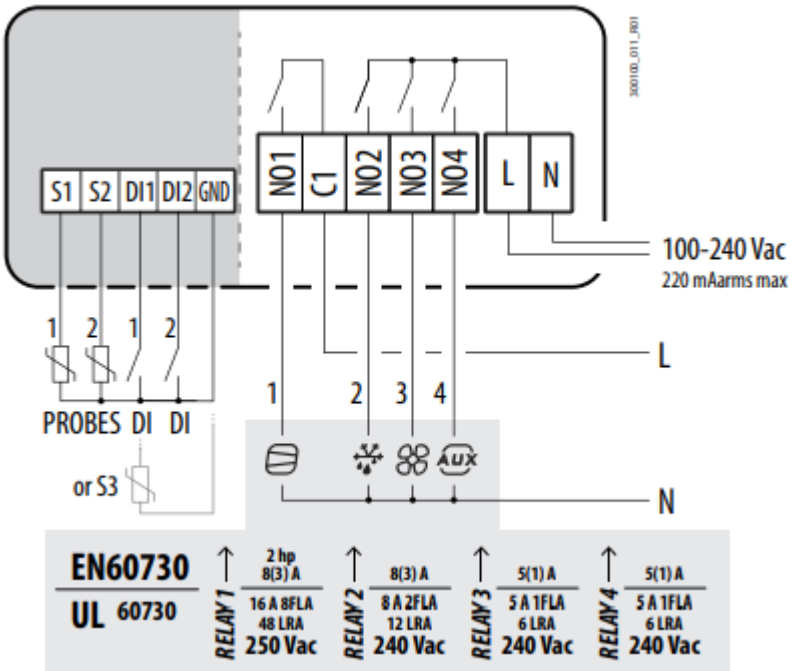
Figure 23c

Parts No.	Description
107168	Fuse Holder
107178	Fuse Holder End Plate

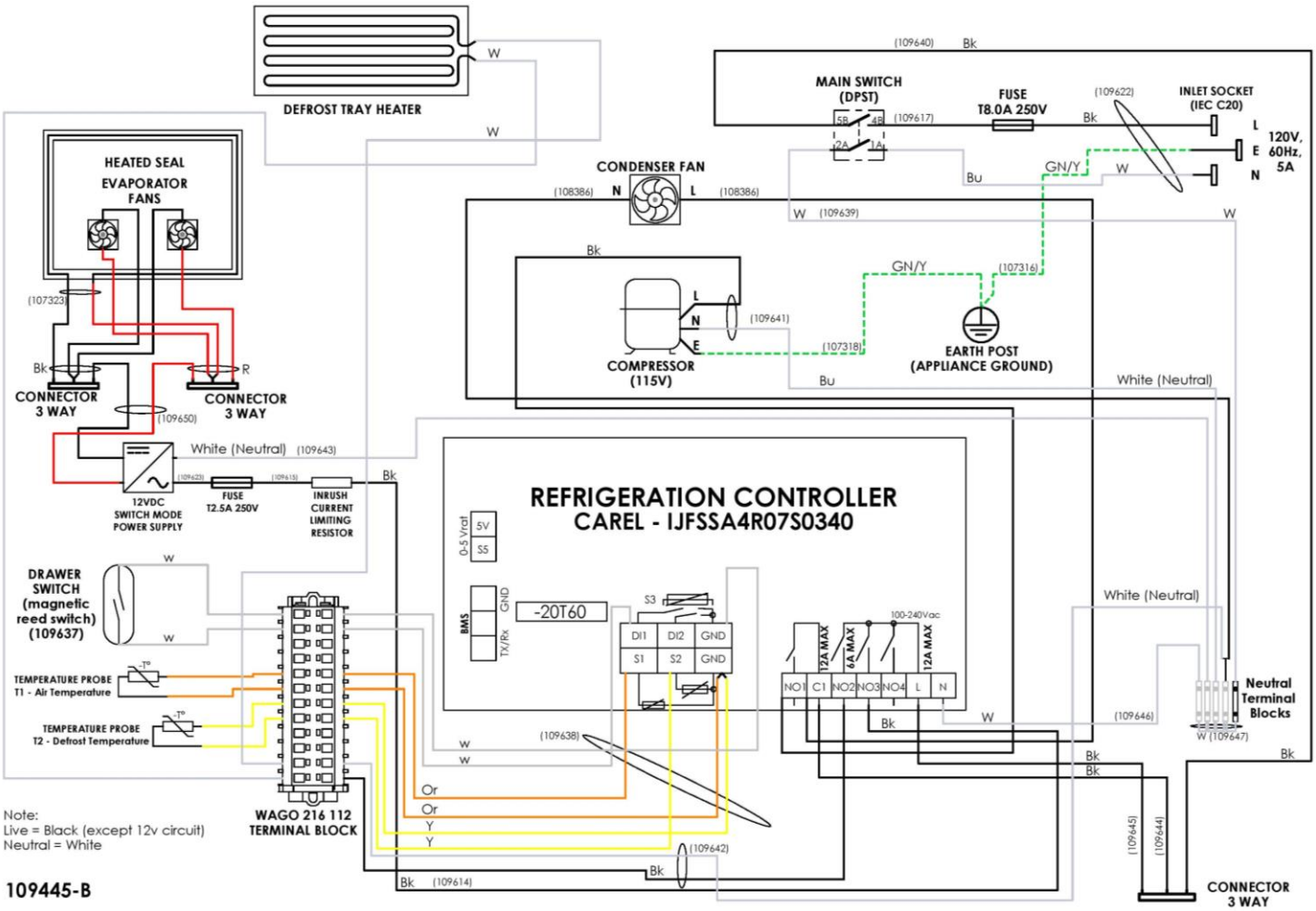
30.3 Electrical Control System

If replacing items connected to the Controller, then please refer to the tables below.

Refrigeration Controller	
S1	Drawer Temperature probe
S2	Defrost Temperature probe
GND	Temperature probe common
DI1	Switch
GND	Switch
NO1	Compressor & Condenser fan live
C1	Live to Wago Block
NO2	Defrost heater live
NO3	Evaporator fans live
L	Mains live
N	Mains neutral



30.4 Wiring diagram



30.5 Settings for Carel IJFSSA4RO2S0299 & 340

The Settings menu is accessed via the Carel app Applica which can be downloaded via the App store or Google play. The passcode for engineers' access is **44**

CAREL APPs
App Store
Google play

NOTE: The yellow highlighted parameters below are the specific parameters that have been adjusted from default for the specific Adande equipment. A full list of the Carel parameters can be supplied on request.

US controller settings for carel IJFSSA4RO2S0299 & 340

Parameter	Description	Value	Default
/5	Unit of measure	°F	°C
/Fb	Assign defrost temperature probe	S2	S1
A3	Defrost terminated after maximum time signal	TRUE	OFF
A7	Delay time for delayed external alarm	3 min	5 min
Ad	Delay time for high and low temp. alarms (AH,AL)	60 min	120 min
AH	Relative high temperature alarm threshold	12°F	0°F
AL	Relative low temperature alarm threshold	12°F	0°F
c0	Delay to enable compressor and evaporator fan at power on	5 min	N/A
c11	Second compressor start delay	0 s	4 s
d6	Display on terminals during defrosts (0 = temperature alternating with 'DEF'; 1 = freeze display; 2 = 'dEF')	2	1
dd	Dripping time after defrosting	6 min	2
dFr	Defrost status	TRUE	FALSE
dI	Maximum interval between consecutive defrost	6 h	8 h
Dlb	Assign delayed external alarm digital input	ID1	Disabled
DOA	Assign solenoid/compressor digital output	NO5	4 Relay = NO1
DOE	Assign light digital output	NO3	4 Relay = NO4
DOG	Assign defrost digital output	NO3	4 Relay = NO2
DOI	Assign evaporator fan digital output	NO2	4 Relay = NO3
dP1	Maximum defrost duration	25 min	45 min
dt1	End defrost temperature	53°F	39.2°F
F2	Evaporator fans with compressor off	See FO	OFF
Fd	Post-dripping time after defrost	0 min	2 min
FIE	Door status – control OFF	FALSE	TRUE
FOb	Alarm	FALSE	TRUE
FOE	Light	FALSE	TRUE
FOn	Liquid valve	FALSE	TRUE
HW_CFG2	HW_CONFIG 2	3	2
Lht	light	FALSE	TRUE
r2	Maximum set point	59°F	122°F
St	Temperature control set point	38°F	59°F
uon	ON time for duty setting operation	15 min	10 min

31 Electrical components

There are two areas of interest for the electrical system. The controller, display, On/Off switch, 12v transformer and fuses are located at the front of the unit behind the front panel (refer to Chapter 18). For the drawer switch, evaporator fans, temperature probes and defrost heater, there is an electrical connection block at the rear of the unit *(figure 24b).* The components are wired into 5 pairs of terminals the low voltage components populate numbers 1 through 4 and the 110v defrost heater is wired into number 5. The evaporator fans are wired into two 3-way Wago lever blocks to allow quick changing of the fans as pictured in *figure 24.*

Wago Connection Block	
1	Evaporator fans & seal heater to 12v switch mode power supply
2	Drawer switch to Terminals 24 & 25 on Controller
3	T2 defrost temperature probe to terminals 21 & 22 on controller
4	T1 air probe to terminals 20 & 21 on controller
5	Defrost heater to terminal 5 & neutral on controller

There is also a seal heater wire with connections that are located underneath the worktop at the rear of the drawer. To gain access to this, remove worktop and back panel.

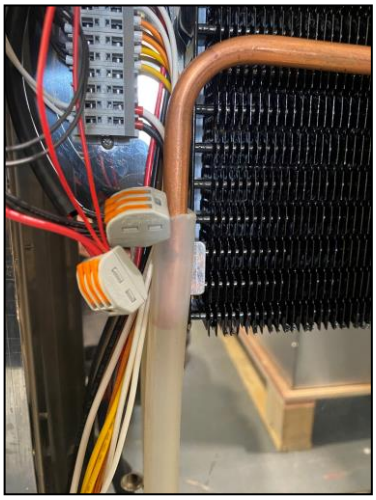


Figure 24a: 12V Wago lever blocks

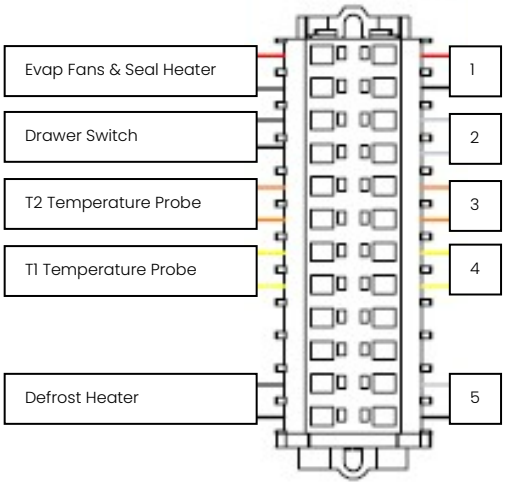


Figure 24b: Connection block

32 Refrigeration maintenance

A standard hermetically sealed vapour compression refrigeration circuit is used in the Adande® drawer system and will need minimum maintenance.
The refrigeration system uses flammable refrigerant R290 and shall be repaired only by trained Service personnel. The refrigerant tubing shall not be punctured in any condition. Please see warning label shown in Figure 25. It is not advised to connect a manifold to the system unless necessary. Before attaching a manifold, please check all other areas as mentioned in this maintenance manual first.



Figure 25

There are two access ports fitted to the refrigeration circuit to enable easy connection of a service manifold. The low-pressure access fitting is located on the compressor service port *(figure 26a)* the high-pressure access fitting is located between the compressor discharge and condenser inlet *(figure 26b)*. Do not use hot taps.

Each module is critically charged with 2.8oz (80g) of R290 refrigerant. When recharging the gas must be weighed in and ideally be within 0.03 – 0.17oz (1-5g) of the stated charge weight. Ensure the refrigeration system is fully vacuumed to a least 1.3mbar before recharging.

The system uses a copper capillary of 0.026" internal diameter, 6ft 7" long for R290 systems and the vast majority of the capillary is wrapped around the base of the copper accumulator for heat exchange. One end of the capillary is inserted into a filter drier the other end is inserted into the evaporator coil inlet pipe, 6.9" (175mm) of the capillary tube should be inserted into the evaporator coil. It is recommended that after any procedure that involves breaking the refrigeration circuit the filter drier should be replaced.

The running pressures of the system during normal operation are as follows.
Please note these pressures may vary depending on the ambient temperature.

- R290 Low side pressures should read between 0.27 bar (3.91 PSI) at 30°C (86°F) and 5.84 bar (85 PSI) at 38°C (100°F)
- R290 High side pressures should read between 12 bar (179 PSI) at 30°C (86°F) and 19 bar (277 PSI) at 38°C (100°F)

NOTE: The rear panel must be fitted when recording running pressures, failure to do so may result in false readings.



Figure 26a

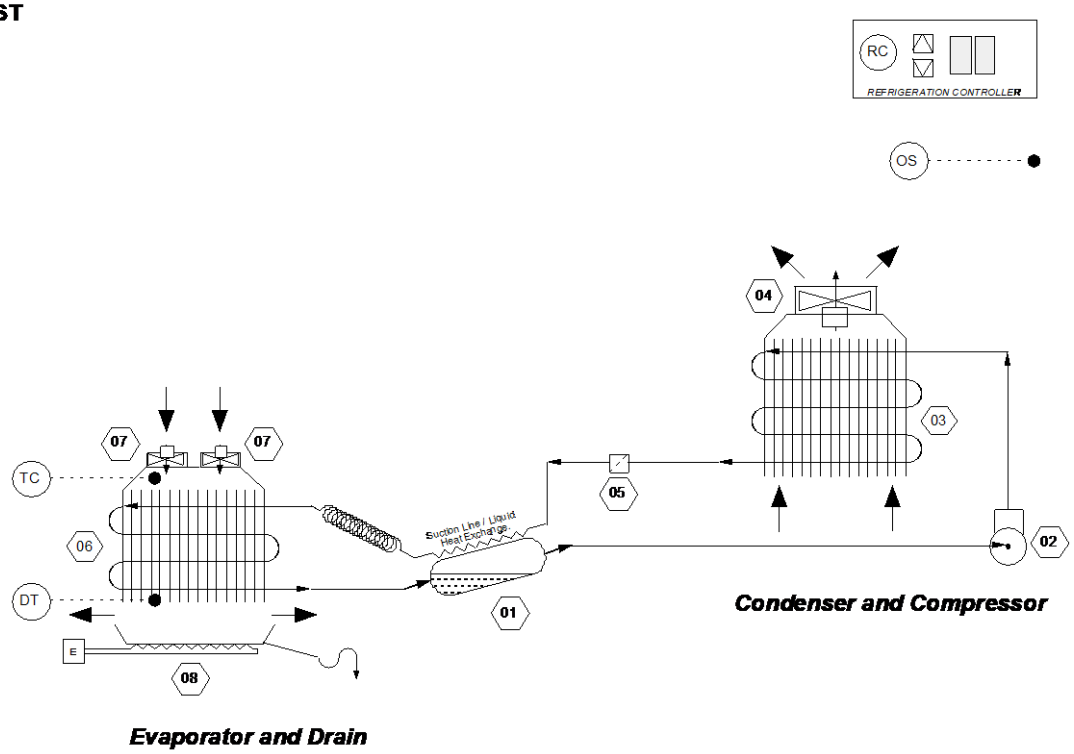


Figure 26b

33 Refrigeration components

All component parts must be replaced with like components as described below. Servicing shall only be carried out by factory authorised service personnel to minimise the risk of possible ignition due to incorrect parts or improper service.

PARTS LIST



Parts No.	Description
107588	Compressor EM2X 3121U R290 120V
103185	Condenser Coil
102930	Filter Drier
107486	Capillary 0.026" 2mtr
104290	Evaporator Coil
104286	Copper Accumulator
102062	Access Fitting ¼"
109434	Refrigeration Pipework Assembly

34 Fault Finding

34.1 Drawers not operating correctly

Possible Cause	Recommended Action
Runners require lubrication	Lubricate runners, see Chapter 27
Runners are mechanically damaged	Replace runners, see Chapter 27
Ice build-up causing diffuser to hit insulated container	Check defrost heater operation and drain for blockages see Chapter 24

34.2 Seal and/or insulated container rim have ice and condensation

Possible Cause	Recommended Action
Seal is contaminated	Clean the seal
Seal damaged	Replace seal, see Chapter 26
Seal heater is not working	a) Check 12V power supply b) Check seal heater continuity, replace seal if faulty, see Chapter 26 c) Check 2 amp fuse to transformer
Product/packaging trapped between insulated container rim and lid distorting seal	Ensure the insulated container is not overfilled.

34.3 Drawer is not maintaining set temperature

Possible Cause	Recommended Action
Failure of evaporator fans	a) Check drawer switch operation b) Check 12V power supply c) Check evaporator fans. Replace evaporator fans if necessary.
Seal failure	Check condition of heated seal
Excessive icing of evaporator coil	a) Check defrost operation b) Check defrost heater operation c) Manually defrost d) Check/clean drain from evaporator e) Check seal condition
Drawer temperature probe faulty	Replace temperature probe
Defrost termination probe faulty	Replace temperature probe
Blocked capillary line	Replace capillary tube.
Low refrigerant	Search for leak in system, repair leak and recharge with refrigerant
Failure of condenser fan	Check the condenser fan is operational, see Chapter 28
Condenser coil is blocked	Clean condenser coil
Failure of compressor	Replace compressor if faulty.

34.4 The Drawer does not power up

Possible Cause	Recommended Action
No mains power at mains terminals	If mains fuse OK then check wiring of the plug. Ensure power is switched off at socket.
Plug into drawer not fully inserted	Check all plugs/ sockets

34.5 Evaporator fans run when drawer is open

Possible Cause	Recommended Action
Controller has failed.	Replace Controller

34.6 Evaporator fans do not run when drawer is closed

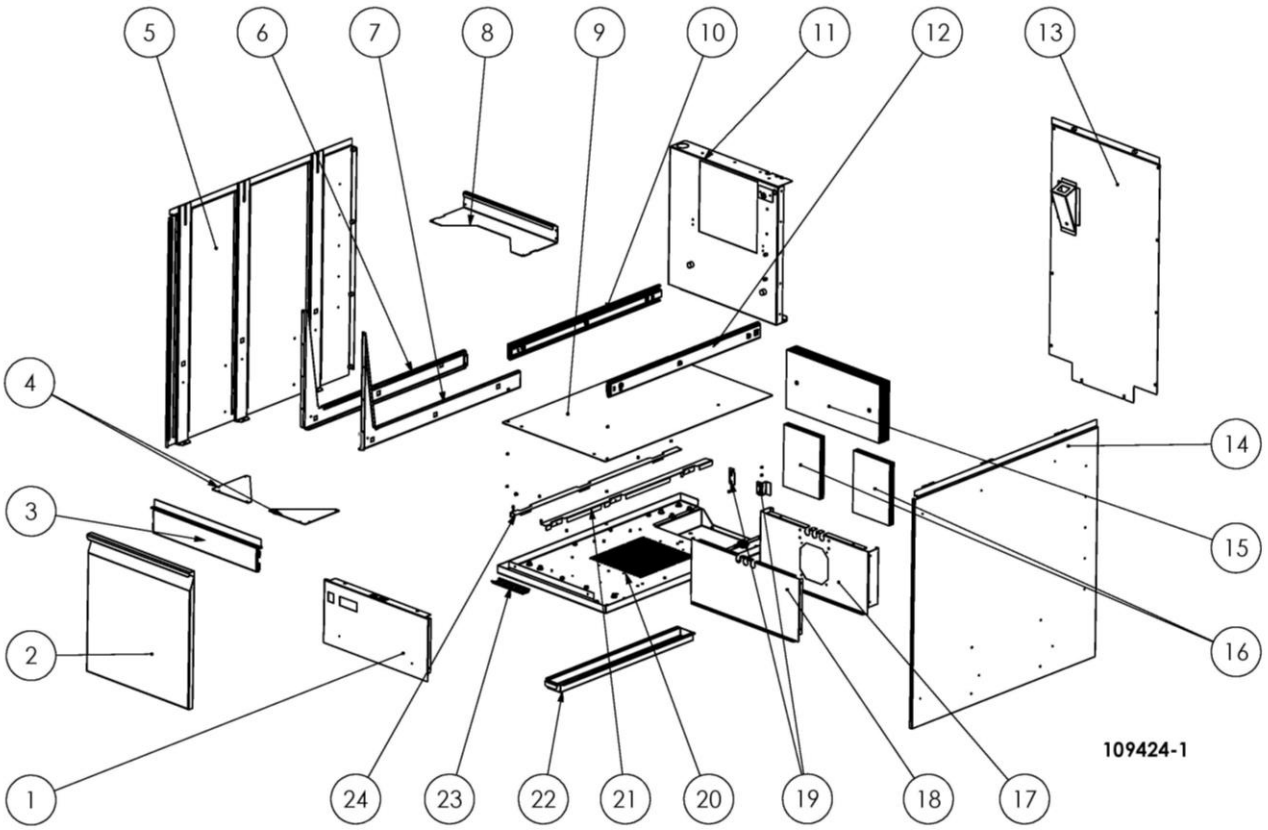
Possible Cause	Recommended Action
Drawer switch has failed	Replace switch
12 v power supply	Check 12V power supply Check wiring to fans for damage Check the 2 amp fuse
Inline resistor has failed	Replace inline resistor

34.7 Display not functioning

Possible Cause	Recommended Action
Ribbon cable connections loose	Check ribbon cable connections at display and controller
Display has failed	Replace display

35 Exploded diagrams

35.1 Housing spare parts VCC

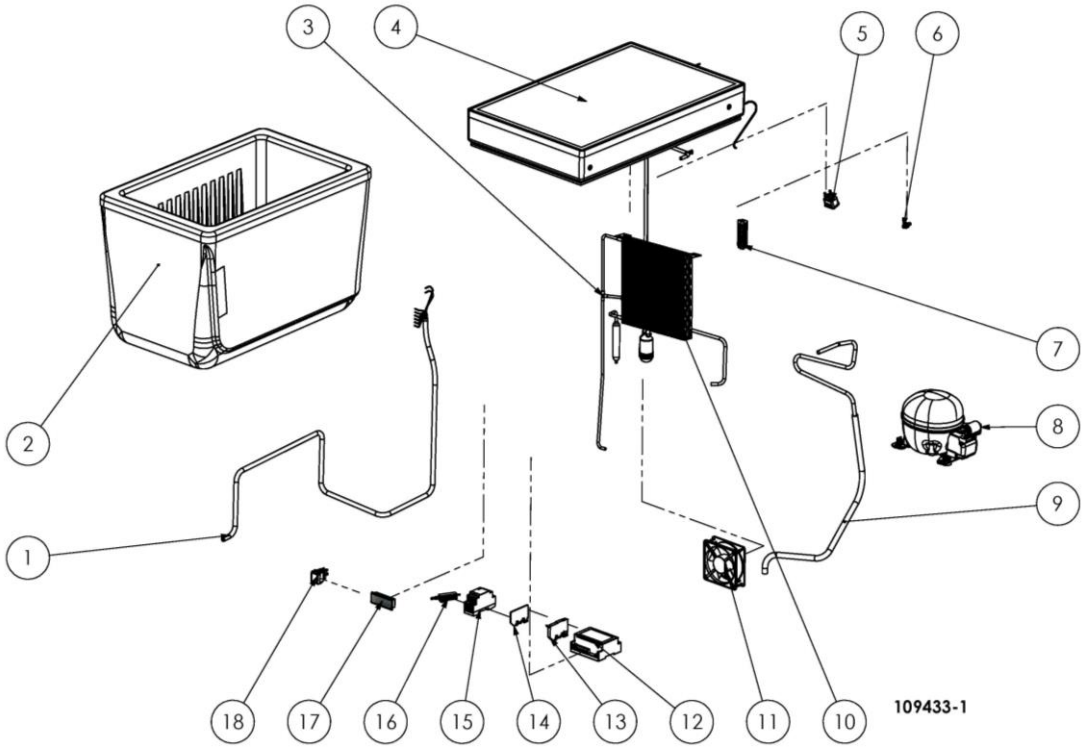


Item No.	Part No.	Description	Quantity
1	109704	Kit spares - Panel front access assy (VCC-US)	1
2	109507	Drawer front (VCC-US)	1
3	109274	Channel upper front assy (VCC-US)	1
4	104123	Bracket drawer assembly stiffening (VCC)	2
5	109272	Panel housing LH S/W assy (VCC-US)	1
6	109287	Container support LH (VCC-US)	1
7	109286	Container support RH (VCC-US)	1
8	109285	Channel container back stop (VCC-US)	1
9	109279	Panel drawer chamber base (VCC-US)	1
10	104741	Drawer slide RH assembly	1
11	109447	Panel internal rear (VCC-US)	1
12	104740	Drawer slide LH assembly	1
13	109705	Kit spares - Panel rear assy (VCC-US)	1
14	109270	Panel housing RH S/W assy (VCC-US)	1
15	103905	Panel counterbalance (VCC)	14
16	103972	Counterbalance weight lower (VCC)	12
17	103874	Panel fan mounting (VCC)	1
18	104129	Panel electrical compartment isolation (VCC)	1
19	104122	Bracket counterbalance weight restraint (VCC)	2
20	109295	Panel base S/Weld assy (VCC-US)	1
21	109280	Bracket support RH drawer chamber base (VCC-US)	1
22	109294	Drain tray (VCC-US)	1
23	103575	DIN rail 35 x 7.5mm	1
24	109281	Bracket support LH drawer chamber base (VCC-US)	1
(*)	109263	Drawer front RT lockable (VCC)(CB)	1

(*) - NOT SHOWN

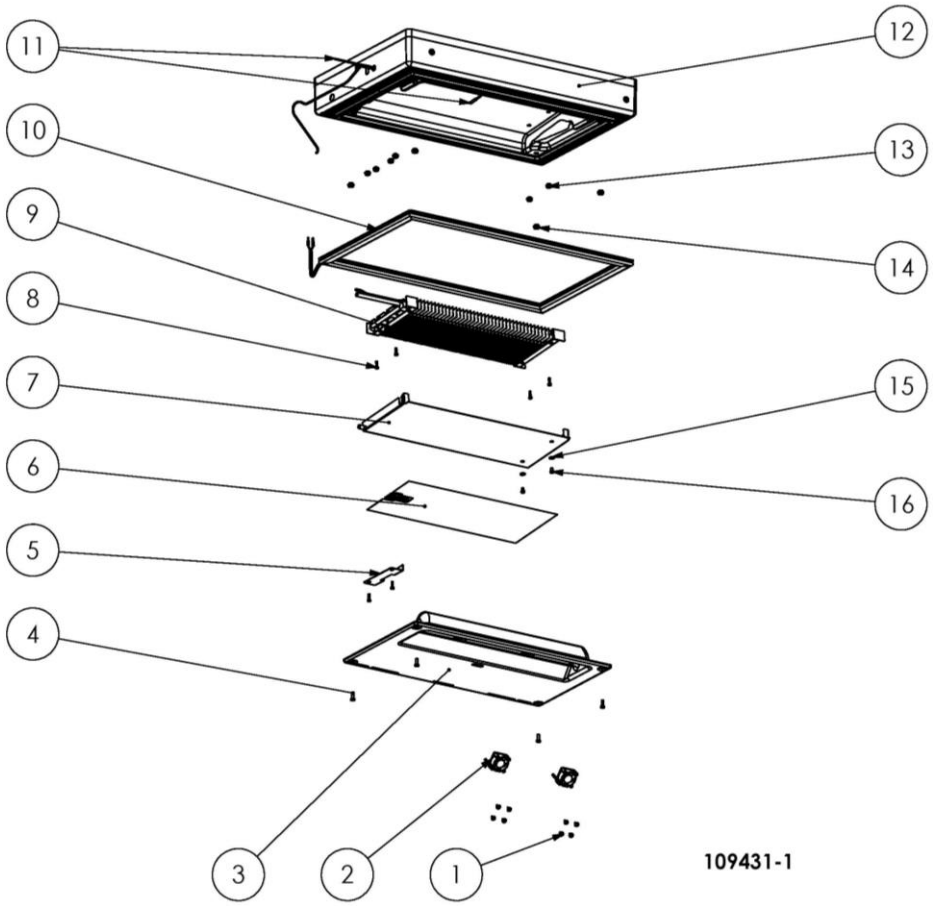
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35.2 R290 Fridge, Electrical System and Drawer Parts VCC



Item No.	Part No.	Description	Quantity
1	109703	Kit spares - harnesses (VCC-US)	1
2	109309	Insulated container built assembly (VCC-US)	1
3	109434	Kit spares - pipework (VCC-US)	1
4	109304	Insulated lid built assembly (VCC-US)	1
5	106430	Power inlet C20 16A snap fit	1
6	108132	Reed switch threaded barrel - H	1
7	109448	Terminal block wago 261-112	1
8	107588	Compressor EM2X 3121U R290	1
9	109305	Defrost drain tube assembly (VCC-US)	1
10	103185	Condenser - tubeless	1
11	108386	Fan axial EC 120 x 38, 100-230V Assy	1
12	107581	Refrigeration controller BD1-28C1S5WH-A	1
13	107168	Fuse holder 10A DIN rail mounted	2
14	107178	End plate 10A DIN rail mounted fuse holder	2
15	107915	Power supply 12v dc, 2A DIN rail - AMR2	1
16	103446	Resistor 47 ohm 50W	1
17	106344	Refrigeration controller display (LAE TU5S-B)	1
18	106392	Switch DPST integral guard with cover	1

35.3 Insulated Lid (part No. 103754 – Complete Assembly)



Item No.	Part No.	Description	Quantity
1	103207	Screw pozi Flange Self Tapper No. 8 x 3/8" ST/ST	8
2	108451	Kit spares - Costec evap fan fixing kit (VCS)	1
3	103799	Lid diffuser (VCC)	1
4	106868	Screw pozi pan M5 x 16 ST/ST	4
Not shown	107039	Lid diffuser & fans assy (VCC)	
5	103903	Bracket retaining plate defrost collection (VCC)	1
6	109267	Defrost heater electric 120v, 60Hz, 150W UL, 440mm x 190	1
7	103800	Plate defrost collection (VCC)	1
Not shown	109310	Defrost tray & heater - kit assy (VCC-US)	
8	106801	Screw pozi pan M4 x 16 ST/ST	6
9	104290	Evaporator coil coated (VCC)	1
10	103865	Heated container seal assy (VCC)	1
11	103063	Temperature probe - NTC silicone sheathed	1
12	103787	Insulated lid assembly (VCC)	1
13	106603	Rubber nut M4 - short grip	4
14	106436	Rubber nut M5 - short grip	6
15	103491	Bonded sealing washer M5 ST/ST	2
16	102082	Screw hex M5 x 12 ST/ST	2

36 Appendix 1: Contact details

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