Maintenance Manual

Hydrocarbon VCR Series USA



Original Instructions 2023

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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: Front view of Adande® Two Drawer VCR under counter prep station

3 Ratings and Specifications

ADANDE VC Series			
Model	VCS R5 V3	VCR R5 V3	VCM R5 V3
Region	USA		
Electrical Specifications			
The Adande VCx range of products is configured for the appropriate electrical supply and supplied with a fixed cordset 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		
Interface Power Cord set (Option)	Optional: Power cord to connect two modules Type SJT, 3 x 14 AWG, 300V 60°C, VW-1 Fitted with an IEC 60320 C19 coupler and an IEC 60320 coupler, 0.6 – 1m (2 – 3 ft) in length		
Environmental			
Operating Temperature	15°C – 40°C (60°F – 100°F)		
Noise	70 dB Max		
Altitude	Maximum operating altitude 6560 ft. (2000m)		
Mechanical			
Dimensions – module only	Model	Height	Width	Depth
	VCS	390mm	1100mm	700mm
	VCR	390mm	880mm	885mm
	VCM	390mm	1100mm	700mm
Module weight without counterbalance weights	130lbs (59kg)			
Counterbalance weights in castor base	36lbs (16.5kg)			
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 leads and daisy chain lead are 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.

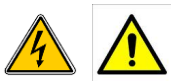
- TEMPERATURE PROBES: If the unit has just been switched on let it run for 5 minutes. Press and release the left button on the controller and then hold to see the T1 storage temperature. Check that the reading is sensible. Press and release the left button again to see the T2 evaporator temperature (T2 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 by pressing and holding the 2nd left button until 'dEF' is shown. 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. If not already fitted, fit the drainage clip as detailed in Service Instruction VC001. 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 do one of the following:

  On serial Numbers after 100942 – Remove the condenser grille to access the controller.

  On earlier serial numbers remove the worktop or and/or the side panel.

- **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, failed power supply or incorrect lid height adjustment.

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:**

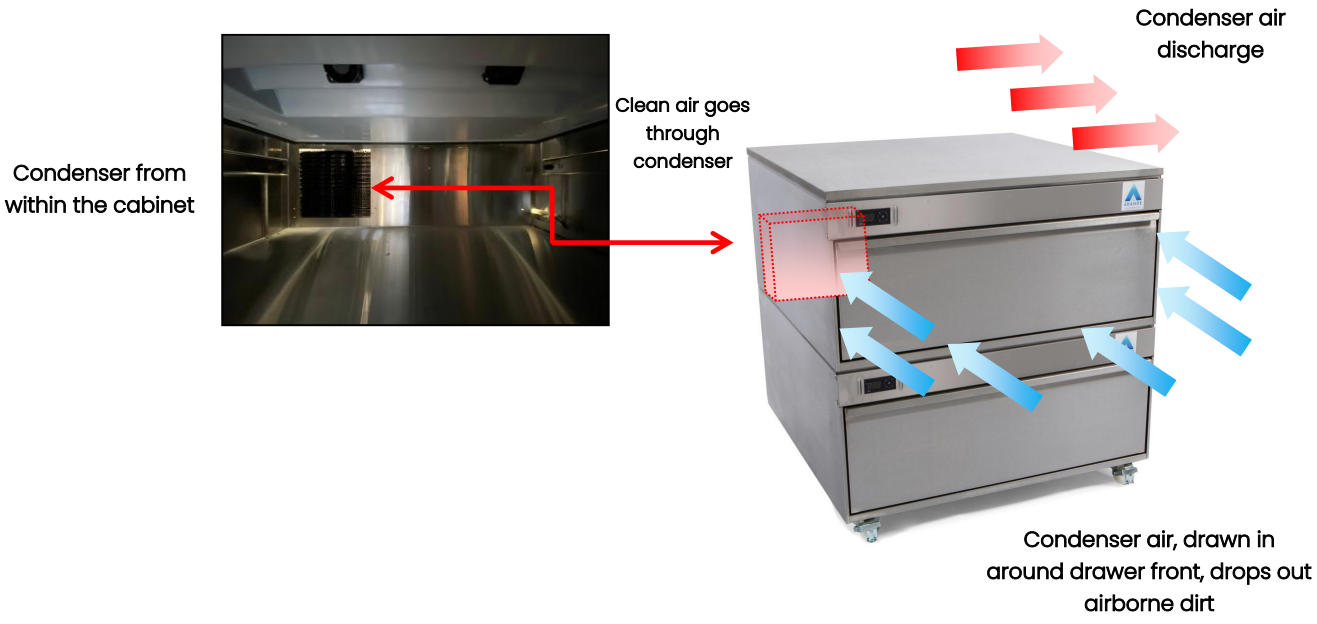
  The refrigeration system uses flammable refrigerant R290 and shall be repaired only by trained Service personnel. The refrigerant tubing shall not be punctured in any condition. It is most unlikely that an Adande unit will suffer from a gas leak because units are leak tested in the factory with helium. 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) or because the lid need adjustment to gain the correct gap. 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 side panels and worktops must always be properly fitted or the condenser will not get adequate airflow.</u>



7. Operating the Adande® Controls – LAE

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.



Figure 2: Adande® Display Control Panel

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 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.

8 Error Codes

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. Please ensure the correct container is being used as a VCM-US unit uses a reed switch activated by a magnet located in the container.

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 22 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 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.

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

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. Please ensure the correct container is being used as a VCM-US unit uses a reed switch activated by a magnet located in the container.

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 21 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 Replacement - LAE

WARNING: To replace a faulty display panel first isolate from the mains power supply by unplugging the unit. Next remove the insulated storage container to gain access. 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 3a/3b)* then remove the ribbon connector from the rear of the display panel *(figure 3c)*. Connect the ribbon cable to the new display then simply push into the panel *(figure 3d)* until it clicks and its sitting flush.



Figure 3a



Figure 3b



Figure 3c



Figure 3d

12 Display Panel Replacement - Carel

WARNING: To replace a faulty display panel first isolate from the mains power supply by unplugging the unit. Next remove the insulated storage container to gain access. 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 4a/4b)* then remove the ribbon connector from the rear of the display panel *(figure 4c)*. Connect the ribbon cable to the new display then simply push into the panel *(figure 4d)* until it clicks and its sitting flush.



Figure 4a



Figure 4b



Figure 4c



Figure 4d

Parts No.	Description
106344	Controller Display (LAE TU5S-B)
106408	Controller Ribbon Cable 2m (BD1-28 to Display)
109130	Carel Display IJFHSA0N00S0296
109131	Carel link cable BX0PZC4000150

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 3 pin plug. The other end of the supply lead, fitted with an appliance plug, which is connected to the Adande® drawer as shown in *figure 5* below. When replacing a mains lead ensure the P clips are secured back into position, this will prevent the leads being pulled out accidently.

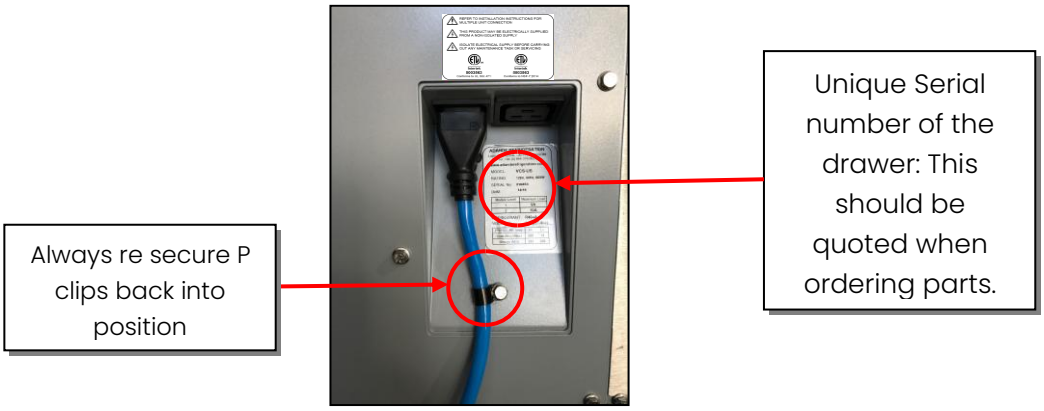


Figure 5

The unused socket on the right-hand side in *figure 6* can be used to provide a mains supply to additional Adande® units using a link cord as shown in *figure 6a* below.



Figure 5a: Mains connection point

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
106444	Mains Link Cord 0.6m (2 ft) 15A C20 Plug To C19 Socket
106430	Mains inlet C20 16A Snap Fit Socket
106431	Mains outlet C19 16A Snap Fit Socket
107548	Mains Link Cord 1 m (3 ft)

14 Location and Stability

It is important that the Adande® drawer 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 (16°C) and 100°F (38°C).

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

The Adande® drawer can be mounted on rubber feet, rollers or castors. When mounted on a castor base, the front two castors should have their brakes ON during normal use as in *figure 6*.

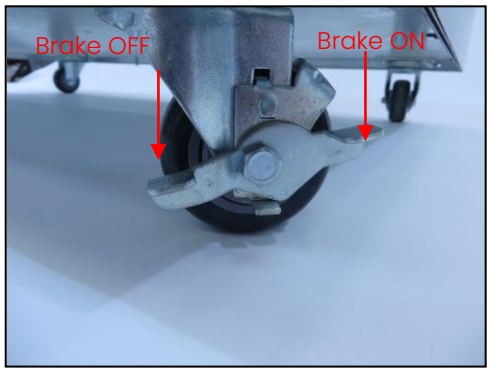


Figure 6: Lockable Castor

If the Adande® drawer is mounted on two rollers at the rear and rubber feet at the front, then to move the drawer lift the front as shown in *figure 6a* and push or pull into position.



Figure 6a

CAUTION: THE INSULATED CONTAINER SHOULD BE UNLOADED BEFORE MOVING

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 7)* lift the container vertically up to remove, the container should be fully emptied before removing.



Figure 7

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
108356	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 condition.

To remove the worktop, first remove the 4 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 8)*. Replacement is the reverse of the removal procedure.

NOTE: CORRECT LIFTING PROCEDURES SHOULD BE FOLLOWED



Figure 8: Worktop removal

17 Rear Panel Removal

The rear panel of the unit may require removal to gain access to the drainpipe or assist in diffuser and heated seal replacements. To remove the back panel, remove all 14 off M5 x 8 Flanged bolts as shown in *figure 9* below.

WARNING: When working on a two staked unit as pictured below in *figure 9* it is important to replace at least one of the bolts once the back panel has been removed. If left unsecured there is a risk that the top unit will tip especially if the drawer is open.

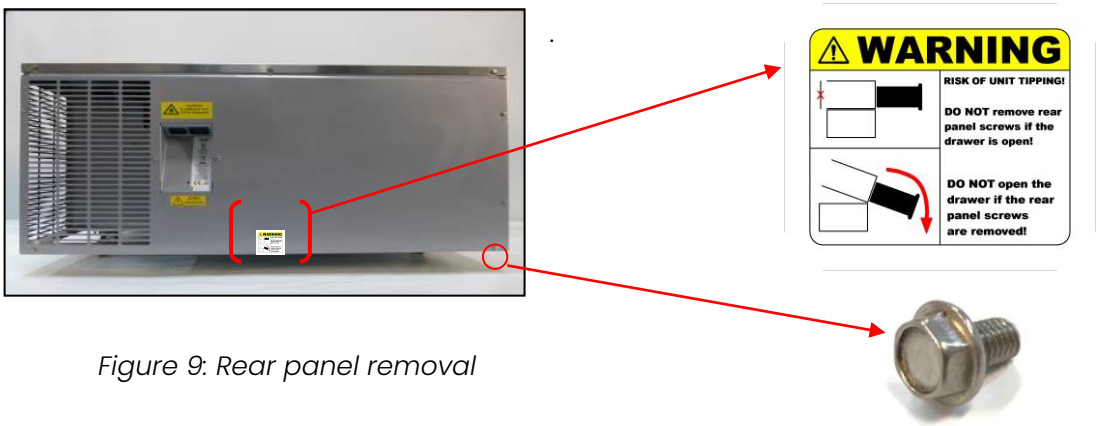


Figure 9: Rear panel removal

Parts No.	Description
108035	Rear Panel
103225	Worktop Cover Top
103223	Worktop
107666	Panel fire enclosure

18 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. To gain access and replace the drawer switch, remove the insulated container, the switch can be located inside the drawer cavity on the left-hand side wall *(figure 10a)*. Disconnect the switch from the harness by accessing the 2 bullet connectors as pictured below *figure 10b* remove the 2 x pozi head screws to release the reed switch and then pull the wires through into the drawer cavity *(figure 10a)*. The wires on the switch do not have a defined polarity.



figure 10a

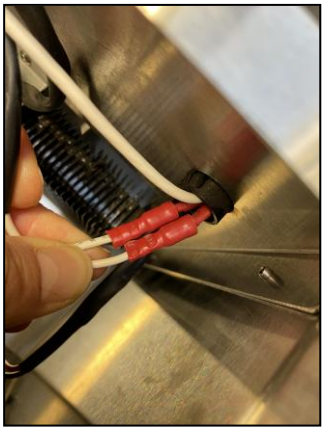


figure 10b

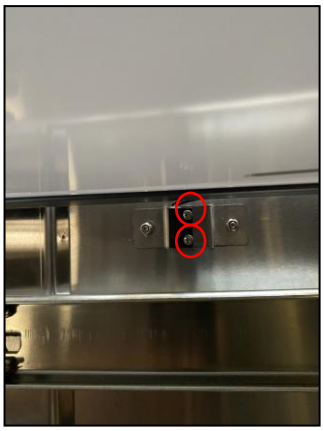


figure 10c

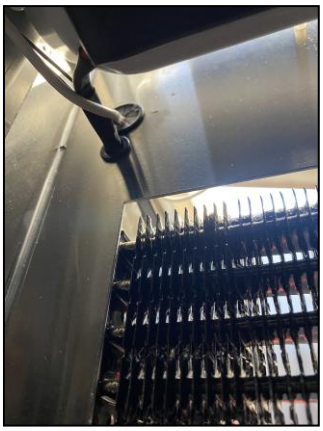


figure 10d

Parts No.	Description
108134	Reed switch threaded barrel – H

19 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.

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

To remove the diffuser, first remove the insulated container. Next remove the 8 x Pozi M5 x 16 ST/ST screws securing the diffuser in position. It is advisable to leave the middle screw till last as this will stop excessive downward force on the weaker corners. 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.

CAUTION: WHEN CARRYING OUT ANY WORK ON THE INSULATED LID THE SEAL HEIGHT SHOULD BE CHECKED AND ADJUSTED IF NECCESARY.



Figure 11a: Diffuser screws in situ



Figure 11b: Fan wires

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.



Figure 11c: Rubber fastenings in situ

Parts No.	Description
103729	Diffuser
108860	Diffuser Assembly (evaporator fans included)
106868	Screw Pozi M5 x 16 ST/ST (Diffuser Screw)
106436	Rubber Nut M5 - Short Grip

20 Evaporator Fan Replacement

Remove the diffuser *(chapter 19)* then cut the wires at the **FAN** end and use these to pull through the new fan wires. Now remove the four self-tapping screws that hold the fans in place as shown in *figure 15a*.



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

The fans are connected to the 12V transformer via two 3 way lever locking terminal blocks which are located within the fridge engine compartment as pictured in *figure 12b* below, pull the new wires through the hole in the lid and fit the new fan wires in to the corresponding terminal block, mount the fans back on the diffuser as shown below in *figure 12a*. Replace all cable ties. If both fans have failed and the 12v transformer has been ruled out it can be preferable to replace the whole diffuser assembly which comes with the two fans already mounted.



Figure 12a: Evaporator fans

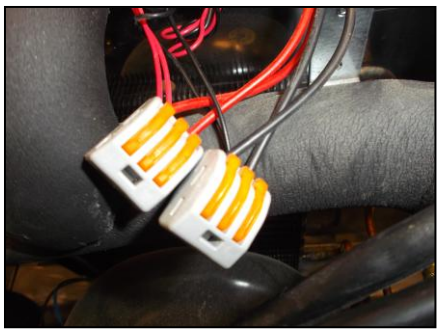


Figure 12b: Lever Locking Terminals

Parts No.	Description
106483	Evaporator Fan
106838	Screw pozi pan self-tap AB No.8 x 1/2" ST/ST (Fan Screws)

107088	Terminal block 3 way lever locking
108860	Diffuser Assy (evap fans inc)

21 Defrost Heater Removal and Replacement

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 46.4°F (8°C). The defrost heater should draw 0.65 amps when working correctly.

WARNING: To fully investigate defrost and draining un-plug the unit from the mains.

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

To replace the defrost heater first remove the rear panel and carefully pull the drainpipe off the back of the defrost heater tray (*figure 13b*) If the pipe is cold, it may become brittle so caution should be exercised when removing the pipe. To gain access to the defrost heater remove the insulated container and drop the diffuser down.

Remove the 4 M5 X 12 bolts and associated sealing washers fixing the drain tray to the evaporator coil, drop down the defrost heater and remove *(figure 13a)* Cut the wires from the old heater and use to pull the wires from the new heater through into the fridge engine compartment.



Figure 13a

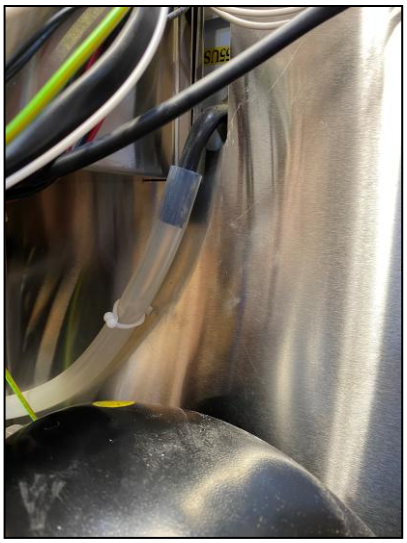


Figure 13b

CAUTION: When replacing the drain tray take care not to bend the tray or the water may not drain correctly, ensure all four sealing washers are on the four fixing bolts. Replace drain tray and putty around drainpipe penetration both inside and outside of lid.

Parts No.	Description
108091	Drainpipe
108478	Defrost Heater Assembly
103491	Washer Bonded
102082	M5 x 12 ST/ST Hex Head

22 Evaporator Temperature Probes Replacement

If the display panel shows an E1 (T1 air probe) or E2 (T2 defrost probe) error message this means that a temperature probe has failed and needs to be replaced.

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

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

Disconnect the faulty probe from the controller and use it as a pull through to Install the new probe back through the electrical wire penetration hole in the lid, then reconnect to controller, replace the P-Clips and refrigeration putty, as shown in *figure 14*.

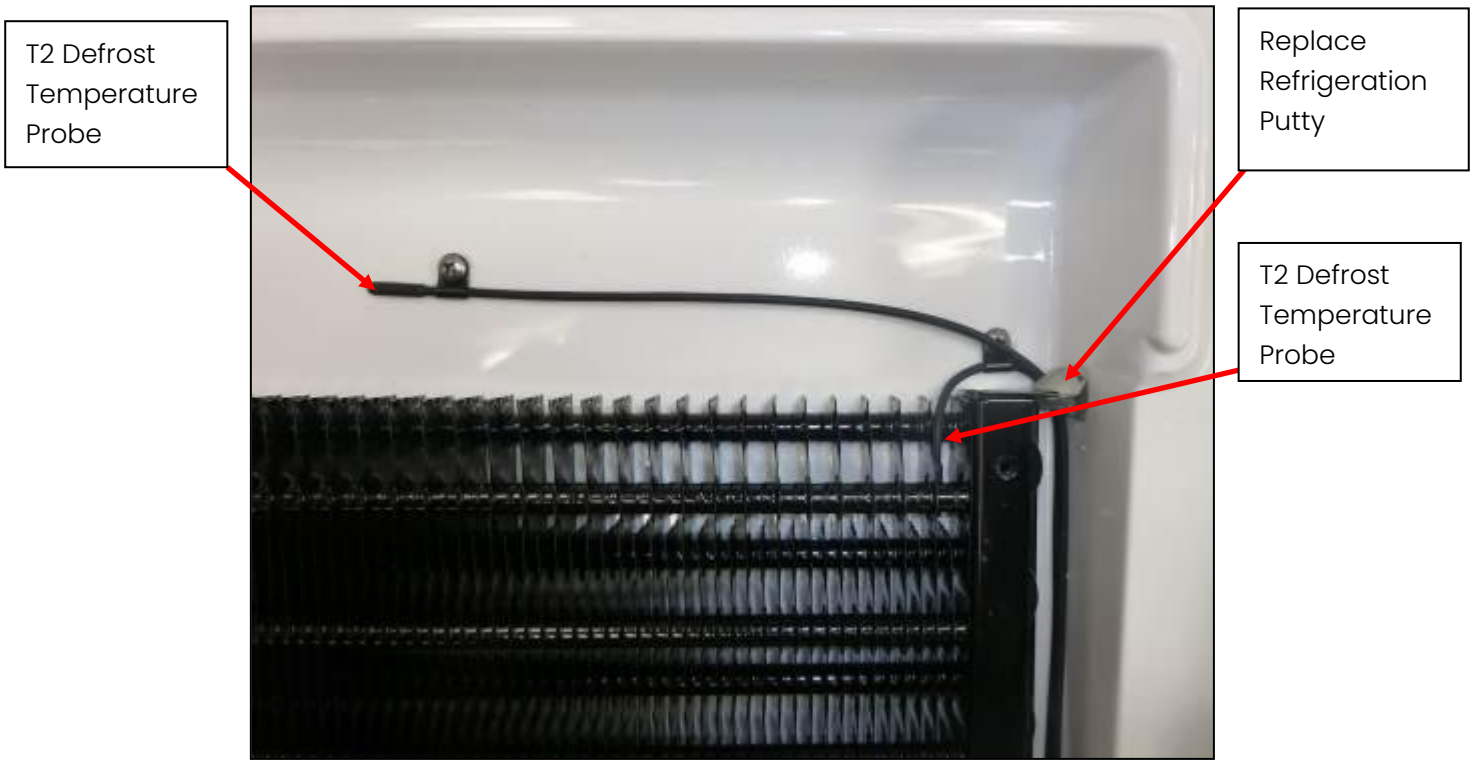


Figure 14: Temperature probes held in place with P-Clips

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

23 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 back panel, locate the heater wires, and disconnect the 2 bullet connectors, this disconnects the heating element from the 12V transformer, then remove insulated container and pull the heater wires through from the compressor housing into the drawer cavity.

Pull the seal out of the retaining channel in the lid and replace with a new seal (Push seal into corners of the retaining channel first for alignment). Pass the seal heater tails back through the Inner Wall into the compressor housing to prevent it snagging on the drawer or runner when closed *(Figure 15b)* finally re-connect the bullet connectors and fit the back panel.

If the seal retaining channel becomes damaged or breaks, this can be ordered as a spare (see parts list below) it is recommended that when replacing a faulty seal retaining channel a quick drying strong adhesive is used to secure in position.

On completion the seal height should be checked refer to Chapter 26.

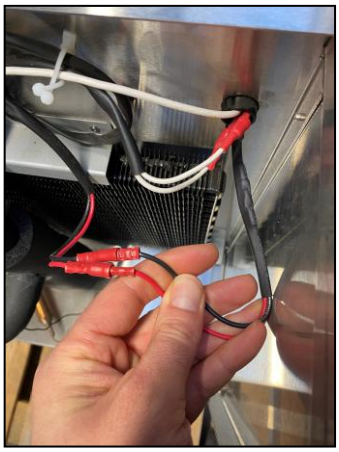


Figure 15a

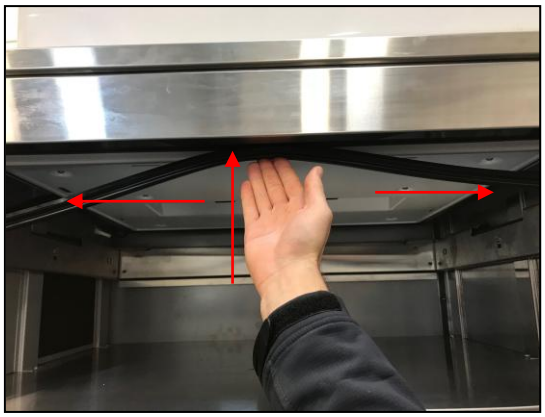


Figure 15b

Parts No.	Description
103746	Drawer seal
107107	Seal Retaining Channel Full Set

24 Seal Height Adjustment

The seal and lid height is critical to ensure:

- The correct closure and opening of the drawer.
- To prevent the insulated container icing closed.
- To prevent access of warm ambient air into the container.

To adjust the lid, start by loosening the 4 off M5 x 16 flange head lid mounting bolts, which are located behind removable caps on the right- & left-hand side panels *(figures 16a* and *16b*). The two rear corners should be adjusted first, apply a small amount of pressure, and tighten, then adjust the two front corners by loosening the screws and letting the lid rest under its own weight. The bolts should be tightened down to a torque of 7 Nm

NOTE: DO NOT OVER COMPRESS THE SEAL

To check that the seal isn't over compressed, open the drawer and ensure there is a 2mm gap between the back edge of the insulated container and the front edge of the seal (container and runners are at a slight angle to the lid).

To prevent a new seal sticking to the rim of the insulated container it is recommended that the seal is lubricated with a silicone-based plastic/ rubber lubricant.

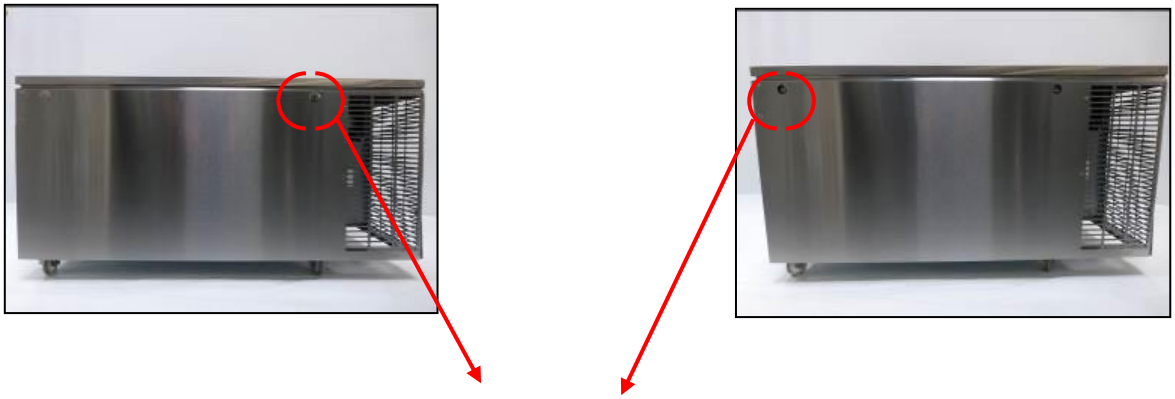


Figure 16a and 16b: Lid mounting bolts

Parts No.	Description
107617	Lid Mounting Bolt

25 Runner Replacement

To replace a drawer runner the Insulated container and container support cradle will need to be removed to gain access.

To remove the container support cradle from the runners first remove the two M5 X 6 ST/ST countersink screws *(figure: 17a)* the support cradle can now be removed by lifting the drawer front up and pulling forward to detach it from the lancing's on the runner inner beam *(figure: 17b)*





Figure 17a: Remove support cradle retaining screws

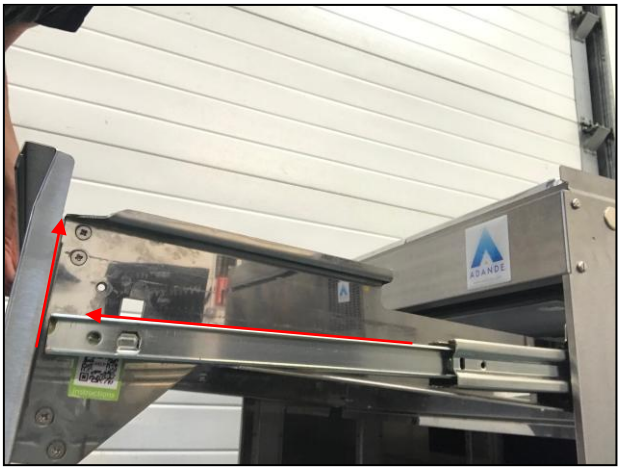


Figure 17b: Remove support cradle from runners

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 below.



Figure 17c: Twist runner.

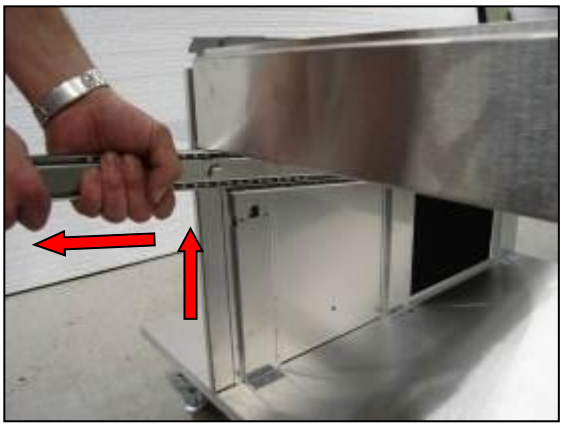


Figure 17d: Lift and pull forward



Figure 17e: Fixings in vertical wall supports and lancing's in runner outer beam

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 now not be able to lift the front of the runner vertically.

Fit the container support cradle in the same way by engaging the rear fixings first with a horizontal motion then engage the front 2 lancing's and press down to fully engaging both then close the retaining clips up to secure in position. Ensure the holes in the front of the runner lines up with the holes in the container support and refit the M5 X 6 countersink screw.

Parts No.	Description
104741	Runner RH
104740	Runner LH

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

26 Condenser Fan Replacement

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

To replace the condenser fan, the rear panel needs to be removed chapter 17, next remove the two loomed wires from the side of the fan. Then remove 4 Off M4 X 45 Br.Zn.Pd. Screws to remove the fan *(figure 18)*.

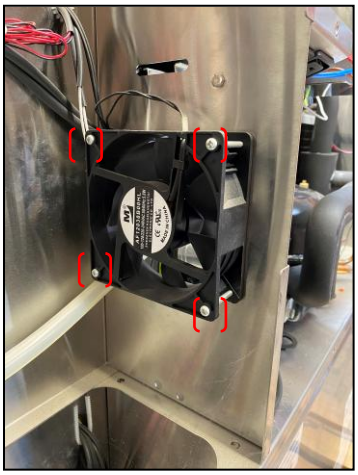


Figure 18

Parts No.	Description
107589	Shenzhen Huaxia Hengtai Condenser Fan axial 120 x 39, 120V
103602	Condenser Fan axial 120 x 39, 120V Guard

27 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.

27.1 Access

The panel on which the main controller and associated components is mounted can be lowered to allow greater access to the components. To access the controller compartment, remove the rear panel, then remove 1 X M5 X 6 ST/ST bolt as pictured below in *figure 19b* The panel can now be lowered as pictured below in *figure 19d*







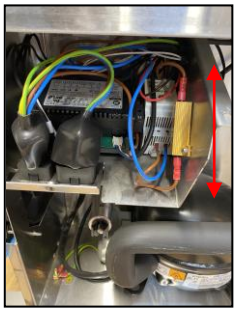


Figure 19a *Figure 19b* *Figure 19c* *Figure 19d*

27.2 Fuse Holder

The electrical system is protected by a 12.5-amp fuse which is located in a dedicated fuse holder situated between the main controller and 12v transformer *figure 20a*
If the fuse fails, there will be no power to the unit. There is a red LED which will illuminate in the event of a fuse failure *figure 20b*

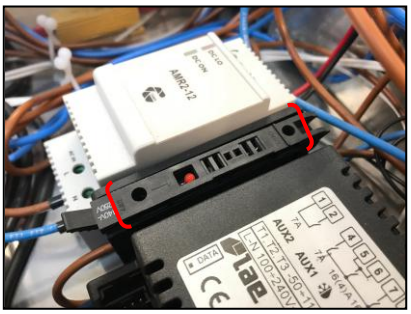


Figure 20a



Figure 20b

To replace the fuse simply pull up the latch on the top of the fuse holder *(figure 24c)* to reveal the fuse carriage. Ensure the carriage is firmly clicked back into position.

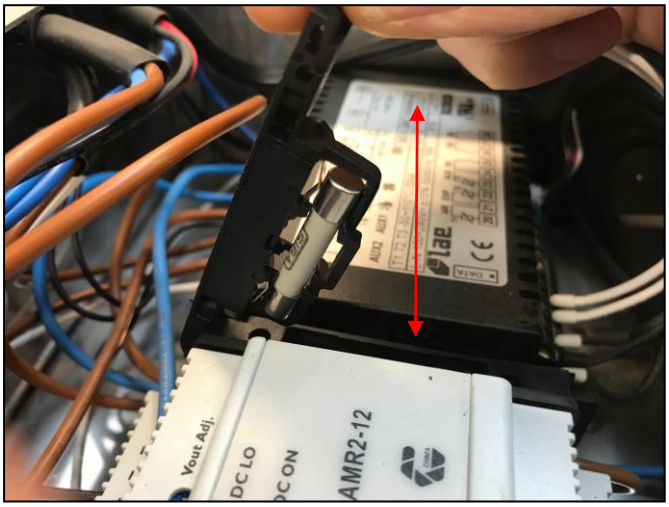


Figure 20c

Parts No.	Description
106885	Fuse Holder
107084	Fuse Holder End Plate

27.3 Main Components

Figure 21 shows the main electrical components and how they are laid out within the unit.

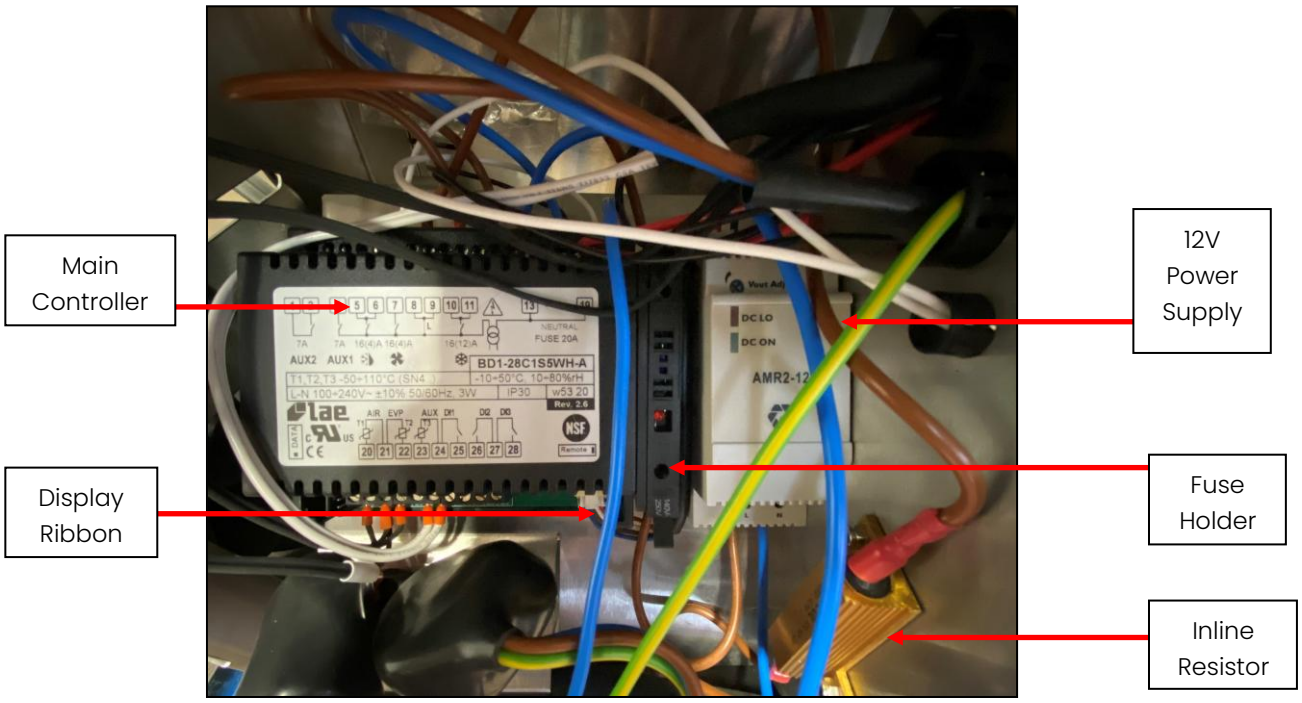


Figure 21

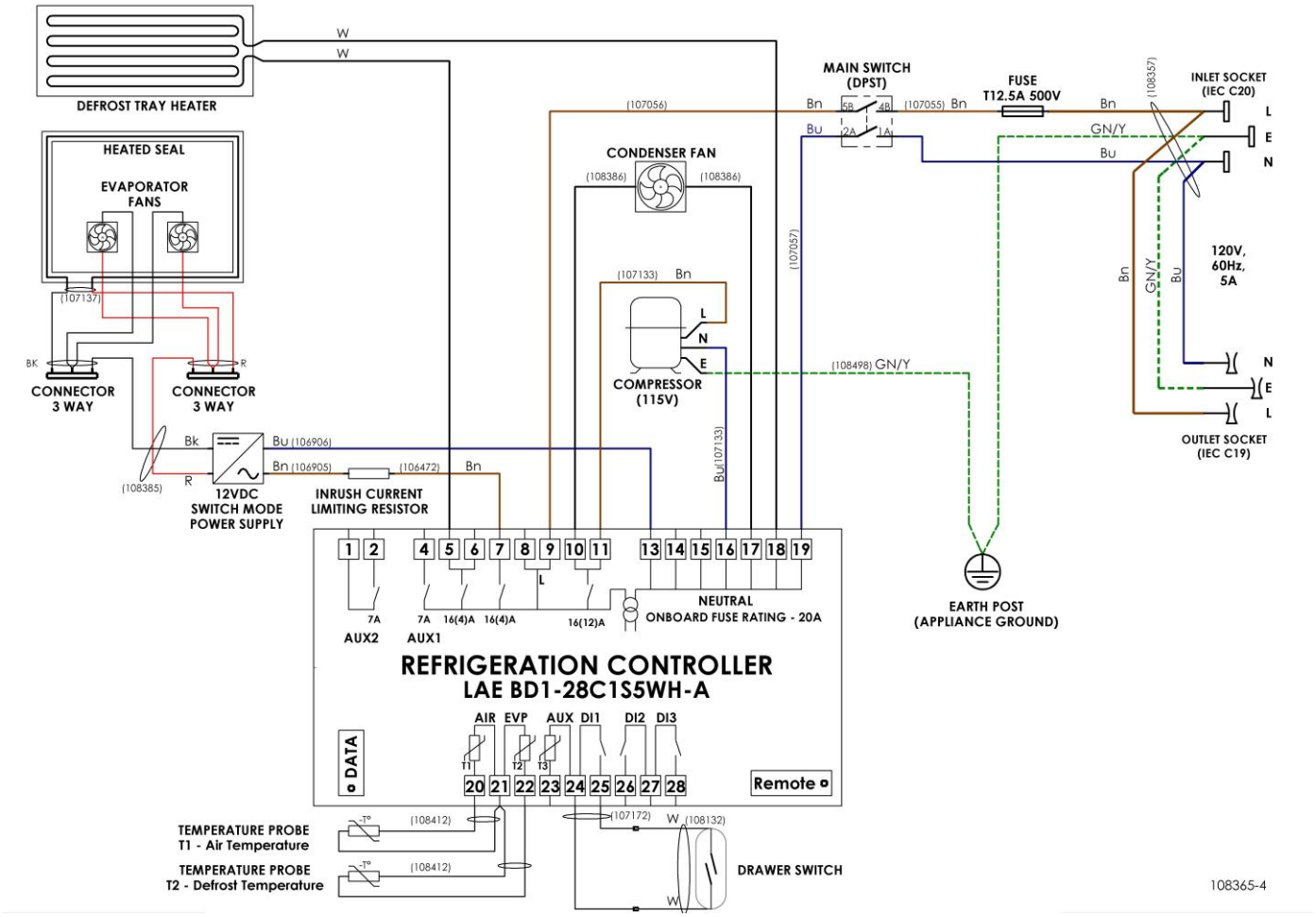
Parts No.	Description
107915	Power Supply 12v dc, 2A Switch Mode DI
103446	Resistor 47 ohm 50W
106408	Controller Ribbon Cable 2m (BD1-28 to Display)
106343	Controller (LAE BD1-28C1S5)
106885	Fuse Holder
107084	Fuse Holder End Plate

27.4 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

27.5 Wiring diagram



27.6 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	6	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	46	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	BDI-28 address for PC communication

28 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.

28.1 Access

The panel on which the main controller and associated components is mounted can be lowered to allow greater access to the components. To access the controller compartment, remove the rear panel, then remove 1 X M5 X 6 ST/ST bolt as pictured below in *figure 22b* The panel can now be lowered as pictured below in *figure 22d*



Figure 22a



Figure 22b



Figure 22c

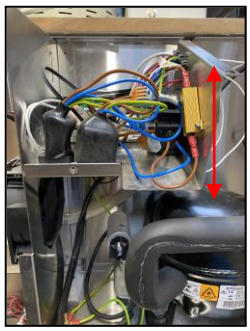


Figure 22d

28.2 Fuse Holder

The electrical system is protected by a 12.5 amp fuse which is located in a dedicated fuse holder situated between the main controller and 12v transformer.

To replace the fuse simply pull up the latch on the top of the fuse holder *(figure 23)* to reveal the fuse. Ensure the fuse is firmly clicked back into position when replacing.

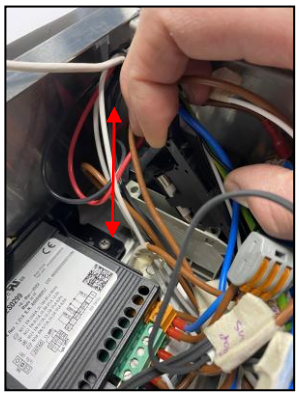


Figure 23

Parts No.	Description
106885	Fuse Holder
107084	Fuse Holder End Plate

28.3 Main Components

Figure 24 shows the main electrical components and how they are laid out within the unit.

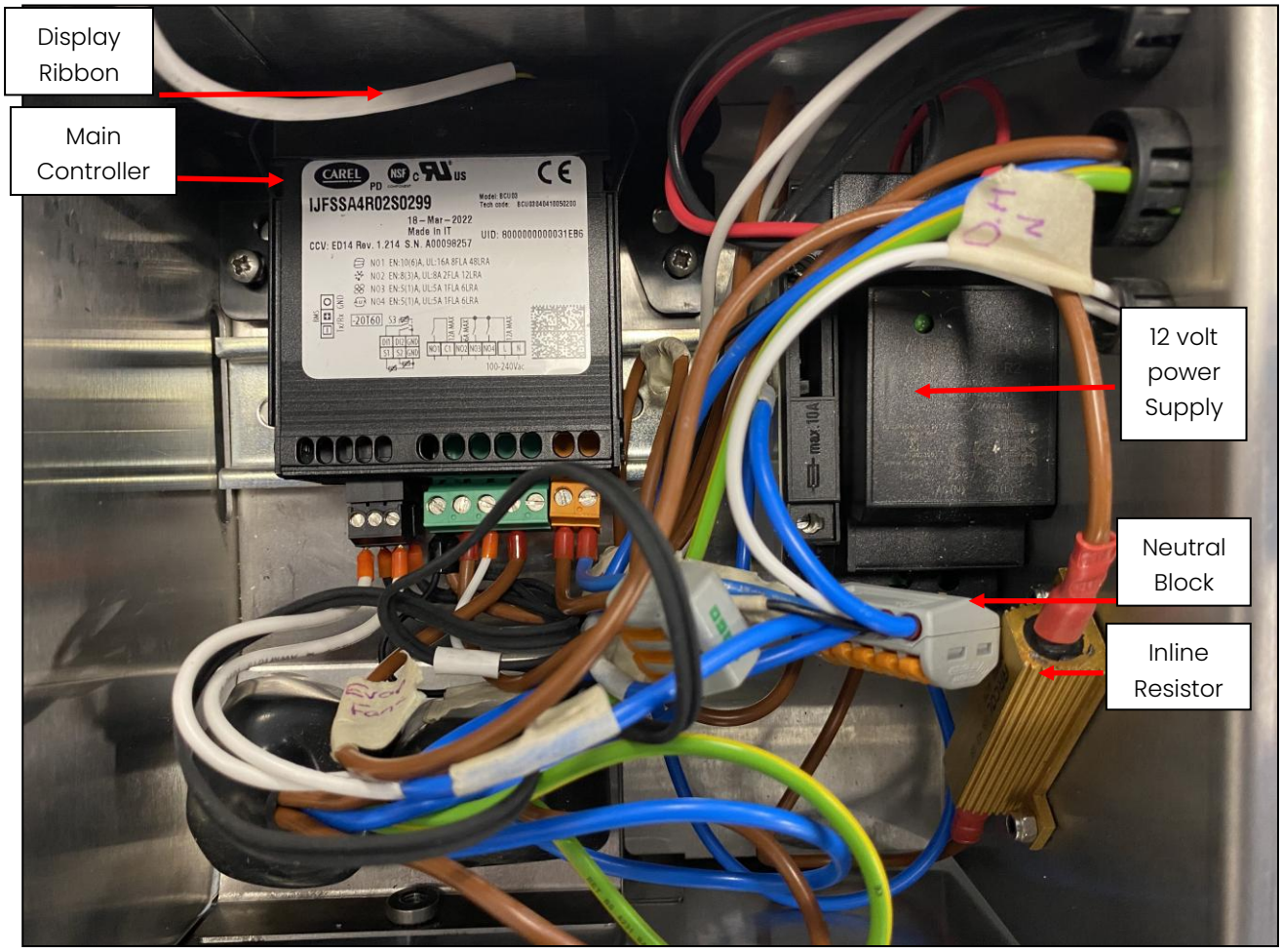


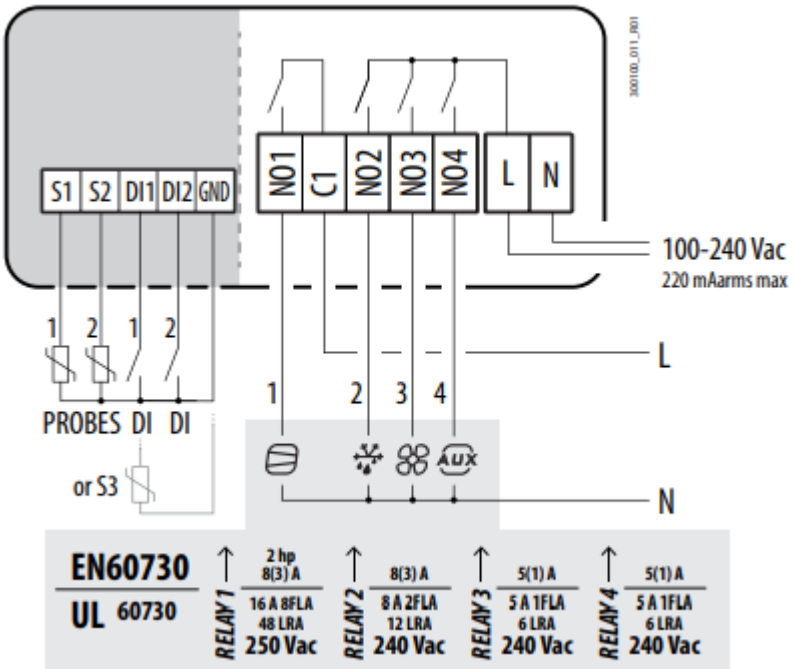
Figure 24

Parts No.	Description
107915	Power Supply 12v dc, 2A Switch Mode DI
103446	Resistor 47 ohm 50W
109131	Carel link cable
109129	Carel controller IJFSSA4R07S0340
106885	Fuse Holder
107084	Fuse Holder End Plate

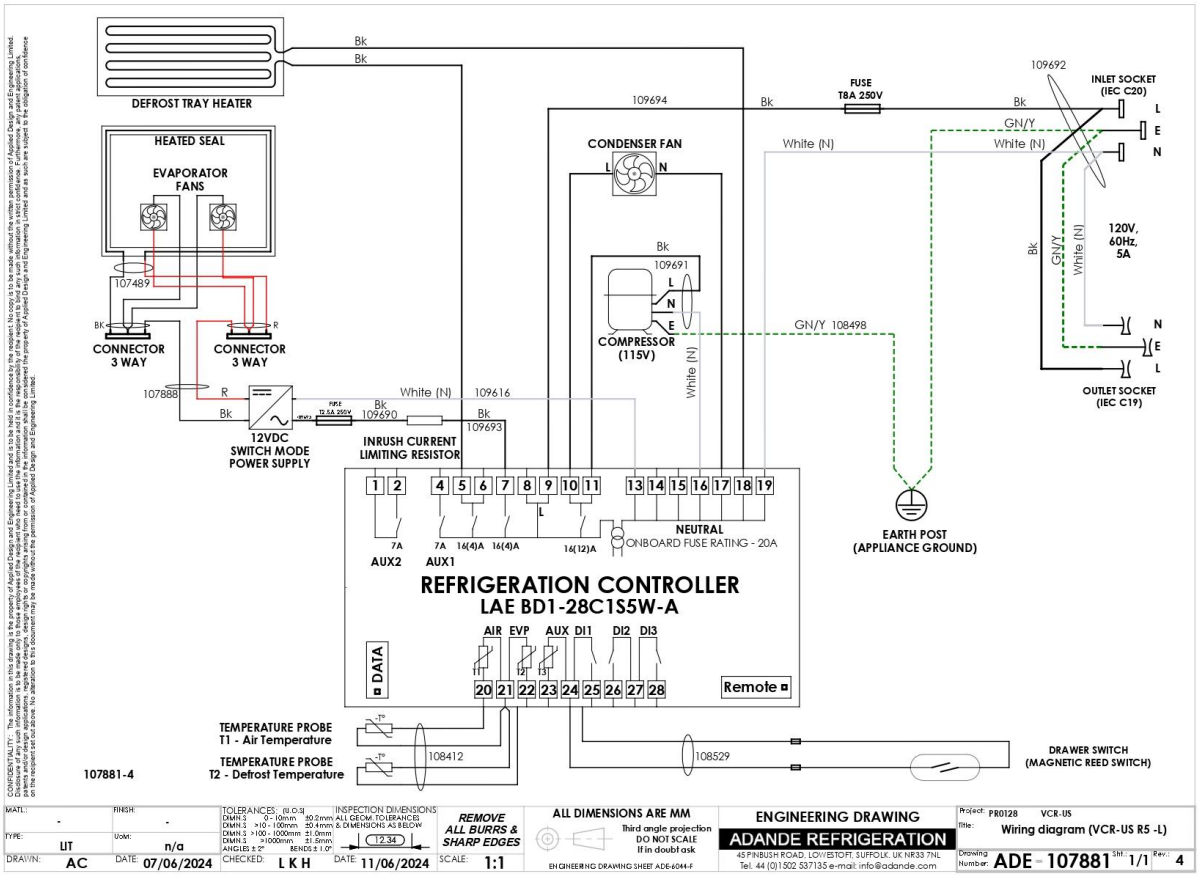
28.4 Electrical Control System

If replacing items connected to the Adande 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



28.5 Wiring diagram



28.6 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

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	46°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

29 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.

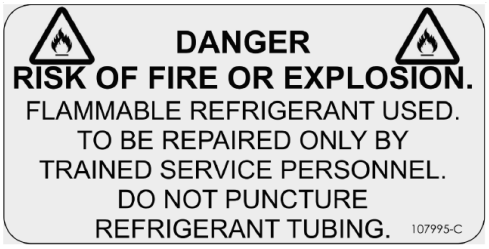


Figure 25

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 25a)* the high-pressure access fitting is located between the compressor discharge and condenser inlet *(figure 25b)*. 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 LH access panel must be fitted when recording running pressures, failure to do so may result in false readings.



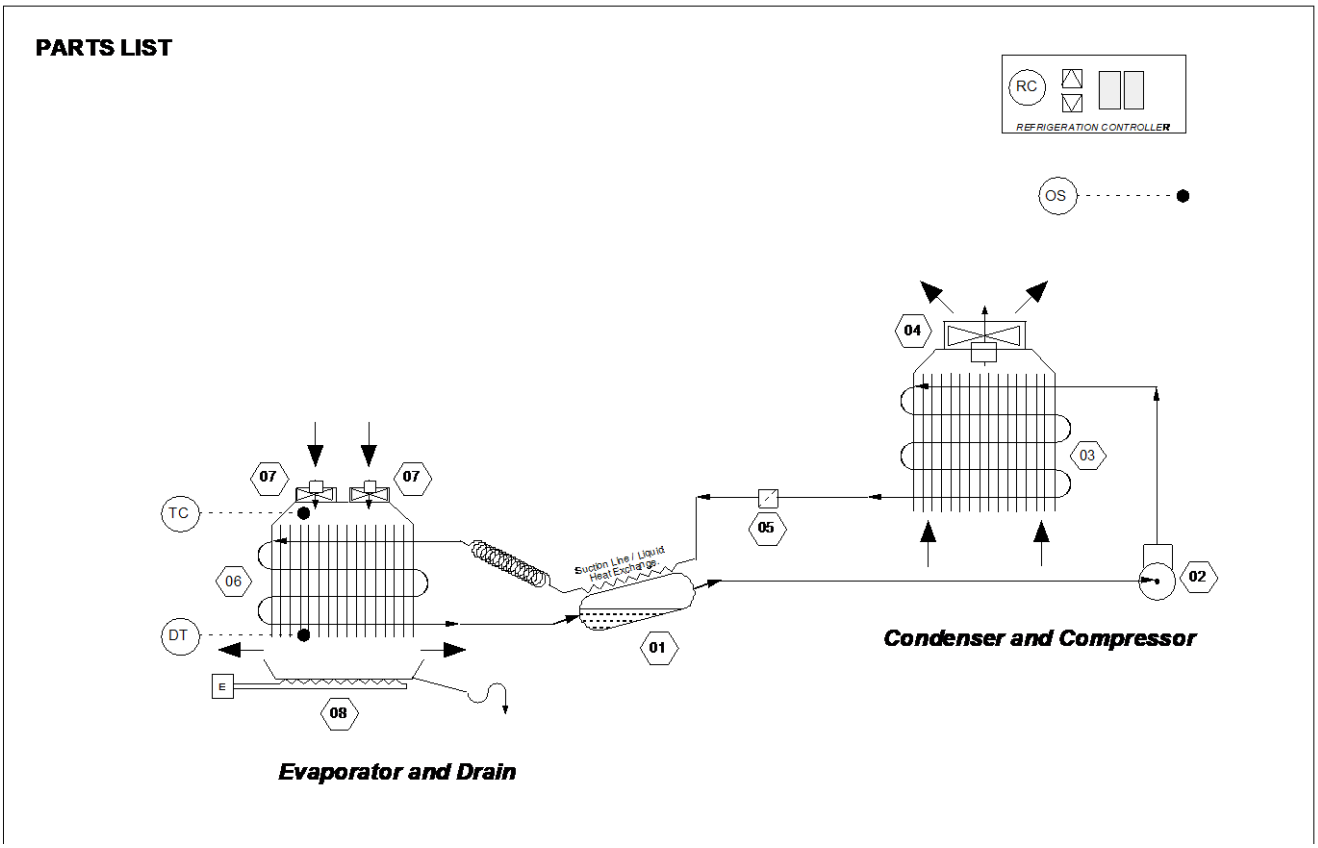
Figure 25a



Figure 25b

29.1 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 No.	Description
107588	Compressor EM2X 3121U R290 120V
103185	Condenser Coil
102930	Filter Drier
107486	Capillary 0.026" 2mtr
103745	Evaporator Coil
104286	Copper Accumulator
102062	Access Fitting ¼"
108532	Refrigeration Pipework Assembly

30 Fault Finding

30.1 Drawers not operating correctly

Possible Cause	Recommended Action
Runners require lubrication	Lubricate runners, see Chapter 25
Runners are mechanically damaged	Replace runners, see Chapter 25
Seal is being over compressed	Readjust lid height, see Chapter 24
Ice build-up causing diffuser to hit insulated container	Check defrost heater operation and drain for blockages see Chapter 21 Check seal height see Chapter 24

30.2 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 23
Seal heater is not working	a) Check 12V power supply b) Check seal heater continuity, replace seal if faulty, see Chapter 23
Seal compression is inadequate	Readjust lid height, see Chapter 24
Product/packaging trapped between insulated container rim and lid distorting seal	Ensure the insulated container is not overfilled.

30.3 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 f) Check lid height
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 26
Condenser coil is blocked	Clean condenser coil

Failure of compressor	Replace compressor if faulty.

30.4 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

30.5 Evaporator fans run when drawer is open

Possible Cause	Recommended Action
Controller has failed.	Replace Controller

30.6 Evaporator fans do not run when drawer is closed

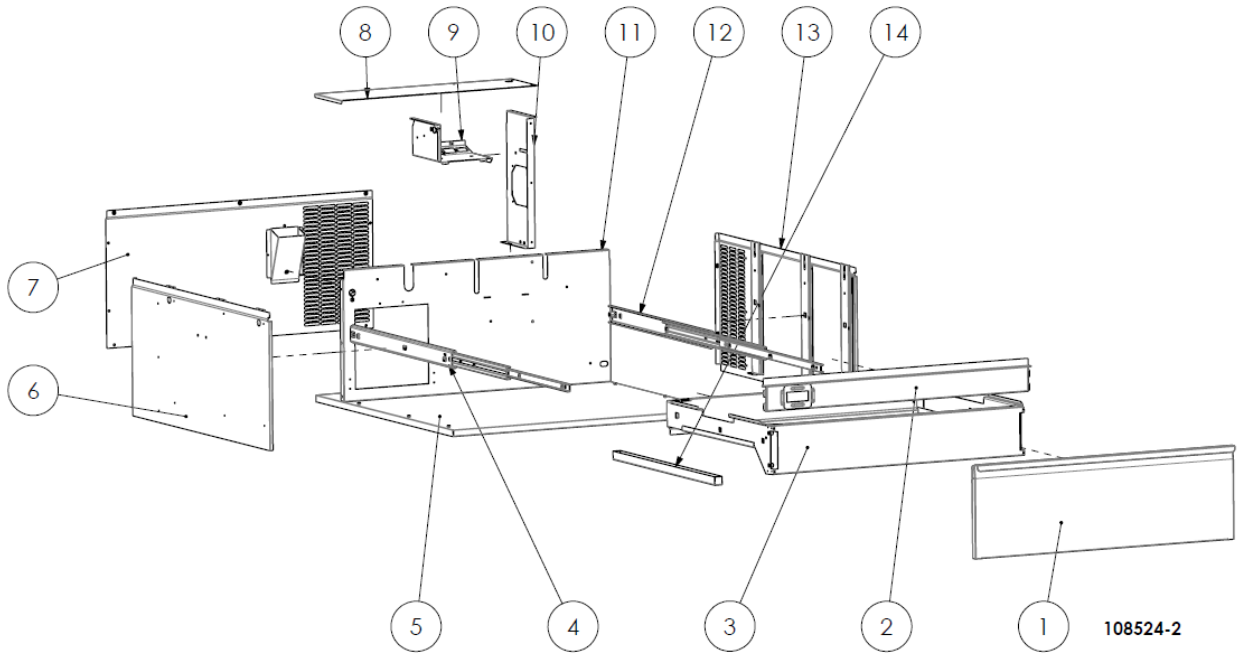
Possible Cause	Recommended Action
Drawer switch has failed	Replace switch
12 v power supply	Check 12V power supply Check wiring to fans for damage
Inline resistor has failed	Replace inline resistor

30.7 Display not functioning

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

31 Exploded diagrams

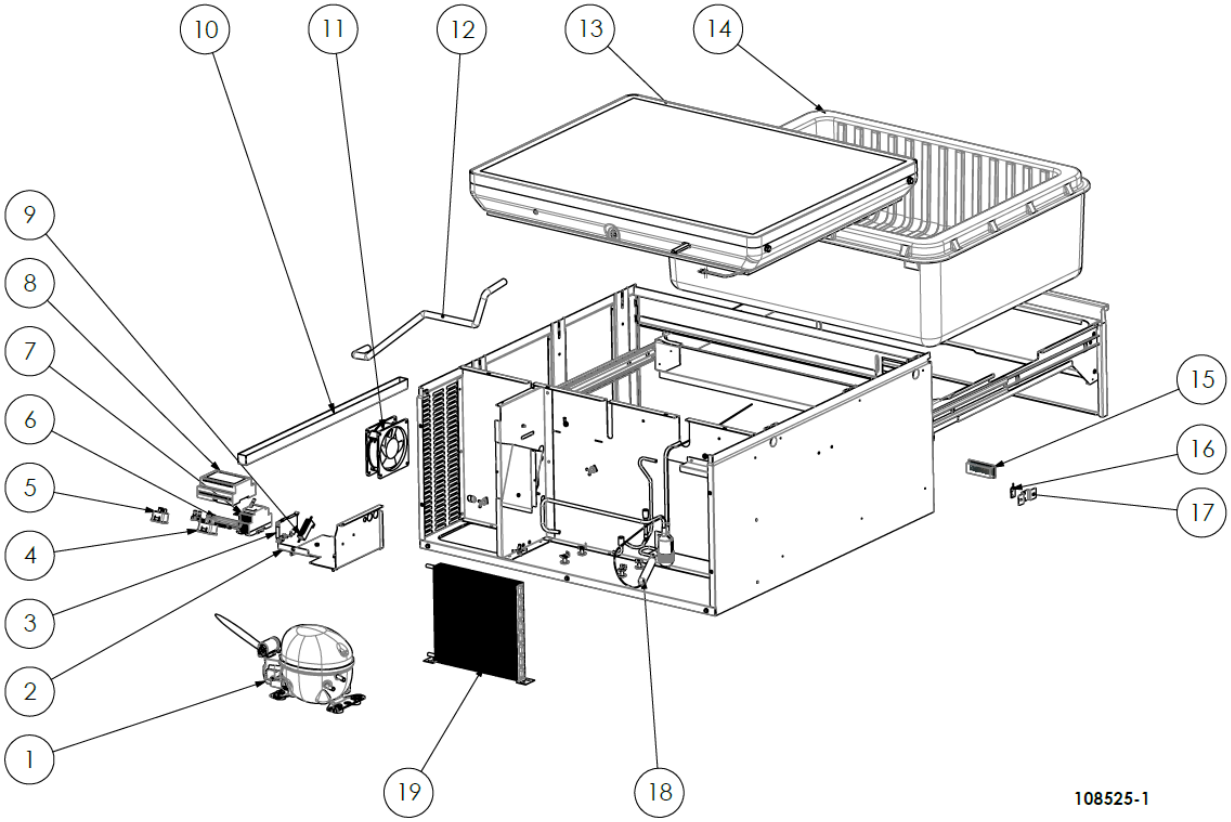
31.1 Housing spare parts



Item	Part No.	Description
1	107220	Drawer front RT
2	108440	Channel upper front spotweld assy
3	108508	Container supports & brace assy
4	104740	Drawer slide LH assy
5	107654	Panel base drawer module (VCR-US)
6	107662	Panel housing LH spot weld assy (VCR-US)
7	108035	Panel cover refrig & mains incomer assy
8	107666	Panel fire enclosure (VCR-US)
9	108033	Housing incomer & electrics (VCR-US)

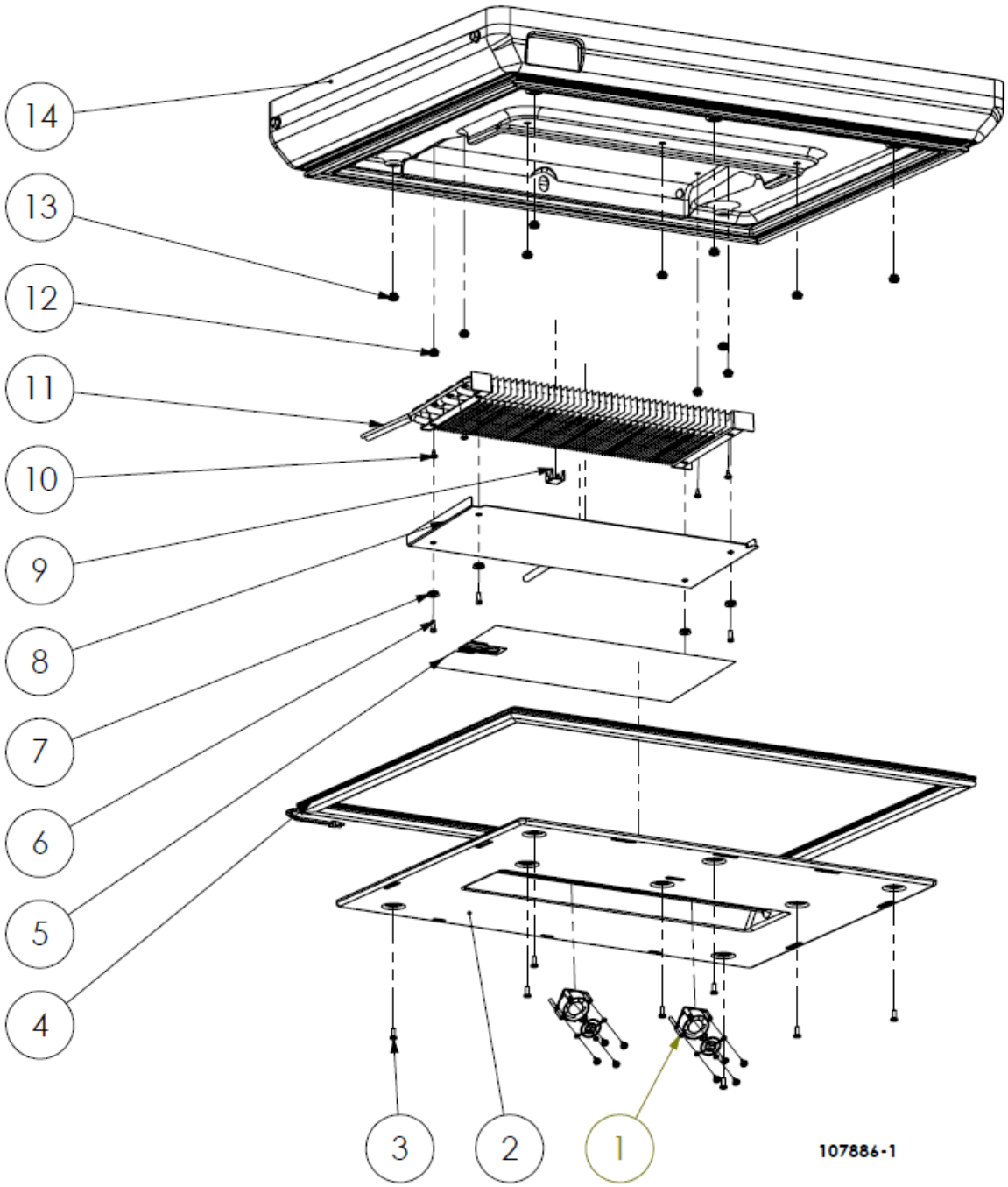
Item	Part No.	Description
10	107657	Panel fan mounting (VCR-US)
11	107656	Panel rear wall drawer chamber (VCR-US)
12	104741	Drawer slide RH assy
13	107660	Panel housing RH spot weld assy (VCR-US)

31.2 R290 Fridge, Electrical System and Drawer Parts



Item	Part No.	Description	Item	Part No.	Description
1	107588	Compressor EM2X3121U R290	12	107589	Fan axial EC 120 x 38, 125-230V
2	106885	Fuse holder DIN rail mounted	12	108091	Defrost drain tube (VCR-US R5)
3	107084	Plate end fuse holder DIN rail mounted	13	107853	Insulated Lid built assy (VCR-US)
4	106431	Power outlet C19 16A snap fit	14	108356	Insulated container assembly
5	106430	Power inlet C20 16A snap fit	15	106344	Refrigeration controller display LAE TU5S-B
6	103575	DIN rail 35 x 7.5mm (50cm)	15	109130	Carel Display IJFHSA0N00S0296
7	107915	Power supply 12v dc, 2A DIN rail - AMR2	16	108134	Reed switch square housing – H assy
8	107581	Refrigeration controller BD1-28C1S5WH-A	17	108037	Bracket reed switch mounting (VCR-US)
8	109129	Carel controller IJFSSA4R07S0340	*	106408	Cable interconnect display LAE
10	103446	Resistor 47 ohm 50W	*	109131	Carel link cable
11	108575	Drain tray magnet location (VCR-US)			

3.3 Insulated Lid (part No. 107853 – Complete Assembly)



Item	Part No.	Description	Item	Part No.	Description
1	108451	Kit spares – Costec evap fan fixing kit	9	103760	Bracket clip-on collection tray spacer (VCS)
2	103729	Lid diffuser	10	106801	Screw pozi pan M4 x 16 ST/ST
3	106868	Screw pozi M5 x 16 ST/ST	11	104073	Evaporator coil coated (VCR)
4	103746	Container seal – heated magnetic	12	106603	Rubber nut M4 - short grip
5	108018	Defrost heater electric 115v, 60Hz, 150W	13	106436	Rubber nut M5 – short grip
6	102082	Screw hex M5 x 12 ST/ST	14	104070	Insulated Lid assembly (VCR)
7	103491	Bonded sealing washer M5 ST/ST			
8	107678	Plate defrost collection (VCR-US)			

32 Appendix 1: Contact details

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