

CL & CC Series

SKOPE Counterline & Slimline Horizontal Chiller



Model: CL400



Model: CL600

CC & CL Series
SKOPE Counterline & Slimline Horizontal Chiller
Service Manual

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1 Specifications

Counterline Integral

	CL400		CL600		CL800	
Description:	2 door integral counterline chiller		3 door integral counterline chiller		4 door integral counterline chiller	
Type:	JD2202 (swing door, fluoro light) JD2102 (sliding door, fluoro light) JD2202V (swing door, LED light) JD2102V (sliding door, LED light)		JD2203 (swing door, fluoro light) JD2103 (sliding door, fluoro light) JD2203V (swing door, LED light) JD2103V (sliding door, LED light)		JD2204 (swing door, fluoro light) JD2104 (sliding door, fluoro light) JD2204V (swing door, LED light) JD2104V (sliding door, LED light)	
Dimensions	External	Internal	External	Internal	External	Internal
Height:	725mm*	545mm	725mm*	545mm	725mm*	545mm
Width:	1600mm	1120mm	2210mm	1730mm	2820mm	2340mm
Depth:	680mm**	565mm	680mm**	565mm	680mm**	565mm
Floor area:	1.09m ²		1.50m ²		1.92m ²	
Internal volume:	390 litres		600 litres		810 litres	
Shelves:	2 × adjustable height, white plastic coated wire shelves per door					
Construction						
Insulation:	42mm polyurethane foam					
Doors:	2		3		4	
Swing	Self-closing, double glazed toughened single Low-E safety glass with aluminium extrusion or solid swing doors - LH and RH hinged					
Sliding	Self-closing, double glazed toughened single Low-E safety glass sliding doors with black plastic door extrusion and anodised aluminium outer frame					
Operating conditions						
Maximum operating temp:	40°C (swing doors) or 32°C (sliding doors)		40°C (swing doors) or 32°C (sliding doors)		40°C (swing doors) or 32°C (sliding doors)	
Cabinet temp range:	+1°C to +4°C		+1°C to +4°C		+1°C to +4°C	
Electrical						
Current draw:	2.5A (swing door, fluo light) 2.3A (swing door, LED light) 2.5A (sliding door, fluo light) 2.5A (sliding door, LED light)		3.4A (swing door, fluo light) 3.2A (swing door, LED light) 3.4A (sliding door, fluo light) 3.4A (sliding door, LED light)		4.0A (swing door, fluo light) 3.8A (swing door, LED light) 4.0A (sliding door, fluo light) 4.0A (sliding door, LED light)	
Internal lighting						
Fluorescent:	1 x 21W T5 fluorescent Tube (Ø16 x 850mm)		1 x 35 Watt T5 fluorescent tube, (Ø16mm x 1450mm)		2 x 21 Watt T5 fluorescent tubes (Ø16mm x 850mm)	
LED:	1 x 20W T8 Frosted LED Tube (Ø26 x 900mm, 5500K) - Switched		1 x 24W T8 Frosted LED Tube (Ø26 x 1500mm, 5500K) - Switched		2 x 20W T8 Frosted LED Tubes (Ø26 x 900mm, 5500K) - Switched	
Refrigeration unit						
Description:	Electronically controlled, side mounted, integral refrigeration unit					
Unit model:	UE11AAC-171		UE11AAC-171		UE21AAC-171	
Nominal capacity:	581 Watts		581 Watts		737 Watts	
Refrigerant:	R134a / 425 g		R134a / 425 g		R134a / 425 g	
Electronic controller:	SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33	

* Height excludes castors, legs or optional worktop

** Depth with optional worktop is 700mm

Counterline Remote

	CL400r		CL600r		CL800r	
Description:	2 door remote counterline chiller		3 door remote counterline chiller		4 door remote counterline chiller	
Type:	JD3202 (swing door, fluoro light) JD3102 (sliding door, fluoro light) JD3202V (swing door, LED light) JD3102V (sliding door, LED light)		JD3203 (swing door, fluoro light) JD3103 (sliding door, fluoro light) JD3203V (swing door, LED light) JD3103V (sliding door, LED light)		JD3204 (swing door, fluoro light) JD3104 (sliding door, fluoro light) JD3204V (swing door, LED light) JD3104V (sliding door, LED light)	
Dimensions	<i>External</i>	<i>Internal</i>	<i>External</i>	<i>Internal</i>	<i>External</i>	<i>Internal</i>
Height:	725mm*	545mm	725mm*	545mm	725mm*	545mm
Width:	1455mm	1120mm	2065mm	1730mm	2675mm	2340mm
Depth:	680mm**	565mm	680mm**	565mm	680mm**	565mm
Floor area:	0.99m ²		1.40m ²		1.82m ²	
Internal volume:	390 litres		600 litres		810 litres	
Shelves:	2 × adjustable height, white plastic coated wire shelves per door					
Construction						
Insulation:	42mm polyurethane foam					
Doors:	2		3		4	
Swing	Self-closing, double glazed toughened single Low-E safety glass with aluminium extrusion or solid swing doors - LH and RH hinged					
Sliding	Self-closing, double glazed toughened single Low-E safety glass sliding doors with black plastic door extrusion and anodised aluminium outer frame					
Operating conditions						
Maximum operating temp:	32°C		32°C		32°C	
Cabinet temp range:	+1°C to +4°C		+1°C to +4°C		+1°C to +4°C	
Electrical						
Current draw:	0.4A (swing door, fluoro light) 0.3A (swing door, LED light) 0.5A (sliding door, fluoro light) 0.5A (sliding door, LED light)		0.8A (swing door, fluoro light) 0.7A (swing door, LED light) 0.9A (sliding door, fluoro light) 0.9A (sliding door, LED light)		1.1A (swing door, fluoro light) 1.0A (swing door, LED light) 1.3A (sliding door, fluoro light) 1.3A (sliding door, LED light)	
Internal lighting						
Fluorescent:	1 x 21W T5 Fluorescent Tube (Ø16 x 850mm)		1 x 35 Watt T5 fluorescent tube, (Ø16mm x 1450mm)		2 x 21 Watt T5 fluorescent tubes (Ø16mm x 850mm)	
LED:	1 x 20W T8 Frosted LED Tube (Ø26 x 900mm, 5500K) - Switched		1 x 24W T8 Frosted LED Tube (Ø26 x 1500mm, 5500K) - Switched		2 x 20W T8 Frosted LED Tubes (Ø26 x 900mm, 5500K) - Switched	
Refrigeration unit						
Description:	Electronically controlled, side mounted, integral refrigeration unit					
Unit model:	UE11AAR-171		UE21AAR-171		UE21AAR-171	
Nominal capacity:	480 Watts		480 Watts		750 Watts	
Refrigerant:	Selected at time of order: R134a, R404A, R507, R22					
Electronic controller:	SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33	

* Height excludes castors, legs or optional worktop

** Depth with optional worktop is 700mm

Slimline Integral

	CC300		CC500		CC700	
Description:	2 door integral slimline chiller		3 door integral slimline chiller		4 door integral slimline chiller	
Type:	JS2202 (swing door, fluoro light) JS2102 (sliding door, fluoro light) JS2202V (swing door, LED light) JS2102V (sliding door, LED light)		JS2203 (swing door, fluoro light) JS2103 (sliding door, fluoro light) JS2203V (swing door, LED light) JS2103V (sliding door, LED light)		JS2204 (swing door, fluoro light) JS2104 (sliding door, fluoro light) JS2204V (swing door, LED light) JS2104V (sliding door, LED light)	
Dimensions	External	Internal	External	Internal	External	Internal
Height:	725mm*	545mm	725mm*	545mm	725mm*	545mm
Width:	1600mm	1120mm	2210mm	1730mm	2820mm	2340mm
Depth:	600mm**	485mm	600mm**	485mm	600mm**	485mm
Floor area:	0.96m ²		1.33m ²		1.70m ²	
Internal volume:	335 litres		517 litres		700 litres	
Shelves:	2 × adjustable height, white plastic coated wire shelves per door					
Construction						
Insulation:	50mm polyurethane foam					
Doors:	2		3		4	
Swing	Self-closing, double glazed toughened single Low-E safety glass with aluminium extrusion or solid swing doors - LH and RH hinged					
Sliding	Self-closing, double glazed toughened single Low-E safety glass sliding doors with black plastic door extrusion and anodised aluminium outer frame					
Operating conditions						
Maximum operating temp:	40°C (swing doors) or 32°C (sliding doors)		40°C (swing doors) or 32°C (sliding doors)		40°C (swing doors) or 32°C (sliding doors)	
Cabinet temp range:	+1°C to +4°C		+1°C to +4°C		+1°C to +4°C	
Electrical						
Current draw:	2.5A (swing door, fluoro light) 2.3A (swing door, LED light) 2.5A (sliding door, fluoro light) 2.5A (sliding door, LED light)		3.4A (swing door, fluoro light) 3.2A (swing door, LED light) 3.4A (sliding door, fluoro light) 3.4A (sliding door, LED light)		4.0A (swing door, fluoro light) 3.8A (swing door, LED light) 4.0A (sliding door, fluoro light) 4.0A (sliding door, LED light)	
Internal lighting						
Fluorescent:	1 x 21W T5 Fluorescent Tube (Ø16 x 850mm)		1 x 35 Watt T5 fluorescent tube, (Ø16mm x 1450mm)		2 x 21 Watt T5 fluorescent tubes (Ø16mm x 850mm)	
LED:	1 x 20W T8 Frosted LED Tube (Ø26 x 900mm, 5500K) - Switched		1 x 24W T8 Frosted LED Tube (Ø26 x 1500mm, 5500K) - Switched		2 x 20W T8 Frosted LED Tubes (Ø26 x 900mm, 5500K) - Switched	
Refrigeration unit						
Description:	Electronically controlled, side mounted, integral refrigeration unit					
Unit model:	UE11AAC-171		UE11AAC-171		UE21AAC-171	
Nominal capacity:	581 Watts		581 Watts		737 Watts	
Refrigerant:	R134a / 425 g		R134a / 425 g		R134a / 425 g	
Electronic controller:	SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33	

* Height excludes castors, legs or optional worktop

** Depth with optional worktop is 700mm

Slimline Remote

	CC300r		CC500r		CC700r	
Description:	2 door remote slimline chiller		3 door remote slimline chiller		4 door remote slimline chiller	
Type:	JS3202 (swing door, fluoro light) JS3102 (sliding door, fluoro light) JS3202V (swing door, LED light) JS3102V (sliding door, LED light)		JS3203 (swing door, fluoro light) JS3103 (sliding door, fluoro light) JS3203V (swing door, LED light) JS3103V (sliding door, LED light)		JS3204 (swing door, fluoro light) JS3104 (sliding door, fluoro light) JS3204V (swing door, LED light) JS3104V (sliding door, LED light)	
Dimensions	External	Internal	External	Internal	External	Internal
Height:	725mm*	545mm	725mm*	545mm	725mm*	545mm
Width:	1455mm	1120mm	2065mm	1730mm	2675mm	2340mm
Depth:	600mm**	485mm	600mm**	485mm	600mm**	485mm
Floor area:	0.87m ²		1.23m ²		1.60m ²	
Internal volume:	335 litres		517 litres		700 litres	
Shelves:	2 × adjustable height, white plastic coated wire shelves per door					
Construction						
Insulation:	50mm polyurethane foam					
Doors:	2		3		4	
Swing	Self-closing, double glazed toughened single Low-E safety glass with aluminium extrusion or solid swing doors - LH and RH hinged					
Sliding	Self-closing, double glazed toughened single Low-E safety glass sliding doors with black plastic door extrusion and anodised aluminium outer frame					
Operating conditions						
Maximum operating temp:	32°C		32°C		32°C	
Cabinet temp range:	+1°C to +4°C		+1°C to +4°C		+1°C to +4°C	
Electrical						
Current draw:	0.4A (swing door, fluoro light) 0.3A (swing door, LED light) 0.5A (sliding door, fluoro light) 0.5A (sliding door, LED light)		0.8A (swing door, fluoro light) 0.7A (swing door, LED light) 0.9A (sliding door, fluoro light) 0.9A (sliding door, LED light)		1.1A (swing door, fluoro light) 1.0A (swing door, LED light) 1.3A (sliding door, fluoro light) 1.3A (sliding door, LED light)	
Internal lighting						
Fluorescent:	1 x 21W T5 Fluorescent Tube (Ø16 x 850mm)		1 x 35 Watt T5 fluorescent tube, (Ø16mm x 1450mm)		2 x 21 Watt T5 fluorescent tubes (Ø16mm x 850mm)	
LED:	1 x 20W T8 Frosted LED Tube (Ø26 x 900mm, 5500K) - Switched		1 x 24W T8 Frosted LED Tube (Ø26 x 1500mm, 5500K) - Switched		2 x 20W T8 Frosted LED Tubes (Ø26 x 900mm, 5500K) - Switched	
Refrigeration unit						
Description:	Electronically controlled, side mounted, integral refrigeration unit					
Unit model:	UE11AAR-171		UE21AAR-171		UE21AAR-171	
Nominal capacity:	400 Watts		540 Watts		660 Watts	
Refrigerant:	Selected at time of order: R134a, R404A, R507, R22					
Electronic controller:	SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33		SKOPE Dixell XR30C or SKOPE CAREL ir33	

* Height excludes castors, legs or optional worktop

** Depth with optional worktop is 700mm

Servicing Tools Tools required for servicing may consist of the following:

- ▣ Screwdriver with Pozidriv PZ1 and PZ2 bit
- ▣ Slotted screwdriver
- ▣ Small slotted screwdriver (for electrical connectors)

2 Electronic Controller

Overview

Introduction The electronic controller controls and displays the cabinet temperature and signals temperature alarms, recording the minimum and maximum value reached at the time of the alarm.

The electronic controller is located on the unit cover and is connected to the refrigeration unit junction box.

Depending on the date of manufacture, the chiller will be fitted with either a SKOPE customised CAREL ir33 controller or a SKOPE customised Dixell XR30C controller (see Figures 1 & 2 below). Check the label on top of the controller to verify the controller type.

Because the controllers are customised and unique to SKOPE, they cannot be replaced with standard Dixell or CAREL controllers.

Variations **Note:** All SKOPE chillers previously manufactured with a SKOPE customised Dixell XR30C controller will now use the SKOPE customised CAREL ir33 controller. Failed SKOPE customised Dixell XR30C controllers will be replaced with the SKOPE customised CAREL ir33. Dixell and CAREL components are not interchangeable, all necessary replacement components are supplied in a replacement kit when ordered as a spare part (see page 39).

See “Electronic Controller” on page 51 for more information and replacement procedures.

While both controllers are similar, there are some visual and functional differences between the two. This manual covers both controller versions.



Figure 1: SKOPE Dixell
XR30C Customised
Controller



Figure 2: SKOPE CAREL
ir33 Customised
Controller

SKOPE Dixell XR30C Controller

Faceplate



Figure 3: Dixell XR30C Faceplate

Item	Key	Function
1		SET: Press to display target set point. In programming mode it selects a parameter or confirms an operation
2		DEFROST: Press to start a manual defrost
3		UP: Press to see the maximum stored temperature. In programming mode it browses the parameter codes, or increases the displayed value
4		DOWN: Press to see the minimum stored temp. In programming mode it browses the parameter codes, or decreases displayed value
5		Compressor ON indicator
6		Defrost cycle ON indicator
7		Set Point displayed indicator
8		Decimal point indicator

Key Combinations		
	+	
Press both keys simultaneously, to lock and unlock the keypad		
	+	
Press both keys simultaneously, to enter the programming mode		
	+	
Press both keys simultaneously, to return to room temperature display		

Meaning of LEDs

Each LED function is described in the following table:

LED	Item	Mode	Function
	Item 5	ON	Compressor enabled
	Item 5	Flashing	Anti-short cycle delay enabled
	Item 6	ON	Defrost enabled
	Item 6	Flashing	Drip time in progress
	Item 5 & 6	Flashing	Programming mode (see page 13)
SP	Item 7	ON	The Set Point is displayed

Programming the Controller The controller keypad must always be locked to prevent unauthorised modification.

How to unlock the keypad (to modify parameters)



1. Press both the **UP** and **DOWN** keys until 'Pon' is displayed.

How to lock the keypad



1. Press and hold both the **UP** and **DOWN** keys for more than 3 seconds.
2. The 'PoF' message will be displayed and the keypad will be locked. At this point it will be possible only to see the Set Point or maximum or minimum temperature stored.
3. If a key is pressed for more than 3 seconds, the 'PoF' message will be displayed.

How to display the Set Point




1. Press, and immediately release the **SET** key. The display will show the Set Point value, and the Set Point LED will be highlighted.

How to change the Set Point



1. Push and hold the **SET** key for more than 2 seconds.



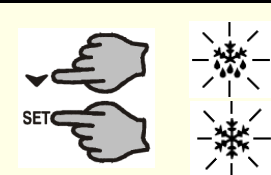
2. The value of the Set Point will be displayed, and the  LED will start blinking.
3. To change the Set value, push the **UP** or **DOWN** keys.
4. To memorise the new Set Point value, push the **SET** key again or wait 15 seconds.

How to start a manual defrost



1. Push and hold the **DEFROST** key for more than 2 seconds.

How to change a parameter value

	<p>1. Enter the programming mode by pressing and holding both the SET and DOWN keys for 3 sec. (❄️ and ❄️ start flashing).</p>
	<p>2. Select the required parameter.</p>
	<p>3. Press the SET key to display the Set value (now only the ❄️ LED is flashing).</p>
	<p>4. Press the UP or DOWN keys to change the Set value.</p>
	<p>5. Press the SET key to store the new value and move to the following parameter.</p>
	<p>6. To exit: Press both the SET and UP keys, or wait 15 seconds without pressing any keys.</p>
	<p>7. To lock in new parameter value: after one minute operation, disconnect and reconnect cabinet into the mains power supply.</p>





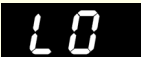

Notes:

1. The Set value is stored even when the procedure is exited by waiting for the time-out to expire.
2. Dependent on customer requirements, the SKOPE electronic controller has different parameter configurations.
Parameter configuration 160 = Beverage, and 170 = Food.
To establish correct controller parameter configuration, see label on controller housing.

Parameters - Dixell XR30C

	Parameters			
Display	Beverage 160	Food 170	Range	Description of Parameter
Set Point Parameters				
Set	2	1	LS to US	Set Point
Hy	2	2	0.1°C to 25.5°C	Differential
LS	+1	-1	DO NOT ADJUST	
US	15	5		
Probe Parameters				
Ot	-0.7	0	DO NOT ADJUST	
OE	0	0		
Control Parameters				
OdS	0	0	DO NOT ADJUST	
AC	3	3		
Display Parameters				
CF	°C	°C	DO NOT ADJUST	
rES	dE	in		
LoD	P1	P1		
Defrost Parameters				
IdF	6	4	1 to 120 hours	Interval between defrost cycles
MdF	20	20	0 to 255 minutes	Maximum length for defrost
dFd	dEF	dEF	DO NOT ADJUST	
dAd	20	20		
Alarm Parameters				
ALc	Ab	Ab	DO NOT ADJUST	Maximum temperature alarm Minimum temperature alarm
ALU	12	7	ALL to 150°C	
ALL	-2	-2	-50°C to ALU	
AtH	1	1	DO NOT ADJUST	
ALd	240	120		
dAO	24	24		
tbA	n	n		
PA2	58	58		
AU2	65	65		
ACH	5	5		
dL2	2	2		
dA2	0	0		
AOP	CL	CL		
Other Parameters				
dP1	-	-	DO NOT ADJUST	
dP2	-	-		
rEL	-	-		
Ptb	-	-		

Display Alarms A flashing LED indicates an alarm. The following is a list of the alarm displays:

Alarm	Description
	Stage ONE - Maintenance required: Immediately attend condenser (for auto alarm reset).
	Stage TWO - Refrigeration Shut-Down: Condenser over-temperature has shut-down system and cabinet lighting. Attend condenser. To reset alarm, cabinet must be replugged into power supply. For repeat alarms, contact an authorised service agent.
	Faulty Ambient probe (internal cabinet - return air)
	Faulty High Temperature probe (condenser)
	Internal cabinet - LOW temperature alarm
	Internal cabinet - HIGH temperature alarm

Note: Refrigeration system and cabinet lighting shut down with 'P1', 'P2' and 'CSd' alarms.

Alarm Recovery

- Condenser over temperature alarm 'COH' recovers when the condenser is either cleaned or cools down.
- Condenser alarm 'CSd' temperature recovers by replugging the cabinet power supply (or isolation switch). In this case, all the alarms are reset.

SKOPE CAREL ir33 Controller

Faceplate

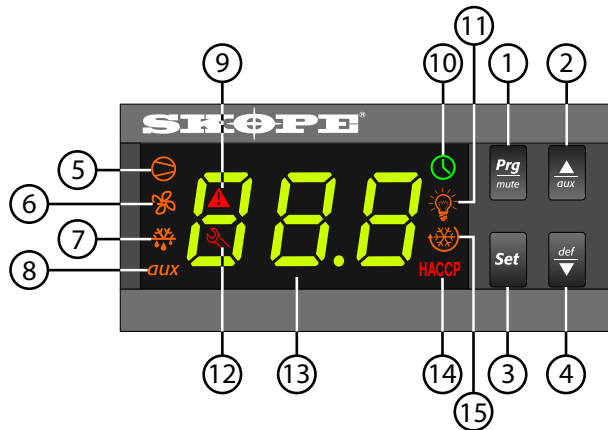






Figure 4: Electronic controller faceplate


Item	Icon	Function
1		Mute / program: Mutes the audible alarm (buzzer) and deactivates the alarm relay. To initiate program sets, press for 5 seconds.
2		Up: To scroll settings up (in program mode).
3		Set point: If pressed for more than 2 seconds displays and / or enables changing the temperature setpoint.
4		Manual defrost / down: Press for more than 5 seconds to initiate manual defrost. To scroll settings down (in program mode).
5		Compressor: ON when the compressor and condenser fan starts. Flashes when activation of the compressor is temporarily delayed.
6		Fan: Shows when the fan is operational.
7		Defrost: ON when the defrost is activated. Flashes when the activation of the defrost is temporarily delayed due to procedures in progress.
8		Aux: n.a.
9		Alarm: Flashes in the event of alarms.
10		Clock: n.a.
11		Light: n.a.
12		Service: Flashes in the event of malfunctions.
13		DISPLAY: Shows the cabinet temperature. Flashes when the door is open.
14		HACCP: n.a.
15		CONTINUOUS CYCLE: On when chiller is running in continuous run mode.

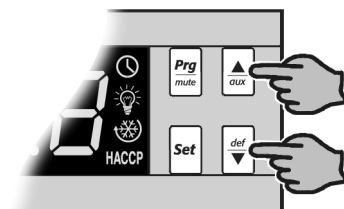
Defrost Cycle To ensure efficient operation, the electronic controller forces a defrost cycle every six hours. During a defrost cycle, the compressor stops, **DEF** and the  will display on the electronic controller faceplate. The chiller will resume normal operation once the defrost cycle has finished. A manual defrost can also be initiated by pressing and holding the  button.

Continuous Cycle The continuous cycle can be used to pull down the temperature of product inside the chiller quickly. During a continuous cool down the compressor runs continuously for a set time.

To start a continuous cycle



1. While the chiller is switched on and running, press and hold the  and  buttons for five seconds.

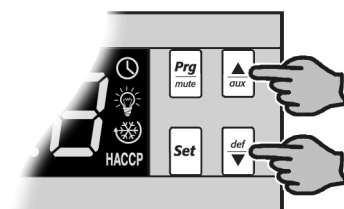
The  symbol will display during a continuous cycle.



To stop a continuous cycle

1. The electronic controller will automatically stop the continuous cycle after a period of time.

The continuous cycle can be stopped by pressing and holding the  and  buttons for five seconds.



Temperature Probes Three temperature probes feed data to the electronic controller - the control, condenser and evaporator probes. Refer to page 51 for information on servicing the probes.

Control Probe

Used to determine cabinet temperature, temperature display and cabinet temperature alarms. Located in return airflow on bracket in front of evaporator face.


Condenser Probe

Used to determine refrigeration shutdown due to overheating of condensing temperature. Located and insulated on outside middle tube of condenser.

Evaporator Probe

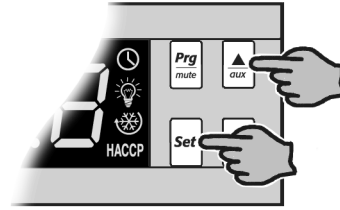
Used to determine defrost termination and evaporator fan activation. Located inside evaporator coil between fins at bottom of coil.

Temperature Probe Reading

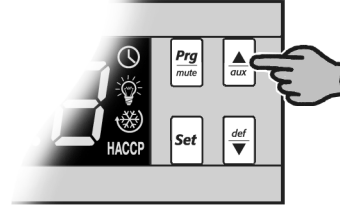
The temperature of each of the three temperature probes can be displayed by pressing and holding both the **Set** and  keys simultaneously for 5 seconds.

To display the temperature probe readings

1. Press and hold both the **Set** and $\frac{\Delta}{aux}$ keys simultaneously for 5 seconds.



2. Press and hold the $\frac{\Delta}{aux}$ key to scroll the probes (see table below). The $\frac{def}{\nabla}$ key is not active for this function. This function will time out after 60 seconds (cannot be turned off prior to 60 seconds elapsed time).

















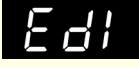
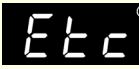







Temperature probe readings

Display	Description
P_1	Control probe temperature
P_2	Evaporator probe temperature
P_3	Condenser probe temperature
P_4	Unused
P_5	Unused

Alarms

The following table explains messages that the electronic controller displays and related alarms. Alarms signal unexpected operational changes in the chiller and stop when action is taken to resolve the problem.

Controller alarms

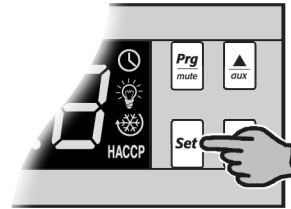
Code	Display Icon	Alarm Description	Action
	 Flashing	Product HIGH temperature alarm	<ol style="list-style-type: none"> 1. Check the cabinet product loading to ensure ventilation slots are not blocked and that product does not overhang the shelves. 2. Ensure the cabinet is installed with good refrigeration unit ventilation. 3. Check and clean the condenser coil. 4. Unplug cabinet from the power supply for 1 minute, then reconnect to power supply. <p>The alarm will automatically reset once the product has returned to temperature specification.</p>
	 Flashing	Product LOW temperature alarm	
		Refrigeration system high temperature pre-warning (auto reset)	<ol style="list-style-type: none"> 1. Clean the condenser coil (see page 54). 2. Check refrigeration ventilation. Ensure clear airpath in front of the cabinet. 3. Ensure the cabinet is installed in a suitable environment. 4. To reset the 'CHT' alarm - unplug the cabinet from the power supply for 1 minute, then reconnect to power supply. <p>If alarm persists:</p> <ol style="list-style-type: none"> 5. Check that the doors are closing and sealing properly. 6. Check that parameters are set correctly. 7. Check that controller is reading correct condenser temperature. 8. Check that condenser fan and compressor are running correctly. 9. Investigate refrigeration system fault.
		Refrigeration system and cabinet high temperature shutdown (manual reset)	
	 Flashing	Control probe fault	<ol style="list-style-type: none"> 1. Unplug cabinet from the power supply for 1 minute to reset alarm, then reconnect to power supply. <p>If alarm persists, work through the following steps until the fault is resolved:</p> <ol style="list-style-type: none"> 2. Check probe connection and wiring. If necessary replace probe or controller. 3. Check probe resistance. If necessary replace probe. 4. Replace controller.
	 Flashing	Evaporator probe fault	
	 Flashing	Condenser probe fault	
	None	Defrost over-time limit	<ol style="list-style-type: none"> 1. Unplug cabinet from the power supply for 1 minute to reset alarm, then reconnect to power supply. 2. Check that controller is reading correct evaporator temperature. 3. Check that parameters are set correctly. 4. Check that evaporator fan is operating correctly. 5. If alarm persists, check the product temperature. If too cool, consider raising setpoint and extending defrost time.
	 Flashing	Real-time clock fault	
	 Flashing	Controller E prom error	<ol style="list-style-type: none"> 1. Unplug cabinet from the power supply for 1 minute to reset alarm, then reconnect to power supply. 2. If alarm persists, replace controller.
	 Flashing	Controller E prom error	
	None	Start defrost request	None
	None	End defrost request	

Programming

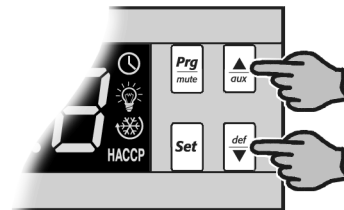
Set-Point The chiller is manufactured with a pre-set control temperature set-point of +1.0°C. If this set-point does not match your required storage temperature it is recommended that you change the set-point accordingly. The set-point can be adjusted between a temperature range of 0°C and +3.5°C.

To view and adjust the temperature set-point

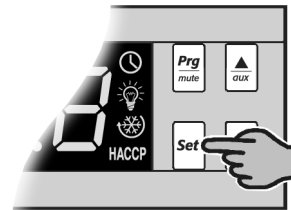
1. To view the set-point: press and hold the **Set** key for 2 seconds, until the set-point value flashes.



2. To adjust the set-point: press either the $\frac{\blacktriangle}{aux}$ and $\frac{\blacktriangledown}{def}$ keys to display the required set-point value.



3. Press the **Set** key again to memorise the new set-point value. If this is not done within 60 seconds, changes will be lost and you will need to repeat the above procedure.

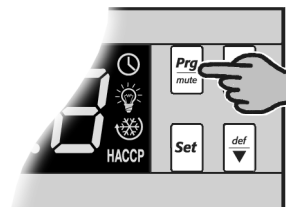


Controller Reset To delete program modifications and reset the controller to SKOPE default program, or when a replacement controller is being fitted, a 'Controller Reset' must be performed.

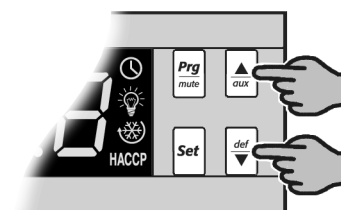
To reset the controller

1. Disconnect the chiller from the power supply.

2. Press and hold the **Prg** mute key while plugging the chiller into the power supply (this may require two people). After a few seconds the controller is reset and program mode '**bn0**' is displayed. The controller must never be left in program mode '**bn0**' as failure will occur.



3. Press the **aux** or **def** keys to select the bn1 program.



4. Immediately press the **Set** key to confirm the preferred program. If not confirmed within 60 seconds the chiller will remain in program mode '**bn0**' (and cause failure). If this occurs, repeat the above procedure.



Default Program Configuration

The controller default program is set by SKOPE to a specific SKOPE product. The factory default cannot be altered in the field. A label on the controller box indicates the default program number (e.g. Counterline and Slimline Series is 'Program 173').

BN Parameter Sets

Program 173 includes one parameter set (BN1) for use with Counterline and Slimline Series cabinets. The BN set must be set to BN1. This can be done by performing a controller reset (see "Controller Reset" above) and selecting the BN1 set.

Field Adjustable Programming

Within the program set are field adjustable (Type C) parameters. To assist with locating, the parameters can be displayed in groups detailed in the table below (non-useful parameters are hidden).

Parameter groups

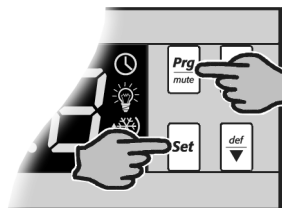
Display	Icon	Group
Pro		Probe
Ctl		Temperature
CMP		Compressor
dEF		Defrost
ALM		Alarm

Display	Icon	Group
Fan		Fan
CnF	aux	General
HcP	HACCP	HACCP
rtc		Real time clock

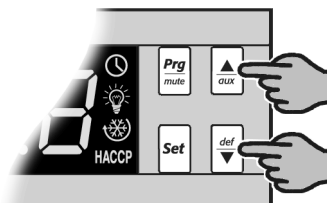
Changes to SKOPE factory default programs are not recommended.

To access Type C parameters

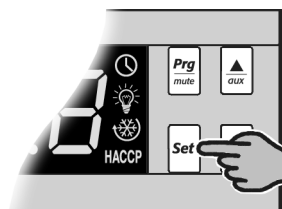
1. Press the **Prg** mute key and **Set** keys together for more than 5 seconds. The display will show either '00' or '1', representing the password prompt.



2. Press the **▲** aux or **▼** def keys until displaying the password number '66'.

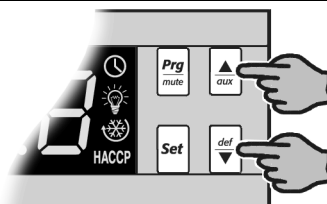


3. Confirm by pressing the **Set** key. The display will show the code of the first modifiable 'Type C' parameter.

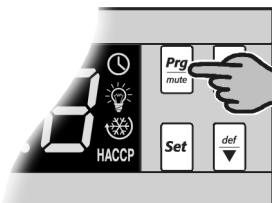


To modify 'Type C' parameters

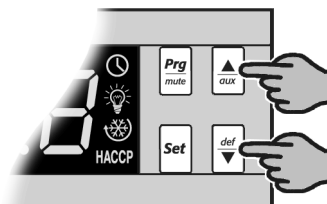
1. Press the **▲** aux or **▼** def keys until reaching the parameter to be modified. When scrolling, an icon appears on the display representing the category the parameter belongs to.



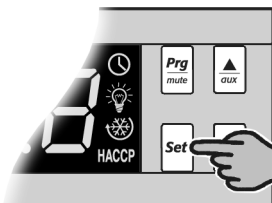
2. Alternatively, press the **Prg** mute key to display a menu that is used to quickly access the group of parameters to be modified (see table on previous page).



3. Scroll the menu with the **▲** aux or **▼** def keys. The display shows the codes of the various categories of parameters.

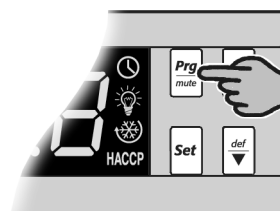


4. When having reached the desired category, press the **Set** key to move directly to the first parameter in the category.

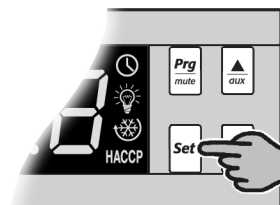


Continued over page

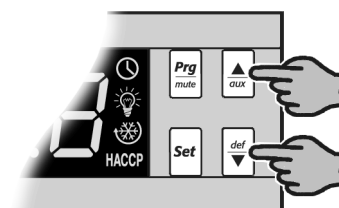
5. At this stage, continue to scroll the parameters or press the **Prg** mute key to return to the categories.



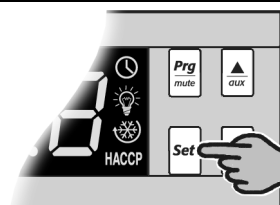
6. Press the **Set** key to display the value associated with the parameter.



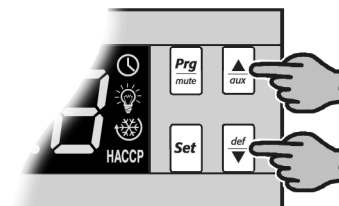
7. Increase or decrease the value using the $\frac{\Delta}{aux}$ or $\frac{def}{\nabla}$ keys respectively.



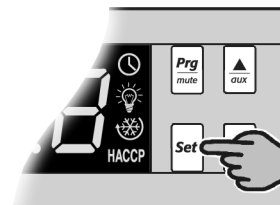
8. Press the **Set** key to temporarily save the new value and return to the display of the parameter code.



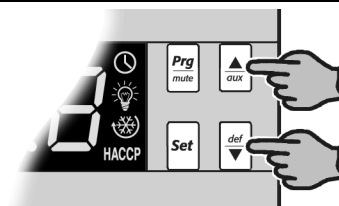
9. Repeat the operations from point 1 or point 2 on the previous page.



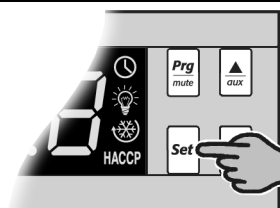
10. If the parameter has sub-parameters, press the **Set** key to display the first sub-parameter.



11. Press the $\frac{\Delta}{aux}$ or $\frac{def}{\nabla}$ keys to display all the sub-parameters.

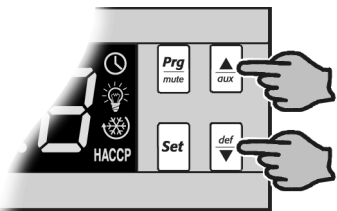


12. Press the **Set** key to display the associated value.

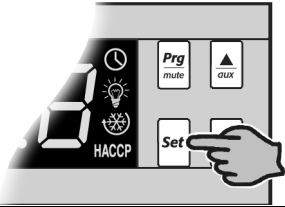


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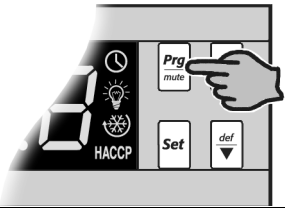
13. Increase or decrease the value using the $\frac{\Delta}{aux}$ or $\frac{def}{\nabla}$ keys respectively.



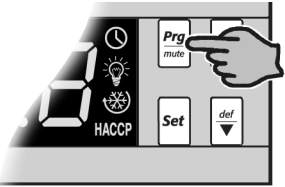
14. Press the **Set** key to temporarily save the new value and return to the display of the sub-parameter code.



15. Press the **Prg mute** key to return to the display of the parent parameter.



16. Press the **Prg mute** key for more than five seconds to store the new values of the modified parameters.



Display Stability

To slow down rapid fluctuations from door openings and more closely represent actual product temperature, change the probe parameters as detailed below.

- To change the display stability, adjust parameter '3' (SKOPE default moderate stabilisation = 8).
- To display setpoint permanently, change parameter 'tl' from 1 to 7.

Parameters

Only an authorised service agent should change the parameters. A label on the top of the controller indicates the default program number. Refer to the tables below for parameters included in this service manual. Refer to "Field Adjustable Programming" on page 21 for information on accessing and changing the parameters.

Parameter sets

Program No.	Model	Page
P173-BN1	Counterline and Slimline Series	25

Program 173



Electronic Controller Parameter Sheet

173

Revision No. 1.1

This sheet is only for use with : **ELZ3333A Custom Controller**
 Controller Code : **IRSKC0HF325**

Standard Mode

BN1

All Available Controller Parameter Sets for this Program
 BN1

CPS1003-173
 Last revised on
 1 December 2011

Display	Standard Mode Settings	Access Level	Range		Description of Parameter	BN0 Default
			Min	Max	Password Parameter (PS) = 66	
Probe Parameters						
/2	4 -	C	1	15	Measurement stability	4
/3	8 -	C	0	15	Probe display speed	0
/5	0 flag	C	0	1	Select °C or °F (0 = °C)	0
/6	0 flag	C	0	1	Disable Decimal Point (0 = decimal point displayed)	0
/tl	1 -	C	1	7	Sensor shown on controller display	1
/A2	2 -	C	0	5	Probe 2 configuration (eg 0=probe absent,2=evap,3=cond)	2
/A3	3 -	C	0	5	Probe 3 configuration (eg 0=digital input,2=evap,3=cond)	0
/c1	-1 °C	C	-20°C	20°C	Calibration of probe 1	0
Control Parameters						
St	1 °C	F	r1	r2	Set Point (Compressor OFF Temperature)	0
rd	2 °C	C	0.1°C	20°C	Differential (Diff + Setpoint = Comp ON Temp)	2
r1	0 °C	C	-50°C	r2	Minimum Set Point allowed	-50
r2	3.5 °C	C	r1	200°C	Maximum Set Point allowed	60
r4	0 °C	C	-20°C	20°C	Value to alter Set Point by when in Night mode	3
r5	0 flag	C	0	1	Enable monitoring (NOT related to HACCP)	0
rt	0 Hours	C	0	999	Elapsed monitoring time (Read only)	0
rH	0 °C	C	-	-	Max temperature during period rt (Read only)	0
rL	0 °C	C	-	-	Min temperature during period rt (Read only)	0
Compressor Parameters						
c2	5 Mins	C	0	15	Minimum compressor OFF time	0
c3	0 Mins	C	0	15	Minimum compressor ON time	0
c4	0 Mins	C	0	100	Comp ON time if Control Probe Fails (OFF = 15mins)	0
Defrost Parameters						
dl	6 Hours	C	0	250	Defrosts Interval (if no RTC defrost times defined)	8
dt1	4.5 °C	C	-50	200	End defrost temperature, (if d0 = 0 or 1)	4
dP1	45 Minutes	C	1	250	Maximum defrost duration	30
d6	1 -	C	0	2	Display during defrost	1
dd	1 Minutes	C	0	15	Dripping time after defrost	2
d8	1 Hours	C	0	15	Bypass alarms after defrost	1
Alarm Parameters						
A0	2 °C	C	0°C	20°C	Alarm and fan differential	2
AL	-2 °C	C	-50°C	200°C	Low Temperature Alarm threshold (see A1 for absol. or rel. to Sp)	0
AH	10 °C	C	-50°C	200°C	High Temperature Alarm threshold (see A1 for absol. or rel. to Sp)	0
Ad	180 Minutes	C	0	250	Low and high temperature alarm delay	120
A8	0 flag	C	0	1	Enable Defrost Overtime Alarms 'Ed1' and 'Ed2'	0
Ac	66 °C	C	0.0°C	200°C	Condenser Alarm Shutdown Set Point	70
AE	11 °C	C	0.1°C	20°C	Cond. Warning (Divided by 2 - i.e. 10 = 5K diff from Ac)	10
Fan Parameters						
F1	20 °C	C	-50°C	200°C	Evap Fan Start Temperature	5
F2	0 flag	C	0	1	Evap Fans Off When Compressor Off	1
F3	0 flag	C	0	1	Evap Fans During Defrost (0 = Fans ON, 1 = Fans OFF)	1
Configuration Parameters						
H0	1 -	C	0	207	Serial address	1
H1	1 -	C	0	15	Configuration relay AUX1 (R2)	1
H2	1 flag	C	1	6	Disable Keypad and/or Remote Control Functions (1 = All functions Enabled)	1
H3	0 -	C	0	255	Remote control enabling code	0
H4	0 flag	C	0	1	Disable buzzer (0=enabled, 1 = disabled)	0
H5	0 flag	C	0	15°C	Configuration relay AUX2 (R3)	3
H6	0 -	C	0	255	Buttons to lock when keypad locked	0
H7	0 -	C	0	1	Enable Alternative Keypad	0
H10	0 flag	C	0	15	Configuration relay AUX3 (R4)	0
HsA	0 flag	C	0	1	Enable alarms on network devices	0
In	0 flag	C	0	6	Standard control or master or slave	0
H17	0 flag	C	0	1	Disable 'Quick View Inputs' Keypad Function (0=Enabled, 1=Disabled)	0
HACCP Parameters						
Real Time Clock Parameters						
HACCP Recorded Parameters						

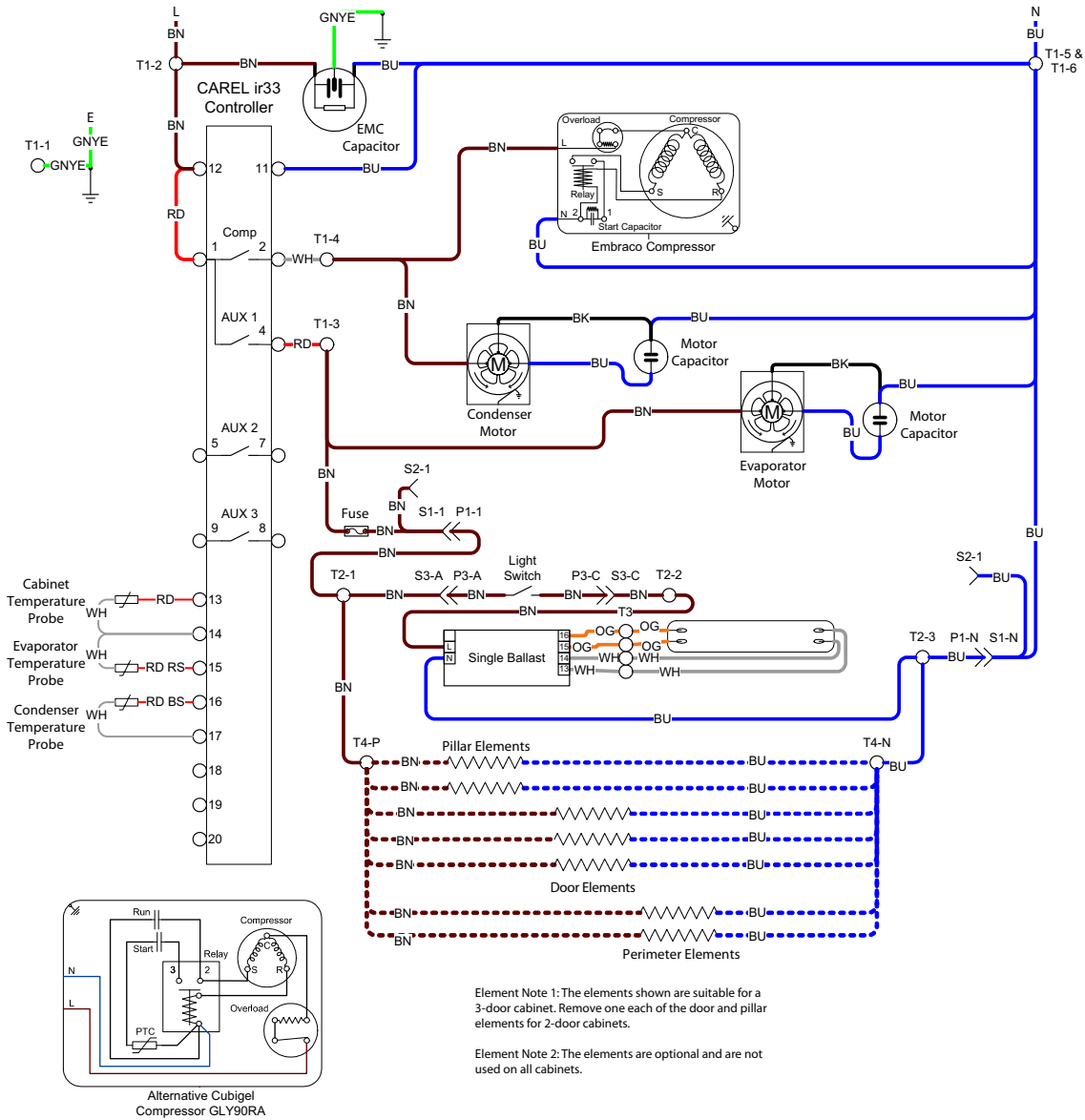
Continued over page

Program 173 (continued)

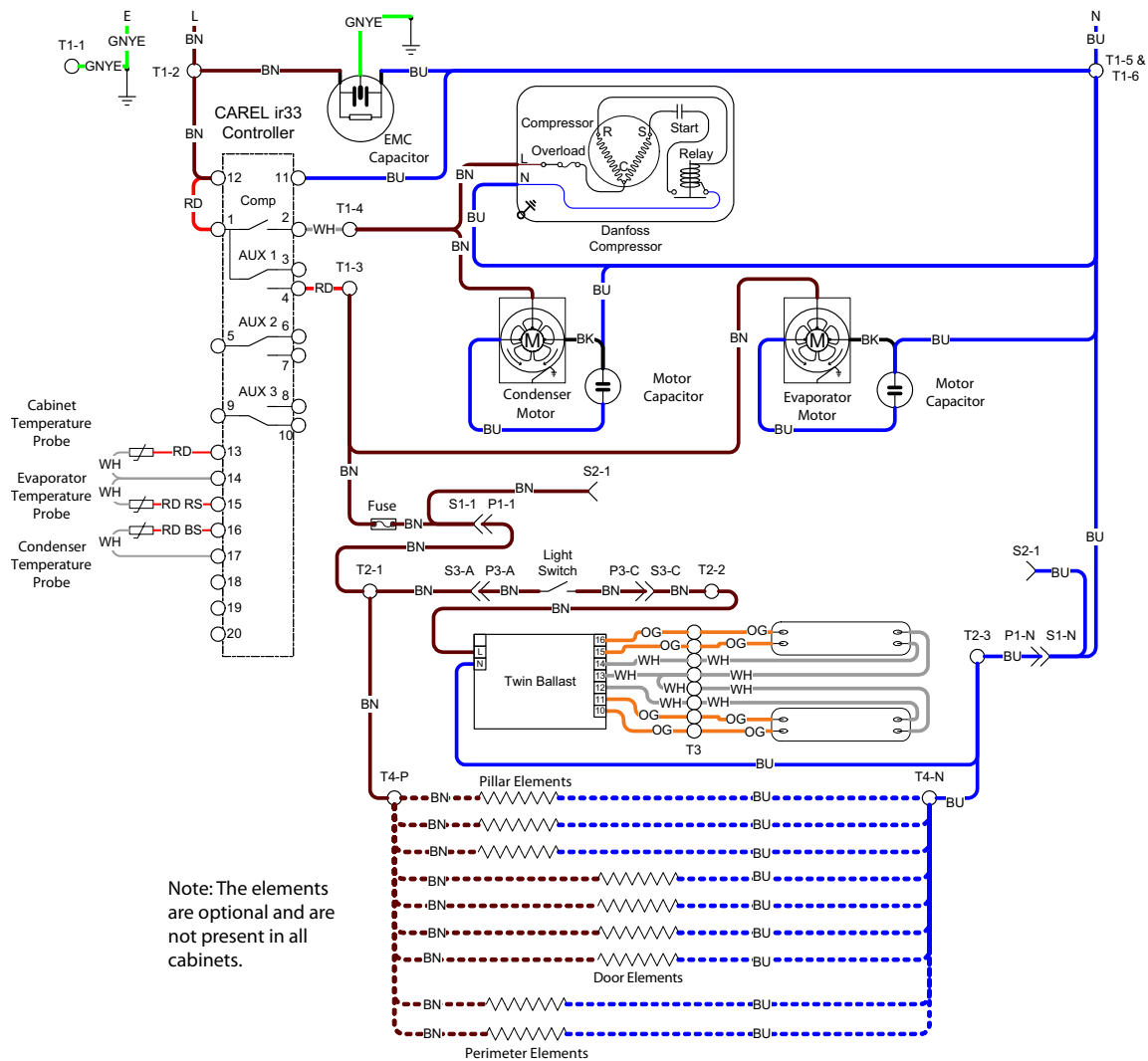
Warning:
<div>1. Confirm Program Mode, BNx number as other Program Modes are available and may be selected.</div> <div>2. At controller reset (PRG button held whilst plugging in cabinet) all parameters return to default settings and BN0. Important cooler must not be operated in BN0 mode as failure will occur.</div> <div>3. Only make program modifications with reference to relevant Operating Manual.</div> <div>4. This programming sheet is set exclusively for the SKOPE Refrigeration System with its dedicated Carel IR33 controller.</div> <div>5. Any alteration from this program may adversely affect the SKOPE Refrigeration System operation.</div> <div>6. Specification may update / change without notice. Please check with Skope Customer Service for latest version.</div>

3 Wiring

CL400, CL600, CC300 & CC500 (CAREL controller, fluorescent lights)



CL800 & CC700 (CAREL controller, fluorescent lights)



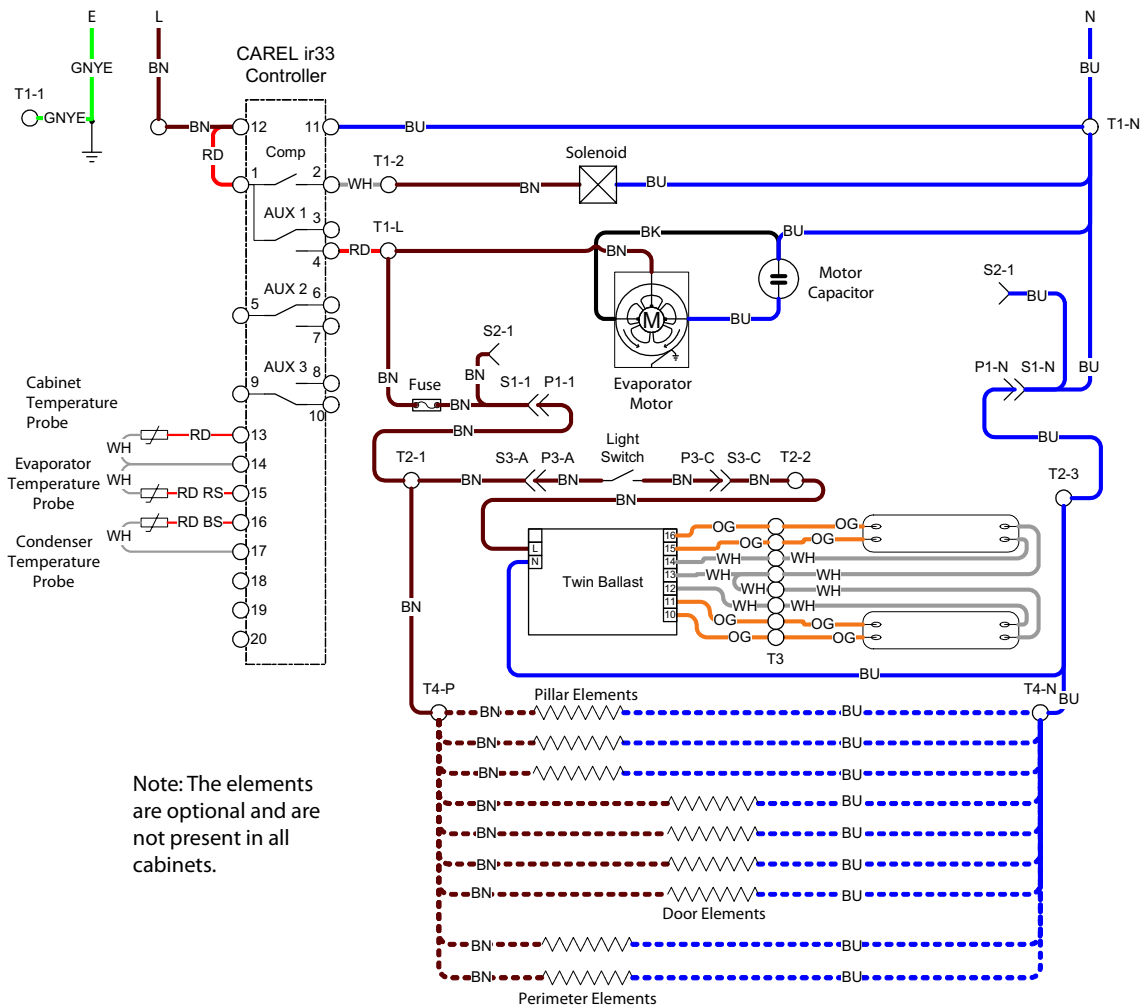
LEGEND

BS	Blue sleeve	T1	Unit terminal block
RS	Red sleeve	T2	Cabinet ballast tray terminal block
P1/S1	Cabinet ENSTO plug & socket	T3	Light terminal block
S2	Unused cabinet ENSTO socket	T4	Element terminal block
P3/S3	Light switch ENSTO plug & socket		
O	Terminal block terminal	>>	Plug & socket

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	

CL800r & CC700r (CAREL controller, fluorescent lights)



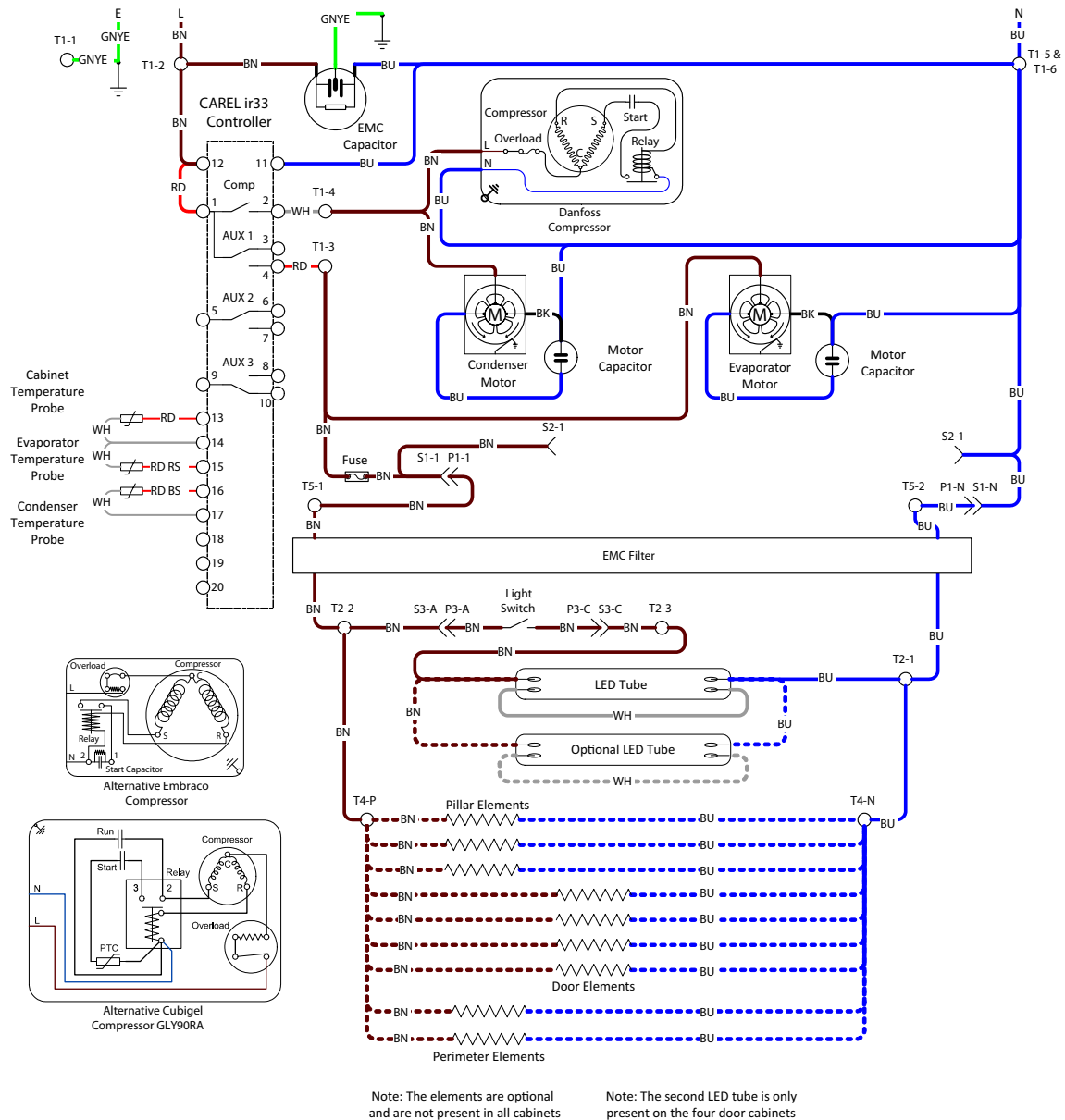
LEGEND

BS	Blue sleeve	T1	Unit terminal block
RS	Red sleeve	T2	Cabinet ballast tray terminal block
P1/S1	Cabinet ENSTO plug & socket	T3	Light terminal block
S2	Unused cabinet ENSTO socket	T4	Element terminal block
P3/S3	Light switch ENSTO plug & socket		
O	Terminal block terminal	>>	Plug & socket

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	

CL & CC Integral (CAREL controller, LED lights)



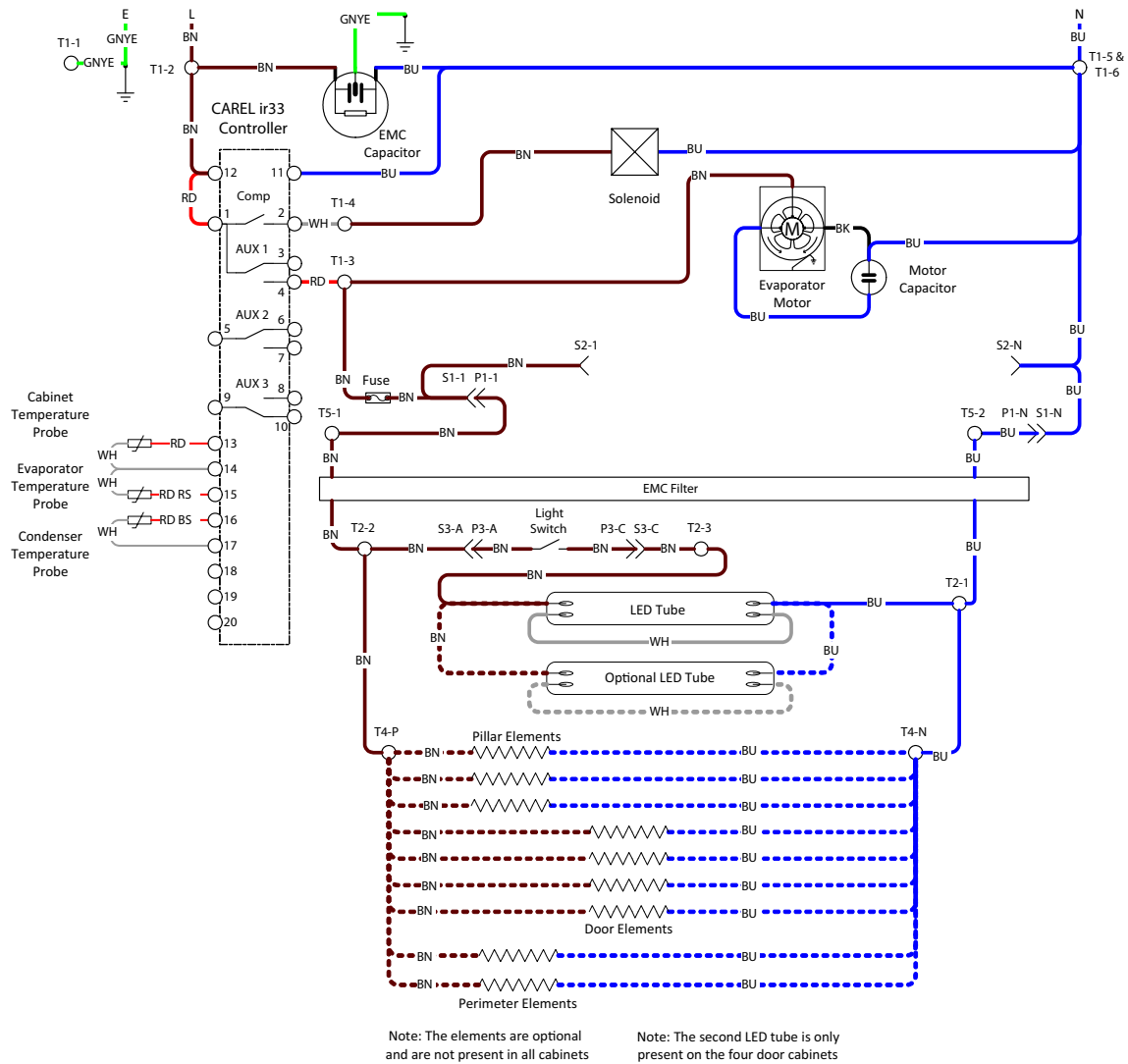
LEGEND

RS	Red sleeve	T1	Unit terminal block
BS	Blue sleeve	T2	Cabinet tray terminal block 1
S1 & P1	Cabinet ENSTO plug & socket	T3	Light terminal block
S2	Unused cabinet ENSTO socket	T4	Element terminal block
S3 & P3	Light switch ENSTO plug & socket	T5	Cabinet tray terminal block 2
O	Terminal block terminal	>>	Plug & socket

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	

CL & CC Remote (CAREL controller, LED lights)



LEGEND

RS	Red sleeve	T1	Unit terminal block
BS	Blue sleeve	T2	Cabinet tray terminal block 1
S1 & P1	Cabinet ENSTO plug & socket	T3	Light terminal block
S2	Unused cabinet ENSTO socket	T4	Element terminal block
S3 & P3	Light switch ENSTO plug & socket	T5	Cabinet tray terminal block 2
O	Terminal block terminal	>>	Plug & socket

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	

4 Spare Parts

Cabinet Assembly

Parts — Counterline Cabinet

Description	SKOPE Part Number		
<i>Models</i>	<i>CL400</i>	<i>CL600</i>	<i>CL800</i>
Control panel (swing door) (LH mounted unit)	JD2202/785L	JD2203/785L	JD2204/785L and JD2204/791L
Control panel (swing door) (RH mounted unit)	JD2202/785R	JD2203/785R	JD2204/785R and JD2204/791R
65mm Bench Top	JD2202/H09-S1	JD2203/H09-S1	JD2204/H09-S1
50mm Bench Top	JD2202/H05-S1	JD2203/H05-S1	JD2203/H05-S1
Wiring Cover (unit)	JD2102/H07	JD2102/H07	JD2104/H07
Wiring Cover (glass door)	JD2202/H07	JD2203/H07	JD2202/H07
Wiring Cover (solid door)	JD2302/H07	JD2302/H07	JD2302/H07 and JD2302/H10
Unit front cover (integral LH mounted unit)	JD2102/124L	JD2102/124L	JD2102/124L
Unit front cover (integral RH mounted unit)	JD2102/124R	JD2102/124R	JD2102/124R
Unit front cover (remote LH mounted unit)	JS3102/124L	JS3102/124L	JS3102/124L
Unit front cover (remote RH mounted unit)	JS3102/124R	JS3102/124R	JS3102/124R
Centre pillar assembly (swing door)	JD2202/L43	JD2202/L43	JD2202/L43
Centre pillar assembly (sliding door)	JD2102/L43	JD2102/L43	JD2102/L43
Centre pillar cover assembly (swing door)	JD2202/L44	JD2202/L44	JD2202/L44
Centre pillar cover assembly (sliding door)	JD2102/L44	JD2102/L44	JD2102/L44
SKOPE label	LAB7562	LAB7562	LAB7562
Load limit label	LAB7332	LAB7332	LAB7332
Outer wire shelf	WRKJC2102/160	WRKJC2102/160	WRKJC2102/160
Centre wire shelf	n.a.	WRKJC2103/160	WRKJC2103/160
Shelf clip	V0973-99	V0973-99	V0973-99
Shelf Support Strip - LH	V9001/150L	V9001/150L	V9001/150L
Shelf Support Strip - RH	V9001/150R	V9001/150R	V9001/150R
Adjustable castor (rear)	SXX6181	SXX6181	SXX6181
Lockable castor (front)	SXX6182	SXX6182	SXX6182

Parts — Slimline Cabinet

Description	SKOPE Part Number		
Models	CC300	CC500	CC700
Control panel (swing door) (LH mounted unit)	JD2202/785L	JD2203/785L	JD2204/785L and JD2204/791L
Control panel (swing door) (RH mounted unit)	JD2202/785R	JD2203/785R	JD2204/785R and JD2204/791R
65mm Bench Top			
50mm Bench Top			
Wiring Cover (unit)	JD2102/H07	JD2102/H07	JD2104/H07
Wiring Cover (glass door)	JD2202/H07	JD2203/H07	JD2202/H07
Wiring Cover (solid door)	JD2302/H07	JD2302/H07	JD2302/H07 and JD2302/H10
Unit front cover (integral LH mounted unit)	JS2102/124L	JS2102/124L	JS2102/124L
Unit front cover (integral RH mounted unit)	JS2102/124R	JS2102/124R	JS2102/124R
Unit front cover (remote LH mounted unit)	JS3102/124L	JS3102/124L	JS3102/124L
Unit front cover (remote RH mounted unit)	JS3102/124R	JS3102/124R	JS3102/124R
Centre pillar assembly (swing door)	JD2202/L43	JD2202/L43	JD2202/L43
Centre pillar assembly (sliding door)	JD2102/L43	JD2102/L43	JD2102/L43
Centre pillar cover assembly (swing door)	JD2202/L44	JD2202/L44	JD2202/L44
Centre pillar cover assembly (sliding door)	JD2102/L44	JD2102/L44	JD2102/L44
SKOPE label	LAB7562	LAB7562	LAB7562
Load limit label	LAB7332	LAB7332	LAB7332
Outer wire shelf	JS2102/160	JS2102/160	JS2102/160
Centre wire shelf	n.a.	JS2103/160	JS2103/160
Shelf clip	V0973-99	V0973-99	V0973-99
Shelf Support Strip - LH	V9001/150L	V9001/150L	V9001/150L
Shelf Support Strip - RH	V9001/150R	V9001/150R	V9001/150R
Adjustable castor (rear)	SXX6181	SXX6181	SXX6181
Lockable castor (front)	SXX6182	SXX6182	SXX6182

Interior Lighting

Parts — Counterline Interior Light Assembly (Fluorescent)

Description	SKOPE Part Number		
<i>Models</i>	<i>CL400</i>	<i>CL600</i>	<i>CL800</i>
Recessed light assembly (fluorescent) (LH mounted unit)	JD2102/670L	JD2103/670L	JS2104/670L
Recessed light assembly (fluorescent) (RH mounted unit)	JD2102/670R	JD2103/670R	JS2104/670R
Recessed light diffuser	JC2102/E71	JC2103/E71	JC2104/E71
Fluorescent tube	ELL0602	ELL0604	ELL0602
Starter	ELZ2840	ELZ2840	ELZ2840
Lamp holder	ELZ0600	ELZ0600	ELZ0600

Parts — Counterline Interior Light Ballast Box Assembly (Fluorescent)

Description	SKOPE Part Number		
<i>Models</i>	<i>CL400</i>	<i>CL600</i>	<i>CL800</i>
Ballast box assembly (fluorescent) (LH mounted unit)	JD2102/E87L	JD2102/E87L	JD2104/E87L
Ballast box assembly (fluorescent) (RH mounted unit)	JD2102/E87R	JD2102/E87R	JD2104/E87R
Ballast	ELZ0605-2	ELZ0605-2	ELZ0606-2

Parts — Counterline Interior Light Assembly (LED)

Description	SKOPE Part Number		
<i>Models</i>	<i>CL400</i>	<i>CL600</i>	<i>CL800</i>
Recessed light assembly (LED) (LH mounted unit)	JD2102V/670L	JD2103V/670L	JD2104/670L
Recessed light assembly (LED) (RH mounted unit)	JD2102V/670R	JD2103V/670R	JD2104/670R
Recessed light diffuser	JC2102/E71	JC2103/E71	JC2104/E71
LED tube	ELL10742	ELL10743	ELL10742
Lamp holder	ELZ6270	ELZ6270	ELZ6270

Parts — Counterline Interior Light Electrics Box Assembly (LED)

Description	SKOPE Part Number		
<i>Models</i>	<i>CL400</i>	<i>CL600</i>	<i>CL800</i>
Interior Light Electrics Box Assembly (LED) (LH mounted unit)	JD2102V/E87L	JD2102V/E87L	JD2102V/E87L
Interior Light Electrics Box Assembly (LED) (RH mounted unit)	JD2102V/E87R	JD2102V/E87R	JD2102V/E87R
EMC LED filter	ELZ10136	ELZ10136	ELZ10136

Parts — Slimline Interior Light Assembly (Fluorescent)

Description	SKOPE Part Number		
<i>Models</i>	<i>CC300</i>	<i>CC500</i>	<i>CC700</i>
Recessed light assembly (fluorescent) (LH mounted unit)	JS2102/670L	JS2103/670L	JS2104/670L
Recessed light assembly (fluorescent) (RH mounted unit)	JS2102/670R	JS2103/670R	JS2104/670R
Recessed light diffuser	JC2102/E71	JC2103/E71	JC2104/E71
Fluorescent tube	ELL0602	ELL0604	ELL0602
Starter	ELZ2840	ELZ2840	ELZ2840
Lamp holder	ELZ0600	ELZ0600	ELZ0600

Parts — Slimline Interior Light Ballast Box Assembly (Fluorescent)

Description	SKOPE Part Number		
<i>Models</i>	<i>CC300</i>	<i>CC500</i>	<i>CC700</i>
Ballast box assembly (fluorescent) (LH mounted unit)	JS2102/E87L	JS2102/E87L	JS2104/E87L
Ballast box assembly (fluorescent) (RH mounted unit)	JS2102/E87R	JS2102/E87R	JS2104/E87R
Ballast	ELZ0605-2	ELZ0605-2	ELZ0606-2

Parts — Slimline Interior Light Assembly (LED)

Description	SKOPE Part Number		
<i>Models</i>	<i>CC300</i>	<i>CC500</i>	<i>CC700</i>
Recessed light assembly (LED) (LH mounted unit)	JD2102V/670L	JD2103V/670L	JD2104/670L
Recessed light assembly (LED) (RH mounted unit)	JD2102V/670R	JD2103V/670R	JD2104/670R
Recessed light diffuser	JC2102/E71	JC2103/E71	JC2104/E71
LED tube	ELL10742	ELL10743	ELL10742
Lamp holder	ELZ6270	ELZ6270	ELZ6270

Parts — Slimline Interior Light Electrics Box Assembly (LED)

Description	SKOPE Part Number		
<i>Models</i>	<i>CC300</i>	<i>CC500</i>	<i>CC700</i>
Interior Light Electrics Box Assembly (LED) (LH mounted unit)	JS2102V/E87L	JS2102V/E87L	JS2102V/E87L
Interior Light Electrics Box Assembly (LED) (RH mounted unit)	JS2102V/E87R	JS2102V/E87R	JS2102V/E87R
EMC LED filter	ELZ10136	ELZ10136	ELZ10136

Doors

Parts — Counterline & Slimline Glass Swing Doors

Description	SKOPE Part Number
Models	All models
Glass door assembly - LH	JD2202/Z03L
Glass door assembly - RH	JD2202/Z03R
Glass door gasket	GKT0660N
Torsion bar assembly	REF5014
Capstan	TUR5100
Bush	PLM5075
Top hinge assembly - LH	V5000/389
Top hinge assembly - RH	V5000/388
Top hinge blank	V5000/390
Bottom hinge - L/H	V4600/394
Bottom hinge - R/H	V4600/393

Parts — Counterline & Slimline Solid Swing Doors

Description	SKOPE Part Number
Models	All models
Solid door assembly - L/H	JD2302/D41
Solid door assembly - R/H	JD2302/D40
Solid door gasket	GKT0660N
Door hinge mechanism	HIN5780
Top hinge - R/H	V9001/388
Top hinge - L/H	V9001/389
Bottom hinge - R/H	H2100/D55R
Bottom hinge - L/H	H2100/D55L

Parts — Counterline & Slimline Sliding Glass Doors

Description	SKOPE Part Number		
<i>Models</i>	<i>CL400 (2 door)</i>	<i>CL600 (3 door)</i>	<i>CL800 (4 door)</i>
Sliding Door Ass'y - R/H	JD2102/N30RF	JD2102/N30LF	JD2102/N30LF and JD2102/ N30LB
Sliding Door Ass'y - L/H	JD2102/N30LB	JD2102/N30RB	JD2102/N30RF and JD2102/ N30RB
Moulded Roller Body	PLM0323	PLM0323	PLM0323
Roller Bearing	SXX7104	SXX7104	SXX7104
Edge Seal Gasket	JD2102/N35	JD2102/N35	JD2102/N35
Brush Door Seal - vert.	JD2102/N36B	JD2102/N36B	JD2102/N36B
Brush Door Seal - horiz.	JC2102/N36C	JC2102/N36C	JC2102/N36C
Door Tension Spring	SPR7106	SPR7106	SPR7106
Door Tension Clip (frame)	V4100/535	V4100/535	V4100/535
Door Tension Clip (door)	V4100/536	V4100/536	V4100/536
Inner Door Frame Ass'y	JD2102/N10	JD2103/N10	JD2104/N10
Frame Vertical Cover	JD2102/N21	JD2102/N21	JD2102/N21
Frame Horizontal Cover	JC2102/N22	JC2103/N22	JC2104/N22
Frame Heater Element	ELE0880	ELE0881	ELE0882
Adjustable Rack	ALXV5000/150	ALXV5000/150	ALXV5000/150
Door Stop	RUM7129	RUM7129 & PLM5040	RUM7129 & PLM5040

Integral Refrigeration Unit

Parts — UE11AAC-171 Integral Refrigeration Unit Assembly

Description	SKOPE Part Number
Refrigeration Unit Assembly	UE11AAC-171
Compressor - Electrolux GLY90RA	CPR0464P
Evaporator Box Assembly	UE21AA/970
Evaporator Coil	CLS9902R
Evaporator Fan Shroud	B2002/231
Evaporator Motor Mounting Bracket	UE40AA/235
Condenser Coil	CLS0484
Condenser Fan Shroud	V9004/232
Condenser Motor Mounting Bracket	UT40AA/235
Condenser Tray	V9001/992-32
Drain Tube	V9022/250
Drier	DRY8783
Unit Base	UE40AA/994
Unit Base Foot	PLM6108
Suction Line Assembly	UE40AA/378
Fan Blade (R/H clockwise)	FAN4100
Fan Motor	ELM9917
Refrigeration unit wiring junction box assembly	UE40AA/R86-173
Electronic controller box assembly (when servicing/replacing Dixell controller)	JC21/K01-SP1-49
Electronic controller box assembly (when servicing/replacing CAREL controller)	JC2102/K01-173-49

Parts — UE21AAC-171 Integral Refrigeration Unit Assembly

Description	SKOPE Part Number
Refrigeration Unit Assembly	UE21AAC-171
Compressor - Danfoss SC15G	CPR7344P
Evaporator Box Assembly	UE21AA/970
Evaporator Coil	CLS9902R
Evaporator Fan Shroud	B2002/231
Evaporator Motor Mounting Bracket	UE40AA/235
Condenser Coil	CLS9317
Condenser Fan Shroud	V9004/232
Condenser Motor Mounting Bracket	UE40AA/235A
Condenser Tray	V9001/992-32
Drain Tube	V9022/250
Drier	DRY8783
Start Capacitor	ELC2369NC
Compressor Relay	ELR2729NC
Unit Base	UE40AA/994
Unit Base Foot	PLM6108
Suction Line Assembly	UE40AA/378
Evaporator Fan Blade (R/H clockwise)	FAN4100
Condenser Fan Blade (R/H clockwise)	FAN7355
Fan Motor	ELM9917
Refrigeration unit wiring junction box assembly	UE40AA/R86-173
Electronic controller box assembly (when servicing/replacing Dixell controller)	JC21/K01-SP1-49
Electronic controller box assembly (when servicing/replacing CAREL controller)	JC2102/K01-173-49

Parts — Integral Refrigeration Unit Wiring Junction Box Assembly

Description	SKOPE Part Number
Unit Wiring Junction Box Assembly	UE40AA/R86-173
Mains Flex Assembly	UE40AA/E53
Fan Motor Capacitor	ELC9142NC
3 Amp Ceramic Fuse	ELZ9654
ENSTO 3-Pole Receptacle (White)	ELZ0499-3
ENSTO 3-Pole Panel Adaptor (White)	PLM0497-3

Parts — Electronic Controller Box Assembly

Description	SKOPE Part Number
Electronic controller box assembly (when servicing/replacing Dixell controller)	JC21/K01-SP1-49
Electronic controller box assembly (when servicing/replacing CAREL controller)	JC2102/K01-173-49
CAREL ir33 electronic controller	ELZ3333AP-173
CAREL ir33 temperature probe assembly	UB80AA/E49C
ENSTO 3-pole NBC	ELZ1014-03
Light switch	ELS6560

Remote Refrigeration Unit

Parts — UE11AAR-171 Remote Refrigeration Unit Assembly

Description	SKOPE Part Number
Refrigeration unit assembly	UE11AAR-171
Evaporator box - foamed	UE21AA/970
Evaporator lid - foamed	UE21AA/980
Evaporator coil	CLS9902R
Fan blade (clockwise)	FAN4100
Evaporator fan motor	ELM9917
Refrigeration unit wiring junction box assembly	UE21AAR/R86-173
Electronic controller box assembly (when servicing/replacing Dixell controller)	JC21/K01-SP1-49
Electronic controller box assembly (when servicing/replacing CAREL controller)	JC2102/K01-173-49

Parts — UE21AAR-171 Remote Refrigeration Unit Assembly

Description	SKOPE Part Number
Refrigeration unit assembly	UE21AAR-171
Evaporator box - foamed	UE21AA/970
Evaporator lid - foamed	UE21AA/980
Evaporator coil	CLS9902R
Fan blade (clockwise)	FAN4100
Evaporator fan motor	ELM9917
Refrigeration unit wiring junction box assembly	UE21AAR/R86-173
Electronic controller box assembly (when servicing/replacing Dixell controller)	JC21/K01-SP1-49
Electronic controller box assembly (when servicing/replacing CAREL controller)	JC2102/K01-173-49

Parts — Remote Refrigeration Unit Wiring Junction Box Assembly

Description	SKOPE Part Number
Refrigeration unit wiring junction box assembly	UE21AAR/R86-173
Mains flex assembly	UE40AA/E53
Fan motor capacitor	ELC9142NC
3 Amp ceramic fuse	ELZ9654
ENSTO 3-pole receptacle (White)	ELZ0499-3
ENSTO 3-pole panel Adaptor (White)	PLM0497-3

Parts — Electronic Controller Box Assembly

Description	SKOPE Part Number
Electronic controller box assembly (when servicing/replacing Dixell controller)	JC21/K01-SP1-49
Electronic controller box assembly (when servicing/replacing CAREL controller)	JC2102/K01-173-49
CAREL ir33 electronic controller	ELZ3333AP-173
CARELXR30C ir33 temperature probe assembly	UB80AA/E49C
ENSTO 3-pole NBC	ELZ1014-03
Light switch	ELS6560

5 Replacement Procedures

Lighting

The chiller is fitted with either fluorescent or LED light tubes. See the table below for light tube specifications. Before replacing a light, determine whether it is fluorescent or LED and replace with the same light type. Fluorescent and LED tubes are not interchangeable.

IMPORTANT

Replace the light with the same type (fluorescent or LED).

Refer to the table below for replacement light specifications.

Model	Light type	Light description	SKOPE Part No.
CL400/ CC300	Fluorescent	1 x 21W T5 Fluorescent Tube (Ø16 x 850mm)	ELL0602
	LED	1 x 20W T8 frosted LED tube (Ø26 x 900mm, 5500K)	ELL10742
CL600/ CC500	Fluorescent	1 x 35W T5 fluorescent tube (Ø16 x 1450mm)	ELL0604
	LED	1 x 24W T8 frosted LED tube (Ø26 x 1500mm, 5500K)	ELL10743
CL800/ CC700	Fluorescent	2 x 21W T5 Fluorescent Tube (Ø16 x 850mm)	ELL0602
	LED	2 x 20W T8 frosted LED tube (Ø26 x 900mm, 5500K)	ELL10742

Note: LED light tubes may be fitted with rotating end caps at each end of the tube. Ensure both end caps are positioned at the '0' setting and that the light faces in the correct direction.

To replace the interior LED light tube

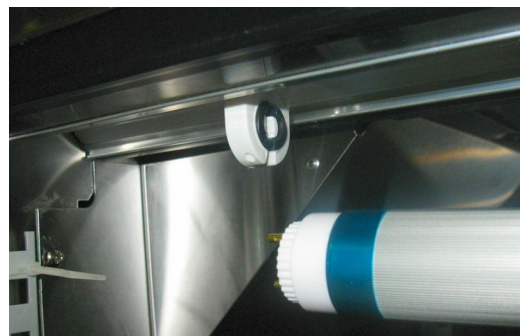
1. Disconnect the cabinet from the power supply.

2. Remove the top light diffuser by squeezing it until it is released from the housing.



3. Rotate the LED tube until the pins on the ends of the tube align with the slots, then slide it out.

4. Fit a new LED tube and clip the diffuser back into place. When fitting vertically mounted LED tubes, ensure the tube is fitted with the 'Power' end at the top.



Glass Swing Door

Alignment Door alignment can be achieved by releasing the bottom hinge fixing bracket. The bracket is provided with slots allowing alignment adjustment.

Gasket The door gasket clips into the door gasket retainer extrusion on the inside of the door and may be removed for repair or replacement by peeling from the frame, starting at a corner.

New gaskets, when fitted, can be lightly lubricated with a clear silicone grease or similar compound to lessen the possibility of the gasket rolling. Should the gasket be out of shape when in place, use hot air (i.e. from hair drier) to realign.

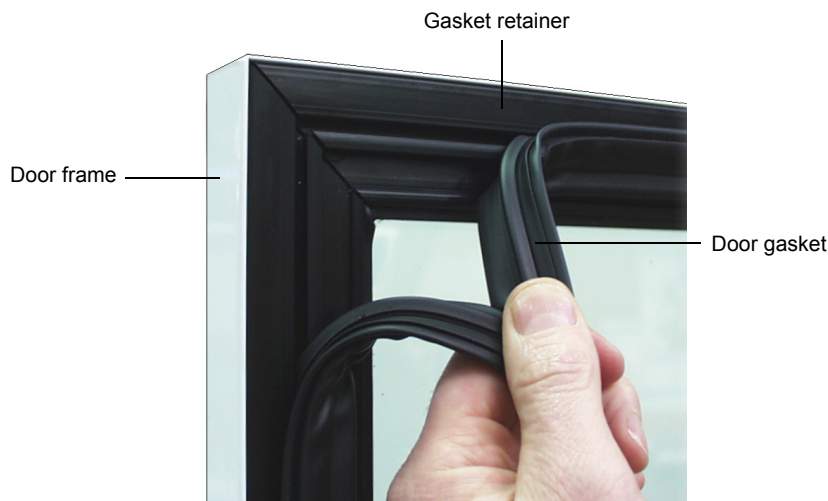


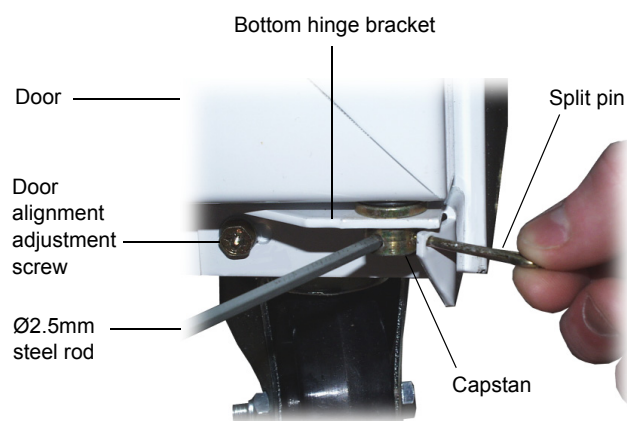
Figure 5: Door Gasket

Tension Adjustment The glass door has an internal torsion bar, pretensioned at the factory, which enables the door to self-close. If necessary, door tension can be adjusted by rotating the capstan mounted in the bottom hinge bracket.

In the event the door tension can no longer be adjusted, the torsion bar may need replacing (see “Torsion Bar Replacement” on page 43).

To adjust door tension

1. Slowly release tension on the capstan by turning the capstan with a Ø2.5mm steel rod, and remove the split pin.
2. With the aid of another Ø2.5mm steel rod, increase the tension by turning the capstan in the direction the door closes.



Continued over page

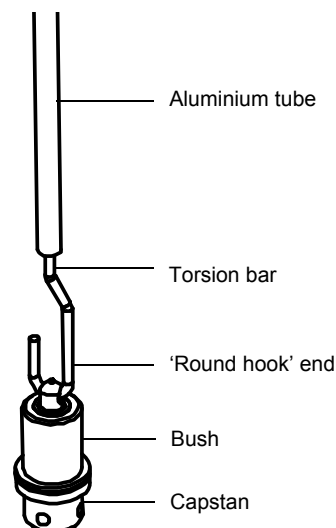
3. Once adequate tension has been achieved, re-insert the split pin through the hole in the hinge bracket to lock in position.
4. To check door tension, hold the door open approximately 100mm and let go of the door. The door should gently close, with the door gasket forming an air tight seal with the cabinet.

Torsion Bar Replacement

The torsion bar assembly is located inside the door frame, and can be replaced if necessary.

To replace the door torsion bar assembly

1. Disconnect the cabinet from the mains power supply.
2. Remove the door (see "Removal" on page 43).
3. Carefully lever out the bottom bush from the door frame, and pull the old torsion bar out from the door frame. The end of the torsion bar will need manoeuvring to allow the 'flat hook' end to clear the hinge hole.
4. Remove the existing capstan and bush from the old torsion bar.
5. Thread the capstan, complete with bush, over the 'round hook' end of the new torsion bar. Ensure the aluminium tube moves freely up and down the torsion bar.
6. Fit the new torsion bar assembly into the door frame. When the torsion bar is correctly installed, the capstan should not turn.
7. Lightly tap bottom of capstan into hinge hole, until the bush is flush with door frame.
8. Refit the door to cabinet, and adjust tension ("Tension Adjustment" on page 42).



Removal For ease of servicing, the door can be removed from the cabinet. **Note:** Glass replacement is not considered economical, as the glass is fixed to the frame for integral strength. Door replacement is recommended.

To remove the door

1. Disconnect the cabinet from the mains power supply.
2. Slowly release tension on the door capstan by turning the capstan with a Ø2.5mm steel rod, and remove the split pin from the bottom hinge bracket (see step 1 in "Tension Adjustment" on page 42).
3. Remove the cabinet control panel.
4. Unscrew top hinge and lift the door clear of bottom pivot.
5. The door and hinge can now be removed from the cabinet.

Solid Swing Door

Tension The solid door hinge mechanism has a preset tension, and is non-adjustable. Ensure the square notch in the hinge plate mates with the door hinge, when replacing.

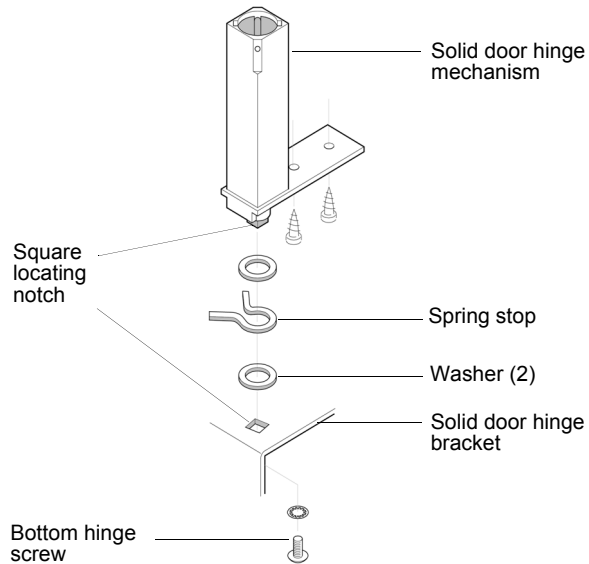


Figure 6: Swing door tension

Removal For ease of servicing, the door can be removed from the cabinet.

To remove the door

1. Disconnect the cabinet from the mains power supply.
2. Remove bottom hinge screw from pivot point.
3. Unbolt bottom hinge plate, and slide door down to remove from top hinge.

Sliding Glass Door

The sliding doors run on rollers that engage with an extruded aluminium 'T' section in the door frame assembly. Automatic closure is by means of an adjustable tension spring fitted on top of the door.

Removal To remove sliding doors from the cabinet

1. Remove the outer door, by lifting the door up into the door guide. Swing door out at the bottom, and then lower down.
2. Disconnect the door tension spring from the adjustable rack on top of door guide assembly.

Note: When doors are fitted with the optional door lock, the doors can be removed only after the locks have been removed.

Gasket The rubber vertical door gasket, which is located on the edge of the door, simply slots into place. A brush sealing strip provides the seal between doors.

Door Rollers Door rollers are located in the recess in the bottom of the door extrusion. If necessary the roller bearings can be levered out from the roller body, and replaced (see page 54 for sliding door spares).

Tension If required, door closing tension can be adjusted by removing the door (see 'Sliding door removal' above), and moving the tension spring to the next slot in the adjustable rack in top of door guide (see Figure 16 below).

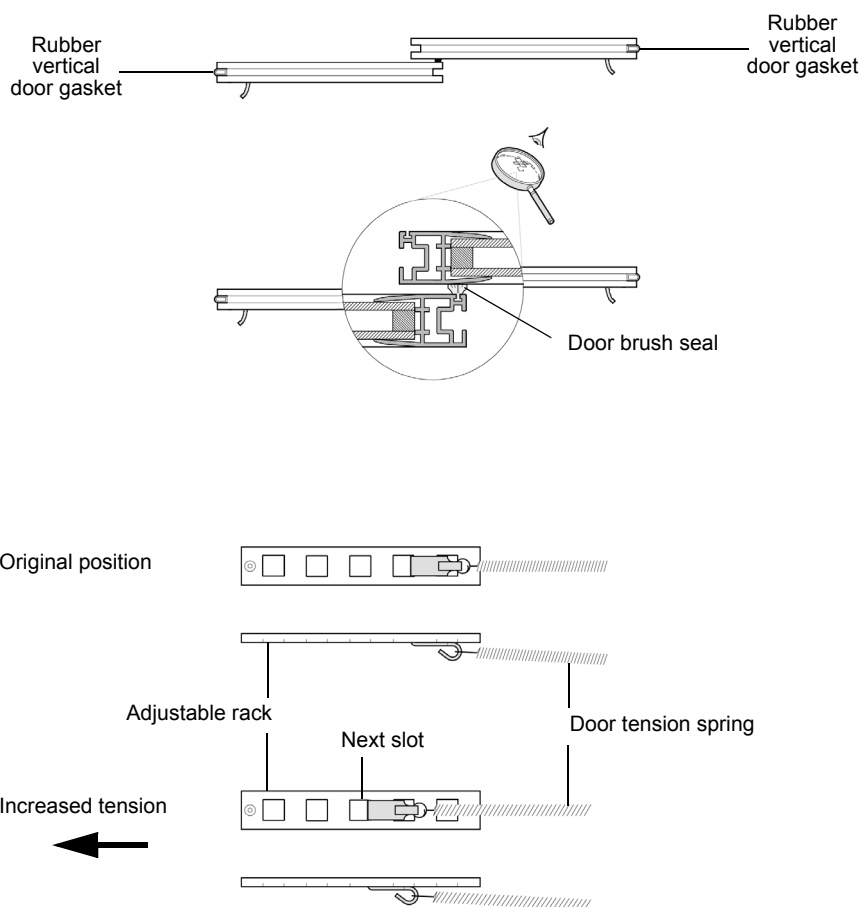


Figure 7: Sliding door tension

Sliding Door Frame Cover Removal

To access the door frame heater element, all four door frame covers will need removing from the door frame. Before removing covers, disconnect unit from the power supply. To remove each cover, use a flat blade screwdriver, inserted into the join between the frame and cover, and twist the screwdriver to separate the cover from the frame. Work along length of the frame until the cover pops out.

To refit the cover, engage the internal flange of the cover under the locating flange of the frame and push firmly into place.

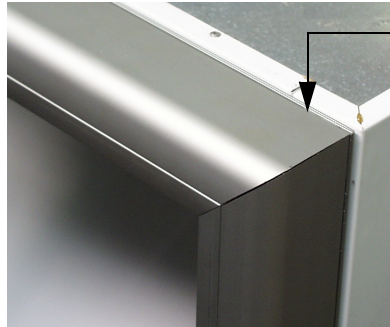


Figure 8: Sliding door frame

Insert a flat blade screwdriver between join in the door frame and cover, and twist to separate cover. Use masking tape around the blade of the screwdriver, so as not to damage the door frame.

Door frame heater elements (2)



Figure 9: Removing door frame covers

Pull cover away from door frame.

Refrigeration Unit

The refrigeration unit features a slide and pull removal method. To access the refrigeration unit for cleaning the condenser, adjusting thermostat and re-setting the pressure switch, open the unit front cover.

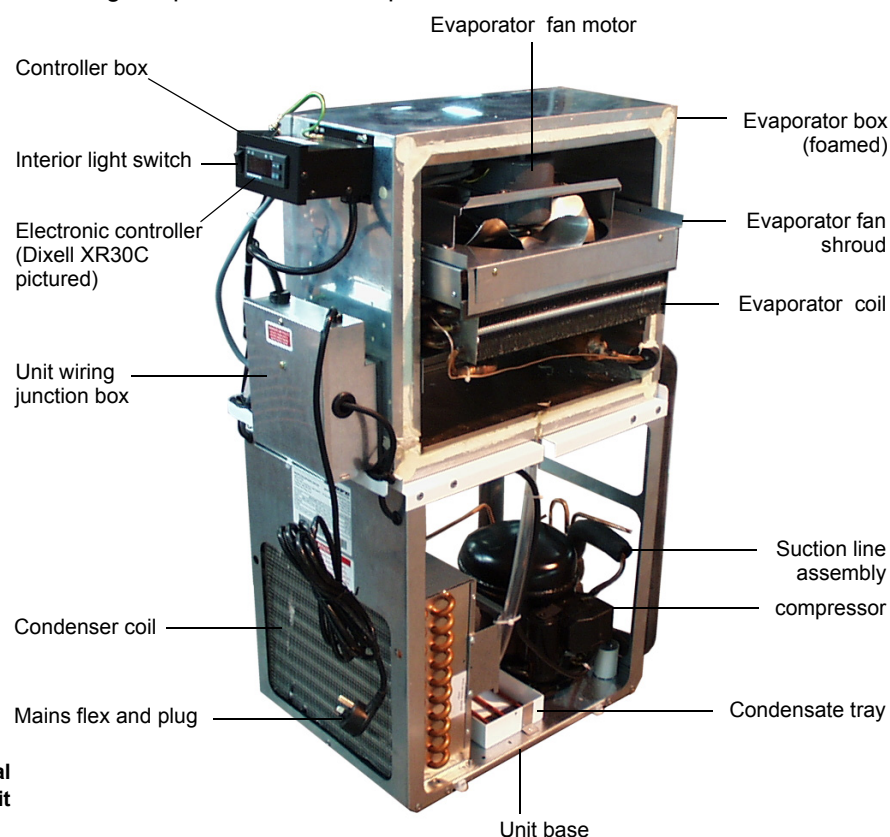


Figure 10: Integral refrigeration unit

Unit Front Cover To open the unit front cover: firstly undo the fixing screw at bottom of cover, then lift the cover up from the bottom and swing open.

To close the unit front cover: lift the cover up from the bottom and push firmly closed. Remember to refit the bottom fixing screw.

Unit Wiring Junction Box

The unit wiring junction box houses the cabinet fuse, and all the refrigeration unit electrics. The unit wiring junction box clips onto the front of the refrigeration unit, and can be accessed by opening the unit front cover (see above).

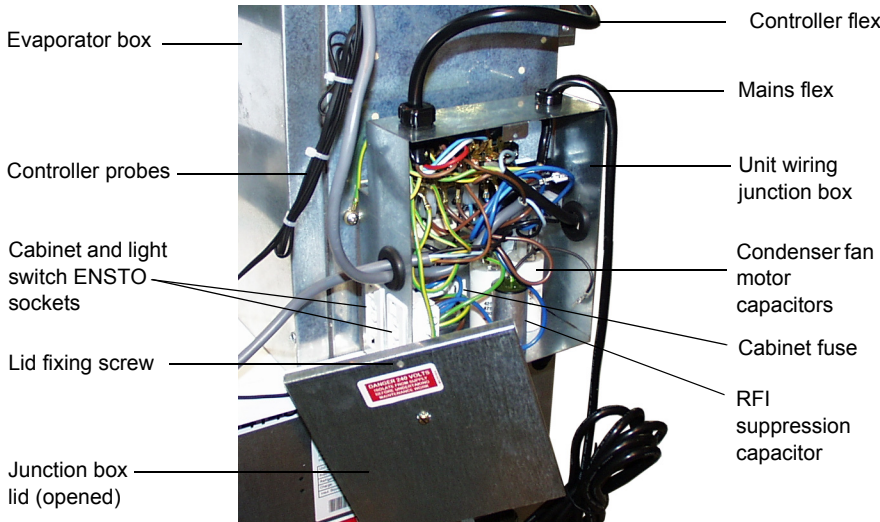


Figure 11: Integral refrigeration unit wiring junction box

Refrigeration Unit Removal

To remove the refrigeration unit from cabinet

1. Disconnect the cabinet from the mains power supply.
2. Open the unit front cover (see previous page).
3. Remove screws holding the unit front cover bottom hinge.
4. Remove bottom hinge and unit front cover.
5. Disconnect the cabinet and light switch ENSTO plugs.
6. Lift the unit wiring junction box off the two keyhole fixing screws on the evaporator box. This will allow access to the evaporator bracket front locating screw, behind the unit wiring junction box.
7. Remove front locating screw on the evaporator bracket, and pull bracket forward to disengage from the refrigeration unit (see Figure 12 below).
8. Carefully slide evaporator box across, away from the cabinet, until entire evaporator is visible and then slide unit forward.
9. Do not remove the rear bracket.
10. Refitting of the refrigeration unit is a reversal of the above procedure. Ensure to reconnect the unit wiring junction box to the front of the refrigeration unit.



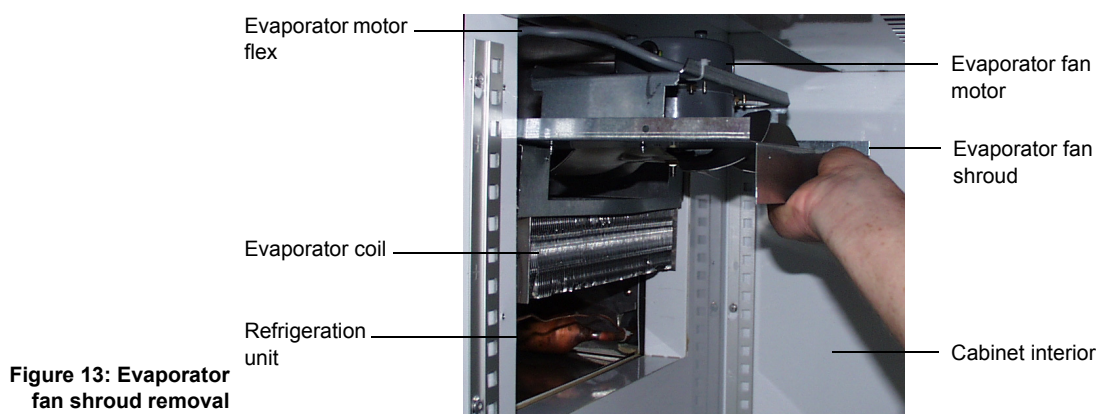
Figure 12: Evaporator bracket

Evaporator Fan Replacement

The evaporator fan can be accessed from inside the cabinet, or by removing the refrigeration unit.

To replace the evaporator fan via the cabinet

1. Disconnect the cabinet from the mains power supply.
2. Open unit front cover (see 'Unit front cover' page 23), and disconnect evaporator motor flex from unit wiring junction box.
3. Remove the duct transition from inside the cabinet, by removing five screws.
4. Undo the screws holding evaporator fan shroud in place.
5. Pull the fan shroud out from the unit, and pull the flex through the evaporator box (see Figure 13 below).
6. Replace fan motor, and re-assemble.
7. To reassemble, reverse steps above.



Recommended Service Procedures

SKOPE recommend the SKOPE Cyclone® demountability and exchangeability philosophy, which in essence means:

The customer must not be inconvenienced during system maintenance.

In the unlikely event of Refrigeration failure, an exchange unit is simply swapped in a matter of minutes. There is no cabinet down time or unloading product. In one short visit, the customer's inconvenience ends. The faulty Cyclone® is then removed to the workshop for repair as time allows.

For a suspected refrigerant problem

Disconnect the evaporator fan motor and with the system running, a 'frost line' will become obvious (after approximately 5 minutes): Entire evaporator, accumulator, and suction line right up to compressor must be frosting. Compressor at suction inlet will sweat.

If these conditions are not met, the system is faulty, either short of refrigerant, compressor not pumping efficiently, or capillary restriction. The system must then be opened (see Refrigerant R134a Handling Precautions section) and gauges temporarily fitted (i.e. either temporarily fit line piercing valves, or braze in service lines).

Short of refrigerant

Where the frosting effect is shorter than required (unless all refrigerant is lost, where there is no frosting effect). Only a small amount of refrigerant will exit the system. A leak test (refrigerant / dry nitrogen mix, up to 250 psig) should be performed to locate the leak. If no leak is found, a pressure test should be performed (dry nitrogen only, up to 250 psig) if there is no pressure drop over 24 hours, the fault should be treated as a capillary restriction.

Compressor not pumping efficiently

Where the frosting effect is not as cold as it should be. Symptoms include: compressor body hotter than normal, condenser cooler than normal, and the compressor may make an unusual hissing sound. All of these symptoms depend on the severity of the problem.

The only way to prove a pumping problem is to perform a compressor pump-down test: braze closed compressor suction line, open discharge line; then run the compressor to pull a vacuum on a vacuum gauge.

The compressor should pull down to approximately 30" Hg (inches of mercury) or 101 kPa vacuum, then turn the compressor off and this vacuum must be held without any loss for 5 minutes. If the Compressor does not pass these tests; it is not pumping efficiently and must be replaced.

There are different methods to proving pumping efficiency. If the test is performed with a system charged with refrigerant, a deep vacuum will not be achieved.

Capillary restriction

With a totally blocked capillary, there will be no refrigeration effect. A partially blocked capillary may have similar symptoms to a system being short of refrigerant. Flush a restricted capillary with dry nitrogen. If the capillary will not clear, it must be replaced.

After the repair, the drier must be replaced. The Cyclone® must be fully evacuated and charged to the volume of refrigerant indicated on the Cyclone® serial/rating label. All service lines must be purged.

Finally, pinch-off the gauge process lines (or remove line piercing valves) and braze the system closed. SKOPE recommend against leaving service valves in the system as these are prone to leak (and are open to abuse). Perform a final system leak test.

Refrigerant R134a handling precautions

It is important to maintain dedicated HFC service equipment and parts

- Refrigeration gauges
- Service lines / Fittings
- Vacuum Pump
- Charging equipment
- Driers
- Compressors
- Temperature / Pressure chart

HFC (R134a) refrigeration systems require special service procedures because of the highly hygroscopic (moisture sensitive) polyolester (POE) compressor oil:

- The system (especially compressor) must only be open for the very minimum time (to prevent moisture ingress). All parts required for servicing must be at hand - before the system is opened, and there should be no interruption until the system is on the vacuum pump (or hermetically sealed).
- The system must not be open for longer than 20 minutes maximum.
- The drier must be replaced every time the system is opened.
- Clean work practices are essential.
- SKOPE recommend brazing the system closed after service, as valves are prone to leak due to the nature of R134a.
- Every time the refrigeration system is opened, the drier MUST be replaced.

Electronic Controller

The electronic controller is located within a metal enclosure attached to the front of the refrigeration unit. Follow the steps below to access the electronic controller.

Depending on the date of manufacture, the chiller will be fitted with either a SKOPE customised CAREL ir33 controller or a SKOPE customised Dixell XR30C controller (see Figure 1 and 2 on page 10). Check the label on top of the controller to verify the controller type.

Variations All SKOPE chillers previously manufactured with a SKOPE customised Dixell XR30C controller will now use the SKOPE customised CAREL ir33 controller. Failed SKOPE customised Dixell XR30C controllers will be replaced with SKOPE customised CAREL ir33. Dixell and CAREL components are not interchangeable, all necessary replacement components are supplied in a replacement kit when ordered as a spare part.

Spare Parts When replacing a SKOPE customised Dixell controller, order the changeover kit: JC21/K01-SP1-49; when replacing a SKOPE CAREL ir33 controller order a standalone controller: ELZ3333AP-173, or the replacement controller assembly: JC2102/K01-173-49.

Part Description	Part Number
SKOPE CAREL Controller Changeover (service kit for replacement of Dixell controller)	JC21/K01-SP1-49
SKOPE CAREL Controller Assembly (including flexible cord and probes)	JC2102/K01-173-49
SKOPE CAREL ir33 Controller (controller only)	ELZ3333AP-173

Diagnostics If the SKOPE electronic controller has a suspected fault, care must be taken to ensure accurate diagnosis. The controller has various programmable parameters that effect operation such as time delay and defrost modes. Any suspected failure must be double checked. Confirm all wiring and terminations are correct. Check that the probe resistance is correct and replace any faulty components. If operation appears erratic, check the controller programming.

To access and remove the electronic controller

1. Disconnect the cabinet from the power supply.
2. Open the unit front cover (see page 47).
3. Unscrew and remove the controller box cover from the front of refrigeration unit.
4. Release the controller fixing clips, each side of the controller.
5. Disconnect the wires from the back of controller.
6. The controller can now be removed from the housing.
7. Fitting the controller is a reversal of these instructions.

CARELController Termination

Refer to the diagram below for controller termination information.

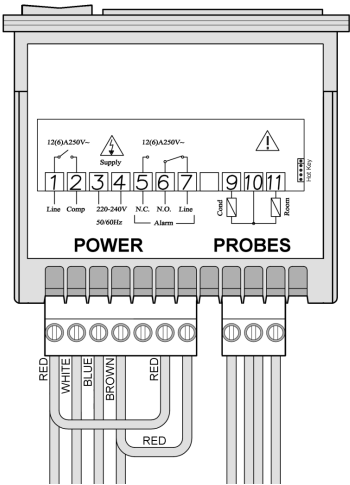


Figure 14: Dixel XR30C electronic controller termination

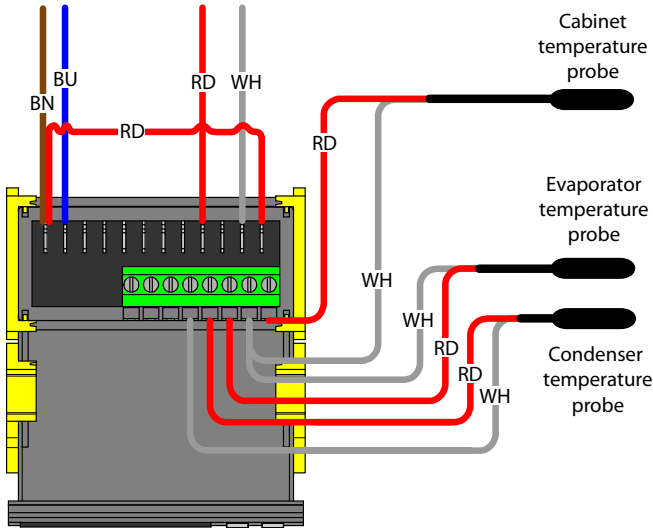


Figure 15: CAREL ir33 electronic controller termination

Probe Resistance		Dixel XR30C	
		Temperature	Resistance*
		-10°C	42.5 Ω
		-5°C	34.0 Ω
		0°C	27.3 Ω
		5°C	22.1 Ω
		10°C	18.0 Ω
		20°C	12.1 Ω
		30°C	8.3 Ω
		40°C	5.8 Ω
		50°C	4.2 Ω

* Tolerance ± 2.4%

CAREL ir33 Probe Resistance

**Table of temperature-resistance values for
NTC sensor 10K@25°C β 3435**

Temp.	Resistance value		
	Max.	Typical	Min.
°C	K Ω	K Ω	K Ω
-50	344,60	329,50	314,90
-49	325,00	310,90	297,30
-48	306,60	293,50	280,90
-47	289,40	277,20	265,40
-46	273,40	262,00	251,00
-45	258,30	247,70	237,40
-44	244,20	234,30	224,70
-43	231,00	221,70	212,80
-42	218,60	209,90	201,60
-41	207,00	198,90	191,00
-40	196,00	188,50	181,10
-39	185,50	178,50	171,60
-38	175,60	169,00	162,60
-37	166,30	160,20	154,20
-36	157,60	151,90	146,30
-35	149,40	144,10	138,80
-34	141,70	136,70	131,80
-33	134,50	129,80	125,20
-32	127,70	123,30	119,00
-31	121,20	117,10	113,10
-30	115,20	111,30	107,50
-29	109,40	105,70	102,20
-28	103,90	100,50	97,20
-27	98,68	95,52	92,45
-26	93,80	90,84	87,97
-25	89,20	86,43	83,73
-24	84,85	82,26	79,74
-23	80,76	78,33	75,96
-22	76,89	74,61	72,39
-21	73,23	71,10	69,01
-20	69,77	67,77	65,82
-19	66,44	64,57	62,74
-18	63,30	61,54	59,83
-17	60,32	58,68	57,07
-16	57,51	55,97	54,46
-15	54,85	53,41	51,99
-14	52,33	50,98	49,65
-13	49,95	48,68	47,43
-12	47,69	46,50	45,32
-11	45,55	44,43	43,33
-10	43,52	42,47	41,43
-9	41,55	40,57	39,60
-8	39,69	38,77	37,86
-7	37,92	37,06	36,21
-6	36,25	35,44	34,64
-5	34,66	33,90	33,15
-4	33,15	32,44	31,73
-3	31,72	31,05	30,39
-2	30,36	29,73	29,11
-1	29,06	28,48	27,89
0	27,83	27,28	26,74

Temp.	Resistance value		
	Max.	Typical	Min.
°C	K Ω	K Ω	K Ω
1	26,65	26,13	25,62
2	25,52	25,03	24,55
3	24,44	23,99	23,54
4	23,42	23,00	22,57
5	22,45	22,05	21,66
6	21,53	21,15	20,78
7	20,64	20,30	19,95
8	19,81	19,48	19,15
9	19,01	18,70	18,39
10	18,25	17,96	17,67
11	17,51	17,24	16,97
12	16,81	16,56	16,30
13	16,14	15,90	15,67
14	15,50	15,28	15,06
15	14,89	14,69	14,48
16	14,31	14,12	13,92
17	13,75	13,58	13,39
18	13,22	13,06	12,89
19	12,72	12,56	12,40
20	12,24	12,09	11,94
21	11,77	11,63	11,50
22	11,32	11,20	11,07
23	10,90	10,78	10,66
24	10,49	10,38	10,27
25	10,10	10,00	9,90
26	9,73	9,63	9,53
27	9,38	9,28	9,18
28	9,04	8,94	8,84
29	8,72	8,62	8,52
30	8,41	8,31	8,21
31	8,11	8,01	7,92
32	7,83	7,73	7,63
33	7,55	7,45	7,36
34	7,29	7,19	7,10
35	7,04	6,94	6,85
36	6,79	6,70	6,61
37	6,56	6,47	6,37
38	6,34	6,25	6,15
39	6,12	6,03	5,94
40	5,92	5,83	5,74
41	5,72	5,63	5,54
42	5,53	5,44	5,35
43	5,34	5,26	5,17
44	5,17	5,08	4,99
45	5,00	4,91	4,83
46	4,83	4,75	4,67
47	4,68	4,59	4,51
48	4,52	4,44	4,36
49	4,38	4,30	4,22
50	4,24	4,16	4,08
51	4,10	4,03	3,95
52	3,97	3,90	3,82
53	3,85	3,77	3,70
54	3,73	3,65	3,58
55	3,61	3,54	3,46

Temp.	Resistance value		
	Max.	Typical	Min.
°C	K Ω	K Ω	K Ω
56	3,50	3,43	3,35
57	3,39	3,32	3,25
58	3,28	3,22	3,15
59	3,18	3,12	3,05
60	3,09	3,02	2,95
61	2,99	2,93	2,86
62	2,90	2,84	2,77
63	2,82	2,75	2,69
64	2,73	2,67	2,61
65	2,65	2,59	2,53
66	2,57	2,51	2,45
67	2,50	2,44	2,38
68	2,42	2,36	2,31
69	2,35	2,30	2,24
70	2,28	2,23	2,17
71	2,22	2,16	2,11
72	2,15	2,10	2,05
73	2,09	2,04	1,99
74	2,03	1,98	1,93
75	1,98	1,92	1,87
76	1,92	1,87	1,82
77	1,87	1,82	1,77
78	1,81	1,77	1,72
79	1,76	1,72	1,67
80	1,72	1,67	1,62
81	1,67	1,62	1,58
82	1,62	1,58	1,53
83	1,58	1,53	1,49
84	1,54	1,49	1,45
85	1,49	1,45	1,41
86	1,45	1,41	1,37
87	1,42	1,37	1,33
88	1,38	1,34	1,30
89	1,34	1,30	1,26
90	1,31	1,27	1,23
91	1,27	1,23	1,19
92	1,24	1,20	1,16
93	1,21	1,17	1,13
94	1,17	1,14	1,10
95	1,14	1,11	1,07
96	1,12	1,08	1,04
97	1,09	1,05	1,02
98	1,06	1,02	0,99
99	1,03	1,00	0,97
100	1,01	0,97	0,94
101	0,98	0,95	0,92
102	0,96	0,92	0,89
103	0,93	0,90	0,87
104	0,91	0,88	0,85
105	0,89	0,86	0,83
106	0,87	0,84	0,81
107	0,84	0,82	0,79
108	0,82	0,80	0,77
109	0,80	0,78	0,75
110	0,79	0,76	0,73

6 Maintenance

Cleaning

Ensure the cabinet is disconnected from the power supply before cleaning.

Cabinet When necessary, wash both interior and exterior of cabinet with soapy water. Ensure the machine is disconnected from the mains power supply before washing the cabinet. Exterior of cabinet may be waxed with automobile polish for extra protection.

Do not wipe the sealant off the swing door gaskets, as the sealant ensures the door gaskets form a good seal with the cabinet.

Condenser Coil Integral cabinets only. The condenser coil should be brushed clean once a month, and blown clean by qualified service personnel, every six months. The condenser coil is located inside the refrigeration unit compartment.

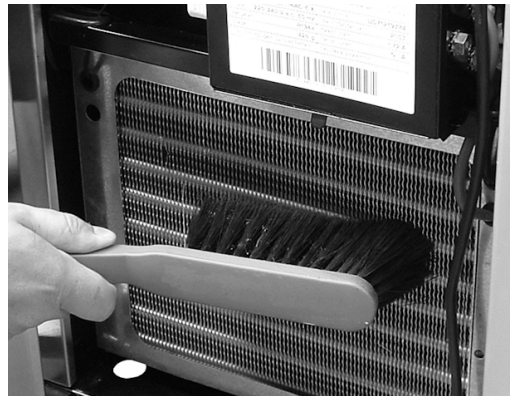
WARNING

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

To clean the condenser coil

1. Disconnect the cabinet from the power supply.
2. Open the unit front cover: firstly undo the fixing screw at bottom of cover, then lift the cover up from the bottom and swing open.

3. Clean the condenser coil with a soft brush.



4. Close the unit front cover: by lifting the cover up from the bottom and pushing firmly closed. Remember to refit the bottom fixing screw.
-

7 Troubleshooting

Diagnostic Table

For questions about the electronic controller, see page 10. For problems with the cabinet and refrigeration cassette, use the following table.

Cabinet

Problem	Possible Cause	Suggestions
Cabinet not operating No controller display	<ul style="list-style-type: none"> • Loss of power supply 	<ul style="list-style-type: none"> • Check mains power supply.
Interior light not on	<ul style="list-style-type: none"> • Light switched off • Failed light tube • Blown cabinet fuse 	<ul style="list-style-type: none"> • Switch on at controller faceplate. • Replace light tube (see page 41). • Replace fuse.
Power consumption is higher than expected	<ul style="list-style-type: none"> • Unit operating too hot • Cabinet doors are opened excessively • Unit and/or door seals compromised 	<ul style="list-style-type: none"> • Clean the condenser coil (see page 54). • Ensure the cabinet has good ventilation around the refrigeration unit. • Ensure the cabinet is in a cool spot. • Ensure doors are closed more often. • Check unit and door seals and service as necessary.
Product is too warm	<ul style="list-style-type: none"> • Restricted airflow to cabinet 	<ul style="list-style-type: none"> • Ensure product is not blocking airflow slots. • Ensure there is space around individual product pieces.
Warm cabinet temperatures Compressor operating for long periods (more than 1 hour)	<ul style="list-style-type: none"> • Blocked condenser • Poor ventilation around refrigeration unit • Unit and/or door seals compromised 	<ul style="list-style-type: none"> • Clean the condenser coil (see page 54). • Ensure the cabinet has good ventilation around the refrigeration unit. • Check unit and door seals and service as necessary.

Refrigeration unit

Problem	Possible Cause	Suggestions
Compressor will not start: no hum.	<ul style="list-style-type: none"> • Loss of power supply • Overload protector tripped. • Wiring improper, or loose. 	<ul style="list-style-type: none"> • Replace fuse. Check reason. • Repair or replace control. • Check wiring against diagram (see page 27).
	<ul style="list-style-type: none"> • Faulty contactor 	<ul style="list-style-type: none"> • Check and if necessary replace contactor.

Continued over page

Problem	Possible Cause	Suggestions
Compressor will not start: hums but trips on overload protector.	<ul style="list-style-type: none"> • Improperly wired. • Low voltage to unit. • Start capacitor defective on CSIR or CSR motor. • Run capacitor defective on PSC motor. • Relay failing to close. • Compressor motor has a winding open or shorted. • Internal mechanical trouble in compressor. 	<ul style="list-style-type: none"> • Check wiring against diagram (see page 27). • Determine reason and correct. • Determine reason and replace. • Determine reason and replace. • Determine reason and correct. Replace if necessary. • Check resistance values. Replace compressor if necessary. • Replace compressor.
Compressor starts, but does not switch off.	<ul style="list-style-type: none"> • Improperly wired. • Low voltage to unit. • Relay failing to open, due to welded contacts or relay incorrectly mounted. • Run capacitor defective on CSR motor. • Excessively high discharge pressure. • Compressor motor has winding open or shorted. Check continuity and resistance. • Internal mechanical trouble in compressor (tight). May be lubrication. 	<ul style="list-style-type: none"> • Check wiring against diagram (see page 27). • Determine reason and correct. • Determine reason and correct. Replace if necessary. • Determine reason and replace. • Clean condenser. Check power input Watts. Possible overcharge, insufficient condenser cooling, or non-condensable gasses. • Replace compressor if faulty. • Replace compressor.
Compressor starts and runs, but short cycles on overload protector (relay may chatter on RSIR, CSIR and CSR motors).	<ul style="list-style-type: none"> • Additional current passing through overload protector. • Low voltage to unit. • Overload protector defective. • Run capacitor defective on CSR motor. • Excessive discharge pressure. • Suction pressure too high. • Compressor too hot - insufficient suction gas cooling. • Compressor motor has a winding shorted. 	<ul style="list-style-type: none"> • Check wiring diagram. Check for added fan motors etc., connected to wrong side of protector. • Determine reason and correct. • Check current, replace protector. • Determine reason and replace. • Check condenser, check ventilation, check for restrictions in refrigeration system. • Check for possibility of misapplication. • Check refrigerant charge (fix leak), add if necessary. Check return vapour temperature and suction superheat. • Replace compressor.
Unit runs OK, but short cycles.	<ul style="list-style-type: none"> • Overload protector. • Electronic controller not operating correctly • Incorrect refrigerant charge. 	<ul style="list-style-type: none"> • See section above. • Diagnose fault with controller and service as necessary (see page 10). • Adjust refrigerant charge.

Continued over page

Problem	Possible Cause	Suggestions
Unit operates long or continuously. Unsatisfactory cabinet temperature.	• Short of refrigerant.	• Fix leak, and add charge.
	• Overcharge of refrigerant.	• Remove refrigerant to correct charge.
	• Chiller has excessive load.	• Establish load within limits.
	• Evaporator coil iced.	• Defrost evaporator. Check evaporator probe. Check refrigeration, Check thermostat. Check elements. Check door closing, seals etc.
	• Electronic controller not operating correctly	• Diagnose fault with controller and service as necessary (see page 10).
	• Restriction in refrigeration system	• Determine location and clear restriction. Flush with dry nitrogen. Replace component if blockage will not clear.
	• Dirty condenser	• Clean condenser. Advise client how to regularly clean condenser.
	• Inadequate air circulation	• Internal: Improve air movement, allow airflow around stock. External: Remove any restrictions to condensing ventilation.
	• Compressor not pumping efficiently	• Replace compressor.
	• Filter dirty (if applicable)	• Clean or replace.
	• Faulty fan motor	• Check rotation. Replace if necessary.
	• Electronic controller not operating correctly	• Diagnose fault with controller and service as necessary (see page 10).
Start capacitor open, shorted or blown.	<ul style="list-style-type: none"> • Relay contact not opening properly. • Prolonged operation on start cycle due to: <ul style="list-style-type: none"> (a) Low voltage to unit. (b) Improper relay. • Excessive short cycling. • Improper capacitor. 	<ul style="list-style-type: none"> • Clean contacts, or replace relay if necessary. • (a) Determine reason and correct. • (b) Replace relay. • Determine reason for short cycling, and correct. • Determine correct size and replace.
Relay defective or burned out.	<ul style="list-style-type: none"> • Incorrect relay. • Line voltage too high or too low. • Excessive short cycling. • Relay being influenced by loose vibrating mount. 	<ul style="list-style-type: none"> • Check and replace. • Determine reason and correct. • Determine reason, and correct. • Remount rigidly.
Suction line frosted.	<ul style="list-style-type: none"> • Evaporator fan not running • Overcharge of refrigerant capillary systems 	<ul style="list-style-type: none"> • Determine reason and correct • Correct charge
Unit noisy.	<ul style="list-style-type: none"> • Loose parts or mountings • Tubing rattle • Bent fan blade causing vibration • Fan motor bearing worn 	<ul style="list-style-type: none"> • Find and tighten • Reform to be free of contact • Replace fan • Replace fan

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