

BME300N and BME400N Series

SKOPE Upright Fridge



BME300N and BME400N Series
SKOPE Upright Fridge
Service Manual

MAN80684
Rev. 1.0 Jun. 2025

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Contents

1 Specifications	
Models	5
2 Installation	
Installation Guidelines	6
Ventilation Requirements	6
Shelves	7
Shelf Clips	7
3 Operation	
Electronic Controller	8
Overview	8
Cleaning	8
Drain Pipe and Condensate Tray	8
4 Replacement Procedures	
Electrical Safety	9
Sign Assembly	9
Lighting	10
Interior Lights	10
Sign Light	11
Doors	12
Alignment	12
Replacing the Gasket	12
Removing and Refitting the Door	13
Adjusting Door Tension	14
Replacing the Torsion Bar	14
Reversing the Hinges	15
Refrigeration System	16
Before Servicing	16
On-site Work	18
Off-site Work	18
Refrigeration Cartridge Assembly	18
Cartridge Removal	19
Transporting the Cartridge	20
Condenser Fan	21
Evaporator Fan	21
Compressor	22
Diagnostics	23
Electronic Controller	25
Location	25
Door Switch	27
Control Probe	28
Evaporator Probe	28
Condenser Probe	29
On-site Work Procedure	30
De-gassing Procedure	32
5 Wiring	
Model: BME300N and BME400N Series	33

6 Spare Parts

Cabinet	34
Glass Door	36
Lit Sign	37
Refrigeration Cartridge – UBQCNI-0092.	38

7 Troubleshooting

Electronic Controller	40
Cabinet and Refrigeration Cartridge	40

1 Specifications

Models

This service manual applies to the SKOPE BME cabinets listed in Table 1 below. Refer to the relevant product specification sheet (available on the SKOPE website: www.skope.com) for details.

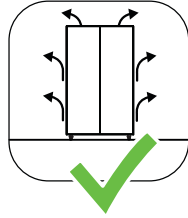
Table 1: Model specifications

Model	SKOPE ID	Cartridge
BME300N-A	SM30GYN	UBQCNI-0092
BME300N-AC	SM30BYN	
BME400N-A	SM40GYN	
BME400N-AC	SM40BYN	

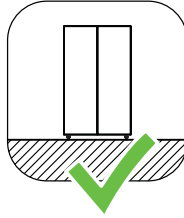
2 Installation

Installation Guidelines

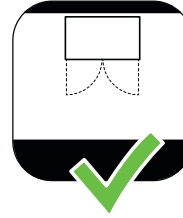
When installing this cabinet, ensure you consider and meet the installation guidelines below.



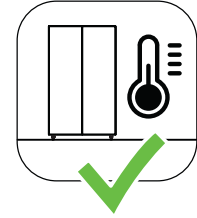
Ventilation
Ensure all ventilation requirements below are met.



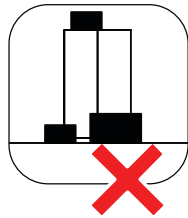
Surface
The installation surface must be capable of supporting the loaded cabinet.



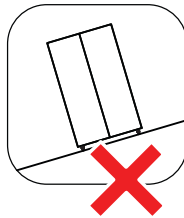
Door Opening
Allow adequate space for the door/s to open and close properly.



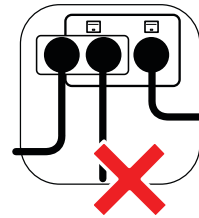
Climate Class
The cabinet must be installed in an environment within its climate class. The climate class is stated on the cabinet rating label inside the fridge.



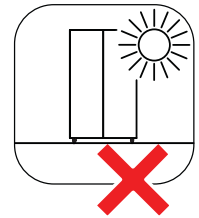
Blocking Ventilation
Do not store boxes or items in front or on top of the cabinet.



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



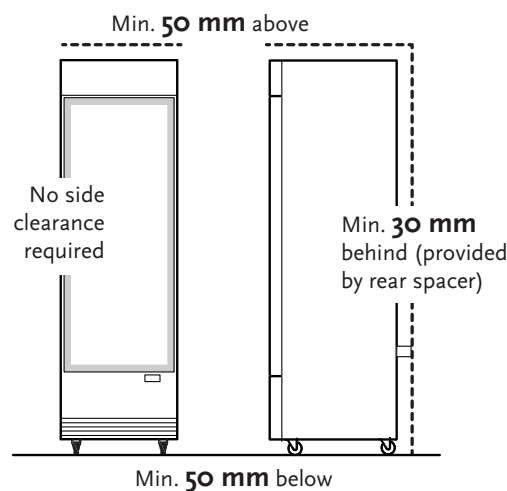
Power Supply
Do not overload the power supply.



Sunlight
Do not install the cabinet in direct sunlight.

Ventilation Requirements

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



CAUTION

To prevent over-heating and conserve energy, ensure air flows freely all around the cabinet, including the front, back, top and underside.

Shelves

The cabinet is fitted with wire shelves which may be positioned at different heights to suit various products.

Shelf Clips Each wire shelf is held in place with four shelf clips, which clip in the shelf support strips and slide up and down to the required shelf position.

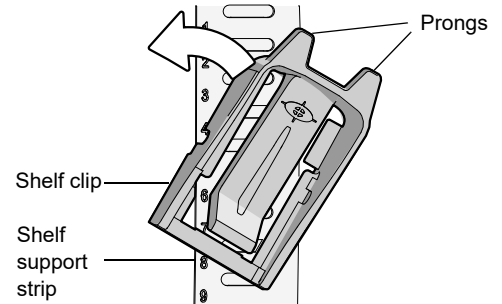
The support strips are numbered to help place the shelf clips. You can see the numbers in the bottom left hand corner of the shelf clip.

Procedure 1: To fit a shelf clip

The shelf clip twists onto the shelf support strip.

1. Position the shelf clip with the flat side against the shelf support strip and the two prongs pointing up.

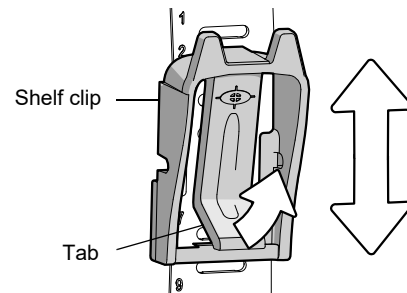
2. Twist the top of the clip anticlockwise onto the shelf support strip until it locks in place.



Procedure 2: To slide a shelf clip up and down

1. Pull the shelf clip tab up and slide the shelf clip up or down as required.

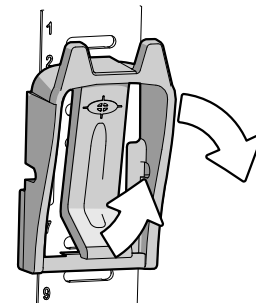
2. Once in position, ensure the shelf clip is locked into place.



Procedure 3: To remove a shelf clip

1. Pull the shelf clip tab up.

2. Twist the top of the clip clockwise off the shelf support strip.



3 Operation

Electronic Controller

Overview The cabinet is fitted with an AoFrio SCS Connect electronic controller, which is located behind the kick panel. It is visible from the outside of the cabinet.

The electronic controller:

- regulates the cabinet's internal temperature.
- signals alarms.
- captures operational information.
- controls the lights, where fitted.

The internal temperature is set at the factory for the applicable cabinet type.

You can run the electronic controller's Service mode using the faceplate, but SKOPE strongly recommends using the SCS Connect Field app.

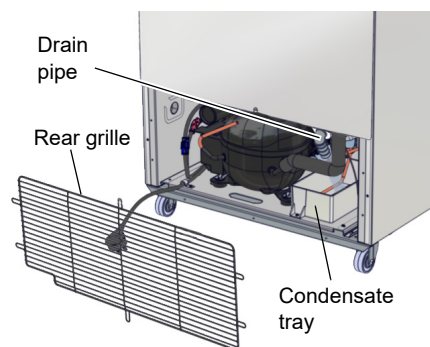
See [MAN80199 "SCS Connect Electronic Controller"](#) for further details.

Cleaning

Drain Pipe and Condensate Tray Check the drain pipe and condensate tray regularly, and clean them as required. You can access and clean the drain pipe and condensate tray at the back of the cabinet without removing the cartridge. When removing the pipe, work gently and take care of refrigeration system pipes in the area.

Procedure 4: To access the drain pipe and condensate tray for cleaning

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Move to the back of the cabinet, and unscrew and remove the rear grille.
3. Gently pull the drain pipe from the evaporator box and out from the condensate tray.
4. Clean the pipe and tray using soapy water.
5. Refit the drain pipe into the evaporator box, ensuring the end of the pipe is in the condensate tray.



6. Refit the rear grille and reconnect the cabinet to the mains power supply.

4 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 5: 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.
-

Sign Assembly

The -AC cabinets are fitted with a sign which can be removed for transporting or moving through doorways or confined spaces. The -A cabinets do not have a sign.

Refer to:

- the procedures below to remove and refit the sign assembly.
- “Sign Light” on page 11 for sign lighting information.

Procedure 6: To remove the sign assembly (-AC cabinets only)

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
 2. Unplug the sign light (the plug is located behind the sign assembly in a pocket on top of the cabinet).
 3. Tilt the sign assembly backwards and lift it off the cabinet.
 4. If required, remove the sign sides:
 - Remove the sign back strip.
 - Loosen the sign side fixing screws to remove the sign sides.
-

Procedure 7: To refit the sign assembly (-AC cabinets only)

1. If removed, refit the sign sides and sign back strip and tighten the fixing screws.
 2. Slot the sign assembly onto the front of the sign sides.
 3. Plug the sign light back in and check for correct operation.
-

Lighting

The cabinet is fitted with 1 × 24 V LED strip side light, and the -AC models are also fitted with an LED sign light. Ensure you replace the light with the same light type. Fluorescent or LED tubes cannot be used in place of the original equipment LED light assemblies.

IMPORTANT

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

Interior Lights The interior lighting is provided by one sealed LED strip light assembly mounted to the side of the cabinet. The assembly is made up of two components:

- LED strip light (replaceable)
- Interior light lead (not replaceable)

Power is supplied to the lights from the LED driver power supply (located on the refrigeration cartridge compartment ceiling) via foamed-in wiring. The foamed-in wiring to the internal LED strip enters the refrigerated compartment just below the LED strip.

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

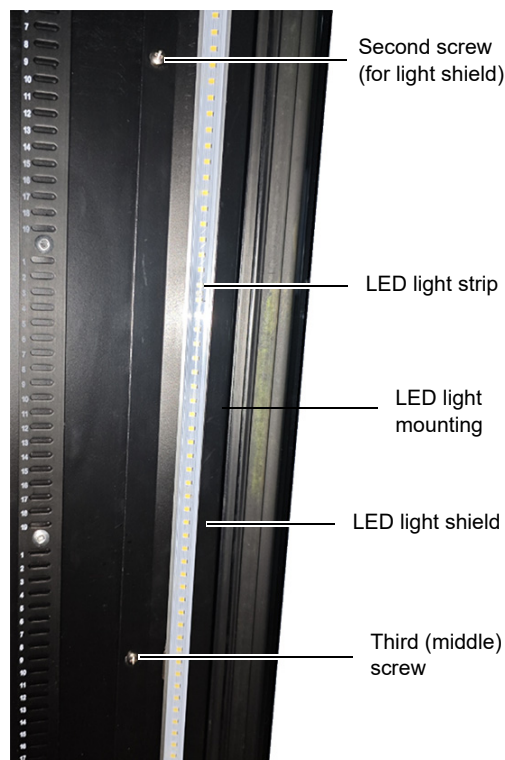
Procedure 8: To replace the interior light

Before you start

- The light assembly is made up of the LED light strip and the light mounting. The assembly is mounted behind a light shield which does not need to be removed to replace the light.
- There are five screws holding the light assembly and light shield to the side of the cabinet liner.

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).

2. Undo the top, middle and bottom screws.



Procedure 8: To replace the interior light (continued)

3. Unplug the light assembly from the supply flex.

Plug



4. Remove the light assembly from the cabinet.
5. Remove the LED light strip from the 3 × mounting clips and fit the replacement light.
6. Return the light assembly to the cabinet and plug in the supply flex.
7. Screw the light assembly through the light shield to the side of the liner.
8. Reconnect the cabinet to the mains power supply and check for correct operation.

Procedure 9: To replace the LED driver power supply

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).

2. Remove the kick panel and controller panel to access the power supply.



LED driver power supply

3. Replace the LED driver power supply.

4. Reassemble the cabinet and perform an electrical safety test as per standard procedure.
5. Reconnect to the mains power supply and check for correct operation.

Sign Light The -AC cabinets have a sign which is lit by a LED modular strip light. The foamed-in wiring to the sign exits the top of the cabinet.

Follow the steps below to replace the light strip.

Procedure 10: To replace the sign light (-AC cabinets only)

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Remove the sign from the cabinet (see Procedure 6, on page 9).
3. From the sign assembly, remove the:
 - sign box top bracket (2 × screws).
 - sign insert panel.
 - decal, if present.

Procedure 10: To replace the sign light (-AC cabinets only) (continued)

4. Cut the cable tie holding the LED light strip flex to the sign body.

5. Remove the faulty LED light strip (4 × screws).

6. Fit the new LED light strip with 4 × screws.

7. Thread the light strip flex through the sign body and cable-tie in place.

8. Refit the:

- sign box top bracket (2 × screws).
- sign insert panel.
- decal, if present.

9. Refit the sign assembly to the cabinet.

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



Doors

Alignment If a door is out of alignment, realign it by loosening top hinge bracket that is provided with slots, enabling the top of the door to be moved sideways. Ensure you securely re-tighten all 4 fasteners after realignment.

Replacing the Gasket The one-piece door gasket clips into the door frame and runs around the perimeter of the door. You can remove the gasket by peeling it from the door frame, starting at a corner. If the gasket is out of shape after you fit it, use a hair dryer to heat and reshape it.



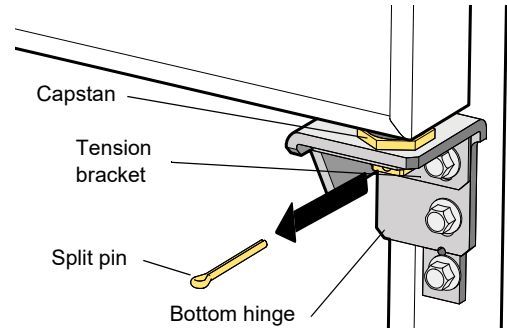
Removing and Refitting the Door

For ease of servicing and to reverse the hinging, the door can be removed from the cabinet.

Procedure 11: To remove the door

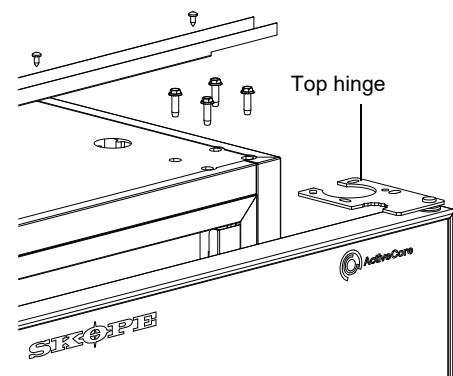
1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. If present, remove the kick panel and sign (you can leave the sign sides and back strip).

3. Remove the split pin from the capstan at the bottom hinge.



4. Release the tension on the capstan by using a tool to rotate and hold the hex part of the capstan in the direction the door closes.
 - Start with the tool near the closed door position to allow room to release the tension.
 - While holding the tension remove the capstan tension bracket and slowly release the tension.

5. Remove the sign rear bracket.



6. Unscrew the top hinge, and lift the door up and off the cabinet.

Procedure 12: To refit the door

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Lift the door onto the bottom hinge.
3. Fit the top hinge and partially fix in place on the top of the cabinet. Align the door with the cabinet and tighten the fixing screws.
4. Refit the rear sign bracket.
5. Apply tension to the door (see steps 3, 4 and 5 in Procedure 13).
6. Fit the height adjustment block to the bottom screw hole.
7. If necessary, rotate the height adjustment block to level the door.
8. If required, refit the kick panel.

Adjusting Door Tension The door has an internal torsion bar, pre-tensioned at the factory, that lets the door self-close. If necessary, the door tension can be adjusted by rotating the capstan mounted in the top hinge bracket.

Procedure 13: To adjust the door tension

Before you start

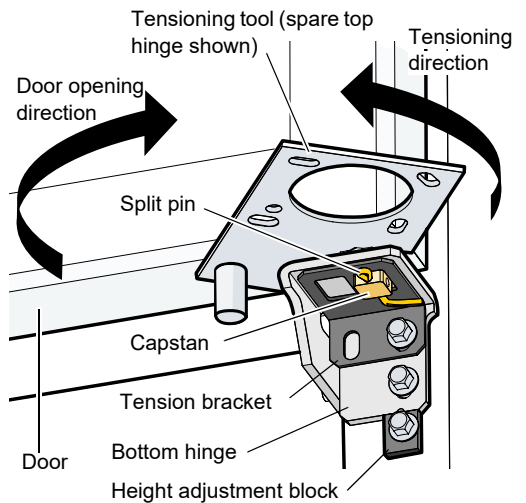
You will need a tensioning tool. The top hinge has a cut-out for tensioning, if a spare is available.

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
 2. Remove the split pin from the capstan at the bottom hinge.
 3. Remove the tension bracket from the bottom hinge.
-

4. Use a tool to apply tension to the door via the capstan.
 - Rotate the capstan against the door opening direction to remove any slack.
 - Once resistance is felt, continue to rotate 180° to provide tension.
-

5. While holding door tension on the capstan, fit the tension bracket so that it supports the door tension on the capstan.
-

6. Fit the split pin through the hole in the capstan to lock the door in place.
-



Bottom hinge assembly (with tensioning tool)

7. Check door tension by holding the door open about 100 mm and letting it go. The door should close gently, with the gasket forming an airtight seal with the cabinet.
-

Replacing the Torsion Bar When the door tension can no longer be adjusted, replace the torsion bar.

Procedure 14: To replace the torsion bar

Before you start

You will need a tool to rotate the capstan, e.g. a spanner or a spare top hinge, which has a cut-out for tensioning.

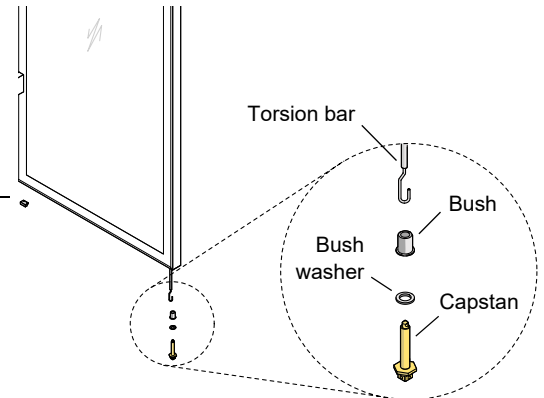
1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
 2. Remove the door from the cabinet (see Procedure 11, on page 13).
-

Procedure 14: To replace the torsion bar (continued)

3. Lever the capstan, bush washer, and bush from the bottom of the door, and unhook them from the torsion bar.

Note: The torsion bar cannot easily be removed from the door. Cut the old torsion bar and push it into the door frame.

4. Fit the capstan, bush washer, and bush to the new torsion bar, and fit this assembly into the bottom of the door.



5. Refit the door (see Procedure 12, on page 13).

Reversing the Hinges

The cabinet is supplied with the door hinged on the right hand side. If required, the hinge can be swapped to the left hand side. Some spare parts are required to complete the procedure, and are available in the Left Hand Hinge Reversal Kit (see Table 4, "Parts – Glass door," on page 36 for the part number).

Procedure 15: To reverse the door hinging

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).

2. Remove the door from the cabinet (see Procedure 11, on page 13).

3. Remove the bottom hinge and height adjustment block.
 - Keep the tension bracket (from removing the door) and height adjustment block (these are fitted to the opposite side once the door is refitted).
 - Discard the bottom hinge.

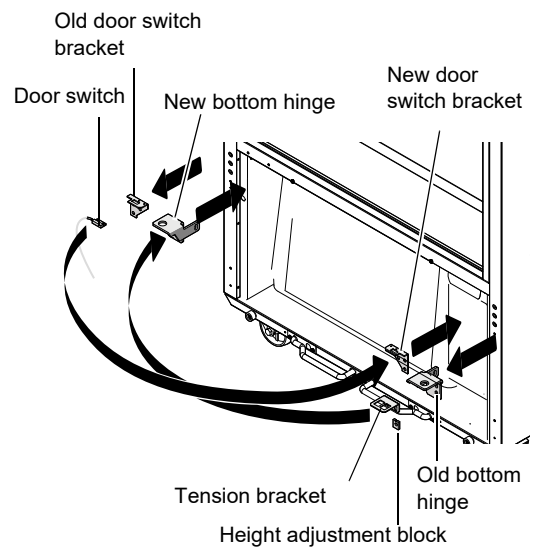
4. Unplug the door switch cable from the cabinet. The door switch is fitted to the door switch bracket, below the door.

5. Remove the door switch and door switch bracket.

6. Remove the door switch from the door switch bracket and discard the door switch bracket.

7. Fit the door switch to the new door switch bracket.

8. Fit the door switch, and new door switch bracket to the opposite end of the door.



Procedure 15: To reverse the door hinging (continued)

9. Fit the new bottom hinge.

10. Remove the top hinge bush and keep it for the opposite end of the door.

11. Remove the capstan, bush, and bush washer, and unhook them from the torsion bar.

Note: The torsion bar cannot easily be removed from the door. Push the torsion bar into the door frame.

12. Fit the capstan, bush and bush washer to the new torsion bar, and fit this assembly to the opposite end of the door.

13. Fit the bush (kept from Step 10) to the end of the door, opposite the capstan.

14. Remove the door switch magnet from the end of the door, and fit to the opposite end.

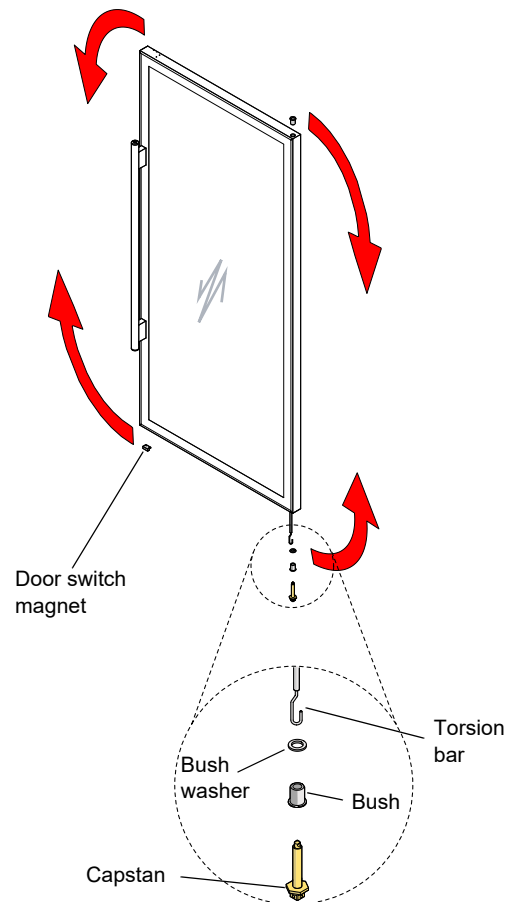
Note: Ensure the magnet is orientated correctly and does not protrude past the edge of the frame.

15. Refit the door (see Procedure 12, on page 13).

16. Apply the SKOPE logo label to the top left hand corner of the door. Use the label backing to align the label as pictured.



17. Apply the blanking labels over the upside down logos at the bottom of the door.



Refrigeration System

Before Servicing Overview

- 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 bottom-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 a fridge with hydrocarbon refrigerant.

The evaporator fan assembly and electronic controller assembly are not part of the refrigeration cartridge. The evaporator fan assembly is located inside the cabinet. The electronic controller assembly is located in front of the refrigeration cartridge, but is matched to the cabinet.

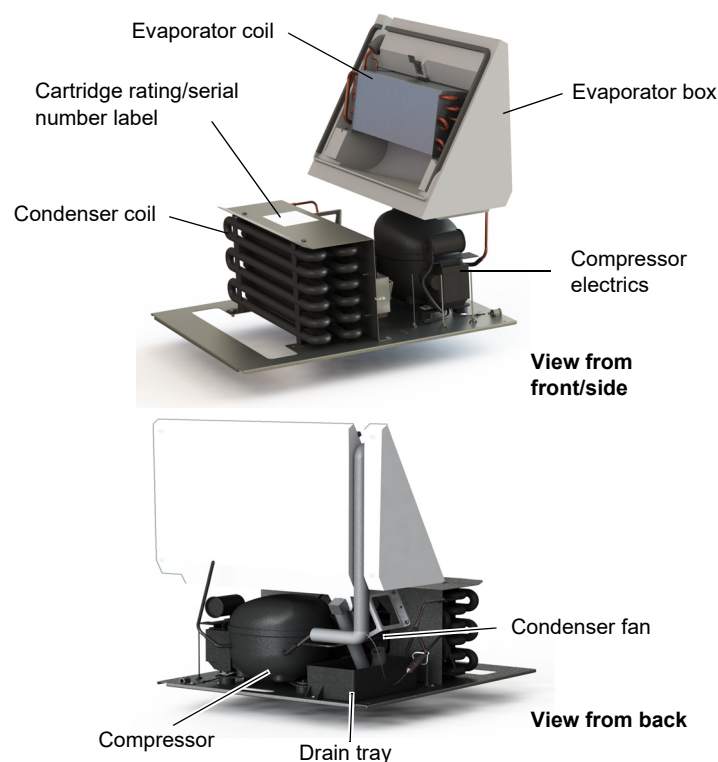
For servicing or transportation, the refrigeration cartridge unplugs and pulls out of the cabinet. When transporting a cartridge outside a cabinet, the cartridge must be packed inside a cartridge transport box (see “Transporting the Cartridge” on page 20). Some minor servicing can be performed without removing the refrigeration cartridge.

The model and serial number are both printed on the cartridge rating label attached to the top of the condenser coil cover. Before ordering spare parts, take note of the model and serial numbers.

Specifications for the model are in the following table. Verify model and basic requirements before servicing.

Table 2: Cartridge specifications

Cartridge model	UBQCNI-0092
Compressor	Huayi NUY45-RA
Compressor capacity	321 watts (EN12900 MBP)
Refrigerant	R290
Charge	50 g



Cartridge Removal For servicing, the refrigeration cartridge can be removed from the rear of the cabinet. Detailed instructions on removing the cartridge are also available on the instruction sheet attached to the back of the cabinet.

Note: The electronic controller is matched to the cabinet, and should be left attached to the cabinet when removing the cartridge from the cabinet.

Procedure 16: To remove the refrigeration cartridge

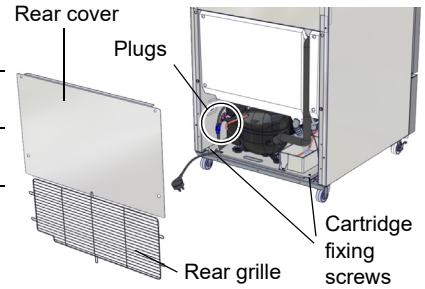
1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).

2. Unscrew and remove the rear grille from the back of the fridge.

3. Unplug all plugs at the back of the refrigeration cartridge.

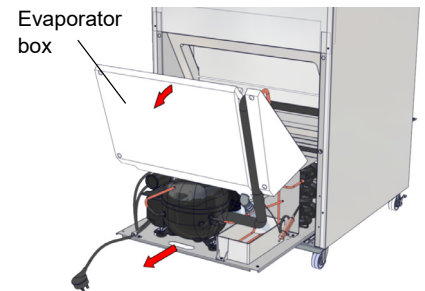
4. Undo the 4 screws to remove the rear cover.

5. Unscrew the cartridge fixing screws, located on the base at the back corners of the cartridge.



6. Gently tilt the evaporator box out to detach it from the cabinet. Support the evaporator box and slide the refrigeration cartridge out then place it on the ground.

- Take care of cables and other components when sliding the cartridge, and only handle the cartridge base when sliding the cartridge out.
- Do **not** use the evaporator box or pipework to slide the cartridge.



7. When handling, transporting and refitting the refrigeration unit:

- Only handle the cartridge base when moving or lifting it. Do **not** use the evaporator box or pipework to move or lift the cartridge.
- Use a cartridge transport box when transporting the cartridge (see "Transporting the Cartridge" below).
- Ensure the gasket on the front of the evaporator box is in good condition. SKOPE recommends replacing the gasket before refitting the cartridge.
- Ensure you push the cartridge fully into the cabinet and screw in the rear fixing screws.
- Make sure you refit the rear cover and rear grille.

Transporting the Cartridge

When transporting the cartridge outside a cabinet, you must pack and secure the cartridge inside a cartridge transport box (supplied with spare cartridges). You must strap the box with a ratchet strap, packing strap, or similar, to ensure the evaporator box and coil are held securely in place and cannot move.

Assemble the box assembled by slotting the sides into the base. Fit the lid once the cartridge is in place inside the box. Strap the box firmly once the cartridge is in place and the lid is on.



Condenser Fan The condenser fan assembly is made up of a high efficiency electronically commutated (EC) fan motor, fan blade and mounting brackets.

The fan blade intentionally forces a draft from the rear of the cabinet to the front of the cabinet.

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

You need to remove the cartridge (see Procedure 16, on page 20) to access the condenser fan assembly. The component parts can be individually replaced when necessary.

IMPORTANT

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

The "A" type fan blade forces the air from the rear of the cabinet to the front of the cabinet.

It is important that you replace the fan blade and fan motor with the same part to ensure safety, correct alignment, and efficient refrigeration performance. When refitting or replacing fan motors, use the correct fasteners (a serrated head screw and 12 mm flat washer) and tighten the fan blade screw to 1.4 Nm.



Evaporator Fan The evaporator fan assembly is located at the top of the cabinet interior, and is made up of a high efficiency electronically commutated (EC) fan motor and fan blade, both of which can be replaced when necessary.

The fan assembly is fixed to the evaporator shroud. The assembly can be unscrewed and pulled through the shroud for servicing.



Before replacing fan parts, check all connections to ensure no plugs have come loose. The evaporator fan motor is connected to a plug behind the evaporator shroud. Remove the fan assembly to access the plug.

IMPORTANT

Replace the motor with the same SKOPE OEM part.

Do not use alternative parts.

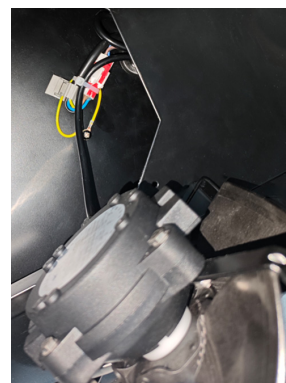
It is important that you replace the fan blade and fan motor with the specified part to ensure safety, correct alignment, and efficient refrigeration performance. When refitting or replacing fan motors, use the correct fasteners (a serrated head screw and 12 mm flat washer) and tighten the fan blade screw to 1.4 Nm.

Procedure 17: To remove the evaporator fan assembly

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).

2. Unscrew the evaporator fan bracket from the evaporator fan shroud, and pull the evaporator fan assembly through the shroud.

3. Cut the 2 × cable ties and unplug red connector to remove the evaporator fan assembly.

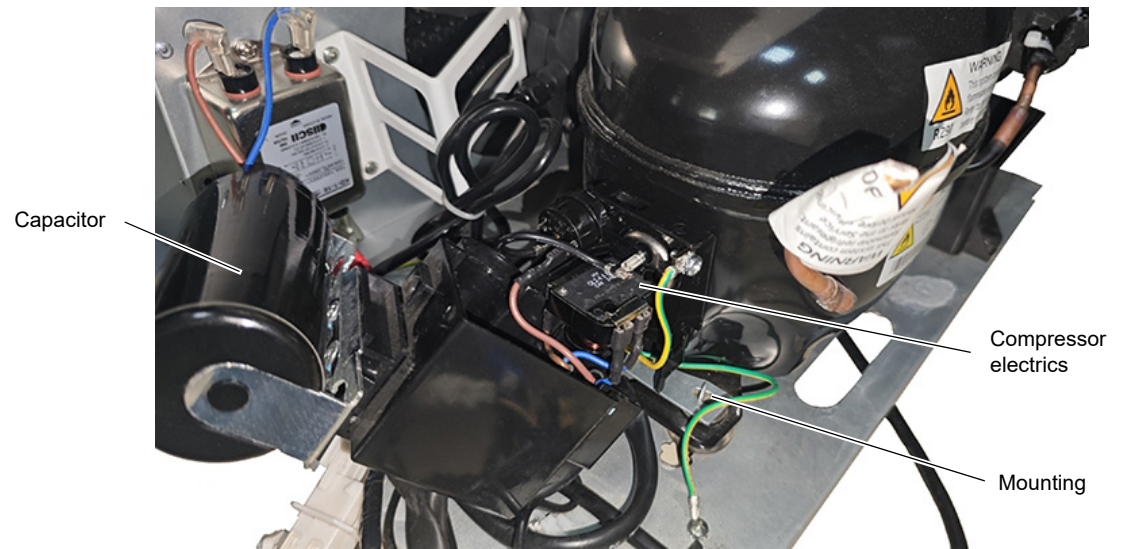


Compressor The compressor is located at the rear of the refrigeration cartridge, behind the condenser.

If the compressor is causing excessive noise, check the mountings to ensure there is no damage to the rubber or the washers, nuts and screws.

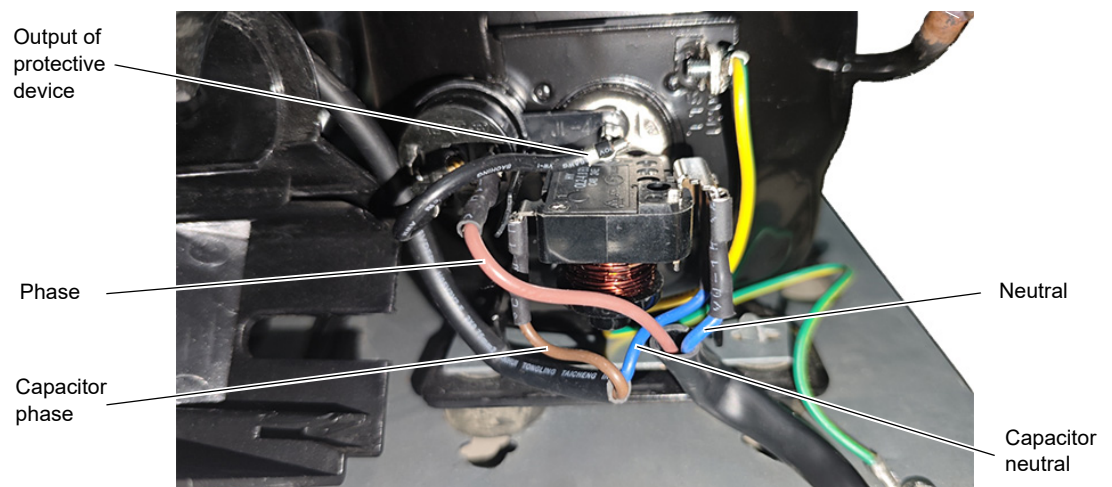
If the compressor is not operating correctly, check all plug connections and ensure the compressor electrics are operating correctly. The compressor electrics are located on the front of the compressor and in the compressor run/start capacitor enclosure at the back of the cartridge.

The compressor must be supplied with consistent voltage over 220 volts. Ensure the voltage does not drop at start-up. If the voltage does drop, ensure the cartridge has a direct power supply (not from a multi-box or extension cord).



IMPORTANT

To eliminate vibration noise, ensure pipes are not making contact with the accumulator, evaporator coil, or condenser shroud.



Diagnostics The following diagnostic test is useful to do in a hydrocarbon-compliant workshop (see “Off-site Work” on page 18) to work out if a removable refrigeration system is short of gas. Always perform it before opening the refrigeration system.

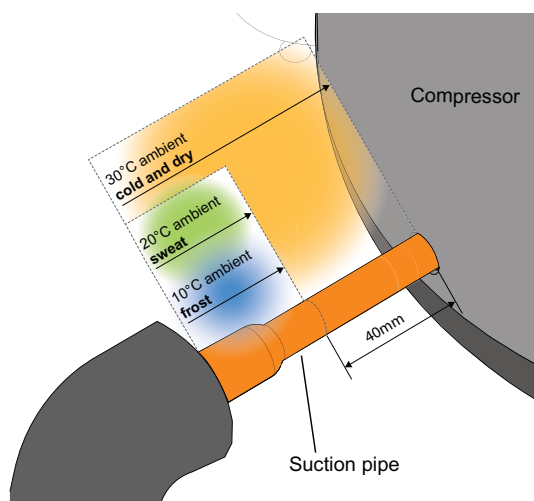
It is helpful to have a correctly operating cartridge running beside the cartridge being serviced to compare behaviour.

Note: This diagnostic procedure is indicative only.

Procedure 18: Refrigeration system diagnostic test**Before you start**

Perform this test in a suitable workshop (see "Off-site Work" on page 18).

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Remove the refrigeration cartridge (see Procedure 16, on page 20).
3. Remove the cartridge cover.
4. Place the cartridge on bench and connect the bench test jumper to the red plug on the cartridge.
5. Connect the refrigeration cartridge to the mains power supply and allow to run for approximately 10 minutes until the evaporator temperature stabilises.
6. Determine if the system charge is correct.
 - Ambient temperature 30°C and below: Check the condition of the compressor suction pipe. A system with correct refrigerant charge will behave as pictured below, depending on the room's ambient temperature.
 - Ambient temperature above 30°C: Go to Step 7.

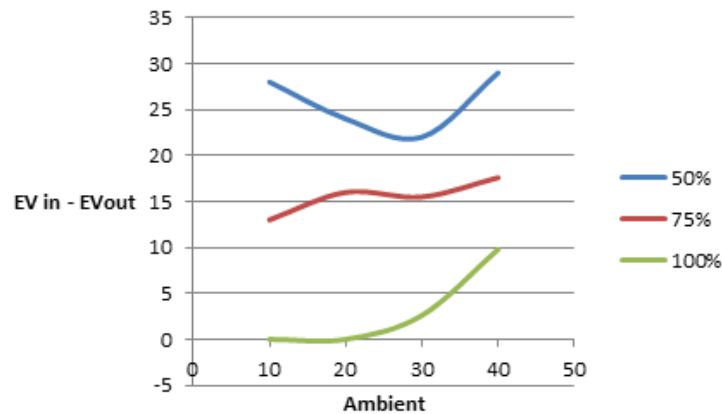


Ambient	50% charged	75% charged	100% charged
10°C	Dry	Cold, but dry	Frost 40 mm from compressor
20°C	Dry	Dry	Sweating 45 mm from compressor
30°C	Dry	Dry	Cold, but dry
40°C (see Step 7)	Dry	Dry	Dry

Procedure 18: Refrigeration system diagnostic test (continued)

7. If the ambient temperature is above 30°C, fit two temperature-measuring tools to the refrigeration system pipes, one at the evaporator in and one at the evaporator out, and refer to the chart below.

If the temperature difference between Evaporator In and Evaporator Out is 10°C and below, the system is correctly charged (regardless of ambient).



8. Diagnose the problem.
- If the suction pipe frosts to the appropriate frost stop point, the charge is likely to be correct. Move onto Step 9 to diagnose a possible capillary blockage.
 - If the frost does not go back to the point shown there may be a capillary blockage or compressor fault.

9. Use the chart below to determine whether the system is short of refrigerant or has a blocked capillary.

Frost back (after 10 mins)	Liquid line	Evaporator in	Evaporator out	Suction line	Diagnosis
None	17.7°C	19.1°C	18.2°C	18.4°C	Blocked capillary
30 mm from compressor	29.5°C	-20°C	-17.4°C	-10°C	Normal operation

10. After fault has been diagnosed and repaired, reassemble the refrigeration system and test run.

Electronic Controller

Location The cabinet is fitted with an AoFrio SCS Connect electronic controller which is located behind the kick panel. It is visible from the outside of the cabinet.

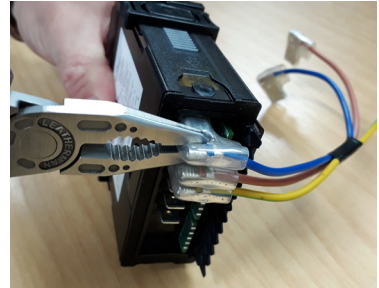
Procedure 19: To access and replace the controller**Before you start**

- Make sure you have the appropriate parameter file to load into the new controller.
 - Open SCS Connect Field app (see [MAN80199 "SCS Connect Electronic Controller"](#)) 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.

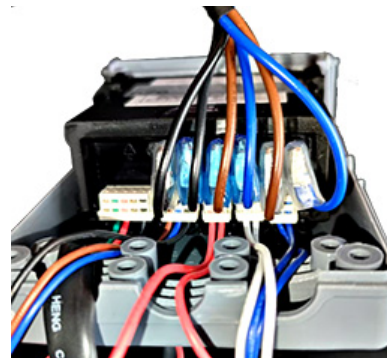
1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Remove the kick panel with the controller housing attached.
3. Remove the controller housing from the kick panel.
4. Open the controller housing to access the rear of the controller.

Procedure 19: To access and replace the controller (continued)

5. Use needle nose pliers to:
 - press in and unlock the tabs.
 - gently remove the QC terminals.



6. Remove any other wiring (SLEV lights and signal) from the controller.
7. Remove the clips from the controller to pull the controller through the front of the housing.
8. Fit the new electronic controller.



9. Reassemble the cabinet.
10. Perform an electrical safety test.
11. Reconnect the cabinet to the mains power supply, and use a mobile device to connect to the controller with the SCS Connect Field app (see [MAN80199 "SCS Connect Electronic Controller"](#)).
12. Navigate to the LOAD PARAMETER FILE menu.
13. Select the appropriate parameter file from LOCAL.
14. Confirm that you have the correct file, and WRITE TO SCS.
15. After WRITE TO SCS is complete, select MENU > DISCONNECT to save the parameter set on SCS Connect Field app.
16. Power cycle the controller and check that the parameter set has been applied.
17. Open SCS Connect Field app and re-connect to the controller.

Door Switch The electronic controller is fitted with a door switch to monitor door openings. The door switch is located below the door on the non-hinge side. A small magnet in the door frame activates the switch.

Procedure 20: To replace the door switch

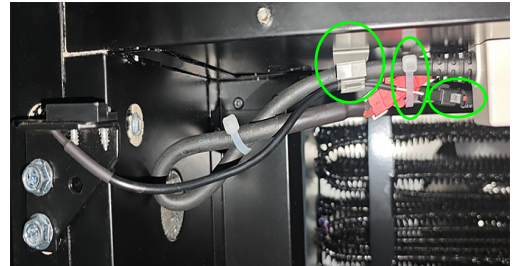
Before you start

If required, you may remove the door switch bracket from the cabinet first to access the door switch screws.

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
 2. Remove the kick panel.
-

3. Cut off the cable tie and unplug the small black 2-way connector.
-

4. Unlatch grey cable clip to release door switch cable.
-

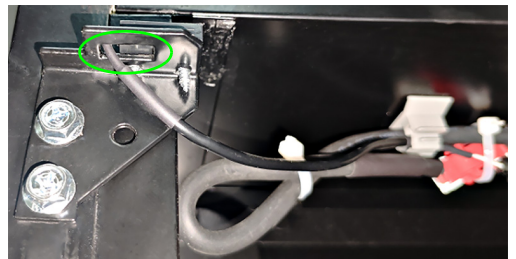


5. Unscrew the door switch.
-

Note: If necessary, you may remove the door switch bracket from the cabinet.



6. Thread the door switch cable through the door switch bracket to remove it from the cabinet.
-

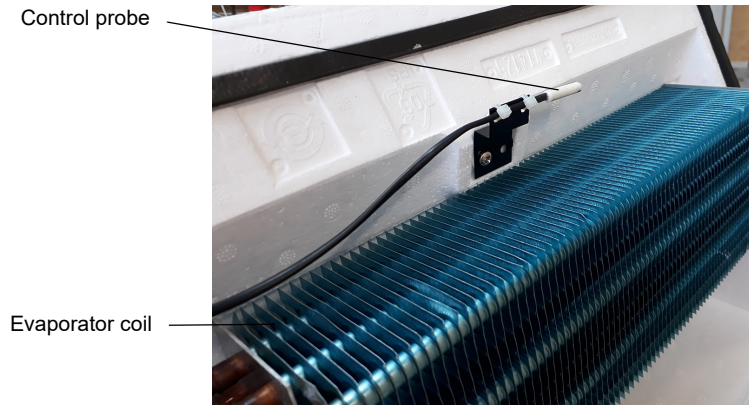


7. Attach the new door switch to the cabinet.
 - Thread the door switch cable back through the door switch bracket.
 - Attach the switch with the 2 × screws.
 - If removed, reattach door switch bracket to the cabinet.
 - Secure the cable in the grey cable clip.
 - Attach the cable to the black 2-way connector.
 - Attach a new cable tie.
-

8. Refit the kick panel.
-

9. Reconnect the cabinet to the mains power supply and check for correct operation.
-

Control Probe The control probe is cable-tied to a bracket at the top of the evaporator box.



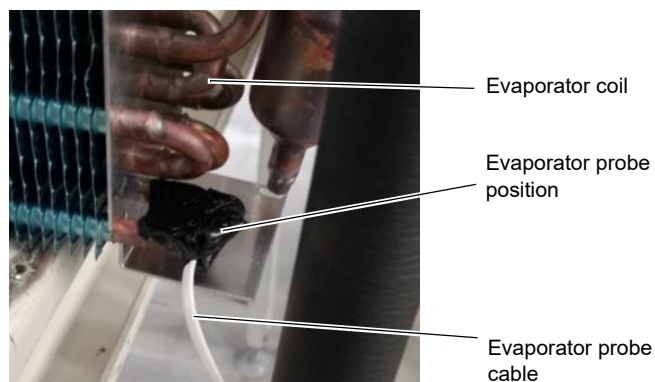
Procedure 21: To replace the control probe

Before you start

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 5, on page 9).
2. Remove the refrigeration cartridge (see Procedure 16, on page 20).
3. Take note of the cable routing, then detach the probe and remove it from the evaporator box.
4. Replace the probe, ensure it is:
 - in the same position as the original probe, extending past the fan bracket.
 - securely attached.
5. Following the same path as the original probe, fit the new probe with cable ties as necessary and plug it in to the connector. Ensure the probe cable runs securely through the evaporator box putty seal to the back of the refrigeration cartridge.
6. Reassemble the cabinet.
7. Reconnect the cabinet to the mains power supply and check for correct operation.

Evaporator Probe The evaporator probe is located on the bottom return bend of the evaporator and insulated with cork tape.

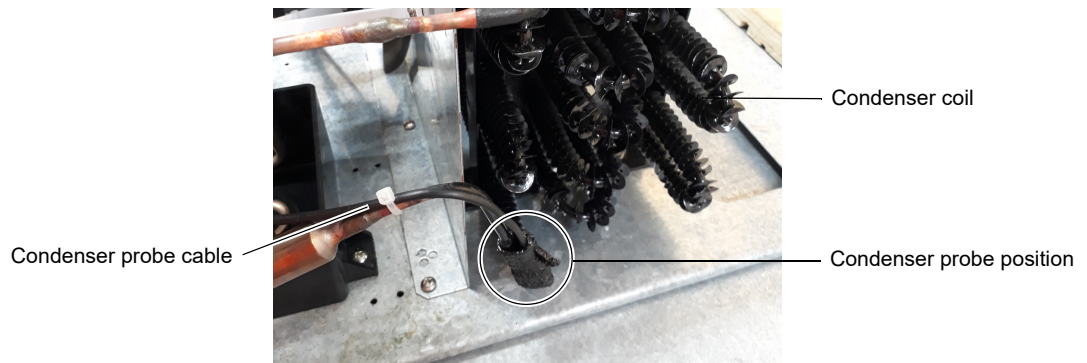


Procedure 22: To replace the evaporator probe**Before you start**

Take note of the original evaporator probe cable's path, e.g. a photo.

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Remove the refrigeration cartridge (see Procedure 16, on page 20).
3. Take note of the cable routing, then detach the probe and remove from the cartridge.
4. Replace the probe, ensure it is:
 - in the same position as the original probe.
 - insulated with cork tape and securely attached.
5. Following the same path as the original probe, fit the new probe with cable ties as necessary and plug it in to the connector. Ensure the probe cable runs securely through the evaporator box putty seal to the back of the refrigeration cartridge.
6. Reassemble the cabinet.
7. Reconnect the cabinet to the mains power supply and check for correct operation.

Condenser Probe The condenser probe is located on the condenser coil outlet pipe and is insulated with cork tape.

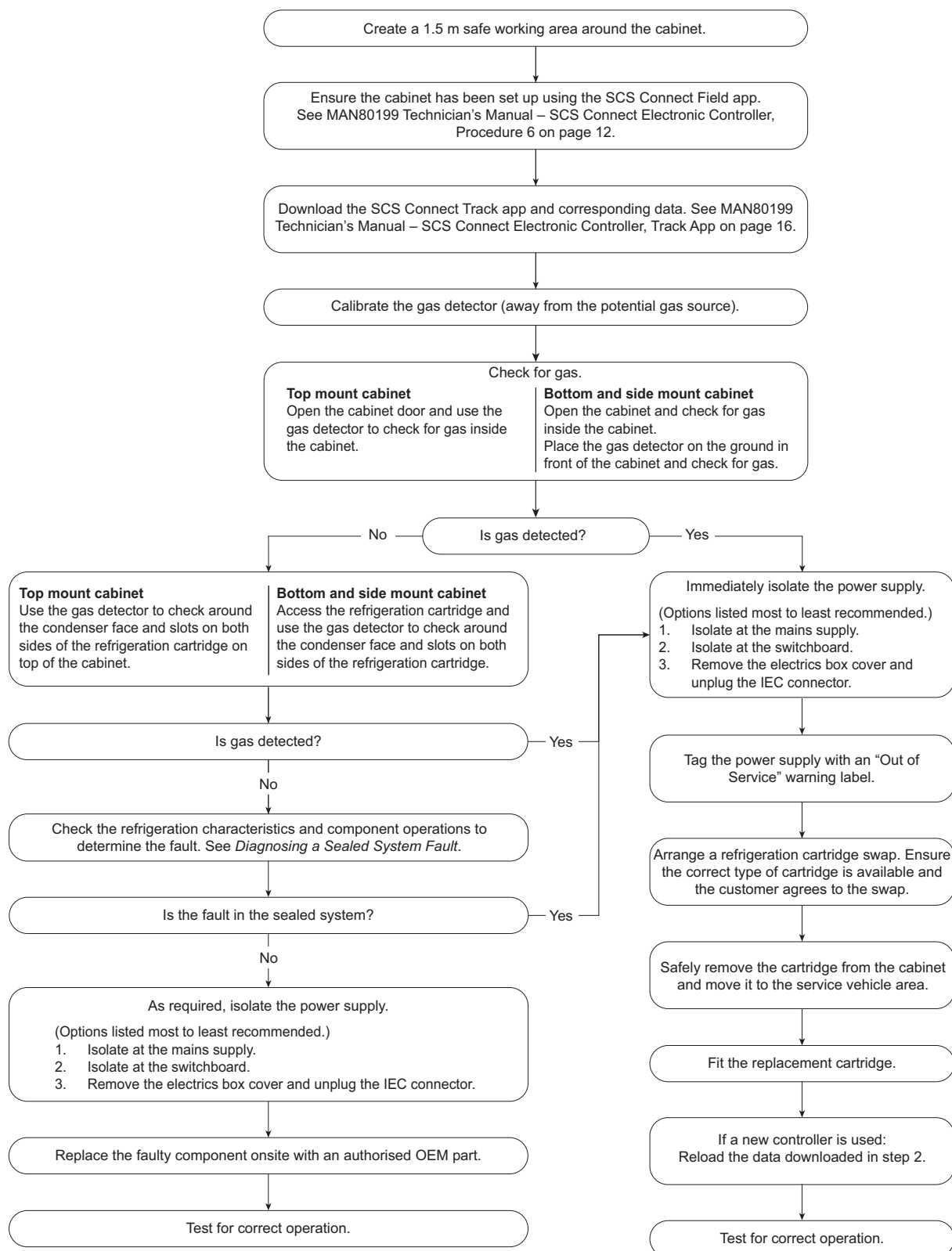
**Procedure 23: To replace the condenser probe****Before you start**

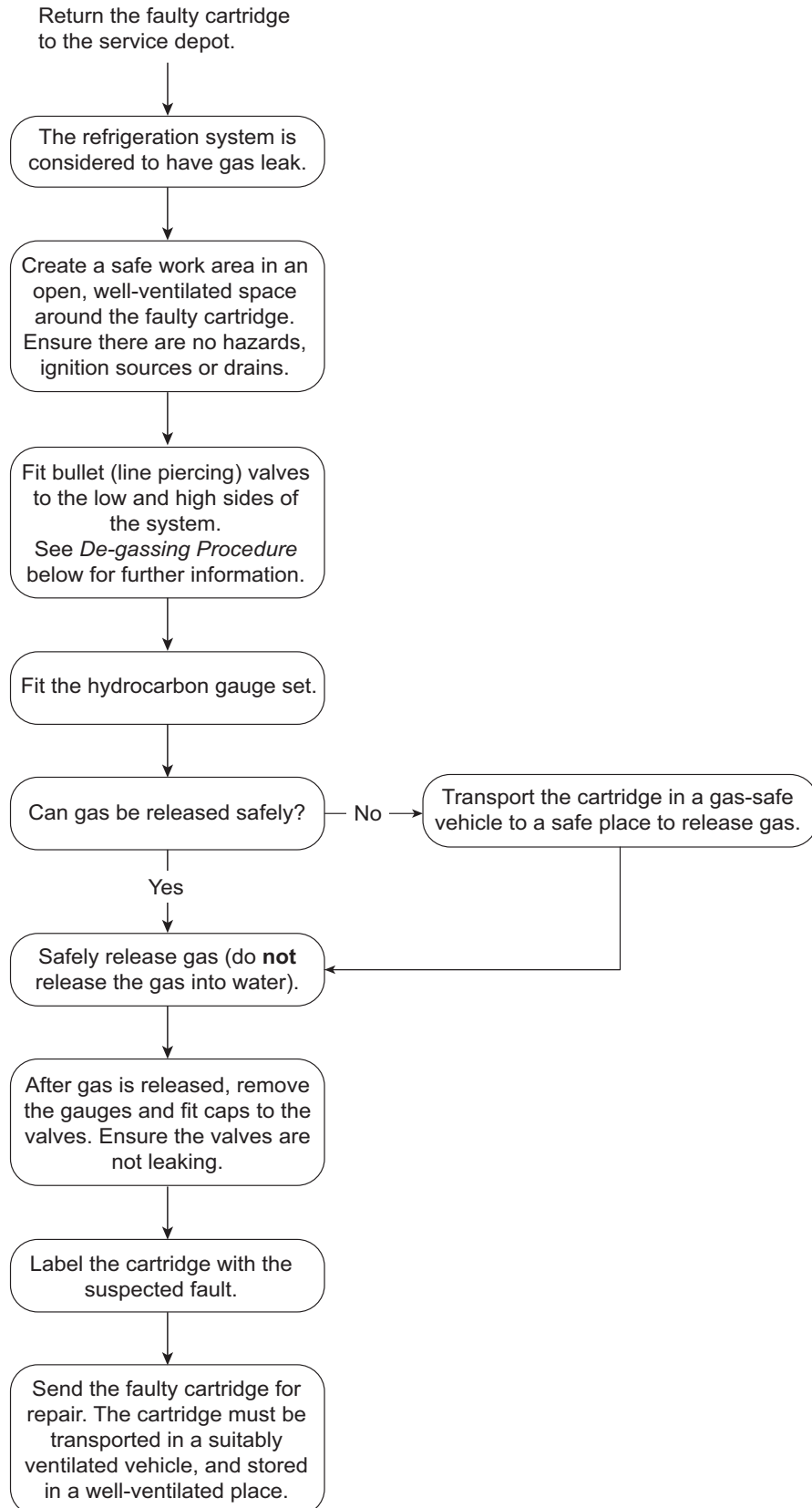
Take note of the original condenser probe cable's path, e.g. a photo.

1. Disconnect the cabinet from the mains power supply (see Procedure 5, on page 9).
2. Remove the refrigeration cartridge (see Procedure 16, on page 20).
3. Take note of the cable routing, then detach the probe and remove from the cartridge.
4. Replace the probe, ensure it is:
 - in the same position as the original probe.
 - insulated with cork tape and securely attached.
5. Following the same path as the original probe, fit the new probe with cable ties as necessary and plug it in to the connector. Ensure the probe cable is clear of the condenser fan.
6. Reassemble the cartridge.
7. Reconnect the cabinet to the mains power supply and check for correct operation.

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 relevant procedure below when making the service visit.





De-gassing Procedure

Follow the procedure below to safely de-gas a hydrocarbon refrigeration cartridge.

Note: Follow all hydrocarbon standard operating procedures when carrying out this procedure.

Procedure 24: To de-gas a refrigeration cartridge

Before you start

You will need:

- 2 × ¼" piercing valve kits
- Align key set
- Hydrocarbon-rated gauge set
- Leak detector

1. Conduct a risk assessment.
2. Disconnect the cabinet from the mains power supply.
3. Leak check the cartridge.
4. Remove the refrigeration cartridge, and place it in a well ventilated area, away from any ignition sources, drains and populated areas.

5. Install the one valve on the low side processing tube.



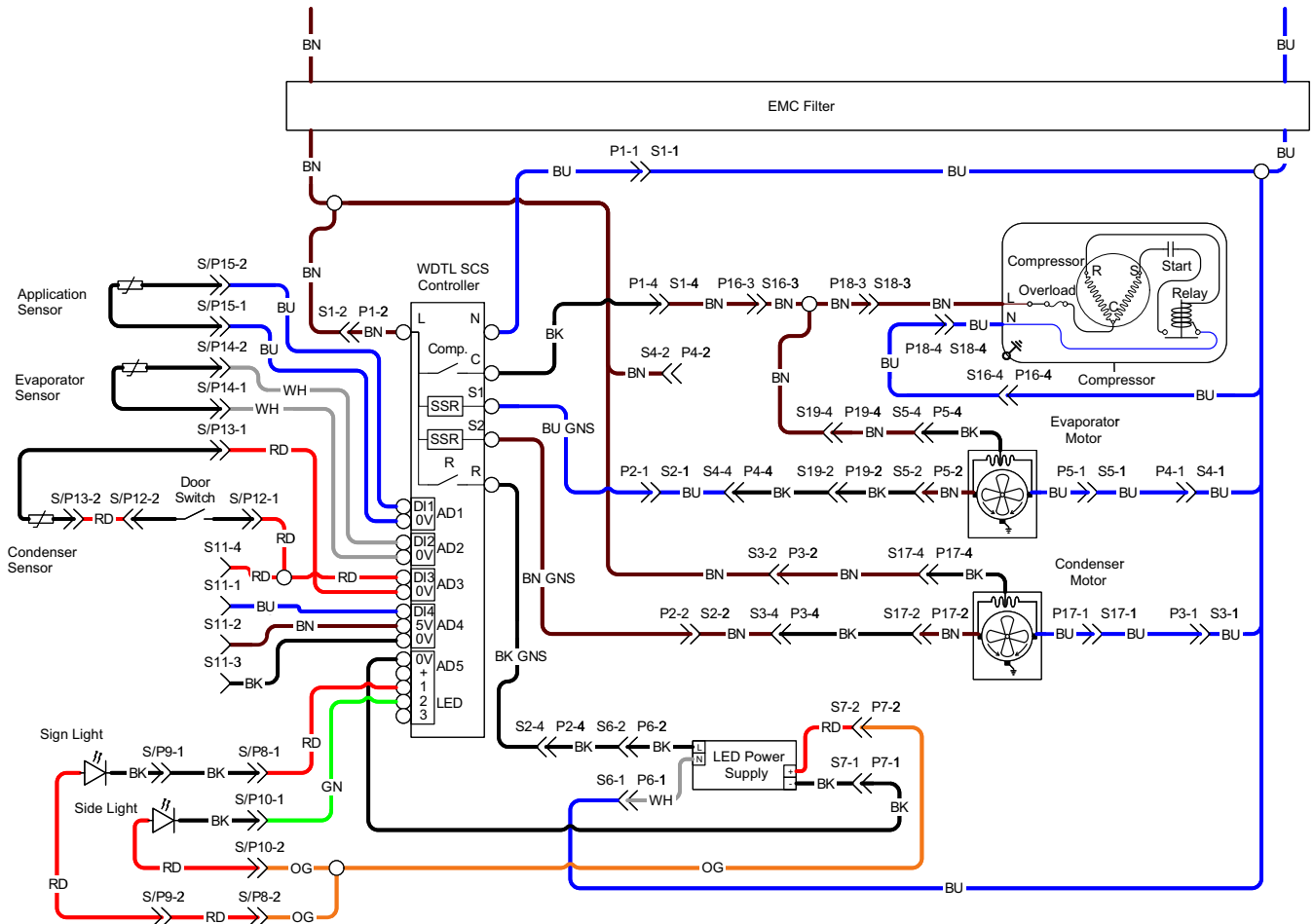
6. Install the one valve on the high side processing tube.



7. Connect the gauge set on the low and high sides and release the refrigerant into the atmosphere.
8. Once all the refrigerant has been released, cap the valves and leave them in position.
9. Complete the repairs at a hydrocarbon repair station.
10. Once the repairs have been completed, remove all piercing valves, and return the system to a sealed state.

5 Wiring

Model: BME300N and BME400N Series



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

Item	Description	Item	Description
S1/P1	Controller socket/plug 1 (red 4-way)	S11	PIR sensor socket (blue 4-way) (unused)
S2/P2	Controller socket/plug 2 (blue 4-way)	S12/P12	Door switch socket/plug (white 2-way)
S3/P3	Condenser socket/plug (red 4-way)	S13/P13	Condenser probe socket/plug (red 2-way)
S4/P4	Evaporator socket/plug (white 4-way)	S14/P14	Evaporator probe socket/plug (black 2-way)
S5/P5	Evaporator top socket/plug (white 4-way)	S15/P15	Application probe socket/plug (blue 2-way)
S6/P6	Power supply input socket/plug (yellow 4-way)	S16/P16	Compressor socket/plug (white)
S7/P7	Power supply output to cabinet socket/plug (red 2-way)	S17/P17	Condenser fan adaptor socket/plug (red 4-way)
S8/P8	Power supply output to sign socket/plug (black 2-way)	S18/P18	Compressor extension socket/plug (white)
S9/P9	Sign top socket/plug (black 2-way)	S19/P19	Evaporator extension socket/plug (white 4-way)
S10/P10	Cabinet extension LED socket/plug (red 2-way)		

6 Spare Parts

Cabinet

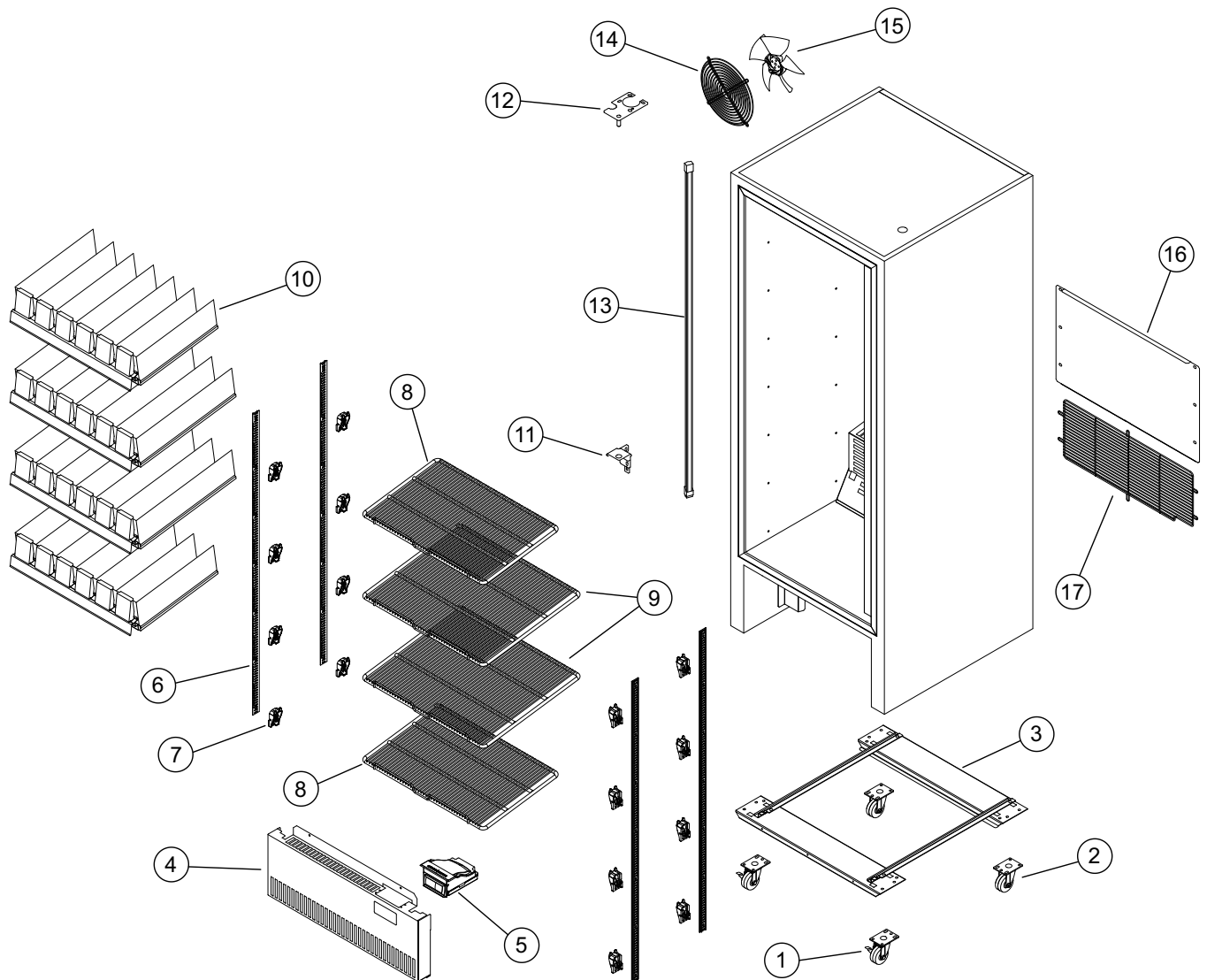


Table 3: Parts – Cabinet BME

Item	Description	SKOPE part number	Cabinet			
			BME300N-A	BME300N-AC	BME400N-A	BME400N-AC
1	Front braked castor	0070107949D	✓	✓	✓	✓
2	Rear castor	0070107949E	✓	✓	✓	✓
3	Plinth assembly	70832235	✓	✓	✓	✓
4	Kick panel assembly	SM30BYN/131	✓	✓	✓	✓
5	AoFrio electronic controller	ELZ11749	✓	✓	✓	✓
6	Shelf support strip – 1000 mm	HB0070110331-1000	✓	✓		
	Shelf support strip – 1320 mm	HB0070110331-1320-BK			✓	✓
7	Shelf clip	HB0070205867A	✓	✓	✓	✓
8	Shelf – top and bottom	SM30BYN/J75	✓	✓	✓	✓
9	Shelf – middle	SM30BYN/J76	✓	✓	✓	✓
10	Gravity matting kit – BME300N	SXX12925	✓	✓		
	Gravity matting kit – BME400N	SXX12926			✓	✓
11	Bottom right hand hinge assembly	SM12BV/393AR-49	✓	✓	✓	✓
12	Top right hand hinge assembly	SM12BV/388R-49	✓	✓	✓	✓
13	LED light bar – 1100 mm	ELL12897	✓	✓		
	LED light bar – 1400 mm	ELL11771			✓	✓
14	Wire fan guard	UX02N00007	✓	✓	✓	✓
15	Evaporator fan blade	FAN12482	✓	✓	✓	✓
16	Evaporator box retainer bracket	SM30BYN/226	✓	✓	✓	✓
17	Rear wire guard	SM30BYN/N86	✓	✓	✓	✓
	Rear spacer	RUM12941	✓	✓	✓	✓
–	Controller power flex 1 (not shown)	UW0100012	✓	✓	✓	✓
–	Controller power flex 2 (not shown)	UW0100013	✓	✓	✓	✓
–	EMI filter (not shown)	ELZ10136	✓	✓	✓	✓
–	LED driver – 40 W 24 V (not shown)	ELZ11887	✓	✓	✓	✓
–	Power supply adaptor flex (not shown)	SM30BYN/X05	✓	✓	✓	✓
–	Door sensor	HB0074091496-1	✓	✓	✓	✓
–	Door sensor magnet	HB0074091496-2	✓	✓	✓	✓
–	Electronic controller signal loom	UW0300067	✓	✓	✓	✓
–	Electronic controller lighting loom	SM30BYN/X04	✓	✓	✓	✓

Glass Door

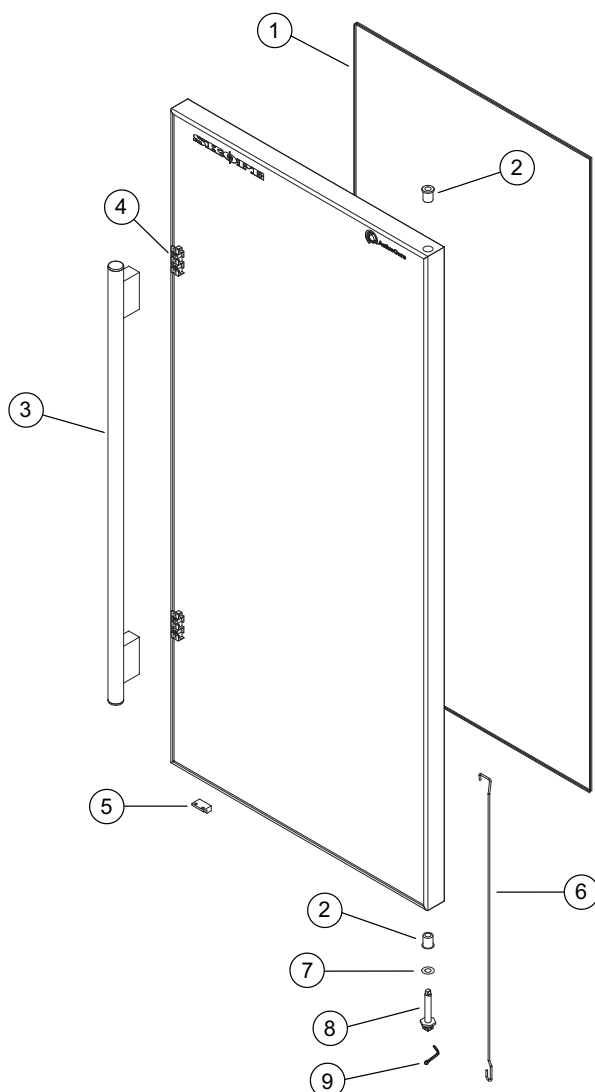


Table 4: Parts – Glass door

Item	Description	SKOPE part number
	Door assembly (right hand) – BME300N	GLD12891
	Door assembly (right hand) – BME400N	GLD12892
1	Gasket – BME300N	GKT12898
	Gasket – BME400N	GKT12899
2	Bush	PLM5075
3	Handle assembly	SM65BYN/H50
4	Door handle mounting bracket	STY11484GY
5	Door sensor magnet	HB0074091496-2
6	Torsion bar	REF5014
7	Bush washer	PLM11298
8	Capstan	TUR11299
9	Split pin	FAS5076
	Left hand hinge reversal kit – white	SM60BV/D100-32
	Left hand hinge reversal kit – black	SM60BV/D100-49

Lit Sign

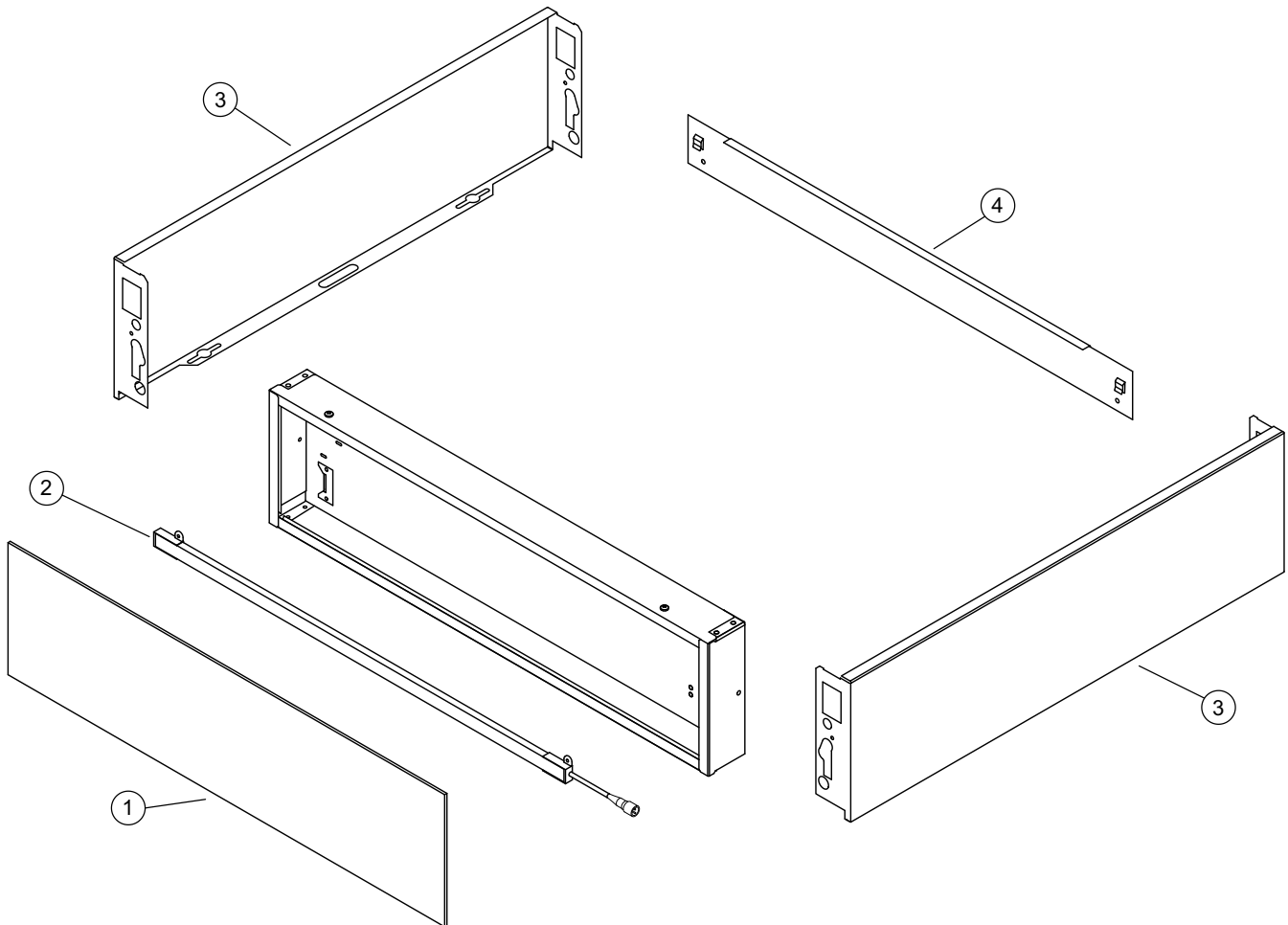


Table 5: Parts – Lit sign

Item	Description	SKOPE part number
-	Sign box assembly (front sign)	SM30BYN/T61
1	Sign insert panel	SYL-2-110-0058-0
2	Sign light	SYL-4-050-0020-0
3	Sign side – black	SM30BYN/S20
4	Sign back strip	SM30BYN/C53
	Sign addition kit (includes back and sides)	SM30BYN/T60

Refrigeration Cartridge - UBQCNI-0092

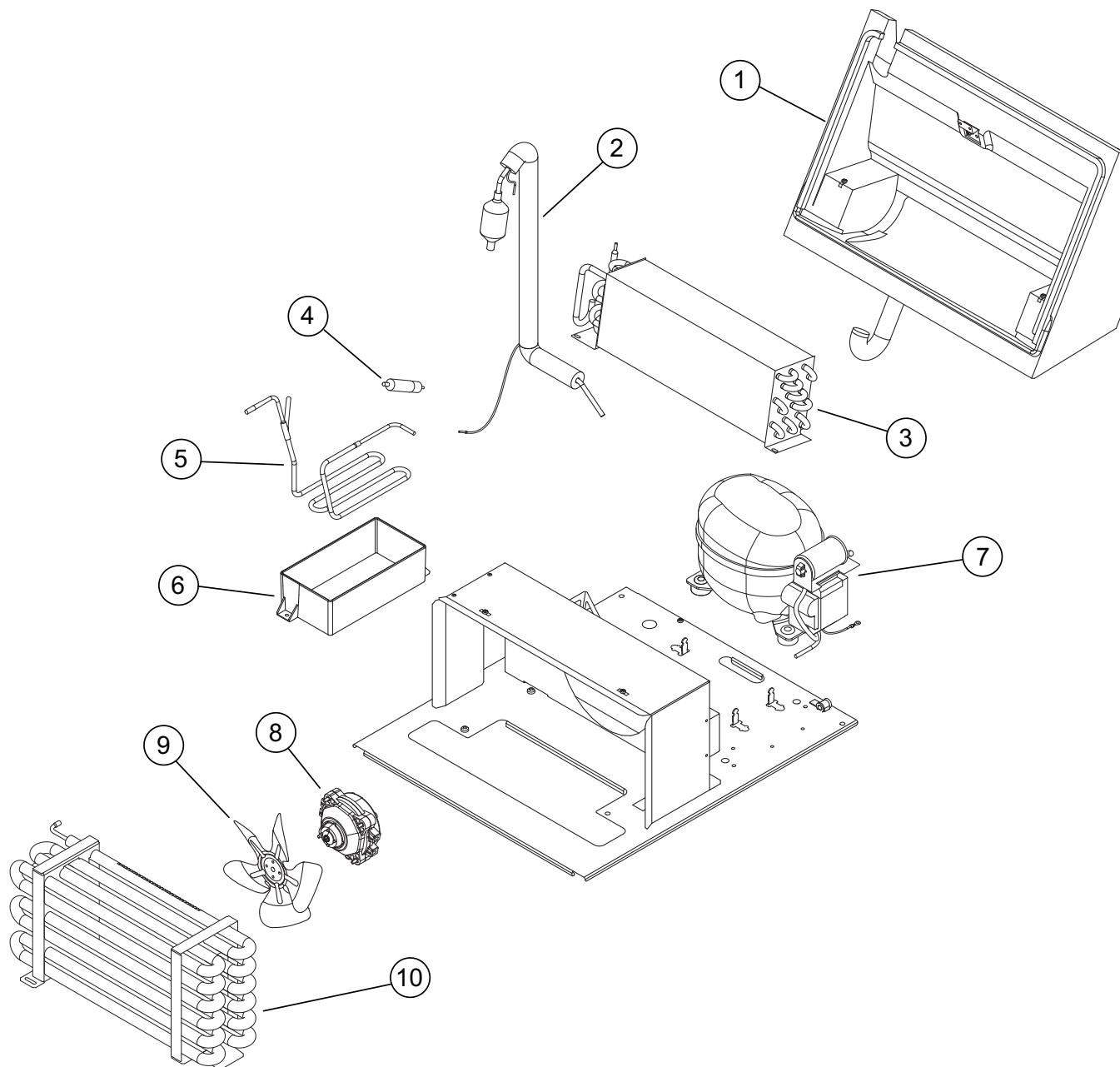


Table 6: Parts – Refrigeration cartridge: UBQCNI-0092

Item	Description	SKOPE part number
–	Refrigeration cartridge	UBQCNI-0092-P
1	Evaporator box assembly	UA0500010
2	Suction line assembly	UA0400053
3	Evaporator coil	CLS11689
4	Dryer	0070702221
5	Discharge/condensate line assembly	HB0070702658
6	Condensate tray	HB0070204929
7	Compressor	CPR11691
8	Condenser fan motor	ELM12774
9	Condenser fan blade	FAN13036
10	Condenser coil	CLS11690
–	Cartridge wiring loom	HB0070401061
–	Compressor/evaporator adaptor loom	SM30BYN/X01
–	Condenser adaptor flex	UW0100124
–	Mains flex	V4800/E53
–	Probe – red	UW0300028-RD
–	Probe – black	UW0300028-BK
–	Probe – blue	UW0300028-BU

7 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 7.

Table 7: Cabinet and cartridge troubleshooting

Problem	Possible cause	Recommended action
- Cabinet not operating - No controller display	Loss of power supply	Check the mains power supply.
	Loose plug	Check that all plugs are connected correctly.
- Cabinet not operating as usual - Defrost cycle incorrect length	Incorrect parameters	AoFrio: Reload the parameter set. The parameter number should be on or near the electronic controller.
Fan not working	Loose plug	Check all plugs are connected correctly.
Lights not on	Electronic controller is in Night mode	- 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.
	Refrigeration system error (indicated by the electronic controller)	Diagnose and repair. If a system fault is found contact SKOPE for information on how to proceed.
	Light switched off	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, or condenser coil assembly.
Compressor not operating	Compressor electrics	- 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 7: 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. 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	• 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	• Check and clean the door gasket. • Ensure the cabinet is on a level surface.
	• Excessive door opening	Limit door openings.
	• Refrigeration system error (indicated by the electronic controller)	Diagnose and repair. If a system fault is found contact SKOPE for information on how to proceed.
	• 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	• 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	• 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 • Compressor operating for long periods (more than 1 hour)	• Blocked condenser coil	Clean the condenser coil.
	• Poor ventilation around the refrigeration cartridge	• Ensure the cabinet has good ventilation around the refrigeration cartridge. • Ensure the cabinet is within the maximum operating temperature.

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