

SC430N

Upright Glass Door Fridge



SC430N
Single Door Vertical Fridge
Service Manual

MAN80304
Rev. 1.2 Jan. 2023

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Contents

1 Servicing Hydrocarbon	
Overview	4
2 Specifications	
Model.	5
3 Product Features and Selling Points	
Product Features.	6
Product Promotion and Selling Points.	6
4 Product Appearance	
SC430N Overall Product View	7
5 Product Information and Improvements	
Product Main Technical Parameters	8
6 Function Adjustment Method	
Electrical Temperature Control	9
7 Schematics and Wiring Diagram	
Schematic SC430N Series	10
Wiring Diagram	10
8 Working Principle and Parameters	
Thermostat and Compressor Model Data	11
Thermostat Model	11
Compressor Model	11
9 Refrigeration Basic Parts	
Sectional View.	12
10 Production Installation and Disassembly Process	
Component Removal.	13
11 Troubleshooting	
Typical Failures and Solutions.	16
12 Servicing	
Cleaning	17
Cabinet	17
Condenser Coil	17
Lighting	17
Refrigeration System.	18
Before Servicing	18
On-site Work	19
Off-site Work	19
13 Spare Parts	
Main Assembly	20
Unit Assembly	21
Details of Exploded Diagrams.	21

1 Servicing Hydrocarbon

Overview

This cooler uses hydrocarbon (HC) R290 as its refrigerant. R290 is a natural refrigerant that has a very low environmental impact.

Special service requirements are needed as R290 is a flammable refrigerant.

Safety hazards

The main R290 safety hazards are:

- Flammable refrigerant.
- Venting of R290 and compressor oil.
- Asphyxiation.



SKOPE does NOT recommend performing hazardous activities on the refrigeration system. See "Refrigeration System" on page 18 for more information, including examples of hazardous activities.

2 Specifications

Model

This service manual is applicable to the Haier SC430N bottom mount chiller, detailed 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
SC430N	SC430N

3 Product Features and Selling Points

Product Features

- The refrigeration module, electronic control module and appearance of the SC430N and products are fully upgraded vertical refrigerators. The product design climate type meets the ST climate type requirements.
- The air duct combination design of fin evaporator + centrifugal fan is adopted for the refrigeration part of the product, the cooling speed is faster and more uniform, and the efficiency is higher and energy saving.
- There is internal cabinet lighting, and an illuminated display box on the cabinet top. The display box holds a sign decal for advertising branding. This type of sign promotes the product to the consumer and enhances the overall cabinet aesthetic.
- Sign decal graphics or imagery can be applied to the side of the cabinet. This improves product and brand awareness for the consumer.
- The glass door has the customer's trademark, which glows to better display the customer's brand image and highlight the brand charm.
- There are four swivel casters on the base for the flexible movement.

Product Promotion and Selling Points

- Overall curved appearance
- Detachable light box
- Tempered transparent glass door
- Forced air-cooled circulation system in the box, fin evaporator with high heat exchange efficiency
- Swivel casters (× 4) + front adjustable feet (× 2)

4 Product Appearance

SC430N Overall Product View



5 Product Information and Improvements

- The refrigerant is R290.
- The side panel at the top of the cabinet is formed as part of the side of the cabinet.
- The SC430N uses a Wanbao compressor for refrigeration and a electronic controller.
- The refrigeration system uses two DC centrifugal fans.

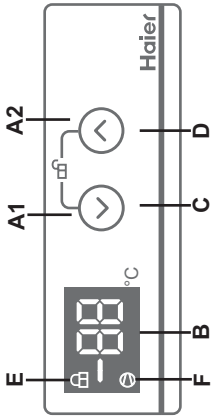
Product Main Technical Parameters

		Unit	Technical Parameter
1.	Refrigerator type description		
	Refrigerator type	-	Commercial refrigerator
	Model	-	SC430N
	Door body type	-	Transparent door
	Colour	-	White/Grey
2.	Main features		
	Power consumption	kWh/24h	1.61
	Total effective volume	L	420L
	Effective volume of refrigerator compartment	L	420L
	Climate class	-	S
	Input total power	W	450W
	Rated current	A	2.3A
	Refrigerant	-	R290/50g
	Defrost type (refrigeration/freezing)	-	Timed natural defrost
	Noise (sound power level)	dB(A)	60
3.	Electrical control		
	Electrical control method (electronic/mechanical)	-	Electronic
	Lighting type	-	LED
4.	Dimensions and instability		
	Body size (D/W/H)	mm	660 × 630 × 2208mm
	Packing size (D/W/H)	mm	720 × 740 × 2312mm
	Net weight	kg	102
	Gross weight	kg	112

6 Function Adjustment Method

Electrical Temperature Control

Electrical Temperature Control



A1 Temperature adjustment

A2 Temperature adjustment

B Temperature display

C D Temperature adjustment icon

E Lock icon

F Compressor on icon

Function introduction

Start

Connect electrical power, then display will be on and under unlock status; Icon-B will show actual temperature

Display lock & unlock

When display is under lock status, push A1 & A2 together for 3 seconds then display will be unlocked and available for adjustment. When display is under unlock status, if pushing A1 & A2 together for 3 seconds, or if no any key is pushed in 30 seconds, display will be locked and lock icon will show. Pushing and together can switch between lock & unlock status.

When display flashes F3, it means sensor has problem. Please call 4006992008 for customer service. F3 will disappear only after problem solved.

Temperature Shift

If the A1 or A2 control buttons are pushed while in unlock mode, the temperature will change by -1° or +1°. By holding either button continuously will cycle through minus or positive temperatures. This can range from 0° to 8° degrees, up or down. Temperatures can be set-up within the system. After 5 seconds of initiating change, the system will save and lock the control system.

Power-off memory

The controller has power-off memory function. When not in use, its work status will be locked. Once operational the system will revert to last settings.

Default setup temperature is 5 °C. Adjusting at electrical temperature control panel is only for SC series electrical temperature products.

GPRS Model Instructions (for products with GPRS function)

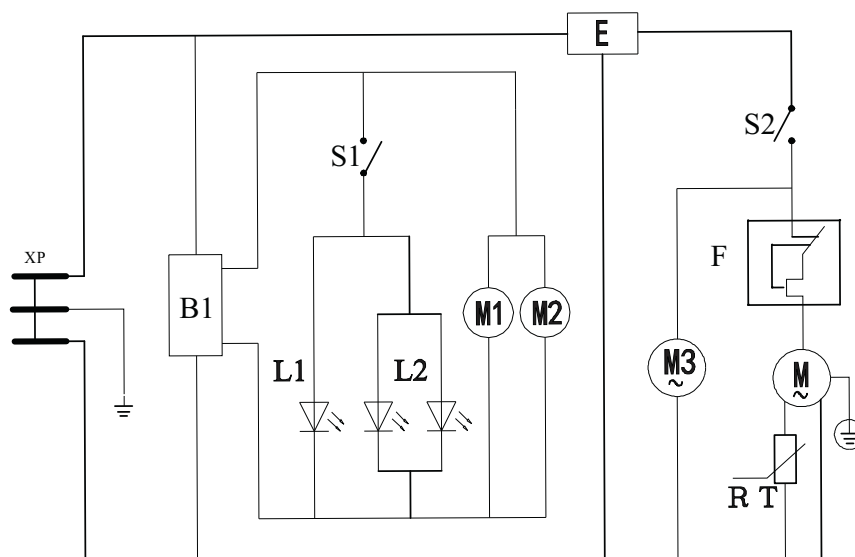
This cabinet has instant messaging function as a low power radio transmitter & receiver. When it's on it will intermittently receive & transmit radio signal. Operator network system will control the transmitting power of module. This cabinet complies with the regulations regarding RF energy leakage of your country.

7 Schematics and Wiring Diagram

Schematic SC430N Series

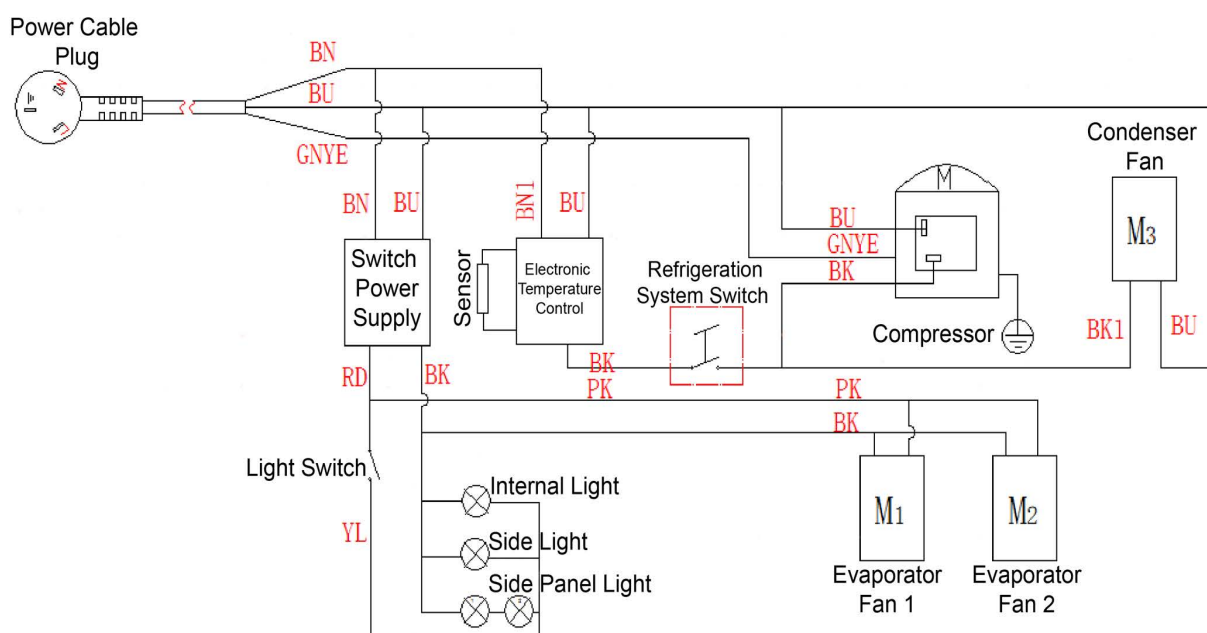
SC430N

XP: Power plug
 L1: Light box LED
 S2: Compressor switch
 F: Motor protector
 S1: LED Lamp switch
 L2: Box LED
 E: Thermostat
 M: Compressor
 B1: Power PCB
 M1/M2: Inner fan
 RT: Starter
 M3: Cooling fan



LAB80296 Rev. 1.1 Jan. 2022

Wiring Diagram



8 Working Principle and Parameters

Thermostat and Compressor Model Data

- This series of refrigerators uses electronic thermostats. The thermostat temperature probes are fixed on the light pipe brackets on the left and right sides of the evaporator in the box, and the compressor is controlled on and off by sensing the air temperature in the box.
- Light box lights, box lights, and glass door logo lights are all controlled by the first rocker switch on the left side of the lower frame of the light box.
- The second rocker switch on the left side of the lower frame of the light box is the refrigeration system switch, which turns the compressor on and off.
- The electronic temperature control is installed on the right side of the engine room and is displayed on the right side of the shield.

Thermostat Model The model, manufacturer and working parameters of the thermostat.

Table 2: Thermostat parameters

Thermostat model	Factory	Cold open	Warm off	Cold open	Cold off	Capillary length (mm)
0074000488BB	Zhengzhou Chunchang Instrument Co. Ltd	—	—	—	—	—

Compressor Model Parameter table of compressor model, manufacturer, power, energy efficiency ratio, cooling capacity, working current and starting current

Table 3: Compressor parameters

Compressor model	Factory	Power	Energy efficient ratio	Cooling capacity	Working current	Starting current
FTK66L	Guangzhou Wanbao Group Compressor Co.Ltd	213	1.55	330	1.12	8

9 Refrigeration Basic Parts

Sectional View

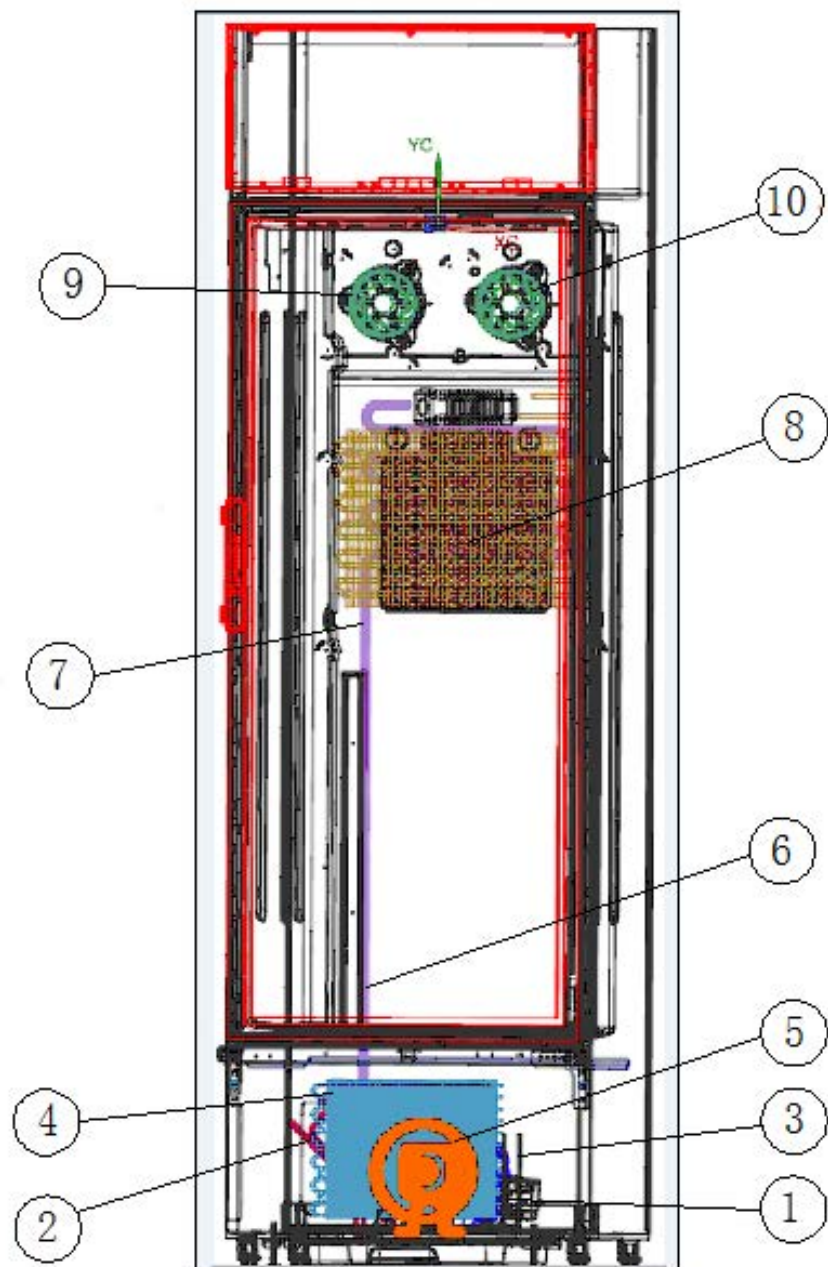


Table 4: Parts – Sectional view

No.	Description	No.	Description
1	Compressor	2	Capillary
3	Filter drier	4	Return air pipe
5	Auxiliary condenser	6	Evaporator
7	Condenser	8	Evaporation fan left
9	Condensing fan	10	Evaporation fan right

10 Production Installation and Disassembly Process

Component Removal

Procedure 1: To remove the components

1. Unplug the cabinet from power supply before removing or installing components.
2. To remove the front cover from the cabinet, use a Phillips screwdriver to remove the two screws on the cover.



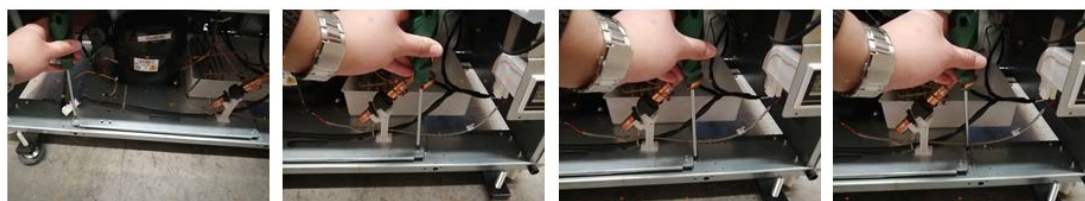
3. To remove rear guard, or gain access to the cabinet back, unscrew the two rear cabinet stops.



4. Remove the seven screws holding the rear guard. You now have access to cabinet refrigeration system, and can replace the wiring harness.

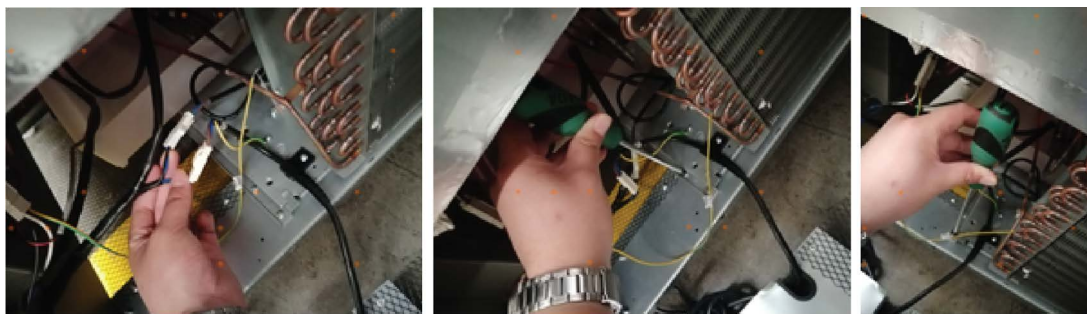


5. To remove the compressor bottom plate, unscrew the four screws (2 × hexagon head and 2 × round head screws). These fix the compressor bottom plate to the front cover of the cassette.

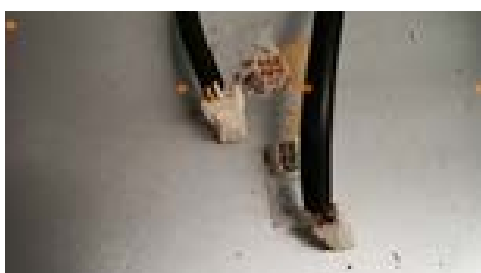


Procedure 1: To remove the components (continued)

6. Remove the rear guard to gain access (see step 3). Disconnect the two terminals of the power cord from the cassette.



7. Unscrew the 2 × round-head screws, then pull out the compressor bottom plate.
8. Unplug the wiring harness connector behind the sign panel before removing the sign panel.

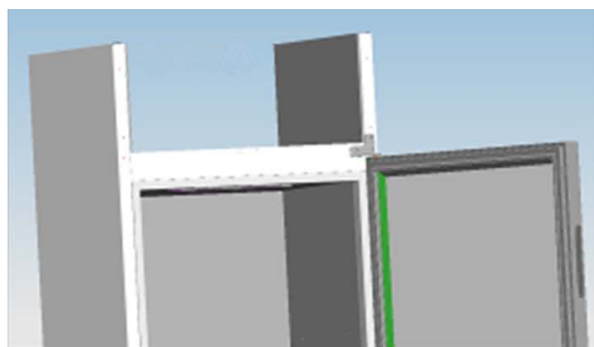


9. To remove the white terminal box cover, unplug the connecting terminals, and then remove two screws on the left and right sides of the sign. The sign panel can now be removed.



To remove the door from the cabinet

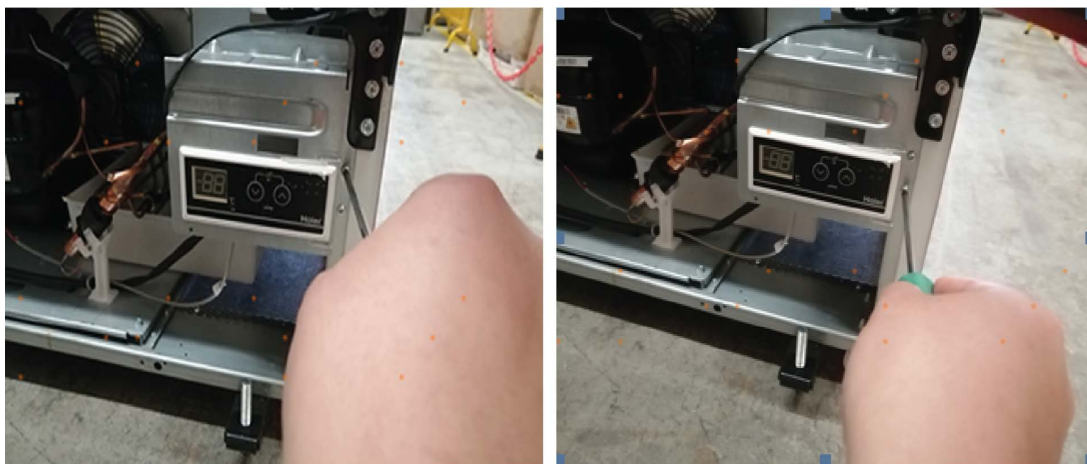
10. First, remove the sign panel as shown above. Then remove the screws from the door top hinge. Lift the door up slightly to remove



Procedure 1: To remove the components (continued)

To disconnect or remove the controller

11. Remove the front cover from the cabinet body (see step 2.) This will give internal access to the refrigeration system. Remove the two screws holding the controller bracket on the right hand side of the panel.



12. Disconnect the wiring harness connector on the controller, then remove the controller.
13. After the repair, reverse the process to reassemble the components.

11 Troubleshooting

Typical Failures and Solutions

Table 5: Troubleshooting

Problem	Probable cause	Maintenance measures
Excessive noise	The cabinet is not flat and stable	Make sure that the cabinet is placed flat and is stable, and that no part of the cabinet is touching other objects.
	Interference in unit pipelines	Check if there is any interference among the unit pipelines. Resettle the pipelines if needed.
	Compressor failure	If a noise is confirmed to be coming from the compressor, replace the compressor.
	Fan blades are interfering with objects or running into obstacles	Check whether any objects or obstacles are interfering with the fan blades.
The temperature inside the cabinet is too low	The temperature controller knob is in the wrong position	Turn the temperature controller knob counterclockwise to the appropriate position.
	Fan failure	Check the fan.
The temperature inside the cabinet is too high	The temperature controller knob is in the wrong position	Turn the temperature knob clockwise to the appropriate position.
	Door being opened too frequently	Reduce the amount of product in the cabinet, the frequency of door openings, and the door opening time.
Electric leakage	Cabinet grounding failure	Check the ground wire of the cabinet to make sure it is grounded.
	Insulation has failed on the compressor's internal coil, causing a short circuit	Replace the compressor.
	The electrical system has become damp, decreasing the insulation, which can cause leak damage	Check carefully. If the insulator is severely damaged, replace it, or put the damp electric device into a drying box to dry.

12 Servicing

Cleaning

As with any maintenance, ensure the fridge is unplugged from the power supply before cleaning.

Cabinet Wipe the inside and outside of the cabinet with a damp cloth, taking care to keep moisture away from electrical parts.

Condenser Coil To ensure trouble-free performance, keep the condenser coil clean. SKOPE strongly urges monthly cleaning with a soft brush to remove dust and fluff. A more thorough cleaning is required by qualified service personnel every six months. The condenser coil **must** be kept clean for efficient and reliable operation.

The condenser coil is located at the front of the cabinet. Unscrew and remove the rear grille to access the condenser coil for cleaning.

WARNING

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



Condenser coil

Lighting

The cabinet and sign LED lights are all non-serviceable and must not be tampered with in any way. If a light is suspected of being faulty, arrange a service call.

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 coolers 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 1.0 gm

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

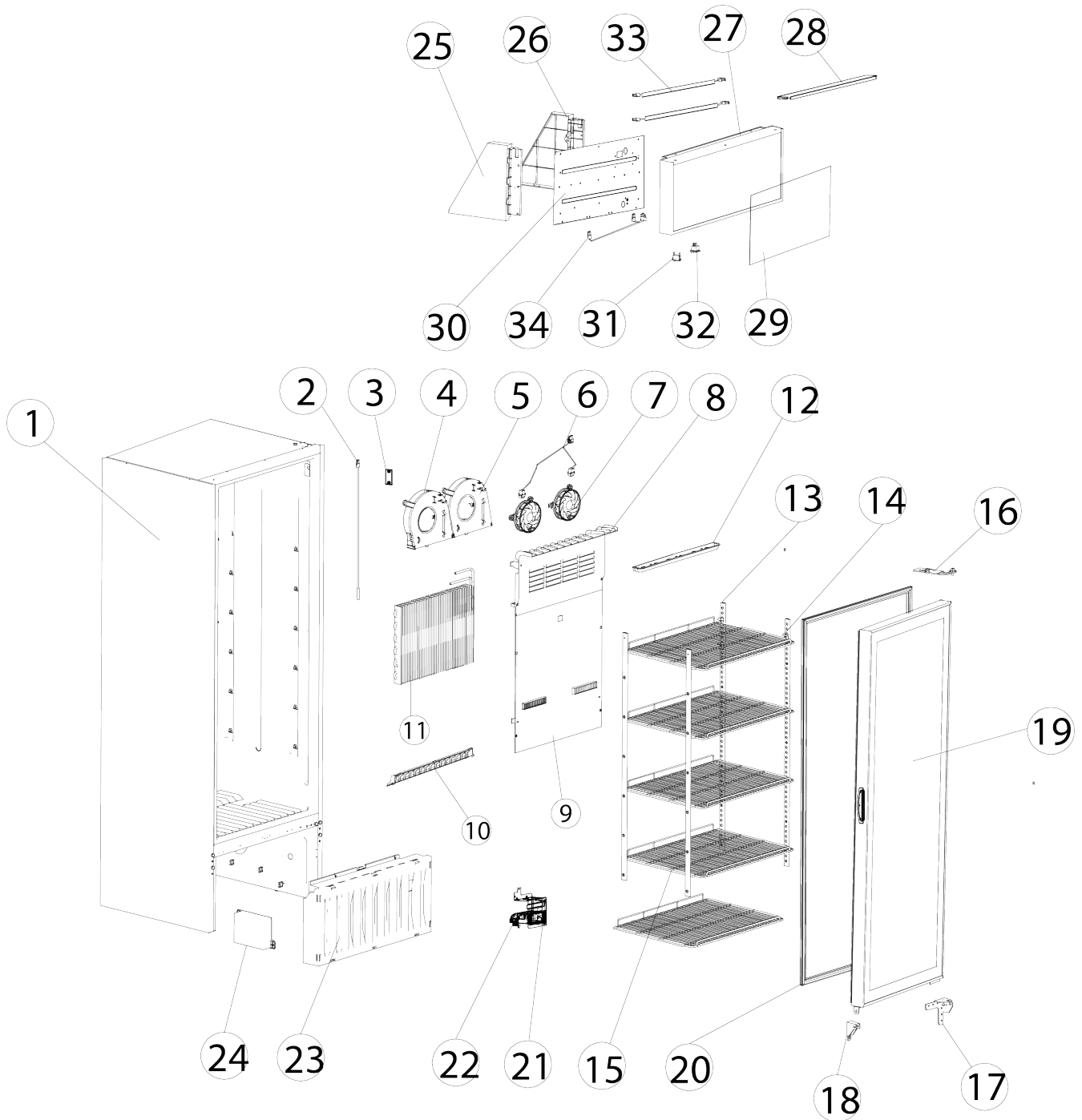
Off-site Work Hydrocarbon workshop

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

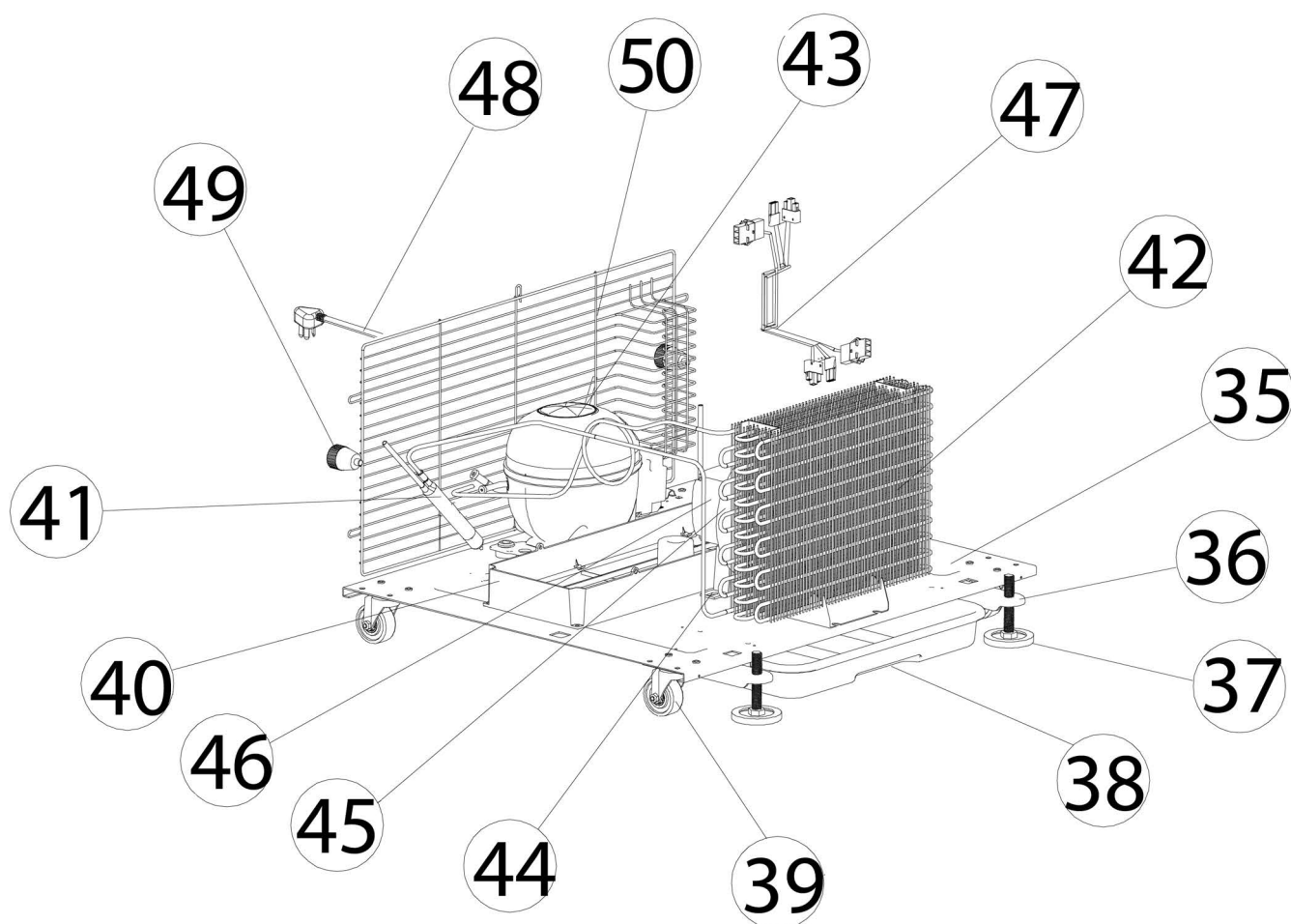
- Dedicated area for hazardous work – suitable for servicing and releasing flammable hydrocarbon refrigerant
- Hydrocarbon leak detector
- Refrigeration gauge set – suitable for flammable hydrocarbon refrigerant
- Dry nitrogen – suitable for purging and high pressure testing
- Intrinsically safe refrigeration 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 1.0 gm
- Hydrocarbon refrigerant supply cylinder

13 Spare Parts

Main Assembly



Unit Assembly



Details of Exploded Diagrams

Table 6: Spare parts

Serial number	Spare part name	Spare part number	Quantity	Spare part model (or material)
1	Box assembly	HB0070837445	1	—
2	Temperature-sensing probe	HB0070400497C	1	—
3	Side lamp cover	HB0070209815BJ	1	—
4	Rear cover	HB0070209577A	1	—
5	Front cover	HB0070209576BJ	1	—
6	Fan motoring wiring	HB0070402704	1	—
7	Evaporator fan motor	HB0064002189	1	—
8	Upper cover plate	HB0070209578C	1	—
9	Down cover plate	HB0070209579BJ	1	—
10	Water disposal pan	HB0070209580B		—
11	Evaporator	HB0070702847		—
12	Cabinet interior light	HB0074001050		—

Table 6: Spare parts (continued)

Serial number	Spare part name	Spare part number	Quantity	Spare part model (or material)
13	Shelf strip	HB0070209541		—
14	Shelf clip	HB0070201371A		—
15	Wire shelf	HB0070113856A	1	—
16	Top hinge	HB0070114049A	1	—
17	Bottom hinge	HB0070105762A	1	—
18	Glass door bracket	HB0070106170	—	—
19	Glass door	HB0070836457A	1	—
20	Door gasket	HB0070209537	1	—
21	Controller support	HB0070112355	1	—
22	Controller	HB0070825284	1	—
23	Kick panel	HB0070209596KBJ	1	—
24	48W power supply	HB0070835674C	1	—
25	Light box left cover	HB0070207497EBJ	1	—
26	Light box right cover	HB0070207499EBJ	1	—
27	Light box frame	HB0070209581MBJ	1	—
28	Light box top cover	HB0070210144BJ	1	—
29	Sign panel	HB0070210143	1	—
30	Electrical installation board	HB0070113888	—	—
31	Lighting switch	HB0075050007	1	—
32	Defrost switch	HB0070401146	—	—
33	Sign light	HB0074001051	—	—
34	Sign wirings	HB0070402812	—	—
35	Compressor base	HB0070113117A	1	—
36	Foot support	HB0070109341D	—	—
37	Foot	SXX10682	—	—
38	Water tray	HB0070208733A	—	—
39	Universal wheel	HB0070800197	2	—
40	Water evaporator case	HB0070208732A	1	—
41	Dry filter	HB0060703265	1	—
42	Condenser	HB0070702733	1	—
43	Compressor	HB0074000757	1	—
44	Condenser fan bracket	HB0071220036A	—	—
45	Condenser fan blades	HB0074000868	—	—
46	Condenser fan motor	HB0074000728B	—	—
47	Wiring	HB0070402811	—	—
48	Power cord	HB0060402108D	—	—
49	Back support	HB0070204762	—	—
50	Back cover	HB0070113057A	—	—

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