ReFlex Upright

SKOPE Fridge, Freezer, Combo

Service Manual

MAN80235 Rev. 1.2 Jul. 2020

SKOPE® Refrigeration

ReFlex Upright
SKOPE Fridge and Freezer
Service Manual

MAN80235
Rev. 1.2 Jul. 2020

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Trademark Infringement

The SKOPE trademark on this product is infringed if the owner, for the time being, does any of the following:

- Applies the trade mark to the product after their state, condition, get-up or packaging has been altered in any manner
- 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

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.

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 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 Upright 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	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
RF8.UPC.2.SD	RF8UPC2-SCTP-SD	R290
RF7.UPF.2.SD	RP2F/T1112	R290

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.

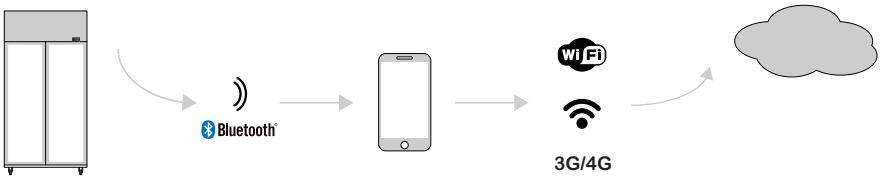
See “SCS Connect Field App and Track App” on page 11 for information on setting up and using the app.

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

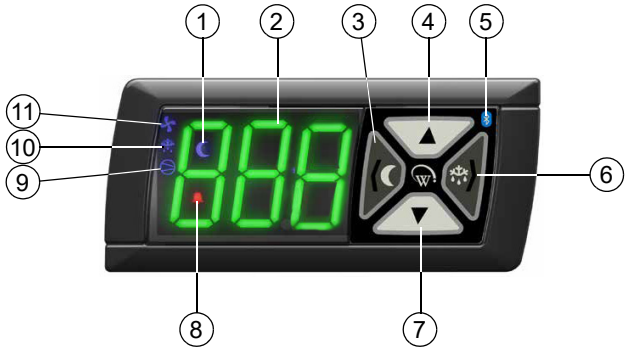
The SKOPE-connect app is designed for end-users only, and provides wireless access to the controller from mobile devices with Bluetooth capability.

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

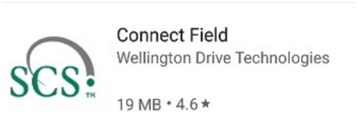
Connecting

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.

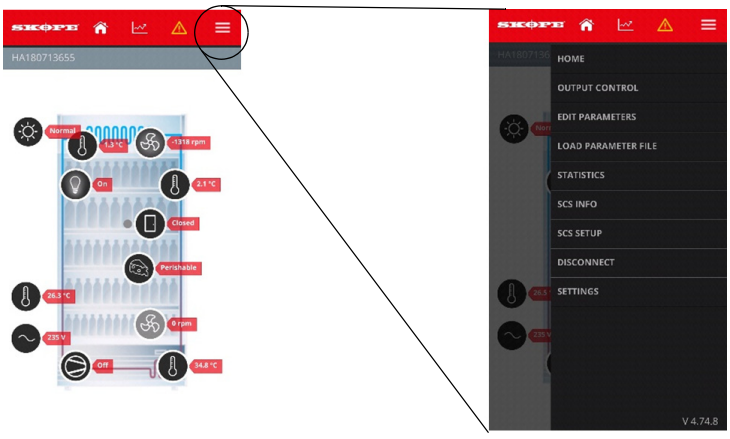


2. Enter your unique Activation Code and press ‘Activate’. The activation code is provided by SKOPE Customer Services.
3. Enter a 4-digit PIN code, re-enter the code, and press ‘SET PIN CODE’.

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.

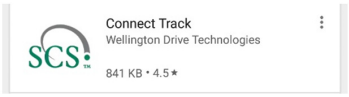
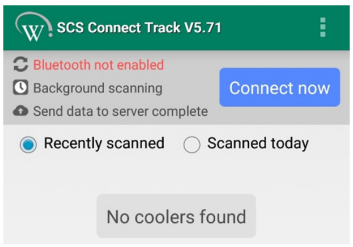


Home screen

Menu screen

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

To install and use the SCS Connect Track app

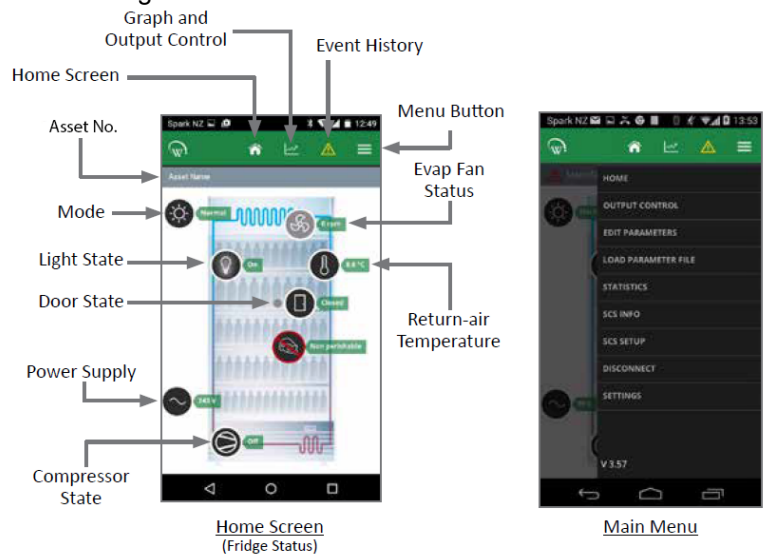
1. Download the SCS Connect Track app from Google Play Store or Apple App Store.	
2. Enter your unique Activation Code and press ‘Activate’ (the same code as used for SCS Connect Field app). The activation code is provided by SKOPE Customer Services.	
3. Respond to any dialogue boxes that appear and 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 53 for instructions.
Note: Updated parameters are not applied until DISCONNECT has been selected from the menu (after loading new parameter set).

		1 Door		2 Door			
	Model No.	RF7.UPR.1.SD	RF7.UPF.1.SD	RF7.UPR.2.SD	RF7.UPF.2.SD	RF7.UPF.2.SD	RF8.UPC.2.SD
	Unit No.	UTKCNI-0017-P	UTKDNI-0019-P	UTKCNI-0018-P	UTKDDI-0020-P	UTKDNI-0037-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.

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	NO swap cartridge required - 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	Take spare cartridge in case refrigeration system fault. - condenser blocked - poor installation / ventilation - cabinet / cartridge 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 = SWAP cartridge

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 - empty or partially filled cabinet
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	Swap cartridge may be required to be taken (may be required as fault could still be with sealed refrigeration system) - condenser blocked - poor installation / ventilation - frozen blocked evap coil - cartridge gasket leaking (to cabinet seal / lid seal) - door leaking air (bad gasket / door not self closing / excessive door opening / door left open) - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - App settings - controller - compressor / gas leak = arrange SWAP cartridge
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	NO swap cartridge required - 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	NO swap cartridge required - 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	Take spare cartridge in case refrigeration system fault. - condenser blocked - poor installation / ventilation - cabinet / cartridge 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 = SWAP cartridge
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 / cartridge - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = SWAP cartridge
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

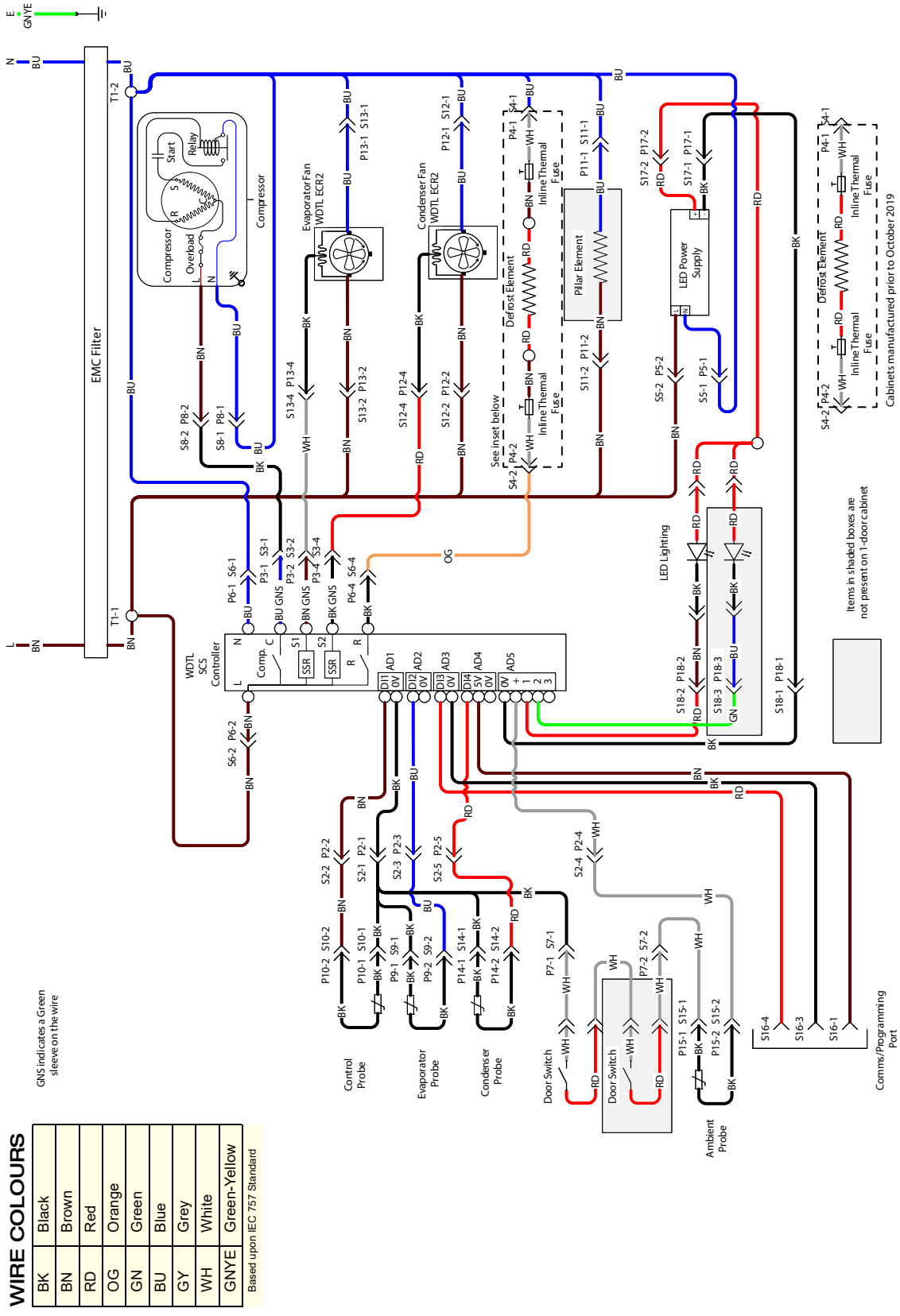
Continued over page

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	NO swap cartridge required - 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	NO swap cartridge required - 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	NO swap cartridge required - Evap probe / connections - controller
28	No downward tendency The temperature is no longer decreasing.	2, 3, 4	Take spare cartridge in case refrigeration system fault. - condenser blocked - poor installation / ventilation - cabinet / cartridge 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 = SWAP cartridge
29	Compressor cutting out The compressor cut out on its internal protection or pressure switch.	2, 3, 4	Take spare cartridge in case refrigeration system fault. - condenser blocked - poor installation / ventilation - cabinet seal leaking / door / cartridge - product hot / blocking cabinet airflow - overloaded from excess door openings / ambient - fan motor / blade (condenser / evaporator) - controller - compressor / gas leak = SWAP cartridge
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 = SWAP cartridge
31	Compressor stalling The compressor is stalling on start up.	2, 3, 4	Take spare cartridge in case refrigeration system fault. - condenser blocked - poor installation / ventilation - cabinet / cartridge 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 = SWAP cartridge

Notes

4 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.

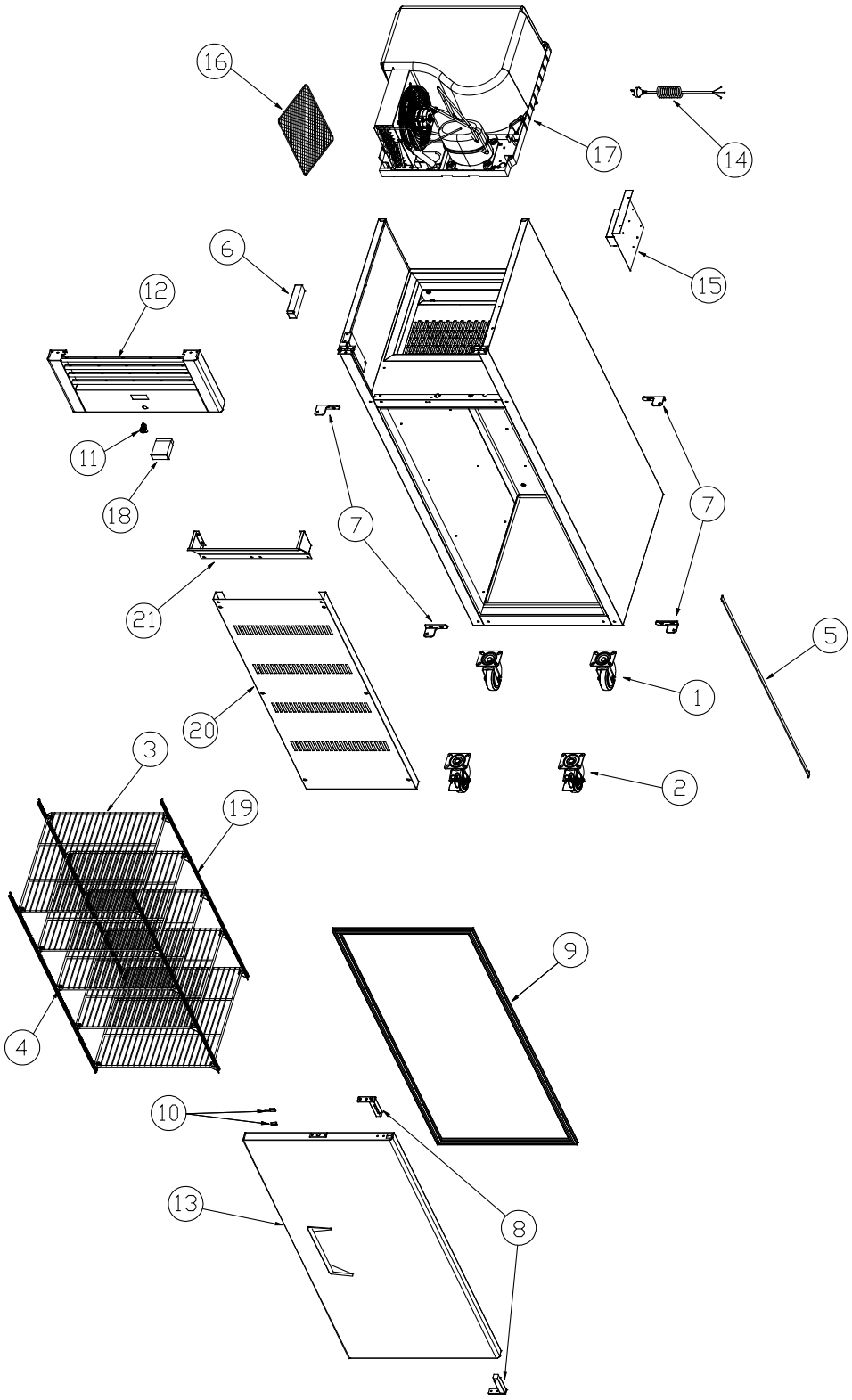
After unplugging connectors, **ALWAYS** ensure reconnection has been undertaken correctly as operational faults may occur if incorrect. It is recommended to photograph wiring setup before unplugging for future reference.

LEGEND

Internal Unit Junction Box Sockets/Plugs			
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	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	-	-

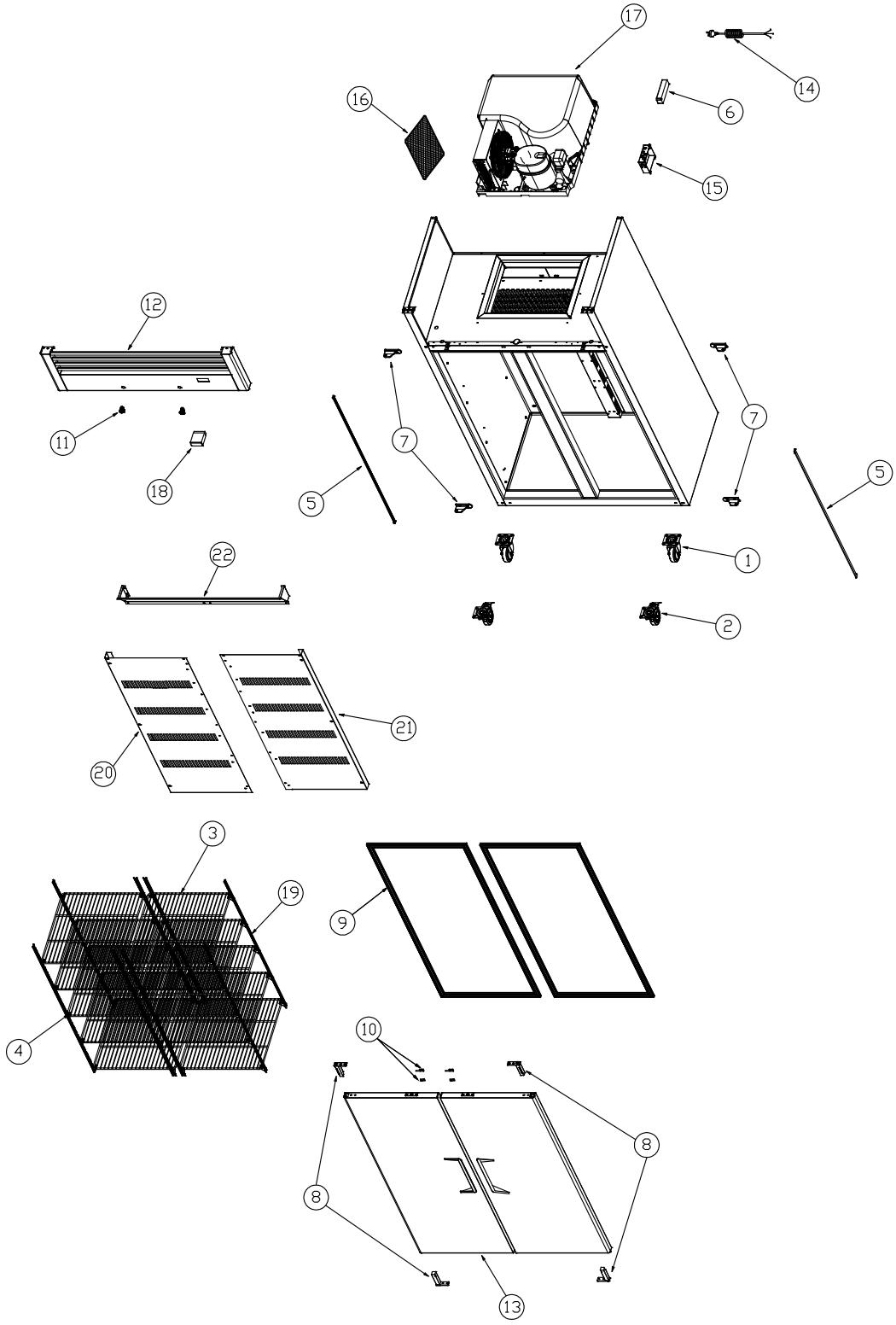
5 Spare Parts

1-Door Cabinet Assembly



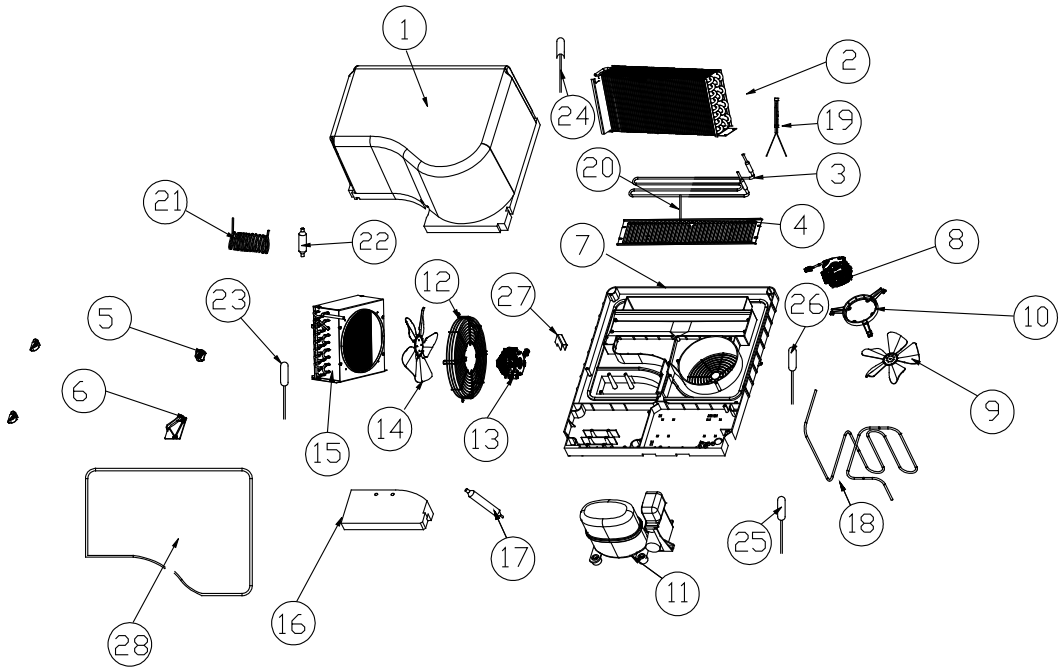
No.	Description	Model No.	RF7.UPR.1.SD	RF7.UPF.1.SD
1	CASTOR-UNBRAKED	KN-SXX11990	✓	✓
2	CASTOR-BRAKED	KN-SXX11991	✓	✓
3	SHELF SET-1DR UPRIGHT	KN-WRK11992	✓	✓
	SHELF-1DR UPRIGHT-540x530	KN-WRK12026	✓	✓
4	SHELF-CLIP	KN-SSY11998	✓	✓
5	LIGHT-LED-UPRIGHT	KN-ELL11999	✓	✓
6	POWER SUPPLY-LPF-16	KN-ELZ12002	✓	✓
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	SHELF SUPPORT STRIP	KN-SXX12145	✓	✓
20	DUCT REAR-1DR UP	KN-STY12147	✓	✓
21	DUCT TRANSITION ASSY-1DR UP	KN-STY12148	✓	✓

2-Door Cabinet Assembly



No.	Description	Model No.	RF7.UPR.2.SD	RF7.UPF.2.SD (R404A)	RF8.UPC.2.SD	RF7.UPF.2.SD (R290)
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			✓	
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	✓	✓	✓	✓
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	SHELF SUPPORT STRIP UP	KN-SXX12145	✓	✓	✓	✓
20	DUCT REAR LH-2DR UP	KN-STY12149	✓	✓		✓
	DUCT REAR-COMBO	KN-STY12152			✓	
21	DUCT REAR RH-2DR UP	KN-STY12150	✓	✓		✓
22	DUCT TRANSITION ASSY-2DR UP	KN-STY12151	✓	✓		✓
	DUCT TRANSITION ASSY-COMBO	KN-STY12153			✓	

Cartridge Assembly

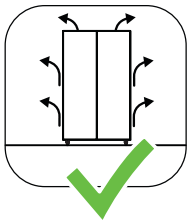


No.	Description	Model No.	RF7.UPR.1.SD **UTKCNI-0017-P**	RF7.UPF.1.SD **UTKDNI-0019-P**	RF7.UPR.2.SD **UTKCNI-0018-P**	RF7.UPF.2.SD **UTKDDI-0020-P**	RP2F/T1112 **UTKDNI-0037-P**	RF8.UPC.2.SD **UTKCNI-0017-P** **UTKDNI-0019-P**
1	EVAPORATOR TUB UP	KN-SXX12085	✓	✓	✓	✓	✓	Combo cartridge parts same as 1-Door fridge and freezer cartridges
2	COIL EVAPORATOR 2R8K425L	KN-CLS12086	✓					
	COIL EVAPORATOR 3R8K425L	KN-CLS12087		✓	✓			
	COIL EVAPORATOR 4R8K425L	KN-CLS12088				✓	✓	
3	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	KN-SXX12092	✓	✓	✓	✓	✓	
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	✓	✓	✓	✓	✓	
11	COMPRESSOR EM2X3117U	KN-CPR12098	✓					
	COMPRESSOR SC21CNX.2	KN-CPR12099		✓				
	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	✓	✓	✓	✓	✓	
15	COIL CONDENSER 3R9K210L	KN-CLS12103	✓					
	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	✓	✓	✓	✓	✓	
21	CAPILLIARY DIA 1 X 3000	KN-COT12111	✓					
	CAPILLIARY DIA 1 X 2000	KN-COT12112		✓				
	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	✓	✓	✓	✓	✓	

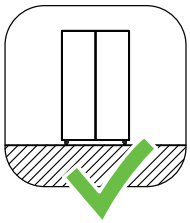
6 Installation

Installation Guidelines

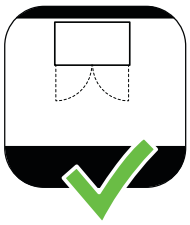
When installing this cabinet, ensure the installation guidelines below are considered and met.



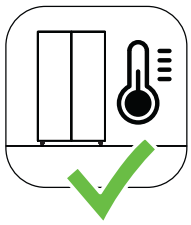
Ventilation
Ensure all ventilation requirements below are met.



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

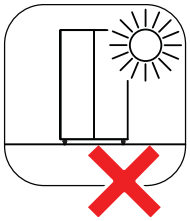


Door Opening
Allow adequate space for the door/s to open and close properly.

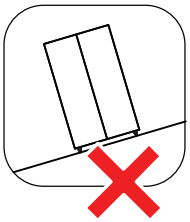


Climate Class
The cabinet must be installed in an environment within its climate class.

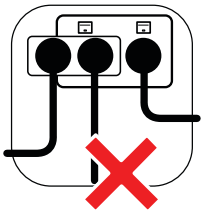
The climate class is stated on the cabinet rating label inside the cabinet.



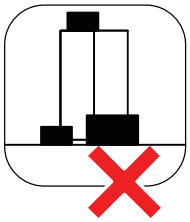
Sunlight
Do not install the cabinet in direct sunlight.



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



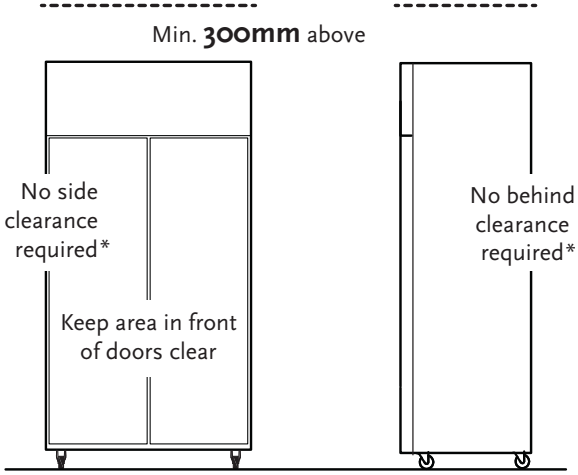
Power Supply
Do not overload the power supply.



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:



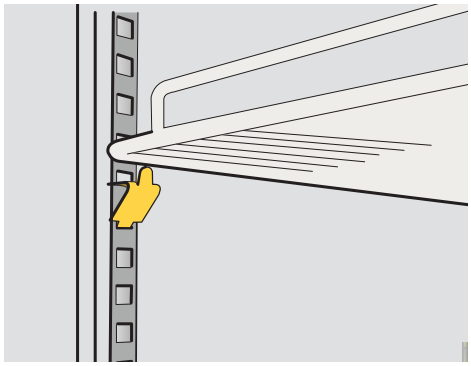
*When installed for continuous duty in climate class 7 environment (35°C ambient / 75% relative humidity), it is recommended to provide 50mm clearance around the sides and back of the cabinet.

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 “Routine Cleaning” on page 58).

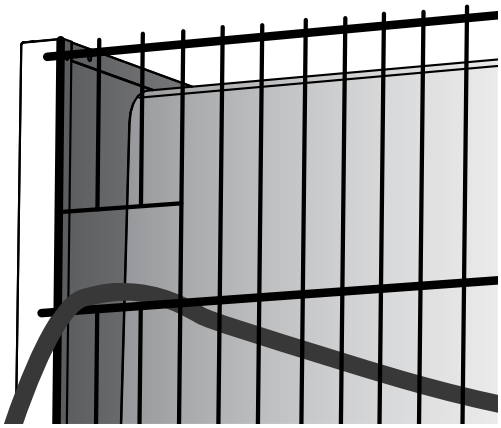
Shelves

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.



7 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 14 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.

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.
• Lights not on.	• See “Lighting” on page 32.	
• Excess noise vibration.	• Refrigeration pipes transferring vibration into cartridge.	• Re-align pipes.
	• Fan hitting shroud.	• Re-align motor mounting.
• 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.	• Cartridge operating too hot.	• Clean the condenser. • Ensure the cabinet has good ventilation around the refrigeration cartridge. • Ensure the cabinet is within the maximum operating temperature.
	• Frequent door opening.	• Limit door openings.
	• Set point to low.	• Raise set point.

Continued over page

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

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.

Refrigeration system diagnostic test (perform in suitable workshop)

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 Bluetooth enabled device with WDT SCS Connect Field app.
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.

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	<110W	110W to 115W	>115W
Evaporator temperature	>-5°C	-10°C to -12°C	<-15°C

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

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

Continued over page

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

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.

8 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, it should be removed and a SKOPE OEM new replacement component fitted.

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.

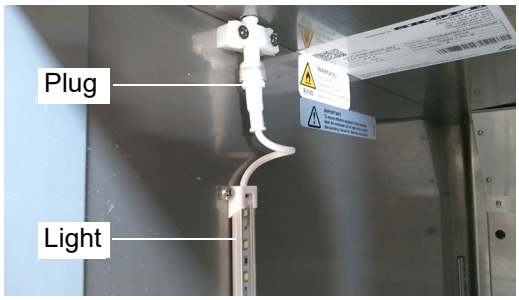
Ensure the cabinet is isolated from the power supply before cleaning or removing parts.

Lighting fault diagnostics

Problem	Possible Cause	Repair
No lights working. Cabinet is dark.	Lights switched off.	Switch lights on at electronic controller faceplate (see page 9), or the app.
	Controller is in Energy Saving mode.	Open the door to bring the controller into Normal mode.
	Controller alarm.	Check controller for alarm code.
	Plug not connected properly.	Check and clean light supply plugs to and from light power supply.
	Light power supply fault.	Replace light power supply.
Light component not working.	Plug not connected properly.	Check and clean plug connection in cabinet.
	Faulty light.	Replace light.
Segment of light not working.	Faulty light.	Replace light.

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.

To replace the LED driver power supply

1. Unplug the cabinet from the power supply.
2. Open the door/s, unscrew the front panel - (Phillips head screwdriver): Two screws on the bottom edge of the panel. Swing the front panel up and tape/ restrain safely in place (see picture on page 42).
3. Unplug, unscrew and replace the light power supply.
4. Reassemble and test for correct operation.

Doors

Alignment Adjustment

If a door is out of alignment, realign it by loosening the top and or bottom hinge bracket fixing screws, move the door as required, and 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 36), the door can be removed from the cabinet.

To remove the door

1. Disconnect the cabinet from the power supply.
2. Open the door/s, unscrew the front panel - (Phillips head screwdriver): Two screws on the bottom edge of the panel. Swing the front panel up and tape/ restrain safely in place (see picture on page 42).
3. Unscrew the top and bottom hinges and remove door from cabinet.

4. If necessary, remove top and bottom hinges, and self-closing mechanism (see “Door Hinges” on page 35). Ensure all bushes and washers are present, and the self-closing mechanism is fitted in closed position for correct self closing.

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

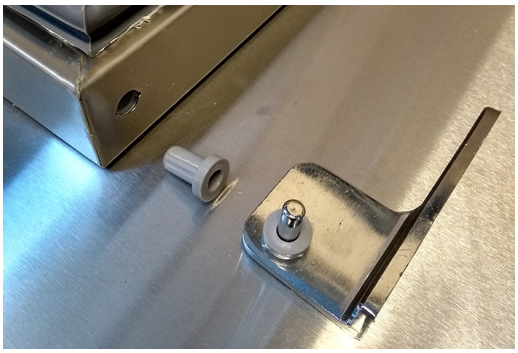
The door is fitted with a self-closing mechanism which allows the door to self-close. If door tension is lost, check that the self-closing mechanism is installed correctly, and if still no tension replace the self-closing mechanism (see “Door Hinges” on page 35).

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.

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:

Description	SKOPE Part No.	Quantity
LH hinge kit	KN-HIN12003	1

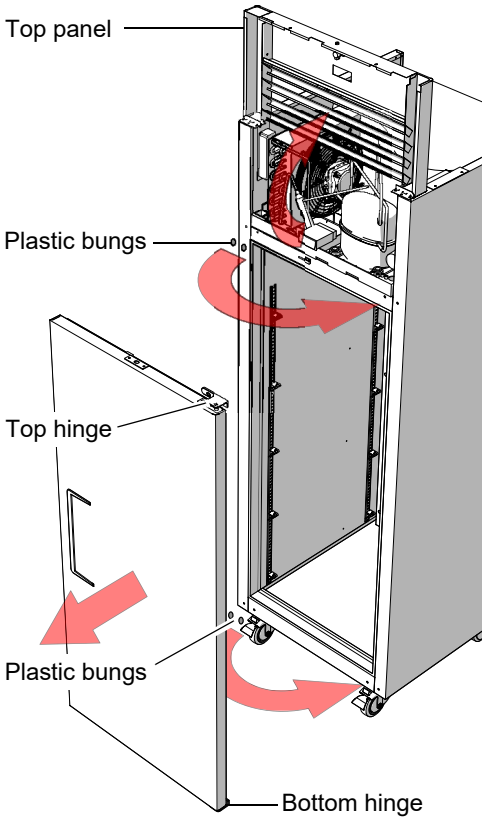
Tools Required

The following tools are required to complete the procedure:

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

Procedure

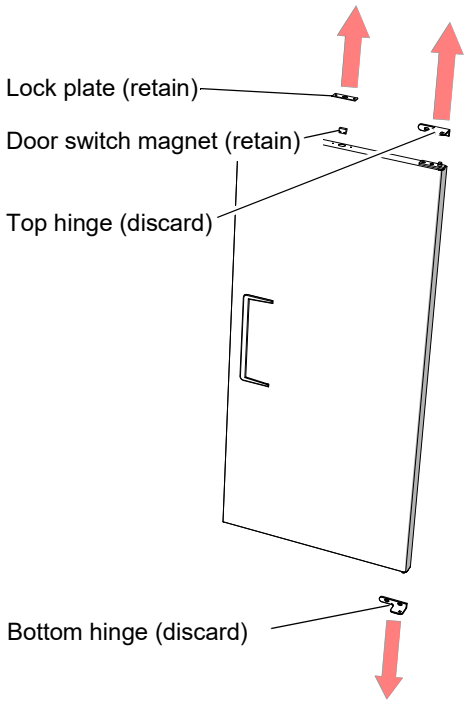
1. Ensure the cabinet is unplugged from the power supply.
2. Unscrew and swing the top panel up and tape/restrain safely in place.
3. Unscrew the top and bottom hinge and remove the door from cabinet (4 × M6 socket head screws).
4. Remove the plastic bungs from the LH hinge screw holes on the LH side of the cabinet, and fit the bungs to the RH hinge screw holes on the RH side of the cabinet.



Continued over page

5. Unscrew and remove the RH 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.



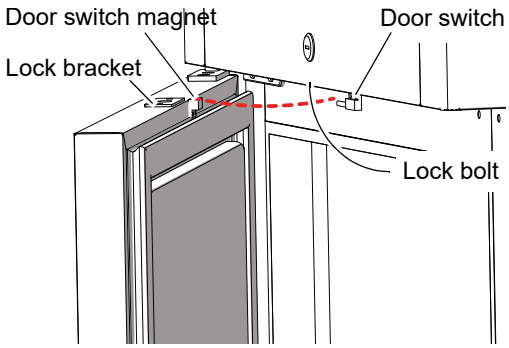
7. Rotate door 180°.

8. Fit the LH 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.

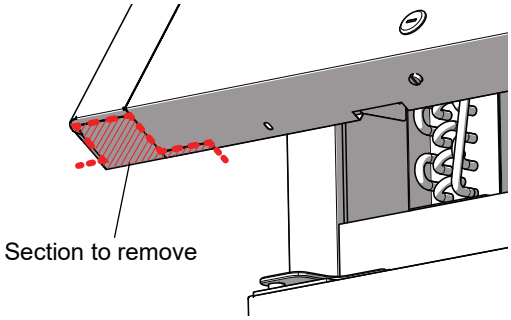
10. Refit the door switch magnet using holes on top of door (2 × screws).

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 LH bottom edge of the top panel, allowing the top panel to close over the new LH hinge. Ensure the exposed edge is fully de-burred.

    Close the top panel and refit screws.



13. 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.

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.

To plinth mount

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

Refrigeration Cartridge

Before Servicing

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 to determine refrigerant type before servicing.

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

Important. Ensure the following before servicing:

- Only technicians contracted to SKOPE hydrocarbon service policy may service SKOPE HC refrigeration systems.
- SKOPE HC refrigeration systems must only be serviced by appropriately skilled refrigeration mechanics.
- Servicing of sealed HC refrigeration system must be completed at a HC workshop/service area with dedicated HC equipment and personal protective equipment.
- All local HC 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 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 HC 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.

HC service equipment

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

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

- Intrinsically safe vacuum pump.

- Dedicated hydrocarbon gauges.
- Intrinsically safe hydrocarbon combustible gas leak detector.
- Intrinsically safe scales to 1gm 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 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 1.0gm.
- R290 refrigerant supply cylinder.

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.

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 - (Phillips head screwdriver): 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.

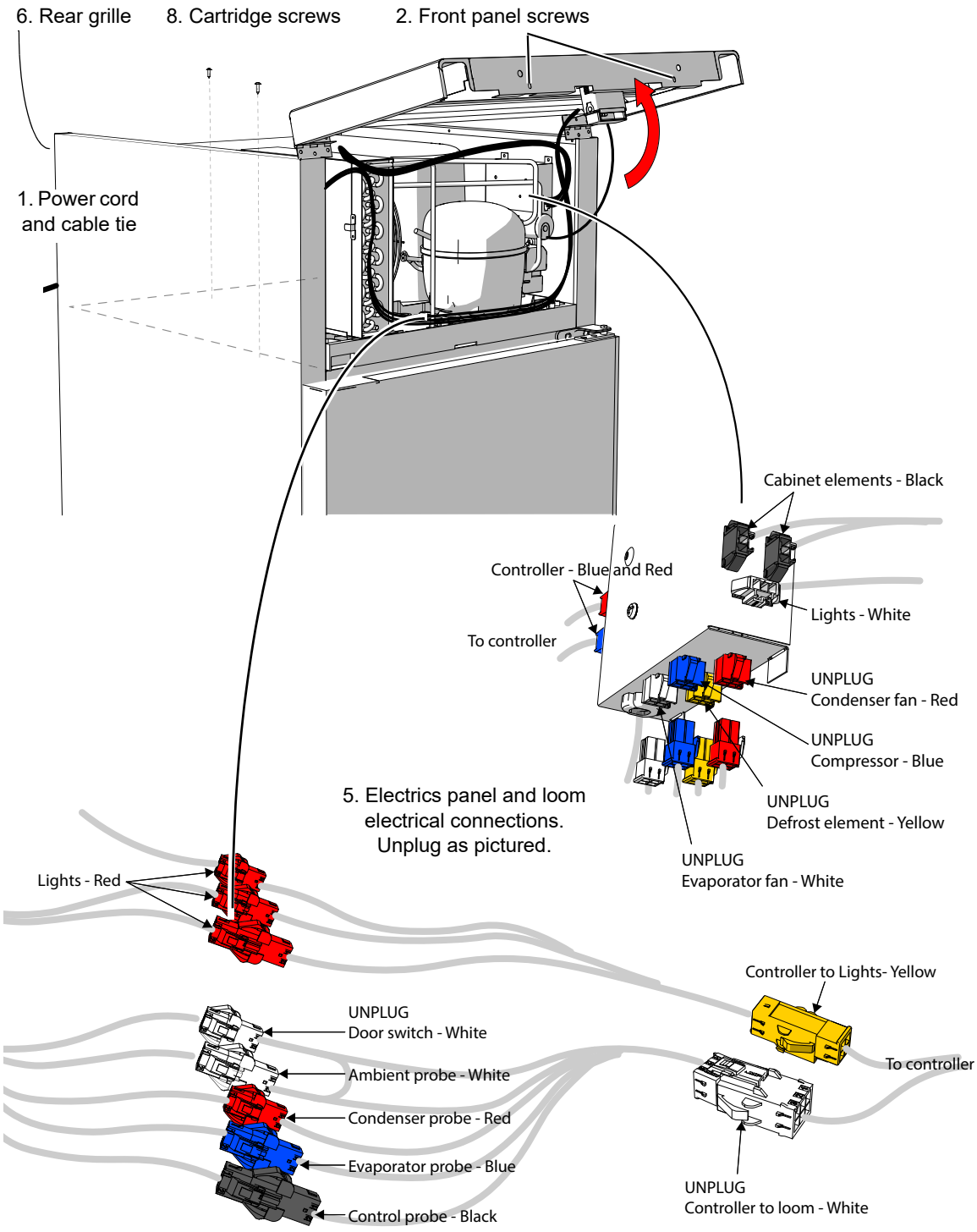
8. Unscrew the cartridge from the top of the cabinet: One screw at the back and one on each side.

9. The cartridge may now be removed from the cabinet.

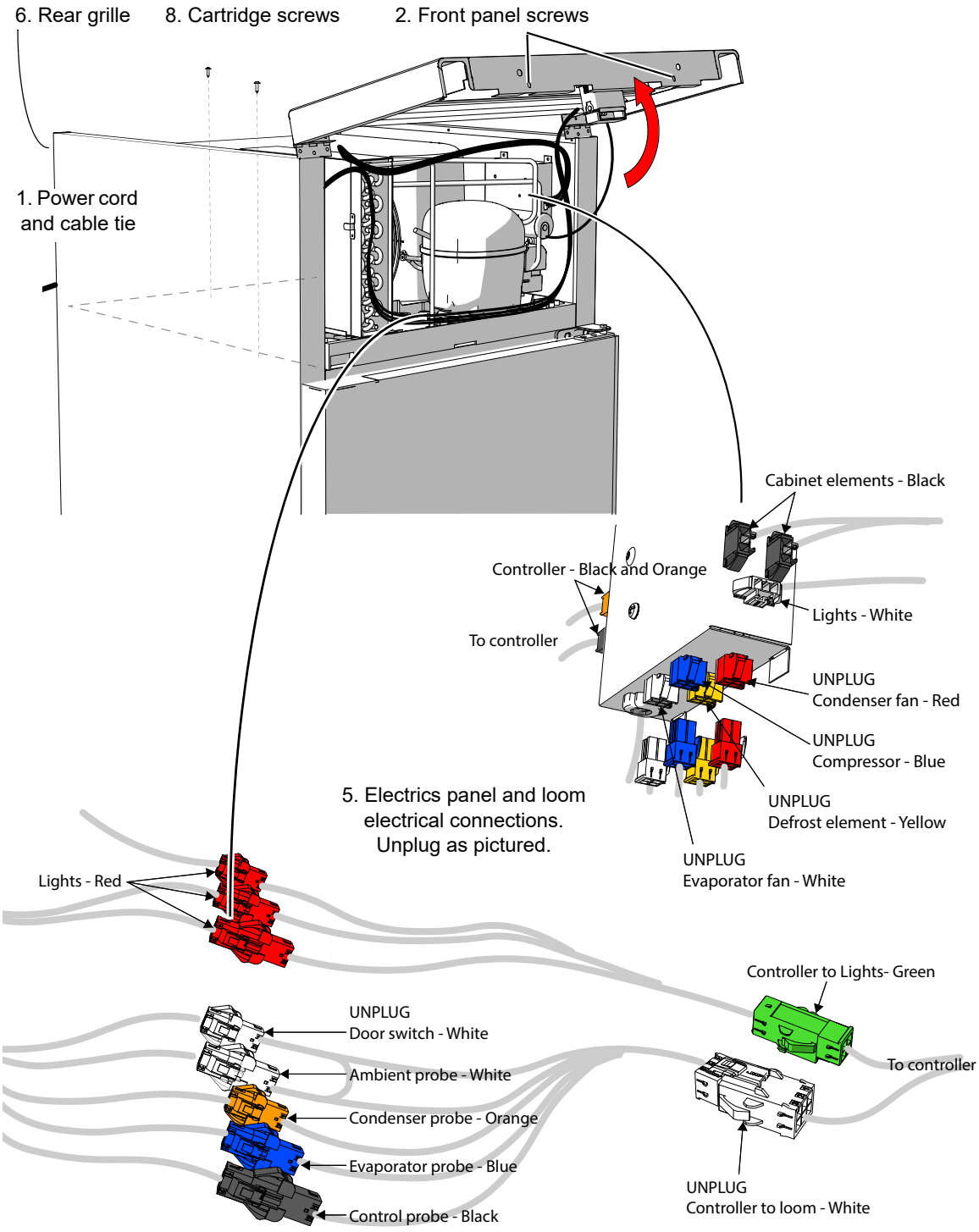
10. Reverse the steps above to refit the cartridge. When refitting, ensure:
    - **IMPORTANT:** Ensure plug reconnection is undertaken correctly as operational faults may occur if incorrect. Refer to relevant image on page 42 and page 43, wiring diagram on page 18, and previous recommended photograph 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 Feb. 2020

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.



Manufactured Feb. 2020 onwards



Refrigeration Cartridge Assembly

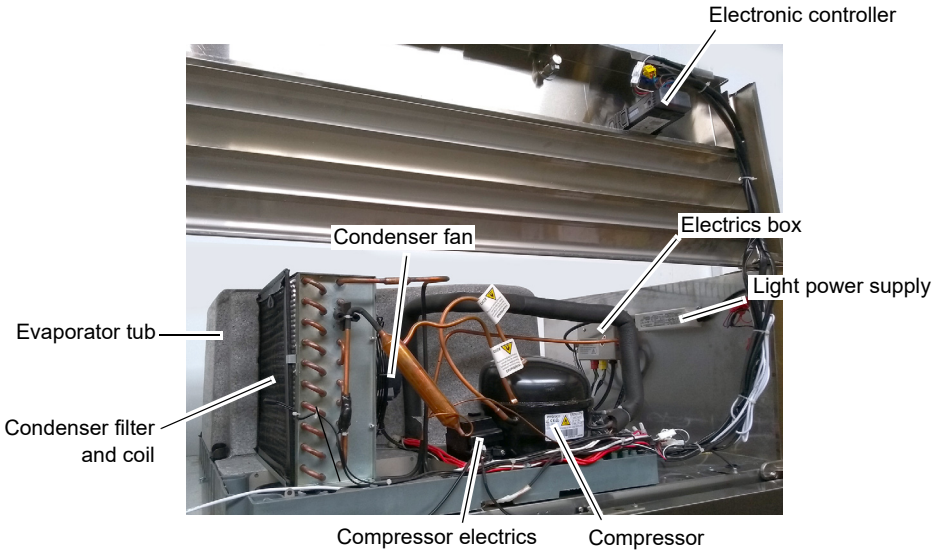
The refrigeration cartridge is a top mounted, electronically controlled removable cartridge.

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 SKOPE supplied parts specifically for this appliance may be used for repairs. 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 an 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.

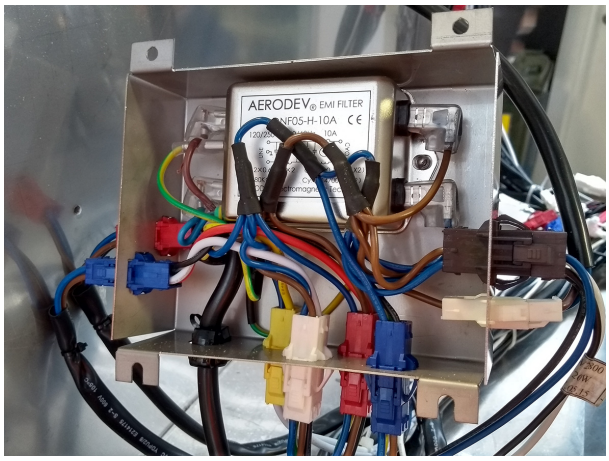
Electrics Box

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.



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. To open the box, unscrew the four screws and lift 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 (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. Remove the cartridge from the cabinet (see page 41).
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.

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 existing 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.

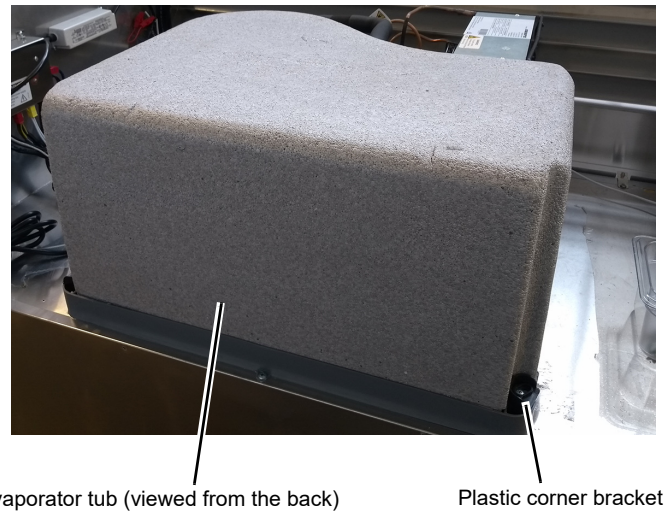
To replace the fan motor (with correct SKOPE spare part only)

1. Remove the condenser fan assembly and the fan blade (see previous page).
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 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 Tub

The evaporator tub is screwed onto the evaporator assembly via plastic corner brackets. A long screw-driver 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.

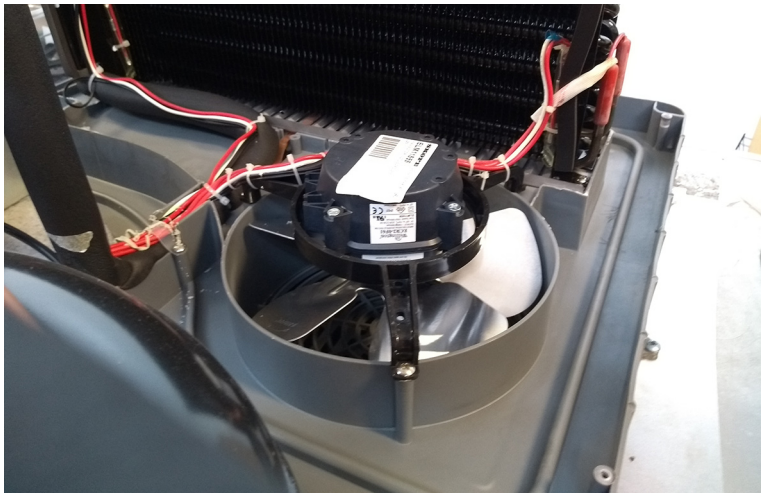


Evaporator Fan

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. Fan blades should be tightened to the recommended torque settings (shown in the table below).

Fan motor manufacturer recommended torque settings

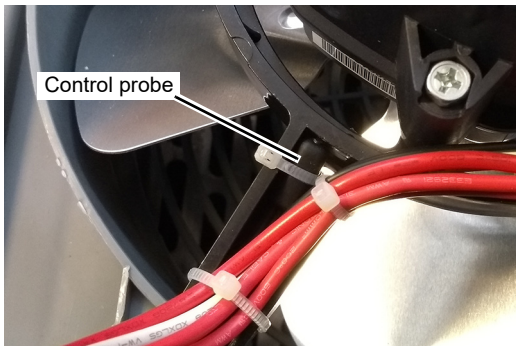
Fan motor manufacturer	Torque setting
Wellington Drive	1.4 Nm

To access and remove the evaporator fan assembly

1. Remove the cartridge from the cabinet (see page 41).
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.

To replace the fan blade

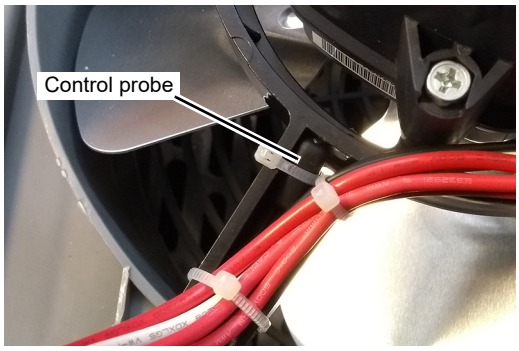
1. Remove the evaporator fan assembly (see previous page).
2. Remove the screw and washer from the centre of the fan blade, and lift the blade from the motor.
3. Replace new blade and fix with existing 12mm flat washer and serrated head screw. Tighten the blade to recommended torque setting.
4. Refit 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.

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

1. Remove the evaporator fan assembly and the fan blade (see previous page).
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 12mm flat washer and serrated head screw. Tighten the blade to recommended torque setting.
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.

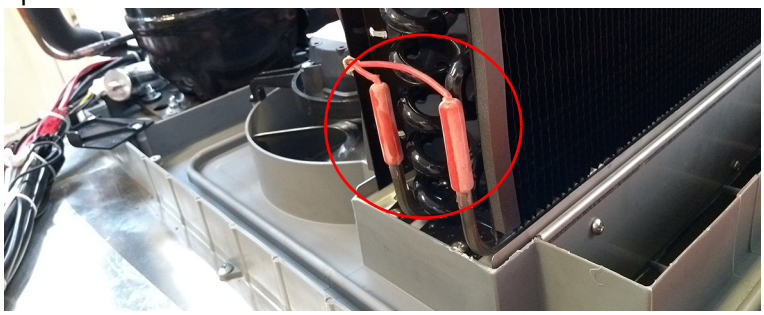
Before replacing the compressor, check all plug connections and ensure the compressor electrics are operating correctly. The compressor must be supplied with consistent voltage over 220 volts, ensure the voltage does not drop at start-up. If the voltage does drop, ensure the cartridge has a direct power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



To replace the defrost element

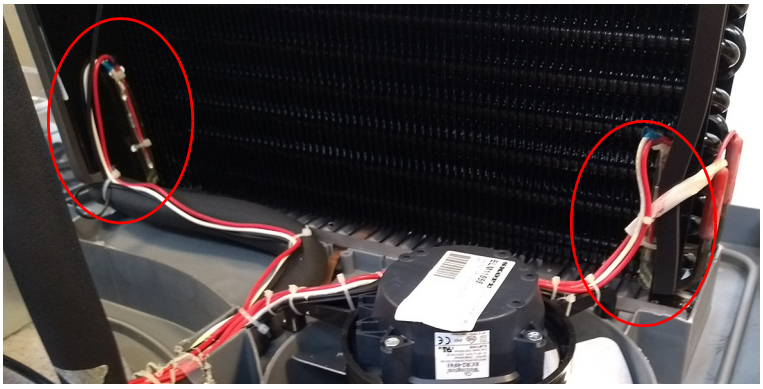
1. Remove the cartridge from the cabinet (see page 41).
2. Unscrew and remove the evaporator box (see page 47).
3. Take note of cable routing (photo recommended), then carefully cut cable ties to release defrost element from the evaporator coil and pipes. Trace the cable back to electrics panel, cutting 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.



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.

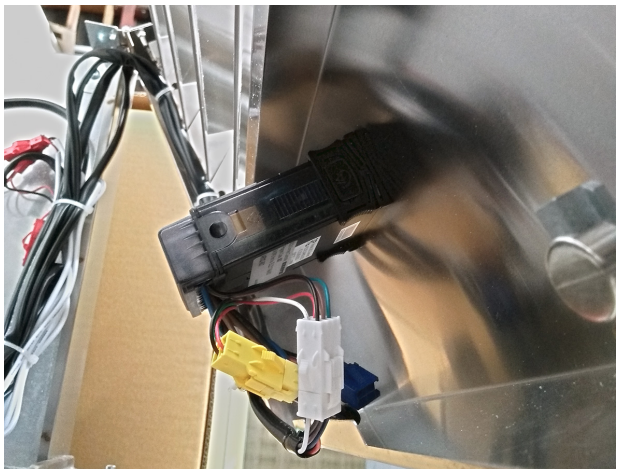
Electronic Controller

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.

Controller Location

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



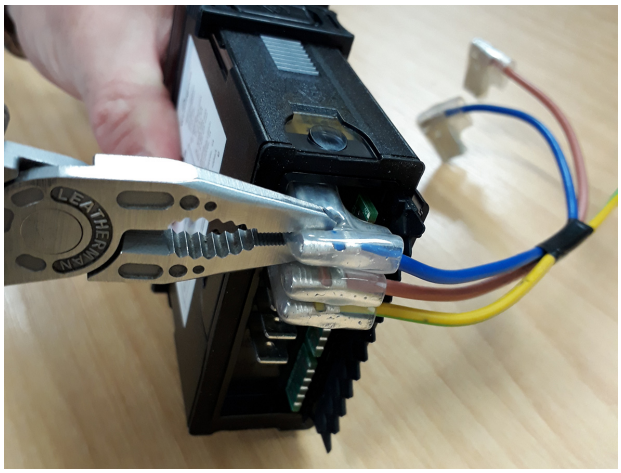
To access and remove the controller

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.



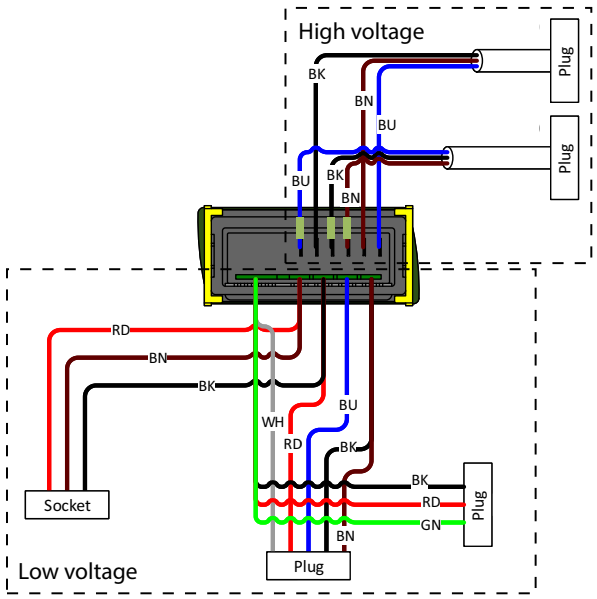
Replacing the Controller

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.

To replace the controller

1. Disconnect the cabinet from the power supply and access the electronic controller (see “Controller Location” on page 52).
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 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 “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 controller.
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.

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.

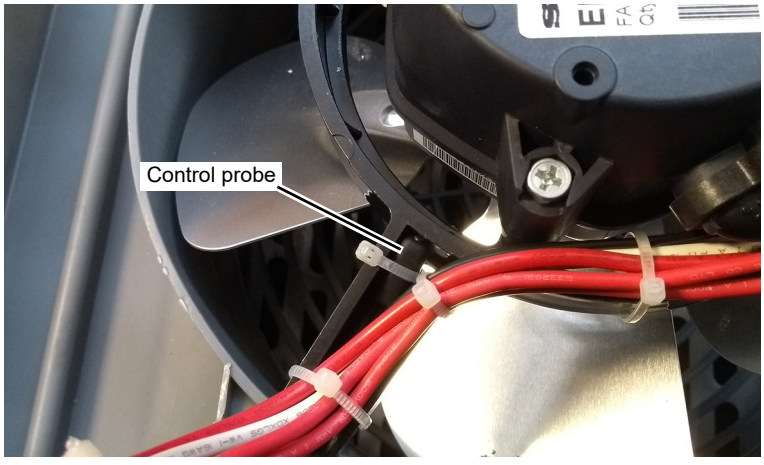
3. Replace the door switch. Following the same path as the original switch, fit the new switch with cable ties as necessary. Ensure the cable is securely connected and cable tied in place.
4. Reconnect the cabinet to the power supply and check for correct operation.

Control Probe

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

To replace the control probe

1. Remove the cartridge from the cabinet (see page 41).
2. Gain access to the evaporator fan assembly (see steps 2-3, “To access and remove the evaporator fan assembly” on page 48).
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 51).

To replace the evaporator probe

1. Remove the cartridge from the cabinet (see page 41).
2. Gain access to the evaporator fan assembly (see steps 2-3, “To access and remove the evaporator fan assembly” on page 48).
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.

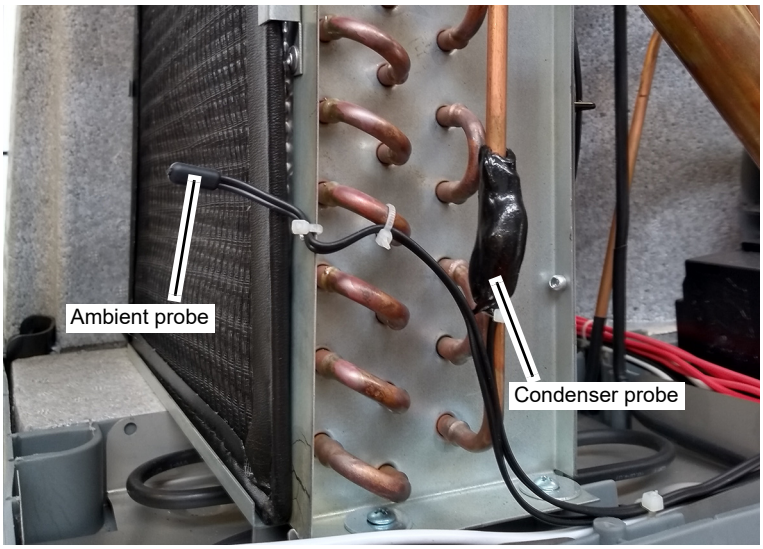
   Ensure the probe is located in the same location (between the 3rd and 4th fins), secured in place with the evaporator fins, and that the probe cable is securely connected and cable tied in place.
5. Reassemble and test for correct operation.

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 refrigeration cartridge (see page 41).
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 it's 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.

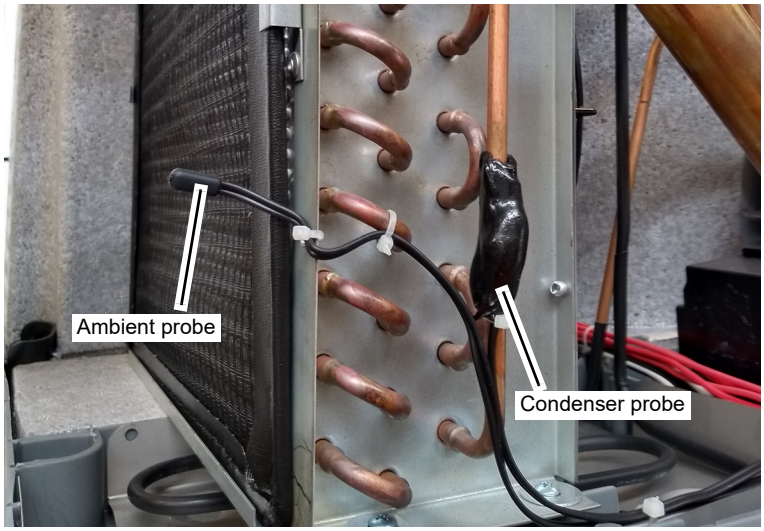


Ambient Probe

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.

To replace the ambient probe

1. Disconnect the cabinet from the power supply and remove the refrigeration cartridge (see page 41).
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 it's 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.



9 Routine Cleaning

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

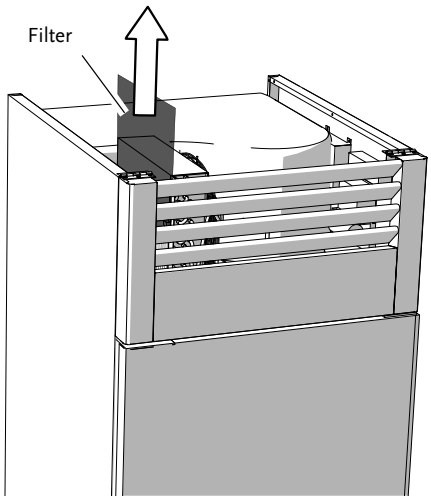
The condenser coil must be kept clean. SKOPE strongly recommends monthly cleaning of the condenser coil and air filter. Do **NOT** use hard or sharp tools to clean the coil as these may cause damage.

WARNING

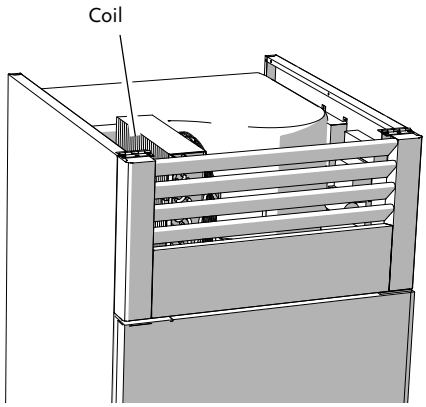
Unplug the cabinet from the power supply before cleaning the condenser coil.

To clean the condenser coil and condenser filter

1. Unplug the cabinet from the power supply.
2. The filter is located 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 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.



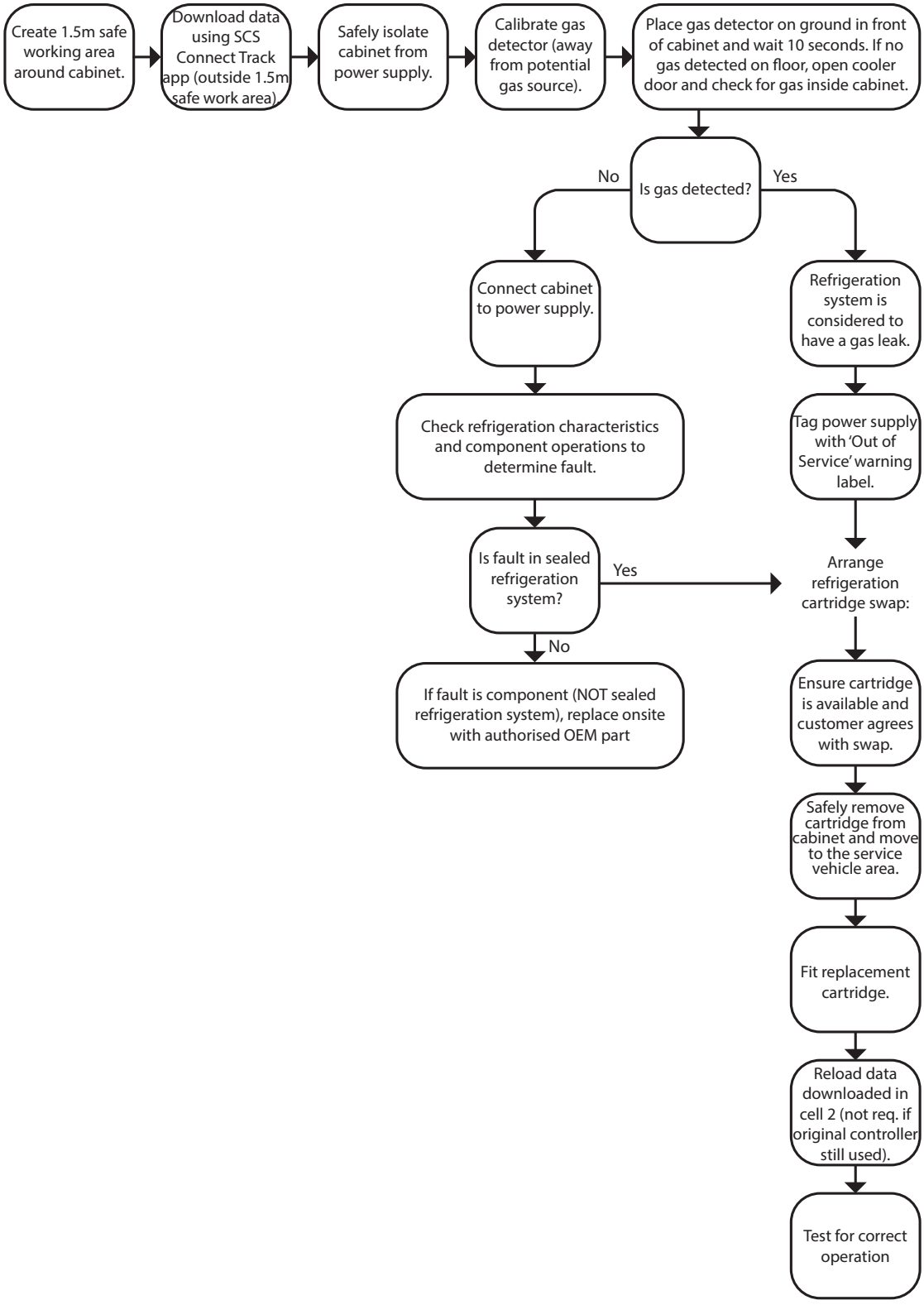
4. With the cabinet unplugged from the power supply and the filter removed (see steps above), brush the condenser coil with a soft brush to remove any dust and fluff.
5. Refit the filter with the tab on top and facing out, check that the ambient probe is in the correct position (see page 57) and reconnect to the power supply.



10 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 procedures below when making the service visit.

Swap Cartridge



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