ReFlex Chef Base

SKOPE Chef Base Fridge
Hydrocarbon

Service Manual

MAN80308 Rev. 1.0 Oct 2021

SKOPE® Refrigeration

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Hydrocarbon
Service Manual

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Rev. 1.0 Oct. 2021

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- Alters, removes (including part removal) or obliterates (including part obliteration) the trade mark on the product
- Applies any other trade mark to the product
- Adds to the product any written material that is likely to damage the reputation of the trade mark

Notice of the above contractual obligations passes to:

- Successors or assignees of the buyer
- Future owners of the product

CONTENTS

1 Servicing Hydrocarbon

Overview

This appliance utilises hydrocarbon (HC) R290 as its refrigerant. R290 is a natural refrigerant that has a very low environmental impact.

Special service requirements are needed as R290 is a flammable refrigerant.

Safety hazards

The main hydrocarbon safety hazards are:

- Flammable refrigerant.
- Venting of hydrocarbon and compressor oil.
- Asphyxiation.

Do not interfere with the refrigeration system. All refrigeration maintenance and repairs must be undertaken according to the SKOPE HC Service Requirements below.

Electrical safety precautions

Correct wiring routing is as important as use of correct components for compliance with safety and radio interference regulations. In order to maintain safety and compliance with regulations, any wiring that is disturbed during servicing must be replaced and secured in its original position.

SKOPE HC Service Requirements

Servicing must only be performed by Approved SKOPE Service Technicians, and must meet all requirements in the SKOPE HC Service Policy (available from SKOPE), including the following:

Hydrocarbon work – SKOPE Service Policy

It is the responsibility of the service technician to follow SKOPE's Hydrocarbon equipment service policy and by accepting a service work order they agree to the following (where applicable):

- MUST – Ensure all workers are trained in the SAFETY of hydrocarbon products to the appropriate level for the work required.
- MUST – Follow all Local Safety Regulations relevant to flammable refrigerant gases.
    - Australia should reference - AIRAH Flammable Refrigerants – Safety Guide
    - New Zealand should reference – Flammable Refrigerant Safety Documentation (Refrigerant License NZ)
- MUST – Adhere to all on-site (workplace) Health and Safety requirements
- MUST – Not modify or alter the design of SKOPE equipment in any way
- MUST – In cases where the refrigeration system is not readily removable from the cabinet; then the entire cabinet MUST be sent to the Hydrocarbon workshop for repair.
- MUST – ONLY use SKOPE OEM Spare Parts; or identical replacement parts. Any variation in replacement part may render the system non-compliant and unsafe.
- MUST – Follow all best practice work activities for servicing hydrocarbon refrigerants (SKOPE recommend attending specific hydrocarbon refrigeration handling training courses). Nitrogen must be used for purging system before commencing "Hot Work" – brazing.
- MUST – Adhere to relevant SKOPE Service Manual. If any contradiction, the local Regulations take precedence over SKOPE requirements
- MUST – Work only in suitable, safe and compliant work spaces. Personal Protective Equipment must always be used when working on Hydrocarbon equipment.
- MUST – Service people diagnosing refrigeration faults must always carry and utilise Flammable Gas detectors when working on Hydrocarbon equipment.
- MUST – Prior to any service work; know where and how to safely and quickly isolate power supply to cabinet
- MUST – Not perform any Hot Work (brazing etc.) in the field. These are to be completed in a suitable service depot / workshop (in a dedicated specific Hazardous Work Area compliant to local flammable gas regulations)
- MUST – Not transport a refrigeration system with a known active leak. If there is an active leak the refrigerant must be safely removed (with use of Bullet Piercing Valve or Line Tap valves) before transporting. Valves must be removed at the hydrocarbon service depot once repair is completed.
- MUST – All hydrocarbon workshop areas must have emergency plans; that includes suitable evacuation and fire control plans and equipment.
- MUST – Only use refrigerant grade hydrocarbon, to precise mass specified on removable refrigeration system serial label.
- MUST – Be accurate refrigerant charge; The refrigerant mass is ultra-low charge and must only be measured in by accurate scales to +/- 1.0gram. Refrigerant MUST not be overcharged; or added to an already charged system.
- MUST – Use identical drier replacement; as any change will affect gas charge volume; and effect reliability compliance and safety.
- MUST – Any pipework replacement, must be identical to genuine SKOPE parts.
- MUST – Not introduce a sparking device inside a cabinet or inside a removable refrigeration system. Battery drills should not be used.
- MUST – Not perform any activity that could stress a refrigeration pipe (unless in a workshop).
- MUST – Get customer authorisation to permanently swap a removable refrigeration system.
- MUST – Have the Wellington Drive SCS Field app installed on a Bluetooth enabled device carried by the service technician (exception is for cabinets that do not utilise the Wellington Drive Controller).

  The app should be utilised for safe, accurate diagnosis of the system and it is required to complete a controller replacement in the field.
- RECOMMENDED – Have the Wellington Drive SCS Track app installed on a Bluetooth enabled device carried by the service technician. This passive app collects system data from the Wellington Drive SCS Connect Controller and transmit it to the cloud.
- Logistics companies may be used to transport a complete refrigerator where no separation of the refrigeration system occurs. Logistics companies are not required to be contracted to this SKOPE Service Policy.

2 Specifications

Models

This service manual is applicable to the SKOPE ReFlex Chef Base Fridge models detailed in the table below. Refer to the relevant product specification sheet (available on the SKOPE website: www.skope.com) for specifications.

Model	SKOPE ID	Product Description
RF8.CBR.1.2D	RC1R	2-Drawer Chef Base Fridge
RF8.CBR.2.4D	RC2R	4-Drawer Chef Base Fridge

3 Electronic Controller

Overview

The cabinet is fitted with a Wellington Drive SCS Connect electronic controller. The controller is located in the cartridge compartment and is visible from the outside of the cabinet through the cartridge cover.

Apps

SCS Connect Field App

The Wellington Drive Field app for mobile devices allows technicians to connect and interact with SKOPE equipment that utilise the Wellington Drive SCS Connect electronic controller. The app allows technicians to:

- View the current state of cabinet components (temperatures, compressor and fan motor states).
- View a 7-day history of those states.
- Manually change component states.
- Update and change controller parameters.
- Update controller firmware.

All technicians who service SKOPE equipment fitted with the Wellington Drive SCS Connect electronic controller are required to have the Wellington Drive Field app installed on their Bluetooth enabled mobile device. SKOPE also recommend that all technicians have the Wellington Drive Track app installed.

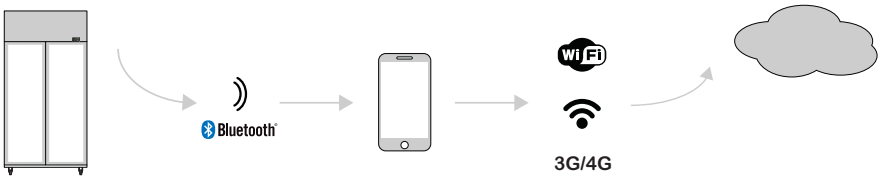
See “SCS Connect Field App and Track App” on page 11 for information on setting up and using the app.

SCS Connect Track App

The Wellington Drive Track app for mobile devices transfers data from SKOPE equipment that utilise the SCS Connect controller to a cloud based server.

The app works automatically in the background. When the app detects a controller, it connects via Bluetooth to receive data from the controller and send data to the cloud. If no mobile data connection is available, the app stores data until a connection becomes available.

SKOPE recommend that all technicians who service SKOPE equipment fitted with the Wellington Drive SCS Connect electronic controller have the Wellington Drive Track app installed on their Bluetooth enabled mobile device.



SKOPE Connect App

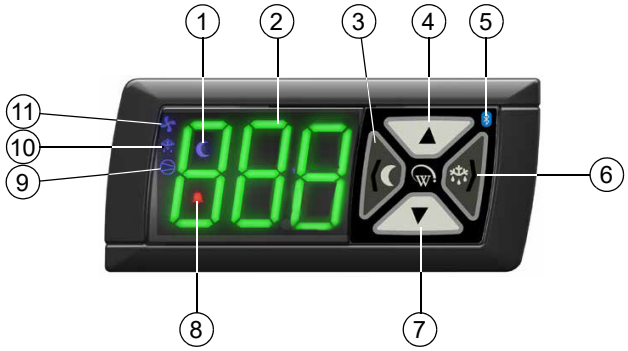
The SKOPE-connect app is designed for end-users only, and provides wireless access to the controller from mobile devices with Bluetooth capability.

The app allows end users to adjust some electronic controller settings including energy saving modes, open/close hours and preset temperature set points for specific product.

Controller Faceplate

Buttons and Display

The controller faceplate includes the front display panel and interface buttons.



No.	Description
1	**Night Mode:** Indicator. On during night mode.
2	**Display:** Indicator. Digital display of cabinet air temperature or messages. The temperature is what the sensor inside the cabinet detects, and not necessarily the product temperature. However, they may be very close depending on how the controller is set to sense temperature.
3	**Light Switch - Night Mode (back/abort):** Button. Press to switch the lights on or off. Press and hold to switch cabinet between day and night mode. Used during programming.
4	**Up:** Button. Used for programming.
5	**Bluetooth:** Indicator. On when ready to connect to a device. Flashing when connected to a device.
6	**Defrost Cycle (next/enter):** Button. Press and hold to initiate manual defrost. Used during programming.
7	**Down:** Button. Used for programming.
8	**Fault - Alarm:** Indicator. On during fault or alarm. Note: Alarm message is also shown on the display during alarm.
9	**Compressor:** Indicator. On when the compressor is running.
10	**Defrost Mode:** Indicator. On during defrost cycle.
11	**Fan:** Indicator. On when evaporator fan running.

Service Mode

Service mode can be accessed and used via the SCS Connect Field app (see “SCS Connect Field App and Track App” on page 11), or the controller faceplate (refer to Wellington Drive Technologies documentation for further information).

Note: A 9 digit pin code is required to access service mode via the controller buttons. Contact SKOPE to receive your service mode pin code.

There are 5 main service mode categories when accessing and using service mode via the controller faceplate:

Parameters

Provides access and editing of individual controller parameters.

It is not recommended that parameters are changed unless absolutely necessary. If incorrect parameter settings are suspected, reload the complete parameter set.

Reset

Returns the controller back to factory settings. Parameter set must be reloaded after performing a reset.

Manual test

Allows inspection of input values from sensors, and check the effects of output adjustments to peripherals, and to run preset test routines.

Statistics

Displays logged values and event counts to assist with fine tuning and diagnostics.

About

Lists the properties of the refrigeration system and the controller, including cabinet model codes, firmware, hardware and software versions.

SCS Connect Field App and Track App

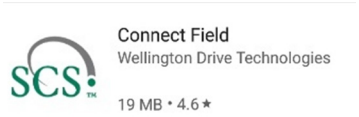
Connecting

Follow the procedures below to install and set-up the app, and connect to a controller.

Note: The SCS Connect Field app and Track app are separate from the SKOPE-connect app.

To install the SCS Connect Field app

1. Download the SCS Connect Field app from Google Play Store or Apple App Store.

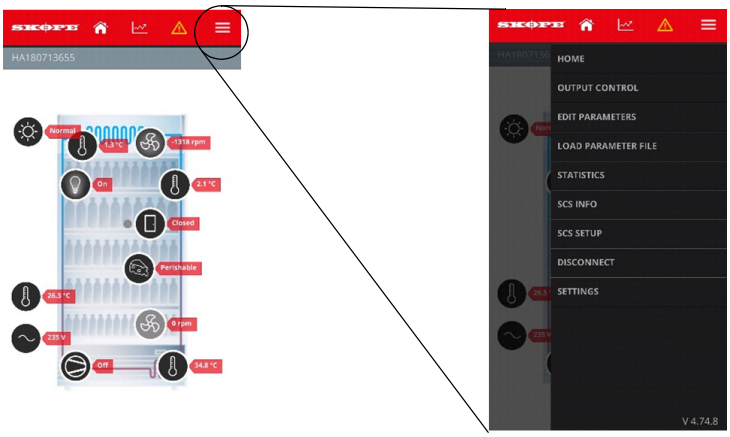


2. Enter your unique Activation Code and press ‘Activate’. The activation code is provided by SKOPE Customer Services.
3. Enter a 4-digit PIN code, re-enter the code, and press ‘SET PIN CODE’.

To connect to a cabinet

1. Ensure Bluetooth is enabled and you have internet access on your mobile device.
2. The app shows a list of nearby SKOPE cabinets. The signal bars indicate how close each cabinet is.

3. Select the cabinet of interest and press ‘CONNECT’.
4. When successfully connected, a blue light flashes on the controller faceplate and the home screen is displayed in the app.

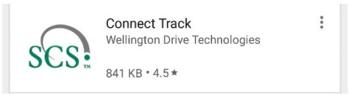
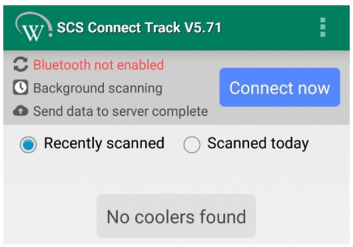


Home screen

Menu screen

Note: Available menu options will differ depending on user access levels

To install and use the SCS Connect Track app

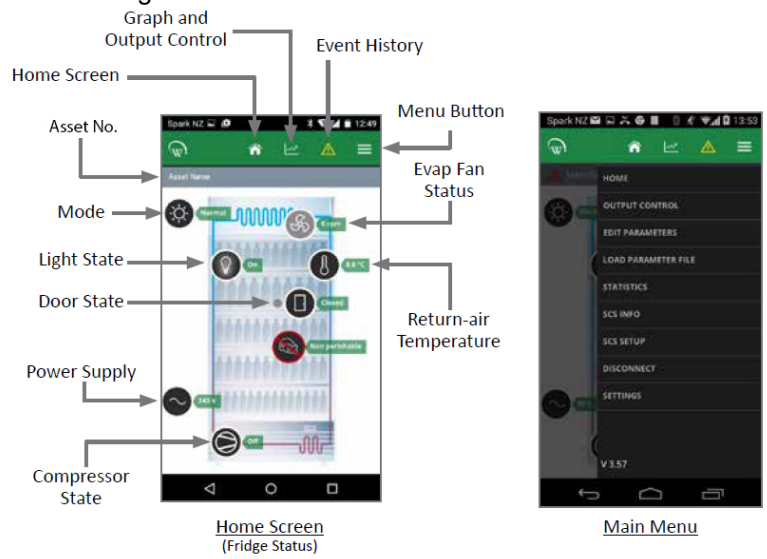
1. Download the SCS Connect Track app from Google Play Store or Apple App Store.	
2. Enter your unique Activation Code and press ‘Activate’ (the same code as used for SCS Connect Field app). The activation code is provided by SKOPE Customer Services.	
3. Respond to any dialogue boxes that appear and the app should be ready to use. Ensure Bluetooth is turned on.	
4. The app is passive and runs in the background (it can track automatically). When servicing a cabinet, the app should be opened to ensure tracking has finished prior to servicing.	

App Categories

Various options are available in the app menu to provide information about the connected controller and its cabinet. Depending on user access level, some menu options may not be available.

Home screen

The home screen shows a graphical representation of the current state of the cabinet being controlled.



Home Screen (Fridge Status)

Main Menu

Output control

Provides control of the controller input sensors and switches, and output relays.

Edit parameters

Provides access and editing of individual controller parameters.
Note: Parameter changes must be recorded on warranty/job card.

It is not recommended that parameters are changed unless absolutely necessary. If incorrect parameter settings are suspected, reload the complete parameter set. **Note:** Updated parameters are not applied until DISCONNECT has been selected from the menu (after loading new parameter set).

Load parameter file

Allows reloading of model default parameter set or changing to new parameter set. See “Replacing the Controller” on page 40 for instructions.
Note: Updated parameters are not applied until DISCONNECT has been selected from the menu (after loading new parameter set).

Statistics

Information from the past seven days on cabinet activity including temperatures, door openings and alarms.

SCS info

Controller version and cabinet asset information.

SCS setup

Add or change SCS info (see above).

Disconnect

Disconnect from currently connected controller.

Settings

Change app general settings.

Parameter numbers table

Model Number		RF8.CBR.1.2D	RF8.CBR.2.4D
Parameters Number	626	✓	✓

Faults and Alarms

The following table explains faults and alarms that the electronic controller may log and display.

If a fault occurs, the fault - alarm indicator is lit on the controller faceplate, but no message is displayed. Faults do not affect product temperature, and require no action from the shop owner.

Alarms are logged and the alarm message is displayed on the controller faceplate. Alarms may result in abnormal product temperature.

Some faults and alarms can be cleared by the shop owner, and others can only be cleared by a service technician.

If the cabinet is connected to the power supply and has warm product, check the SCS Connect Field App for active fault or alarm, and investigate. If the cabinet does not have an active fault or alarm, check the app statistics to determine if and when the controller signalled a fault or alarm.

Refer to the tables below for faults and alarm descriptions and possible causes and actions. The service tech type column refers to the service tech skill level required to complete a task. Refer to the SKOPE HC Service Policy (available from SKOPE) for service tech type details.

Faults (alarm indicator lit - no message displayed)

Description	Service tech type	Possible root cause
Door left open. The door has been open for several minutes.	1, 2, 3, 4	- door not self closing (torsion fault) - door switch / circuit - controller
Excessive door open counts		
Over-voltage protection The maximum allowable mains supply voltage has been exceeded. The cabinet has temporarily shut down to prevent damage and will restart once the supply voltage decreases.	1, 2, 3, 4	- should be a one off; if continues: - line voltage / rural - voltage setting parameter - controller
Under-voltage protection The mains supply voltage has dropped below the minimum allowable level. The cabinet has temporarily shut down to prevent damage and will restart once the supply voltage increases.	1, 2, 3, 4	- should be a one off; if continues: - power supply overloaded / multibox - line voltage / rural. - voltage setting parameter - controller
High condensing temperature protection The system was operating at an elevated temperature and has temporarily shut down to prevent damage. Extended operation in this condition may result in ALARM 15, increased energy consumption and a reduction in cabinet life. This alarm may be caused by very high ambient temperature.	2, 3, 4	- cabinet installed in location outside rated conditions - condenser not clean - poor installation / ventilation - condenser fan motor / blade - controller
Excessive compressor cycling protection The system has been turning on and off too frequently.	2, 3, 4	- condenser blocked - poor installation / ventilation - cabinet gasket seals leaking - door not self closing / gasket leaking - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = remove cabinet

Alarms

Code	Description	Service tech type	Possible root cause
dor	Door left open. The door has been open for several minutes. Will revert to door left open FAULT after 10 minutes (see faults table on previous page).	1, 2, 3, 4	- door not self closing (torsion fault) - door switch / circuit - controller
8	Estimated product temperature below allowable range The estimated product temperature has been below the allowable range for longer than the permissible time. Potential causes are: an empty or partially filled cabinet, or low ambient temperature.	1, 2, 3, 4	- low ambient - App settings - controller
9	Estimated product temperature above allowable range The estimated product temperature has been above the allowable range for longer than the permissible time. Potential causes are: excessive door openings, door being left open, or warm product loaded into cabinet.	2, 3, 4	- condenser blocked - poor installation / ventilation - frozen blocked evap coil - door leaking air (bad gasket / door not self closing) - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - App settings - controller - compressor / gas leak = remove cabinet
15	Excessive condensing temperature protection The system was operating at an excessive temperature and has shut down to prevent permanent damage. This alarm may occur due to very high ambient temperature.	2, 3, 4	- cabinet installed in location outside rated conditions - condenser not clean - poor installation / ventilation - condenser fan motor / blade - controller
17	Control probe failure A critical system sensor has failed and the cabinet can no longer operate.	2, 3, 4	- control Probe / circuit - controller
18	Electrical over-current protection activated The compressor was drawing too much current and has shut down to prevent permanent damage.	2, 3, 4	- condenser blocked - poor installation / ventilation - cabinet gasket seals leaking - door not self closing / gasket leaking - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = remove cabinet
19	Failed to reach set temperature The refrigeration system has been operating continuously for a long period without reaching the set temperature.	2, 3, 4	Take spare cartridge in case refrigeration system fault. - condenser blocked - poor installation / ventilation - frozen blocked evap coil - cabinet seal leaking / door - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = remove cabinet
20	Over cooling product The internal temperature is too low. The system has temporarily shut down until the temperature has returned to normal. This can occur if the set temperature has been raised by a large amount.	1, 2, 3, 4	- confirm if really too cold; change parameters accordingly

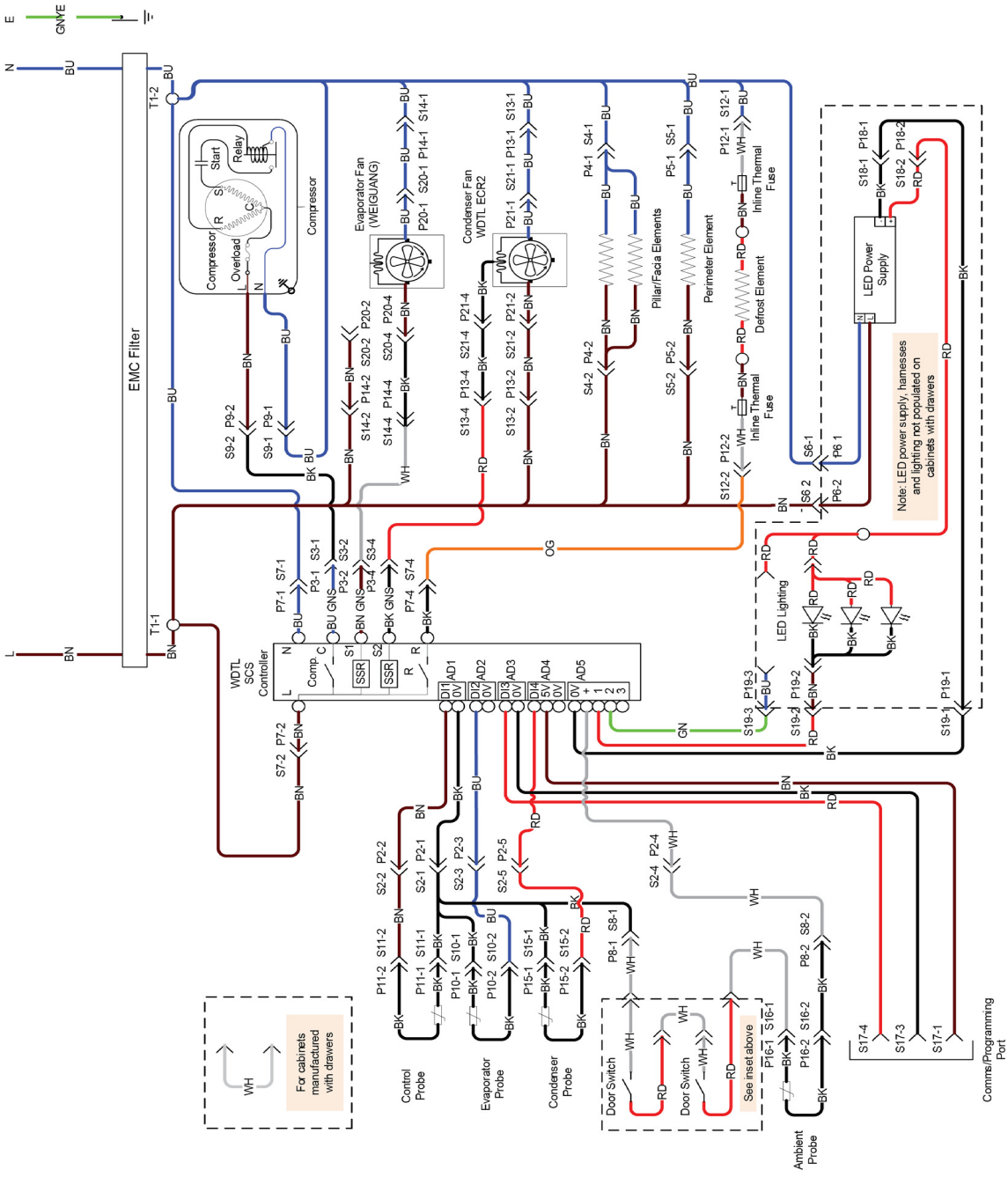
Continued over page

Code	Description	Service tech type	Possible root cause
22	Evaporator fan over-current protection The current supplied to the evaporator fan motor is too high.	2, 3, 4	- faulty fan motor - fan blade fault (imbalance / debris / blockage) - controller
23	Condenser fan over-current protection The current supplied to the condenser fan motor is too high.	2, 3, 4	- faulty fan motor - fan blade fault (imbalance / debris / blockage) - controller
24	Controller communication error Controller has lost communication channels.	1, 2, 3, 4	- App - controller / circuit
25	Controller update failed Controller update could not be completed.	1, 2, 3, 4	- App - controller / circuit
26	Controller hardware failure Controller hardware has failed.	1, 2, 3, 4	- App - controller / circuit
27	Probe failure A non-critical system probe has failed. The cabinet will continue to operate with partial function but requires service.	2, 3, 4	- Evap probe / connections - controller
28	No downward tendency The temperature is no longer decreasing.	2, 3, 4	- condenser blocked - poor installation / ventilation - cabinet / unit gasket seals leaking - door not self closing / gasket leaking - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = remove cabinet
29	Compressor cutting out The compressor cut out on its internal protection or pressure switch.	2, 3, 4	Take spare unit in case refrigeration system fault. - condenser blocked - poor installation / ventilation - cabinet seal leaking / door / unit - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = remove cabinet
30	Excessive automatic defrosting The system is automatically defrosting too frequently.	2, 3, 4	Take spare cartridge in case refrigeration system fault. - door not self closing / gasket leaking - Evaporator probe - Evaporator motor / fan - controller - compressor / gas leak = remove cabinet
31	Compressor stalling The compressor is stalling on start up.	2, 3, 4	- condenser blocked - poor installation / ventilation - cabinet gasket seals leaking - door not self closing / gasket leaking - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = remove cabinet

Notes

4 Wiring

ReFlex Chef Base Fridge



WIRE COLOURS	
BK	Black
BN	Brown
RD	Red
OG	Orange
GN	Green
BU	Blue
GY	Grey
WH	White
GNYE	Green-Yellow

Based upon IEC 757 Standard

CAUTION

Some connector colours vary depending on date of manufacture.

Refer to Plug type/colour column in the table below for colour variations.

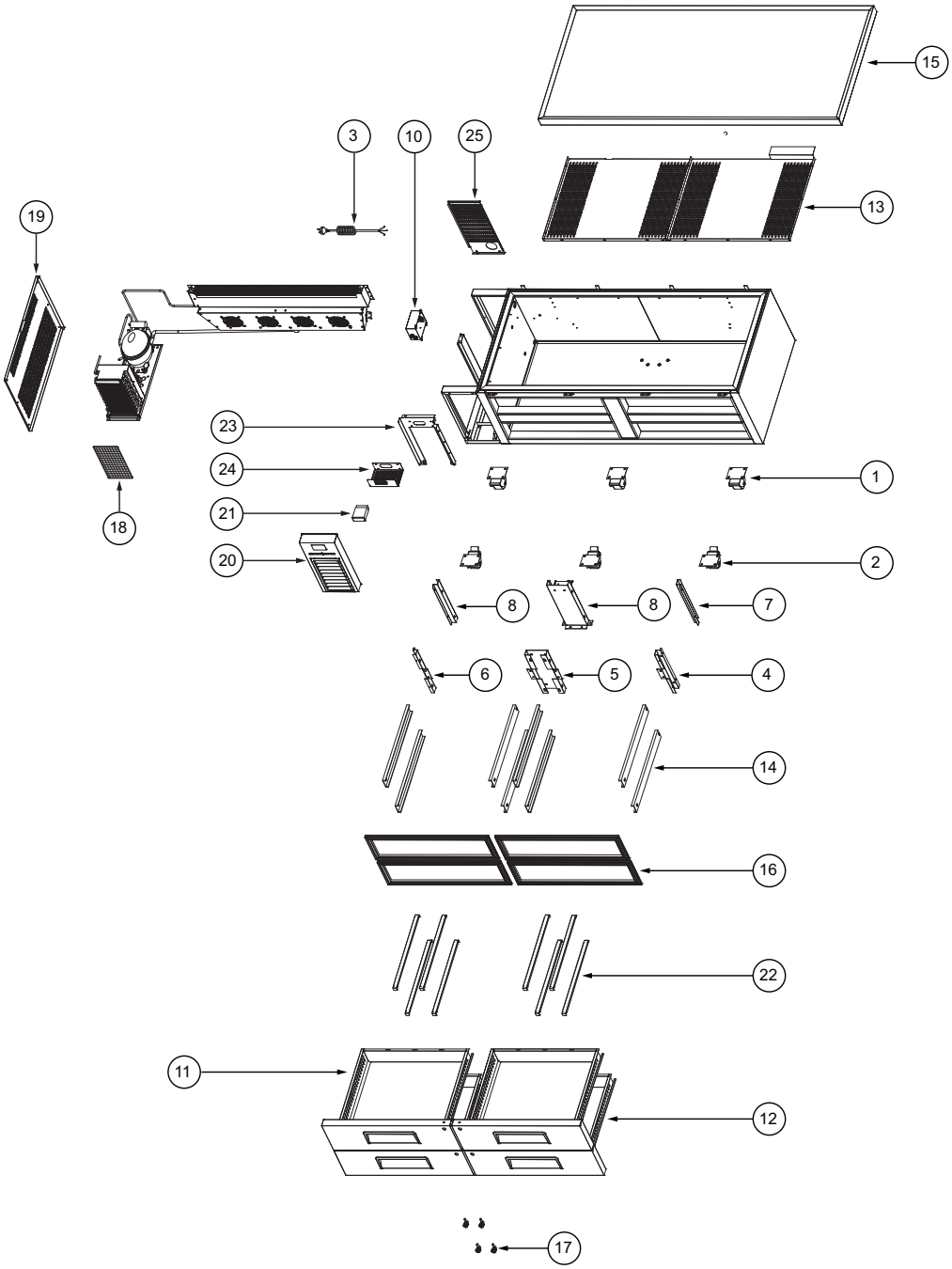
After unplugging connectors, **ALWAYS** ensure reconnection has been undertaken correctly as operational faults may occur if incorrect. It is recommended to photograph wiring setup before unplugging for future reference.

LEGEND

Internal Unit Junction Box Sockets/Plugs			
Name	***Description***	***Plug type/colour***	
		Before Feb. 2020	***From Feb. 2020***
Inlet	IEC Cabinet Socket/Plug	IEC	IEC
S1/P1	Not Used	-	-
S2/P2	Unit Junction Box to Controller Signal Socket/Plug	White 6-way	White 6-way
S3/P3	Unit to Controller Power Socket/Plug	Blue 4-way	Black 4-way
S4/P4	Heater Wire Unit Socket/Plug	Black 3-way	Black 3-way
S5/P5	Heater Wire Unit Socket/Plug 2	Black 3-way	Black 3-way
S6/P6	Light Unit Socket/Plug	White 3-way	White 3-way
S7/P7	Unit to Controller Power Socket/Plug 1	Red 4-way	Orange 4-way
S8/P8	Door Sensor Socket/Plug	White 2-way	White 2-way
S9/P9	Compressor Unit Socket/Plug	Blue 4-way	Blue 4-way
S10/P10	Evaporator Sensor Socket/Plug	Black 2-way	Black 2-way
S11/P11	Cabinet Sensor Socket/Plug	Blue 2-way	Blue 2-way
S12/P12	Defrost Element Socket/Plug	Yellow 4-way	Yellow 4-way
S13/P13	Condenser Motor Unit Socket/Plug	Red 4-way	Red 4-way
S14/P14	Evaporator Motor Unit Socket/Plug	White 4-way	White 4-way
S15/P15	Condenser Sensor Socket/Plug	Red 2-way	Orange 2-way
S16/P16	Ambient Sensor Socket/Plug	White 2-way	White 2-way
S17/P17	Programming/Comms Port Socket	Blue 4-way	Blue 4-way
S18/P18	LED Driver DC Out Put Socket/Plug	Red 2-way	Red 2-way
S19/P19	LED Lighting Loom Socket/Plug	Yellow 4-way	Green 4-way
S20/P20	Evaporator Extension Flex Socket/Plug	White 4-way	White 4-way
S21/P21	Condenser Extension Flex Socket/Plug	Red 4-way	Red 4-way
T1	Unit Terminals	-	-

5 Spare Parts

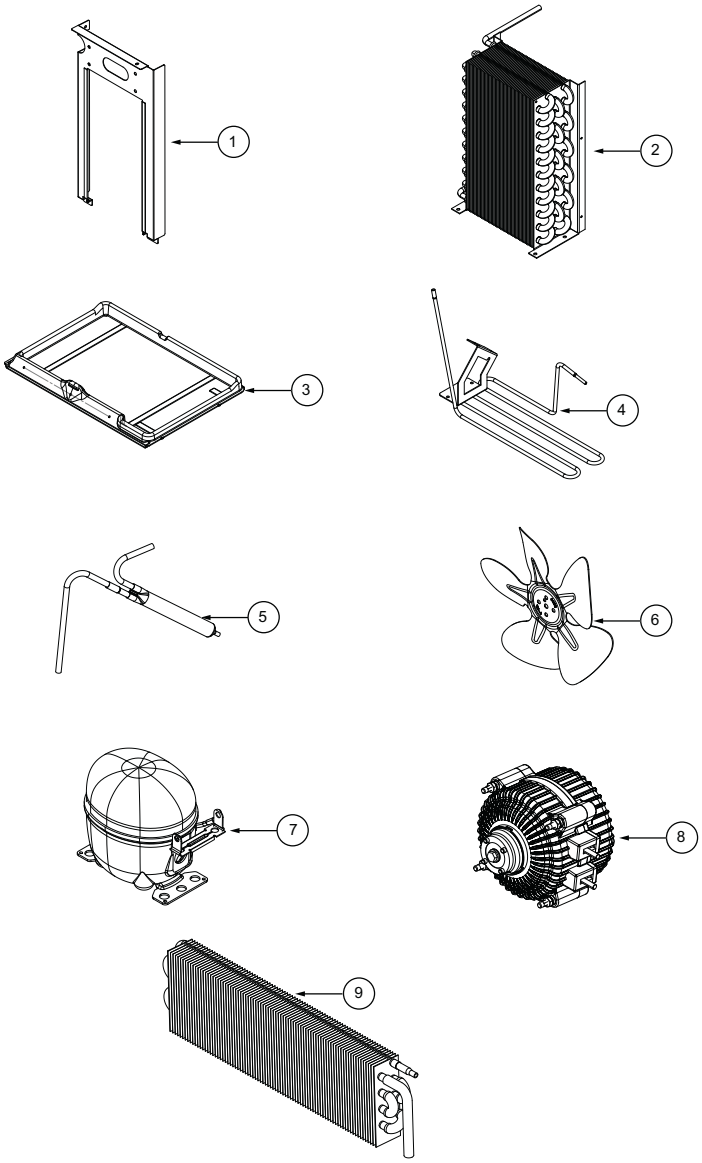
Chef Base 4 Drawer Assembly



Parts - ReFlex Chef Base

No.	Description	Part No.	RF8.CBR.1.2D	RF8.CBR.2.4D
1	CASTOR-UNBRAKED	KN-SXX12408	✓	✓
2	CASTOR-BRAKED	KN-SXX12407	✓	✓
3	MAINS FLEX AUS/NZ UP 3M	KN-FLX12382	✓	✓
4	RIGHT FRONT RAIL	KN-SSY12427	✓	
	RIGHT FRONT RAIL	KN-SSY12398		✓
5	CENTRE FRONT RAIL	KN-SSY12397		✓
6	LEFT FRONT RAIL	KN-STY12428	✓	
	LEFT FRONT RAIL	KN-STY12395		✓
7	RIGHT BACK RAIL	KN-STY12428	✓	
	RIGHT BACK RAIL	KN-STY12406		✓
8	BACK MIDDLE RAIL	KN-SSY12394		✓
9	LEFT BACK RAIL	KN-SSY12429	✓	
	LEFT BACK RAIL	KN-SSY12393L		✓
10	WIRING BOX-U/BENCH	KN-ELZ12383	✓	✓
11	DRAWER COMPONENT - LH LOCK	KN-SSY12431R	✓	✓
12	DRAWER COMPONENT - RH LOCK	KN-SSY12400R	✓	✓
13	AIR DUCT	KN-SSY12432	✓	✓
14	GUIDE	KN-STY12411	✓	✓
15	2 DRAWER BENCH TOP (with heat shield)	KN-STY12433	✓	
	4 DRAWER BENCH TOP (with heat shield)	KN-STY12406		✓
16	GASKET DRAWER CHEFBASE	KN-GKT12413	✓	✓
17	KIT-LOCK PIN AND KEY	KN-SXX12401	✓	✓
18	FILTER CONDENSOR	KN-FIL12387	✓	✓
19	UNIT LEFT PANEL-CHEF BASE	KN-STY12404	✓	✓
20	CABINET PANEL-LOUVRE-CHEF BASE	KN-STY12405	✓	✓
21	WDTL SCS FIRMWARE	ELZ11749-1629	✓	✓
22	PAN HOLDER	KN-SSY12447	✓	✓
23	CONDENSER SHIELD	KN-SXX12379	✓	✓
24	CONTROLLER MOUNTING PLATE-CHEF BASE	KN-SXX12381	✓	✓
25	UNIT REAR PANEL	KN-CLS12378	✓	✓

Integrated Unit Components



Please Note: Images are indicative only

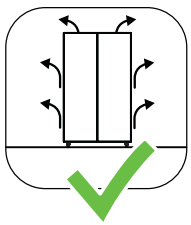
Parts - Integrated Unit

No.	Description	Part No.	RF8.CBR.1.2D	RF8.CBR.2.4D
1	CONDENSER SHIELD	KN-SSY12435	✓	✓
2	CONDENSER COIL	KN-CLS12391	✓	✓
3	CONDENSER TRAY	KN-ELZ12384	✓	✓
4	CONDENSATE LINE	KN-FIL12387	✓	✓
5	FILTER DRIER	KN-DRY12386	✓	✓
6	CONDENSER FAN BLADE	KN-COT12385	✓	✓
7	COMPRESSOR	KN-CPR12100	✓	✓
8	CONDENSER FAN MOTOR	ELM11309	✓	✓
9	EVAPORATOR COIL	KN-CLS12392	✓	
	EVAPORATOR COIL	KN-CLS12378		✓

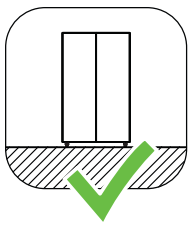
6 Installation

Installation Guidelines

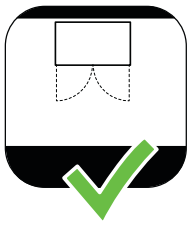
When installing this cabinet, ensure the installation guidelines below are considered and met.



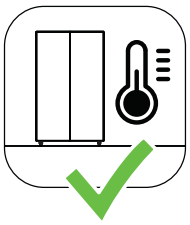
Ventilation
Ensure all ventilation requirements below are met.



Surface
The installation surface must be capable of supporting the loaded cabinet.

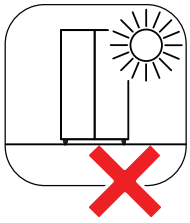


Door Opening
Allow adequate space for the door/s to open and close properly.

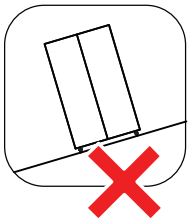


Climate Class
The cabinet must be installed in an environment within its climate class.

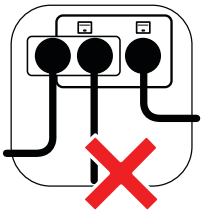
The climate class is stated on the cabinet rating label inside the cabinet.



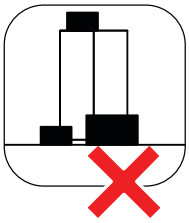
Sunlight
Do not install the cabinet in direct sunlight.



Uneven Surface
Do not install the cabinet on an uneven surface.



Power Supply
Do not overload the power supply.

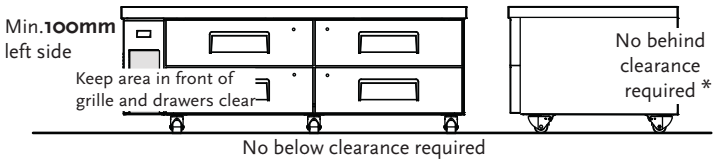


Blocking Ventilation
Do not store boxes or items in front or on top of the cabinet.

Ventilation Requirements

This cabinet must have the following ventilation clearances at all times:

Chef Base Cabinets



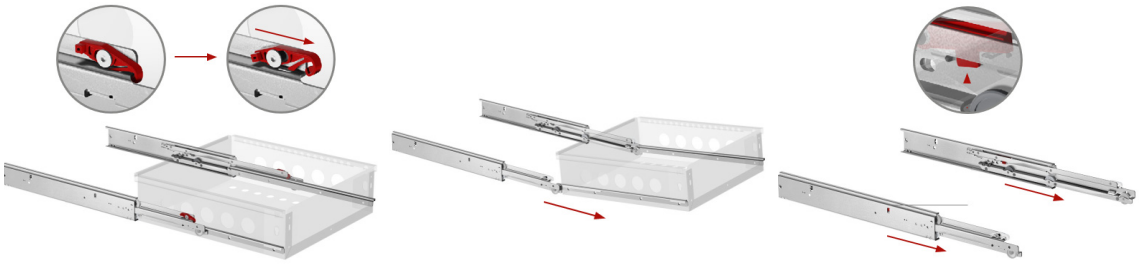
*When installed for continuous duty in climate class 7 environment (35°C ambient / 75% relative humidity), it is recommended to provide 50 mm clearance around the sides and back of the cabinet.

Cleaning Before First Use

The cabinet interior and food contact surfaces such as the worktop must be thoroughly cleaned and sanitised before first use. Ensure the cabinet is unplugged from the power supply before cleaning, and use only standard stainless steel cleaners suitable for food preparation areas. If required, the cabinet exterior can be cleaned as instructed in the cleaning section of this service manual (see “Routine Cleaning” on page 44).

Drawers

Where fitted, drawers should be removed for cleaning. Pull the drawer out of the cabinet, release latches at side of drawer as shown, and lift the drawer out at an angle. The drawer slider can also be removed by releasing the side catches as shown. Reverse operation to refit drawers to cabinet after cleaning.



Power Cord

Before final positioning of the cabinet, pull the power cord out and connect to the power supply.

7 Troubleshooting and Diagnostics

Electronic Controller

Alarms signal unexpected operational changes in the cabinet or cartridge. When an alarm is activated, use the electronic controller app to assist with fault diagnosis and service as necessary. See “Faults and Alarms” on page 14 for information.

General Operation

For problems with the cabinet and refrigeration unit use the following table. Refer to relevant section in this service manual for safe access to perform repair.

Problem	Possible Cause	Repair
• Cabinet not operating • No controller display	• Loss of power supply	• Check mains power supply.
	• Loose plug	• Check all plugs are connected correctly.
• Excess noise vibration	• Refrigeration pipes transferring vibration into cartridge	• Re-align pipes away from other parts.
• Frozen evaporator coil	• Set-point is too cold	• Check and raise.
	• Evaporator probe fault	• Check and replace evaporator probe.
	• Controller fault	• Replace controller.
	• Short of refrigerant	• Perform refrigeration system diagnostics and service as required.
• Power consumption is higher than expected	• Refrigeration unit operating too hot	• Clean the condenser. • Ensure the cabinet has good ventilation around the refrigeration unit • Ensure the cabinet is within the maximum operating temperature.
	• Cabinet door is opened excessively	• Ensure door is closed more often.
	• Set point too low	• Raise set point

Continued over page

• Product is too warm.	• Frequent door opening. • Recently loaded • Door not closing properly. • Refrigeration unit operating too hot. • Excessive door opening or refrigeration heat load. • Set point is too high	• Limit door openings. • Allow time for the product to cool down. • Check and clean door gasket. • Ensure the cabinet has good ventilation around the refrigeration unit. • Ensure the cabinet is within the maximum operating conditions. • Lower set point.
• Moisture build up on door or exterior.	• High humidity. • Frequent door opening. • Door not closing properly.	• Check ambient operating temperature and ventilation requirements, and reposition cabinet if necessary. • Limit door openings. • Check and clean door gasket.
• Cabinet door does not shut properly.	• Cabinet is on an uneven surface. • Door is obstructed.	• Level the cabinet. • Check shelves and product.
• Warm cabinet temperatures • Compressor operating for long periods (more than 1 hour)	• Blocked condenser • Poor ventilation around the refrigeration unit	• Clean the condenser. • Ensure the cabinet has good ventilation around the refrigeration unit. • Ensure the cabinet is within the maximum operating temperature.

Refrigeration System

Unlike in other SKOPE cabinets, the Chef Base refrigeration system is integrated in to the cabinet and can not be easily removed.

The condensing unit can be easily accessed by removing the side panels. The evaporator can only be removed by safely degassing the entire unit, detaching the entire benchtop, and cutting or detaching the suction line.

A frost back check can be completed by unplugging cabinet, unplugging the evaporator fan motor (white 4-pin plug) from the electrics box, and then connecting the cabinet back to the power supply. The suction pipe at the compressor should become cold and start to frost up if the unit is correctly charged with refrigerant.

8 Replacement Procedures

Drawers

Alignment Adjustment

If a drawer is out of alignment, realign it by loosening the top and/or bottom drawer bracket fixing screws, move the drawer as required, and re-tighten the bracket screws.

Drawer Gasket

The one-piece drawer gasket clips into the drawer frame and runs around the perimeter of the drawer. Remove the gasket by peeling it from the door frame, starting at a corner.

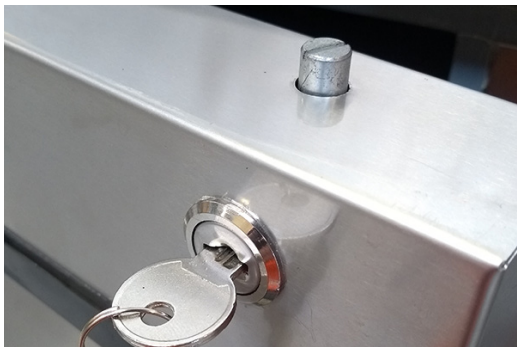
If the gasket is out of shape after refitting, use a hair dryer to heat and reshape it.

Drawer Locks

Each drawer is fitted with a key lock. The lock bolt can be removed and replaced. The lock is foamed into the drawer and cannot be removed.

To replace a drawer lock bolt

1. Unlock and open the drawer.
2. Use a slotted screwdriver to remove or fit the lock bolt to the lock mechanism inside the door.



Castors and Legs

The cabinet is supplied fitted with swivel castors. The front castors are lockable, the rear castors are free. A set of adjustable height legs is also included in the cabinet.

The castors can be removed for plinth mounting or for fitting the height adjustable legs.

To remove the castors

1. Raise the cabinet off the ground, and unbolt the castors from the bottom of the cabinet.

To fit the height adjustable legs

1. The supplied legs fit onto the castor mounting holes.

Unit End Panel

The panel at the LH end of the cabinet can be replaced.

To replace the end panel

1. Unplug the cabinet from the power supply.
2. Unscrew and remove the front panel: Two screws at the bottom and two screws at the top of the front panel.
3. To remove the LH end panel: Unscrew eight screws from the side of the cabinet.
4. Fit the replacement end panel, and refit the front panel.

Refrigeration

Before Servicing

Overview

Ensure you have read and understand this section before commencing with refrigeration cartridge servicing.

Important. Ensure the following before servicing:

- Only technicians contracted to SKOPE hydrocarbon service policy may service this cabinet.
- SKOPE hydrocarbon refrigeration systems must only be serviced by appropriately skilled refrigeration mechanics.
- Servicing of sealed refrigeration system must be completed at a hydrocarbon workshop/service area with dedicated hydrocarbon equipment and suitable personal protective equipment.
- All local hydrocarbon storage and handling regulations and procedures must be adhered to at all times.

Ensure all electronic controller alarms diagnostics and refrigeration system diagnostics are performed to confirm a refrigeration system fault is present. Do **NOT** open the refrigeration system. Check all components such as the electronic controller and electrical systems. If a sealed system fault is suspected, the system must not be opened; it must be sent to a SKOPE approved service depot for repair.

IMPORTANT

Use only dedicated hydrocarbon SKOPE OEM spare parts.

DO NOT use alternative parts.

For safety compliance, only SKOPE supplied components specified for the appliance shall be used for repairs.

Safety hazards

The main hydrocarbon safety hazards are:

- Flammable refrigerant.
- Venting of hydrocarbon and compressor oil.
- Asphyxiation.

Refrigerant identification

The cabinet rating label (located inside the cabinet) states the refrigerant type. In addition to this, warning labels are fitted to hydrocarbon refrigeration cabinets to indicate the use of R290 refrigerant.

Personal Protective Equipment

Ensure all required P.P.E. is used correctly during servicing.

Service equipment

All refrigeration service tools must be hydrocarbon compliant and any electrical equipment that could be exposed to the refrigerant must be intrinsically safe. ONLY dedicated hydrocarbon service equipment may be used.

In addition to standard tools for accessing and removing parts, specialist tools are required when completing refrigeration system service tasks detailed in this manual:

- Intrinsically safe vacuum pump.

- Dedicated hydrocarbon gauges.
- Intrinsically safe hydrocarbon combustible gas detector.
- Intrinsically safe scales to 1gram accuracy.
- Well ventilated work area.

Gas Detector

A gas detector is required and must be used when servicing HC cartridges. A gas detector is a safety device for Hydrocarbon gas to warn the technician that hazardous flammable gas is present.

Leak Detector

A leak detector is recommended for servicing HC cartridges. It is used to track and locate the source of Hydrocarbon gas leaks.

On-Site Work

The service technician must have required knowledge, skills and tools to proceed with on-site refrigeration sealed system diagnostics.

Minimum knowledge and skills

- Experience and qualifications suitable for work on a flammable refrigeration system.
- Performs no unsafe activity.
- Fully complies with SKOPE HC service policy.

Minimum tools and equipment

- Hydrocarbon gas detector
- Safety signage - suitable to create a safe work zone 1.5m around the cabinet.
- Refrigeration gauge set - suitable for R290 flammable refrigerant.

Service vehicle

- Suitable for transporting flammable gas (being HC refrigeration systems). Vehicle storage area must be well ventilated externally, and not ventilated into the vehicle. There must be no ignition sources in the storage area, nor any areas where the gas may pool.
- Must be able to transport cartridges.
- Should carry minimum SKOPE HC service parts.

Not Cooling Fault

If a customer reports a ‘not cooling’ fault, and it has been established that the cabinet is not cooling, follow the procedure “Replacing the Controller” on page 40 when making the service visit.

Hydrocarbon Workshop

The following tools and equipment are required in the hydrocarbon workshop:

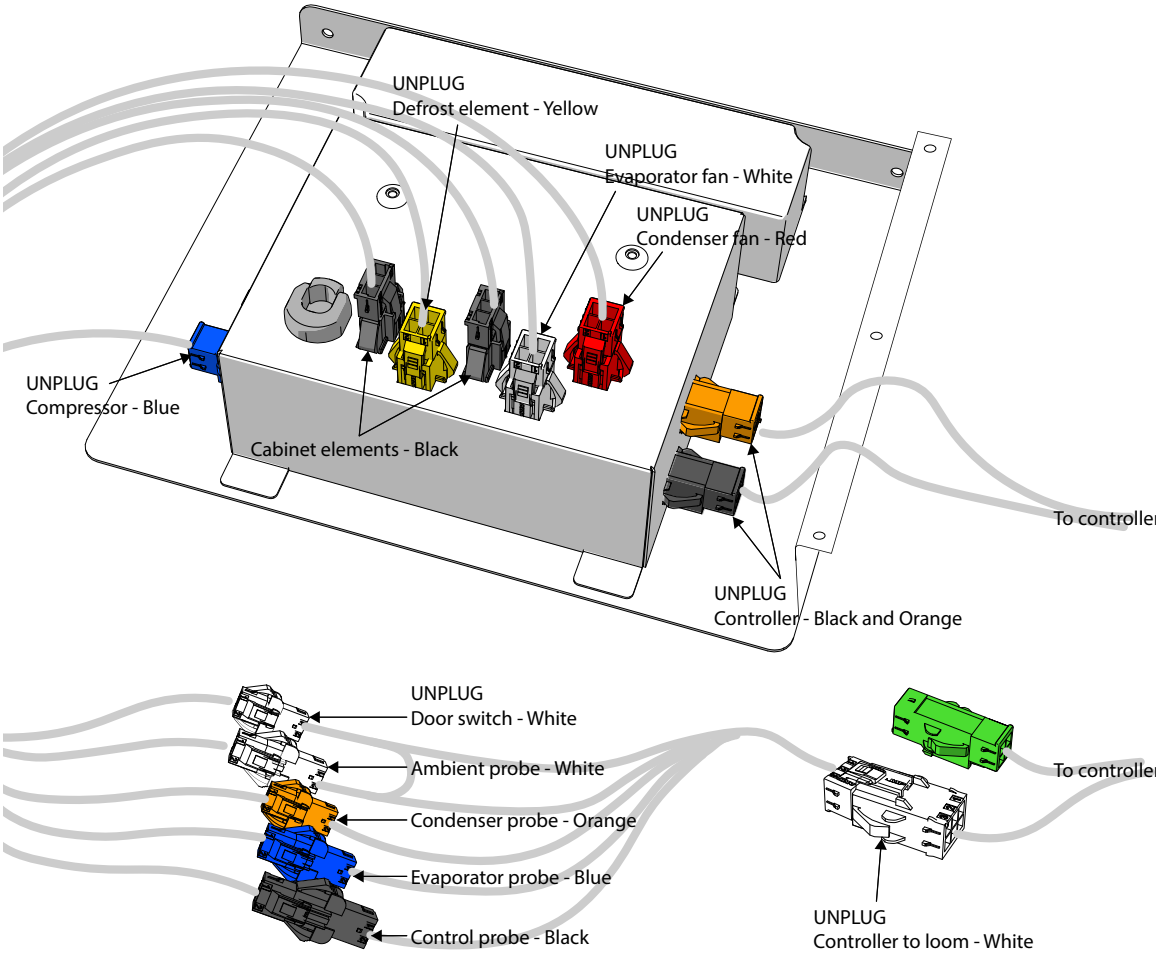
- Hydrocarbon Leak Detector.
- Dedicated Hazardous workshop Area - suitable for servicing and release of flammable refrigerant.
- Refrigeration Gauge set - suitable for R290 flammable refrigerant.
- Dry Nitrogen - suitable for purging and high pressure testing.
- Refrigeration Vacuum pump rated as suitable for use with R290 (by Vacuum pump supplier).
- Charging scales rated as suitable for use with R290 (by scales supplier), accuracy to 1 gram.
- R290 refrigerant supply cylinder.

Electrics Panel & Loom Electrical Connections

Manufactured Feb. 2020 onwards

Due to the use of limited colour connectors, 2 × red 4-way and 2 × yellow 4-way connectors have been used. ALWAYS ensure reconnection has been undertaken correctly as operational faults may occur if incorrect.

Unplug as pictured

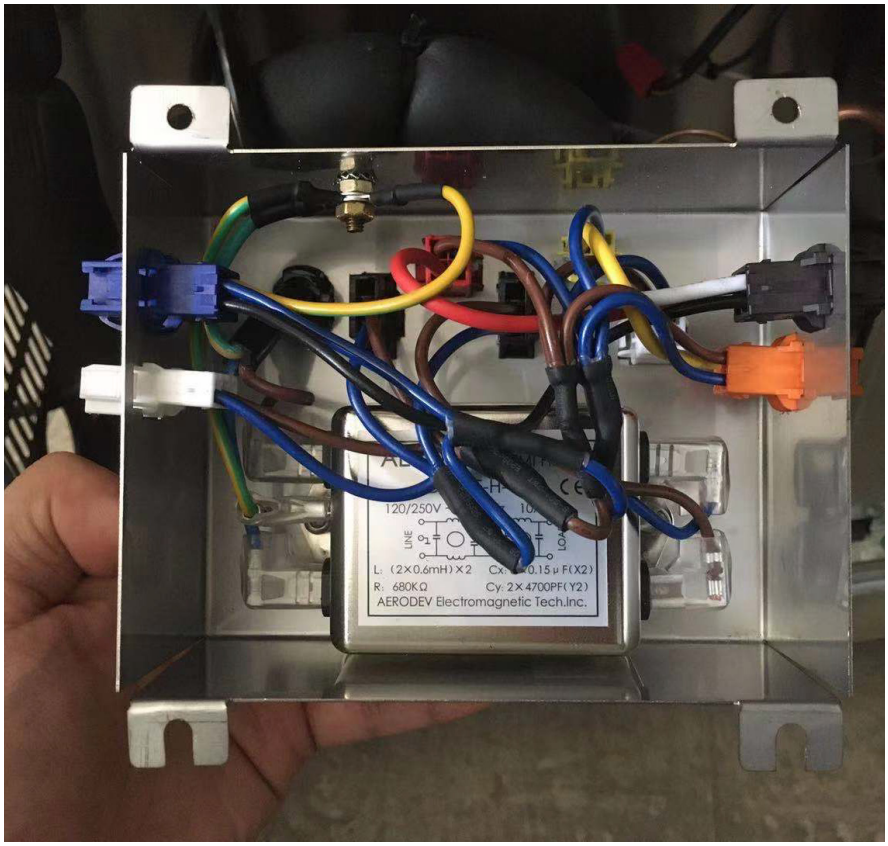


Cartridge Electrics Panel

The cartridge electrics panel is matched to the cabinet, and must be left with the cabinet when servicing the refrigeration unit.

The cartridge electrics panel assembly contains the EMI filter and panel mount socket connectors for the integrated cartridge and cabinet.

Due to the confined space within the electrics box, plugs may come loose as a result of movement and vibrations during servicing. Take care when refitting to ensure all plugs are securely attached to the correct sockets.



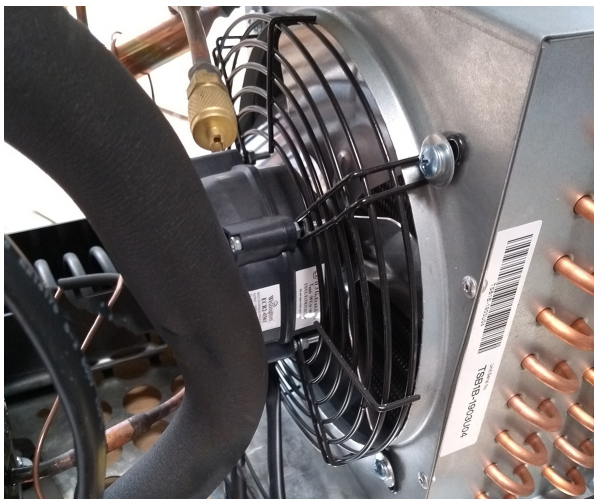
To remove the unit electrics panel and open the electrics box

1. Remove the LH end panel “Unit End Panel” on page 29. This will give access to the unit electric box.
2. Unscrew the four screws and lift the electrics box off the cabinet side wall

Condenser Fan

The condenser fan assembly is made up of a fan motor, fan blade and mounting brackets which can be replaced if necessary.

If the fan stops for any reason, check all connections to ensure no plugs have come loose.



IMPORTANT

Replace the motor with the same SKOPE OEM part.

DO NOT use alternative parts.

It is important that the fan blade and/or fan motor is replaced with the same part to ensure safety, correct alignment, refrigeration performance, and compliance. Fan blades should be tightened to the recommended torque settings (shown in the table below).

Fan motor manufacturer recommended torque settings

Fan motor manufacturer	Torque setting
Wellington Drive	1.4 Nm

To access and remove the condenser fan assembly

1. Disconnect the cabinet from the power supply, remove the unit cover and remove the LH panel (see “Unit End Panel” on page 29).
2. Remove the unit centre pillar (Unscrew 2 screws on the top and 2 screws on the bottom)
3. Take note of cable routing (photo recommended), then cut the cable ties holding the condenser fan motor cable along the cartridge, and free up the condenser fan motor cable.
4. Unscrew the condenser fan assembly from the condenser coil, and remove the assembly (fan motor, fan blade, mounting brackets) from the cartridge by lifting the shroud up and out.

To replace the fan blade

1. Remove the condenser fan assembly (see above).
2. Remove the screw and washer from the centre of the fan blade, and lift the blade from the motor.
3. Replace new blade and fix with 12mm flat washer and serrated head screw. Tighten the blade to recommended torque setting.
4. Refit the condenser fan assembly to the cartridge. Following the same path as the original probe, secure the condenser fan motor cable with cable ties as necessary.
5. Reassemble and test.

To replace the fan motor (with correct SKOPE spare part only)

1. Remove the condenser fan assembly and the fan blade (as above).
2. Detach the fan motor from the fan mounting brackets by removing the four screws from the mounting bracket.
3. Fit new motor and reattach fan blade with 12mm flat washer and serrated head screw. Tighten the blade to recommended torque setting.
4. Refit the condenser fan assembly to the cartridge. Following the same path as the original cable, secure the condenser fan motor cable with cable ties as necessary.
5. Reassemble and test.

Evaporator Fan

The evaporator fan assembly is a one piece assembly which can be replaced if necessary.

If the fan stops for any reason, check all connections to ensure no plugs have come loose. Refer to the label on the electrics box cover to identify the evaporator fan plug and socket in the electrics box.

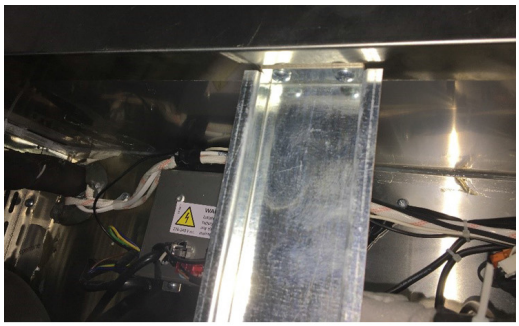
The fan assembly is fixed to evaporator shroud with screws and metal bars.

IMPORTANT
Replace the motor with the same SKOPE OEM part.
DO NOT use alternative parts.

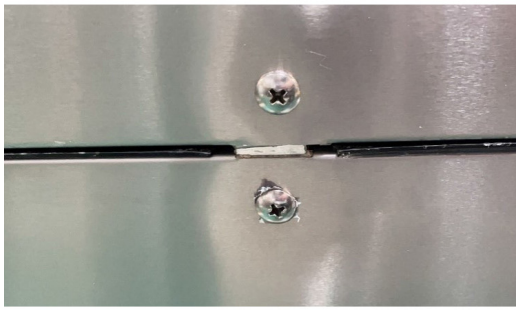
It is important that the assembly is replaced with the same part to ensure safety, correct alignment and refrigeration performance, and compliance.

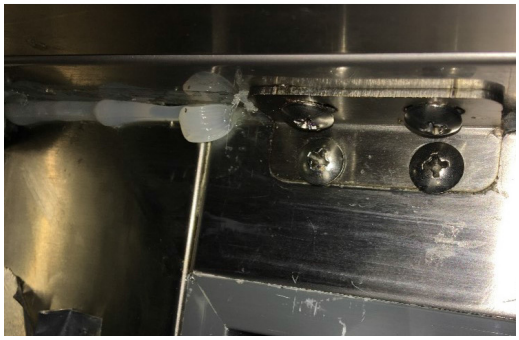
To access and replace the evaporator fan assembly

1. Disconnect the cabinet from the power supply. Remove unit side panel

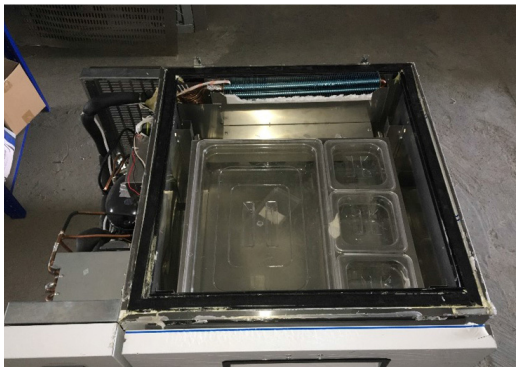


2. Unscrew the 2 bolts on the unit centre pillar. Unscrew all the bench top mounting screws on the front and rear of the cabinet. The bench top can now be removed





3. Unscrew the duct mounting screws and remove the duct.



4. Unscrew all the evaporator fan shroud mounting screws.

5. The evaporator assembly can be removed.

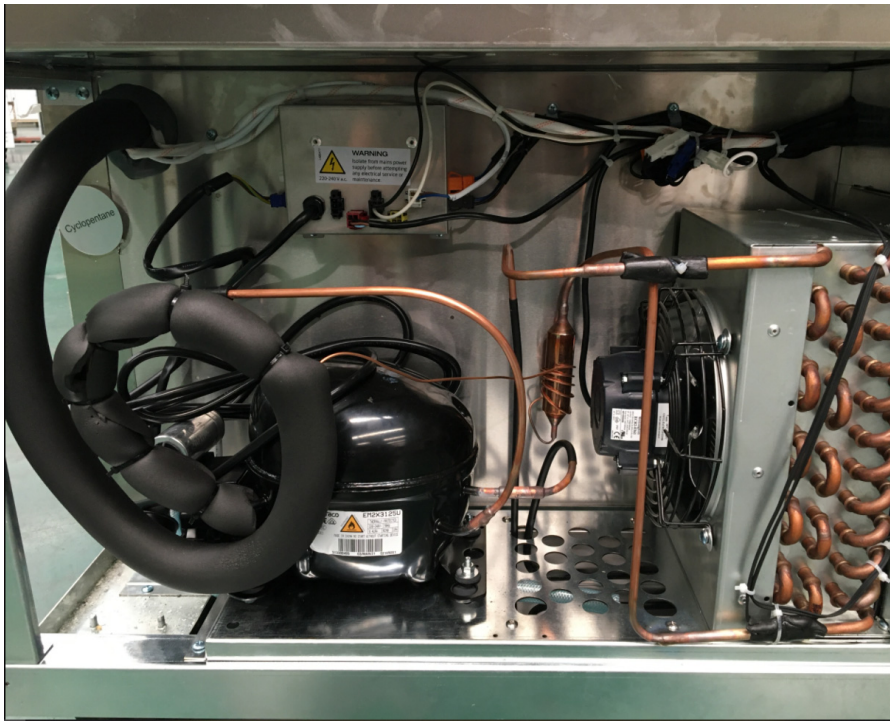
6. Reassemble and test.

Compressor

The compressor is located at the back of the refrigeration unit. If the compressor is causing excessive noise, check the mountings to ensure there is no damage to the rubber or the washers, nuts and screws.

Before replacing the compressor, check all plug connections and ensure the compressor electrics are operating correctly. The compressor must be supplied with consistent voltage over 220 volts, ensure the voltage does not drop at start-up. If the voltage does drop, ensure the unit has a direct power supply (not from a multi-box or extension cord). Generally a faulty compressor may have a distinct hissing sound and run with a very hot body temperature.

IMPORTANT
To eliminate possible vibration noise, ensure no pipes touch the cartridge housing and condenser assembly.



Electronic Controller

The electronic controller and electrics panel is matched to the cabinet, and must be left with the cabinet when servicing the refrigeration unit. Only specific components can be replaced in the unit.

Different controller parameter sets are used across different models. Ensure the controller is set-up with the correct parameter set for the cabinet model.

Controller Location

The electronic controller is located on the electrics panel at the front of the refrigeration cartridge.

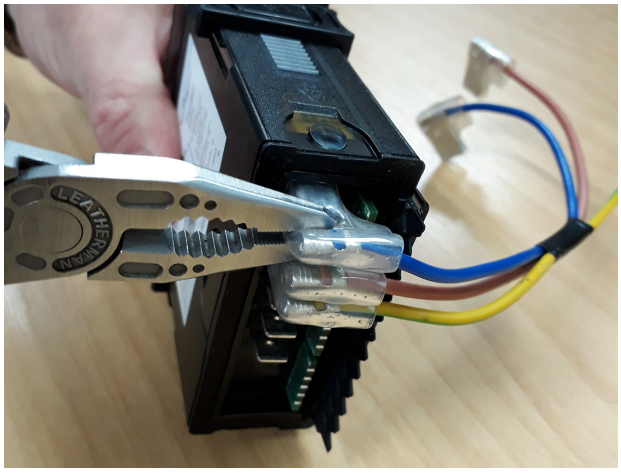
To access and remove the controller

1. Unplug the cabinet from the power supply.
2. Remove the unit cover from the cabinet.
3. To remove the controller: Press and hold the tabs on each side of the electronic controller to unlock, and push the controller through the front of the controller box. Unplug the electronic controller from the cartridge.

QC Terminals

The terminals at the back of the controller are locking QC terminals, which cannot be pulled off without pressing in the locking tabs.

Use needle nose pliers to unlock and gently remove the terminals.



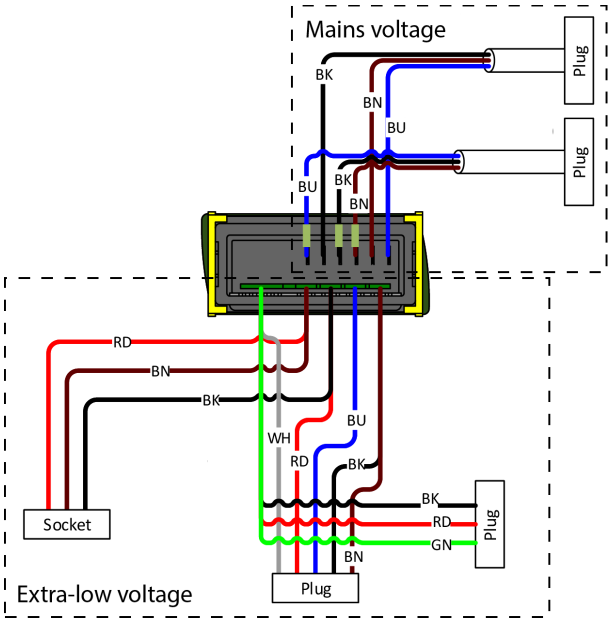
Replacing the Controller

Follow the steps below to replace the controller.

Note: Replacement spare part electronic controllers are not supplied with the parameter set loaded. This must be loaded via the SCS Connect Field app after replacing the controller. Internet access may be required.

To replace the controller

1. Disconnect the cabinet from the power supply and access the electronic controller (see “Controller Location” on page 39).
2. Disconnect the terminals from the back of the controller.
3. Fit the new replacement controller, and connect up the terminals at the back of the controller (see image below). (Connect extra-low voltage terminals before mains voltage terminals)
4. Reassemble, perform electrical safety test, and reconnect to the power supply.
5. Use a mobile device to connect to the controller with the SCS Connect Field app (see “SCS Connect Field App and Track App” on page 11).
6. Navigate to the LOAD PARAMETER FILE menu.
7. Select the appropriate parameter file from LOCAL. If not available in LOCAL, search for the parameter file in SERVER (internet access required), and download to LOCAL.
8. Confirm correct file and WRITE TO SCS.
9. After WRITE TO SCS is complete, select MENU DISCONNECT to save parameter set on SCS.
10. Power cycle the controller, reconnect via SCS Connect Field app and check that correct parameter set has been applied.
11. Navigate to the SCS SETUP menu and select the model (as per the cabinet rating label).
12. Set up controller and cabinet links as required:
    Corporate
    The service tech must link the controller to the cabinet serial number in the SCS Connect Field app.
    General Market
    The owner must set up SKOPE-connect (if in use).



Control Probe

The control probe is clipped to the inside of the evaporator assembly.

To replace the control probe

1. Gain access to the evaporator fan assembly (see steps 2-3, “To access and replace the evaporator fan assembly” on page 36).
2. Take note of cable routing (photo recommended), then carefully cut cable ties to release the probe cable. Detach the probe from the evaporator assembly, trace back to its connector and unplug.
3. Replace the probe. Following the same path as the original probe, fit the new probe with cable ties as necessary. Ensure the probe cable is securely connected and cable tied in place.
4. Reassemble and test for correct operation.

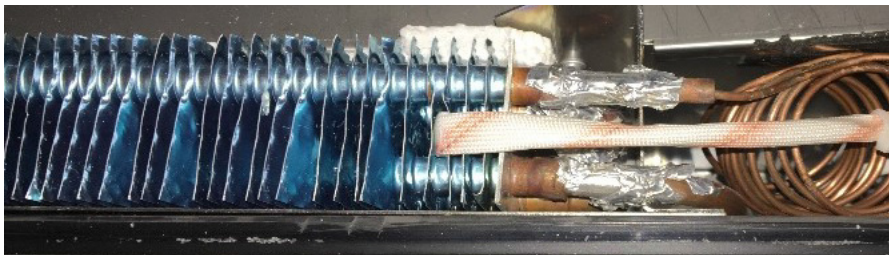
Evaporator Probe

The evaporator probe is located within the evaporator coil. It controls the refrigeration system defrost initiation and termination.

To replace the evaporator probe

1. Gain access to the evaporator fan assembly (see steps 1-2, “To access and replace the evaporator fan assembly” on page 36).
2. Take note of cable routing (photo recommended), then carefully cut cable ties to release the probe cable. Carefully separate the coil fins around the probe, withdraw the probe from the evaporator coil, trace back to its connector and unplug.
3. Replace the probe. Following the same path as the original probe, fit the new probe with cable ties as necessary.

   Ensure the probe is located in the same location (between the 4th and 5th fins), secured in place with the evaporator fins, and that the probe cable is securely connected and cable tied in place.
4. Reassemble and test for correct operation.



Condenser Probe

The condenser probe is located on the side of the condenser coil.

To replace the condenser probe

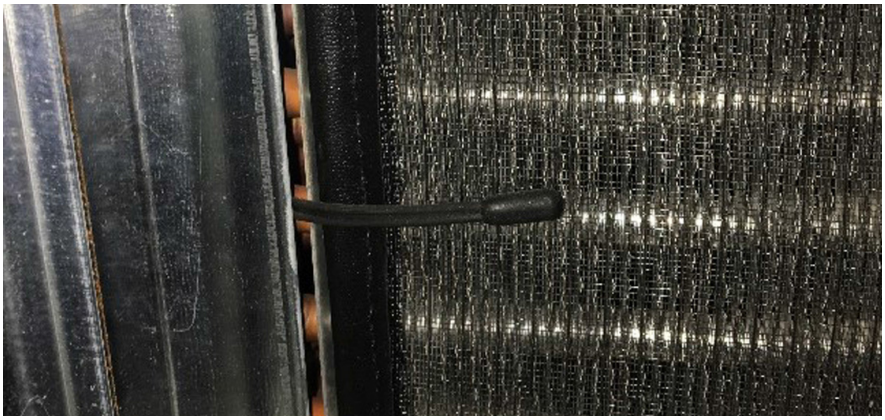
1. Disconnect the cabinet from the power supply and remove the left hand end plate “Unit End Panel” on page 29
2. Take note of cable routing (photo recommended), then carefully cut cable ties to release the probe cable. Detach the probe from the side of the condenser coil, and trace the probe cable back to its connector, and unplug.
3. Following the same path as the original probe, run the new probe to the condenser coil and secure with cable ties. Locate the probe in the same location as the original probe.
4. Reassemble and test for correct operation.

Ambient Probe

The ambient probe is located in front of the condenser coil. It monitors the temperature around the refrigeration unit. **Note:** The ambient probe is wired in series with the door switch.

To replace the ambient probe

1. Disconnect the cabinet from the power supply, remove the unit cover and remove the LH panel (see “Unit End Panel” on page 29).
2. Take note of cable routing (photo recommended), then carefully cut cable ties to release the probe cable. Detach the probe from the front of the cartridge, and trace the probe cable back to its connector and unplug.
3. Following the same path as the original probe, run the new probe to the condenser coil and secure with cable ties. Locate the probe in the same location as the original probe.
4. Reassemble and test.



9 Routine Cleaning

Drawers

Where fitted, drawers should be removed for cleaning. Pull the drawer out of the cabinet, release latches at side of drawer, and lift the drawer out at an angle. The drawer slider can also be removed by releasing the side catches as shown. Reverse operation to refit drawers to cabinet after cleaning (see “Drawers” on page 24).

Cabinet

Ensure the cabinet is unplugged from the power supply before cleaning.

Wipe the outside of the cabinet with a damp cloth, and the inside of the cabinet with standard stainless steel cleaners suitable for food preparation areas. Take care to keep moisture away from electrical parts.

IMPORTANT

Do **NOT** use abrasive, corrosive or solvent based cleaners, as this could damage the protective coating on the cabinet exterior.

Condenser Coil

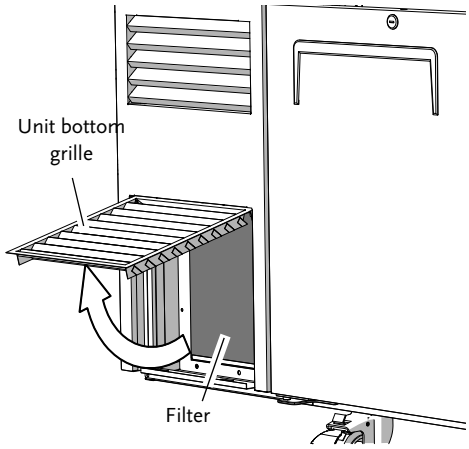
The condenser coil must be kept clean. SKOPE strongly recommends monthly cleaning of the condenser coil and air filter. Do **NOT** use hard or sharp tools to clean the coil as these may cause damage.

WARNING

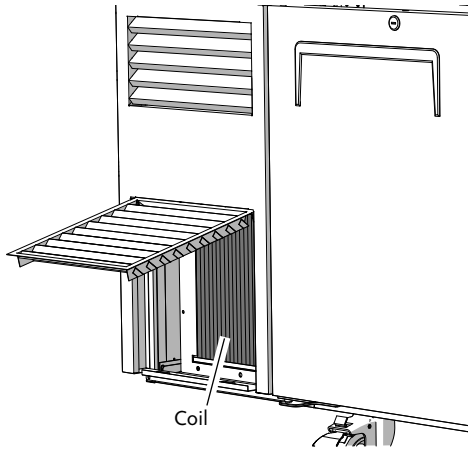
Unplug the cabinet from the power supply before cleaning the condenser coil.

To clean the condenser coil and condenser filter

1. Unplug the cabinet from the power supply.
2. The filter is located behind the unit bottom grille. Rotate the grille out and slide the filter up and off the cabinet.
3. Clean the filter with a vacuum cleaner, wash with cold water and shake off any excess water before refitting. Do **NOT** apply hot water, blow-dry or place in dishwasher. If necessary, discard and refit new filter.



4. With the cabinet unplugged from the power supply and the filter removed (see steps above), brush the condenser coil with a soft brush to remove any dust and fluff.
5. Refit the filter, close the bottom grille and reconnect to the power supply.



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