

ReFlex Upright

SKOPE Fridge, Freezer, Combo



ReFlex Upright
SKOPE Fridge, Freezer, Combo
Service Manual

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1 Servicing Hydrocarbon

Overview

Some models in the ReFlex Upright Series use hydrocarbon (HC) R290 propane as their refrigerant. Refer to the cabinet rating label inside the cabinet for the refrigerant type before servicing.

Hydrocarbon is a natural refrigerant that has a very low environmental impact. Special service requirements are needed as hydrocarbon is a flammable refrigerant.

Safety hazards

The main hydrocarbon safety hazards are:

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

SKOPE does **not** recommend performing hazardous activities on the refrigeration system.



SKOPE Hydrocarbon Service Requirements

Servicing must only be performed by approved SKOPE Service Technicians, and must meet all requirements in the SKOPE Hydrocarbon 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 Upright models listed in Table 1. Refer to the relevant product specification sheet (available on the SKOPE website: www.skope.com) for specifications.

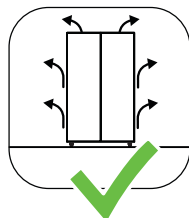
Table 1: Model specifications

Model	SKOPE ID	Refrigerant
RF7.UPR.1.SD	RF7UPR1-SCTP-SD	R290
RF7.UPR.2.SD	RF7UPR2-SCTP-SD	R290
RF7.UPF.1.SD	RF7UPF1-SCTP-SD	R290
RF7.UPF.2.SD	RF7UPF2-SCTP-SD	R404A
RF7.UPF.2.SD	RP2F/T1112	R290
RF8.UPC.2.SD	RF8UPC2-SCTP-SD	R290

3 Installation

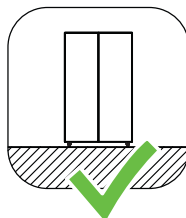
Installation Guidelines

When installing this cabinet, ensure you consider and meet the installation guidelines below.



Ventilation

Ensure all ventilation requirements below are met.



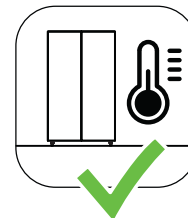
Surface

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



Door Opening

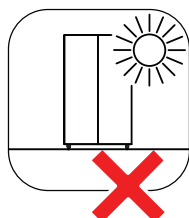
Allow adequate space for the door/s to open and close properly.



Climate Class

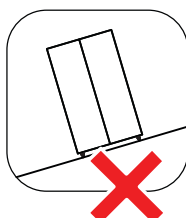
The cabinet must be installed in an environment within its climate class.

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



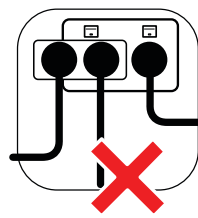
Sunlight

Do not install the cabinet in direct sunlight.



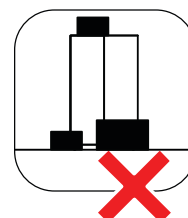
Uneven Surface

Do not install the cabinet on an uneven surface.



Power Supply

Do not overload the power supply.

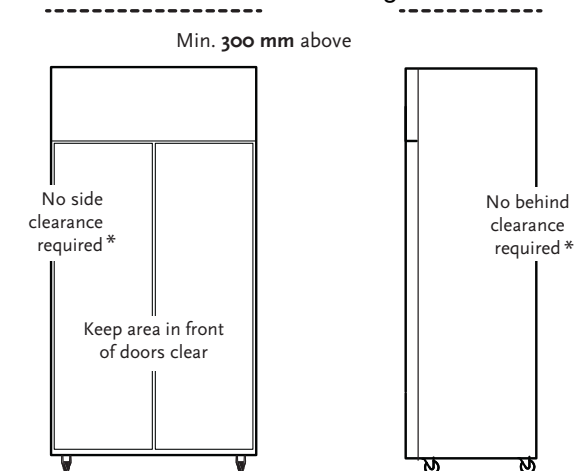


Blocking Ventilation

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:



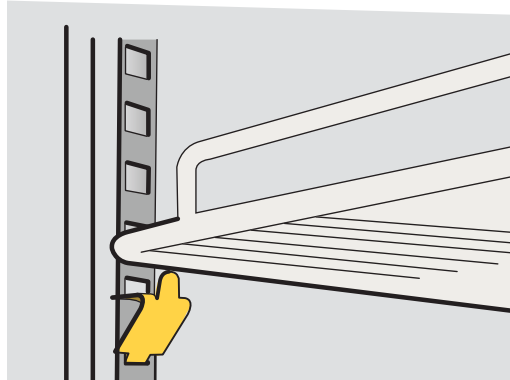
*When installed for continuous duty in climate class 7 environment (35°C ambient / 75% relative humidity), it is recommended to provide 50 mm clearance around the sides and back of the cabinet.

Cleaning Before First Use

The cabinet interior and food contact surfaces 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 “On-site Work Procedure” on page 42).

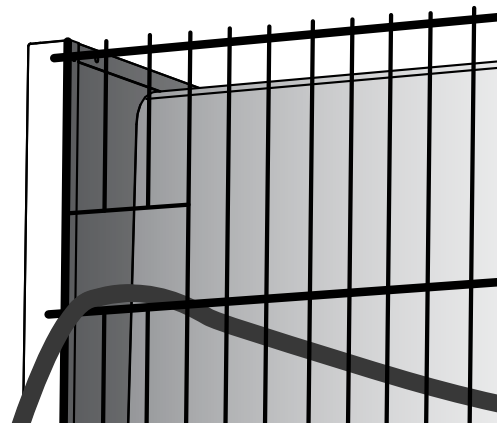
Shelves

Each shelf is held in place with four shelf clips, which clip into the shelf support strips. The shelf clips may be positioned at different heights to suit various product.



Power Cord

Before final positioning of the cabinet, pull the power cord out and connect to the power supply. Ensure the power cord is routed through the opening on the wire grille at the back of the cabinet.



4 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.

Wellington Drive SCS Connect

The service mode can be run using the controller faceplate, but SKOPE strongly recommends using the SCS Connect Field app.

See [MAN80199 SCS Connect Electronic Controller \(https://tinyurl.com/4n2dvury\)](https://tinyurl.com/4n2dvury) for details.

Controller Faceplate

Buttons and Display The faceplate includes the front display panel and interface buttons.

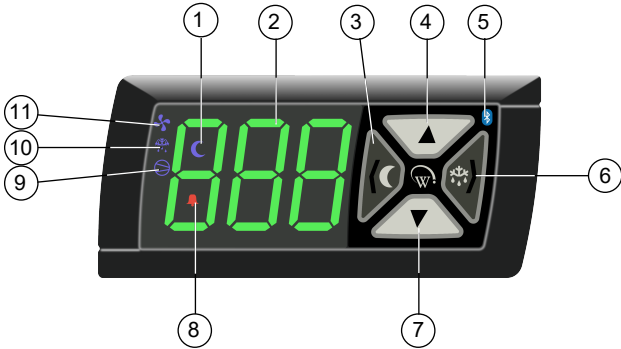


Table 2: Controller faceplate

No.	Description			Use
1	Night Mode	Indicator	On during night mode.	
	Display	Indicator	Digital display of: <ul style="list-style-type: none">the cabinet's air (not product) temperature.alarm messages.	
	Light Switch - Night Mode (back/abort)	Button	Used during programming.	Press to switch the lights on or off. Press and hold to switch the fridge between Day and Night modes.
	Up	Button	Used during programming.	
	Bluetooth	Indicator	On when ready to connect to a device. Flashing when connected to a device.	
	Defrost Cycle (next/enter)	Button	Used during programming.	Press and hold to start a manual defrost.
	Down	Button	Used during programming.	
	Fault - Alarm	Indicator	On during a fault or alarm.	
	Compressor	Indicator	On when the compressor is running.	
	Defrost Mode	Indicator	On during the defrost cycle.	
	Fan	Indicator	On when the fans are running.	

Service Mode The service mode can be run using the controller faceplate, but SKOPE strongly recommends using the SCS Connect Field app. You will need a 9-digit PIN to enter the service mode via the controller. If you don't have one, contact SKOPE Customer Services to request a PIN.

Service mode includes:

Parameters

Allows you to access and edit individual controller parameters.

Reset

Returns the controller back to factory or default settings.

Manual test

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

Statistics

Displays logged values and event counts for diagnostics and fine tuning.

About

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

Refer to AoFrio documentation for further information.

Table 3: Parameter numbers

	Model No.	1 Door		2 Door		
		RF7.UPR.1.SD	RF7.UPF.1.SD	RF7.UPR.2.SD	RF7.UPF.2.SD	RF8.UPC.2.SD
	Unit No.	UTKCNI-0017-P	UTKDNI-0019-P	UTKCNI-0018-P	UTKDDI-0020-P	UTKCNI-0017-P UTKDNI-0019-P
Parameter Number	606	✓				✓
	607			✓		
	608		✓			✓
	609				✓	✓

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.

If a fault occurs, it is logged, the Fault - Alarm indicator is lit on the controller faceplate, and a message may be displayed. Faults do not affect product temperature, and do not require action from the shop owner, unless they turn into an alarm.

If an alarm occurs, it is logged, the Fault - Alarm indicator is lit, 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. Faults and alarms can be cleared by the shop owner by power-cycling the cabinet. However the fault or alarm will only clear if the problem has been fixed. If the problem still exists after a power-cycle, a service technician will need to fix the problem.

Table 4: Faults

Description	Possible root cause	Actions
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.	Should be a one-off. If it continues, consider:	
	<ul style="list-style-type: none"> poor line voltage 	Test the incoming voltage to ensure it is correct. The test voltage needs to be between 198 and 264 volts. <ul style="list-style-type: none"> If outside this, the controller will shut the system down until the voltage returns to between these measurements. If the voltage is correct and the controller is still showing a fault, replace the controller.
	<ul style="list-style-type: none"> rural location 	
	<ul style="list-style-type: none"> voltage setting parameter 	<ul style="list-style-type: none"> Check the voltage parameter settings are between 198 and 264 volts. If this parameter is outside the correct voltage, changing it may damage the controller.
	<ul style="list-style-type: none"> controller 	<ul style="list-style-type: none"> The controller may be reading incorrectly and need replacing.
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.	Should be a one-off. If continues, consider:	
	<ul style="list-style-type: none"> power supply overloaded poor line voltage 	Test the incoming voltage to ensure it is correct. The test voltage needs to be between 198 and 264 volts. <ul style="list-style-type: none"> If outside this, the controller will shut the system down until the voltage returns to between these measurements. If the voltage is correct and the controller is still showing a fault, replace the controller.
	<ul style="list-style-type: none"> multi-box use 	<ul style="list-style-type: none"> Check that there are not too many plugs using the same multi-box adaptor causing the voltage to drop.
	<ul style="list-style-type: none"> rural location 	
	<ul style="list-style-type: none"> voltage setting parameter 	<ul style="list-style-type: none"> Check the voltage parameter settings are between 198 and 264 volts. If this parameter is outside the correct voltage, changing it may damage the controller.
	<ul style="list-style-type: none"> controller 	<ul style="list-style-type: none"> The controller may be reading incorrectly and need replacing.
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.	<ul style="list-style-type: none"> Condenser not clean 	Cartridge swap is not required. <ul style="list-style-type: none"> Remove and clean the condenser filter. Check that the condenser is free of debris. If the coil is dirty, clean it with a vacuum cleaner or soft brush.
	<ul style="list-style-type: none"> Poor installation or ventilation 	<ul style="list-style-type: none"> Check the installation guidelines. If fitted, check the rear stand-offs are extended.
	<ul style="list-style-type: none"> Condenser fan motor or blade 	<ul style="list-style-type: none"> Check that the condenser fan blades are in place and all condenser fans are operating correctly.
	<ul style="list-style-type: none"> Controller 	The controller may be reading incorrectly and need replacing. <ul style="list-style-type: none"> Confirm the temperature reading with an independent thermometer.
	<ul style="list-style-type: none"> Very high ambient temperature 	<ul style="list-style-type: none"> Check if the probes are faulty and reading incorrectly.

Table 4: Faults (continued)

Description	Possible root cause	Actions
<p>Excessive compressor cycling protection</p> <p>The system has been turning on and off too frequently.</p>	<ul style="list-style-type: none"> Door not self-closing 	<ul style="list-style-type: none"> Open the door and let it go. If it does not close on its own, repair the self-closing mechanism.
	<ul style="list-style-type: none"> Blocked condenser 	<ul style="list-style-type: none"> Remove and clean the condenser filter. Check that the condenser is free of debris. If the coil is dirty, clean it with a vacuum cleaner or soft brush.
	<ul style="list-style-type: none"> Poor installation or ventilation 	<ul style="list-style-type: none"> Check the installation guidelines.
	<ul style="list-style-type: none"> Cartridge or cabinet gasket seals leaking 	<ul style="list-style-type: none"> Remove the cartridge and check the integrity of the gaskets and seals. If required, replace the door gasket.
	<ul style="list-style-type: none"> Hot product 	<ul style="list-style-type: none"> Check if the product has been recently loaded, and is causing the extra heat.
	<ul style="list-style-type: none"> Product blocking cabinet airflow 	<ul style="list-style-type: none"> Check if the return air grille is covered by product. If so, move the product from the grille and observe.
	<ul style="list-style-type: none"> Compressor is overloaded from excess door openings or ambient temperature 	<ul style="list-style-type: none"> Ensure that the cabinet is operating in its climate class.
	<ul style="list-style-type: none"> Condenser or evaporator fan motor or blade 	<ul style="list-style-type: none"> Inspect the condenser and evaporator fans safely, and replace if faulty.
	<ul style="list-style-type: none"> Controller 	<ul style="list-style-type: none"> The controller may be reading incorrectly and need replacing.
	<ul style="list-style-type: none"> Compressor or gas leak 	<ul style="list-style-type: none"> Swap the cartridge.

Table 5: Alarms

Code	Description	Possible root cause	Action
8	Estimated product temperature below allowable range	<ul style="list-style-type: none"> Low ambient temperature 	<ul style="list-style-type: none"> Ensure that the cabinet is operating in its climate class.
	The estimated product temperature has been below the allowable range for longer than the permissible time.	<ul style="list-style-type: none"> App settings 	<ul style="list-style-type: none"> Check all app settings, and reinstall the parameters if required.
		<ul style="list-style-type: none"> Controller 	<ul style="list-style-type: none"> Check the probe calibration to make sure that the controller is reading the temperature correctly.

Table 5: Alarms (continued)

Code	Description	Possible root cause	Action
9	<p>Estimated product temperature above allowable range</p> <p>The estimated product temperature has been above the allowable range for longer than the permissible time.</p>	• Excessive door openings	• Make sure the door is not opened unnecessarily.
		• Door being left open	• Ensure the door is closed.
		• Door leaking air (bad gasket or door not self-closing)	• Open the door and let it go. If it does not close on its own, repair the self-closing mechanism. • If required, replace the door gasket.
		• Sealed refrigeration system	• Consider a cartridge swap.
		• Incorrect setpoint	• Reload the correct parameters using the SCS Connect Field app.
		• Too much product	• If the cabinet is overloaded, remove the excess product.
		• Blocked return air grille	• Check if the return air grille is covered by product. If so, move the product from the grille and observe.
		• Warm product loaded into cabinet	• Wait for the product to cool down.
		• Blocked condenser	• Remove and clean the condenser filter. • Check that the condenser is free of debris. • If the coil is dirty, clean it with a vacuum cleaner or soft brush.
		• Poor installation or ventilation	• Check the installation guidelines.
		• Frozen or blocked evaporator coil	• De-ice the coil and check that the evaporator fan motor is working. • Check the defrost cycle and that the defrost probe are working correctly. • Check that the drain is clear.
		• Cartridge gasket leaking (to cabinet seal or lid seal)	• Check that the gasket is intact and not broken and leaking. • Ensure the installation levers are lifting the cartridge up onto the case correctly.
		• Compressor is overloaded from excess door openings or ambient temperature	• Ensure that the cabinet is operating in its climate class.
		• Condenser or evaporator fan motor or blade	• Inspect the condenser and evaporator fans safely, and replace if faulty.
		• Incorrect parameter settings	• Use the SCS Field app to check that the correct setpoint and parameters have been selected.
15	<p>Excessive condensing temperature protection</p> <p>The system was operating at an excessive temperature and has shut down to prevent permanent damage.</p>	• Controller	• Check the probe calibration to make sure that the controller is reading the temperature correctly.
		• Compressor or gas leak	• Swap the cartridge.
		• Very high ambient temperature	Cartridge swap is not required. • Ensure that the cabinet is operating in its climate class.
		• Condenser is not clean	• Remove and clean the condenser filter. • Check that the condenser is free of debris. • If the coil is dirty, clean it with a vacuum cleaner or soft brush.
		• Poor installation or ventilation	• Check the installation guidelines.
		• Condenser fan motor or blade	• Inspect the condenser and evaporator fans safely, and replace if faulty.
		• Incorrectly placed condenser probe	• Either: <ul style="list-style-type: none"> • Measure the probe resistance to make sure it is within the range. • Compare the probe's temperature with the known temperature, using an external trusted thermometer. • Replace the probe if required.

Table 5: Alarms (continued)

Code	Description	Possible root cause	Action
17	Control probe failure A critical system sensor has failed and the cabinet can no longer operate.	<ul style="list-style-type: none"> Control probe or circuit 	Cartridge swap is not required. <ul style="list-style-type: none"> Either: <ul style="list-style-type: none"> Measure the probe resistance to make sure it is within the range. Compare the probe's temperature with the known temperature, using an external trusted thermometer. Replace the probe if required.
		<ul style="list-style-type: none"> Controller 	<ul style="list-style-type: none"> If you have replaced the probe and it is still reading incorrectly, replace the controller.
18	Electrical over-current protection activated The compressor was drawing too much current and has shut down to prevent permanent damage.	<ul style="list-style-type: none"> Blocked condenser 	<ul style="list-style-type: none"> Remove and clean the condenser filter. Check that the condenser is free of debris. If the coil is dirty, clean it with a vacuum cleaner or soft brush.
		<ul style="list-style-type: none"> Product blocking cabinet airflow 	<ul style="list-style-type: none"> Check if the return air grille is covered by product. If so, move the product from the grille and observe.
		<ul style="list-style-type: none"> Compressor is overloaded from excess door openings or ambient temperature 	<ul style="list-style-type: none"> Ensure that the cabinet is operating in its climate class.
		<ul style="list-style-type: none"> Compressor or gas leak 	<ul style="list-style-type: none"> Swap the cartridge.
19	Failed to reach set temperature The refrigeration system has been operating continuously for a long period without reaching the set temperature.	<ul style="list-style-type: none"> Blocked condenser 	<ul style="list-style-type: none"> Remove and clean the condenser filter. Check that the condenser is free of debris. If the coil is dirty, clean it with a vacuum cleaner or soft brush.
		<ul style="list-style-type: none"> Poor installation or ventilation 	<ul style="list-style-type: none"> Check the installation guidelines.
		<ul style="list-style-type: none"> Frozen or blocked evaporator coil 	<ul style="list-style-type: none"> De-ice the coil and check that the evaporator fan motor is working. Check the defrost cycle and that the defrost probe is working correctly.
		<ul style="list-style-type: none"> Cartridge, cabinet, or door gasket leaking 	<ul style="list-style-type: none"> Check that the gasket is intact and not broken and leaking. If required, replace the door gasket. Ensure the installation levers are lifting the cartridge up onto the case correctly.
		<ul style="list-style-type: none"> Product blocking cabinet airflow 	<ul style="list-style-type: none"> Check if the return air grille is covered by product. If so, move the product from the grille and observe.
		<ul style="list-style-type: none"> Compressor is overloaded from excess door openings or ambient temperature 	<ul style="list-style-type: none"> Ensure that the cabinet is operating in its climate class.
		<ul style="list-style-type: none"> Condenser or evaporator fan motor or blade 	<ul style="list-style-type: none"> Inspect the condenser and evaporator fans safely, and replace if faulty.
		<ul style="list-style-type: none"> Controller 	<ul style="list-style-type: none"> The controller may be reading incorrectly and need replacing.
20	Over-cooling product The internal temperature is too low. The system has temporarily shut down until the temperature has returned to normal.	<ul style="list-style-type: none"> Set temperature has been raised by a large amount 	<ol style="list-style-type: none"> Confirm if really too cold. Change parameters accordingly.
		<ul style="list-style-type: none"> Controller 	<ul style="list-style-type: none"> The controller may be reading incorrectly and need replacing.
22	Evaporator fan over-current protection The current supplied to the evaporator fan motor is too high.	<ul style="list-style-type: none"> Faulty fan motor 	<ul style="list-style-type: none"> Replace the fan motor.
		<ul style="list-style-type: none"> Fan blade fault (imbalance, debris, blockage) 	<ul style="list-style-type: none"> Visually inspect the fan blades and replace if faulty.

Table 5: Alarms (continued)

Code	Description	Possible root cause	Action
23	Condenser fan over-current protection The current supplied to the condenser fan motor is too high.	• Faulty fan motor	• Replace fan motor.
		• Fan blade fault (imbalance, debris, blockage)	• If the fan motor is working correctly, update the controller firmware to the latest version.
		• Controller	• The controller may be reading incorrectly and need replacing.
24	Controller communication error Controller has lost communication channels.	• Parameters	• Load the correct parameter settings.
		• Controller or circuit	• The controller may be reading incorrectly and need replacing.
25	Controller update failed Controller update could not be completed.	• Parameters	• Load the correct parameter settings.
		• Controller or circuit	• The controller may be reading incorrectly and need replacing.
26	Controller hardware failure Controller hardware has failed.	• Parameters	• Load the correct parameter settings.
		• Controller or circuit	• Replace the controller.
27	Probe failure A probe other than the control probe has failed. The cabinet will continue to operate with partial function but requires service.	• Evaporator probe or connections	Cartridge swap is not required. • Either: • Measure the probe resistance to make sure it is within the range. • Compare the probe's temperature with the known temperature, using an external trusted thermometer. • Replace the probe if required.
		• Controller	• The controller may be reading incorrectly and need replacing.
28	No downward tendency The temperature is no longer decreasing.	• Blocked condenser	• Remove and clean the condenser filter. • Check that the condenser is free of debris. • If the coil is dirty, clean it with a vacuum cleaner or soft brush.
		• Poor installation or ventilation	• Check the installation guidelines.
		• Cartridge or cabinet gasket seals leaking	• Check that the gasket is intact and not broken and leaking. If required, replace the door gasket. • Ensure the installation levers are lifting the cartridge up onto the case correctly.
		• Door not self-closing or door gasket leaking	• Open the door and let it go. If it does not close on its own, repair the self-closing mechanism. • If required, replace the door gasket.
		• Product blocking cabinet airflow	• Check if the return air grille is covered by product. If so, move the product from the grille and observe.
		• Compressor is overloaded from excess door openings or ambient temperature	• Ensure that the cabinet is operating in its climate class.
		• Condenser or evaporator fan motor or blade	• Inspect the condenser and evaporator fans safely, and replace if faulty.
		• Controller	• The controller may be reading incorrectly and need replacing.
		• Compressor or gas leak	• Swap the cartridge.

Table 5: Alarms (continued)

Code	Description	Possible root cause	Action
30	Excessive automatic defrosting The system is automatically defrosting too frequently.	• Door not self-closing or door gasket leaking	• Open the door and let it go. If it does not close on its own, repair the self-closing mechanism. • If required, replace the door gasket.
		• Evaporator probe	Either: • Measure the probe resistance to make sure it is within the range. • Compare the probe's temperature with the known temperature, using an external trusted thermometer.
		• Evaporator motor or fan	• Check that the fan motors are working and the fan blades are not damaged.
		• Controller	• The controller may be reading incorrectly and need replacing.
		• Blocked drain	• Clear the blockage with a wet vacuum. • Clear the debris to prevent a blockage.
		• Defrost setting too high	• Reload the correct parameters using the SCS Connect Field app.
		• Compressor or gas leak	• Swap the cartridge.

Notes

This image shows a full page of blank, lined paper. It features approximately 28 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.

5 Replacement Procedures

Lighting

The cabinet is fitted with LED modular interior lights. Ensure the light is replaced with the same light type. Fluorescent or LED tubes cannot be used in place of LED modular lights.

IMPORTANT

Replace the light with the same SKOPE OEM part.
DO NOT use alternative LED strip or tube lights, or fluorescent tubes.

The lighting is made up of three components which are replaceable:

- LED modular light/s
- Light power supply
- Interior wiring loom

Lighting components are all non-serviceable items. If a component is faulty, remove it and replace it with a SKOPE OEM new part.

Refer to the diagnostics table below to determine what component may be at fault, and the procedures over the next few pages for component replacement instructions.

Ensure you isolate the cabinet from the power supply before cleaning or removing parts.

Table 6: Lighting fault diagnostics

Problem	Possible Cause	Repair
No lights working. Cabinet is dark.	Lights switched off.	Switch the lights on at electronic controller faceplate (see page 10), or the app.
	Controller is in Energy Saving mode.	Open the door to bring the controller into Normal mode.
	Controller alarm.	Check the controller for the alarm code.
	Plug not connected properly.	Check and clean light supply plugs to and from the light power supply.
	Light power supply fault.	Replace the light power supply.
Light component not working.	Plug not connected properly.	Check and clean the plug connection in the cabinet.
	Faulty light.	Replace the light.
Segment of light not working.	Faulty light.	Replace the light.

Procedure 1: To replace an interior light component

1. Unplug the cabinet from the power supply.
2. Remove shelves to allow access to light.
3. Unplug the light.
4. Unscrew and replace the light.
5. Plug the light in and reassemble the shelves.
6. Reconnect to the power supply and check for correct operation.



Procedure 2: To replace the LED driver power supply

1. Unplug the cabinet from the power supply.
2. Open the door/s and unscrew the front panel using a Phillips head screwdriver. There are two screws on the bottom edge of the panel.
3. Swing the front panel up and tape/restrain safely in place (see the image on page 29).
4. Unplug, unscrew and replace the light power supply.
5. Reassemble and test for correct operation.

Doors

Alignment Adjustment

Procedure 3: To realign a door

1. Loosen the top and/or bottom hinge bracket fixing screws.
2. Move the door as required.
3. Re-tighten the hinge bracket screws.

Door Gasket

The one-piece door gasket clips into the door frame and runs around the perimeter of the door. 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.

Removing and Refitting the Door

For ease of servicing, and to reverse the hinging (1-door models only, see page 23), the door can be removed from the cabinet.

Procedure 4: To remove the door

1. Disconnect the cabinet from the power supply.
2. Open the door/s and unscrew the front panel using a Phillips head screwdriver. There are two screws on the bottom edge of the panel.

Procedure 4: To remove the door (continued)

3. Swing the front panel up and tape/restrain safely in place (see the image on page 29).
4. Unscrew the top and bottom hinges and remove door from cabinet.



5. If necessary, remove top and bottom hinges, and self-closing mechanism (see "Door Hinges" on page 21). Ensure all bushes and washers are present, and the self-closing mechanism is fitted in closed position for correct self closing.

Procedure 5: To refit the door

1. If necessary, refit self-closing mechanism and top and bottom hinges. Ensure all bushes and washers are present, and the self-closing mechanism is fitted in closed position for correct self closing.
2. Refit the door to the cabinet.
3. Check that the door switch magnet aligns with the door switch at the top of the door opening. If the magnet does not align: reposition, drill holes and refit in the correct alignment.
4. Check that the door seal gasket is fitted correctly and forms a complete seal with the cabinet when the door is closed (e.g. lantern inside cabinet to check for gaps)

Door Tension The door is fitted with a self-closing mechanism which allows the door to self-close. If door tension is lost, check that the self-closing mechanism is installed correctly, and if there is still no tension replace the self-closing mechanism (see "Door Hinges" on page 21).

Door Hinges Each door is fitted with top and bottom hinges, and an additional self-closing mechanism which allows the door to self-close. The hinges and self-closing mechanism are replaceable.

Procedure 6: To remove the hinges

1. Remove the top hinge, washers and bush from the top of the door.



2. Unscrew and remove the bottom hinge and washers from the bottom of the door.



3. Unscrew and remove the self closing hinge from the bottom of the door.



Door Locks The sign is fitted with a key lock for each door. The lock bolt and lock barrel can be removed and replaced.



Door Hinge Reversal Follow the steps below to reverse the door hinging on ReFlex Upright 1-Door fridge and freezer.

Parts required

The following kit is required to complete the procedure:

Table 7: Parts

Description	SKOPE part no.	Quantity
Left hand hinge kit	KN-HIN12003	1

Tools required

The following tools are required to complete the procedure:

Table 8: Tools

Screwdriver – Phillips head	Allen key – 3 mm	Drill bit – 10 mm
Side cutters	Allen key – 5 mm	
Socket - M6	Drill	

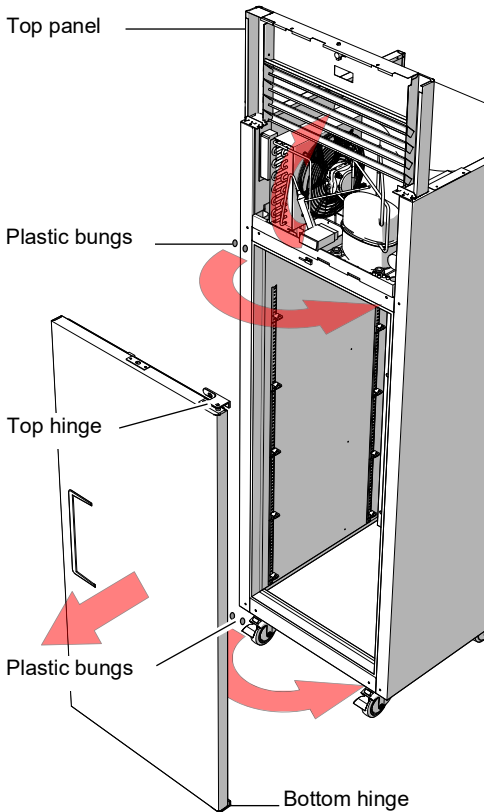
Procedure 7: To reverse a door’s hinges

1. Ensure the cabinet is unplugged from the power supply.

2. Unscrew and swing the top panel up and tape/restrain safely in place.

3. Unscrew the top and bottom hinge and remove the door from cabinet (4 × M6 socket head screws).

4. Remove the plastic bungs from the left hand hinge screw holes on the left hand side of the cabinet, and fit the bungs to the right hand hinge screw holes on the right hand side of the cabinet.



Procedure 7: To reverse a door's hinges (continued)

5. Unscrew and remove the right hand top and bottom hinges from the door (2 × M4 socket head screws and washers per hinge). These are no longer required.

6. Unscrew and remove the door switch magnet and lock plate from the top of the door. Retain these for refitting later.

7. Rotate the door 180°.

8. Fit the left hand top and bottom hinges to the door (2 × M4 socket head screws and washers per hinge). Top and bottom hinges are not interchangeable, and can be differentiated by weight (the bottom heavy duty hinge is heavier than the top hinge). Ensure the bottom hinge is fitted the bottom of the door, and the top hinge to the top of the door (when the door is rotated 180° from original hinging).

9. Fit the door back onto the cabinet (4 × M6 socket head screws). Adjust height as required to align door to cabinet.

10. Refit the door switch magnet using holes on top of door (2 × screws).

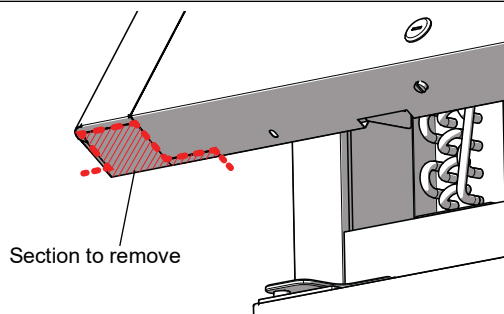
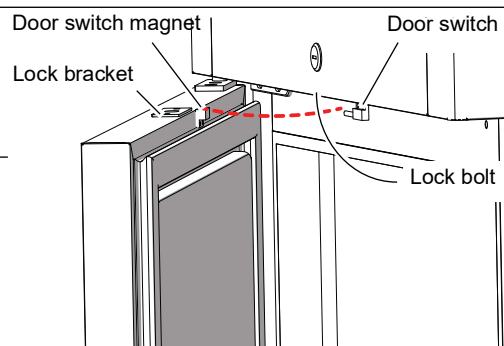
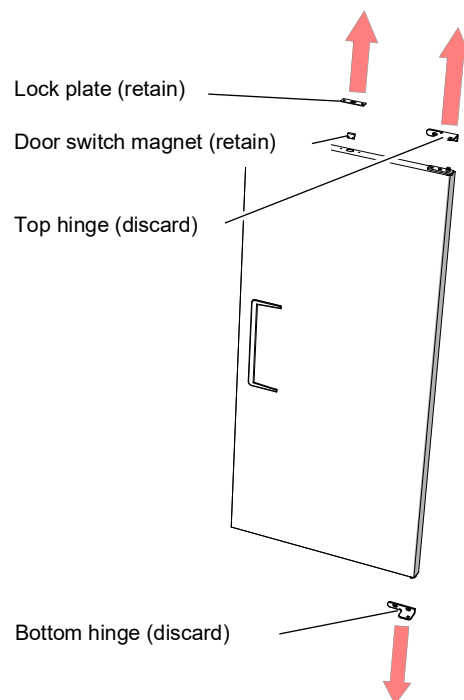
11. Refit the lock plate:

- Drill 1 × 10mm hole, 10mm deep for lock bolt engagement.
- Refit the lock plate using holes on top of door (2 × screws).

12. Remove the slotted section from the left hand bottom edge of the top panel, allowing the top panel to close over the new left hand hinge. Ensure the exposed edge is fully de-burred.

13. Close the top panel and refit screws.

14. Check that the door seal gasket is fitted correctly and forms a complete seal with the cabinet when the door is closed.



Castors and Legs

The cabinet is supplied fitted with swivel castors. The front castors are braked, the rear castors are swivel only. 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.

Procedure 8: To remove the castors

1. Raise the cabinet off the ground.



2. Unbolt the castors from the bottom of the cabinet.
-

Procedure 9: To fit the height-adjustable legs

1. Fit the supplied legs into the castor mounting holes.
-

Procedure 10: To plinth mount

1. The underside of the cabinet is completely flat for plinth mounting.
-

Refrigeration System

Before Servicing Overview

Ensure you have read and understood this manual before starting any servicing.

Important

- SKOPE hydrocarbon refrigeration systems must only be serviced by appropriately skilled and qualified refrigeration mechanics.
- Servicing a sealed refrigeration system must occur at a hydrocarbon workshop or service area with dedicated hydrocarbon equipment and personal protective equipment (PPE).
- All local hydrocarbon storage and handling regulations and procedures must be followed at all times.

Ensure all electronic controller alarms diagnostics and refrigeration system diagnostics are performed to confirm a refrigeration system fault is present.

Check all components including the electronic controller and electrical systems.

Ensure your work area is well ventilated.

IMPORTANT

Use only dedicated hydrocarbon SKOPE OEM spare parts.
DO NOT use alternative parts.
For safety compliance, use only SKOPE-supplied components specified for the appliance.



Safety hazards

The main hydrocarbon safety hazards are:

- Flammability
- Venting of hydrocarbon and compressor oil
- Asphyxiation

Refrigerant identification

Correctly identifying the refrigerant is critical to maintain safety and the correct functioning of the cabinet.

- The cabinet rating label (located in the upper inside of the cabinet) states the refrigerant type.
- Warning labels are fitted to hydrocarbon refrigeration cabinets to indicate the use of hydrocarbon refrigerant.

Personal protective equipment (PPE)

Correctly wear or use all PPE required by local regulations and procedures during servicing.

Service equipment

Only use dedicated hydrocarbon service equipment which is hydrocarbon-compliant. Electrical equipment that could be exposed to the refrigerant must be intrinsically safe.

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

- Intrinsically safe refrigeration vacuum pump, rated by the manufacturer as suitable for use with hydrocarbon refrigerant
- Dedicated hydrocarbon gauge set
- Flammable gas detector to warn if flammable refrigerant is present
- Charging scales, rated by the manufacturer as suitable for use with hydrocarbon refrigerant, accurate to 1 gram

Leak detector

A leak detector is used to track and locate the source of hydrocarbon gas leaks. It is:

- recommended for servicing hydrocarbon units on-site.
- required for servicing hydrocarbon units off-site.

Service vehicle

- Must be suitable for transporting flammable gas.
- Vehicle cargo area:
 - Must be well ventilated to outside the vehicle only.
 - Must have no ignition sources, nor any areas where the gas may pool.
- Must be able to transport swap units.
- Should carry minimum SKOPE hydrocarbon service parts.

On-site Work The service technician must have required knowledge, skills, qualifications, and tools before beginning any on-site work on the refrigeration sealed system.

Minimum knowledge and skills

- Qualifications and certifications required by local/state regulatory bodies to service hydrocarbon refrigeration systems
- Safe working practices, including a safe working environment at all times

Minimum tools and equipment

- Safety signage and/or barrier – suitable to create a safe work zone 1.5 m around the cabinet
- Hydrocarbon gas detector
- Dedicated hydrocarbon gauge set
- Bullet valves/line piercing valves suitable for a 6 mm tube

Off-site Work Hydrocarbon workshop

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

- Dedicated area for hazardous work – suitable for servicing and releasing flammable hydrocarbon refrigerant
- Hydrocarbon leak detector
- Refrigeration gauge set – suitable for flammable hydrocarbon refrigerant
- Dry nitrogen – suitable for purging and high pressure testing
- Intrinsically safe refrigeration vacuum pump, rated by the manufacturer as suitable for use with hydrocarbon refrigerant
- Charging scales, rated by the manufacturer as suitable for use with hydrocarbon refrigerant, accurate to 1 gram
- Hydrocarbon refrigerant supply cylinder

Refrigerant Type Some models in the ReFlex Upright Series use hydrocarbon (HC) R290 propane as their refrigerant. Refer to the cabinet rating label inside the cabinet to determine refrigerant type before servicing.

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 on page 42 when making the service visit.

Raising the Front Panel When working on the cabinet top/cartridge area with the front panel swung/rotated up, the front panel must be restrained so that it does not accidentally fall. The front panel can also be unscrewed and removed during servicing.

Removing the Cartridge Follow the steps below and image over the page to remove the refrigeration cartridge from the cabinet. Ensure the cabinet is disconnected from the power supply before removing the cartridge. **Note:** The electronic controller and electrics panel (including light power supply) is matched to the cabinet, and must be left with the cabinet when exchanging the cartridge. Replacement spare part cartridges are not supplied with controller and electrics panel.

IMPORTANT

Some connector colours vary depending on date of manufacture. 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.

Procedure 11: To remove the refrigeration cartridge

1. Unplug the cabinet from the power supply, and if necessary, cut the cable tie from the back grille to release the power cord.

Note: On Combo models (2 × cartridges), unplug the cabinet from the mains supply, then after step 2 unplug the cartridge supply from the junction box between the two cartridges.

2. Open the door/s and unscrew the front panel using a Phillips head screwdriver. There are two screws on the bottom edge of the panel.
3. Swing the front panel up and tape/restrain safely in place.
4. Photograph wiring setup for future reference when refitting the cartridge.
5. Unplug the electrical cables from the cabinet as detailed.

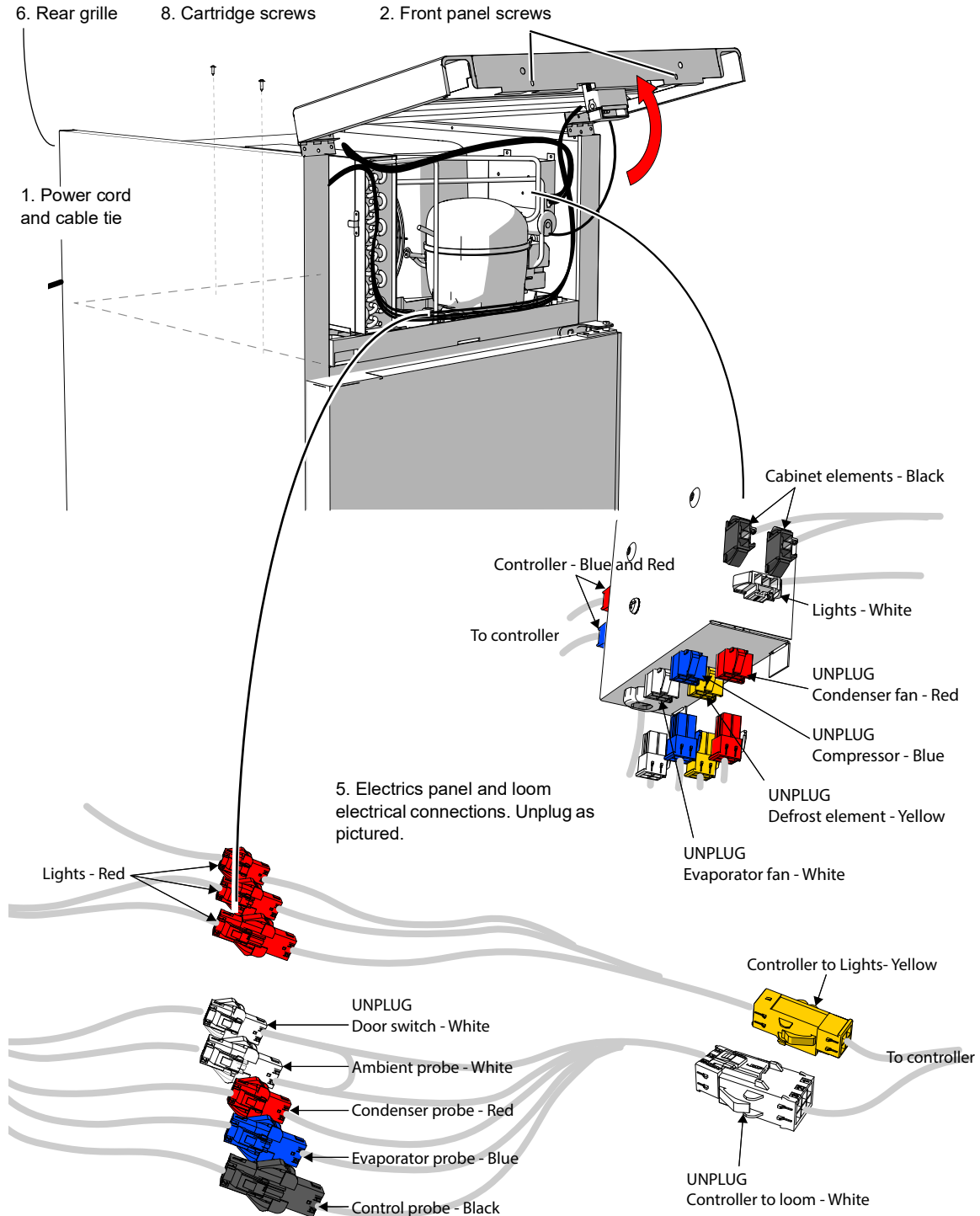
Note: It may be necessary to cut cable ties to access and release cables:

 - 4-way plugs from the bottom of the electrics box (condenser fan, evaporator fan, compressor and defrost element).
 - 6-way plug (probes/door switch) behind controller.
 - 2-way plug (door switch) on wiring loom.
 - The controller and electrics box stay with the cabinet, therefore the controller 4-way plugs (connected to the back of the electrics box), and the controller to lights 4-way plug do not need to be unplugged.
6. Move to the back of the cabinet, unscrew and remove the rear grille.
7. 1-door cabinets: Unscrew and remove the electrics box.

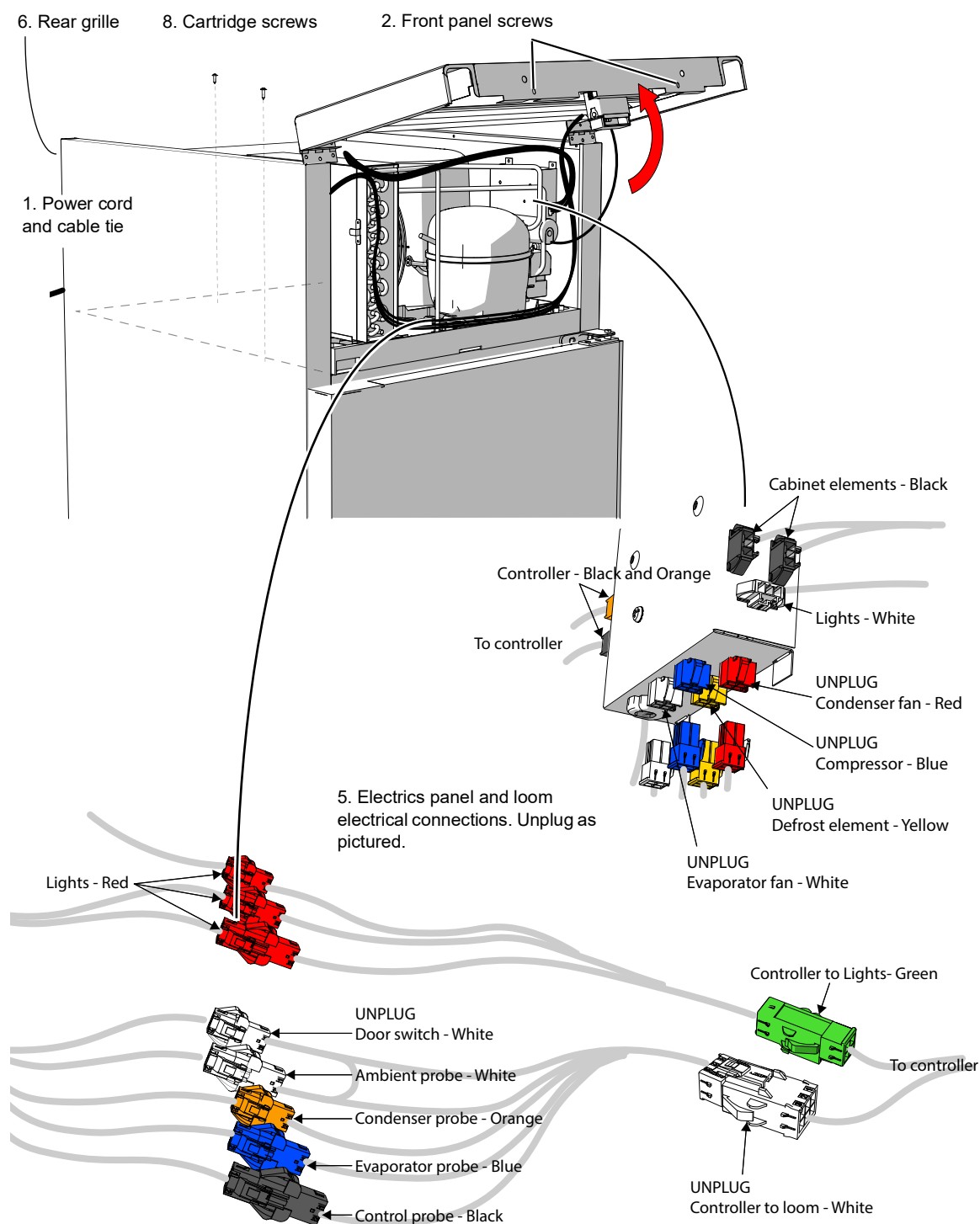
Note: The electrics box does not need to be removed on 2-door cabinets.
8. Unscrew the cartridge from the top of the cabinet: One screw at the back and one on each side.
9. The cartridge may now be removed from the cabinet.
10. Reverse the steps above to refit the cartridge. When refitting, ensure that:
 - you **reconnect the plugs correctly**, as operational faults may occur otherwise. Refer to relevant image on page 29 and page 30, wiring diagram on page 19, and the recommended photograph for reference.
 - the evaporator box gasket is in good condition.
 - wires and cables are clear of the cartridge when moving it.
 - all plugs and cables are re-connected to the correct socket and cable-tied back into place.
 - the cartridge is screwed in place.
 - the front cover is screwed into place and rear grille refitted.

Manufactured before February 2020

Due to the use of limited colour connectors, 2 × red 4-way and 2 × yellow 4-way connectors have been used. **Always** make sure you reconnect the plugs correctly as operational faults may occur if incorrect.



Manufactured from February 2020 onwards



Refrigeration Cartridge Assembly

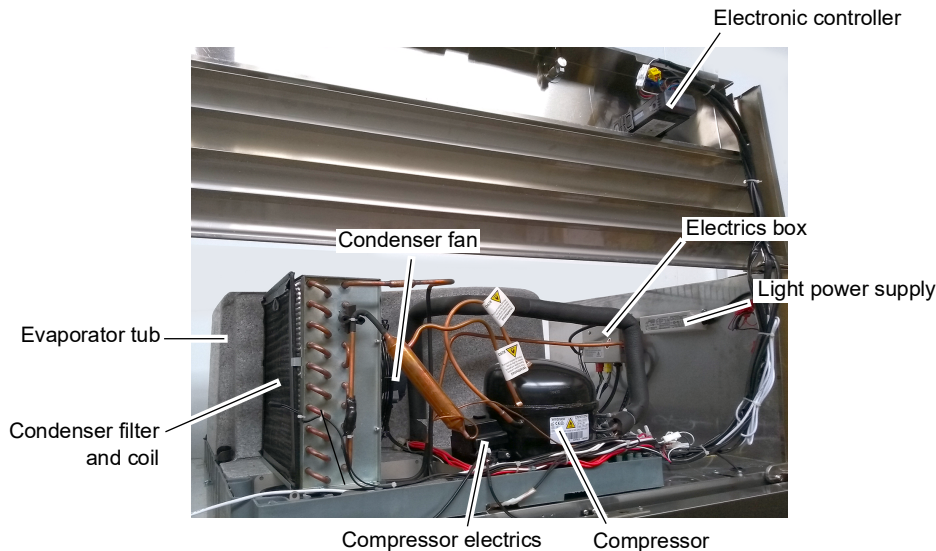
The refrigeration cartridge is a top-mounted, electronically controlled removable cartridge.

The electronic controller and electrics panel (including light power supply) is matched to the cabinet, and must be left with the cabinet when exchanging the cartridge. Replacement spare part cartridges are not supplied with controller and electrics panel.

For servicing or transportation, the refrigeration cartridge unplugs and lifts off the cabinet. Some minor servicing can be performed without removing the refrigeration cartridge.

The model and serial number are both printed on the cartridge rating/serial number label attached to the cartridge.

Various fridge and freezer cartridges are used across different models, and cartridge spare parts vary between cartridges. Refrigeration system pipe routing varies between different model releases.



Hydrocarbon cartridges

Hydrocarbon cartridges must only be used on a SKOPE Hydrocarbon compliant cabinet. Refer to the cabinet rating label to determine if the cabinet is suitable for use with a hydrocarbon cartridge. The rating label **must** state refrigerant as R290. If the label states a different refrigerant, or does **not** state a refrigerant, it is **not** suitable for a hydrocarbon cartridge.

For safety and compliance, only repair the cartridge with SKOPE-supplied parts made specifically for this appliance. Other parts may appear suitable, but may not be approved or safe for use in an appliance with hydrocarbon refrigerant.

WARNING

The hydrocarbon cartridge must only be used on a hydrocarbon-compliant cabinet.

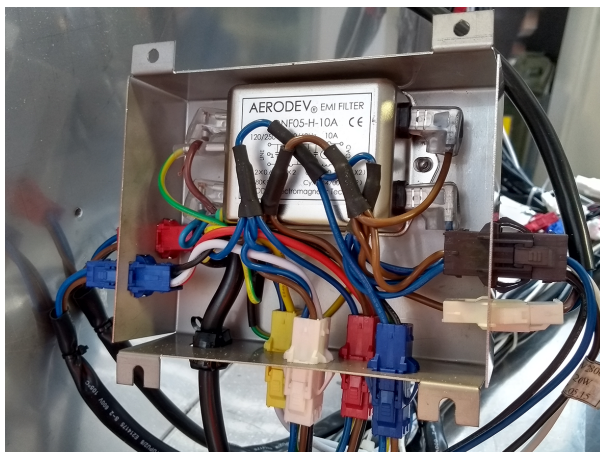
Defrost Cycle Electric defrosting is used for both fridges and freezers. Defrost parameters vary depending on product type, and can be reviewed in the SCS Connect Field app.

Electrics Box The electrics box is fitted to the side of the cabinet top, beside the refrigeration cartridge. Combo models are equipped with two electrics boxes: one for each cartridge.

The electrics box is matched to the cabinet, and must be left with the cabinet when exchanging the cartridge. Replacement spare part cartridges are not supplied with an electrics box.

The electrics box assembly contains the EMI filter and panel mount socket connectors for the cartridge and cabinet. Note: Connector colour may vary depending on date of manufacture.

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.



Procedure 12: To remove the cartridge electrics panel and open the electrics box

1. Unplug the cabinet from the power supply.
2. Swing the front panel up and tape/restrain safely in place.
3. Open the box by unscrewing the four screws and lifting the box off the panel.

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.

Table 9: Fan motor manufacturer recommended torque settings

Fan motor manufacturer	Torque setting
Wellington Drive	1.4 Nm

Procedure 13: To access and remove the condenser fan assembly

1. Remove the cartridge from the cabinet (see page 27).
2. 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.
3. 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.

Procedure 14: To replace the fan blade

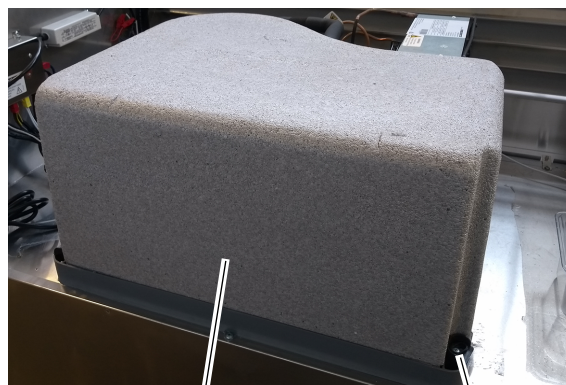
1. Remove the condenser fan assembly (see Procedure 13 above).
2. Remove the screw and washer from the centre of the fan blade, and lift the blade from the motor.
3. Replace new blade and fix with existing 12 mm flat washer and serrated head screw. Tighten the blade to recommended torque setting (1.4 Nm).
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.

Procedure 15: To replace the fan motor

1. Remove the condenser fan assembly and the fan blade (see Procedure 13 and Procedure 14).
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 existing 12 mm flat washer and serrated head screw. Tighten the blade to recommended torque setting (1.4 Nm).
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 Tub The evaporator tub is screwed onto the evaporator assembly via plastic corner brackets. A long screwdriver may be required to reach the tub plastic corner bracket screws.

The evaporator tub should only be removed if necessary, not for routine maintenance. Take care when refitting as misalignment may damage the tub.



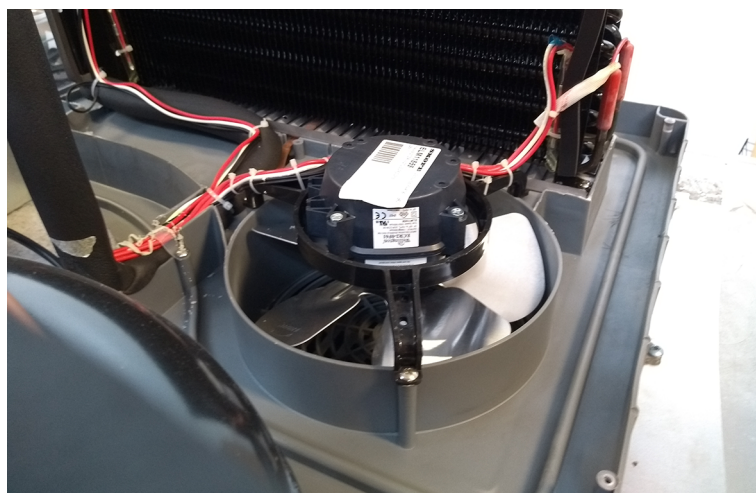
Evaporator tub (viewed from the back)

Plastic corner bracket

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

Determining if the evaporator fan is actually running during fault-finding can be difficult. Place a separate magnet on the door switch to stop the controller detecting open door (stopping the evaporator fan), and place a sheet of paper across the return air port – it will get sucked onto the grille when the evaporator fan is working.

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. Tighten fan blades to the recommended torque settings (shown in Table 10 below).

Table 10: Fan motor manufacturer recommended torque settings

Fan motor manufacturer	Torque setting
Wellington Drive	1.4 Nm

Procedure 16: To access and remove the evaporator fan assembly

1. Remove the cartridge from the cabinet (see Procedure 11).
2. Unscrew and remove the evaporator box.
3. Take note of cable routing (photo recommended), then cut the cable ties holding the evaporator fan motor cable and the control probe along the cartridge, and free up the evaporator fan motor cable and control probe cable.
4. Unscrew the evaporator fan assembly from the cartridge, and remove the assembly (fan motor, fan blade, mounting brackets) from the cartridge by lifting the shroud up and out.

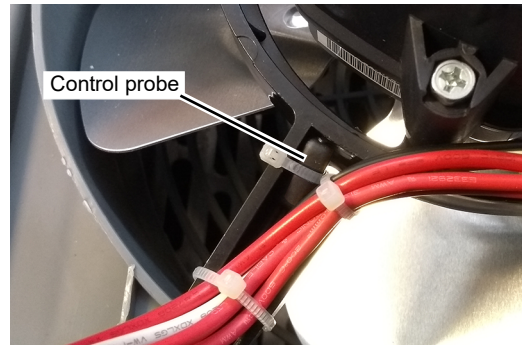
Procedure 17: To replace the fan blade

1. Remove the evaporator fan assembly (see Procedure 16).
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 existing 12 mm flat washer and serrated head screw. Tighten the blade to recommended torque setting (1.4 Nm).

Procedure 17: To replace the fan blade (continued)

4. Refit the evaporator fan assembly to the cartridge. Following the same path as the original cable, secure the evaporator fan motor cable with cable ties as necessary.

5. Following the same path, refit the control probe in the evaporator fan bracket housing, and secure with a cable tie.

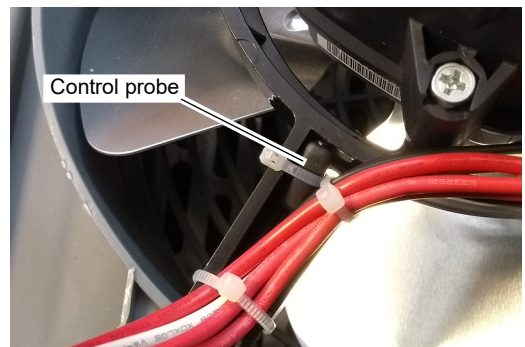


6. Reassemble and test.

Procedure 18: To replace the fan motor

1. Remove the evaporator fan assembly and the fan blade (see Procedure 16 and Procedure 17).
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 existing 12 mm flat washer and serrated head screw. Tighten the blade to recommended torque setting (1.4 Nm).
4. Refit the evaporator fan assembly to the cartridge. Following the same path as the original cable, secure the evaporator fan motor cable with cable ties as necessary.

5. Following the same path, refit the control probe in the evaporator fan bracket housing, and secure with a cable tie.



6. Reassemble and test.

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

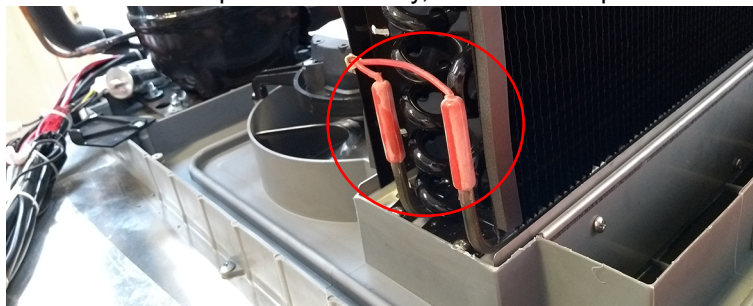
Before replacing the compressor, check all plug connections and ensure the compressor electrics are operating correctly. The compressor must be supplied with consistent voltage over 220 volts, ensure the voltage does not drop at start-up. If the voltage does drop, ensure the cartridge has a direct power 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 plastic base and condenser assembly.

Defrost Element Electric defrosting is used for both fridges and freezers. Defrost parameters vary depending on product type, and can be reviewed in the SCS Connect Field app.

The cartridge is fitted with a defrost element which can be replaced if necessary. The element is located within the evaporator assembly, below the evaporator coil.



Procedure 19: To replace the defrost element

1. Remove the cartridge from the cabinet (see page 28).
2. Unscrew and remove the evaporator box (see page 33).
3. Take note of cable routing (photo recommended), then carefully cut cable ties to release defrost element from the evaporator coil and pipes. Trace the cable back to electrics panel, cutting cable ties as required.

4. Unscrew the evaporator coil from the cartridge (2 × screws at each end of the coil), and gently move the coil to expose defrost element.

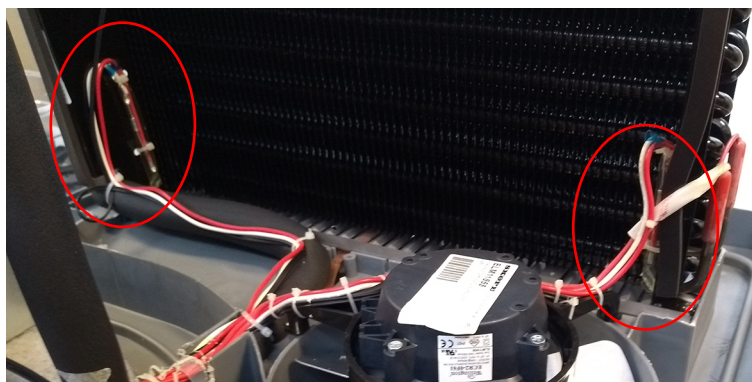


5. Gently pry open the defrost element retaining brackets, and carefully move the element out from under the coil.
6. Fit the replacement element under the retaining brackets. Following the same path as the original cable, secure the element cable with cable ties as necessary.
7. Refit evaporator coil fixing screws, reassemble and test.

Defrost Element Fuses

The element is fitted with 2 thermal fuses (one at each end of the evaporator coil). If a fuse fails, diagnostic work to determine the cause of failure is required.

If the evaporator probe fails, the defrost element thermal fuse may activate due to prolonged defrosting. Due to this, if the evaporator probe is replaced the resistance of the thermal fuse must be checked and replaced if required.



Procedure 20: To check fuse resistance

1. Unplug the cabinet from the power supply.
2. Unscrew and remove the front panel.
3. Unplug the defrost element plug from the bottom of the electrics box (yellow 4-way).
4. Use a multimeter to check for resistance across the defrost element plug connections. If open circuit, replace the fuses.

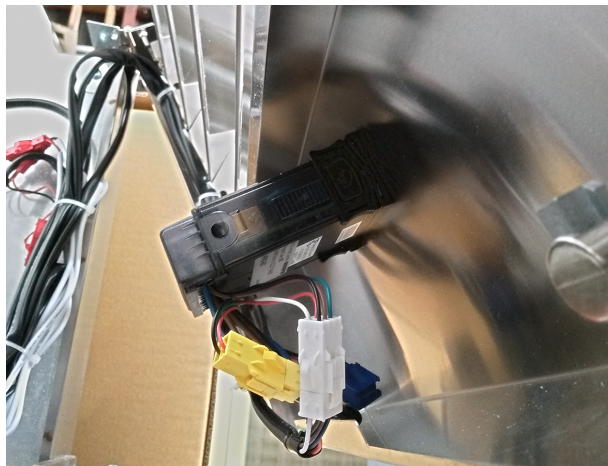
Electronic Controller

The electronic controller is matched to the cabinet, and must be left with the cabinet when exchanging the cartridge. Replacement spare part cartridges are not supplied with controller and electrics panel.

Different controller parameter sets are used across various models. Ensure the controller is set up with the correct parameter set for the cabinet model (see Table 3, "Parameter numbers," on page 11).

Controller Location

The electronic controller is attached to the front panel in front of the refrigeration cartridge.

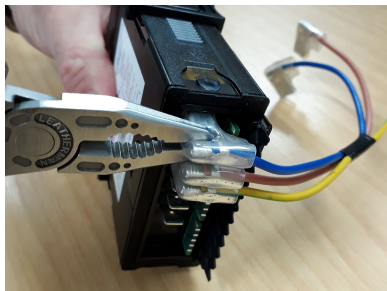
**Procedure 21: To access and remove the controller**

1. Unplug the cabinet from the power supply.
2. Swing the front panel up and tape/restrain safely in place.
3. To remove the controller: Unplug the electronic controller from the cartridge. Press and hold the tabs on each side of the electronic controller to unlock, and push the controller through the front panel.

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.



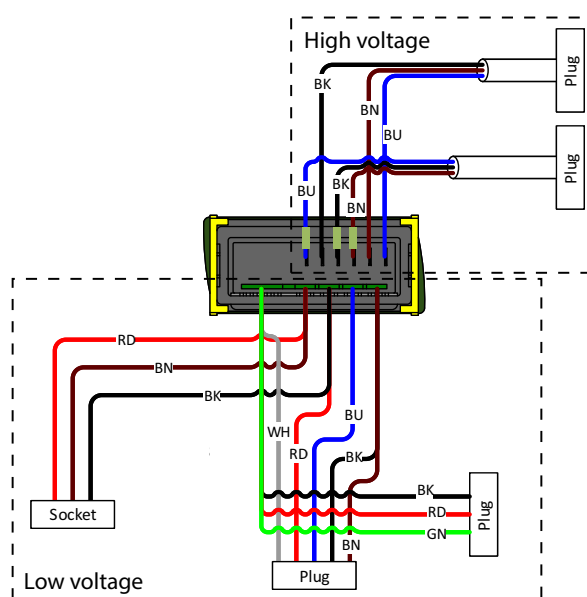
Replacing the Controller

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.

Procedure 22: To replace the controller

1. Disconnect the cabinet from the power supply and access the electronic controller (see Procedure 21).
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. Connect low voltage terminals before high voltage terminals.



4. Reassemble, perform electrical safety test as per standard procedure, and reconnect to the power supply.
5. Use a mobile device to connect to the controller with the SCS Connect Field app (see [MAN80199 SCS Connect Electronic Controller](#)).
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 controller.

Procedure 22: To replace the controller (continued)

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 to the controller to the cabinet serial number in the SCS Connect Field app.
 - General Market:
The owner must set up via SKOPE-connect (if in use).

Door Switch The cabinet is fitted with a door switch at the top of each door opening, which tells the electronic controller when a door is opened. A small magnet at the top of the door activates the switch.

Procedure 23: To replace the door switch

1. Unplug the cabinet from the power supply.
2. Take note of cable routing (photo recommended). Carefully cut cable ties to release the cable. Unscrew the door switch from the evaporator assembly, trace back to its connector and unplug.
3. Replace the door switch. Following the same path as the original switch, fit the new switch with cable ties as necessary. Ensure the cable is securely connected and cable tied in place.

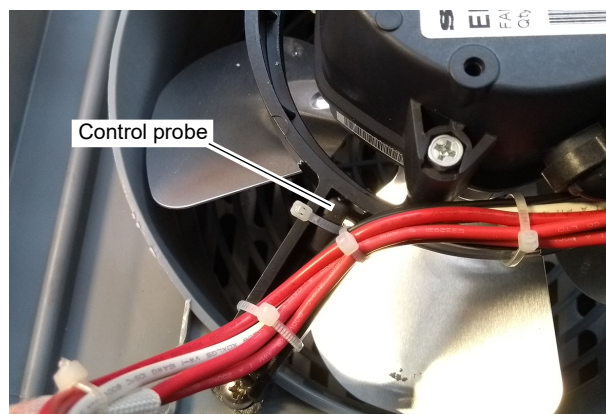


4. Reconnect the cabinet to the power supply and check for correct operation.

Control Probe The control probe is located in the evaporator fan motor bracket.

Procedure 24: To replace the control probe

1. Remove the cartridge from the cabinet (see page 28).
2. Gain access to the evaporator fan assembly (see steps 2 and 3, "To access and remove the evaporator fan assembly" on page 34).
3. 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.
4. 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.
5. 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.

If the evaporator probe fails, the defrost element thermal fuses may activate due to prolonged defrosting. Due to this, if the evaporator probe is replaced the resistance of the thermal fuses must be checked and fuses replaced if required (see “Defrost Element Fuses” on page 36).

Procedure 25: To replace the evaporator probe

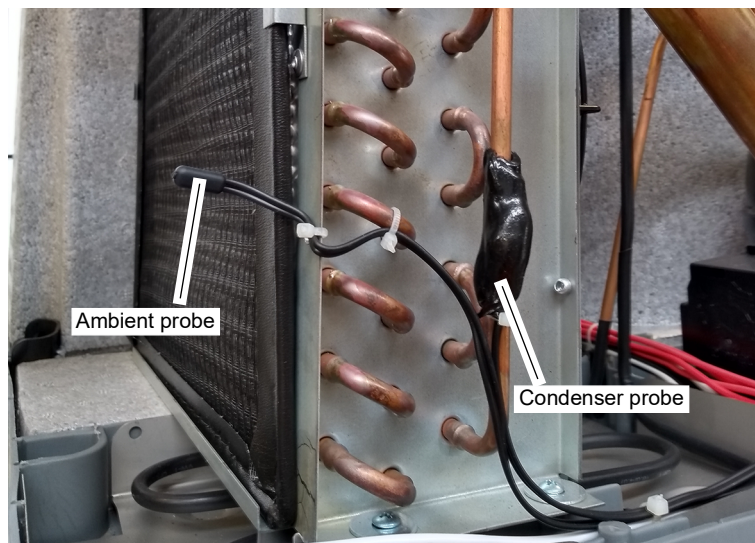
1. Remove the cartridge from the cabinet (see page 28).
2. Gain access to the evaporator fan assembly (see steps 2 to 3, “To access and remove the evaporator fan assembly” on page 34).
3. Take note of probe location and cable routing (photo recommended), then carefully cut cable ties to release the probe cable. Carefully separate the coil fins around the probe, withdraw the probe from the evaporator coil, trace back to its connector and unplug.
4. Replace the probe. Following the same path as the original probe, fit the new probe with cable ties as necessary.
5. Ensure the probe is located in the same location (between the 3rd and 4th fins), secured in place with the evaporator fins, and that the probe cable is securely connected and cable tied in place.
6. Reassemble and test for correct operation.



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

Procedure 26: To replace the condenser probe

1. Disconnect the cabinet from the power supply and remove the refrigeration cartridge (see page 28).
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 cartridge. **Note:** The ambient probe is wired in series with the door switch.

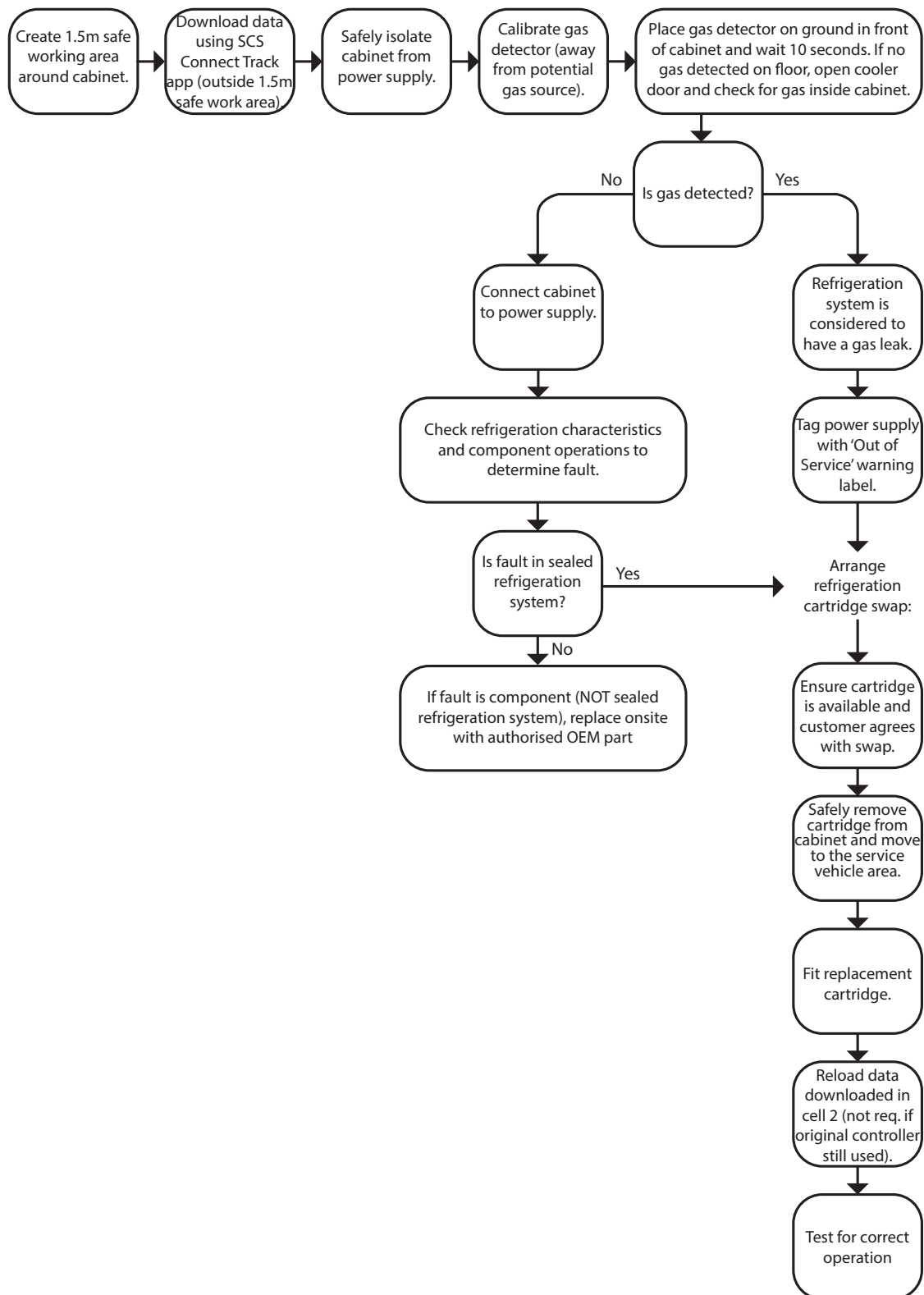
Procedure 27: To replace the ambient probe

1. Disconnect the cabinet from the power supply and remove the refrigeration cartridge (see page 28).
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. Position the probe in the same location as the original probe.
4. Reassemble.

On-site Work Procedure

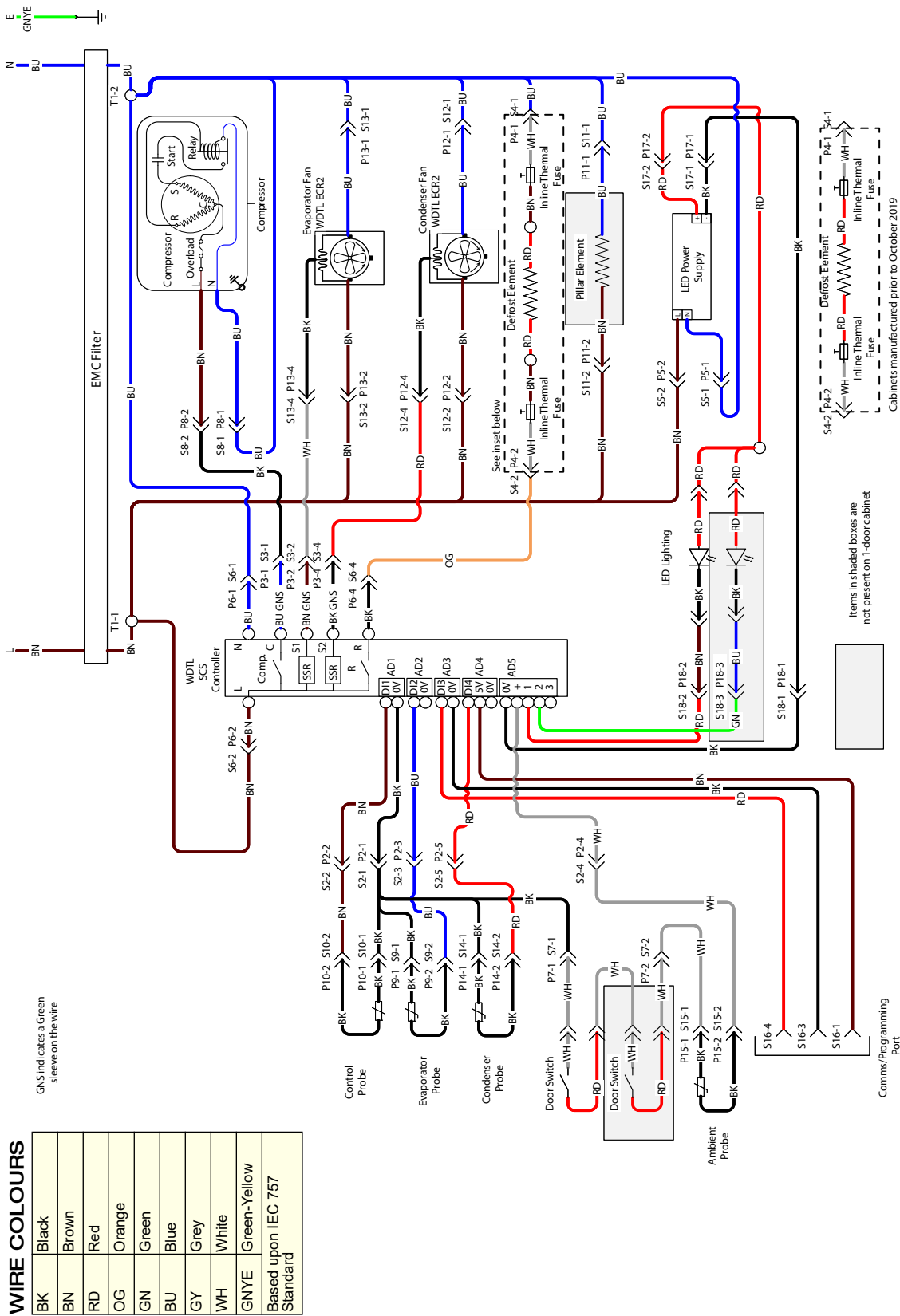
If a customer reports a “not cooling” fault, and it has been established that the cabinet is not cooling, follow the procedure below when making the service visit.

Swap Cartridge



6 Wiring

ReFlex Upright Fridge, ReFlex Upright Freezer



CAUTION

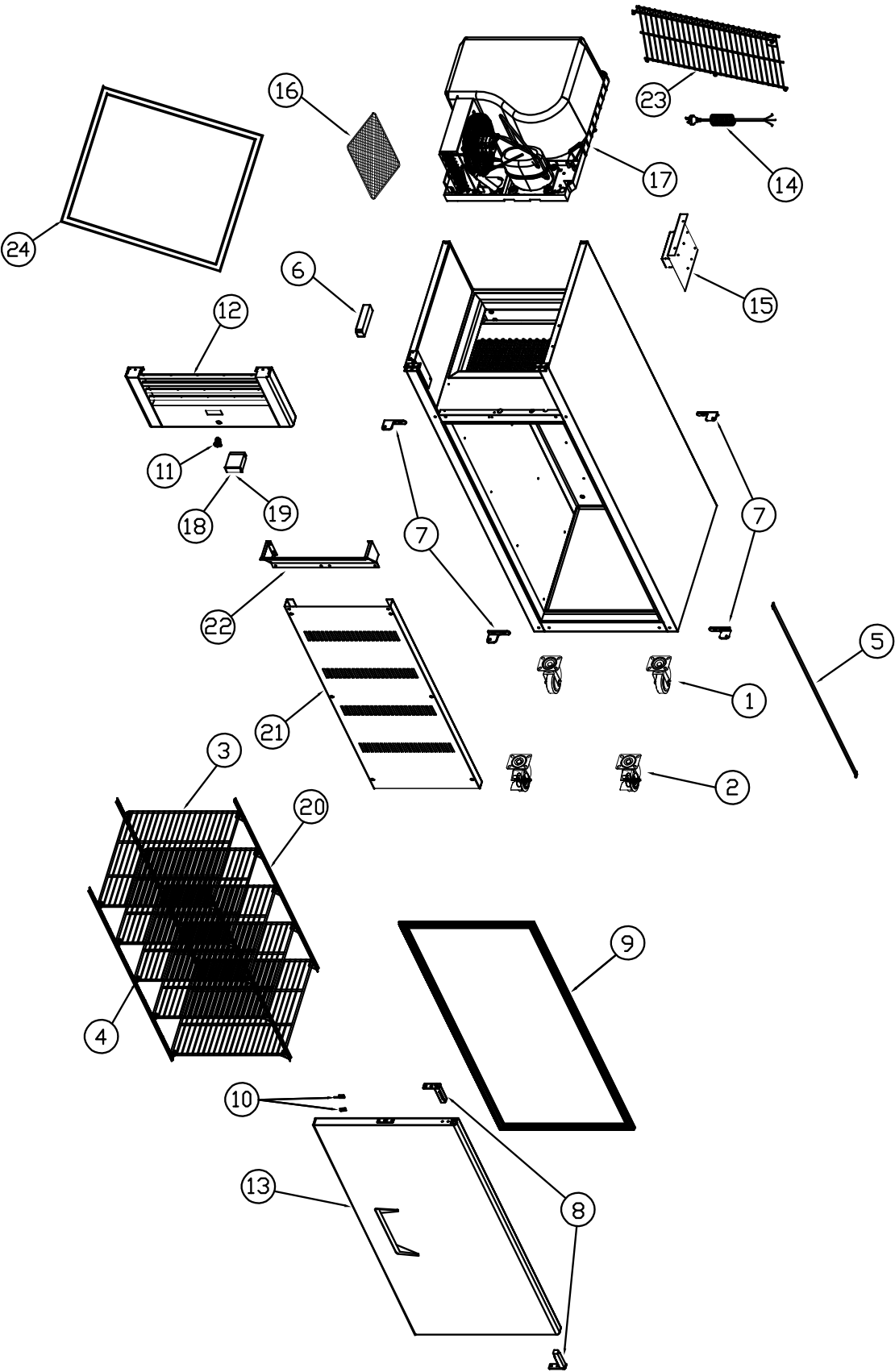
Some connector colours vary depending on date of manufacture.
 Refer to Plug type/colour column in the table below for colour variations.
 After unplugging connectors, **always** ensure reconnection has been undertaken correctly as operational faults may occur if incorrect. It is recommended to photograph wiring setup before unplugging for future reference.

Legend

Internal Unit Junction Box Sockets/Plugs			
<i>Name</i>	<i>Description</i>	<i>Plug type/colour</i>	
		<i>Before Feb. 2020</i>	<i>From Feb. 2020</i>
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	Light Unit Socket/Plug	White 3-way	White 3-way
S6/P6	Unit to Controller Power Socket/Plug 1	Red 4-way	Orange 4-way
S7/P7	Door Sensor Socket/Plug	White 2-way	White 2-way
S8/P8	Compressor Unit Socket/Plug	Blue 4-way	Blue 4-way
S9/P9	Evaporator Sensor Socket/Plug	Black 2-way	Black 2-way
S10/P10	Cabinet Sensor Socket/Plug	Blue 2-way	Blue 2-way
S11/P11	Defrost Element Socket/Plug	Yellow 4-way	Yellow 4-way
S12/P12	Condenser Motor Unit Socket/Plug	Red 4-way	Red 4-way
S13/P13	Evaporator Motor Unit Socket/Plug	White 4-way	White 4-way
S14/P14	Condenser Sensor Socket/Plug	Red 2-way	Orange 2-way
S15/P15	Ambient Sensor Socket/Plug	White 2-way	White 2-way
S16/P16	Programming/Comms Port Socket	Blue 4-way	Blue 4-way
S17/P17	LED Driver DC Out Put Socket/Plug	Red 2-way	Red 2-way
S18/P18	LED Lighting Loom Socket/Plug	Yellow 4-way	Green 4-way
T1	Unit Terminals	-	-

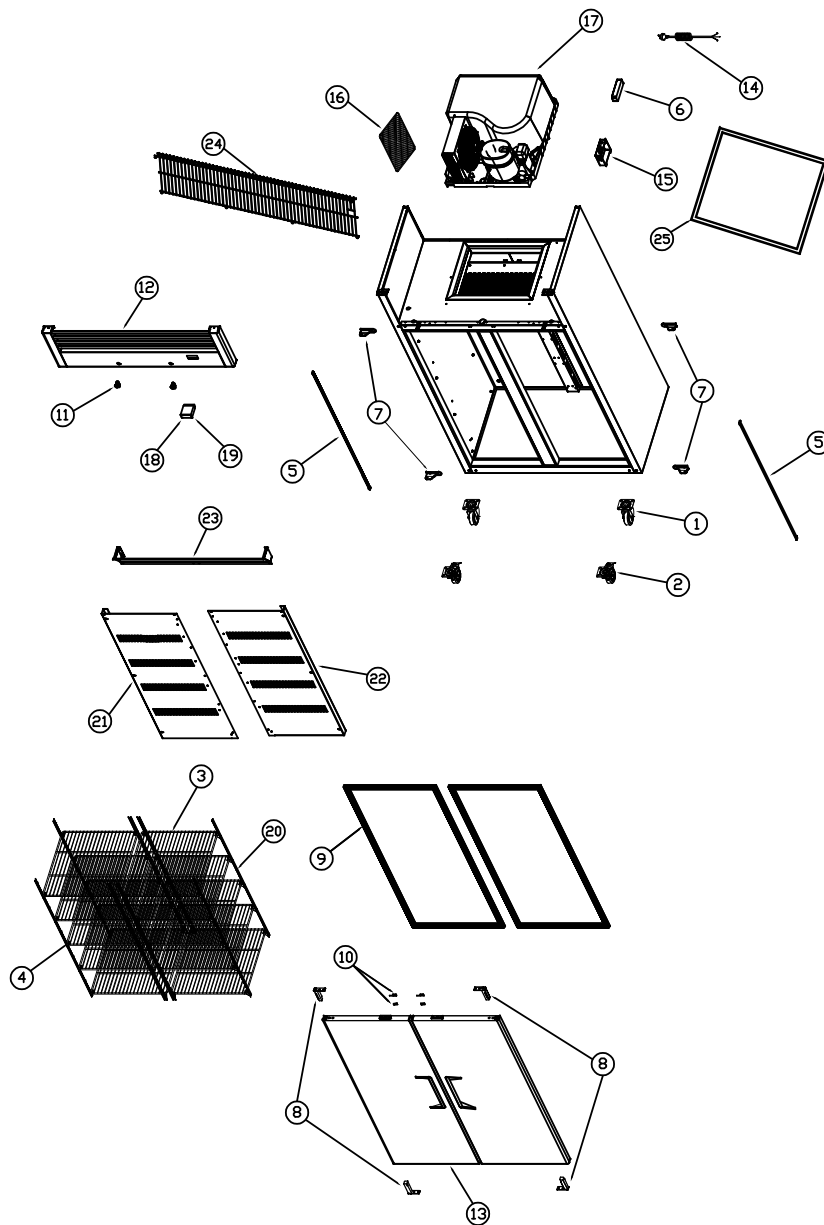
7 Spare Parts

One-door Cabinet Assembly



No.	Description	Model No.	RF7.UPR.1.SD	RF7.UPF.1.SD
1	CASTOR-UNBRAKED	KN-SXX11990	✓	✓
2	CASTOR-BRAKED	KN-SXX11991	✓	✓
3	SHELF SET-1DR UPRIGHT	KN-WRK11992	✓	✓
	SHELF-1DR UPRIGHT-540×530	KN-WRK12026	✓	✓
	SHELF SET-1DR UP FREEZER	KN-WRK12629		✓
	SHELF-1DR UP FREEZER-540×530	KN-WRK12631		5
4	SHELF-CLIP	KN-SSY11998	✓	✓
5	LIGHT-LED-UPRIGHT	KN-ELL11999	✓	✓
6	POWER SUPPLY-LPF-16	KN-ELZ12002	✓	✓
7	HINGE SET-LH-1DR UPRIGHT	KN-HIN12003	✓	✓
	HINGE SET-RH-1DR UPRIGHT	KN-HIN12004	✓	✓
8	HINGE-SELF CLOSING	KN-HIN12021	✓	✓
9	GASKET-DOOR-1DR UPRIGHT	KN-GKT12009	✓	✓
10	KIT-DOOR SENSOR	KN-ELS12013	✓	✓
11	KIT-BARREL LOCK-UPRIGHT	KN-SXX12014	✓	✓
12	COVER-UPPER-1DR UPRIGHT	KN-STY12016	✓	✓
13	DOOR-SOLID-1DR UPRIGHT	KN-SDR12022	✓	✓
14	MAINS FLEX AUS/NZ 3M	KN-FLX12138	✓	✓
	MAINS FLEX UAE 3M	KN-FLX12138-AE		
15	WIRING BOX-1DR UPRIGHT	KN-ELZ12139	✓	✓
16	FILTER CONDENSER UPRIGHT	KN-FIL12143	✓	✓
17	REFRIGERATION UNIT UPR1	UTKCNI-0017-P	✓	
	REFRIGERATION UNIT UPF1	UTKDNI-0019-P		✓
18	CONTROLLER WDTL	ELZ11749 - 1627	✓	✓
19	CONTROLLER PROGRAM 606	ELZ11749-606	✓	
	CONTROLLER PROGRAM 608	ELZ11749-607		✓
20	SHELF SUPPORT STRIP	KN-SXX12145	✓	✓
21	DUCT REAR-1DR UP	KN-STY12633	✓	
22	DUCT TRANSITION ASSY-1DR UP	KN-STY12148	✓	✓
23	UNIT REAR GRILLE-1DR	KN-GRL12707	✓	✓
24	GASKET – UNIT SEALING	KN-GKT12721	✓	✓

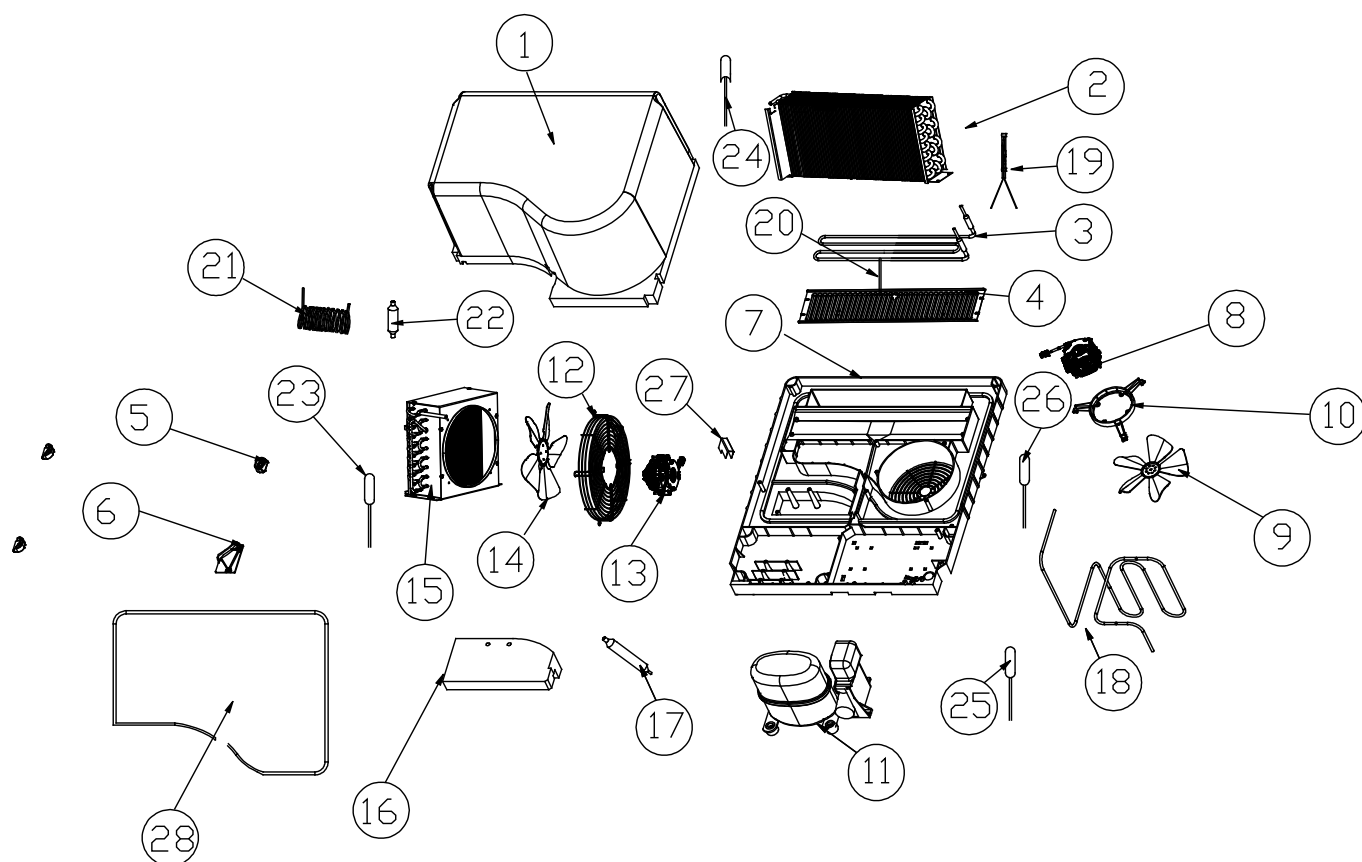
Two-door Cabinet Assembly



No.	Description	Model No.	RF7.UPR.2.SD	RF7.UPF.2.SD (R404A)	RF7.UPF.2.SD (R290)	RF8.UPC.2.SD
1	CASTOR-UNBRAKED	KN-SXX11990	✓	✓	✓	✓
2	CASTORS-BRAKED	KN-SXX11991	✓	✓	✓	✓
3	SHELF SET-2DR UPRIGHT	KN-WRK11993	✓	✓	✓	
	SHELF SET-COMBO	KN-WRK11994				✓
	SHELF-2DR UPRIGHT-530x530	KN-WRK12027	✓	✓	✓	
	SHELF-COMBO-530x595	KN-WRK12028				✓
	SHELF SET-2DR UP FREEZER	KN-WRK12630		✓		✓
	SHELF-2DR UP FREEZER-530x530	KN-WRK12632		10		10

No.	Description	Model No.	RF7.UPR.2.SD	RF7.UPF.2.SD (R404A)	RF7.UPF.2.SD (R290)	RF8.UPC.2.SD
4	SHELF-CLIP	KN-SSY11998	✓	✓	✓	✓
5	LIGHT-LED-UPRIGHT	KN-ELL11999	✓	✓	✓	✓
6	POWER SUPPLY-LPF-25	KN-ELZ12001	✓	✓	✓	✓
7	HINGE SET-2DR UPRIGHT	KN-HIN12005	✓	✓	✓	✓
8	HINGE-SELF CLOSING	KN-HIN12021	✓	✓	✓	✓
9	GASKET-DOOR-2DR UPRIGHT	KN-GKT12010	✓	✓	✓	
	GASKET-DOOR-COMBO	KN-GKT12011				✓
10	KIT-DOOR SENSOR	KN-ELS12013	✓	✓	✓	✓
11	KIT-BARREL LOCK-UPRIGHT	KN-SXX12014	✓	✓	✓	✓
12	COVER-UPPER-2DR UPRIGHT	KN-STY12017	✓	✓	✓	
	COVER-UPPER-COMBO	KN-STY12018				✓
13	DOOR-SOLID-2DR UPRIGHT	KN-SDR12023	✓	✓	✓	
	DOOR-SOLID-COMBO	KN-SDR12024				✓
14	MAINS FLEX AUS/NZ 3M	KN-FLX12138	✓	✓	✓	✓
	MAINS FLEX UAE M	KN-FLX12138-AE				
15	WIRING BOX-2DR UPRIGHT	KN-ELZ12140	✓	✓	✓	
	WIRING BOX-COMBO	KN-ELZ12141				✓
16	FILTER CONDENSER UPRIGHT	KN-FIL12143	✓	✓	✓	2
17	REFRIGERATION UNIT UPR1	UTKCNI-0017-P				✓
	REFRIGERATION UNIT UPR2	UTKCNI-0018-P	✓			
	REFRIGERATION UNIT UPF1	UTKDNI-0019-P				✓
	REFRIGERATION UNIT UPF2 (R404A)	UTKDDI-0020-P		✓		
	REFRIGERATION UNIT UPF2 (R290)	UTKDNI-0037-P			✓	
18	CONTROLLER WDTL	ELZ11749 - 1627	✓	✓	✓	✓
19	CONTROLLER PROGRAM	ELZ11749-606				✓
		ELZ11749-607	✓			
		ELZ11749-608				✓
		ELZ11749-609		✓	✓	
20	SHELF SUPPORT STRIP UP	KN-SXX12145	✓	✓	✓	✓
21	DUCT REAR LH-2DR UP	KN-STY12149	✓	✓	✓	
	DUCT REAR-COMBO	KN-STY12152				✓
22	DUCT REAR RH-2DR UP	KN-STY12150	✓	✓	✓	
23	DUCT TRANSITION ASSY-2DR UP	KN-STY12151	✓	✓	✓	
	DUCT TRANSITION ASSY-COMBO	KN-STY12153				✓
24	UNIT REAR GRILLE-2DR UP	KN-GRL12708	✓	✓	✓	
	UNIT REAR GRILLE-COMBO	KN-GRL12709				✓
25	GASKET – UNIT SEALING	KN-GKT12721	✓	✓	✓	2

Cartridge Assembly



No.	Description	Model No.	RF7.UPR.1.SD UTKCNI-0017-P	RF7.UPF.1.SD UTKDNI-0019-P	RF7.UPR.2.SD UTKCNI-0018-P	RF7.UPF.2.SD UTKDDI-0020-P	RP2F/T1112 UTKDNI-0037-P	RF8.UPC.2.SD UTKCNI-0017-P UTKDNI-0019-P
1	EVAPORATOR TUB UP	KN-SXX12085	✓	✓	✓	✓	✓	Combo cartridge parts same as 1-Door fridge and freezer cartridges
	COIL EVAPORATOR 2R8K425L	KN-CLS12086	✓					
2	COIL EVAPORATOR 3R8K425L	KN-CLS12087		✓	✓			
	COIL EVAPORATOR 4R8K425L	KN-CLS12088				✓	✓	
	HEATER ELEMENT DEFROST UP 150W	KN-ELE12089	✓		✓			
	HEATER ELEMENT DEFROST UP 250W	KN-ELE12090		✓				
	HEATER ELEMENT DEFROST UP 700W	KN-ELE12091				✓		
	HEATER ELEMENT DEFROST UP 400W	KN-ELE12224					✓	
4	DEFROST TRAY UP – FRIDGE	KN-SXX12092	✓		✓			
	DEFROST TRAY UP – FREEZER	KN-SXX12635		✓		✓	✓	
5	RETAINER EVAP TUB SMALL	KN-SXX12093	✓	✓	✓	✓	✓	
6	RETAINER EVAP TUB LARGE	KN-SXX12094	✓	✓	✓	✓	✓	
7	UNIT BASE UP	KN-SXX12095	✓	✓	✓	✓	✓	
8	FAN MOTOR WDTL ECR2-0F61 (white plug)	ELM11858	✓	✓	✓	✓	✓	
9	FAN BLADE DIA 200 V28	KN-FAN12096	✓	✓	✓	✓	✓	
10	MOTOR MOUNT	KN-SXX12097	✓	✓	✓	✓	✓	
	COMPRESSOR EM2X3117U	KN-CPR12098	✓					
	COMPRESSOR SC21CNX.2	KN-CPR12099		✓				
11	COMPRESSOR EM2X3125U	KN-CPR12100			✓			
	COMPRESSOR NT2192GK	KN-CPR12101				✓		
	COMPRESSOR NT2210U	KN-CPR12225					✓	
12	FAN GUARD/MOTOR MOUNT	KN-SXX12102	✓	✓	✓	✓	✓	
13	FAN MOTOR WDTL ECR2-0361 (red plug)	ELM11309	✓	✓	✓	✓	✓	
14	FAN BLADE DIA 200 V28	See Item 9	✓	✓	✓	✓	✓	
	COIL CONDENSER 3R9K210L	KN-CLS12103	✓					
15	COIL CONDENSER 3R10K245L	KN-CLS12104		✓	✓			
	COIL CONDENSER 4R11K275L	KN-CLS12105				✓		
	COIL CONDENSER 4R11K275L-XX	KN-CLS12226					✓	
16	INSULATION BLOCK	KN-SXX12106	✓	✓	✓	✓	✓	
17	DRIER DIA 3.1-DIA 6.2-B	KN-DRY12107	✓	✓	✓			
	DRIER DIA 3.1-DIA 8.2-B	KN-DRY12108				✓	✓	
18	CONDENSATE LINE UP	KN-COT12109	✓	✓	✓	✓	✓	
19	THERMAL FUSE	KN-ELZ12110	✓	✓	✓	✓	✓	
20	HEAT CONDUCTOR BAR	Info Only	✓	✓	✓	✓	✓	
	CAPILLIARY DIA 1 X 3000	KN-COT12111	✓					
	CAPILLIARY DIA 1 X 2000	KN-COT12112		✓				
21	CAPILLIARY DIA 1.17 X 4000	KN-COT12113			✓			
	CAPILLIARY DIA 1.17 X 2000	KN-COT12114				✓		
	CAPILLIARY DIA 1.17 X 2800	KN-COT12227					✓	
22	ACCUMULATOR DIA 25 X 130	KN-COT12115		✓		✓	✓	
23	PROBE CONDENSER	KN-ELZ12116	✓	✓	✓	✓	✓	
24	PROBE EVAPORATOR	KN-ELZ12117	✓	✓	✓	✓	✓	
25	PROBE AMBIENT	KN-ELZ12118	✓	✓	✓	✓	✓	
26	PROBE CABINET	KN-ELZ12119	✓	✓	✓	✓	✓	
27	SUCTION PIPE SUPPORT	KN-SXX12228	✓	✓	✓	✓	✓	
28	CLOSED CELL INSEAL 12 X 5 X 2000	KN-RUE12238	✓	✓	✓	✓	✓	

8 Maintenance

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

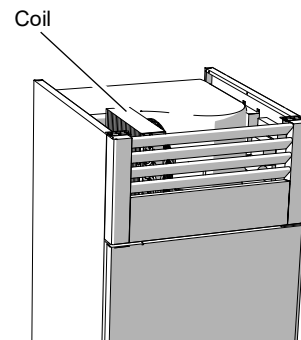
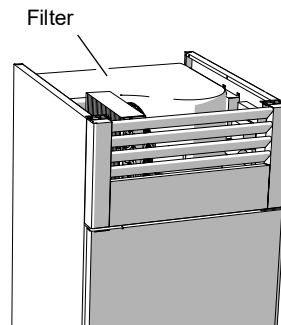
The condenser coil must be kept clean. SKOPE strongly recommends monthly cleaning of the condenser coil and air filter. Do **NOT** use hard or sharp tools to clean the coil as these may cause damage.

WARNING

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

Procedure 28: To clean the condenser coil and condenser filter

1. Unplug the cabinet from the power supply.
2. The filter is located on the side of the condenser coil, on top of the cabinet. Reach over the top of the cabinet and use the tab on top of the filter to slide it 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 with the tab on top and facing out, check that the ambient probe is in the correct position (see page 41) and reconnect to the power supply.



9 Troubleshooting

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 page 10 for information.

General Operation

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

Table 11: Troubleshooting

Problem	Possible cause	Repair
<ul style="list-style-type: none"> Cabinet not operating. No controller display. 	<ul style="list-style-type: none"> Loss of power supply. Loose plug. 	<ul style="list-style-type: none"> Check mains power supply. Check all plugs are connected correctly.
<ul style="list-style-type: none"> Lights not on. 	<ul style="list-style-type: none"> See "Lighting" on page 19. 	
<ul style="list-style-type: none"> Excess noise vibration. 	<ul style="list-style-type: none"> Refrigeration pipes transferring vibration into cartridge. Fan hitting shroud. 	<ul style="list-style-type: none"> Re-align pipes. Re-align motor mounting.
<ul style="list-style-type: none"> Frozen evaporator coil. 	<ul style="list-style-type: none"> Set-point is too cold. Evaporator probe fault. Controller fault. Short of refrigerant. 	<ul style="list-style-type: none"> Check and raise. Check and replace evaporator probe. Replace controller. Perform refrigeration system diagnostics and service as required.
<ul style="list-style-type: none"> Power consumption is higher than expected. 	<ul style="list-style-type: none"> Cartridge operating too hot. Frequent door opening. Set point to low. 	<ul style="list-style-type: none"> Clean the condenser. Ensure the cabinet has good ventilation around the refrigeration cartridge. Ensure the cabinet is within the maximum operating temperature. Limit door openings. Raise set point.
<ul style="list-style-type: none"> Product is too warm. 	<ul style="list-style-type: none"> Frequent door opening. Recently loaded. Door not closing properly. Refrigeration cartridge operating too hot. Excessive door opening or refrigeration heat load. Set point is to high. 	<ul style="list-style-type: none"> 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 cartridge. Ensure the cabinet is within the maximum operating conditions. Lower set point.
<ul style="list-style-type: none"> Moisture build up on door or exterior. 	<ul style="list-style-type: none"> High humidity. Frequent door opening. Door not closing properly. 	<ul style="list-style-type: none"> Check ambient operating temperature and ventilation requirements, and reposition cabinet if necessary. Limit door openings. Check and clean door gasket.
<ul style="list-style-type: none"> Cabinet door does not shut properly. 	<ul style="list-style-type: none"> Cabinet is on an uneven surface. Door is obstructed. 	<ul style="list-style-type: none"> Level the cabinet. Check shelves and product.

Table 11: Troubleshooting (continued)

<ul style="list-style-type: none"> • Warm cabinet temperatures. • Compressor operating for long periods (more than 1 hour). 	<ul style="list-style-type: none"> • Blocked condenser. • Poor ventilation around refrigeration cartridge. • Refrigeration fault. 	<ul style="list-style-type: none"> • Clean the condenser. • Ensure the cabinet has good ventilation around the refrigeration cartridge. • Ensure the cabinet is within the maximum operating temperature. • Swap cartridge and service faulty cartridge as required.
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Refrigeration System

The following diagnostic test is useful for workshop diagnosis of a short of gas situation. Perform the test before opening the refrigeration system.

It is beneficial to have a correctly operating unit running beside the unit being serviced to compare behaviour.

Note: These diagnostic procedures are indicative only.

Procedure 29: Refrigeration system diagnostic test

Before you start

Ensure you are in a suitable workshop (see page 26).

1. Unplug the cabinet from the power supply, and if necessary remove the refrigeration cartridge including controller and wiring loom assembly.
2. Unplug the evaporator fan motor (white 4-pin plug) from the wiring loom.
3. Install door switch jumper (white 2-pin plug) into wire harness.
4. Remove the evaporator tub cover and install blocker to prevent condenser airflow from affecting evaporator coil.
5. Connect the refrigeration cartridge to the power supply and allow to run for approximately 10 minutes until the evaporator temperature stabilises.
6. Optional: For enhanced diagnostics, connect to the controller via a Bluetooth-enabled device with WDT SCS Connect Field app.

Procedure 29: Refrigeration system diagnostic test (continued)

7. Refer to the relevant table below as a guideline to determine if the system charge is correct at typical ambient condition around 25°C.

Table 12: RF7.UPR.1.SD (cartridge UTKCNI-0017)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction dry	Suction cold	Frost back to compressor shell
Evaporator coil	Top row return bends frosted	½ return bends frosted	All return bends frosted
Unit power	<110 W	110W to 115W	>115W
Evaporator temperature	>-5°C	-10°C to -12°C	<-15°C

Table 13: RF7.UPR.2.SD (cartridge UTKCNI-0018)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction dry	Suction cold	Suction cold
Evaporator coil	Top row return bends frosted	½ return bends frosted	All return bends frosted
Unit power	<150W	150W to 160W	>160W
Evaporator temperature	>-5°C	-10°C to -12°C	<-15°C

Table 14: RF7.UPF.1.SD (cartridge UTKDNI-0019)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction cool and dry	Suction cold and wet	Frost back to and on compressor shell
Evaporator coil	All return bends frosted	All return bends frosted	All return bends frosted
Unit power	<450W	500W to 520W	>530W
Evaporator temperature	>-25°C	<-25°C	<-25°C

Table 15: RF7.UPF.2.SD (cartridge UTKDDI-0019)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction dry	Suction cold	Frost back to compressor shell
Evaporator coil	½ return bends frosted	All return bends frosted	All return bends frosted
Unit power	<350W	475W to 500W	>575W
Evaporator temperature	>0°C	<-10 to -15°C	<-20°C

Table 16: RF7.UPF.2.SD (cartridge UTKDNI-0037)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction dry	Suction cold	Suction cold and wet
Evaporator coil	½ return bends frosted	¾ return bends frosted	All return bends frosted
Unit power	<425W	500W to 550W	>600W
Evaporator temperature	>10°C	<-15 to -20°C	<-30°C

8. Generally, a system with the correct refrigerant charge will frost back to the compressor. If the frost does not go back to the point shown there may be a capillary blockage or compressor fault. The point where the frost stops is affected by the ambient temperature. The tables above show system characteristics at different charge and 25°C ambient condition for a cartridge running on the bench.
9. Determine whether the system is short of refrigerant, blocked capillary or compressor fault.
- A dry suction could indicate either short of gas, blocked capillary or compressor fault, and further analysis may be required.
 - If there is no frost present at the evaporator coil inlet pipe a blocked capillary is likely.
 - If frost is forming at evaporator coil inlet pipe system, and suction/compressor is behaving as shown in table above at 50% or 75%, the system is likely short of gas.
10. After fault has been diagnosed and repaired, reassemble the refrigeration system and test run.

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