



# Maintenance Manual

## VCS



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# Welcome to Adande® Refrigeration

## 1 What is Adande®?

Adande® is a new method of cold storage developed as a series of refrigerated drawers that offer storage temperature flexibility in 1°C increments between –22°C and +15°C.

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 and maintained.

## 2 Adande® 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 40kg of product at any set point temperature, in the range of –22°C to +15°C. VCS units operate at climate class 5 (40°C , 40% rH)



Figure 1: Front view of Adande® Single Drawer

### 3 Safety Symbols

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

<u>Meaning / Description</u>	<u>Symbol</u>
<p><b>Dangerous Voltage</b></p> <p>Electrical warning symbol To indicate hazards arising from High voltages.</p>	
<p><b>Protective Earth (Ground)</b></p> <p>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.</p>	
<p><b>Warning/Caution</b></p> <p>An appropriate safety instruction should be followed or caution to a potential hazard exists.</p>	
<p><b>Disposal of Hazardous Waste</b></p> <p>Disposal of Hazardous Waste The product contains hazardous waste which is harmful to the environment. Correct procedures in line with WEEE directive should be followed when disposing of the product, including removable/replaceable items like :-</p> <ul style="list-style-type: none"> <li>a) Refrigerant Gas/oil</li> <li>b) Insulated container</li> <li>c) Controller</li> </ul>	
<p><b>Do Not Pressure Wash</b></p> <p>Do Not Pressure Wash the Modules.</p>	
<p><b>Heavy</b></p> <p>This product is heavy and reference should be made to the safety instructions for provisions of lifting and moving</p>	

## 4 EC Declaration of Conformity

Product Description: Professional Refrigerated Storage Counter Cabinets  
Make: Adande®.  
Type: Adande® Refrigeration Units manufactured by Adande® Refrigeration



We declare that the following product models:

VCS R1 & R2; VCS-BC R1; VCS-S2 & S3 R1; VCS-T R2; VCS-Rm R1 & R7  
VCR R1 & R2; VCR-BC R1; VCS-S4 & S5 R1;  
VCM R1 & R2; VCM-BC R1; VCM-T R2;  
VLS R1 & R2; VCC R1 & R2; HCS R2; HCR R2;



Comply with the requirements of the following European Directives:

The Machinery Directive 2006/42/EC  
The Low Voltage Directive 2014/35/EU  
The Electromagnetic Compatibility Directive 2014/30/EU  
The Pressure Equipment Directive 2014/68/EU  
The Food Equipment Regulation (EC) 1935/2004  
The Ecodesign Directive 2009/125/EC  
The Energy Labelling Directive 2010/30/EU  
The Fluorinated Greenhouse gases Regulation (EU) 517/2014  
The Restriction of use of Hazardous Substances (RoHS2) Directive 2011/65/EU  
The Waste Electrical and Electronic Equipment Directive 2012/19/EU

In accordance with the following transposed harmonised European Standards:

- 1.1 EN ISO 12100:2010 Safety of machinery. General principles for design. Risk assessment and risk reduction
- 1.2 EN ISO 13857:2008 Safety of machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs

EN 60204-1:2006+A1:2009 Safety of machinery – Electrical equipment of machines – Part 1: General requirements

- 1.3 EN 378-1:2016 Refrigerating systems and heat pumps. Safety and environmental requirements. Basic requirements, definitions, classification and selection criteria
- 1.4 EN 61000-6-1:2007 Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments
- 1.5 EN 61000-6-3:2007+A1:2011 Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

EN IEC 60335-1:2012 + A11:2014 Household and similar electrical appliances – Part 1: General requirements

EN IEC 60335-2-89:2010 + A1:2016 Household and Similar Electrical Appliances – Safety – Part 2–89: Particular requirements for commercial refrigerating appliances with incorporated or remote refrigerant condensing unit or compressor

EN 16825:2016 Refrigerated storage cabinets and counters for professional use – Classification, requirements and test conditions

The technical file for this machinery will be prepared on demand by :-

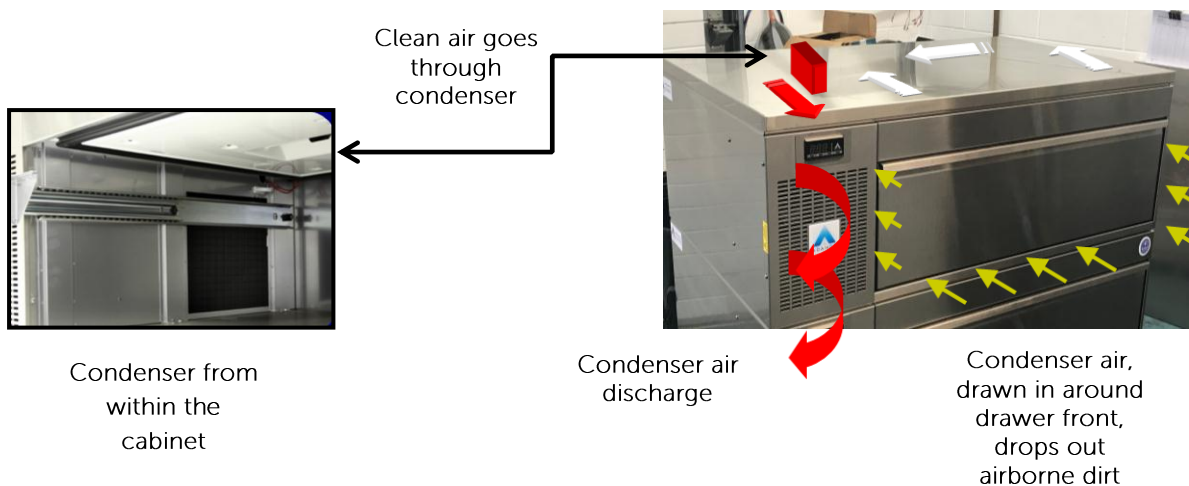
Name: Ian Wood  
Position: Managing Director  
Who signs on behalf of the manufacturer  
ADANDE® REFRIGERATION  
45 Pinbush Road  
South Lowestoft Industrial Estate  
Lowestoft  
Suffolk  
NR33 7NL

## 5 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 4°C to 8°C 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 2<sup>nd</sup> 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.
- **GAS LEAKS:** 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 R404a molecule. The helium is 'sniffed' using an incredibly sensitive leak detector. Possible exceptions to this are early units with serial numbers before 100444 where the evaporator coils may leak through corrosion. This can usually be checked by looking for green traces in the plastic drain tray above the compressor.
- **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. **The side panels and worktops must always be properly fitted or the condenser will not get adequate airflow.**





## 6 Operating Adande® Controls

The Adande® temperature control system allows you to set and control the drawer within a temperature range of -22°C (-8°F) and +15°C (59°F).




Temperature accuracy in the drawer will be maintained within  $\pm 2^{\circ}\text{C}$  of the set point for R600a and  $\pm 1^{\circ}\text{C}$  for R404a







Figure 2: Adande® Display Control Panel

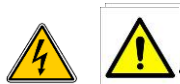
### 6.1 The Display Temperature Controls

The set-point is factory set to 3°C, however should you need to adjust the temperature set point, please follow the procedure below:

- First press and hold the set temperature button  this will display the current set point.
- To adjust the set point simply keep the set temperature button held down and press the +  or –  button until the desired set point is displayed.
- Next release all buttons. The temperature is now set.

Display Control Keys	
Set Temperature/Scroll Menu	
Decrease Temperature/Manual Defrost	
Increase Temperature	
Manual Defrost	

### 6.2 Defrost



The refrigeration system automatically defrosts 4 times a day by means of a defrost heater which runs off the 230v supply. 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 press and hold the down arrow until dEF is displayed. Check the defrost temperature probe is steadily rising in temperature, the cut out temperature is set to 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.

## 7 Error Codes

### 7.1 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 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.**

### 7.2 Probe Error Alarm

If display reads "E1" or "E2", a temperature probe has failed and should be replaced. Please refer to chapter 20 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.

### 7.3 Temperature Alarm

The "HI" temperature alarm is a general alarm indicating the drawer temperature has exceeded its set point by 7°C. 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 7°C. 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.

## 8 Display Panel Replacement



To replace a faulty display panel first isolate the power supply, then remove the front grill, (refer to chapter 12).

Next unplug the data ribbon from the back of the controller (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 3b/3c)

Push the new display into the front grill and click into position (figure 3d), finally plug in the new displays data ribbon into the back of the controller, ensuring that it is fully inserted.

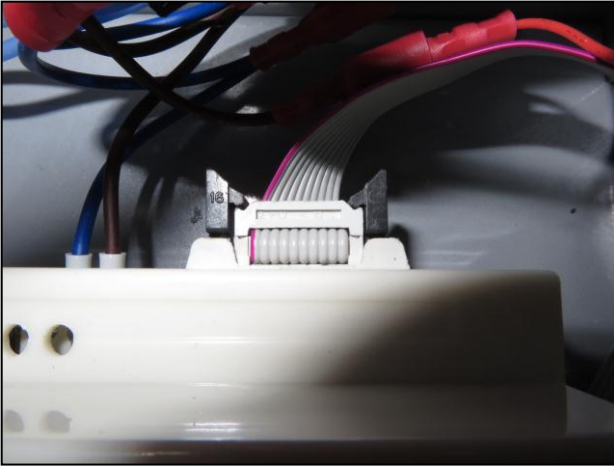


Figure 3a: Data cable input on controller



Figure 3b



Figure 3c



Figure 3d

Parts No.	Description
103755	Display Panel

## 9 Electrical Connection



The Adande® drawer should be connected to a 230V, single phase, 50 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 13 amp 3 pin plug (fused at 13A). The other end of the supply lead, fitted with an appliance plug, which is connected to the Adande® drawer as shown in *figure 4a* below. When replacing a mains lead ensure the P clips are secured back into position, this will prevent the leads being pulled out accidentally.



Figure 4

The unused socket on the right hand side in *figure 5* can be used to provide a mains supply to additional Adande® units using a link cord as shown in *figure 5a* below.



Figure 4a: Mains connection point

**DO NOT REMOVE ACCESS PANELS WITH THE ELECTRICAL SUPPLY CONNECTED.**

Parts No.	Description
106670	Mains supply cord 2m UK C19
106671	Mains supply cord 2m 16A Commando to C19
107547	Mains supply daisy chain 1m C19 to C20
106430	Mains inlet socket C20 16A
106431	Mains outlet socket C19 16A

## 10 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 +16°C (60°F) and +38°C (100°F).

**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 5*.

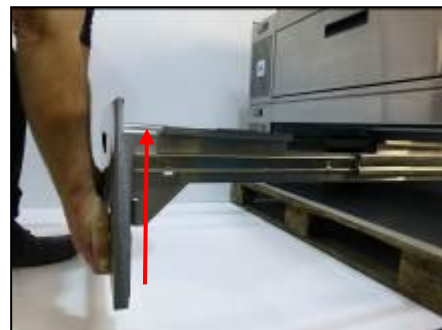


*Figure 5: Lockable Castor*

If the Adande® drawer is mounted on two rollers at the rear and rubber feet at the front, then to move the drawer either lift the front as shown in *figure 6* and push or pull into position, or use an open drawer as a lever to lift, as shown in *figure 7*, this method may be preferable if units are stacked more than one high.



*Figure 6*



*Figure 7*

**THE INSULATED CONTAINER SHOULD BE UNLOADED BEFORE MOVING**

## 11 Insulated Container Removal



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 (two people should lift the container out if still filled with product).



*Figure 8: Removing the insulated container*

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
103727	Insulated Container

## 12 Worktop Removal



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

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 9*). Replacement is the reverse of the removal procedure.

**NOTE: CORRECT LIFTING PROCEDURES SHOULD BE FOLLOWED**



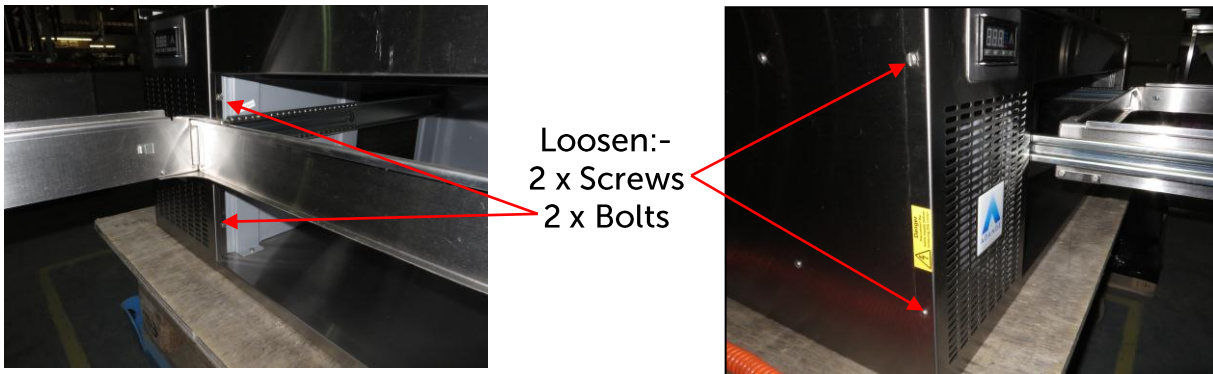
*Figure 9: Worktop removal*

## 13 Front Grille Removal



To gain access to the electrical components it is necessary to remove the front grille, to do this first remove the insulated container from the drawer, slacken the 2 off M5 X 8 ST/ST bolts located inside the drawer space, and slacken the 2 off M5 X 8 ST/ST screws located externally at the side of the unit. The front grille can now be removed by pulling forward at the bottom and then down. (*figure10*).

**NOTE: POWER MUST BE ISOLATED BEFORE REMOVING ANY PANELS**



*Figure 10: Front grille removal*

Parts No.	Description
106576	Louvre Panel With Spot Welded Protector (VCS)

## 14 Left Hand Panel Removal



To gain access to the compressor, the left hand panel must be removed from the drawer, to remove this panel the 4 off M5 X 8 ST/ST screws on the side of the drawer and 2 off M5 X 8 bolts from the rear of the drawer must be removed as shown in *figure 11*, then slide the panel down and out.

Remove 4x screws and 2x bolts

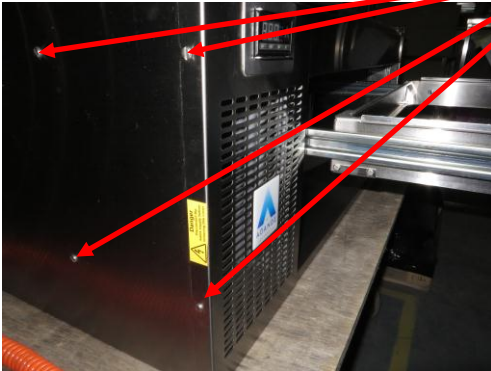


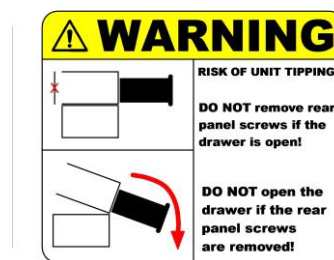
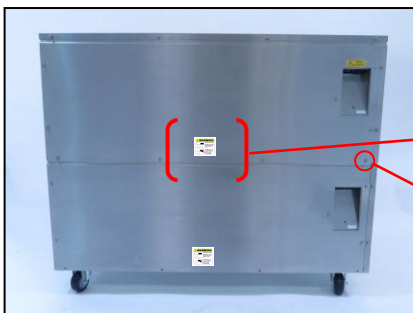
Figure 11: LH side fridge engine access panel removal

## 15 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, remove all 14 off M5 x 8 Flanged bolts as shown in *figure 12* below.

When working on a two stacked unit as pictured below in *figure 11* 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 of tipping especially if the drawer is open.



M5 x 8 Panel bolt, replace at least 1 of these when removing the rear panel.

Figure 12: Rear panel removal

Parts No.	Description
103718	LH Panel housing
103717	Rear Panel



## 16 Drawer Front Removal

For certain procedures such as seal replacement it may be beneficial to remove the drawer front and support brace especially if working in a tight space.

To remove the drawer front you will need to remove the 4 off M5 x 8 pozi ST/ST as shown in figure 13 below.

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



*Figure 13: Removing the four M5x 8 ST/ST screws*

Once these fixings are removed the drawer front will now slide off as shown below in Figure 14.



*Figure 14: Removing the drawer front*

Parts No.	Description
107085	Drawer Front
103424	Screw Pozi M5 x 8 ST/ST

To remove the drawer support brace you will need to remove the 8 off M5 x 8 pozi ST/ST as shown in figure 15 below.

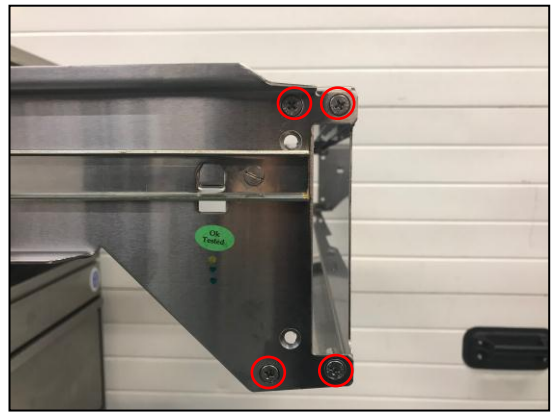


Figure 15: Removing the eight M5x 8 ST/ST screws

Once these fixings are removed the drawer support brace will now slide off as shown below in Figure 16. This will allow unhindered access to the entire drawer cavity to allow maintenance procedures such as seal replacement to be carried out without restriction.



Figure 16: Removing the drawer support



Figure 17: Full access to drawer cavity

## 17 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 physically depress the lever on the switch, the 12v fans should run. To gain access and replace the drawer switch, remove the insulated container. Using a flathead screw drive prise the faulty switch into the drawer cavity (*figure 18a*) then remove the spade connection wires from the back (*figure 18b*) Fit the wires to the new switch then click into the chassis. The wires on the switch are not polarity conscious.



*Figure 18a*



*Figure 18b*



*Figure 18c: Drawer switch mounted in the chassis*

Parts No.	Description
102923	Drawer Switch

## 18 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 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 lowered. It is important that the slack on the wires is pulled back through to the fridge engine compartment.

On older drawers the screws may be plastic, if this is the case they should be replaced with the M5 screws found in your spares box.



**NOTE: WHEN CARRYING OUT ANY WORK ON THE INSULATED LID THE SEAL HEIGHT SHOULD BE CHECKED AND ADJUSTED IF NECESSARY.**



Figure 19a: Diffuser screws in situ



Figure 19b: 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 19c: Rubber fastenings in situ

Parts No.	Description
103729	Diffuser
104641	Diffuser Assy (evap fans inc)
106868	Screw Pozi M5 x 16 ST/ST ( Diffuser Screw)
106603	Rubber Nut M4 - Short Grip

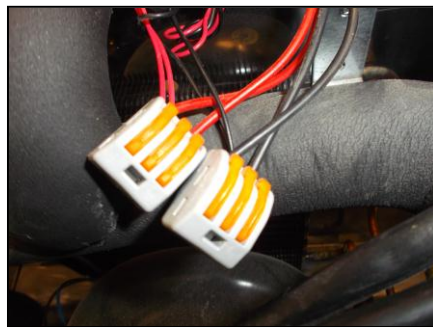
## 19 Evaporator Fan Replacement

Remove the diffuser (*chapter 17*) 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 20a*.

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 20b* 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 20a*. Replace all cable ties. If both fans have failed and the 12V transformer has been ruled out, it may be preferable to replace the whole diffuser assembly which comes with the two fans already mounted.



*Figure 20a: Evaporator fans*



*Figure 20b: 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
104641	Diffuser Assy (evap fans inc)

## 20 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.

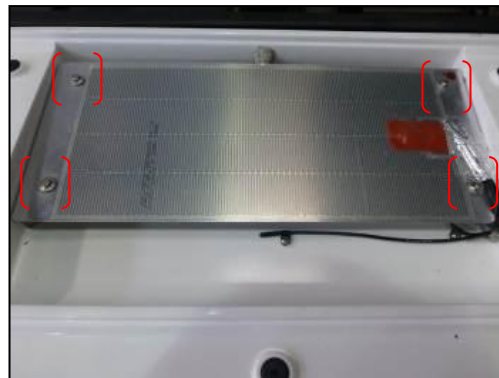
To indirectly check if the defrost heater has failed force the unit into a manual defrost (*chapter 5*) check the T2 defrost probes temperature, it should steadily rise in temperature, the cut out temperature is 8°C The defrost heater should draw 0.65 amps when working correctly.

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 18a*) 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 21b*) Cut the wires from the old heater and use to pull the wires from the new heater through into the fridge engine compartment.



*Figure 21a: Drain pipe and putty*



*Figure 21b: Remove four bolts and sealing washers to release drain tray*

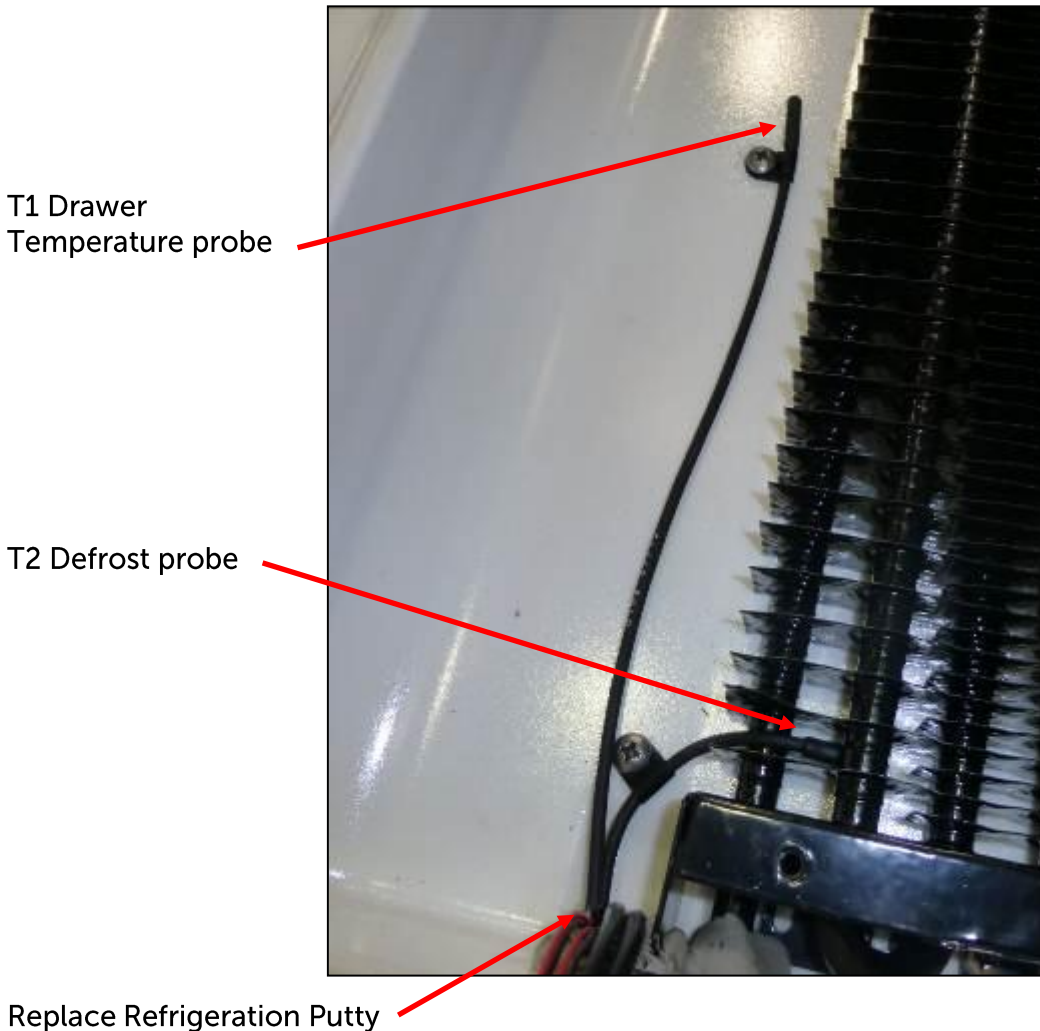
**NOTE:** When replacing the drain tray take care not to bend the tray or the water may not drain correctly, ensure all four sealing washers are on the four fixing bolts. Replace drain tray and putty around drain pipe penetration both inside and outside of lid.

Parts No.	Description
106681	Drain Pipe
104291	Defrost Heater Assembly
103491	Washer Bonded
102082	M5 x 12 ST/ST Hex Head

## 21 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. To replace a faulty probe the insulated container, diffuser and defrost heater will need to be removed. To gain access to the 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 22*.



*Figure 22: Temperature probes held in place with P-Clips*

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

## 22 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 insulated container then pull the heated seals wires through the inner wall from the compressor housing into the drawer cavity and disconnect the two bullet connectors; this disconnects the heating element from the 12v transformer. (Figure 23b)

Pull the seal out of the retaining channel in the lid and replace with a new seal. Push the seal into the retaining channel, start in the middle and work into the corners (Figure 23a) some force will be required to ensure the profile is correctly clicked in to position. Once the seal is fully inserted in to the retaining strip reconnect the bullet connectors and pass back through the Inner Wall into the compressor housing to prevent it snagging on the drawer or runner when closed. (Figure 23c)

On completion the seal height should be checked refer to Chapter 23.

In the event that 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.



Figure 23a



Figure 23b

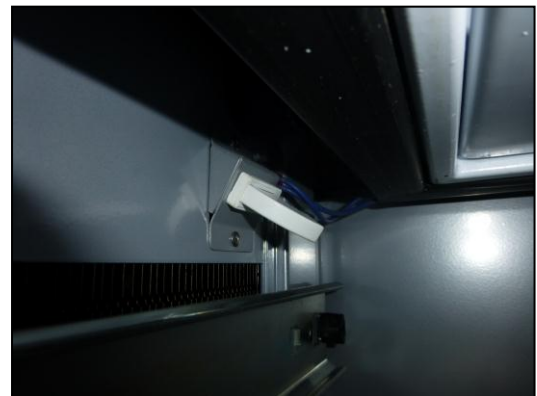


Figure 23c

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



## 23 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 M5 x 16 flange head lid mounting bolts, 2 are located behind removable caps on the RH side panel and 2 within the compressor housing (as shown below with the worktop removed in *figures 24a and 24b*). 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.

To adjust the lid height on a drawer that is stacked, while the nut driver is located on the head of the nut lever the lid up or down as required, repeat the process for all screws until the desired height is achieved. 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.

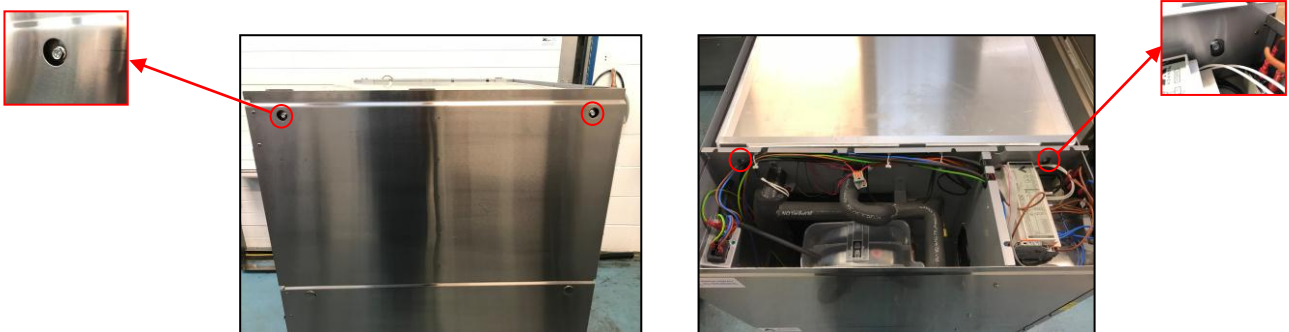
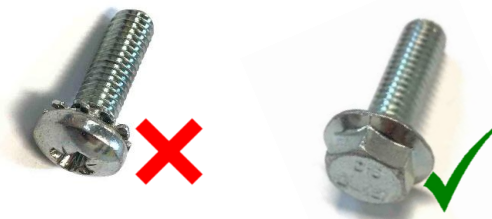


Figure 24a and 24b: Lid mounting bolts when worktop is removed

On older drawers the adjustment bolts may be pozi head screws as pictured, these should be replaced with the M5 hex head bolts found in your spares box. Ensure the bolts are tightened sufficiently to prevent the seal height from being knocked out of adjustment.



Parts No.	Description
107617	Lid Mounting Bolt

## 24 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: 25a) the support cradle can now be removed by lifting the drawer front up and pulling forward to detach it from the lancing on the runner inner beam (figure: 25b)



Figure 25a: Remove support cradle retaining screws

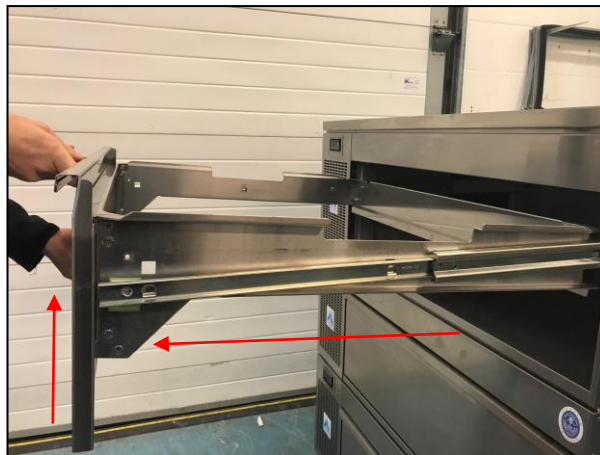


Figure 25b: Remove support cradle from runners

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 figures below.



Figure 26a: Twist runner.



Figure 26b: Lift and pull forward



Figure 26c: Fixings in vertical wall supports and lancing 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 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 in the same way by engaging the rear fixing first with a horizontal motion then engage the front 2 lancing's and press down to 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 6 countersink screw, once you have done this you will also need to refit the brace container support rear with four off M5x8 bolts.

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

Parts No.	Description
104741	Runner RH
104740	Runner LH

## 25 Adande Controller

Each Adande drawer is controlled by a central controller pictured below. All major electrical components are wired to this central controller. The Adande controller is fitted with a 6.3 amp and 2 amp glass fuse. The 6.3 amp fuse runs on the compressor and defrost heater circuit. The 2 amp fuse runs on the live in circuit.

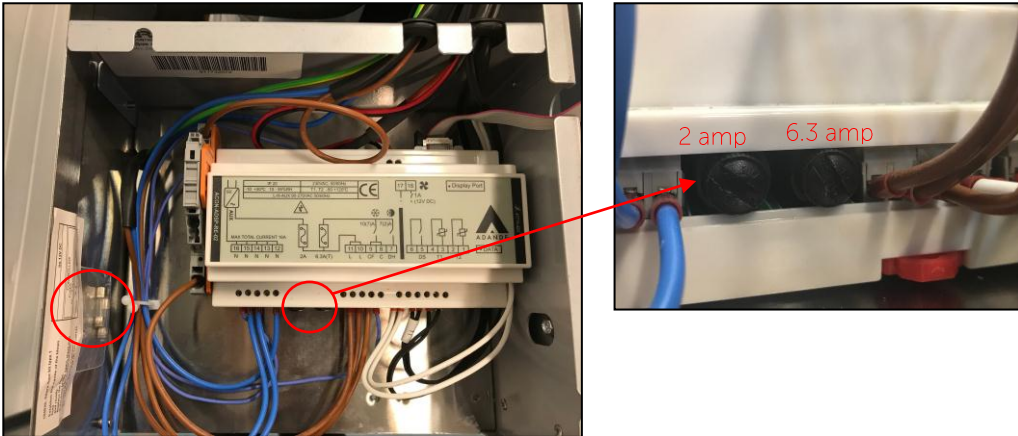


Figure 27: Adande Controller

If the 6.3 amp fuse fails this may indicate an issue with either the compressor or the defrost heater and further investigation is recommended. The fuse holders themselves can work loose so should also be checked they are screwed in tight. Spare fuses can be found in the controller compartment as shown in figure 27. If there is no power to the unit and there is no issue with the mains leads/plug sockets, the 2 amp fuse may have failed and will require further investigation.

In addition to the 2 internal fuses there is an additional 6.3 amp fuse located in a holder adjacent to the controller (figure 28a), like the main controller this is attached to a din rail. This fuse runs between the main live in and the live in on the controller and can be accessed by pulling up the fuse carrier (figure 28b/c)



Figure 28a

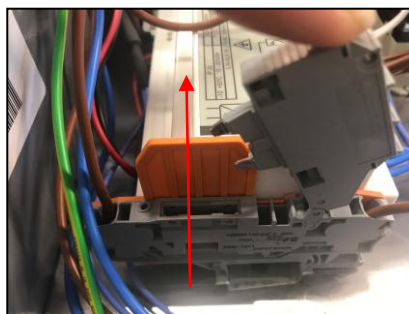


Figure 28b



Figure 28c

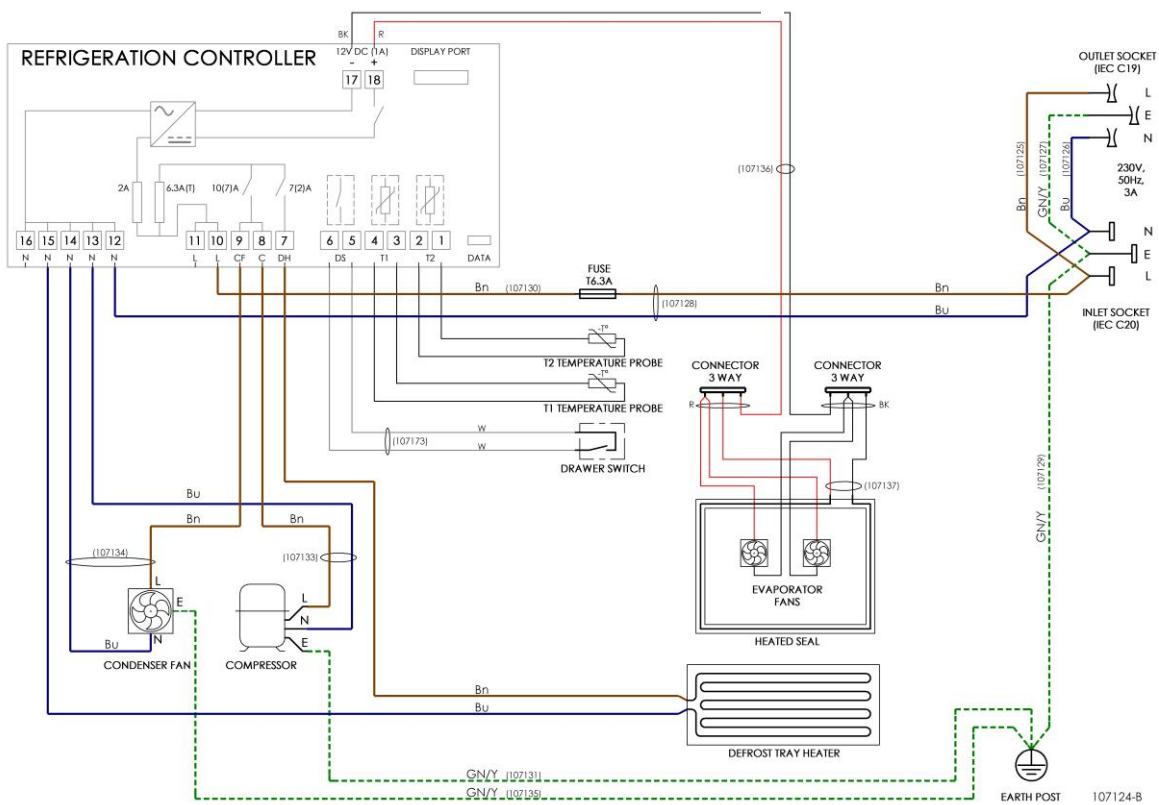
## 26 Electrical Control System

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

**NOTE: ALL NEUTRAL CONNECTIONS GO TO THE NEUTRAL PORTS 12 - 16.**

Adande Controller	
1	Defrost temperature probe T2
2	Defrost temperature probe T2
3	Drawer temperature probe T1
4	Drawer temperature probe T1
5	Drawer switch
6	Drawer switch
7	Defrost heater live
8	Compressor live
9	Condenser fan live
10	240v live in
11	
12	Neutral
13	Neutral
14	Neutral
15	Neutral
16	
17	Neutral 12v outlet (evaporator fans and seal)
18	Live 12v outlet (evaporator fans and seal)

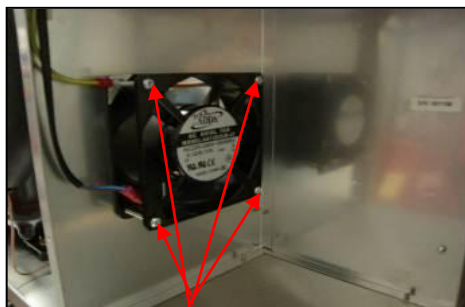
## 26.1 Wiring diagram



## 27 Condenser Fan Replacement



To replace the condenser fan, the front grille will need to be removed. First remove the two loomed wires that run through the 6.4mm grommet to the controller. Then remove the four fixing screws and remove the fan (*figure 29*). Reverse this to replace the fan and connect to terminal 9 on the controller.



4 Off M4 X 45 Br.Zn.Pd. Screws  
*Figure 29: Condenser Fan mounting*



**WARNING:** Keep clear of any obstruction to all ventilation openings in the appliance enclosure or in the structure for units that are built in.

## 28 Settings for Adande ACON-ADSP-RE-02 Controller R404a

The Settings menu is accessed by pressing the 2 outer buttons X + i for 5 seconds

<i>Code</i>	<i>Setting</i>	<i>Description</i>	<i>Code</i>	<i>Setting</i>	<i>Description</i>
SCL	1.0'C	Readout scale	FT1	0	Fan stop delay after comp stop
SPL	-22	Min temperature set point	FT2	0	Timed fan stop
SPH	15	Max temperature set point	FT3	0	Timed fan run
SP	3.2	Effective temperature set point	ATM	REL	Alarm thresholds
HYS	1	Thermostat hysteresis	ALR	-7	Low temp alarm differential
CRT	3	Compressor rest time	AHR	7	High temp alarm differential
CT1	5	Compressor run time with sensor T1 failure	ATD	60	Delay before alarm warning
CT2	5	Compressor off time with sensor T1 failure	ADO	3	Drawer alarm delay
CSD	1	Compressor stop delay from door opening	ACC	0	Periodic condenser cleaning
DFR	4	Defrosting frequency/24h	SB	YES	Button (0/1) enabling
DLI	8	Defrost end temperature	DS	YES	Drawer switch enabling
DTO	25	Max defrost duration	LSM	Non	Light control mode
DTY	ELE	Defrost type	OS1	0	Probe 1 offset
DRN	6	Drain down time	T2	YES	Probe 2 enabling
DDY	30	Defrosting display control	OS2	0	Probe 2 offset
FID	No	Fans active during defrost	TLD	5	Delay for min/max temp. logging
FDD	-5	Fan restart temp after defrost	SIM	100	Display slowdown
FTC	NO	Evaporator fan timed out	ADR	1	Address for PC communication

## 29 Refrigeration maintenance



**WARNING:** Do not damage the refrigeration circuit

A standard hermetically sealed vapour compression refrigeration circuit is used in the Adande® drawer system and will need minimum maintenance. It is not advised to connect a manifold to the system unless absolutely necessary. Before attaching a manifold please check all other areas as mentioned in this maintenance manual first.

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 30a*) the high pressure access fitting is located between the compressor discharge and condenser inlet (*figure 30b*). **Do not use hot taps.**

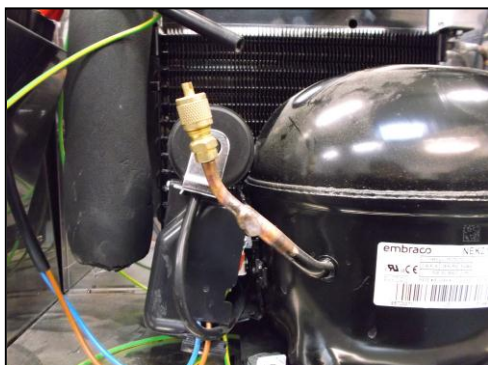
Each unit is critically charged with 200g of R404a When recharging the gas must be weighed in and ideally be within 1-5g of the stated charge weight. Ensure the refrigeration system is fully vacuumed to a least 1.3mbar before recharging.

The system uses a copper capillary of 0.026" internal diameter at 2.75 meters in length, 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, 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.

- R404a Low side pressures should read between 1 bar (14.5 PSI) and 3bar (43.5 PSI)
- R404a High side pressures should read between 10 bar (145 PSI) and 15 bar (217.5 PSI)

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



*Figure 30a*



*Figure 30b*



## 30 Refrigeration components

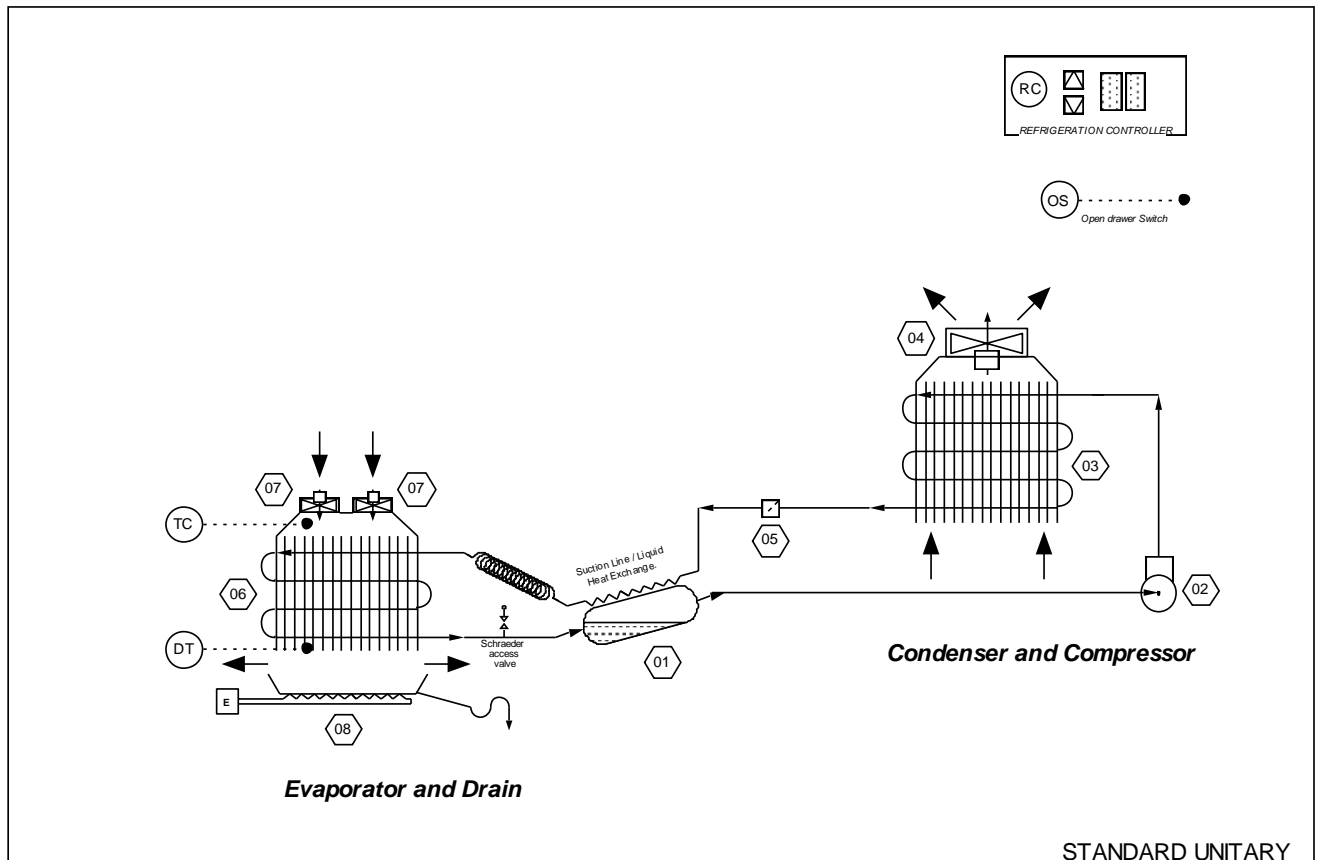


Figure 31: Refrigeration circuit diagram

Parts No.	Description
103969	Compressor – EMT2117GK R404a
103185	Condenser Coil
102930	Filter Drier
104628	Capillary 0.026" 2.75mtr
103745	Evaporator Coil
104286	Copper Accumulator
102062	Access Fitting 1/4"
104717	Pipework Assembly R404a

### 31 Drawer configurations

The Adande® Side Engine Drawer Fridge (VCS) can be configured in several ways. Below are some examples of single, two and three drawer options.



#### VCS1HCHS

- Single drawer
- High castor base
- Heat shielding worktop

This arrangement is intended to support a grill or oven.



#### VCS2CT

- Two drawer
- Standard castor base
- Top cover

The top cover is a non-load bearing cover.

This arrangement is intended for under counter installations



#### VCS3CW

Three drawer  
setup  
Castor base  
Worktop

## 32 Fault Finding

### 32.1 Drawers not opening correctly

Possible Cause	Recommended Action
Runners require lubrication	Lubricate runners, see Chapter 24
Runners are mechanically damaged	Replace runners, see Chapter 24
Seal is being over compressed	Readjust lid height, see Chapter 23
Ice build up causing diffuser to hit insulated container	Check defrost heater operation and drain for blockages see Chapter 20 Check seal height see Chapter 23
Something jammed in drawer	Remove obstruction

### 32.2 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 20
Seal heater is not working	a) Check 12 v power supply b) Check seal heater continuity, Replace seal if faulty, see Chapter 24
Seal compression is inadequate	Readjust lid height, see Chapter 23
Product/package trapped between insulated container rim and lid distorting seal	Ensure container is not overfilled

### 32.3 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, see Chapter 19
Seal failure	Check condition of heated seal
Excessive icing of evaporator coil	a) Check defrost operation b) Check evaporator fans/power supply 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 27
Condenser coil is blocked	Clean condenser coil
Failure of compressor	Replace compressor if faulty.

### 32.4 The Drawer does not power up

Possible Cause	Recommended Action
Fuse has failed in mains plug	Check fuse, if it has failed investigate for possible cause before fitting new 13A fuse.
Fuse has failed within electrical system	Check internal 6.3 amp fuse – see Chapter 25
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, ensure 'P' clips correctly fitted.

### 32.5 Evaporator fans run when drawer is open

Possible Cause	Recommended Action
DS Parameter set to NO	Check parameters, see Chapter 28
Controller has failed.	Replace Controller
Switch has been linked out	Check switch replace if necessary

### 32.6 Evaporator fans do not run when drawer is closed

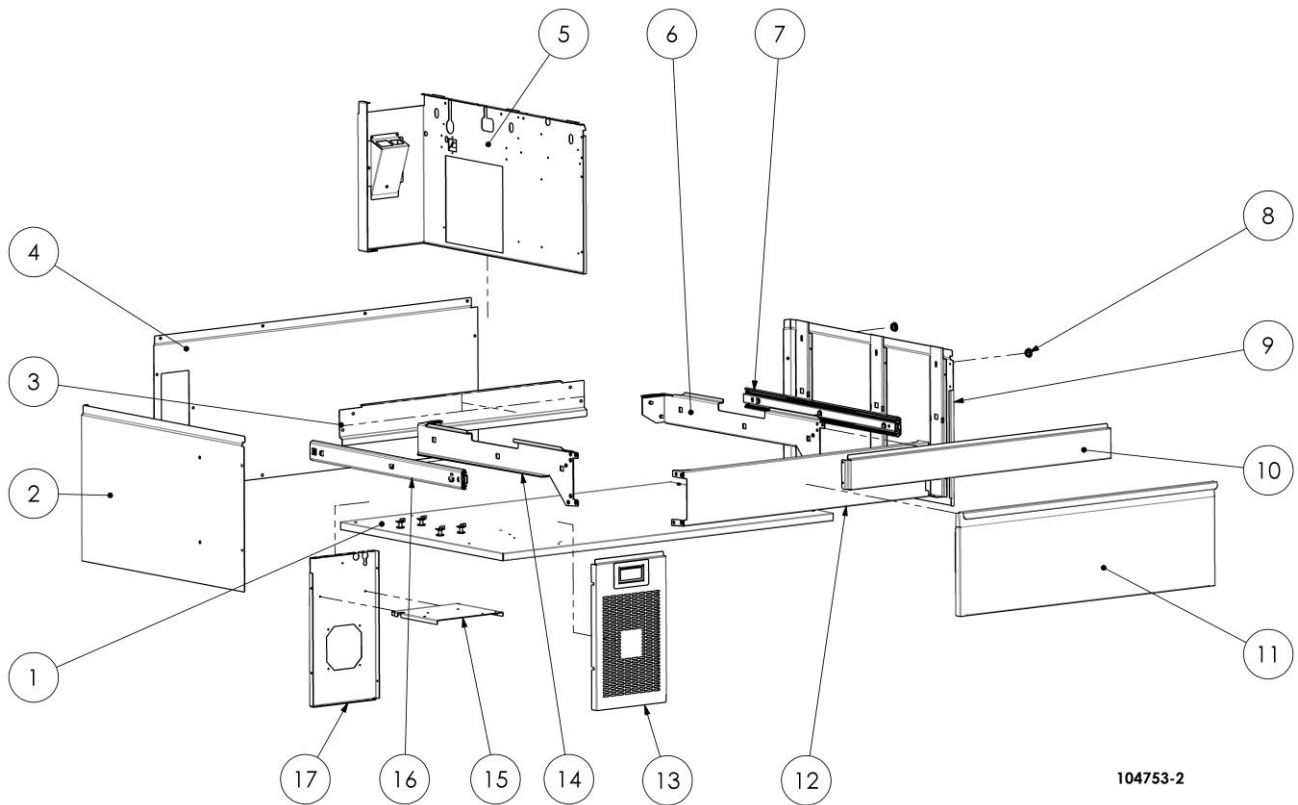
Possible Cause	Recommended Action
Drawer switch has failed	Replace switch
12 v power supply in control module failed	Check 12v power supply in controller module Check wiring to fans for damage

### 32.7 Display not functioning

Possible Cause	Recommended Action
Ribbon cable connections loose	Check ribbon cable connections at display and controller
Fuse has failed within unit	Check 6.3amp fuse in controller
Display has failed	Replace display

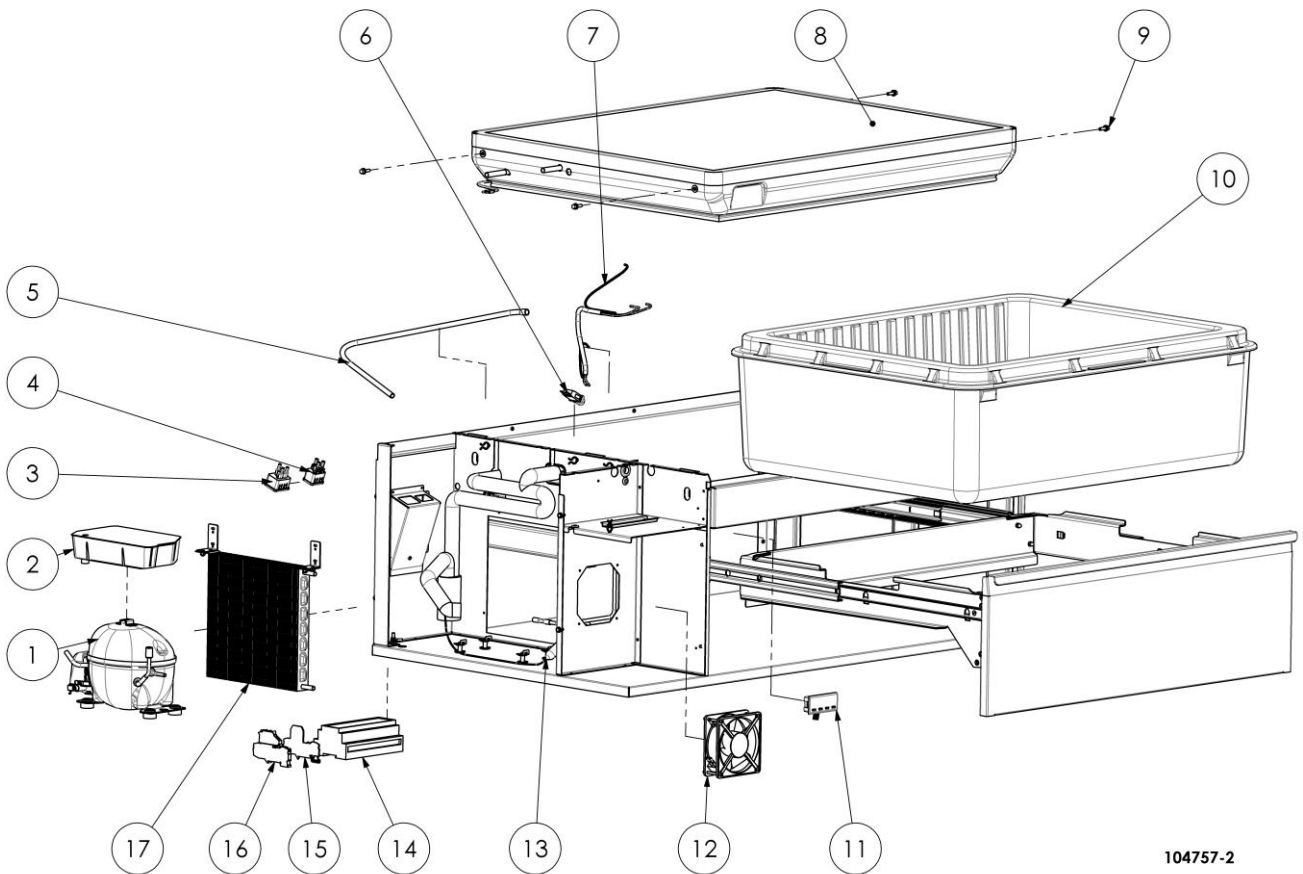
## 33 Exploded diagrams

### 33.1 Housing spare parts



Item	Part No.	Description	Item	Part No.	Description
1	103733	Base drawer module assembly	10	103716	Channel upper front
2	103718	Panel Housing LH	11	107220	Drawer front RT
3	107218	Brace container support rear	12	107219	Brace drawer front
4	103717	Panel housing rear	13	106576	Panel Controller & louvre spot weld assembly
5	107105	Panel common wall spot weld assembly	14	107217	Container support LH
6	107216	Container support RH	15	103712	Panel lower controls
7	104741	Drawer slide RH assembly	16	104740	Drawer slide LH assembly
8	103292	Plug button – snap in	17	103711	Panel fan mounting
9	103713	Panel housing RH spot weld assembly			

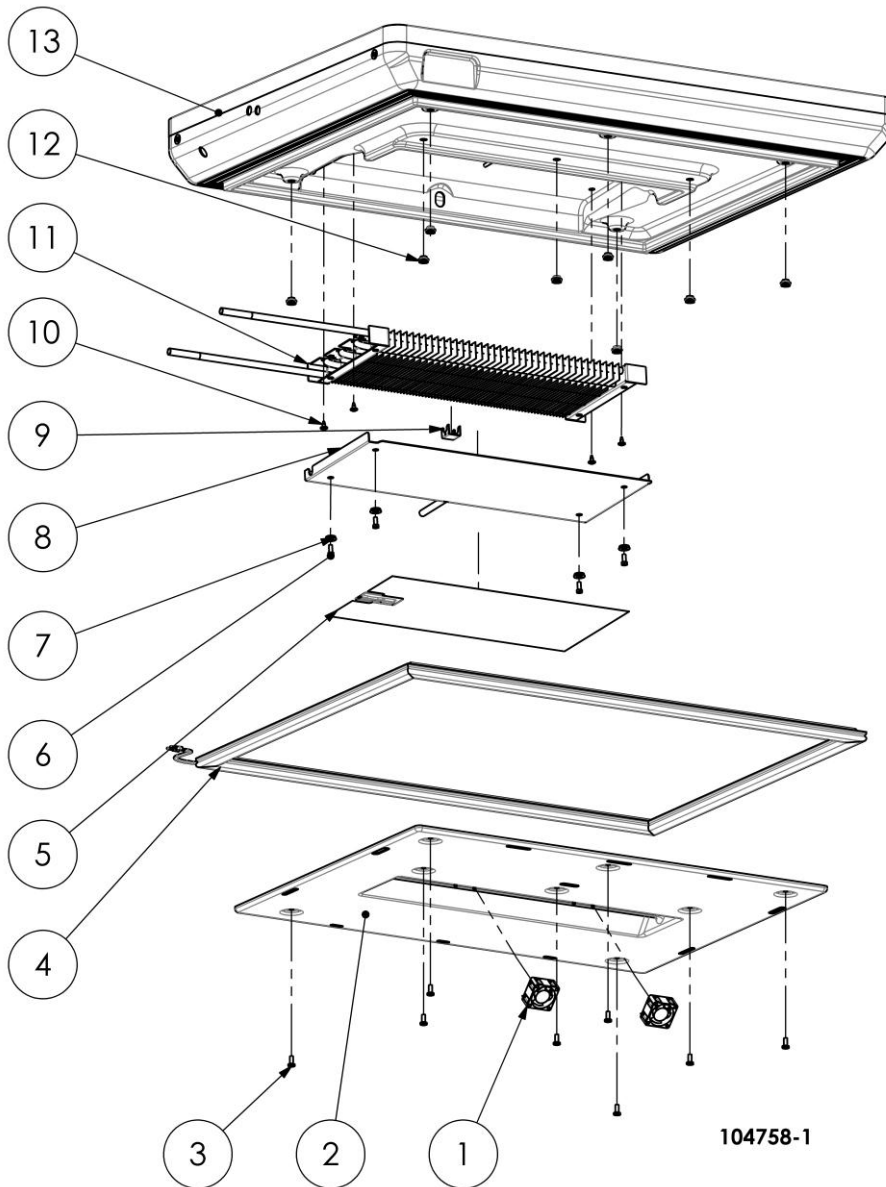
### 33.2 R404a Fridge, Electrical System and Drawer Parts



104757-2

Item	Part No.	Description	Item	Part No.	Description
1	103969	Compressor EMT2117GK	9	107617	Screw hex serrated flange M5 x 16
1	104944	Compressor ML45FG ECC (50-60Hz)	10	103727	Insulated container assembly
2	103970	Evaporator tray compressor	11	103755	Refrigeration controller display
2	102945	Evaporator tray MLxxFB compressor	12	103008	Fan axial
3	106431	Power outlet C19 16A snap fit	13	102930	Filter drier
4	106430	Power inlet C20 16A snap fit	14	103744	Refrigeration controller relay unit
5	106688	Defrost drain tube	15	107178	End plate fuse holder
6	102923	Drawer switch	16	107168	Fuse holder
7	107274	Kit spares – harnesses (VCS)	17	103185	Condenser - tubeless
8	103754	Insulated lid built assembly			

### 33.3 Insulated Lid (part No. 103754 – Complete Assembly)



Item	Part No.	Description	Item	Part No.	Description
1	108451	Kit spares – Costec evap fan fixing kit (VCS)	9	103760	Bracket clip-on collection tray spacer
2	103729	Lid diffuser	10	106801	Screw pozi pan M4 x 16 ST/ST
3	106868	Screw pozi M5 x 16 ST/ST	(*)	106603	Rubber nut M4 - short grip
4	103746	Container seal – heated magnetic	11	103745	Evaporator coil coated
5	103009	Defrost heater electric 150W 400 x 190mm	12	106436	Rubber nut M5 – short grip
6	102082	Screw hex M5 x 12 ST/ST	13	103735	Insulated lid assembly
7	103491	Bonded sealing washer M5 ST/ST	(*)	104291	Defrost tray & heater - kit assy (VCS)
8	103726	Plate defrost collection			

(\*) Not shown

### 34 Product Fiche VCS

Information requirements for professional refrigerated storage cabinets			
Model: VCS R1			
Intended use	storage		
Operating temperature(s)	multi-use		
Category	counter		
(where applicable)			
Refrigerant fluid: HFC R404A (GWP ~ 4200)			
Item	Symbol	Value	Unit
<b>Annual Energy Consumption</b>	<i>AEC</i>	1073	kWh
<b>Energy Efficiency Index</b>	<i>EEI</i>	37.2	
<b>Net volume</b>	$V_N$	<b>86.2</b>	<b>litre</b>
(where applicable)			
Chilled volume	$V_{NRef}$	-	litre
Frozen volume	$V_{NFz}$	86.2	litre
Refrigerant charge		0.200	kg
Contact details	Applied Design and Engineering Ltd. trading as: Adande Refrigeration. 45 Pinbush Road, South Lowestoft Industrial Estate, Lowestoft, Suffolk. NR33 7NL. United Kingdom.		



## 35 Appendix

### Contact us

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