

ProSpec

SKOPE Top Mount Fridge R290



ProSpec
SKOPE Top Mount Fridge
R290
Service Manual

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SKOPE INDUSTRIES LIMITED

Head Office
PO Box 1091, Christchurch
New Zealand
A.B.N. 73 374 418 306
AU: 1800 121 535
NZ: 0800 947 5673
E-mail: skope@skope.com
Website: www.skope.com

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1 Servicing Hydrocarbon

Overview

This cabinet uses hydrocarbon R290 as its refrigerant. R290 is a natural refrigerant that has a very low environmental impact.

Special service requirements apply, as R290 is a flammable refrigerant.

Safety hazards

The main hydrocarbon safety hazards are:

- Flammability
- Venting of hydrocarbon and compressor oil
- Asphyxiation



Service requirements

Do not interfere with the refrigeration system. All refrigeration maintenance and repairs must be undertaken according to the SKOPE Hydrocarbon Service Requirements. See the "SKOPE Hydrocarbon Service Requirements" for more information, including examples of hazardous activities.

Electrical safety precautions

To comply with safety and radio interference regulations, make sure you route wiring correctly and use the correct components. In order to maintain safety and compliance with regulations, any wiring that is disturbed during servicing must be replaced and secured in its original position.

SKOPE 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:

- **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 refer to AIRAH Flammable Refrigerants – Safety Guide.
 - New Zealand should refer to Flammable Refrigerant Safety Documentation (Refrigerant Licence 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, send the entire cabinet 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 recommends attending specific hydrocarbon refrigeration handling training courses). Nitrogen must be used for purging the system before commencing brazing (“hot work”).
- **MUST** – Adhere to relevant SKOPE Service Manual. If there is any contradiction, the local regulations take precedence over SKOPE requirements.
- **MUST** – Work only in suitable, safe and compliant workspaces. Personal protective equipment (PPE) must always be used when working on hydrocarbon equipment.
- **MUST** – Always carry and use flammable gas detectors when diagnosing refrigeration faults in hydrocarbon equipment.
- **MUST** – Know where and how to safely and quickly isolate the power supply to cabinet before undertaking any service work.
- **MUST** – Not perform any brazing etc. (“hot work”) in the field. This is to be completed in a suitable service depot or workshop (in a dedicated, specific hazardous work area compliant with 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 (by using bullet piercing valves or line tap valves) before transportation. Valves must be removed at the hydrocarbon service depot once the repair is completed.
- **MUST** – Have an emergency plan for the hydrocarbon workshop area, which includes suitable evacuation and fire control plans and equipment.
- **MUST** – Only use refrigerant grade hydrocarbon to the precise mass specified on removable refrigeration system serial label.
- **MUST** – Be accurate with the refrigerant charge. The refrigerant mass is ultra-low charge and must only be measured with scales which are accurate to +/- 1.0 gram. Refrigerant must **not** be overcharged or added to an already charged system.
- **MUST** – Use identical drier replacement, as any change will affect the gas charge volume and affect reliability compliance and safety.
- **MUST** – Only replace pipework with parts which are identical to genuine SKOPE parts.
- **MUST** – Not introduce a sparking device inside a cabinet or inside a removable refrigeration system. Never use battery drills.
- **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 AoFrio SCS Field app installed on a Bluetooth-enabled device carried by the service technician. (This does not apply to cabinets that do not use the AoFrio controller.)
The app should be used for safe, accurate diagnosis of the system, and it is required to complete a controller replacement in the field.
- **RECOMMENDED** – Have the AoFrio SCS Track app installed on a Bluetooth-enabled device carried by the service technician. This passive app collects system data from the AoFrio SCS Connect controller and transmits it to the cloud.
- **PERMITTED** – Use a logistics company 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 applies to the SKOPE ProSpec top mount upright fridges listed in Table 1 below. Refer to the relevant product specification sheet (available on the SKOPE website: www.skope.com) for specifications.

Table 1: Model specifications

Series	Model	SKOPE ID	Cartridge
ProSpec Fridge Series	PG21.UPR.1.SD	PP1R	HB0070832517A
	PG21.UPR.2.SD	PP2R	

3 Installation

Mounting

The cabinet is supplied fitted with either legs or swivel castors. The front castors are lockable, the rear castors are free. The castors can be replaced if necessary.

Depending on specific height and manoeuvrability requirements, either legs or castors can be screwed into the mounting plates on the bottom of the cabinet.

Note: If fitting the castors, attach the lockable castors to the front of the cabinet, and the non-locking castors to the rear.

Castors and Legs

Follow the procedures below to remove and fit a castor or leg.

Procedure 1: To remove a castor or leg

Before you start

You will need two people to complete this procedure.

- 1. Disconnect the cabinet from the mains power supply.
- 2. Remove all product from the shelves, then remove the shelves.
- 3. Remove the refrigeration cartridge.

Upright cabinets

- 4. With two people, lie the cabinet on its back on a non-scratch surface.

Underbench cabinets

- 4. With two people, raise the cabinet off the ground.

- 5. Undo the 4 × bolts and remove the castor or leg from the bottom of the cabinet.



Procedure 2: To fit a castor or leg

Before you start

- You will need two people to complete this procedure.
- Fit lockable castors to the front of the cabinet, and non-locking castors to the rear.

- 1. Disconnect the cabinet from the mains power supply.
- 2. Remove all product from the shelves, then remove the shelves.

Procedure 2: To fit a castor or leg (continued)

3. Remove the refrigeration cartridge.

Upright cabinets

4. With two people, lie the cabinet on its back on a non-scratch surface.

Underbench cabinets

4. With two people, raise the cabinet off the ground.

5. Fit the replacement castor or leg into position and securely tighten the 4 × bolts.



Legs Follow the procedure below to adjust the height of a leg.

Procedure 3: To adjust a leg height

1. Disconnect the cabinet from the mains power supply.

2. Turn the black plastic foot at the bottom of the leg anti-clockwise (left) to raise the height.

Mounting plate

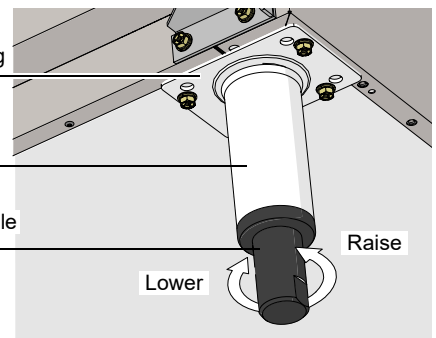
Leg

3. Turn the black plastic foot at the bottom of the leg clockwise (right) to lower the height.

Adjustable plastic foot

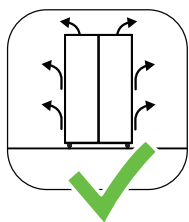
Lower

Raise



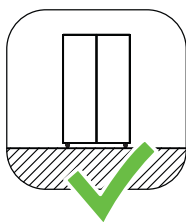
Installation Guidelines

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



Ventilation

Ensure all ventilation requirements below are met.



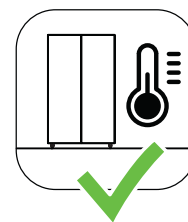
Surface

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



Door Opening

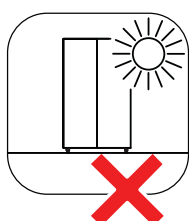
Allow adequate space for the door/s to open and close properly.



Climate Class

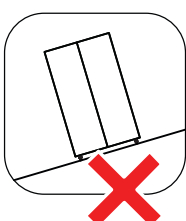
The cabinet must be installed in an environment within its climate class.

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



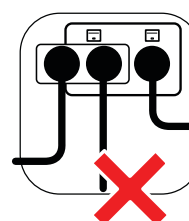
Sunlight

Do not install the cabinet in direct sunlight.



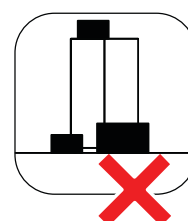
Uneven Surface

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 of or on top of the cabinet.

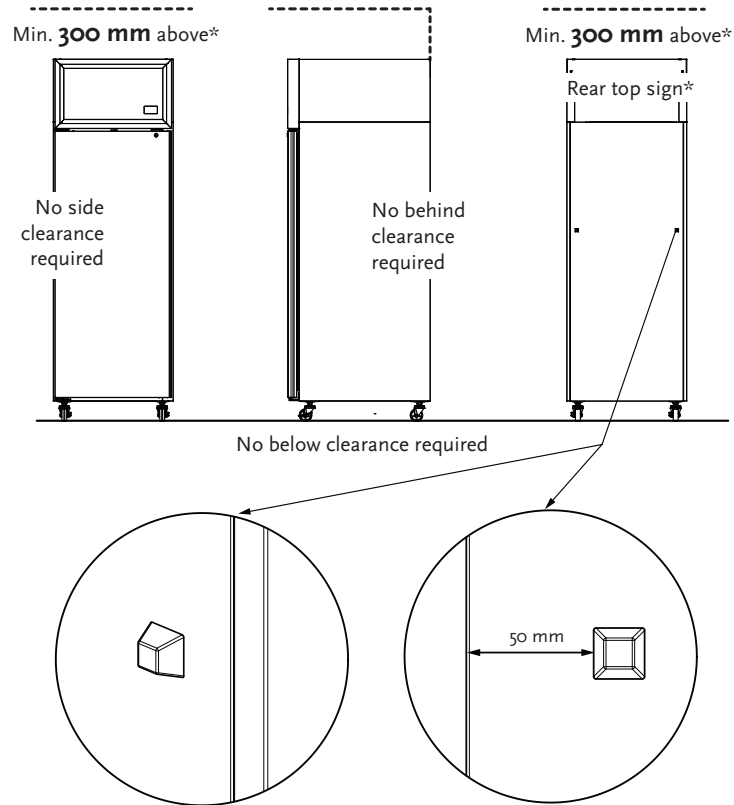
Ventilation Requirements

See the diagram over for ventilation requirements.

When positioning the cabinet, ensure there is at least a 300 mm space above the top panel. Adequate ventilation around the refrigeration cartridge is essential for efficient operation. The air surrounding the refrigeration cartridge must not exceed 40°C.

Keep the ventilation slots at the top of the cabinet clear at all times and **never** store cardboard cartons or other objects on top of the cabinet.

In certain climatic conditions, condensation may form on the back of the cabinet. If this is observed, ensure air circulation between cabinet and wall by adhering two of the enclosed self-adhesive blocks to the cabinet back as shown.



Adhesive Blocks

If required use two adhesive blocks on the rear of the cabinet. Position the blocks on the left and right hand sides of the cabinet, 50 mm from the cabinet edge, and approximately half way up.

Shelves

The cabinet is fitted with five wire shelves per door, which may be positioned at different heights to suit various products

Shelf Rails Each wire shelf is held in place by two shelf rails, which clip into the shelf support strips, and can move up and down to the desired shelf position.

The support strips are numbered for easy positioning of the shelf rails. You can see the numbers in the bottom left hand corner of the shelf rail.

Procedure 4: To fit a shelf rail

The shelf rails hook into the shelf support strips on the left and right sides of the cabinet.

1. Engage the rear hook on the shelf support strip first, then the front hook.

2. Check that the shelf rail is secure.



Procedure 5: To remove a shelf rail

1. Pull the front of shelf rail **up** and **away** from the vertical support. This will free up the front section of the rail.
 2. Pull the rear clip in the shelf rail **forward** and **away** from the cabinet.
-

Procedure 6: To adjust a shelf rail

The holes in the shelf support stripes are spaced at different heights to allow for various shelf positions.

1. Remove the shelf rail as above.
 2. Hook the shelf rail into the notch features on the shelf support strips.
-



Repositioning Shelves

Procedure 7: To reposition a standard shelf

1. Unload the shelf and remove it from the cabinet.
 2. Move each shelf rail to the new position in the shelf support strips (see Procedure 6 above).
 3. Replace the shelf back in the cabinet.
-

4 Operation

Loading Product

Let the cabinet run for 30 minutes before loading it with product for the first time. When loading the cabinet:

- Do not exceed a maximum load of 46 kg per shelf (standard shelves).
- Remove some product if the shelves are flexing and do not let anything hang over the shelves because this might stop the doors from shutting or cause potential cabinet damage.

Light Switch

Switch the lights on and off by pressing and holding the **AUX** button on the electronic controller display (see “Buttons and Display” on page 14).

5 Electronic Controller

Overview

The product is fitted with an AoFrio SCS Connect electronic controller. The controller is located above the door/s and is visible from the outside of the cabinet.

The controller does not control the cabinet body or door heater elements.

The controller is pre-programmed. SKOPE does not recommend changing the settings unless it is absolutely necessary. To ensure efficient operation, the controller automatically forces a defrost cycle when required.

IMPORTANT

The controller must only be adjusted by an authorised service agent.

Controller Faceplate

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

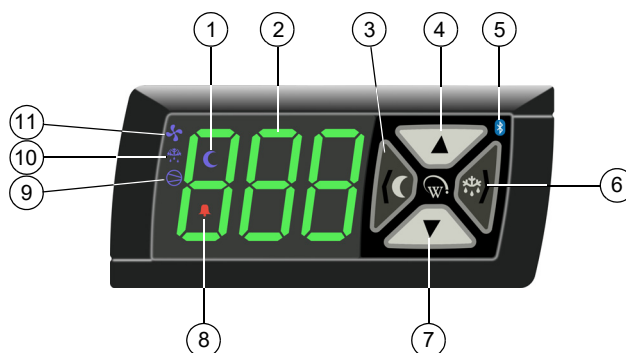


Table 2: Controller faceplate

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

Service Mode Service mode can be accessed and used via the SCS Connect Field app (see “SCS Connect Field App” on page 16), or the controller faceplate.

Note: A 9-digit PIN is required to access service mode via the controller buttons. Contact your User Manager to receive your activation code.

Procedure 8: To enable and use service mode via the controller faceplate

1. Press and hold the up and down buttons simultaneously until prompted to enter the 9-digit PIN.
 2. Enter service mode PIN.
 3. Use the up, down, back/abort and next/enter buttons to navigate to the required category.
-

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 or [MAN80199 “SCS Connect Electronic Controller”](#) for further information.

Apps

SCS Connect Field App The SCS Connect Field app is designed for service technicians, and provides access to the controller from mobile devices with Bluetooth capability. The app provides information on data logging, alarm notification and diagnostic control.

See “SCS Connect Field App” on page 16 for information on setting up and using the app.

SCS Connect Track App The SCS Connect Track app is used to upload data from cabinets fitted with a Wellington SCS Connect electronic controller.

SKOPE-connect App The SKOPE-connect app is designed for end users 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, opening and closing, hours and pre-set temperature setpoints for specific product.

The app may be useful for diagnostics. Download from the Google Play Store, or Apple App Store.



SCS Connect Field App

Connecting The SCS Connect Field app gives authorised service technicians wireless access to the controller from mobile devices with Bluetooth capability. The app provides data logging, alarm notification, and diagnostic control.

Procedure 9: To install the SCS Connect Field app

Before you start

- When you first run the app, you will need to enter an activation code – a 9-digit PIN. If you don't already have one, contact your User Manager to request an activation code. You will need to be connected to the internet at the time of activation.
- Your activation code is unique to you, and determines your personal level of access for the app. **Never** share it with anyone else. The same code will give you access to all SCS apps you are authorised to use.

1. Download and install the Connect Field app:

- Apple App Store:
<https://apps.apple.com/nz/app/scs-connect-field/id1172570106>.
- Google Play Store:
<https://play.google.com/store/apps/details?id=air.com.wdtl.scs.diagnostic.mobile>



2. Make sure you are connected to the internet, and enter your 9-digit activation code.

3. Once activation is complete, you must define a 4-digit PIN. This can be any code unique to you. Each time you start the app, you will be required to enter this same PIN. This is to prevent other people accessing the app from an unlocked phone.

Procedure 10: To connect to a controller

1. Check that the Bluetooth logo on the top right of the controller faceplate is unlit, indicating that the controller is ready to connect to a device.

Note: A flashing Bluetooth logo indicates that the controller is currently connected to a device.

2. Open the SCS Connect Field app.

3. Select the controller from the list of visible controllers.

Note:

- This list is filtered by your activation permissions, so devices you are not authorised to connect to will not be displayed.
- The signal bars indicate how close each cabinet is.



4. Select "CONNECT" to connect to the controller.

5. Check that the Bluetooth logo on the top right of the controller faceplate is flashing, indicating that the controller is connected.

App Menu Items You can find information and make changes to the connected controller and its cabinet via the app menu.

Home screen

Shows a graphic representation of the cabinet being controlled.

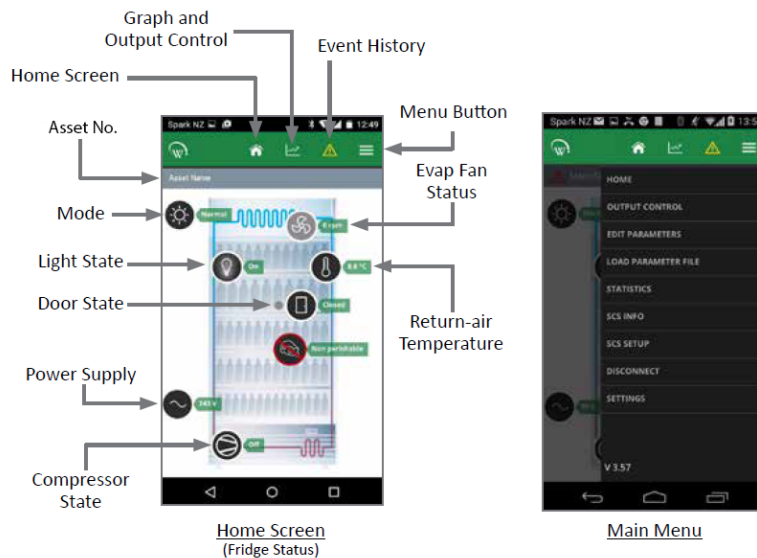


Table 3: SCS Connect Field app main menu

Item	Description	Action
Output control	Gives you control of the input sensors and switches, and output relays.	
Edit parameters	Allows you to access and edit individual controller parameters. SKOPE does not recommended changing parameters unless absolutely necessary.	If you edit a parameter, you must: select "DISCONNECT" from the menu to apply the updated parameter. record the changes on the warranty/job card.
Load parameter file	Allows you to reload a default parameter set or change to new parameter set. SKOPE does not recommended changing parameters unless absolutely necessary.	If you suspect an incorrect parameter setting, reload the complete parameter set. After loading the new parameter set, select "DISCONNECT" from the menu to apply the updated parameters.
Statistics	Displays information from the past seven days about the cabinet's activity, including temperatures, and door openings. Alarm statistics are found on the home screen and events log.	
SCS info	Displays information about the cabinet and the controller version.	
SCS setup	Allows you to add or change SCS info (see above).	
Disconnect	Allows you to disconnect from the currently connected controller.	
Settings	Allows you to change the app's general settings and see which databases you have activated. You can have more than one database activated at the same time.	To add a new database, select ACTIVATE ANOTHER DATABASE, and enter the new database's unique activation code.

Table 4: Parameter numbers

Model	Parameter numbers	
ProSpec Fridge Series	PG21.UPR.1.SD	616
	PG21.UPR.2.SD	617

Faults and Alarms

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.

Faults

Table 5: 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:	Test the incoming voltage to ensure it is correct. The test voltage needs to be between 198 and 264 volts.
	• poor line voltage	<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.
	• rural location	
	• 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.
	• controller	<ul style="list-style-type: none"> The controller may be reading incorrectly and need replacing.

Table 5: Faults (continued)

Description	Possible root cause	Actions
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:	
	• power supply overloaded	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.
	• poor line voltage	
	• multi-box use	• Check that there are not too many plugs using the same multi-box adaptor causing the voltage to drop.
	• rural location	
	• voltage setting parameter	• 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.
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.	• controller	• The controller may be reading incorrectly and need replacing.
	• 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.
	• Poor installation or ventilation	<ul style="list-style-type: none"> • Check the installation guidelines. • If fitted, check the rear spacers are extended.
	• Condenser fan motor or blade	• Check that the condenser fan blades are in place and all condenser fans are operating correctly.
	• Controller	The controller may be reading incorrectly and need replacing. <ul style="list-style-type: none"> • Confirm the temperature reading with an independent thermometer.
	• Very high ambient temperature	• Check if the probes are faulty and reading incorrectly.

Table 5: 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.

Alarms

Table 6: 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 6: 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>	<ul style="list-style-type: none"> Excessive door openings 	<ul style="list-style-type: none"> Make sure the door is not opened unnecessarily.
		<ul style="list-style-type: none"> Door being left open 	<ul style="list-style-type: none"> Ensure the door is closed.
		<ul style="list-style-type: none"> Door leaking air (bad gasket or 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. If required, replace the door gasket.
		<ul style="list-style-type: none"> Sealed refrigeration system 	<ul style="list-style-type: none"> Consider a cartridge swap.
		<ul style="list-style-type: none"> Incorrect setpoint 	<ul style="list-style-type: none"> Reload the correct parameters using the SCS Connect Field app.
		<ul style="list-style-type: none"> Too much product 	<ul style="list-style-type: none"> If the cabinet is overloaded, remove the excess product.
		<ul style="list-style-type: none"> Blocked return air grille 	<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"> Warm product loaded into cabinet 	<ul style="list-style-type: none"> Wait for the product to cool down.
		<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 the that evaporator fan motor is working. Check the defrost cycle and that the defrost probe are working correctly. Check that the drain is clear.
		<ul style="list-style-type: none"> Cartridge gasket leaking (to cabinet seal or lid seal) 	<ul style="list-style-type: none"> Check that the gasket is intact and not broken and leaking. Ensure the installation levers are lifting the cartridge up onto the case correctly.
		<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"> Incorrect parameter settings 	<ul style="list-style-type: none"> Use the SCS Field app to check that the correct setpoint and parameters have been selected.
		<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.
		<ul style="list-style-type: none"> Compressor or gas leak 	<ul style="list-style-type: none"> Swap the cartridge.

Table 6: Alarms (continued)

Code	Description	Possible root cause	Action
15	Excessive condensing temperature protection The system was operating at an excessive temperature and has shut down to prevent permanent damage.	<ul style="list-style-type: none"> Very high ambient temperature 	Cartridge swap is not required. <ul style="list-style-type: none"> Ensure that the cabinet is operating in its climate class.
		<ul style="list-style-type: none"> Condenser is not clean 	<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"> Condenser 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"> Incorrectly placed condenser probe 	<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.
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.

Table 6: Alarms (continued)

Code	Description	Possible root cause	Action
19	Failed to reach set temperature The refrigeration system has been operating continuously for a long period without reaching the set temperature.	• 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.
		• Poor installation or ventilation	• Check the installation guidelines.
		• Frozen or blocked evaporator coil	<ul style="list-style-type: none"> De-ice the coil and check the that evaporator fan motor is working. Check the defrost cycle and that the defrost probe is working correctly.
		• 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.
		• 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.
20	Over-cooling product The internal temperature is too low. The system has temporarily shut down until the temperature has returned to normal.	• Set temperature has been raised by a large amount	<ol style="list-style-type: none"> Confirm if really too cold. Change parameters accordingly.
		• Controller	• 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.	• Faulty fan motor	• Replace the fan motor.
		• Fan blade fault (imbalance, debris, blockage)	• Visually inspect the fan blades and replace if faulty.
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.

Table 6: Alarms (continued)

Code	Description	Possible root cause	Action
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.
30	Excessive automatic defrosting The system is automatically defrosting too frequently.	• Compressor or gas leak	• Swap the cartridge.
		• 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.

Table 6: Alarms (continued)

Code	Description	Possible root cause	Action
31	Compressor stalling The compressor is stalling on start up.	<ul style="list-style-type: none"> Door not self-closing or door gasket leaking 	<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. If required, replace the door gasket.
		<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"> 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"> Cabinet, door, or cartridge 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"> 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.

6 Replacement Procedures

Electrical Safety

Caution

Disconnect the cabinet from the mains power supply before attempting **any** maintenance.

Correct wiring routing is as important as using the correct components for compliance with safety and radio interference regulations.

In order to maintain safety and compliance with regulations, make sure you replace any wiring that is disturbed during servicing and secure it back in its original position.

Procedure 11: To disconnect the cabinet from the mains power supply

1. Switch the cabinet off at the mains power supply.
2. Unplug the power cord from the mains power supply.

Lighting

The cabinet is fitted with LED modular interior light(s). 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.

Refer to Table 7 below for replacement light specifications.

Table 7: Light specifications

Model	Interior light	
	Description	Part No.
PG21.UPR.1.SD – PP1R	Interior LED light	SKC-2-190-0099-0 – Opaque
PG21.UPR.2.SD – PP2R		

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

- LED modular light
- Light power supply (1 per cabinet)
- Interior wiring loom (1 per door)

Power is supplied to the lights by the power supply (located in the cabinet electrics panel above the door/s) via the wiring looms which run down through a port on top of the cabinet.

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

Refer to Table 22, "Cabinet and cartridge troubleshooting," on page 63 to determine which component may be at fault, and the procedures over the next few pages for component replacement instructions.

Ensure you disconnect the cabinet from the mains power supply before removing any parts.

Procedure 12: To replace an interior LED light assembly

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
-

2. Remove all wire shelves from the cabinet.
-

3. Remove the shelf rails from the same side of the cabinet as the LED assembly you are replacing.
-



Under the LED light assembly are five clips which hold the light in place. These clips are positioned at the top and spaced 300 mm down the cabinet wall.

4. Firmly squeeze the light assembly and pull it away from the clips.

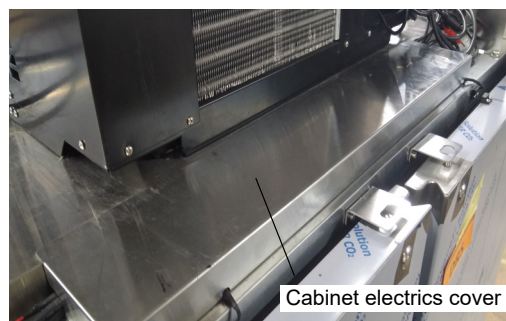


5. Cut the lighting loom cable and remove the light assembly from cabinet.
 6. Rewire the lighting loom to the Ensto connector and connect new LED light assembly.
 7. Reattach the LED light assembly and clip into the cabinet.
 8. Reconnect the cabinet to the mains power supply and check for correct operation.
-
-

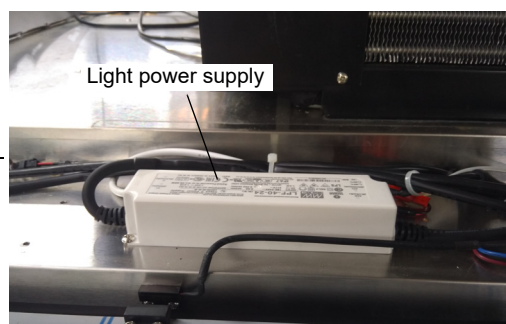
Procedure 13: To replace the LED driver power supply

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the front panel assembly (see Procedure 37, on page 62), sign sides, and back strip. If fitted with key locks, open the door/s and unscrew the sign from the brackets below the sign.
3. Lift the cartridge back to access the cabinet electrics cover.

4. Unscrew the cabinet electrics cover.



5. Remove the light power supply.



6. Fit the new light power supply.

7. Reassemble the cabinet and test for correct operation.

Procedure 14: To replace an interior wiring loom

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Unplug the light from the wire loom.
3. Gain access to the cabinet electrics panel (see Procedure 13 above).
4. Move up to the cabinet roof, and unplug the wiring loom from the light power supply.
5. Remove the putty from the loom entry point on the cabinet roof, and pull the loom up through the cabinet ceiling.
6. Refit the new loom and reassemble the cabinet. Ensure that:
 - all plugs are clean, correctly fitted and plugged in.
 - the ceiling and roof hole are completely sealed with putty.

Doors

Door sealing is critical. The gasket must fully seal around the entire cabinet perimeter because any air gaps will form ice inside the cabinet.

WARNING

For safe operation the bottom hinge bracket must always be fitted with a split pin.

Alignment Adjustment If a door is out of alignment, realign it by loosening the top hinge bracket fixing screws, and move the top of the door as required.

Replacing the 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, the door can be removed from the cabinet.

Procedure 15: To remove the door

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).

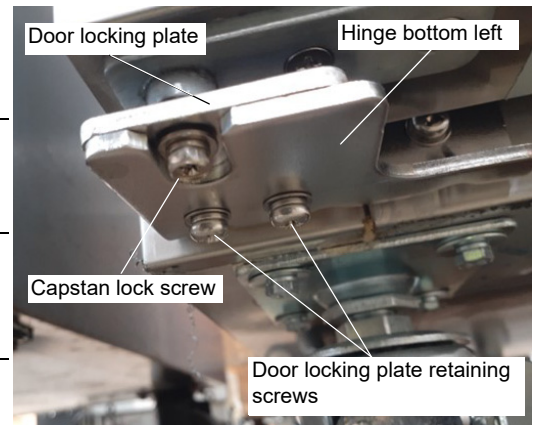
2. Loosen the door locking plate retaining screws.

3. Use an 8 mm socket wrench to take up tension on the capstan lock screw.

4. Remove the door locking plate retaining screws.

5. Remove the tension.

6. Remove the door from the cabinet.



Procedure 16: To replace the top hinge bracket

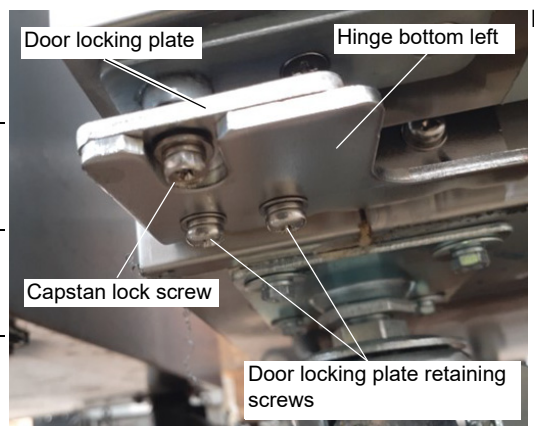
1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).

2. Follow Procedure 15 above to remove the door.

3. Remove the top hinge from the top of the door and replace it.

Procedure 17: To replace the door

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. If replacing the door with a new door, confirm that the door locking plate is in the correct position.
3. Position the door in the top and bottom hinges.
4. Use an 8 mm socket wrench on the capstan lock screw to put the door locking plate into the correct position.
5. Rotate the door locking plate until the mounting holes align. This will apply tension through the capstan to close the door.
6. Fit door locking plate and retaining screws.
7. Check the tension by holding the door open about 100 mm and letting it go. The door should gently close, and the gasket form an airtight seal with the cabinet.

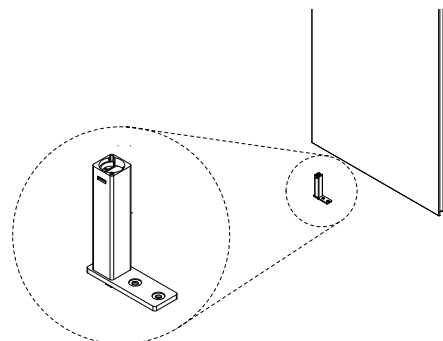


Replacing the Capstan

When the door tension can no longer be adjusted, replace the self-closing mechanism.

Procedure 18: To replace the capstan

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the door from the cabinet (see Procedure 15, on page 29).
3. Remove the 2 x screws from the bottom of the capstan.
4. Use the tip of a screw driver or another metal instrument to pry out the capstan.
5. Fit the new capstan and fasten with 2 x screws.
6. Refit the door (see Procedure 17 above).



Refrigeration System

Before Overview**Servicing**

- Ensure you have read and understood this manual before starting any servicing.
- Ensure installation complies with electrical wiring regulations or rules, and the relevant part of the applicable refrigeration code of practice: the *Australia and New Zealand Refrigerant Handling Code of Practice 2024*.
 - [Part 1 – Self-contained low charge systems.](#)
 - [Part 2 – Systems other than self-contained low charge systems.](#)

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 signs 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

Refrigeration Cartridge Assembly

The refrigeration cartridge is a top-mounted, electronically controlled removable cartridge. For safety and compliance, only repair the cartridge with SKOPE-supplied parts made specifically for this cabinet. Other parts may appear to be suitable, but may not be approved or safe for use in an appliance with hydrocarbon refrigerant.

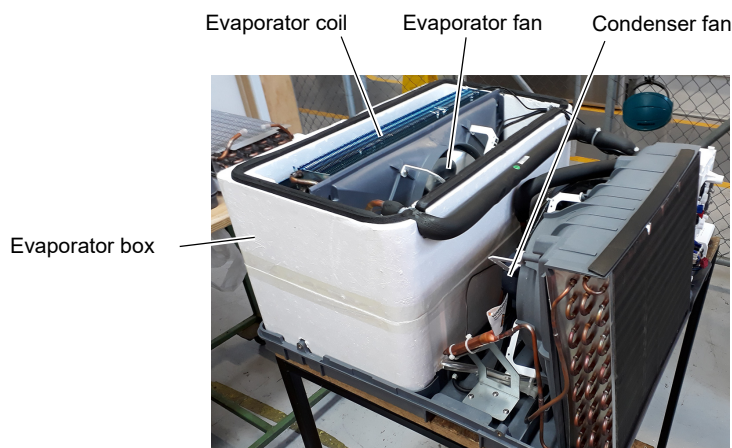
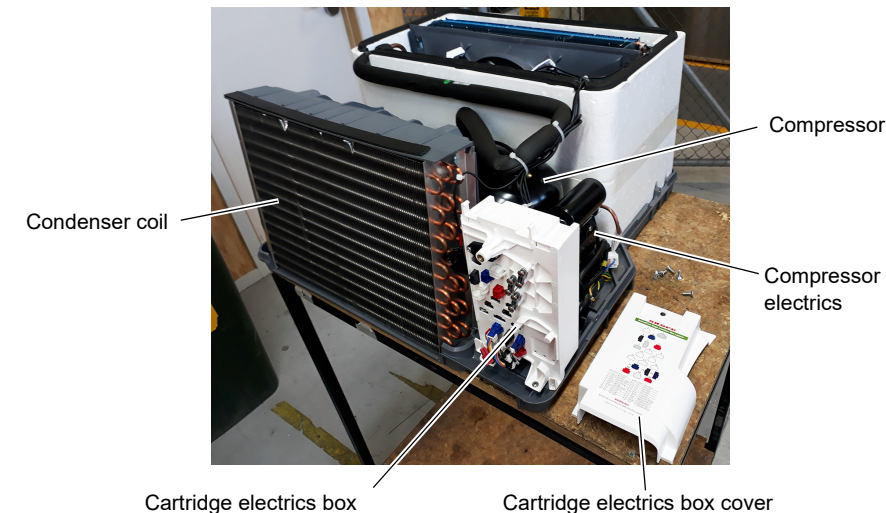
The cartridge must only be used on a SKOPE hydrocarbon-compliant cabinet. Refer to the cabinet rating label to determine if the cabinet is suitable for use with a hydrocarbon cartridge. The rating label **must** state refrigerant as R290. If the label states a different refrigerant, or does not state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

WARNING

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

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 top of the side of the cover.



Specifications for the model are in Table 8 below. Verify the model and basic requirements before servicing or ordering spare parts.

Table 8: Cartridge specifications

Cartridge model	UTHCNI-0010 (spare part number: HB0070832517A)
Compressor	Wanbao FN90M
Compressor capacity	740 Watts
Refrigerant/charge	R290/99 g

Not Cooling Fault If a customer reports a “not cooling” fault, and it has been established that the cabinet is not cooling, follow the “On-site Work Procedure” on page 65 when making the service visit.

Removing the Cartridge Follow the steps below to remove the refrigeration cartridge from the cabinet. Ensure you disconnect the cabinet from the mains power supply before removing the cartridge. The cartridge is heavy and requires a minimum of two people to lift it from the cabinet. Steps or a platform about one metre high are suggested to allow the cartridge to be safely lifted, carried and put down at waist height.

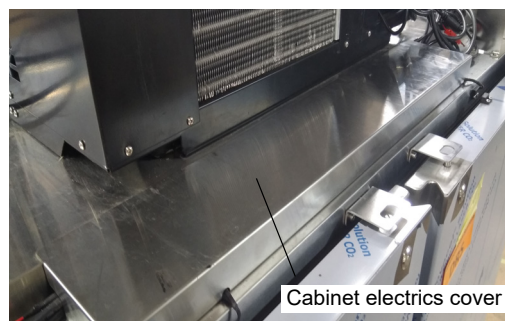
Procedure 19: To remove the refrigeration cartridge

Before you start

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the front panel assembly (see Procedure 37, on page 62). If fitted with key locks, open the door/s and unscrew the sign from the brackets below the sign.
3. Detach the electronic controller assembly from the top of the cabinet, and clip it onto the top of the cartridge.
4. Lift the cartridge back to access the cabinet electrics cover.

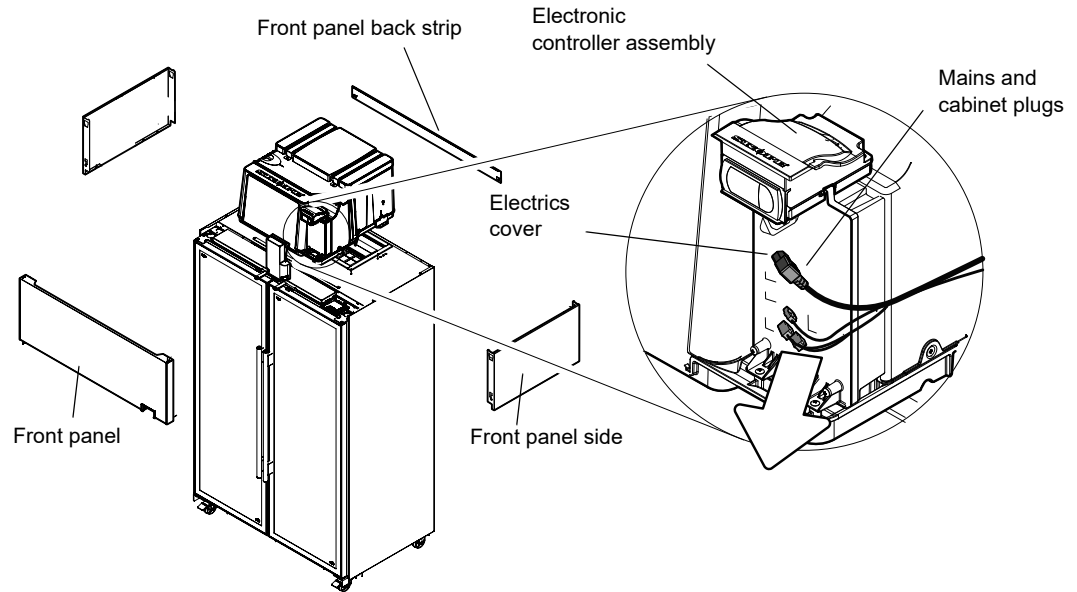
5. Unscrew the cabinet electrics cover.



6. Remove electrics cover and unplug the mains supply plug and cabinet plugs.

Note: The cabinet plugs (plugs feeding into the cartridge) and electronic controller plugs (plugs feeding to the electronic controller assembly) do not need to be unplugged.

7. Remove the sign back strip. Note: If necessary you can remove the front panel sides.
8. Undo the two cartridge fixing screws (one on each side of the cartridge) and, with two people, lift the cartridge off the cabinet.
9. Replace the seal if it is damaged, because any gap may allow ice to build up.
10. When refitting the cartridge, ensure that you:
 - check that the gasket on the top of the cabinet is in good condition.
 - reconnect the mains and cabinet plugs.
 - refit the electrics cover.
 - re-fix the cartridge back in place.



Replacing the Cartridge The SKOPE ActiveCore refrigeration cartridge is interchangeable between bottom and top mount hydrocarbon (R290) ActiveCore fridges.

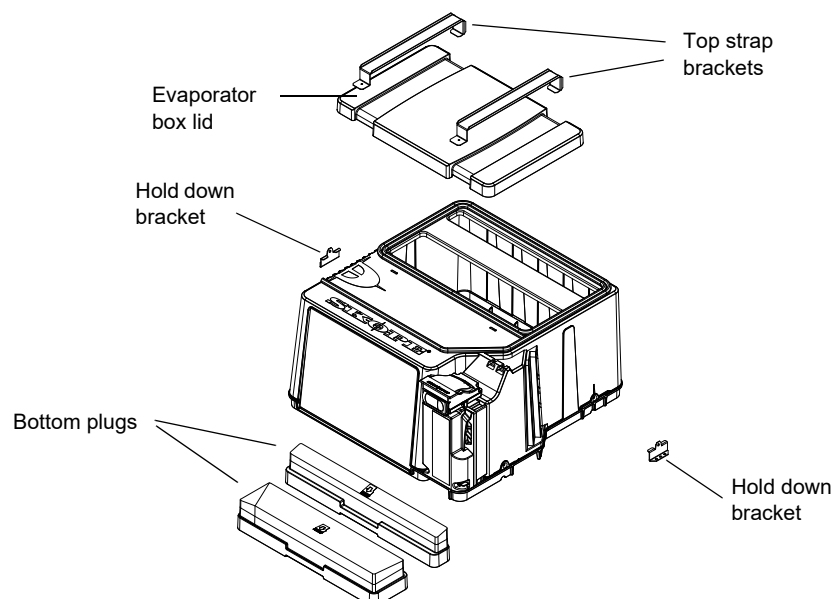
WARNING

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

When changing from a bottom mount cabinet to a top mount cabinet, an evaporator lid, strap brackets and hold down brackets must be fitted to seal the top of the evaporator box, and to fix the cartridge to the top of the cabinet.

New spare part refrigeration cartridges supplied by SKOPE are not supplied with the evaporator box lid, top strap brackets or hold down brackets. When replacing a faulty top mount refrigeration cartridge, keep these parts for using on the new spare part replacement cartridge.

The evaporator box lid, top strap brackets and hold down brackets can be ordered in addition to the refrigeration cartridge if required. See Table 18, "Parts – Fridge cartridge assembly," on page 58 for spare part numbers.



Procedure 20: To replace a cartridge**Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. On the new cartridge, push the bottom plugs out of the bottom of the evaporator box.
4. Swap the evaporator box lid, top strap brackets and hold down brackets from the existing cartridge to the new cartridge.
5. Fit the new cartridge to the cabinet.
6. Reassemble the cabinet, and test for correct operation.

Diagnosing a Sealed System Fault

The following test is useful to do in a hydrocarbon-compliant workshop (see “Off-site Work” on page 32) to work out if the system is short of gas. Always perform it before opening the refrigeration system.

It is helpful to have a correctly operating cartridge running beside the cartridge being serviced to compare behaviour.

Note: This diagnostic procedure is indicative only.

Procedure 21: Refrigeration system diagnostic test**Before you start**

- Make sure you are in a suitable workshop.
- Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Place the cartridge on the bench and remove the cover (see Procedure 23, on page 38).
4. Connect the service probe to the red plug on the cartridge.
5. Connect the refrigeration cartridge to the power supply and allow to run for approximately 10 minutes, until the evaporator temperature stabilises.
6. Refer to Table 9 below to determine if the system charge is correct.
 - A system with the correct refrigerant charge will frost back towards the compressor.
 - The point where the frost stops is affected by the ambient temperature.

Table 9 lists the frost stop point on systems at different levels of charge.

Table 9: Frost stop point

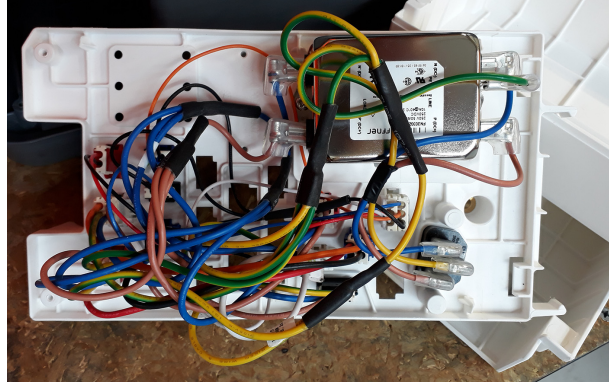
Ambient	50% charged	75% charged	100% charged
10°C	Cold with light sweat	Cold with light sweat	Frosting to compressor
20°C	Cold with light sweat	Sweating 50 mm from compressor	Frosting to compressor
30°C	Dry	Dry	Frosting 20 mm from compressor
40°C	Dry	Dry	Sweating 50 mm from compressor

7. Determine the problem.
 - If the suction pipe frosts to the appropriate frost stop point, the charge is likely to be correct.
 - If the frost does not go back to the specified point, there may be a capillary blockage or compressor fault.
8. After you have diagnosed and repaired the fault, reassemble the refrigeration system and test run.

Cartridge Electrics Box Assembly

The cartridge electrics box assembly contains the mains supply socket, EMI filter and panel mount socket connectors for the cartridge and cabinet. Refer to the “Wiring Diagram” on page 38 or label on the electrics box cover to identify the socket connections.

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



Procedure 22: To remove and open the cartridge electrics box assembly

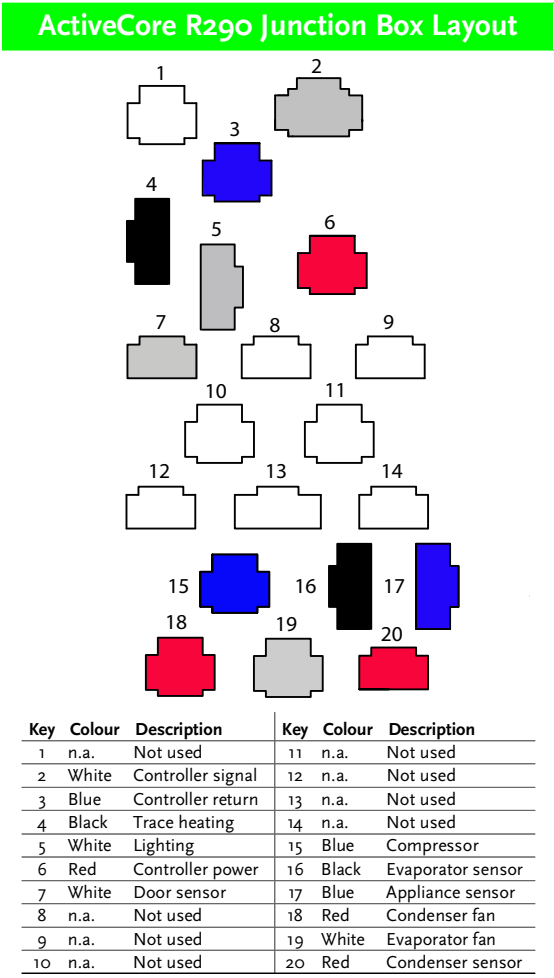
1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. If present, unclip the electronic controller from the top of the electrics box.

3. Undo the fixing screw at the top of the electrics box cover, and remove the cover.



4. Unplug all the cartridge plugs from the cartridge electrics box.
5. Undo the two fixing screws at the base of the electrics box, and detach the electrics box from the cartridge.
6. To open the electrics box, undo the two fixing screws on the back of the electrics box and swing the back cover off.

Wiring Diagram



Cartridge Cover

Remove the cartridge cover to access parts within the cartridge assembly.

Procedure 23: To remove the cartridge cover

Before you start

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).

3. Unscrew the four machine screws from the sides of the refrigeration cartridge and lift the cover off the cartridge.



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 the connections to ensure that no plugs have come loose. Refer to the "Wiring Diagram" on page 38 or the label on the electrics box cover to identify the condenser fan plug and socket in the electrics box.

IMPORTANT

Replace the motor with the same SKOPE OEM part.

Do not use alternative parts.

It is important that you replace the fan blade and fan motor with the same part to ensure safety, correct alignment and refrigeration performance, and compliance. Tighten fan blade screws to the fan motor manufacturer's recommended torque setting of 1.5 Nm.

Table 10: Fan motor manufacturer recommended torque settings

Fan motor manufacturer	Torque setting
AoFrio	1.5 Nm

Procedure 24: To access and remove the condenser fan assembly

Before you start

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Remove the cartridge cover (see Procedure 23 above).
4. Open the electrics box and unplug the condenser fan motor plug (see "Cartridge Electrics Box Assembly" on page 37).

5. Cut the cable ties holding the cable along the cartridge to free up the condenser fan motor cable.



6. Remove the fan assembly (fan motor, fan blade, mounting brackets) from the cartridge by lifting the shroud up and out.

Procedure 25: To replace the condenser fan blade**Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the condenser fan assembly (see Procedure 24 above).
3. Remove the screw and washer from the centre of the fan blade, and lift the blade from the motor.
4. Fit the new blade and fix with the 12 mm flat washer and serrated head screw. Tighten the screw to the fan motor manufacturer's recommended torque setting of 1.5 Nm.
5. Reassemble the cartridge and test for correct operation.

Procedure 26: To replace the condenser fan motor**Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the condenser fan assembly (see Procedure 24, on page 39).
3. Remove the condenser fan blade (see Procedure 25 above).
4. Unplug the fan flexible cord from the cartridges electrics box (see "Cartridge Electrics Box Assembly" on page 37).
5. Detach the condenser fan motor from the fan mounting brackets by removing the four screws from the mounting brackets.
6. Fit the new motor and reattach the fan blade with the 12 mm flat washer and serrated head screw. Tighten the screw to 1.5 Nm.
7. Reassemble the cartridge, ensuring all cables are neatly cable-tied away from the fan blade, and test for correct operation.

Evaporator Fan

The evaporator fan assembly is made up of a fan motor and fan blade, both of which can be replaced when necessary. The evaporator fan flexible cord has a white plug.

If the fan stops for any reason, check all connections to ensure no plugs have come loose. Refer to the "Wiring Diagram" on page 38 or the label on the electrics box cover to identify the evaporator fan plug and socket in the electrics box.

The fan motor and fan blade are fixed to the evaporator shroud via the brackets. The shroud (complete with fan motor and fan blade) can be lifted off the evaporator box once the refrigeration cartridge cover has been removed.

IMPORTANT

Replace the motor with the same SKOPE OEM part.
Do not use alternative parts.

It is important that you replace the fan blade and fan motor with the same part to ensure safety, correct alignment and refrigeration performance, and compliance. Tighten fan blades to the fan motor manufacturer's recommended torque settings of 1.5 Nm.

Table 11: Fan motor manufacturer recommended torque settings

Fan motor manufacturer	Torque setting
AoFrio	1.5 Nm

Procedure 27: To access the evaporator fan assembly**Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Remove the refrigeration cartridge cover (see Procedure 23, on page 38).
4. Free up the cables from the putty on the edge of the evaporator box.
5. Release the control probe from the fan bracket by cutting the cable ties.

6. Lift the evaporator fan assembly up and out of the evaporator box.

**Procedure 28: To replace the evaporator fan blade****Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Remove the evaporator fan assembly (see Procedure 27 above).
4. Remove the screw and washer from the centre of the fan blade, and lift the blade from the motor.
5. Fit the new blade, ensuring it is centred within the evaporator shroud.
6. Tighten the screw to fan motor manufacturer's recommended torque setting of 1.5 Nm.
7. Reassemble the cartridge and test for correct operation.

Procedure 29: To replace the evaporator fan motor**Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the evaporator fan assembly (see Procedure 27, on page 41).
3. Remove the evaporator fan blade (see Procedure 28 above).
4. Free the fan flexible cord by cutting the cable ties.
5. Trace the cord back to the connector (near the compressor electrics) and unplug it.
6. Detach the fan motor from the fan mounting brackets by removing the four screws from the mounting brackets.

Procedure 29: To replace the evaporator fan motor (continued)

7. Attach to the replacement motor.
 - Ensure that the flexible cord points towards the bottom of the evaporator box once reinstalled.
 - Take care to re-cable tie the fan and temperature probe flexible cords back onto the mounting bracket to prevent high frequency vibration.
8. Fit the fan blade, ensuring it is centred within the evaporator shroud. Tighten the screw to 1.5 Nm.
9. Reassemble the cartridge and test for correct operation.

Compressor The compressor is located at the front of the refrigeration cartridge, beside the condenser. It must be supplied with consistent voltage over 220 volts.

Before replacing the compressor

If considering replacing the compressor (e.g. it is not going, it is causing excessive noise, it has a distinctive hissing sound and is running with a very hot body temperature):

- check the mountings to ensure there is no damage to the rubber or the washers, nuts and screws.
- check all plug connections and ensure the electrics are operating correctly.
- 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).

Capacitor



IMPORTANT

To prevent possible vibration noise, ensure that the pipes do not touch the plastic base and condenser assembly.

Compressor Electrics The compressor electrics are located on the front of the compressor.

Procedure 30: To access the compressor electrics

Before you start

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
 2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
 3. Remove the cartridge cover (see Procedure 23, on page 38).
 4. Unclip the capacitor from the relay cover.
 5. Unclip the relay cover from the compressor.
-
-

Electronic Controller

Controller Location The electronic controller is located in the electronic controller box assembly.



Procedure 31: To access the controller

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).

One-door cabinets only

2. Move the cartridge back to access the controller box assembly.
 3. Open the electronic controller box assembly by undoing the two fixing screws at the rear of the assembly.
-
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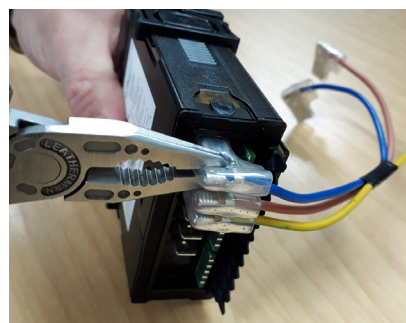
Replacing the Controller Follow the steps below to replace the electronic controller.
Note: Replacement spare part electronic controllers are not supplied with the parameter set loaded. This must be loaded via the SCS Connect Field app after replacing the controller. Internet access may be required.

Procedure 32: To replace the controller**Before you start**

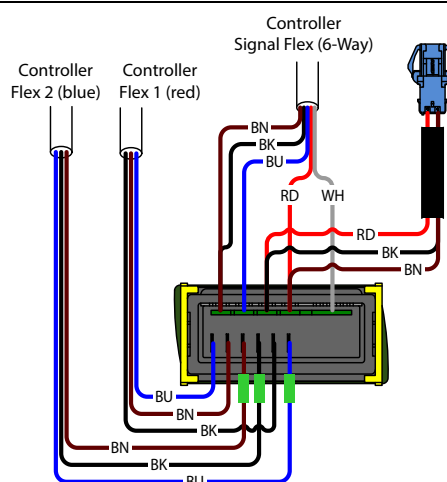
- Make sure you have the appropriate parameter file to load into the new controller.
 - Open SCS Connect Field app (see “SCS Connect Field App” on page 16) and check that the parameter file is in LOCAL.
 - If it is not available in LOCAL, ensure you are connected to the internet, search for it in SERVER, and download it to LOCAL.
- You will need needle nose pliers.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Gain access the electronic controller (see “Controller Location” on page 43).
3. Remove the cable clamps.

4. Use needle nose pliers to press in and unlock the tabs, and gently remove the QC terminals at the back of the controller.



5. Fit the new replacement controller, and connect up the terminals at the back of the controller. Fit low voltage terminals before high voltage terminals.



6. Reassemble the controller box and cabinet, perform electrical safety test as required, and reconnect to the power supply.
7. Use a mobile device to connect to the controller with the SCS Connect Field app (see “SCS Connect Field App” on page 16).
8. Navigate to the LOAD PARAMETER FILE menu.
9. 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.
10. Confirm correct file and WRITE TO SCS.

Procedure 32: To replace the controller (continued)

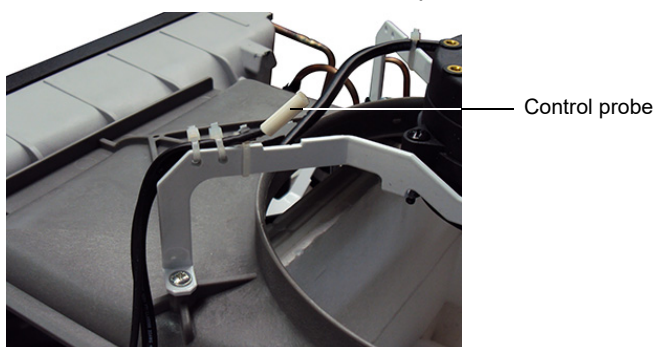
11. After WRITE TO SCS is complete, select MENU DISCONNECT to save parameter set on SCS.
12. Power cycle the controller and check that correct parameter set has been applied
13. Set up controller and cabinet links as required:
 - Corporate:
The service tech must link to the controller to the cabinet serial number in the SCS Connect Field app.
 - General Market:
The owner must set up SKOPE-connect (if in use).

Door Switch The cabinet is fitted with a door switch above each door, which tells the electronic controller when a door is opened. A small magnet in the door frame activates the switch. A cable connects the switch to the electronic controller via an inline connector on top of the cabinet.

Procedure 33: To replace the door switch

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Disconnect the door switch cable plug from the inline connector on top of the cabinet.
3. Unscrew the two fixing screws from the door switch and remove.
4. Fit the replacement door switch and connect via the inline connector.

Control Probe The control probe is cable-tied to one of the evaporator fan motor brackets.

**Procedure 34: To replace the control probe****Before you start**

- Make sure there are two people to remove the refrigeration cartridge because it is heavy.
- Make sure you take note of the original control probe cable's path, e.g. a photo.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Remove the cartridge cover (see Procedure 23, on page 38).
4. Remove the evaporator fan assembly (see Procedure 27, on page 41).
5. Detach the control probe from the evaporator fan shroud bracket.
6. Trace the probe cable back to the cartridge electrics box (see "Cartridge Electrics Box Assembly" on page 37), cutting cable ties as required, and unplug it.

Procedure 34: To replace the control probe (continued)

7. Fit the new control probe, ensuring it is:
 - cable-tied to the evaporator fan motor bracket, and bent away from the fan bracket at a 45° angle.
 - securely plugged into the rear of the cartridge junction box.
8. Following the same path as the original probe cable, fit with cable ties as necessary.
9. Reassemble the cabinet and test for correct operation.

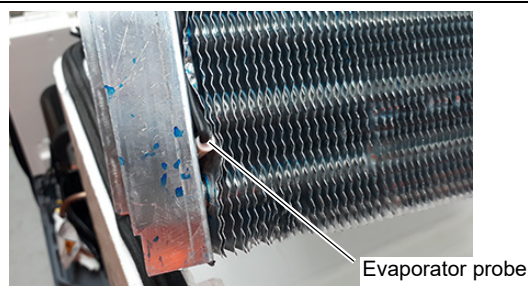
Evaporator Probe The evaporator probe is located within the evaporator coil. It controls the refrigeration system defrost initiation and termination

Procedure 35: To replace the evaporator probe**Before you start**

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

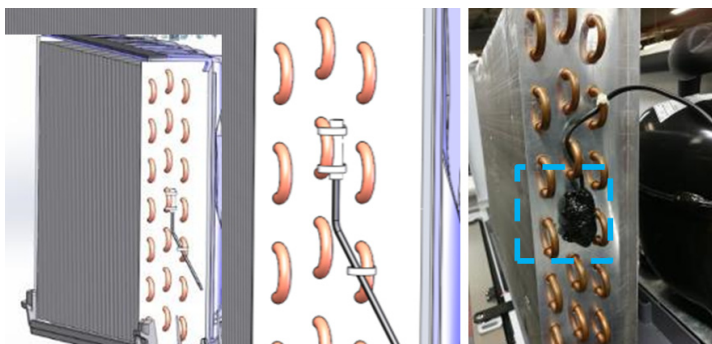
1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Remove the cartridge cover (see Procedure 23, on page 38).
4. Remove the evaporator fan assembly (see Procedure 27, on page 41).
5. Remove both pieces of putty securing the pipes and cables on the edge of the evaporator box.
6. Carefully lift the evaporator coil up and out of the evaporator box. Take care of pipes and cables when removing it.

7. Detach the probe from the side of the evaporator coil.



8. Trace the probe cable back to the cartridge electrics box (see "Cartridge Electrics Box Assembly" on page 37), cutting cable ties as required, and unplug it.
9. Following the same path as the original probe, run the new probe to the evaporator coil and secure with cable ties.
10. Fit the new evaporator probe, ensuring it is:
 - positioned in the same location as the original probe (against the side of the coil above the bottom pipe).
 - securely plugged into the electrics box.
11. Reassemble the cartridge and test for correct operation.

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



Procedure 36: To replace the condenser probe

Before you start

Make sure there are two people to remove the refrigeration cartridge because it is heavy.

1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).
2. Remove the refrigeration cartridge (see Procedure 19, on page 34).
3. Remove the cartridge cover (see Procedure 23, on page 38).
4. Detach the probe from the side of the condenser coil.
5. Trace the probe cable back to the cartridge electrics box (see "Cartridge Electrics Box Assembly" on page 37), cutting cable ties as required, and unplug it.
6. Following the same path as the original probe, run the new probe to the condenser coil and secure with cable ties.
7. Fit the new condenser probe, ensuring it is:
 - in the same position the original probe in the same location as the original probe.
 - insulated with cork tape.
 - securely plugged into the electrics box.
8. Reassemble the cartridge and test for correct operation.

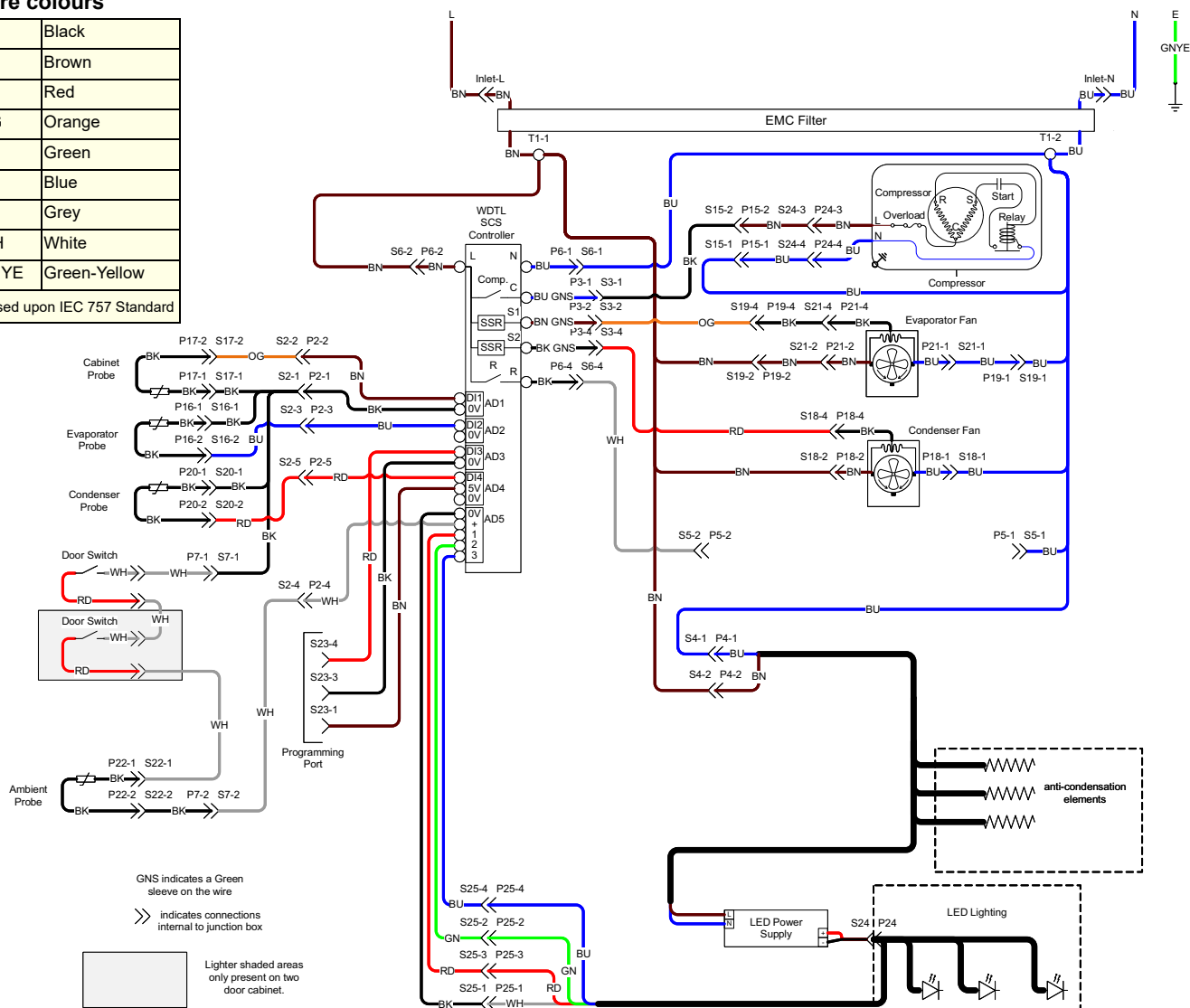
7 Wiring

Model IDs: PG21.UPR.1.SD and PG21.UPR.2.SD

Wire colours

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

Based upon IEC 757 Standard



Legend

Internal cartridge electrics box sockets/plugs			
Inlet	IEC cabinet socket/plug	S15/P15	Compressor cartridge socket/plug (blue 4-way)
S1/P1	Not used	S13/P13	Not used
S2/P2	Cartridge electrics box to controller signal socket/plug (6-way)	S14/P14	Not used
S3/P3	Cartridge electrics box to controller power socket/plug (blue 4-way)	S15/P15	Compressor cartridge socket/plug (blue 4-way)
S4/P4	Lighting/heater wire cartridge socket/plug (black 3-way)	S13/P13	Not used
S5/P5	Lighting cartridge socket/plug (white 3-way)	S14/P14	Not used
S6/P6	Cartridge junction box to controller power socket/plug 1 (red 4-way)	S15/P15	Compressor cartridge socket/plug (blue 4-way)
S7/P7	Door sensor socket/plug (white 2-way)		
S8/P8	Not used	External sockets/plugs	
S9/P9	Not used	S21/P21	Evaporator motor extension socket/plug (red 4-way)
S10/P10	Not used	S22/P22	Ambient sensor socket/plug (white 2-way)
S11/P11	Not used	S23/P23	Programming/comms port socket (blue 4-way)
S12/P12	Not used	S24/P24	LED driver DC output socket/plug (red 2-way)
S13/P13	Not used	S25/P25	Programming/comms port socket (blue 4-way)
S14/P14	Not used		

8 Spare Parts

Main Assembly

One-door Fridge – Main Assembly

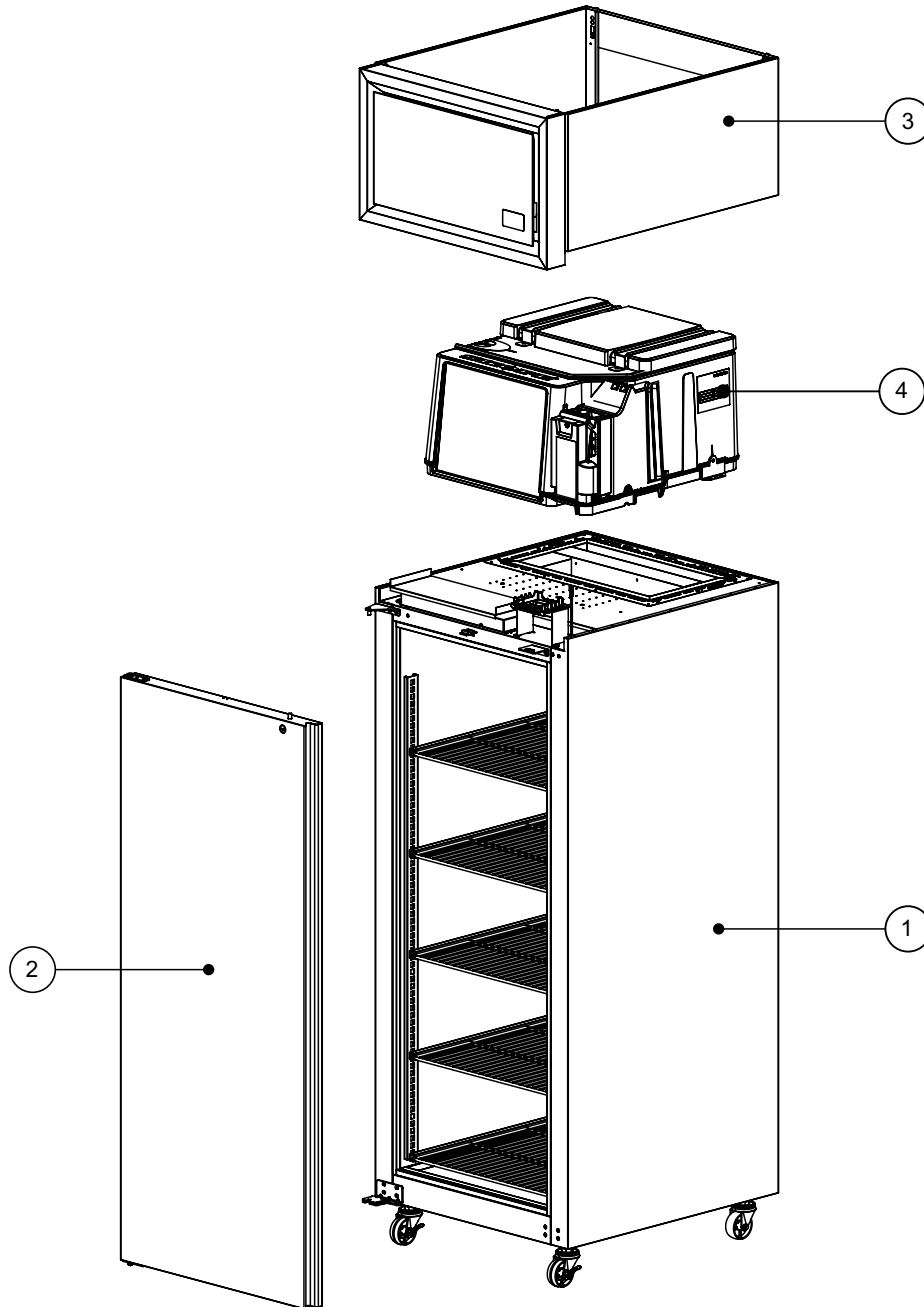


Table 12: Parts – Main assembly: One-door fridge

No.	Description	Location
1	Cabinet assembly	"One-door Fridge – Cabinet Assembly" on page 51
2	Solid door assembly	"Solid Door Assembly" on page 55
3	Front panel assembly	"Front Panel Assembly" on page 56
4	Cartridge assembly	"Fridge Cartridge Assembly" on page 57

Two-door Fridge – Main Assembly

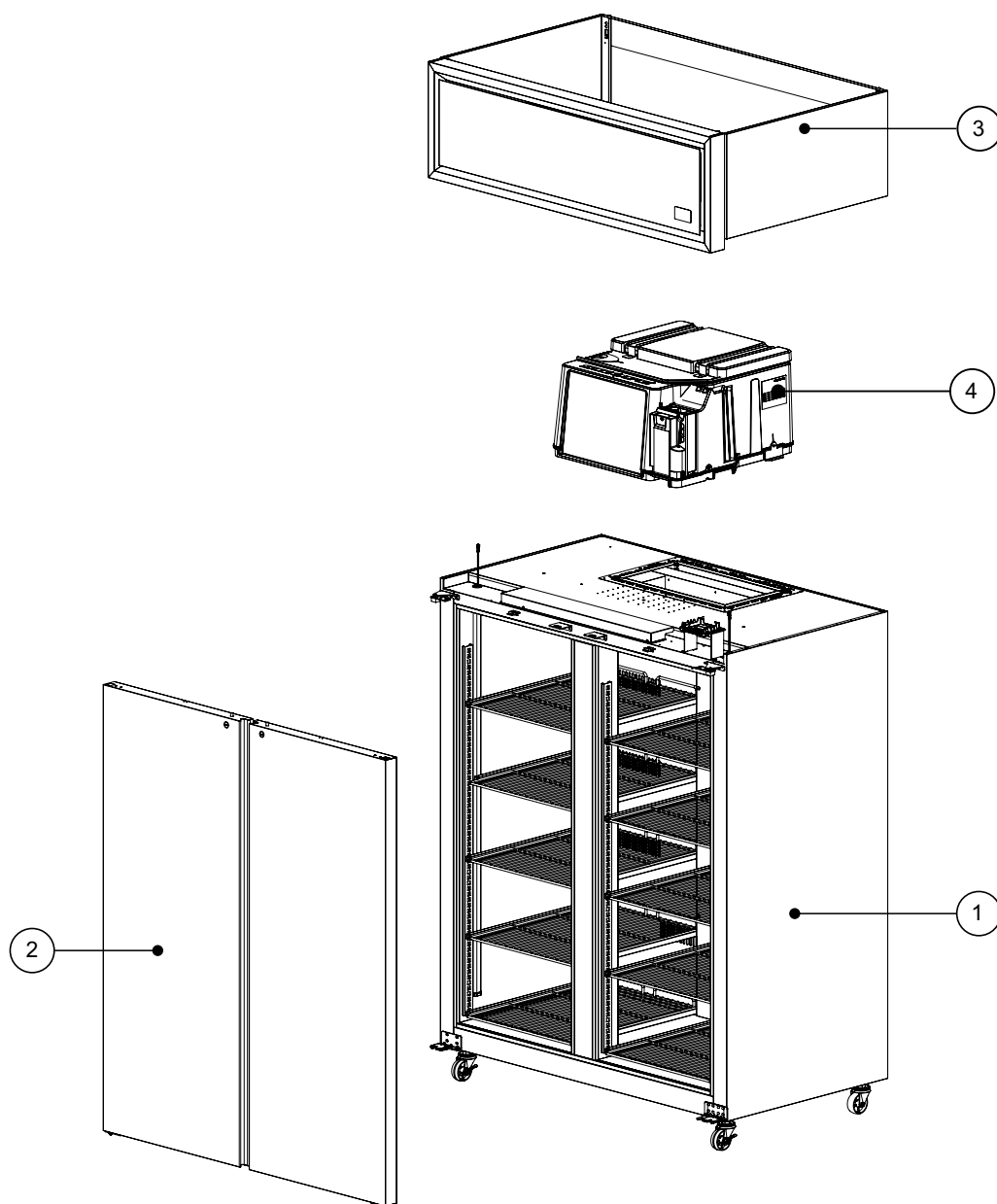


Table 13: Parts – Main assembly: Two-door fridge

No.	Description	Location
1	Cabinet assembly	"Two-door Fridge – Main Assembly" on page 50
2	Solid door assembly	"Solid Door Assembly" on page 55
3	Front panel assembly	"Front Panel Assembly" on page 56
4	Cartridge assembly	"Parts – Fridge cartridge assembly" on page 58

Cabinet Assembly

One-door Fridge – Cabinet Assembly

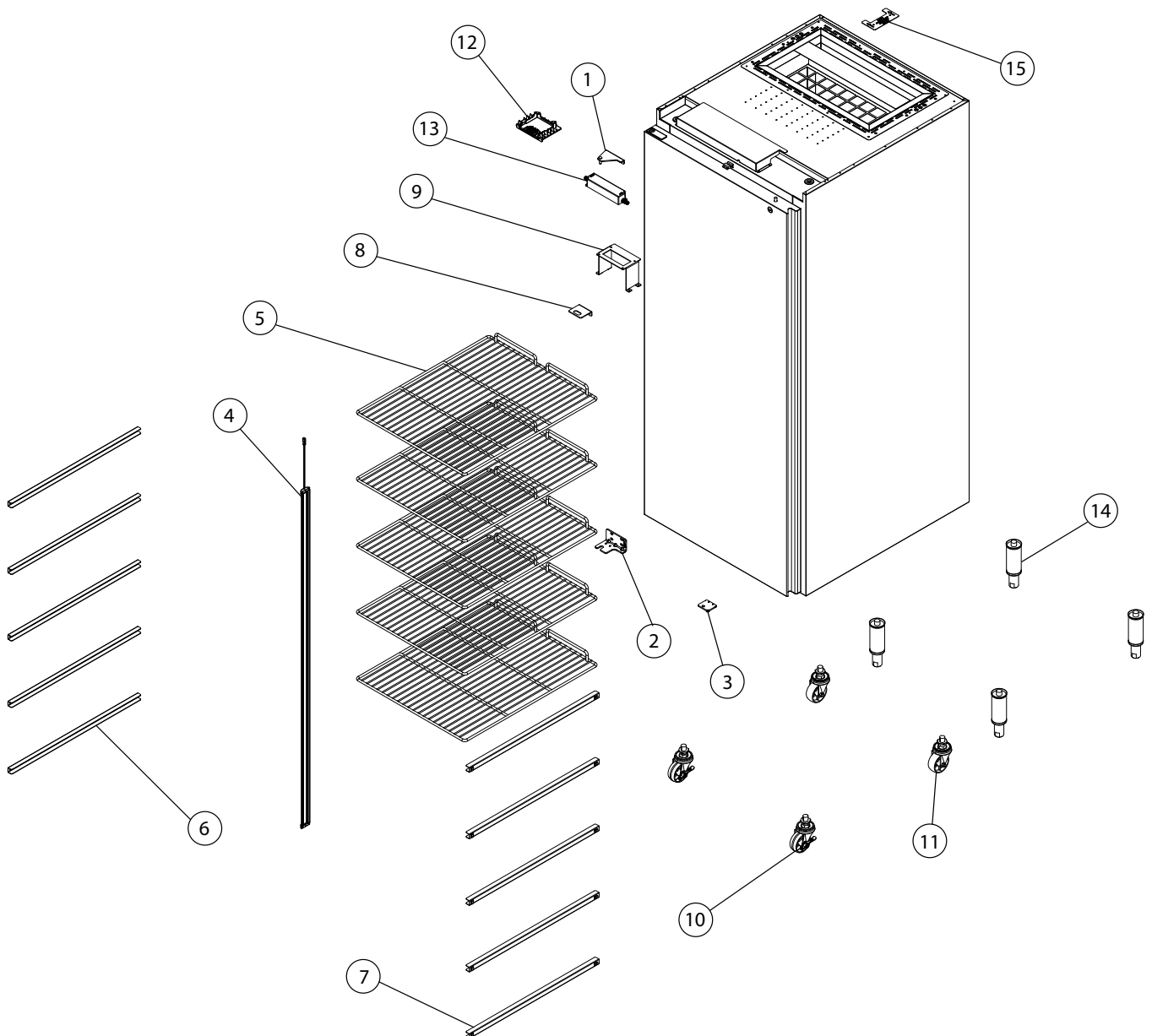


Table 14: Parts – One-door cabinet assembly

No.	Description	SKOPE spare part no.
1	Hinge top left	SKC-2-190-0007-0
2	Hinge bottom left	SKC-2-190-0008-0
3	Hinge torsion plate	SKC-2-190-0009-0
4	LED light assembly – clear*	SKC-4-050-0128-0
	LED light assembly – opaque*	SKC-2-190-0099-0
5	Shelf	SKC-2-190-0013-0
6	Shelf support strip left	SKC-2-180-0042-0
7	Shelf support strip right	SKC-2-180-0041-0
8	Door locking plate	SKC-2-190-0012-0
9	Controller mounting bracket	SKC-2-190-0011-0
10	Swivel castor	SKC-2-190-0229-0
11	Lockable swivel castor	SKC-2-190-0230-0
–	Adjustable castor kit (not shown)	KN-SXX13043-KIT
12	Controller clip ABS white	HB0070206333
13	LED power supply	ELZ11887
14	6" adjustable leg (150 mm to 180 mm)	SXX5893
–	Adjustable leg kit (not shown)	KN-SXX13042-KIT
15	Cartridge clamp bracket	SKC-0-010-0266-0
–	Door sensor assembly, including magnet* (not shown)	HB0074091496

* Indicates component sub-assembly

Two-door Fridge - Cabinet Assembly

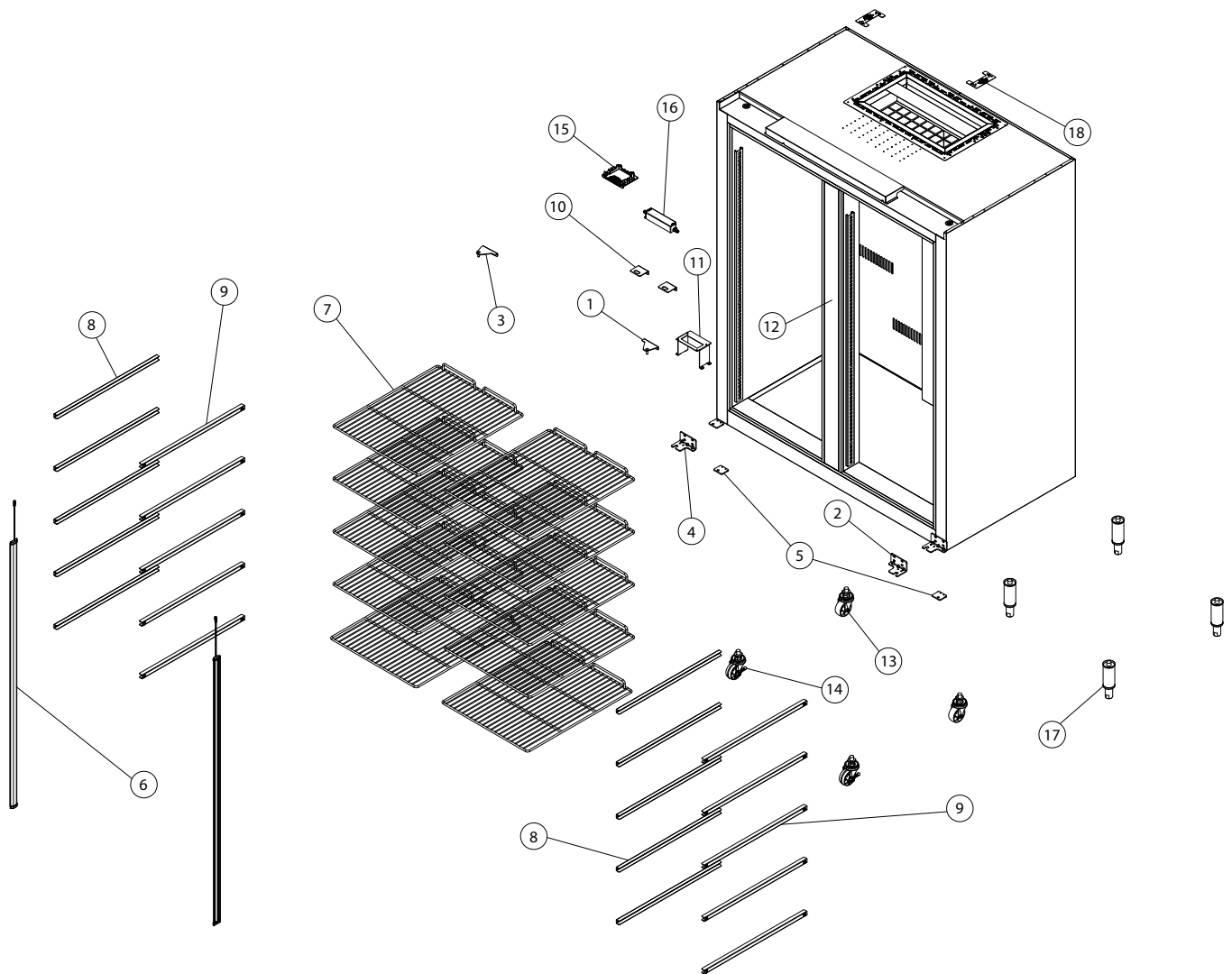


Table 15: Parts – Two-door cabinet assembly

No.	Description	SKOPE spare part no.
1	Hinge top right	SKC-2-190-0022-0
2	Hinge bottom right	SKC-2-190-0023-0
3	Hinge top left	SKC-2-190-0007-0
4	Hinge bottom left	SKC-2-190-0008-0
5	Hinge torsion plate	SKC-2-190-0009-0
6	LED light assembly – clear*	SKC-4-050-0128-0
	LED light assembly – opaque*	SKC-2-190-0099-0
7	Shelf	SKC-2-190-0013-0
8	Shelf support strip left	SKC-2-180-0042-0
9	Shelf support strip right	SKC-2-180-0041-0
10	Door locking plate	SKC-2-190-0012-0
11	Controller mounting bracket	SKC-2-190-0011-0
12	Centre pillar	SKC-0-000-1013-0
13	Swivel castor	SKC-2-190-0229-0
14	Lockable swivel castor	SKC-2-190-0230-0
–	Adjustable castor kit (not shown)	KN-SXX13043-KIT
15	Controller clip ABS white	HB0070206333
16	LED power supply	ELZ11887
17	6" adjustable leg (150 mm to 180 mm)	SXX5893
–	Adjustable leg kit (not shown)	KN-SXX13042-KIT
18	Cartridge clamp bracket	SKC-0-010-0266-0
–	Door sensor assembly, including magnet* (not shown)	HB0074091496

* Indicates component sub-assembly

Solid Door Assembly

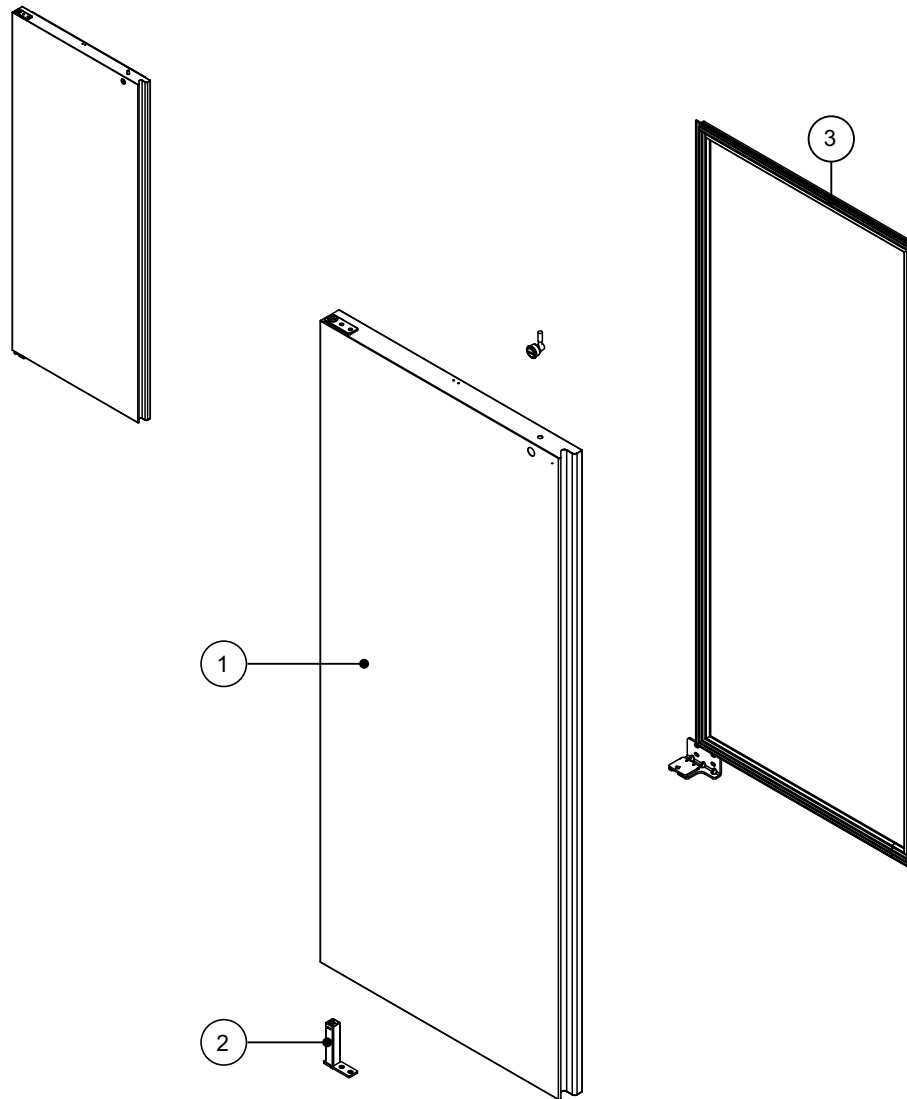


Table 16: Parts – Solid door assembly

No.	Description	SKOPE Spare Part No.	
		1-door	2-door
1	Door assembly - left hand	SKC-0-000-1022-0	–
	Door assembly - right hand (reversible option)	SKC-0010-0040-0	–
	2 Door assembly - left hand	–	SKC-0-000-1014-0
	2 Door assembly - right hand	–	SKC-0-000-1021-0
2	Capstan	SKC-2-170-0410-0	SKC-2-170-0410-0
3	Door gasket	SKC-2-190-0010-0	SKC-2-190-0010-0

Front Panel Assembly

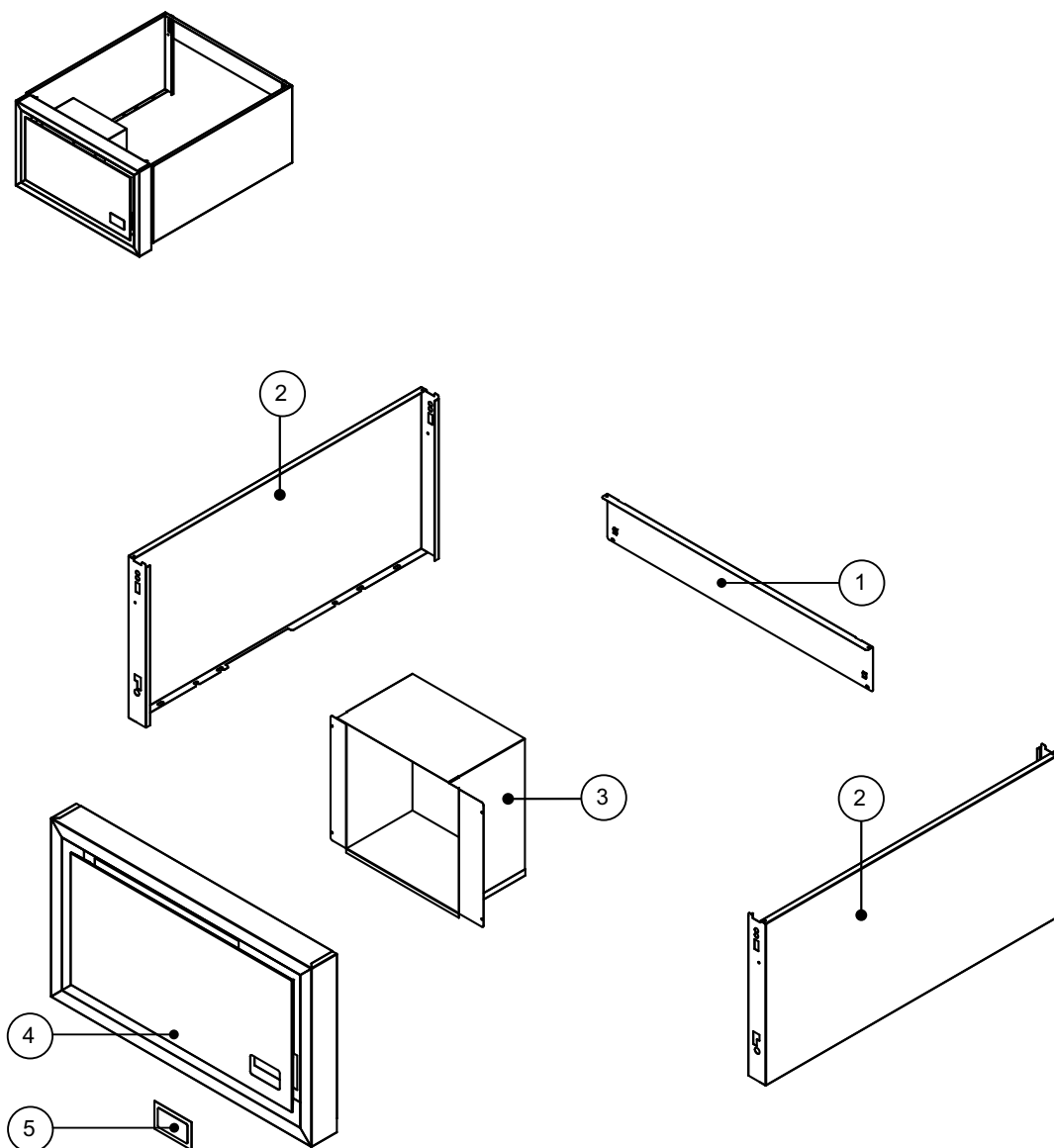


Table 17: Parts – Front panel assembly

No.	Description	SKOPE spare part no.	
		1-door	2-door
1	Sign back strip	SKC-2-180-0012-0	SKC-2-180-0057-0
2	Sign panel left	SKC-2-180-0234-0	SKC-2-180-0234-0
	Sign panel right	SKC-2-180-0011-0	SKC-2-180-0011-0
3	Baffle	SKC-0-000-1023-0	SKC-0-000-1023-0
4	Front panel assembly (minus baffle)*	SKC-0-010-0036-0	SKC-0-010-0037-0
5	Controller window	PLY124709	PLY124709

* Indicates component sub-assembly

Fridge Cartridge Assembly

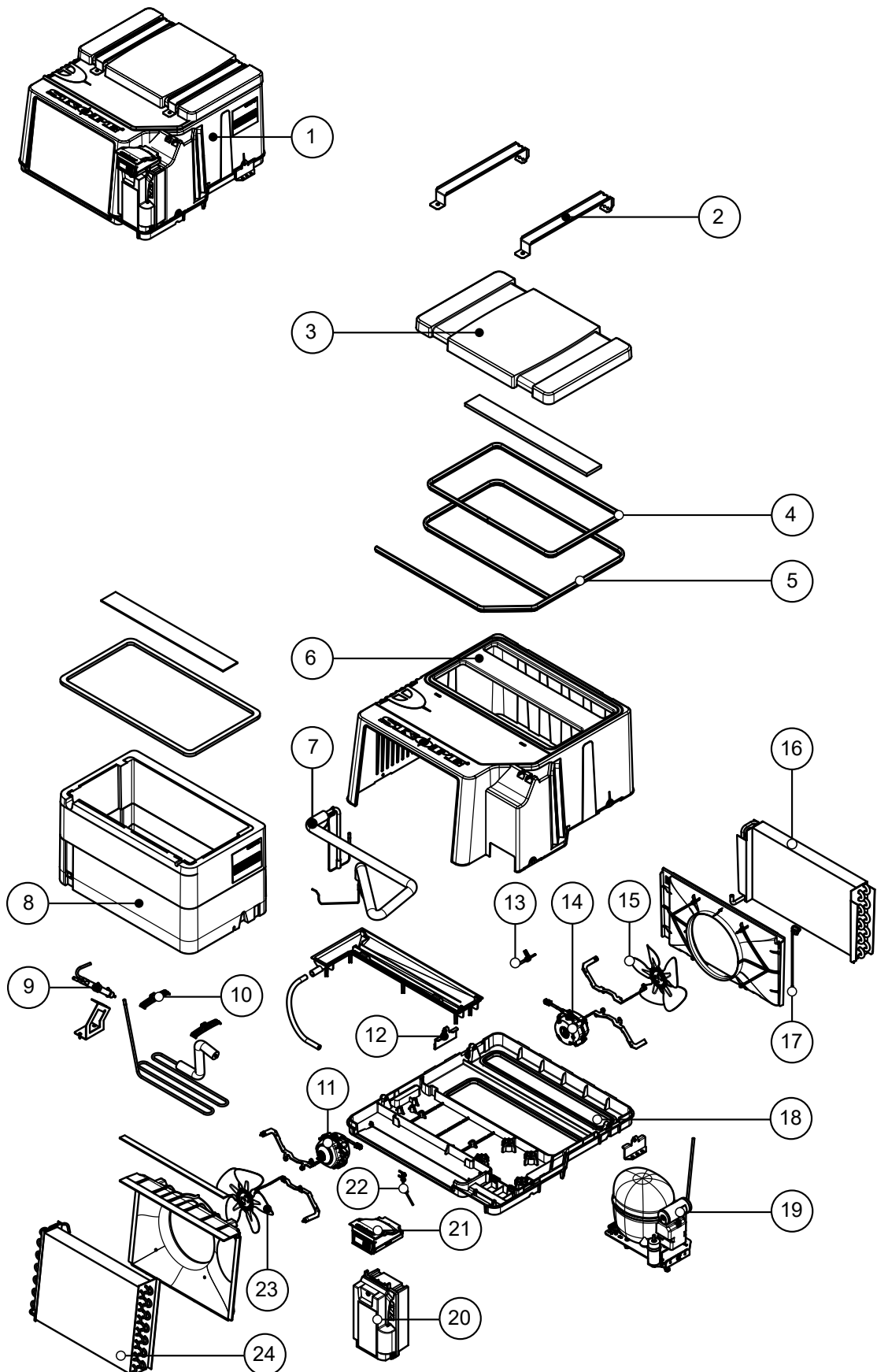


Table 18: Parts – Fridge cartridge assembly

No.	Description	SKOPE spare part no.	
		1-door	2-door
1	Refrigeration cartridge assembly*	HB0070832517A	HB0070832517A
2	Top metal strap bracket	HB0070114875	HB0070114875
3	Evaporator box lid	HB0070511356	HB0070511356
4	Cartridge gasket seal 1571 mm	PLE11052-1571	PLE11052-1571
5	Cartridge gasket seal 2306 mm	PLE11052-2306	PLE11052-2306
6	Cartridge plastic top cover	HB0070206133	HB0070206133
7	Suction line assembly*	HB0070702718	HB0070702718
8	Evaporator box	HB0070510928A	HB0070510928A
9	Drier	HB0074180006	HB0074180006
10	Condensate pipe support	HB0070110674	HB0070110674
11	Condenser fan motor	ELM11309	ELM11309
12	Hold down bracket	HB0070110815A	HB0070110815A
13	Control temperature probe	HB0070400542	HB0070400542
14	Evaporator fan motor	ELM11309	ELM11309
15	Evaporator fan blade	HB0074000313A	HB0074000313A
16	Evaporator coil	HB0070702232	HB0070702232
17	Evaporator temperature probe	HB0070400506	HB0070400506
18	Cartridge plastic bottom	HB0070206212B	HB0070206212B
19	Compressor – Wanbao FN90M	HB0074000848	HB0074000848
20	“Electrics Box Assembly” on page 60*	–	–
21	“Electronic Controller Assembly” on page 59*	UA0300021-616	UA0300021-617
22	Condenser temperature probe	HB0070401693B	HB0070401693B
23	Condenser fan blade	HB0074000313	HB0074000313
24	Condenser coil	HB0070702720	HB0070702720
–	Ambient temperature probe (not pictured)	HB0070401693B	HB0070401693B
–	Mains power cord (not pictured)	HB0070400636	HB0070400636

* Indicates component sub-assembly

Electronic Controller Assembly

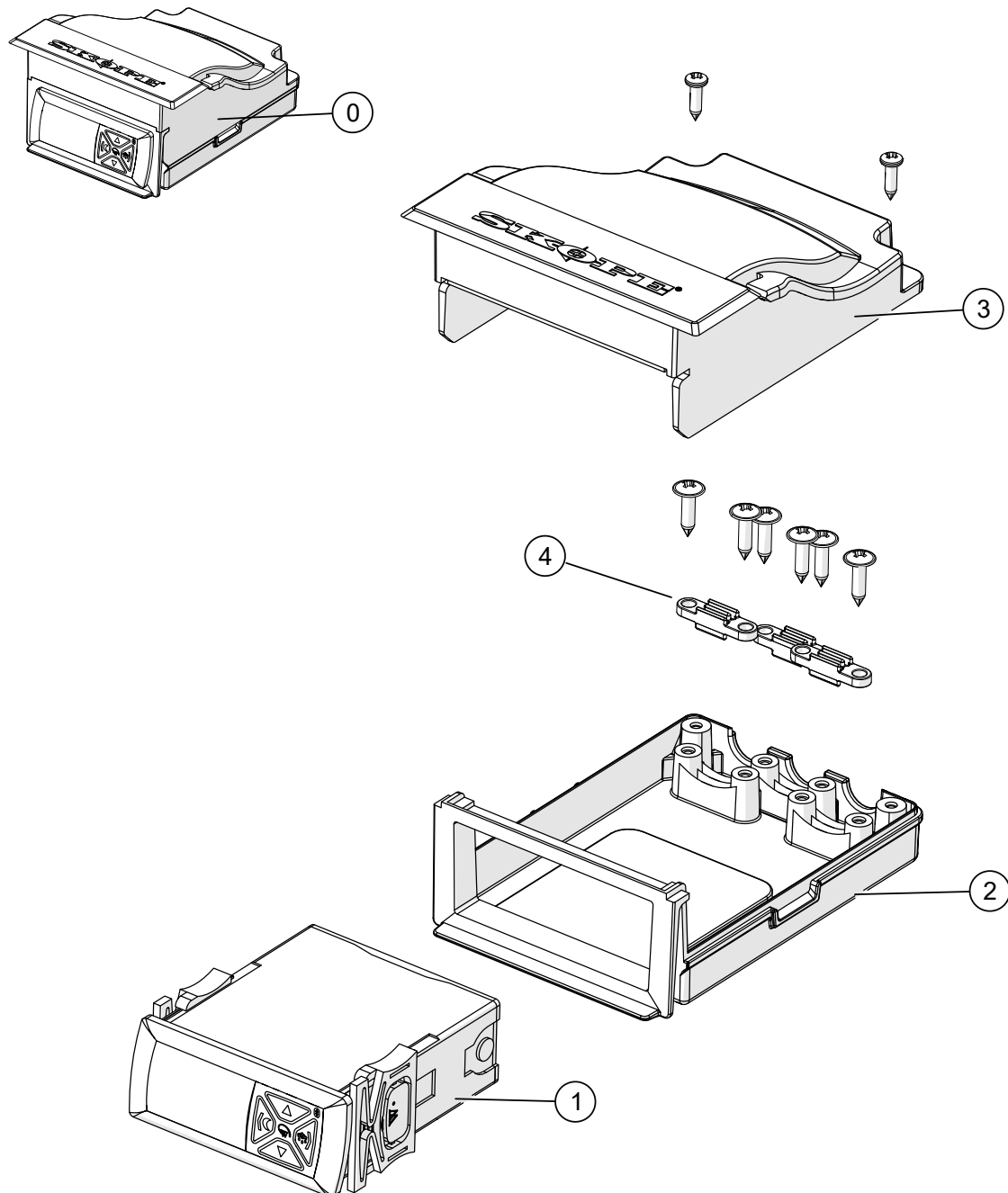


Table 19: Parts – Electronic controller

No.	Description	SKOPE spare part no.
0	Electronic controller assembly*	UA0300055
1	AoFrio controller	ELZ11749-1629
2	Controller housing base	HB0070206125
3	Controller housing cover	HB0070206126
4	Cable clamp	HB0070206127

* Indicates component sub-assembly

Electrics Box Assembly

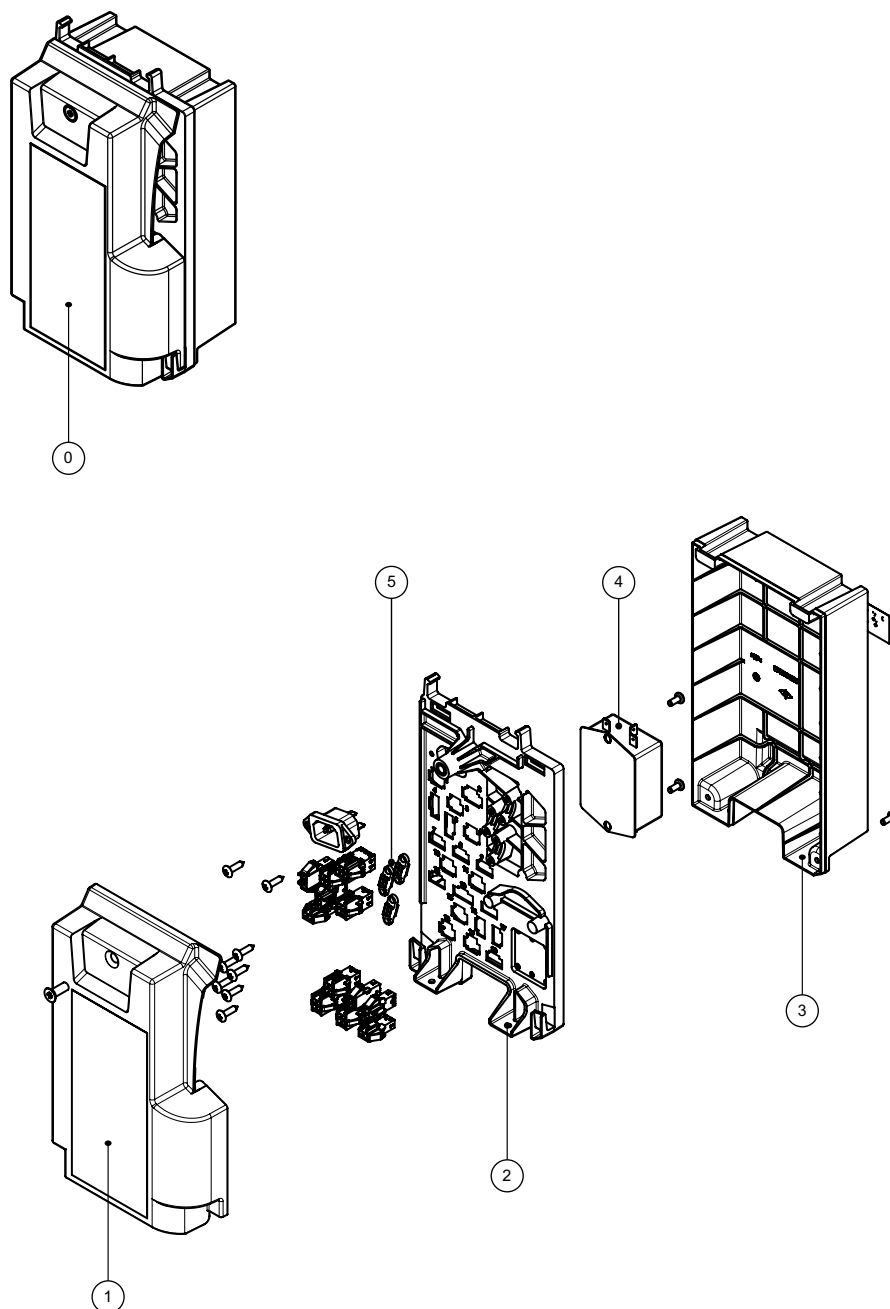


Table 20: Parts – Electrics box assembly

No.	Description	SKOPE spare part no.
0	Electrics junction box assembly*	
1	Electrical front panel	HB0070207012A
2	Electrical enclosure panel	HB0070207014
3	Electrical rear panel	HB0070207013A
4	EMI filter	HB0074600001
5	Cable clamp	HB0070206127

* Indicates component sub-assembly

9 Maintenance

Cleaning

Before any maintenance, unplug the cabinet from the mains power supply.

Cabinet The owner should periodically wipe the inside and outside of the cabinet with a damp cloth, taking care to keep moisture away from electrical parts.

Condenser Coil To ensure trouble-free performance, SKOPE strongly recommends the cleaning schedule in Table 21, which will depend on:

- the cabinet's location and environment.
- the condition of the condenser coil.

Table 21: Cleaning schedule

Timeframe	Performed by	Action
At least once a month	Owner	Condenser coil Brush with a soft brush to remove dust and fluff. If debris can no longer be removed, arrange a service call for comprehensive maintenance and coil clean.
Every 6 months, or as required	Service technician	Condenser coil Comprehensive maintenance based on the condition of the coil, which may include: <ul style="list-style-type: none"> • a nitrogen blow-out. • a PH-neutral chemical clean.

The condenser coil **must** be kept clean for efficient and reliable operation.

WARNING

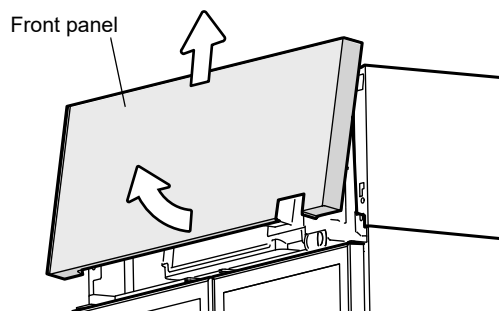
Unplug the cabinet from the mains power supply before cleaning the condenser coil.

Procedure 37: To clean the condenser coil

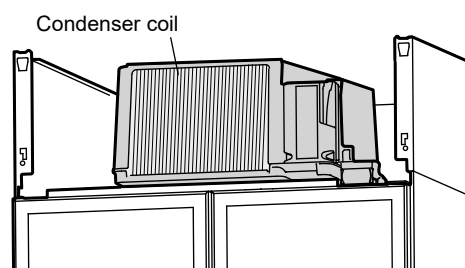
1. Disconnect the cabinet from the mains power supply (see Procedure 11, on page 26).

2. Remove the front panel assembly from the top of the cabinet by swinging it out and off. Lit sign front panels will also need to be unplugged.

WARNING: The front panel is heavy, a two person lift is recommended.



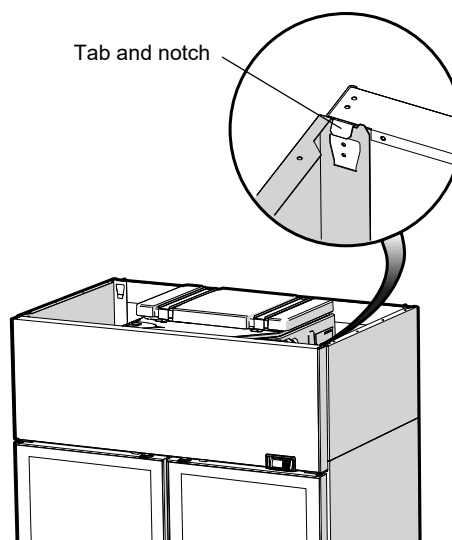
3. Brush the condenser coil with a soft brush to remove any dust and fluff.



4. Refit the front panel and reconnect to the power supply.

Important

When refitting, ensure the tabs on the back of the sign are located in the notches on top of the cabinet, and that the sign is pushed fully in and secure.



10 Troubleshooting

Electronic Controller

Alarms signal unexpected operational changes in the cabinet. When an alarm is activated, use the service app for the electronic controller to help diagnose the problem, and service as necessary.

Cabinet and Refrigeration Cartridge

For problems with the cabinet and refrigeration cartridge use Table 22.

Table 22: Cabinet and cartridge troubleshooting

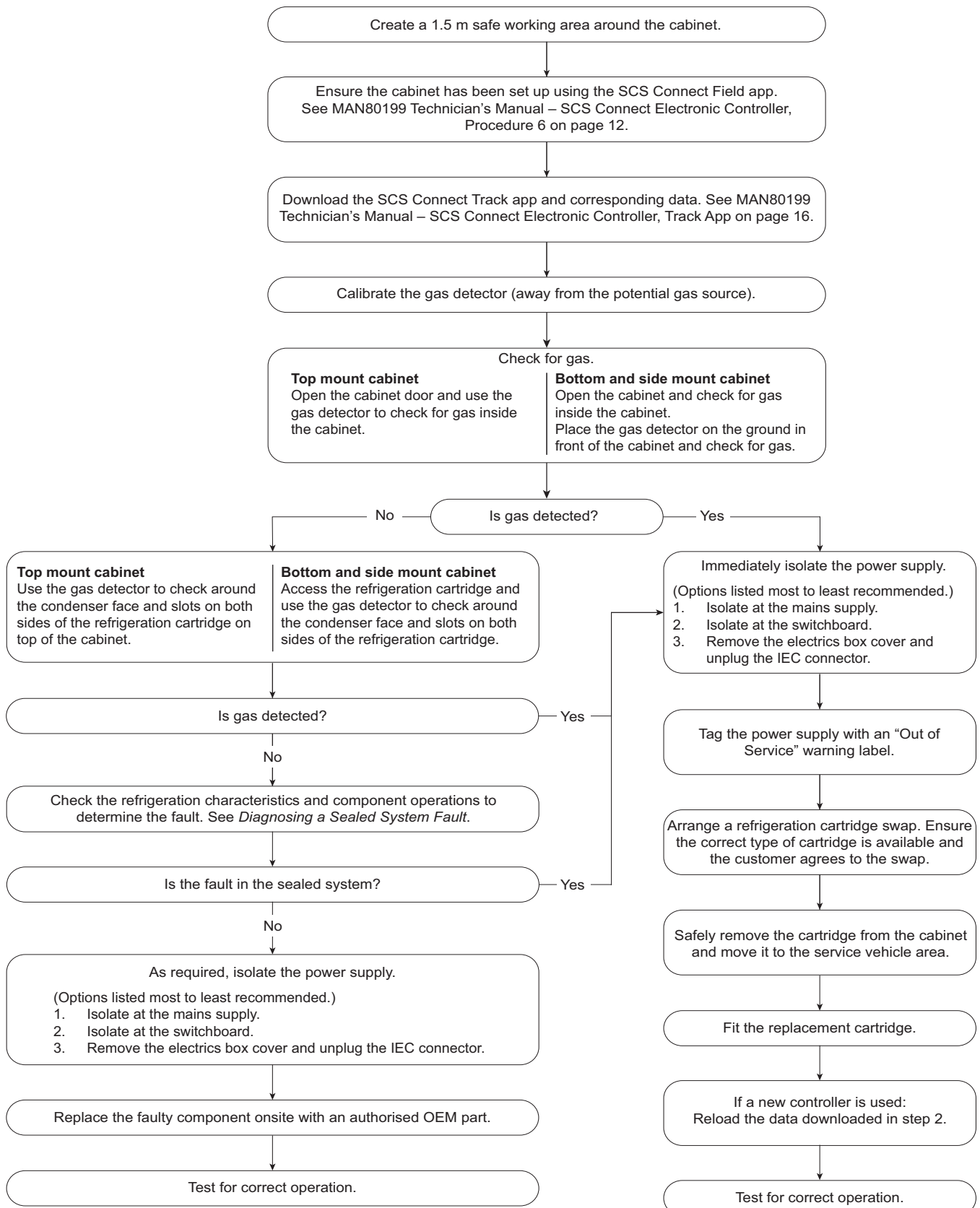
Problem	Possible cause	Recommended action
• Cabinet not operating	• Loss of power supply	Check the mains power supply.
• No controller display	• Loose plug	Check that all plugs are connected correctly.
• Cabinet not operating as usual	• Incorrect parameters	AoFrio: Reload the parameter set. The parameter number should be on or near the electronic controller.
• Defrost cycle incorrect length		
• Fan not working	• Loose plug	Check all plugs are connected correctly.
• Lights not on	• Electronic controller is in Night mode	<ul style="list-style-type: none"> Switch the light on while keeping the cabinet in Night mode by pressing the light button on the electronic controller faceplate. Change the cabinet into Day mode by pressing and holding the light button on the electronic controller faceplate, or holding the door open for 10 seconds.
	• Faulty door switch	Check that the door switch is working. Use the app to help diagnose the problem.
	• Light switched off	<ul style="list-style-type: none"> Open the door. Switch the light on via the light button on the electronic controller faceplate, or the app.
	• Failed LED light	Replace the light.
	• Plug not connected properly	Check and clean the plugs.
	• Power supply fault	Replace the light's power supply.
• Light component not working	• Plug not connected properly	Check and clean the plug connection.
	• Faulty light	Replace the light.
• Excess noise vibration	• Refrigeration pipes transferring vibration into the cartridge	Re-align the pipes to ensure they are not touching the evaporator box bottom surface, evaporator box support legs, plastic base, or condenser coil assembly.
• Compressor not operating	• Compressor electrics	<ul style="list-style-type: none"> Check all plug connections and ensure that the compressor electrics are operating correctly. Make sure the compressor is 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).
	• Failed compressor	Replace the compressor.
• Excess compressor noise	• Damaged mountings	Check the mountings to ensure there is no damage to the rubber, or the washers, nuts or screws.

Table 22: Cabinet and cartridge troubleshooting (continued)

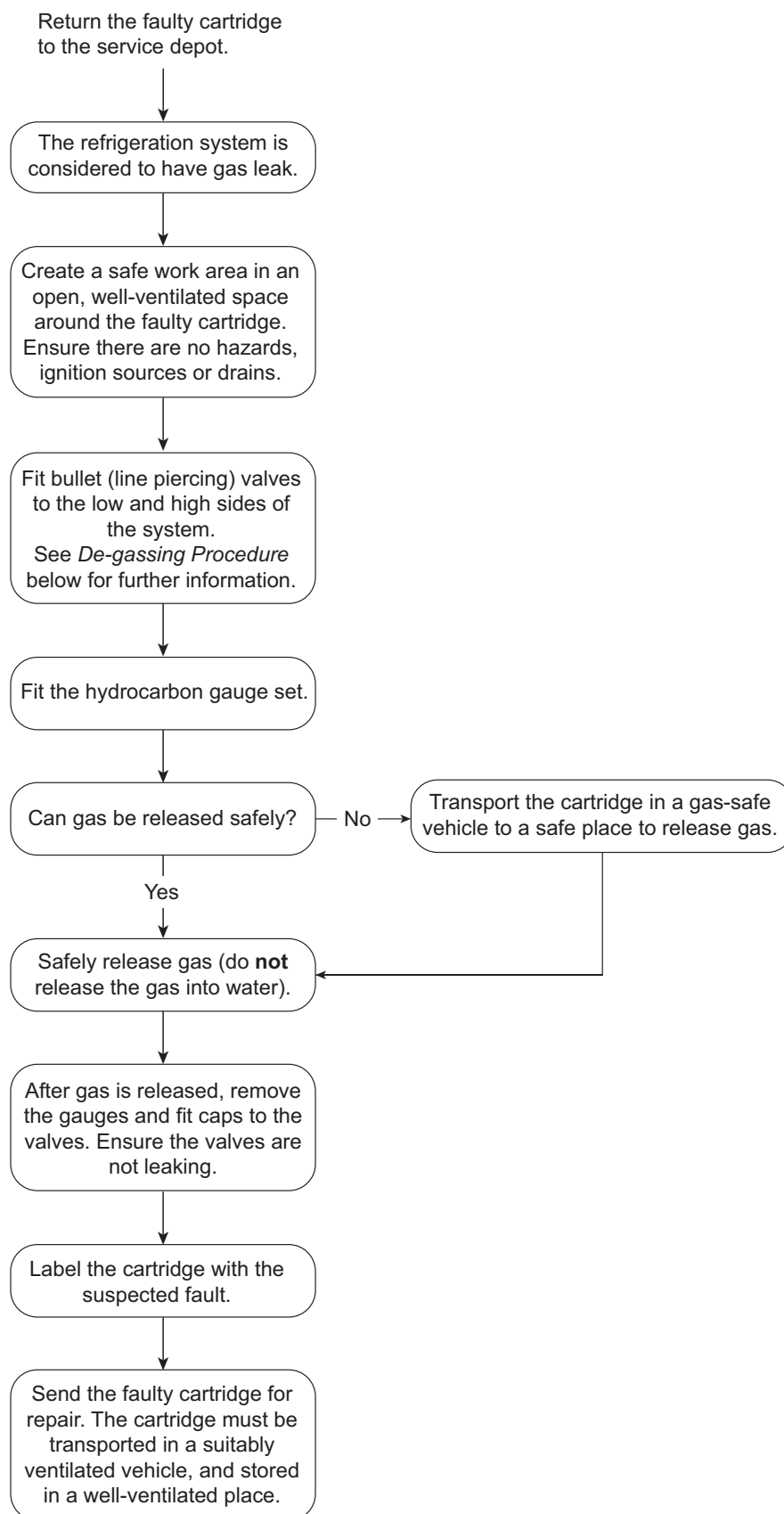
Problem	Possible cause	Recommended action
• Frozen evaporator coil	• Evaporator probe fault	Replace the evaporator probe.
	• Setpoint is too low	Check and raise the setpoint.
	• Electronic controller fault	Replace the controller.
	• Short of refrigerant	Perform refrigeration system diagnostics and service as required.
• Ice build-up inside the evaporator box	• Leaking cartridge seal	Check that the evaporator box seals are fully clamped, and the cabinet top seal is good without gaps. Micro-gaps will allow ice build-up in the cabinet.
• Power consumption is higher than expected	• Excessive door opening	Limit door openings.
	• Cartridge is operating too hot	<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.
	• Product is too cold	Raise the setpoint.
• Product is too warm	• Electronic controller is in Night mode	Change the cabinet into Day mode by pressing and holding the light button on the electronic controller faceplate, or holding the door open for ten seconds.
	• Door not closing properly	<ul style="list-style-type: none"> • Check and clean the door gasket. • Ensure the cabinet is on a level surface.
	• Excessive door opening	Limit door openings.
	• Cartridge is operating too hot	• Ensure the cabinet has good ventilation around the refrigeration cartridge.
	• Excessive refrigeration heat load	• Ensure the cabinet is within the maximum operating conditions.
	• Setpoint is too high	Lower the setpoint.
	• The cabinet is recently loaded	Allow the product time to cool down.
	• The cabinet is overstocked	<ul style="list-style-type: none"> • Remove some product. • Do not allow product to hang over the shelves.
• Moisture build up on cabinet exterior	• Frequent door opening	Limit door openings.
	• Door not closing properly	<ul style="list-style-type: none"> • Check and clean the door gasket. • Ensure the cabinet is on a level surface.
	• High humidity	Check the ambient operating temperature and reposition the cabinet if necessary.
• Cabinet door does not close properly	• Cabinet is on an uneven surface	Level the cabinet.
	• Door is obstructed	Check the shelves and product.
	• Door gasket is dirty	Check and clean the door gasket.
• Warm cabinet temperatures	• Blocked condenser coil	Clean the condenser coil.
• Compressor operating for long periods (more than 1 hour)	• Poor ventilation around the refrigeration cartridge	<ul style="list-style-type: none"> • Ensure the cabinet has good ventilation around the refrigeration cartridge. • Ensure the cabinet is within the maximum operating temperature.

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 for an authorised service person below when making the service visit.



On-site work procedure (continued)



SKOPE Contacts

SKOPE Industries Limited

ABN: 73 374 418 306

AU: 1800 121 535

NZ: 0800 947 5673

skope@skope.com

www.skope.com