

ReFlex 1-Door Underbench

SKOPE Fridge and Freezer
Hydrocarbon



ReFlex 1-door Underbench
SKOPE Fridge and Freezer
Hydrocarbon
Service Manual

MAN80258
Rev. 1.2 May 2023

© 2020 SKOPE Industries Limited. All rights reserved.

SKOPE Industries Limited reserves the right to alter specifications without notice.

SKOPE® is a registered trademark of SKOPE Industries Limited.
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

Trademark Infringement

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

- Applies the trade mark to the product after its state, condition, get-up or packaging has been altered in any manner
- Alters, removes (including part removal) or obliterates (including part obliteration) the trade mark on the product
- Applies any other trade mark to the product
- Adds to the product any written material that is likely to damage the reputation of the trade mark

Notice of the above contractual obligations passes to:

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

Contents

1 Servicing Hydrocarbon	
Overview	5
SKOPE HC Service Requirements	6
2 Specifications	
Models	7
3 Installation	
Installation Guidelines	8
Ventilation Requirements	8
Cleaning Before First Use	8
Shelves	9
Power Cord	9
4 Electronic Controller	
Overview	10
Apps	10
SCS Connect Field App	10
SCS Connect Track App	10
SKOPE Connect App	10
Controller Faceplate	11
Buttons and Display	11
Service Mode	11
SCS Connect Field App and Track App	12
Connecting	12
App Categories	13
Faults and Alarms	15
Notes	17
5 Wiring	
ReFlex 1-door Underbench Fridge (RF6.UBR.1.SD)	19
ReFlex 1-door Underbench Freezer (RF6.UBF.1.SD)	20
6 Replacement Procedures	
Doors	21
Alignment Adjustment	21
Door Gasket	21
Door Hinges	21
Removing and Refitting the Door	22
Door Tension	22
Door Locks	22
Hinge Reversal	22
Cabinet Feet and Rollers	23
EMI Filter (Freezer)	24
Refrigeration System	24
Before Servicing	24
On-site Work	26
Off-site Work	26
Evaporator Assembly	26
Condenser Assembly	27
Electronic Controller	28
Controller Location	28
QC Terminals	28

Replacing the Controller	28
Control Probe	29
7 Spare Parts	
ReFlex 1-door Underbench Fridge (RF6.UBR.1.SD)	30
ReFlex 1-Door Underbench Freezer (RF6.UBF.1.SD)	32
8 Routine Cleaning	
Cabinet and Condenser Coil	34
Defrosting (Freezer Only)	34
9 Troubleshooting and Diagnostics	
Electronic Controller	35
General Operation.	35
Refrigeration System.	35

1 Servicing Hydrocarbon

Overview

This appliance uses hydrocarbon (HC) as its refrigerant (Fridge: R600a, Freezer: R290). Hydrocarbon refrigerants have a very low environmental impact.

Special service requirements are needed, as hydrocarbon refrigerants are flammable.

Safety hazards

The main hydrocarbon safety hazards are:

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

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

SKOPE HC Service Requirements

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

Hydrocarbon work – SKOPE Service Policy

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

- MUST – Ensure all workers are trained in the SAFETY of hydrocarbon products to the appropriate level for the work required.
- MUST – Follow all Local Safety Regulations relevant to flammable refrigerant gases.
 - Australia should reference - AIRAH Flammable Refrigerants – Safety Guide
 - New Zealand should reference – Flammable Refrigerant Safety Documentation (Refrigerant License NZ)
- MUST – Adhere to all on-site (workplace) Health and Safety requirements
- MUST – Not modify or alter the design of SKOPE equipment in any way
- MUST – In cases where the refrigeration system is not readily removable from the cabinet; then the entire cabinet MUST be sent to the Hydrocarbon workshop for repair.
- MUST – ONLY use SKOPE OEM Spare Parts; or identical replacement parts. Any variation in replacement part may render the system non-compliant and unsafe.
- MUST – Follow all best practice work activities for servicing hydrocarbon refrigerants (SKOPE recommend attending specific hydrocarbon refrigeration handling training courses). Nitrogen must be used for purging system before commencing "Hot Work" – brazing.
- MUST – Adhere to relevant SKOPE Service Manual. If any contradiction, the local Regulations take precedence over SKOPE requirements
- MUST – Work only in suitable, safe and compliant work spaces. Personal Protective Equipment must always be used when working on Hydrocarbon equipment.
- MUST – Service people diagnosing refrigeration faults must always carry and utilise Flammable Gas detectors when working on Hydrocarbon equipment.
- MUST – Prior to any service work; know where and how to safely and quickly isolate power supply to cabinet
- MUST – Not perform any Hot Work (brazing etc.) in the field. These are to be completed in a suitable service depot / workshop (in a dedicated specific Hazardous Work Area compliant to local flammable gas regulations)
- MUST – Not transport a refrigeration system with a known active leak. If there is an active leak the refrigerant must be safely removed (with use of Bullet Piercing Valve or Line Tap valves) before transporting. Valves must be removed at the hydrocarbon service depot once repair is completed.
- MUST – All hydrocarbon workshop areas must have emergency plans; that includes suitable evacuation and fire control plans and equipment.
- MUST – Only use refrigerant grade hydrocarbon, to precise mass specified on removable refrigeration system serial label.
- MUST – Be accurate refrigerant charge; The refrigerant mass is ultra-low charge and must only be measured in by accurate scales to +/- 1.0gram. Refrigerant MUST not be overcharged; or added to an already charged system.
- MUST – Use identical drier replacement; as any change will affect gas charge volume; and effect reliability compliance and safety.
- MUST – Any pipework replacement, must be identical to genuine SKOPE parts.
- MUST – Not introduce a sparking device inside a cabinet or inside a removable refrigeration system. Battery drills should not be used.
- MUST – Not perform any activity that could stress a refrigeration pipe (unless in a workshop).
- MUST – Get customer authorisation to permanently swap a removable refrigeration system.
- MUST – Have the Wellington Drive SCS Field app installed on a Bluetooth enabled device carried by the service technician (exception is for cabinets that do not utilise the Wellington Drive Controller). The app should be utilised for safe, accurate diagnosis of the system and it is required to complete a controller replacement in the field.
- RECOMMENDED – Have the Wellington Drive SCS Track app installed on a Bluetooth enabled device carried by the service technician. This passive app collects system data from the Wellington Drive SCS Connect Controller and transmit it to the cloud.
- Logistics companies may be used to transport a complete refrigerator where no separation of the refrigeration system occurs. Logistics companies are not required to be contracted to this SKOPE Service Policy.

2 Specifications

Models

This service manual is applicable to the SKOPE ReFlex 1-door Underbench models listed in the table below. Refer to the relevant product specification sheet (available on the SKOPE website: www.skope.com) for specifications.

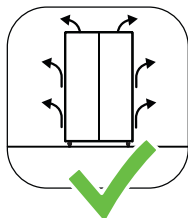
Table 1: Model specifications

Model	SKOPE ID	Product description
RF6.UBR.1.SD	RB1R	1-Door Underbench Fridge
RF6.UBF.1.SD	RB1F	1-Door Underbench Freezer

3 Installation

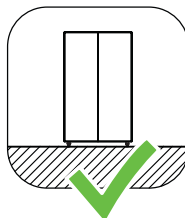
Installation Guidelines

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



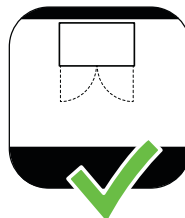
Ventilation

Ensure all ventilation requirements below are met.



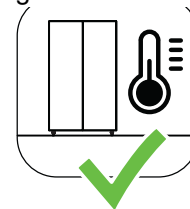
Surface

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



Door Opening

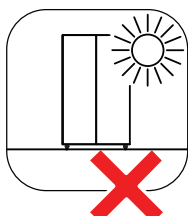
Allow adequate space for the door/s to open and close properly.



Climate Class

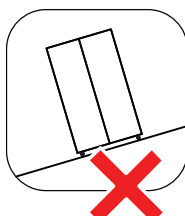
The cabinet must be installed in an environment within its climate class.

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



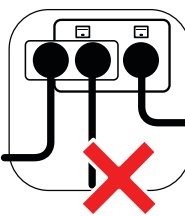
Sunlight

Do not install the cabinet in direct sunlight.



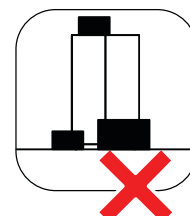
Uneven Surface

Do not install the cabinet on an uneven surface.



Power Supply

Do not overload the power supply.



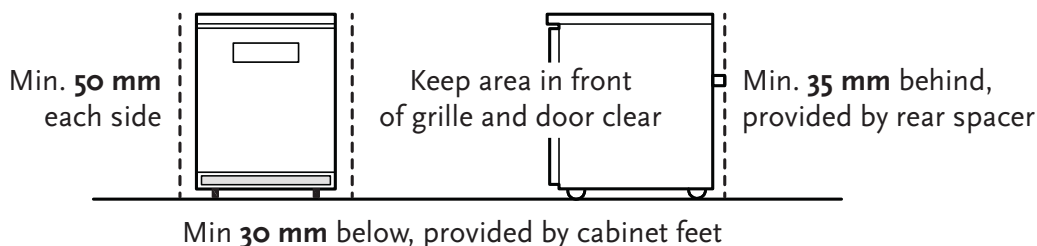
Blocking Ventilation

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

Ventilation Requirements

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

No above clearance required



Cleaning Before First Use

You must thoroughly clean and sanitise the cabinet interior and food contact surfaces before first use. Ensure the cabinet is unplugged from the power supply before cleaning, and use only standard stainless steel cleaners suitable for food preparation areas. See "Ventilation Requirements" on page 8 for routine cleaning instructions.

Shelves

The upper shelf is held in place with four shelf clips, which clip into the shelf support strips. The bottom shelf has integrated runners that sit on the cabinet floor. You can position the shelf clips at different heights to suit various product.



Power Cord

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

4 Electronic Controller

Overview

The cabinet is fitted with a Wellington Drive SCS Connect electronic controller. The controller is located above the door and is visible from the outside of the cabinet.

Apps

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

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

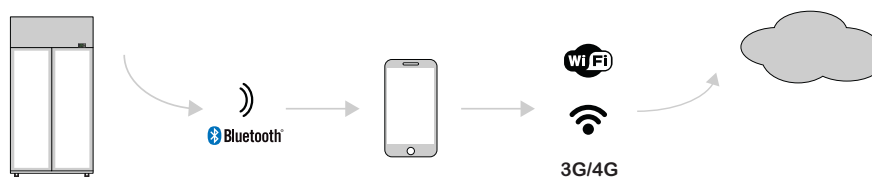
All technicians who service SKOPE equipment fitted with the Wellington Drive SCS Connect electronic controller are required to have the Wellington Drive Field app installed on their Bluetooth enabled mobile device. SKOPE also recommend that all technicians have the Wellington Drive Track app installed.

See “SCS Connect Field App and Track App” on page 12 for information on setting up and using the app.

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

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

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



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

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

Controller Faceplate

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

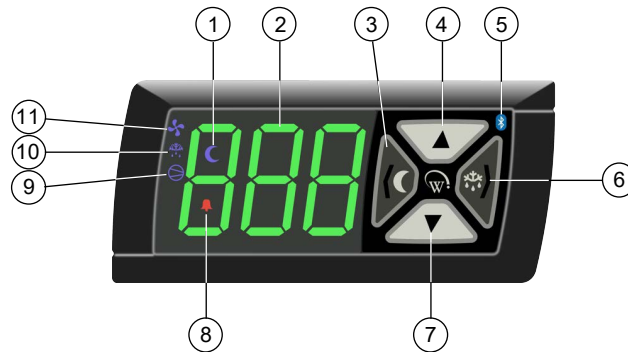


Table 2: Controller faceplate

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.	

Please note that support for the listed controller functions may vary between SKOPE models.

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

Service mode includes:

Parameters

Allows you to access and edit individual controller parameters.

Reset

Returns the controller back to factory or default settings.

Manual test

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

Statistics

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

About

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

Refer to AoFrio documentation for further information.

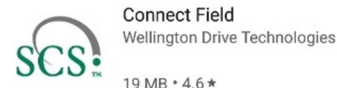
SCS Connect Field App and Track App

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

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

Procedure 1: To install the SCS Connect Field app

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



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

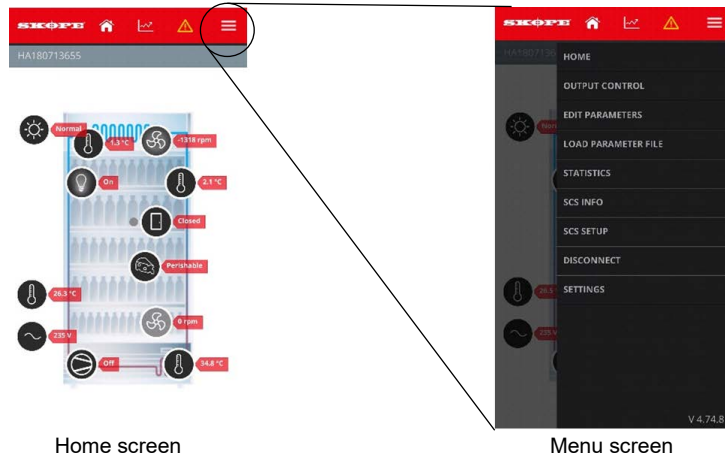
Procedure 2: To connect to a cabinet

1. Ensure Bluetooth is enabled and you have internet access on your mobile device.

2. The app shows a list of nearby SKOPE cabinets. The signal bars indicate how close each cabinet is.



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



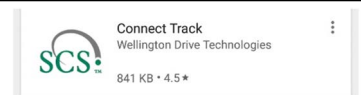
Home screen

Menu screen

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

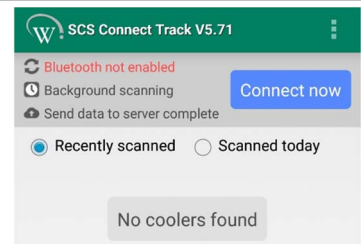
Procedure 3: To install and use the SCS Connect Track app

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



2. Enter your unique Activation Code and press "ACTIVATE" (the same code as used for SCS Connect Field app). The activation code is provided by SKOPE Customer Services.

3. Respond to any dialogue boxes that appear and the app should be ready to use.
Ensure Bluetooth is turned on.

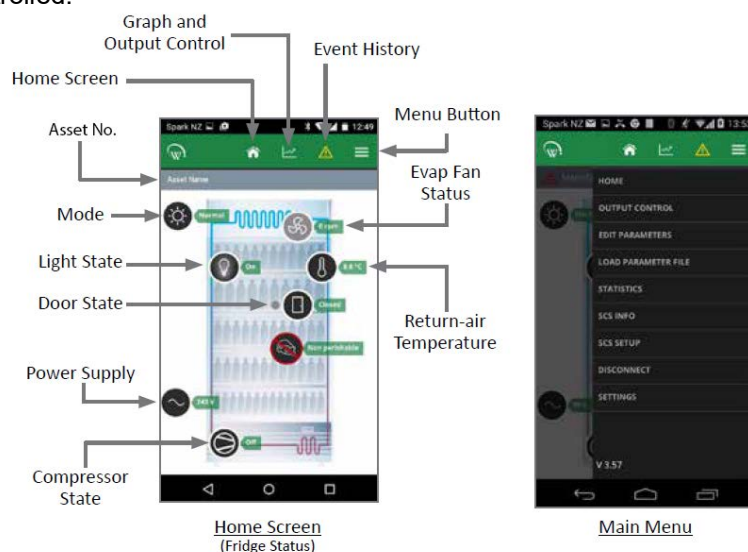


4. The app is passive and runs in the background (it can track automatically). When servicing a cabinet, the app should be opened to ensure tracking has finished prior to servicing.

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

Home screen

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



Output control

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

Edit parameters

Provides access and editing of individual controller parameters.

Note: Parameter changes must be recorded on warranty/job card.

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

Load parameter file

Allows reloading of model default parameter set or changing to new parameter set. See "Replacing the Controller" on page 28 for instructions. **Note:** Updated parameters are not applied until DISCONNECT has been selected from the menu (after loading new parameter set).

Statistics

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

SCS info

Controller version and cabinet asset information.

SCS setup

Add or change SCS info (see above).

Disconnect

Disconnect from currently connected controller.

Settings

Change app general settings.

Table 3: Parameters

	Model number	RF6.UBR.1.SD	RF6.UBF.1.SD
Parameter numbers	618	✓	
	619		✓

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.

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

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

Table 4: Faults

Description	Service tech type	Possible root cause
Door left open. The door has been open for several minutes.	1, 2, 3, 4	<ul style="list-style-type: none"> Door not self-closing (torsion fault) Door switch/circuit Controller
Excessive door open counts		
Over-voltage protection The maximum allowable mains supply voltage has been exceeded. The cabinet has temporarily shut down to prevent damage and will restart once the supply voltage decreases.	1, 2, 3, 4	Should be a one-off. If continues, consider: <ul style="list-style-type: none"> line voltage/rural voltage setting parameter controller
Under-voltage protection The mains supply voltage has dropped below the minimum allowable level. The cabinet has temporarily shut down to prevent damage and will restart once the supply voltage increases.	1, 2, 3, 4	Should be a one-off. If it continues, consider: <ul style="list-style-type: none"> power supply overloaded/multi-box line voltage/rural voltage setting parameter controller
High condensing temperature protection The system was operating at an elevated temperature and has temporarily shut down to prevent damage. Extended operation in this condition may result in ALARM 15, increased energy consumption and a reduction in cabinet life. This alarm may be caused by very high ambient temperature.	2, 3, 4	<ul style="list-style-type: none"> Cabinet installed in location outside rated conditions Condenser needs cleaning Poor installation or ventilation Condenser fan motor or blade Controller
Excessive compressor cycling protection The system has been turning on and off too frequently.	2, 3, 4	<ul style="list-style-type: none"> Condenser blocked Poor installation or ventilation Cabinet or refrigeration cartridge gasket seals leaking Door not self-closing or gasket leaking Product hot or blocking cabinet airflow Overloaded from excess door openings/ambient Condenser or evaporator fan motor or blade Controller Compressor or gas leak

Table 5: Alarms

Code	Description	Service tech type	Possible root cause
dor	Door left open. The door has been open for several minutes. Will revert to door left open FAULT after 10 minutes (see faults table on previous page).	1, 2, 3, 4	<ul style="list-style-type: none"> Door not self closing (torsion fault) Door switch or circuit Controller
8	Estimated product temperature below allowable range The estimated product temperature has been below the allowable range for longer than the permissible time. Potential causes are: an empty or partially filled cabinet, or low ambient temperature.	1, 2, 3, 4	<ul style="list-style-type: none"> Low ambient App settings Controller
9	Estimated product temperature above allowable range The estimated product temperature has been above the allowable range for longer than the permissible time. Potential causes are: excessive door openings, door being left open, or warm product loaded into cabinet.	2, 3, 4	<ul style="list-style-type: none"> Condenser blocked Poor installation or ventilation Frozen blocked evaporator coil System gasket leaking (to cabinet seal or lid seal) Door leaking air (bad gasket or door not self-closing) Product hot or blocking cabinet airflow Overloaded from excess door openings/ambient Condenser or evaporator fan motor or blade App settings Controller Compressor or gas leak
15	Excessive condensing temperature protection The system was operating at an excessive temperature and has shut down to prevent permanent damage. This alarm may occur due to very high ambient temperature.	2, 3, 4	<ul style="list-style-type: none"> Cabinet installed in location outside rated conditions Condenser needs cleaning Poor installation or ventilation Condenser fan motor or blade Controller
17	Control probe failure A critical system sensor has failed and the cabinet can no longer operate.	2, 3, 4	<ul style="list-style-type: none"> Control probe or circuit Controller
18	Electrical over-current protection activated The compressor was drawing too much current and has shut down to prevent permanent damage.	2, 3, 4	<ul style="list-style-type: none"> Condenser blocked Poor installation or ventilation Cabinet or system gasket seals leaking Door not self-closing or gasket leaking Product hot or blocking cabinet airflow Overloaded from excess door openings/ambient Condenser or evaporator fan motor or blade Controller Compressor or gas leak
19	Failed to reach set temperature The refrigeration system has been operating continuously for a long period without reaching the set temperature.	2, 3, 4	<ul style="list-style-type: none"> Condenser blocked Poor installation / ventilation Frozen blocked evaporator coil Cabinet seal leaking / door / system Product hot / blocking cabinet airflow Overloaded from excess door openings / ambient Fan motor / blade (condenser / evaporator) Controller Compressor / gas leak
20	Over cooling product The internal temperature is too low. The system has temporarily shut down until the temperature has returned to normal. This can occur if the set temperature has been raised by a large amount.	1, 2, 3, 4	Confirm if really too cold; change parameters accordingly.
22	Evaporator fan over-current protection The current supplied to the evaporator fan motor is too high.	2, 3, 4	<ul style="list-style-type: none"> Faulty fan motor Fan blade fault (imbalance, debris or blockage) Controller
23	Condenser fan over-current protection The current supplied to the condenser fan motor is too high.	2, 3, 4	<ul style="list-style-type: none"> Faulty fan motor Fan blade fault (imbalance, debris or blockage) Controller
24	Controller communication error Controller has lost communication channels.	1, 2, 3, 4	<ul style="list-style-type: none"> App Controller or circuit
25	Controller update failed Controller update could not be completed.	1, 2, 3, 4	<ul style="list-style-type: none"> App Controller or circuit
26	Controller hardware failure Controller hardware has failed.	1, 2, 3, 4	<ul style="list-style-type: none"> App Controller or circuit
27	Probe failure A non-critical system probe has failed. The cabinet will continue to operate with partial function but requires service.	2, 3, 4	<ul style="list-style-type: none"> Probe or connections Controller

Table 5: Alarms (continued)

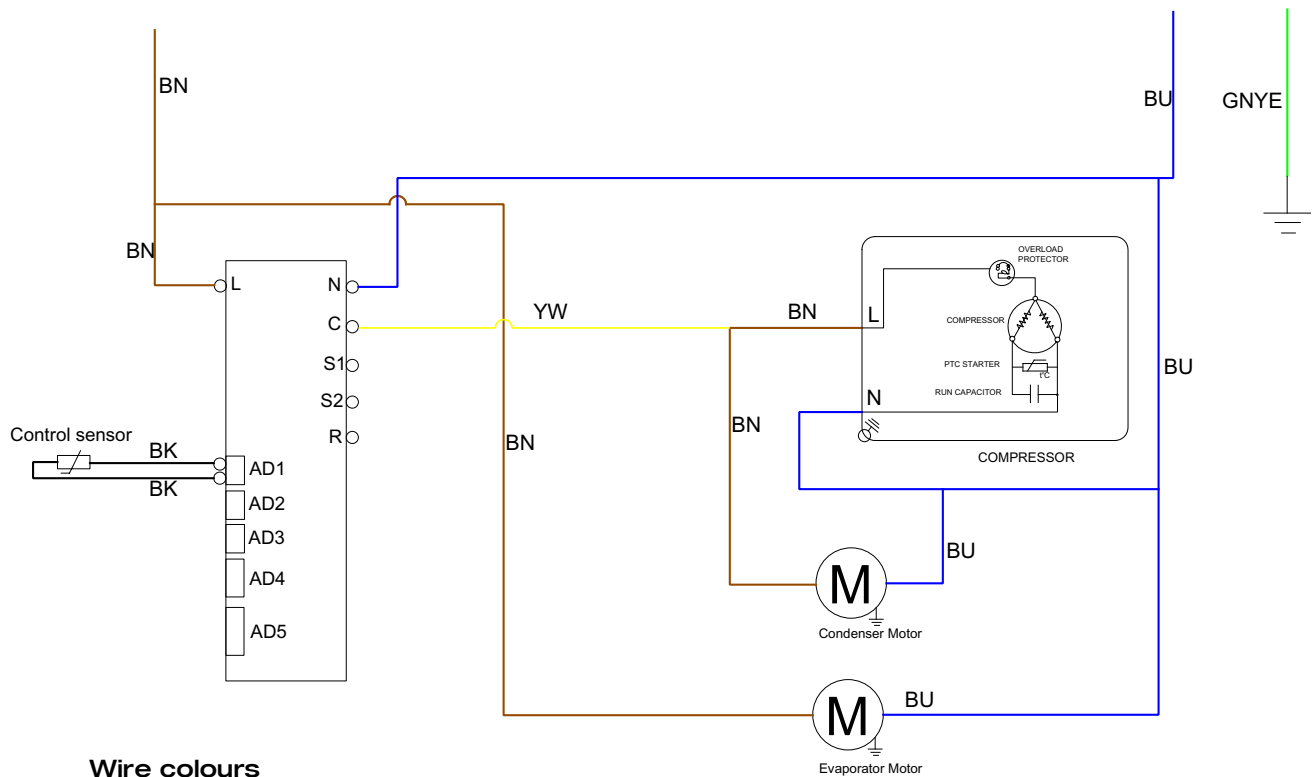
Code	Description	Service tech type	Possible root cause
28	No downward tendency The temperature is no longer decreasing.	2, 3, 4	<ul style="list-style-type: none"> • Condenser blocked • Door installation or ventilation • Cabinet or refrigeration cartridge gasket seals leaking • Door not self-closing or gasket leaking • Product hot or blocking cabinet airflow • Overloaded from excess door openings/ambient • Condenser or evaporator fan motor or blade • Controller • Compressor or gas leak
29	Compressor cutting out The compressor cut out on its internal protection or pressure switch.	2, 3, 4	<ul style="list-style-type: none"> • Condenser blocked • Door installation or ventilation • Cabinet, door or refrigeration cartridge seal leaking • Product hot or blocking cabinet airflow • Overloaded from excess door openings/ambient • Condenser or evaporator fan motor or blade • Controller • Compressor or gas leak
30	Excessive automatic defrosting The system is automatically defrosting too frequently.	2, 3, 4	<ul style="list-style-type: none"> • Door not self-closing or gasket leaking • Evaporator probe • Evaporator motor or fan • Controller • Compressor or gas leak
31	Compressor stalling The compressor is stalling on start up.	2, 3, 4	<ul style="list-style-type: none"> • Condenser blocked • Door installation or ventilation • Cabinet or refrigeration cartridge gasket seals leaking • Door not self-closing or gasket leaking • Product hot or blocking cabinet airflow • Overloaded from excess door openings/ambient • Condenser or evaporator fan motor or blade • Controller • Compressor or gas leak

Notes

[illegible]

5 Wiring

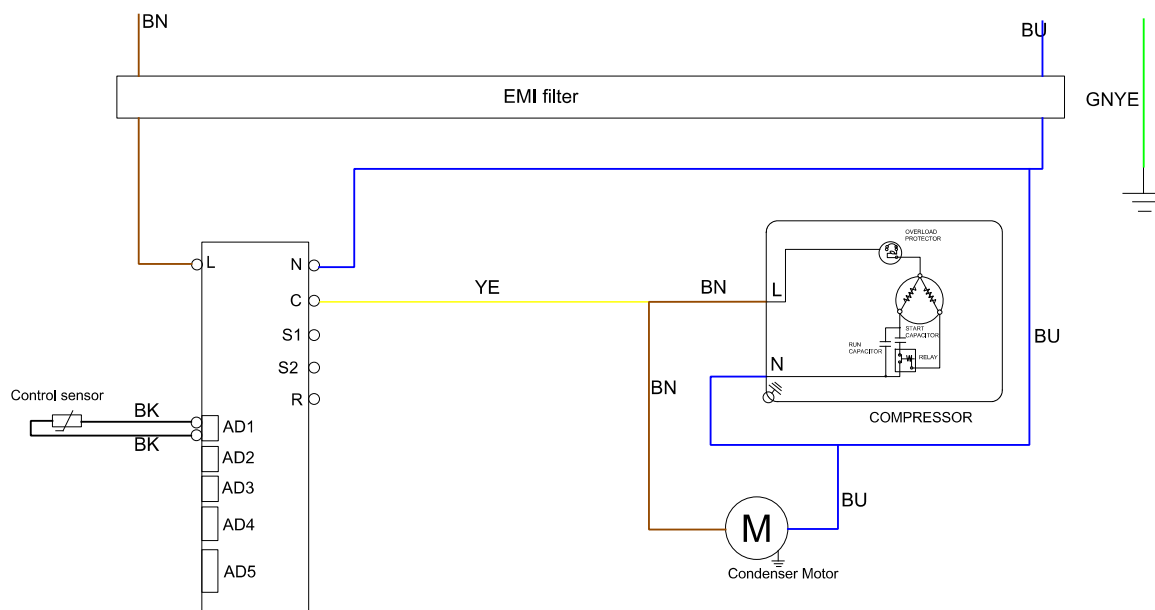
ReFlex 1-door Underbench Fridge (RF6.UBR.1.SD)



Wire colours

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

ReFlex 1-door Underbench Freezer (RF6.UBF.1.SD)



Wire colours

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

6 Replacement Procedures

Doors

Alignment Adjustment If a door is out of alignment, you can realign it.

Procedure 4: To realign a door

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

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

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

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

Procedure 5: To remove the bottom hinge

1. Unplug the cabinet from the mains power supply.
 2. Unscrew the bottom hinge (3 × screws), and lower the door off the cabinet.
-
3. Remove the bottom hinge from the bottom of the door.
-



Procedure 6: To remove the top hinge

1. Unplug the cabinet from the power supply, and remove the bottom hinge and door (see Procedure 6 above).

2. Unscrew and remove the top cover (with the controller attached) (2 × screws on each side of the cover), and place it on top of the cabinet.



3. Remove the under cover plate (3 × screws into the top hinges and centre bracket).

4. Unscrew and remove the top hinge (3 × screws).



Removing and Refitting the Door

For ease of servicing, you can remove the door from the cabinet.

Procedure 7: To remove the door

1. Unplug the cabinet from the mains power supply.
2. Unscrew the bottom hinge (3 × screws), and lower the door off the cabinet.

Procedure 8: To refit the door

1. Check that the bottom hinge is fitted to the bottom of the door with the square hole positioned so that the hinge forces the door closed.
2. Slot the top hinge - door onto the hinge pin, and screw the bottom hinge - cabinet (3 × screws) onto the mounting holes at the bottom of the cabinet opening.

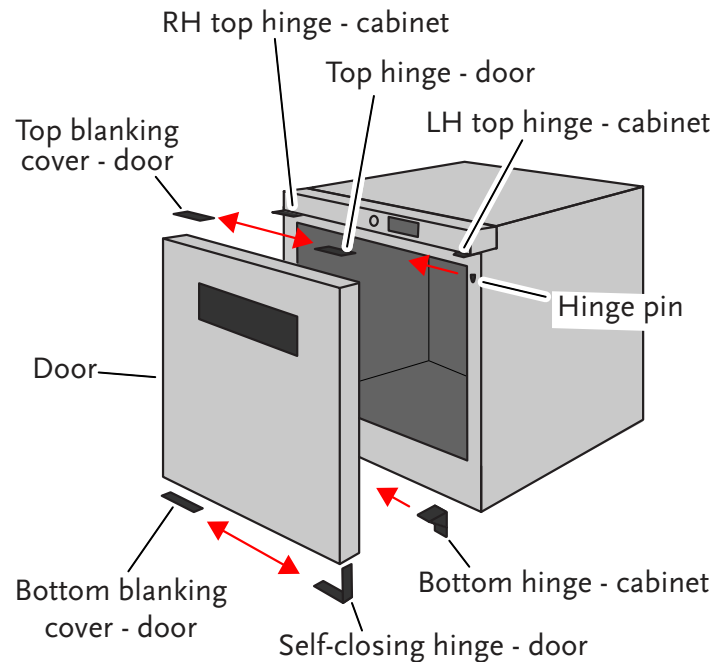
Door Tension The door is fitted with a self-closing mechanism which allows the door to self-close. If door tension is lost, check that the self-closing mechanism is installed correctly, and if necessary replace it.

Door Locks The top cover is fitted with a key lock. You can remove the replace the lock bolt and lock barrel.

Hinge Reversal You can change which side the door opens on by reversing the door hinge.

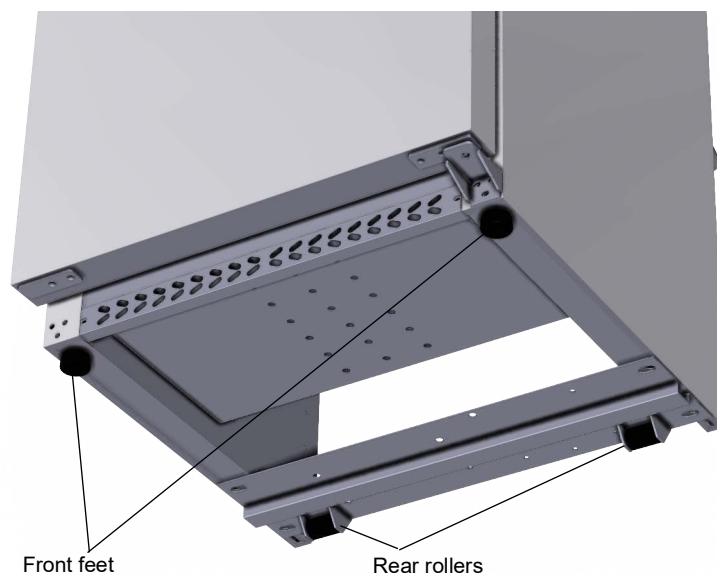
Procedure 9: To reverse the hinge

1. Unplug the cabinet from the mains power supply.
2. Unscrew the bottom hinge - cabinet (3 × screws), and lower the door off the cabinet. Remove the bottom hinge - cabinet from the bottom of the door and keep it for refitting later.
3. Unscrew and swap the self-closing hinge - door (2 × screws) with the bottom blanking cover - door (2 × screws).
4. Unscrew and swap the top hinge - door (2 × screws), with the top blanking cover - door (2 × screws).
5. Unscrew the hinge pin from the top hinge - cabinet, and fit to the opposite side.
6. Refit the door to the cabinet.
 - Fit the bottom hinge - cabinet to the bottom of the door, with the square hole positioned so that the hinge forces the door closed.
 - Slot the top hinge - door onto the hinge pin, and screw the bottom hinge - cabinet (3 × screws) onto the mounting holes at the bottom of the cabinet opening.
7. Check for correct operation. The door should self-close from approximately 45°, and stay open past 70°. If the door does not self close, change the bottom hinge square hole orientation so the hinge forces the door closed (step 6).

**Cabinet Feet and Rollers**

The cabinet is supplied fitted with 2 × adjustable height front feet and 2 × rear rollers.

The adjustable height front feet can be rotated to level the cabinet and can be removed and replaced. The rear rollers are not height adjustable.



EMI Filter (Freezer)

Freezers are fitted with an EMI filter. Remove the panel on the back of the cabinet to gain access. The EMI filter is located above the condenser coil.



Refrigeration System

Before Servicing Overview

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

Important

- SKOPE hydrocarbon refrigeration systems must only be serviced by appropriately skilled and qualified refrigeration mechanics.

- Servicing a sealed refrigeration system must occur at a hydrocarbon workshop or service area with dedicated hydrocarbon equipment and personal protective equipment (PPE).
- All local hydrocarbon storage and handling regulations and procedures must be followed at all times.

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

Check all components including the electronic controller and electrical systems.

Ensure your work area is well ventilated.

IMPORTANT

Use only dedicated hydrocarbon SKOPE OEM spare parts.

DO NOT use alternative parts.

For safety compliance, use only SKOPE-supplied components specified for the appliance.



Safety hazards

The main hydrocarbon safety hazards are:

- Flammability
- Venting of hydrocarbon and compressor oil
- Asphyxiation

Refrigerant identification

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

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

Personal protective equipment (PPE)

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

Service equipment

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

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

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

Leak detector

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

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

Service vehicle

- Must be suitable for transporting flammable gas.
- Vehicle cargo area:
 - Must be well ventilated to outside the vehicle only.

- Must have no ignition sources, nor any areas where the gas may pool.
- Must be able to transport swap units.
- Should carry minimum SKOPE hydrocarbon service parts.

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

Minimum knowledge and skills

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

Minimum tools and equipment

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

Off-site Work Hydrocarbon workshop

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

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

**Evaporator Fridge
Assembly**

Fridges are fitted with an evaporator plate which is attached to the back wall inside the cabinet.

Fridges are also fitted with an evaporator fan at the top of the evaporator plate. Remove the evaporator fan shroud to access the evaporator fan motor.

The evaporator fan should blow air over the evaporator plate. Use a sheet of paper to check when the system is running: the paper should be sucked onto the fan.



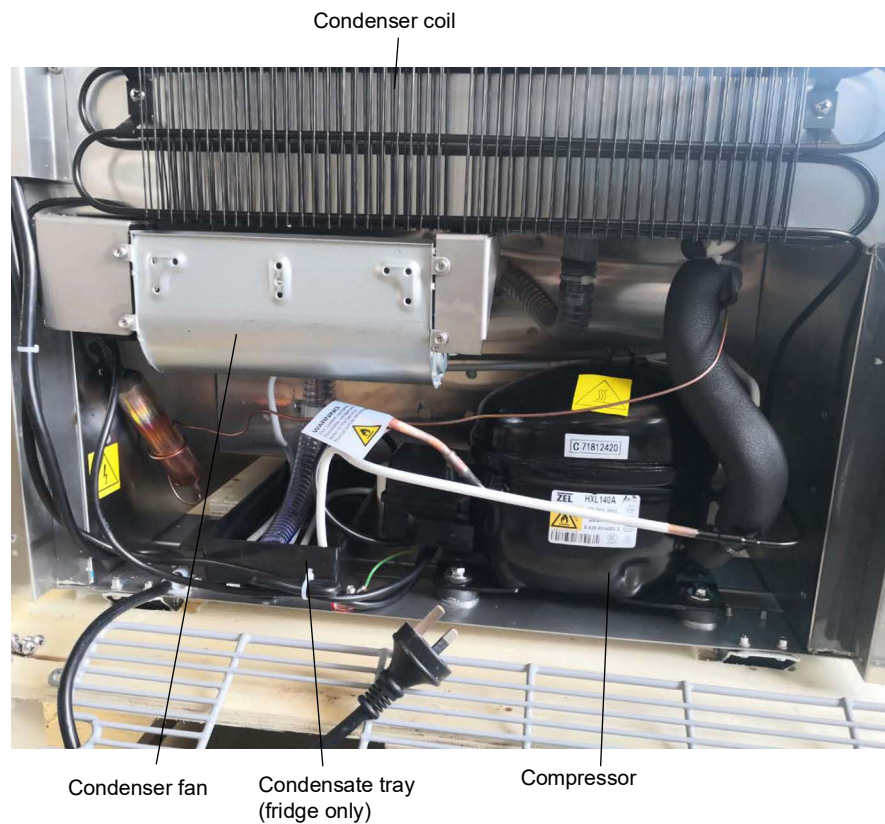
Freezer

Freezer evaporator pipes are foamed into the left, top and right interior walls. Freezers are not fitted with an evaporator fan.

Condenser Assembly The condenser coil is attached to the rear of the cabinet. The condenser coil should be brushed regularly to remove any dust build up.

The condenser fan and compressor are located in the refrigeration system compartment. Remove the rear grille to access them.

Fridges are also fitted with a condensate tray. Remove the rear grille for cleaning.



Electronic Controller

Controller Location

The electronic controller is located on the top cover at the front of the cabinet.

Procedure 10: To access and remove the controller

1. Unplug the cabinet from the mains power supply.

2. Unscrew and remove the top cover (with controller attached) (2 × screws on each side of the cover), and place it on top of the cabinet.



3. Unplug the plugs at the back of the controller.
4. Slide the controller out from the top cover: Press and hold the tabs on each side of the electronic controller to unlock, and push the controller through the front of the top of the top cover.

QC Terminals

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

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



Replacing the Controller

Follow the steps below to replace the controller.

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

Procedure 11: To replace the controller

1. Disconnect the cabinet from the power supply and access the electronic controller (see Procedure 10 above).
2. Disconnect the terminals from the back of the controller.
3. Fit the new replacement controller, and connect up the terminals at the back of the controller. Connect low voltage terminals before high voltage terminals.
4. Reassemble the cabinet, perform an electrical safety test, and reconnect to the mains power supply.
5. Use a mobile device to connect to the controller with the SCS Connect Field app (see “SCS Connect Field App and Track App” on page 12).
6. Navigate to the LOAD PARAMETER FILE menu.

Procedure 11: To replace the controller (continued)

7. Select the appropriate parameter file from LOCAL. If it is not available in LOCAL, search for the parameter file in SERVER (internet access required), and download to LOCAL.
8. Confirm that it is the correct file and WRITE TO SCS.
9. After WRITE TO SCS is complete, select MENU DISCONNECT to save parameter set on SCS.
10. Power cycle the controller, reconnect via SCS Connect Field app and check that correct parameter set has been applied.
11. Navigate to the SCS SETUP menu and select the model (as per the cabinet rating label).
12. Set up controller and cabinet links as required:
 - Corporate:
The service tech must link 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).

Control Probe The control probe is located at the back of the cabinet interior.

Procedure 12: To replace the control probe

1. Unplug the cabinet from the mains power supply and gain access to the rear of the electronic controller (see steps 1 and 2 in Procedure 10, "To access and remove the controller").
2. Unplug the probe cable from the rear of the controller.
3. Take note of the cable routing (photo recommended), then carefully withdraw it through the top of the cabinet and the back wall to the cabinet interior. Carefully cut cable ties as necessary.



4. Unscrew the probe housing and remove the probe.



Fridge



Freezer

Control probe
(in housing)

5. Replace the probe. Following the same path as the original probe, fit the new probe. Ensure the probe cable is securely connected and cable-tied in place.
6. Reassemble the cabinet and test for correct operation.

7 Spare Parts

ReFlex 1-door Underbench Fridge (RF6.UBR.1.SD)

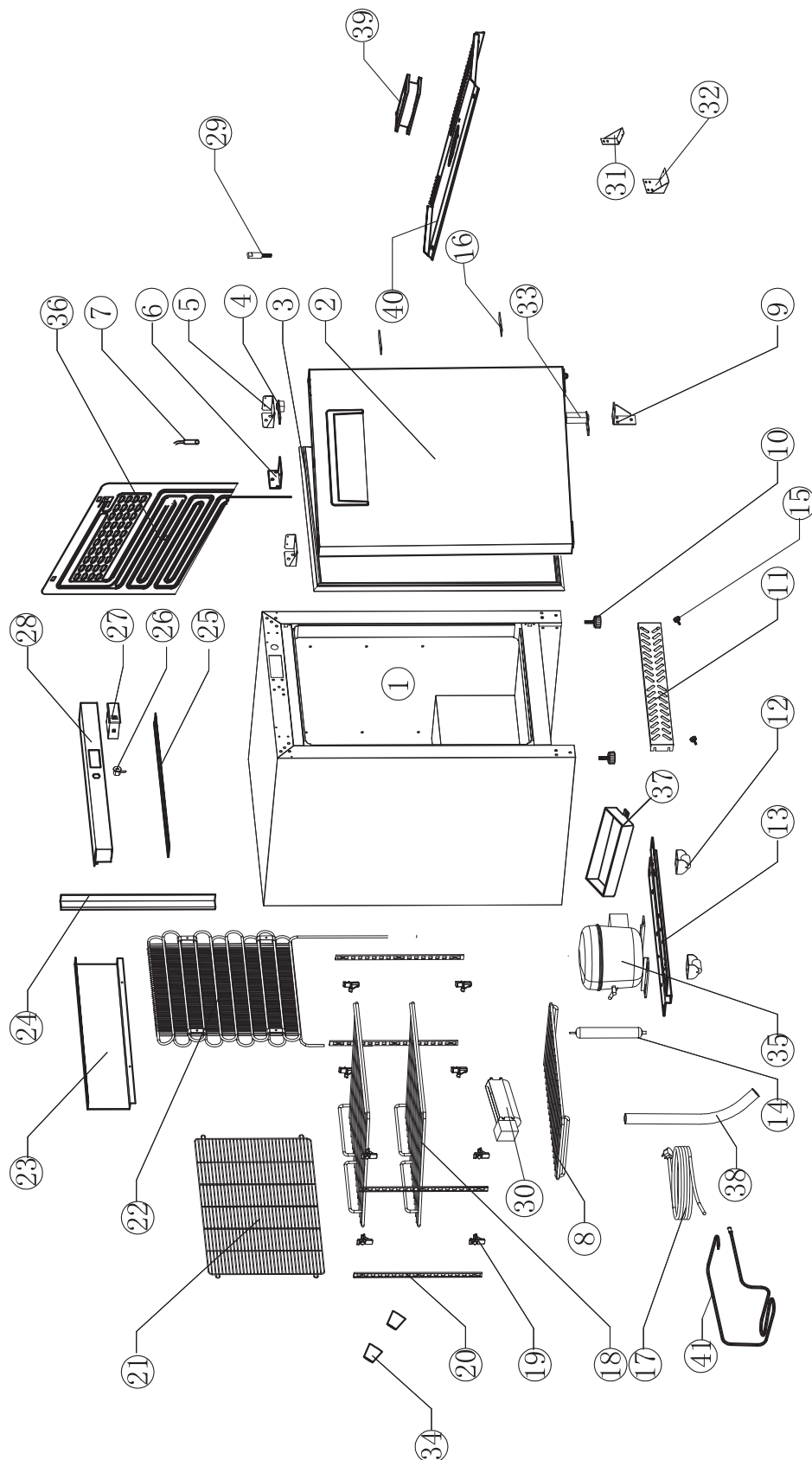


Table 6: Parts – ReFlex 1-door Underbench Freezer (RF6.UBF.1.SD)

No.	Description	Part number
1	Foamed cabinet body	SKC-0-000-1077-0
2	Door	SKC-0-000-1082-0
3	Door gasket	SKC-2-110-0433-0
4	Top door bush	SKC-2-110-0353-0
5	Top hinge	SKC-2-006-0493-0
6	Door lock tab	SKC-2-006-1076-0
7	Control probe	SKC-4-030-0006-0
8	Bottom wire shelf	SKC-2-120-0193-0
9	Bottom hinge	SKC-2-006-1077-0
10	Adjustable feet	SKC-2-140-0008-0
11	Bottom grill panel	SKC-2-006-1078-1
12	Rear roller wheel	SKC-2-110-0638-0
13	Compressor base plate	SKC-2-006-1080-0
14	Drier	SKC-2-103-0001-0
15	Bottom grill panel fastener	SKC-2-160-0034-0
16	Hinge hole cover	SKC-2-006-1073-0
17	Power flex	SKC-4-050-0084-0
18	Wire shelf	SKC-2-120-0199-0
19	Shelf clip	SKC-2-110-0625-0
20	Shelf support strip	SKC-2-120-0073-0
21	Rear unit cover	SKC-2-170-0405-0
22	Condenser	SKC-2-102-0034-0
23	Rear wire cover	SKC-2-006-0895-0
24	Wire channel	SKC-2-006-0894-0
25	Control panel – bottom	SKC-2-130-0040-1
26	Door lock	SKC-2-006-0996-0
27	Controller	ELZ11749-1627
28	Control panel – top	SKC-2-130-0039-1
29	Top hinge pin	SKC-2-170-0211-0
30	Condenser fan motor	SKC-4-001-0054-0
31	Condenser fan bracket – left	SKC-2-006-1081-0
32	Condenser fan bracket – right	SKC-2-006-1082-0
33	Door return system	SKC-2-170-0410-0
34	Rear stop	SKC-2-170-0406-0
35	Compressor	SKC-4-040-0177-0
36	Evaporator	SKC-2-101-0002-0
37	Condensate tray	SKC-2-110-0640-0
38	Drainage pipe	SKA-2-110-0018-0
39	Evaporator fan motor	SKC-4-001-0002-0
40	Evaporator fan shroud	SKC-2-006-1064-0
41	Condensate line	SKC-2-104-0375-0

ReFlex 1-Door Underbench Freezer (RF6.UBF.1.SD)

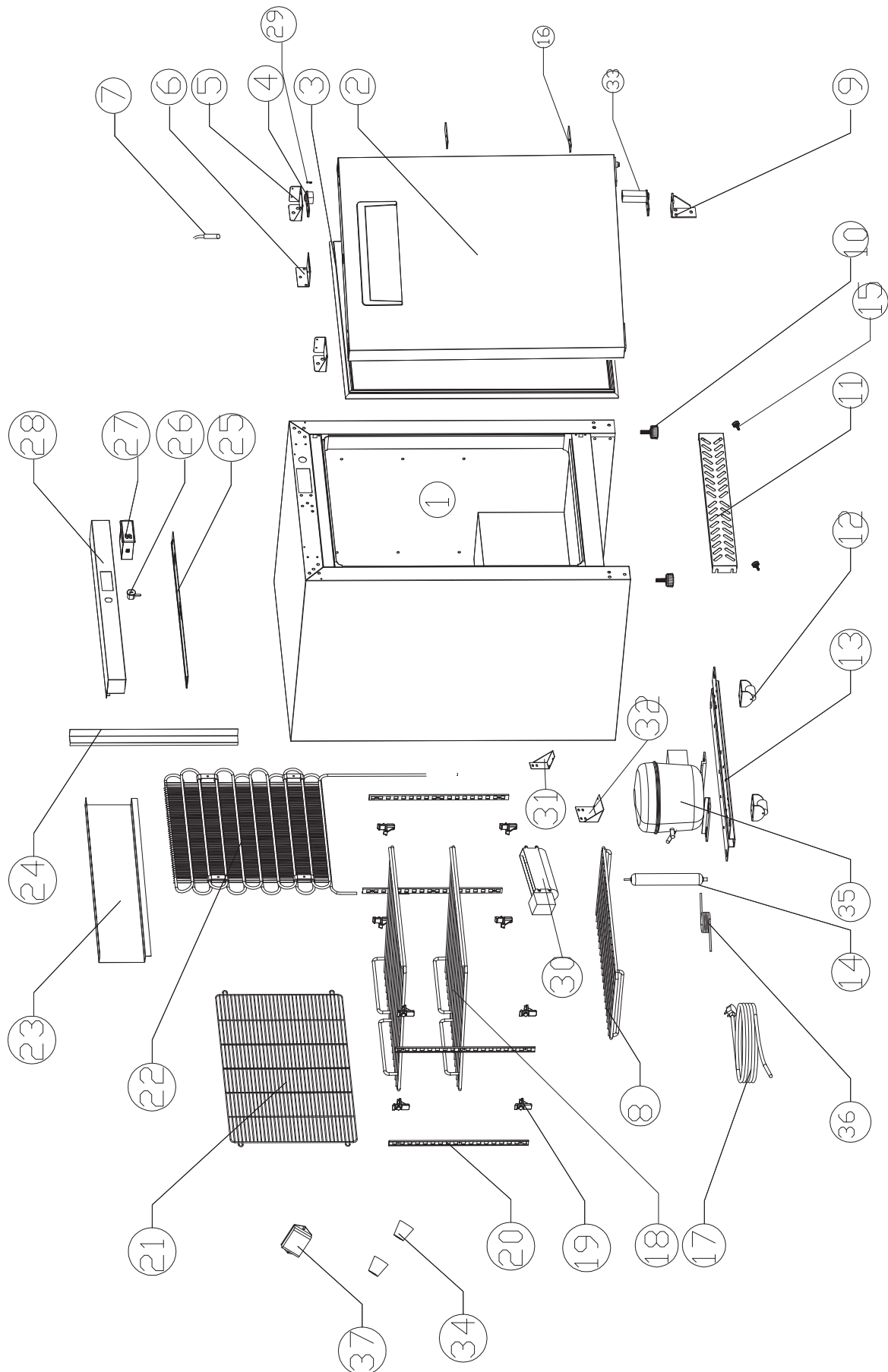


Table 7: Parts – ReFlex 1-Door Underbench Freezer (RF6.UBF.1.SD)

No.	Description	Part No.
1	Foamed cabinet body	SKC-0-000-1084-0
2	Door	SKC-0-000-1082-0
3	Door gasket	SKC-2-110-0433-0
4	Top door bush	SKC-2-110-0353-0
5	Top hinge	SKC-2-006-0493-0
6	Door lock tab	SKC-2-006-1076-0
7	Control probe	SKC-4-030-0006-0
8	Bottom wire shelf	SKC-2-120-0193-0
9	Bottom hinge	SKC-2-006-1077-0
10	Adjustable feet	SKC-2-140-0008-0
11	Bottom grill panel	SKC-2-006-1078-1
12	Rear roller wheel	SKC-2-110-0638-0
13	Compressor base plate	SKC-2-006-1080-0
14	Drier	SKC-2-103-0001-0
15	Bottom grill panel fastener	SKC-2-160-0034-0
16	Hinge hole cover	SKC-2-006-1073-0
17	Power flex	SKC-4-050-0084-0
18	Wire shelf	SKC-2-120-0199-0
19	Shelf clip	SKC-2-110-0625-0
20	Shelf support strip	SKC-2-120-0073-0
21	Rear unit cover	SKC-2-170-0405-0
22	Condenser	SKC-2-102-0034-0
23	Rear wire cover	SKC-2-006-0895-0
24	Wire channel	SKC-2-006-0894-0
25	Control panel – bottom	SKC-2-130-0040-1
26	Door lock	SKC-2-006-0996-0
27	Controller	ELZ11748-1627
28	Control panel – top	SKC-2-130-0039-1
29	Top hinge pin	SKC-2-170-0211-0
30	Condenser fan motor	SKC-4-001-0054-0
31	Condenser fan bracket – left	SKC-2-006-1081-0
32	Condenser fan bracket – right	SKC-2-006-1082-0
33	Door return system	SKC-2-170-0410-0
34	Rear stop	SKC-2-170-0406-0
35	Compressor	SKC-4-040-0073-0
36	Capillary	SKC-2-104-0166-0
37	EMI filter	SKC-4-050-0149-0

8 Routine Cleaning

Cabinet and Condenser Coil

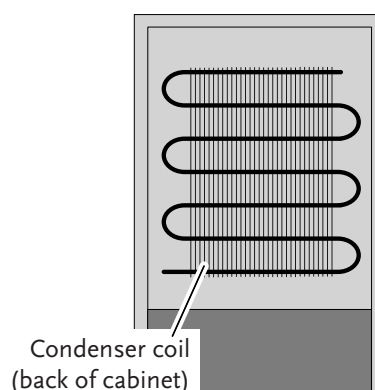
Ensure the cabinet is unplugged from the mains power supply before cleaning.

IMPORTANT

Do **NOT** use abrasive, corrosive or solvent-based cleaners, as they could damage the cabinet.

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

The condenser coil is located on the back of the cabinet and must be kept clean. SKOPE strongly recommends the condenser coil is brushed monthly to remove dust.



Defrosting (Freezer Only)

To ensure efficient operation, defrost the cabinet when ice and frost has built up 20 to 30 mm inside the cabinet.

CAUTION

Do **NOT** use mechanical methods (scraping, chiselling) to remove ice, as this may damage the refrigeration circuit. Ensure ice and water is collected during defrost to prevent a slip hazard.

Procedure 13: To defrost the cabinet

1. Remove all product from the cabinet and store in a suitable place.
2. Unplug the cabinet from the power supply.
3. Leave the door open and allow the ice to melt. Collect ice and water during defrost.
4. Once all ice has melted and water is cleaned up, reconnect the cabinet to the power supply. Let the cabinet cool down to the desired storage temperature before reloading product.

9 Troubleshooting and Diagnostics

Electronic Controller

Alarms signal unexpected operational changes in the cabinet or system. When an alarm is activated, use the electronic controller app to help diagnose faults, then service as necessary. See page 15 for information.

General Operation

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

Table 8: Troubleshooting

Problem	Possible cause	Repair
<ul style="list-style-type: none"> Cabinet not operating No controller display 	<ul style="list-style-type: none"> Loss of power supply Loose plug 	<ul style="list-style-type: none"> Check the mains power supply. Check all plugs are connected correctly.
<ul style="list-style-type: none"> Excess noise vibration 	<ul style="list-style-type: none"> Refrigeration pipes transferring vibration into cabinet 	<ul style="list-style-type: none"> Re-align the pipes away from other parts.
<ul style="list-style-type: none"> Frozen evaporator coil 	<ul style="list-style-type: none"> Setpoint is too cold Controller fault 	<ul style="list-style-type: none"> Check and raise the setpoint. Replace the controller.
<ul style="list-style-type: none"> Power consumption is higher than expected 	<ul style="list-style-type: none"> Refrigeration system operating too hot Cabinet door is opened excessively Setpoint too low 	<ul style="list-style-type: none"> Clean the condenser. Ensure the cabinet has good ventilation. Ensure the cabinet is within the maximum operating temperature. Ensure the door is closed more often. Raise the setpoint
<ul style="list-style-type: none"> Product is too warm. 	<ul style="list-style-type: none"> Frequent door opening. Recently loaded Door not closing properly. Refrigeration system operating too hot. Excessive door opening or refrigeration heat load. Product overloading causes poor circulation of air. Setpoint is too high Incorrect evaporator fan direction 	<ul style="list-style-type: none"> Limit door openings. Allow time for the product to cool down. Check and clean the door gasket. Ensure the cabinet has good ventilation. Ensure the cabinet is within the maximum operating conditions. 25 mm space between product and cabinet interior is recommended. Lower the setpoint. Remove, reverse, and refit the evaporator fan motor. Airflow blows over evaporator plate.
<ul style="list-style-type: none"> Moisture build-up on door or exterior. 	<ul style="list-style-type: none"> High humidity. Frequent door opening. Door not closing properly. 	<ul style="list-style-type: none"> Check the ambient operating temperature and ventilation requirements, and reposition the cabinet if necessary. Limit door openings. Check and clean the door gasket.
<ul style="list-style-type: none"> Cabinet door does not shut properly. 	<ul style="list-style-type: none"> Cabinet is on an uneven surface. Door is obstructed. 	<ul style="list-style-type: none"> Level the cabinet. Check the shelves and product.
<ul style="list-style-type: none"> Warm cabinet temperatures Compressor operating for long periods (more than 2 hours) 	<ul style="list-style-type: none"> Dirty condenser Poor ventilation 	<ul style="list-style-type: none"> Clean the condenser. Ensure the cabinet has good ventilation. Ensure the cabinet is within the maximum operating temperature.

Refrigeration System

The following workshop test is useful for diagnosing if a system is short of gas. Perform the test before opening the refrigeration system.

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

Note: These diagnostic procedures are indicative only.

Procedure 14: Refrigeration system diagnostic test

Before you start

Make sure you are in a suitable workshop (see See "Off-site Work" on page 26).

1. Unload cabinet and defrost (clear of frost or ice on all surfaces) before conducting the service test.
2. For RF6.UBR.1.SD (fridge), cover or disable the evaporator fan to prevent airflow past the evaporator plate on the back wall of the cabinet.
3. Connect the cabinet to the mains power supply and allow to run with the door closed for approximately 15 to 20 minutes until the evaporator temperature stabilises.
4. Optional: For enhanced diagnostics, connect to the controller via a Bluetooth-enabled smart phone and SCS Connect Field app (see See "SCS Connect Field App and Track App" on page 12).
5. Refer to table below as a guideline to determine if the system charge is correct at a typical ambient condition of around 25°C.

Table 9: RF6.UBR.1.SD (Fridge)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction cool and dry	Suction cold	Light frost on suction pipe. Low suction temperature system over charged.
Evaporator coil	Top row return bends frosted	½ return bends frosted	All return bends frosted
Unit power	<75W	75W to 80W	>80W
Evaporator temperature	>-10°C	-10°C to -12°C	<-15°C

Table 10: RF6.UBF.1.SD (Freezer)

Observation	50% charged	75% charged	100% charged
Suction pipe at compressor	Suction cold	Light frost on suction pipe	Frost to compressor shell
Evaporator coil	Top row return bends frosted	½ return bends frosted	All return bends frosted
Evaporator temperature	>-15°C	<-30°C	<-30°C

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

SKOPE Contacts

SKOPE Industries Limited

ABN: 73 374 418 306

AU: 1800 121 535

NZ: 0800 947 5673

skope@skope.com

www.skope.com