

SL295

SKOPE Speed Lane Cooler



SL295
SKOPE Speed Lane Cabinet
Service Manual

MAN1555
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1 Specifications

SL295

Cabinet

| <i>Construction</i> | | |
|--------------------------------------|--|-----------------------------|
| Insulation: | 50mm thick, polyurethane foam Cyclo-iso Pentane blowing agent: C ₅ H ₁₀ /C ₅ H ₁₂ | |
| <i>Dimensions</i> | <i>External</i> | <i>Internal</i> |
| Height: | 1300mm | 750mm |
| Width: | 920mm | 770mm |
| Depth: | 710mm | 520mm |
| Floor area: (Inc. 50mm stand-off) | 0.65m ² | |
| Internal volume: | 295 litres | |
| Max operating temp: | Swing door 40°C | Sliding door 32°C |
| Cabinet temp. range: | +2°C to +4°C | |
| Door: | 2 x self-closing, double glazed, toughened safety glass doors | |
| Shelves: | 2 x adjustable height top shelves: 755mm x 363mm 1 x bottom shelf: 715mm x 363mm | |

Refrigeration Unit

| | |
|--|---|
| Bottom mounted SKOPE refrigeration unit with electronic controller | |
| Unit model: | S3020 |
| Compressor: | Danfoss SC18G |
| Controller: | Dixell xr30c (prior to Feb. 2009) or SKOPE Carel ir33 (from Feb. 2009) |
| Nominal capacity: | 860 Watts |
| Refrigerant: | R134a |
| Charge: | 370 grams |

Electrical

| | |
|-----------------|--|
| Supply: | 220-240 Volts a.c. 50 Hz, single phase supply |
| Total run Amps: | 5.2 Amps |
| Lighting: | 4 x 18 Watt T8 fluorescent tubes (Ø26mm x 588mm) Daylight 860 |

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. The preset temperature setting controls the internal air temperature between 1°C and 5°C. The electronic controller also signals temperature alarms (see page 11 & page 15), recording the minimum and maximum value reached at the time of the alarm.

The electronic controller is attached to the front of the refrigeration unit, behind the cabinet front panel.

Depending on the date of manufacture, the cabinet 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 cabinets 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 46).

See “Electronic Controller” on page 45 for service 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

Faceplate

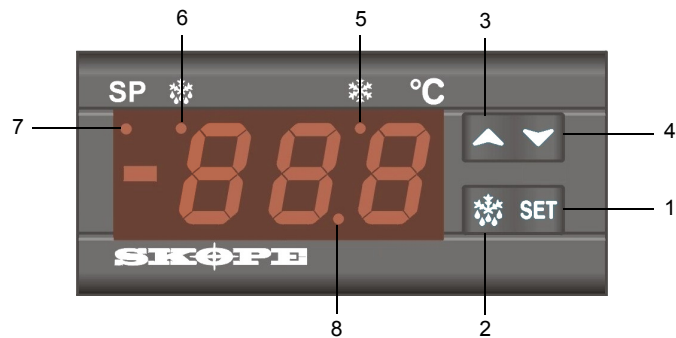


Figure 3: SKOPE Dixell XR30C Faceplate

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

Programming the Controller The controller keypad should 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.



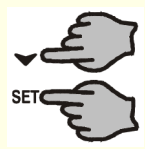
2. The value of the Set Point will be displayed, and the  LED will start blinking.
3. To change the Set value, push the **UP** or **DOWN** keys.
4. To memorise the new Set Point value, push the **SET** key again or wait 15 seconds.

How to start a manual defrost



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

How to change a parameter value



1. Enter the programming mode by pressing and holding both the **SET** and **DOWN** keys for 3 sec. (❄️ and ❄️ start flashing).

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







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

| Display | Parameters | | Range | Description of Parameter |
|-----------------------------|--------------|----------|------------------|---------------------------------|
| | Beverage 160 | Food 170 | | |
| 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 | |
| ALU | 12 | 7 | ALL to 150°C | Maximum temperature alarm |
| ALL | -2 | -2 | -50°C to ALU | Minimum temperature alarm |
| 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

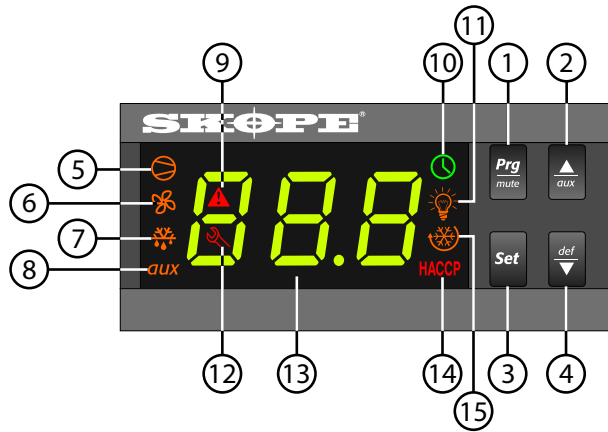


Figure 4: Electronic controller faceplate

| 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 | | Aux / 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 | <i>aux</i> | 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. |
| 14 | | HACCP: n.a. |
| 15 | | CONTINUOUS CYCLE: On when cabinet is running in continuous run mode. |

Cycles Defrost Cycle

To ensure efficient operation, the electronic controller forces a defrost cycle when required. During a defrost cycle, the compressor stops, **DEF** and the ❄️ will display on the electronic controller faceplate. The cabinet will resume normal operation once the defrost cycle has finished. A manual defrost can also be initiated by pressing and holding the $\frac{def}{\nabla}$ button.

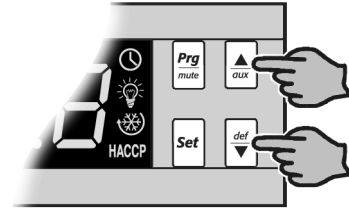
Continuous Cycle

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

To start a continuous cycle

1. While the cabinet is switched on and running, press and hold the $\frac{\triangle}{aux}$ and $\frac{def}{\nabla}$ buttons for five seconds.

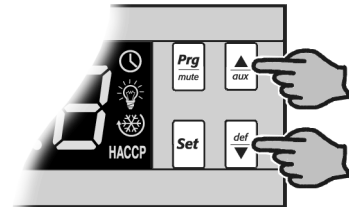
The ❄️ symbol will display during a continuous cycle.



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 $\frac{\triangle}{aux}$ and $\frac{def}{\nabla}$ buttons for five seconds.



Temperature Probes

Three temperature probes feed data to the electronic controller - the control, condenser and evaporator 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

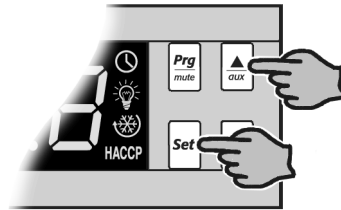
Used to determine defrost termination and evaporator fan activation. Located inside evaporator coil between fins at bottom of coil.

Temperature Probe Reading

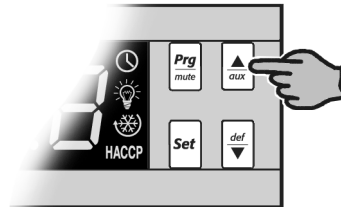
The temperature of each of the three temperature probes can be displayed by pressing and holding both the **Set** and $\frac{\blacktriangle}{aux}$ keys simultaneously for 5 seconds.

To display the temperature probe readings

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



2. Press and hold the $\frac{\blacktriangle}{aux}$ key to scroll the probes (see table below). The $\frac{\blacktriangledown}{def}$ 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).



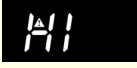











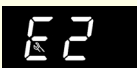


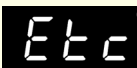







Temperature probe readings

| 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 cabinet 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 | |
|  |  Flashing | Refrigeration system high temperature pre-warning | <ol style="list-style-type: none"> 1. Clean the condenser coil (see page 40). 2. Check refrigeration ventilation. Ensure clear airpath at the top and front of the cabinet (to extract hot air). A minimum of 200mm clear space is required in front of the refrigeration unit. 3. Ensure the cabinet is installed in a suitable environment. 4. Unplug cabinet from the power supply for 1 minute, then reconnect to power supply. |
|  |  Flashing | Refrigeration system high temperature shutdown | |
|  |  Flashing | Control probe fault | <ol style="list-style-type: none"> 1. Check probe connection and wiring. 2. Check probe resistance. 3. Replace probe. |
|  |  Flashing | Evaporator probe fault | |
|  |  Flashing | Ambient probe fault | |
|  | None | Defrost over-time limit | <ol style="list-style-type: none"> 1. Check defrost elements are operating correctly. |
|  |  Flashing | Real-time clock fault | <ol style="list-style-type: none"> 1. Unplug cabinet from the power supply for 1 minute, then reconnect to power supply. 2. Replace controller. |
|  |  Flashing | Controller E prom error | |
|  |  Flashing | Controller E prom error | |
|  | None | Start defrost request | None |
|  | None | End defrost request | |

Programming Set-Point

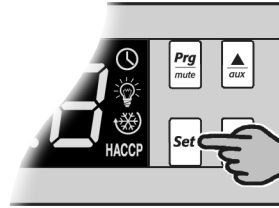
The cabinet is manufactured with a pre-set control temperature set-point. If this set-point does not match your required storage temperature it is recommended that you change the set-point accordingly. The set-point can be adjusted between a temperature range as detailed in the table below.

Temperature set-point

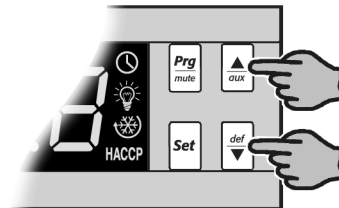
| Parameter set | Operational mode | Factory set-point | Adjsutable temperature range |
|---------------|------------------|-------------------|------------------------------|
| 160 | Standard | 2.0°C | 1.0°C to 3.5°C |

To view and adjust the temperature set-point

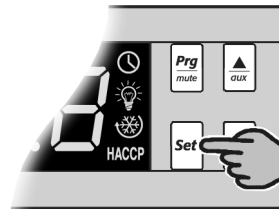
1. To view the set-point: press and hold the **Set** key for 2 seconds, until the set-point value flashes



2. To adjust the set-point: press either the $\frac{\triangle}{aux}$ and $\frac{def}{\nabla}$ 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.

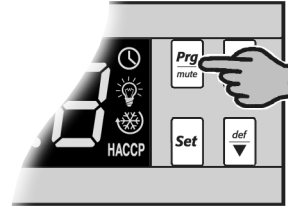


Controller Reset To delete program modifications and reset the controller to SKOPE default program or when a replacement controller is being fitted, a 'Controller Reset' must be performed.

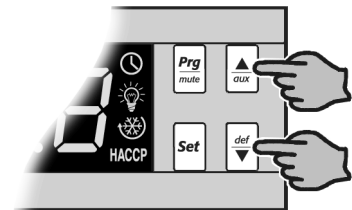
To reset the controller

1. Disconnect the cabinet from the power supply.

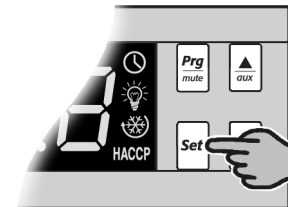
2. Press and hold the **Prg** mute key while plugging the cabinet into the power supply (this may require two people). After a few seconds the controller is reset and program mode '**bn0**' is displayed. The controller must never be left in program mode '**bn0**' as failure will occur.



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



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



Default Program Configuration

Factory Default Configuration of the controller 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 configuration number (e.g. 'Program 160').

BN Parameter Sets

Program 160 for the SL295 includes one parameter set (BN1).

BN set variations

| Parameter set | Operational mode |
|---------------|------------------|
| 160 BN1 | Standard |

Field Adjustable Programming

Within each 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

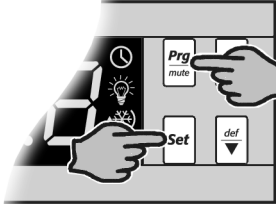
| Display | Icon | Group |
|---------|------|-------------|
| Pro | | Probe |
| Ctl | | Temperature |
| CMP | | Compressor |
| dEF | | Defrost |
| ALM | | Alarm |

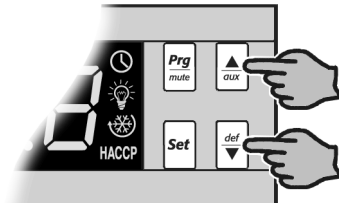
| Display | Icon | Group |
|---------|------------|-----------------|
| Fan | | Fan |
| CnF | <i>aux</i> | General |
| HcP | HACCP | HACCP |
| rtc | | Real time clock |

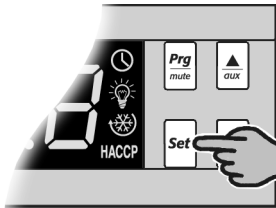
Changes to SKOPE factory default programs are not recommended.

To access Type C parameters

- 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.

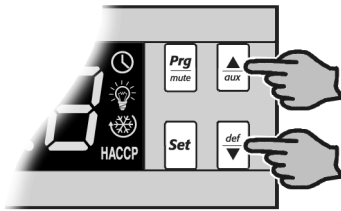

- Press the **aux** (up arrow) or **def** (down arrow) keys until displaying the password number '66'.


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

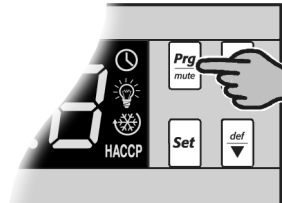


To modify 'Type C' parameters

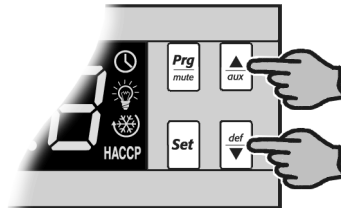
1. Press the $\frac{\blacktriangle}{aux}$ or $\frac{\blacktriangledown}{def}$ keys until reaching the parameter to be modified. When scrolling, an icon appears on the display representing the category the parameter belongs to.



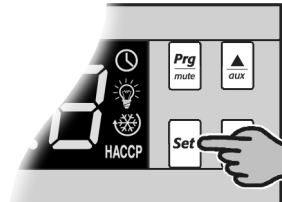
2. Alternatively, press the $\frac{Prg}{mute}$ key to display a menu that is used to quickly access the group of parameters to be modified (see table on previous page).



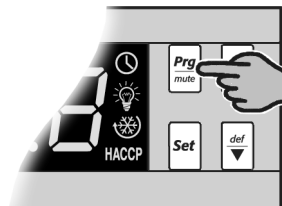
3. Scroll the menu with the $\frac{\blacktriangle}{aux}$ or $\frac{\blacktriangledown}{def}$ keys. The display shows the codes of the various categories of parameters.



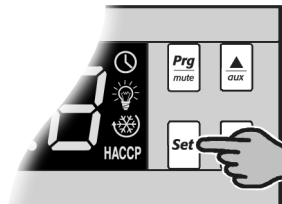
4. When having reached the desired category, press the **Set** key to move directly to the first parameter in the category.



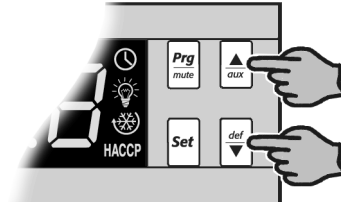
5. At this stage, continue to scroll the parameters or press the $\frac{Prg}{mute}$ key to return to the categories.



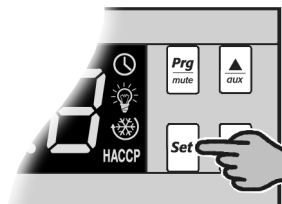
6. Press the **Set** key to display the value associated with the parameter.



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

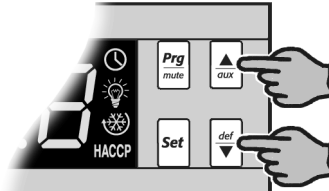


8. Press the **Set** key to temporarily save the new value and return to the display of the parameter code.

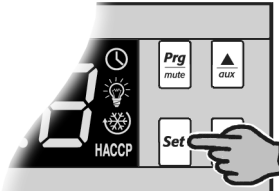


Continued over page

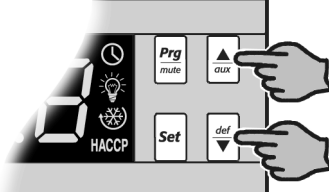
9. Repeat the operations from point 1 or point 2 on the previous page.



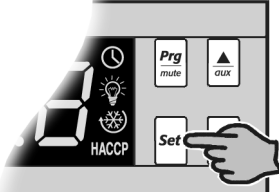
10. If the parameter has sub-parameters, press the **Set** key to display the first sub-parameter.



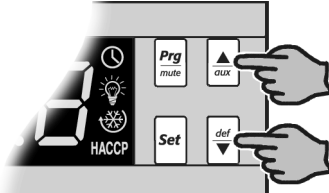
11. Press the $\frac{\text{aux}}{\uparrow}$ or $\frac{\text{def}}{\downarrow}$ keys to display all the sub-parameters.



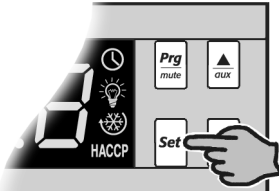
12. Press the **Set** key to display the associated value.



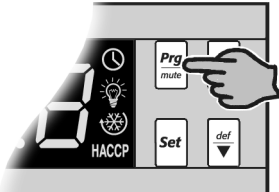
13. Increase or decrease the value using the $\frac{\text{aux}}{\uparrow}$ or $\frac{\text{def}}{\downarrow}$ keys respectively.



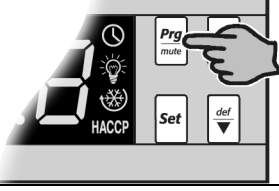
14. Press the **Set** key to temporarily save the new value and return to the display of the sub-parameter code.



15. Press the $\frac{\text{Prg}}{\text{mute}}$ key to return to the display of the parent parameter.



16. Press the $\frac{\text{Prg}}{\text{mute}}$ 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 factory parameter program. Refer to the table below for parameters included in this service manual. Refer to "Field Adjustable Programming" on page 18 for information on accessing and changing the parameters.

Parameter sets

| Program No. | Model | Page |
|-------------|----------------|------|
| P160-BN1 | Standard SL295 | 22 |

Program 485 BN1



Electronic Controller Parameter Sheet

160
Revision No. 1.1

Standard Mode
BN1

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

All Available Controller Parameter Sets for this Program
BN1 BN2

CPS1003-160
Last revised on
23 September 2011

| Display | Standard Mode Settings | | Access Level | Range | | Description of Parameter | BN0 |
|-----------------------------------|------------------------|---------|--------------|-------|-------|--|-----|
| | Min | Max | | Min | Max | | |
| 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 | 0 | °C | C | -20°C | 20°C | Calibration of probe 1 | 0 |
| Control Parameters | | | | | | | |
| St | 2 | °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 | 1 | °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 | 3 | 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 | 12 | °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 | | | | | | | |

Continued over page

Program 485 BN1 (continued)

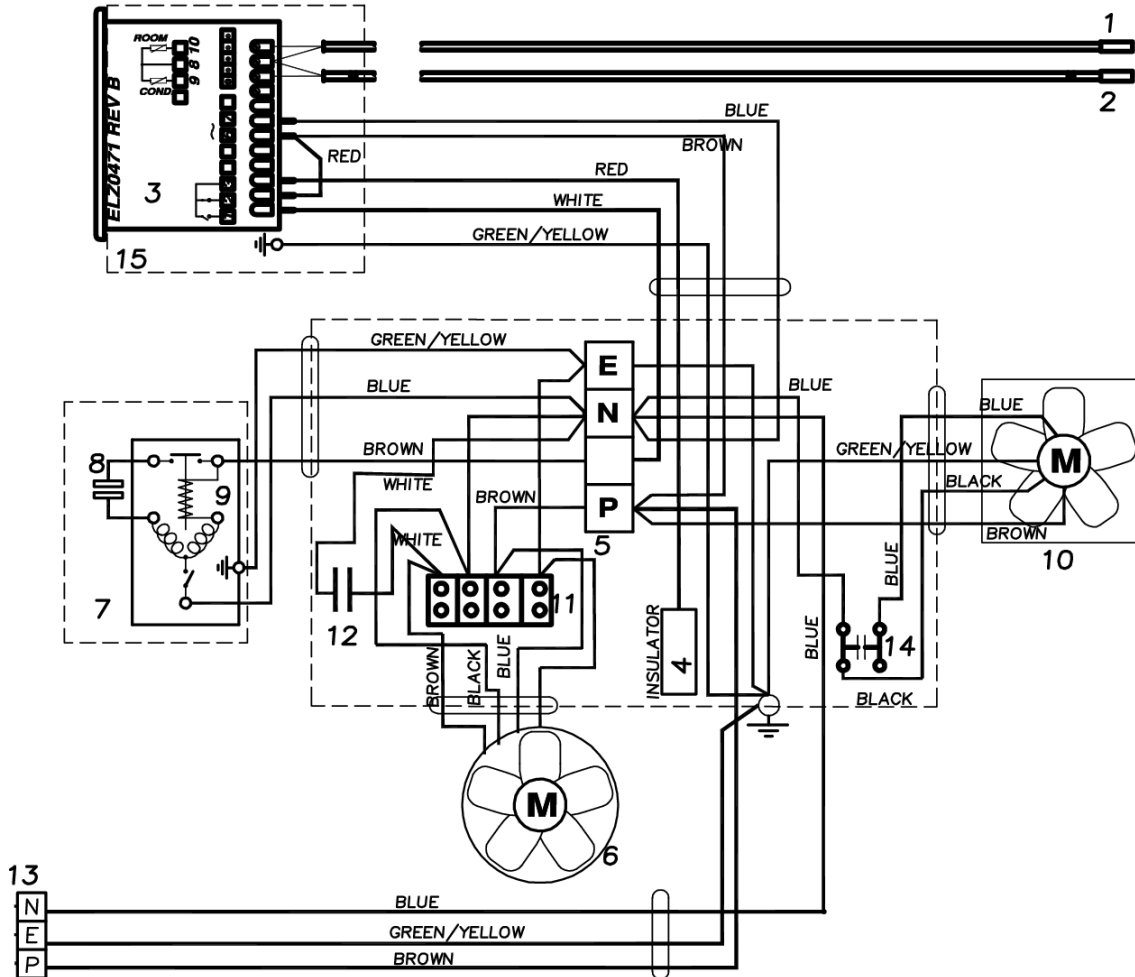
| Display | Standard Mode Settings | Access Level | Range | | Description of Parameter | BN0 |
|---------|---------------------------|-----------------|-------|-----|------------------------------|-----|
| | | | Min | Max | | |
| | | | | | Password Parameter (PS) = 66 | |

HACCP Recorded Parameters

| Warning: |
|--|
| <ol style="list-style-type: none"> 1. Confirm Program Mode, BNx number as other Program Modes are available and may be selected. 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. 3. Only make program modifications with reference to relevant Operating Manual. 4. This programming sheet is set exclusively for the SKOPE Refrigeration System with its dedicated Carel IR33 controller. 5. Any alteration from this program may adversely affect the SKOPE Refrigeration System operation. 6. Specification may update / change without notice. Please check with Skope Customer Service for latest version. |

3 Wiring

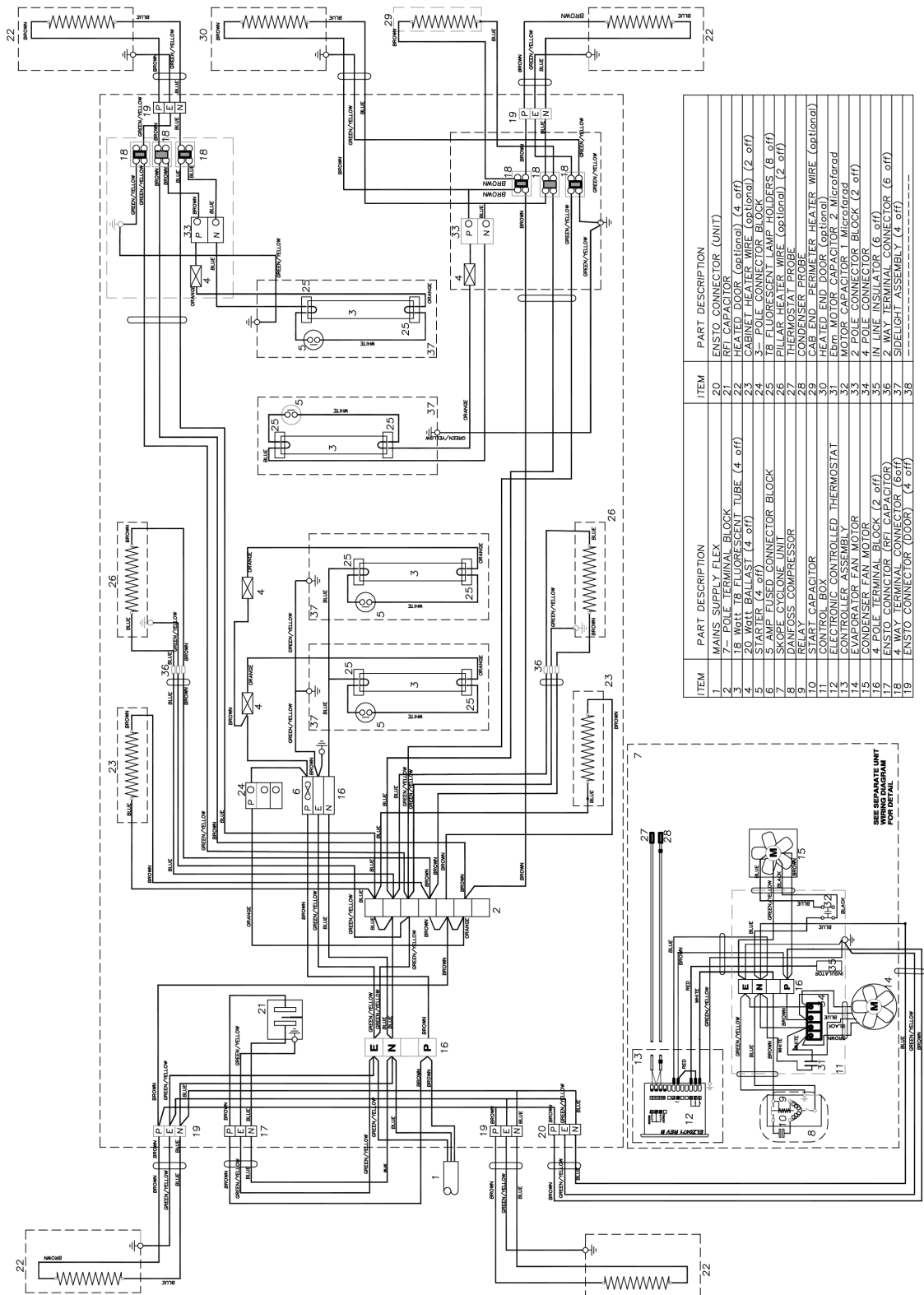
SL295 Refrigeration Unit (SKOPE Dixell XR30C controller)



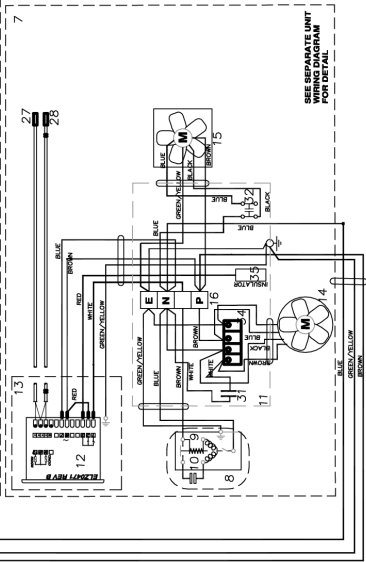
Unit Components

| No. | Description |
|-----|------------------------------------|
| 1 | Refrigeration Unit Assembly |
| 2 | Danfoss Compressor |
| 3 | Relay - Compressor |
| 4 | Start Capacitor - Compressor |
| 5 | Control Box Assembly |
| 6 | Carel ir33 Electronic Controller |
| 7 | Electronic Controller Assembly |
| 8 | Evaporator Fan Motor |
| 9 | Condenser Fan Motor |
| 10 | 4-Pole Terminal Block |
| 11 | Thermostat Probe |
| 12 | Condenser Probe (blue sleeve) |
| 13 | EBM Motor Capacitor (2 μ F) |
| 14 | Motor Capacitor (1 μ F) |
| 15 | Evaporator Coil Probe (red sleeve) |

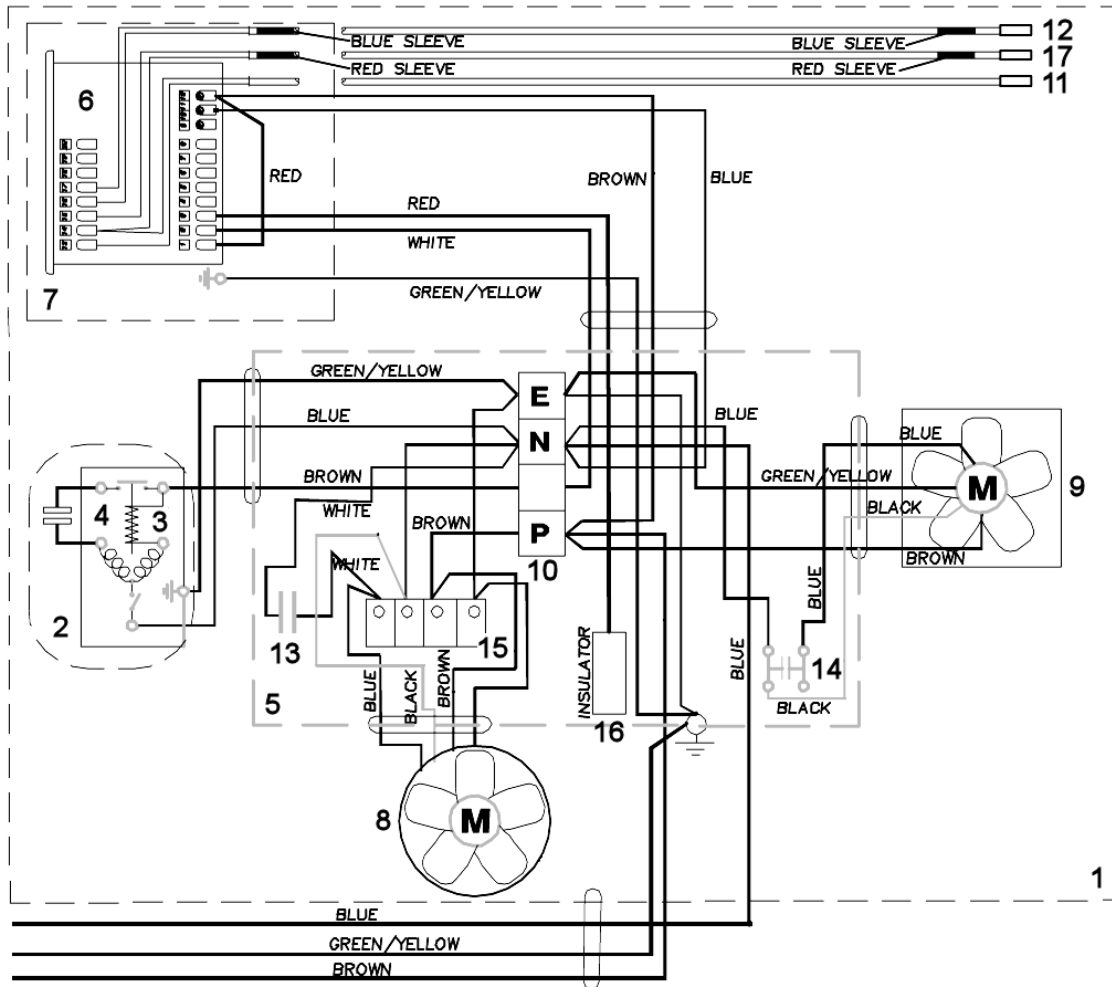
SL295 Cabinet (SKOPE Dixell XR30C controller)



| ITEM | PART DESCRIPTION | ITEM | PART DESCRIPTION |
|------|------------------------------------|------|--|
| 1 | MAINS SUPPLY FLEX | 20 | ENSTO CONNECTOR (UNIT) |
| 2 | 7- POLE TERMINAL BLOCK | 21 | RFI CAPACITOR |
| 3 | 18 Wgt. T8 FLUORESCENT TUBE (4 of) | 22 | HEATED DOOR (optional) (4 of) |
| 4 | 5 AMP FUSED CONNECTOR BLOCK | 23 | WIRE INSULATOR (optional) (2 of) |
| 5 | STARTER (4 of) | 24 | SAMPLE CONNECTOR BLOCK (optional) (2 of) |
| 6 | SKOPE CYCLONE UNIT | 25 | T8 FLUORESCENT LAMP HOLDERS (8 of) |
| 7 | DANFOSS COMPRESSOR | 26 | PILLAR HEATER WIRE (optional) (2 of) |
| 8 | CONDENSER FAN MOTOR | 27 | THERMOSTAT PROBE |
| 9 | SELECT CAPACITOR | 28 | CONDENSER PROBE |
| 10 | CONTROL BOX | 29 | HEATED END DOOR (optional) |
| 11 | ELECTRONIC CONTROLLED THERMOSTAT | 30 | FAN MOTOR CAPACITOR 2 Microtarad |
| 12 | CONTROLLER ASSEMBLY | 31 | MOTOR CAPACITOR 1 Microtarad |
| 13 | EVAPORATOR FAN MOTOR | 32 | POLE CONNECTOR BLOCK (2 of) |
| 14 | CONDENSER FAN MOTOR | 33 | IN LINE INSULATOR (6 of) |
| 15 | 4- POLE TERMINAL BLOCK (2 of) | 34 | ENSTO CONNECTOR (RFI CAPACITOR) |
| 16 | 4- WAY TERMINAL CONNECTOR (6 of) | 35 | 2 WAY TERMINAL CONNECTOR (4 of) |
| 17 | ENSTO CONNECTOR (RFI CAPACITOR) | 36 | 2 WAY TERMINAL CONNECTOR (6 of) |
| 18 | 4- WAY TERMINAL CONNECTOR (4 of) | 37 | SIDE LIGHT ASSEMBLY (4 of) |
| 19 | ENSTO CONNECTOR (DOOR) | 38 | ENSTO CONNECTOR (DOOR) |



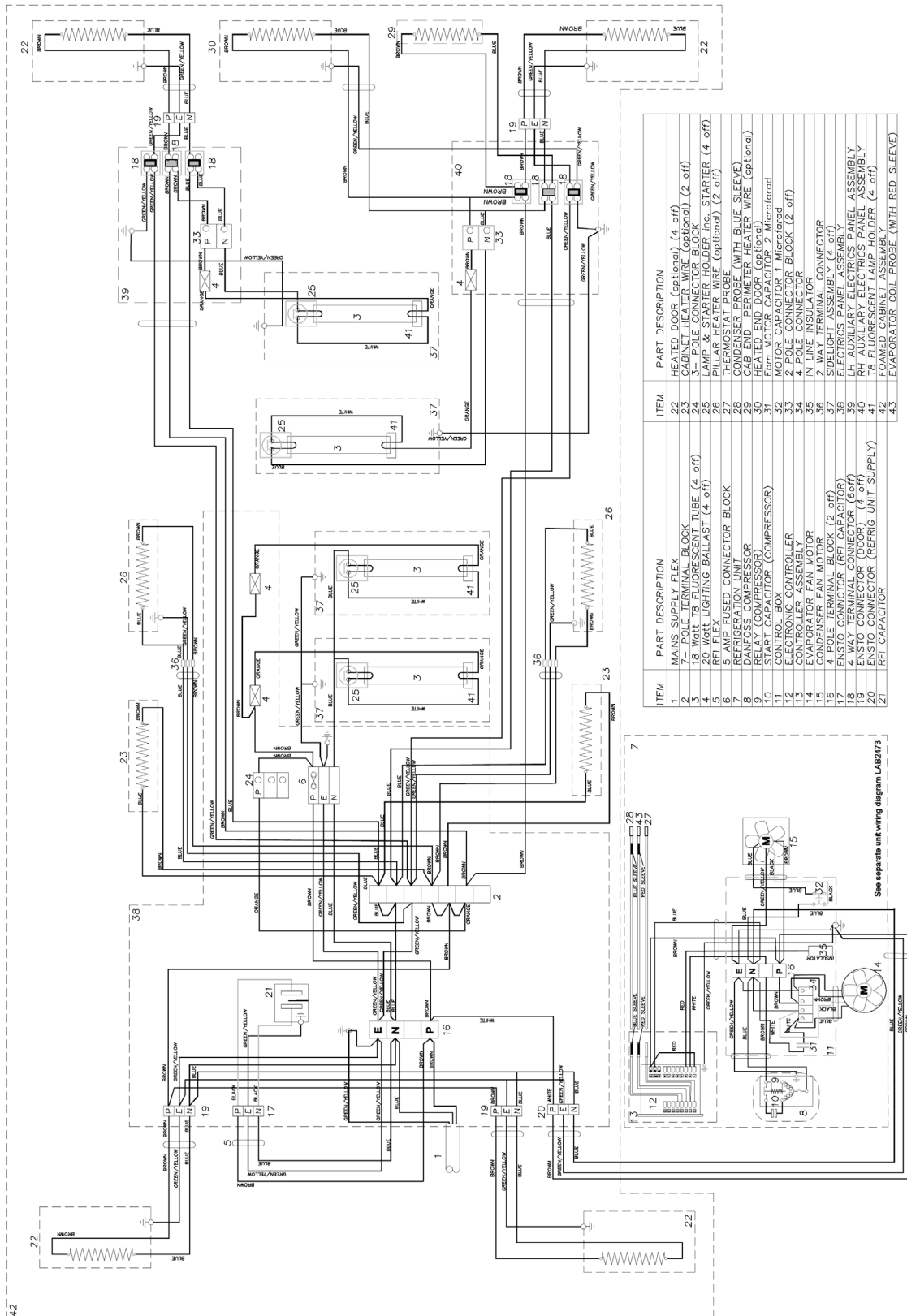
SL295 Refrigeration Unit (SKOPE Carel ir33 controller)



Unit Components

| No. | Description |
|-----|------------------------------------|
| 1 | Refrigeration Unit Assembly |
| 2 | Danfoss Compressor |
| 3 | Relay - Compressor |
| 4 | Start Capacitor - Compressor |
| 5 | Control Box Assembly |
| 6 | Carel ir33 Electronic Controller |
| 7 | Electronic Controller Assembly |
| 8 | Evaporator Fan Motor |
| 9 | Condenser Fan Motor |
| 10 | 4-Pole Terminal Block |
| 11 | Thermostat Probe |
| 12 | Condenser Probe (blue sleeve) |
| 13 | EBM Motor Capacitor (2 μ F) |
| 14 | Motor Capacitor (1 μ F) |
| 15 | 4-Pole Connector |
| 16 | In-Line Insulator |
| 17 | Evaporator Coil Probe (red sleeve) |

SL295 Cabinet (SKOPE Carel ir33 controller)



4 Spare Parts

Cabinet Assembly

| Description | SKOPE Part No. | Customer Part No. |
|------------------------------|----------------|-------------------|
| Cabinet Top (sliding door) | PAT9600 | |
| Cabinet Top (swing door) | PAT9601 | |
| Sliding Door Spring Adjuster | V4100/532 | |
| Sliding Door Track | S2000/538 | |
| Sliding Door Kick Panel | S3000/131 | |
| Dial Thermometer | V5000/95 | |
| Top Shelf | S3000/568 | |
| Shelf Bracket | V0973-99 | |
| Bottom Shelf | S3000/575 | |
| Merchandising Strip (650mm) | PLE6615-0650 | |
| Merchandising Strip (682mm) | PLE6615-0682 | |
| Filter Panel | S2000/C64 | |
| Filter (320mm x 282mm) | FIL9607 | |
| Bumper Strip | PLE9806 | |
| 50mm Wheel | SXX7520 | |

Note: When ordering painted items, quote the relevant colour or colour code.

Interior Light Assembly

| Description | SKOPE Part No. | Customer Part No. |
|-----------------------------|----------------|-------------------|
| Front Light Cover (830mm) | S3000/E71A | |
| Rear Light Cover (822.5mm) | S3000/E71B | |
| 18 Watt T8 Fluorescent Tube | ELL9387 | |
| T8 Lamp Holder | ELZ6270 | |
| T8 Lamp and Starter Holder | ELZ6271 | |
| Starter GEC ST111 | ELZ2840 | |

Cabinet Electrical Panel Assembly

| Description | SKOPE Part No. | Customer Part No. |
|-----------------------------|----------------|-------------------|
| Cabinet Electrical Panel | S3000/E76 | |
| ENSTO 3-Pole Panel Adaptor | PLM0497-3 | |
| RFI Capacitor | B3100/E65 | |
| 18 Watt Ballast | ELZ1039B2 | |
| Fused Connector Block | ELZ6461 | |
| Fuse Holder | ELZ6462NC | |
| Fuse Holder 2-Way Connector | ELZ6463NC | |
| 5 Amp Ceramic Fuse | ELZ9325 | |
| Mains Flex Assembly | V5000/E53 | |

Auxillary Electrical Panel Assembly

| Description | SKOPE Part No. | Customer Part No. |
|----------------------------|----------------|-------------------|
| Auxillary Electrical Panel | S2000/E42T | |
| 18 Watt Ballast | ELZ1039B2 | |

Sliding Door Assembly

| Description | SKOPE Part No. | Customer Part No. |
|---------------------------|----------------|-------------------|
| L/H Sliding Door Assembly | S3000/D23L | |
| R/H Sliding Door Assembly | S3000/D23R | |
| Door Roller | SXX7078 | |
| Top Spring Clip | V4100/535-99 | |
| Bottom Spring Clip | V4100/536-99 | |
| Door Tension Spring | SPR7115 | |
| Door Seal Gasket | RUE7122-1090 | |
| Door Wiper Seal | RUE3012 | |
| L/H Door 'SLIDE' Label | LAB7203L | |
| R/H Door 'SLIDE' Label | LAB7203R | |

Swing Door Assembly

| Description | SKOPE Part No. | Customer Part No. |
|-------------------------------|----------------|-------------------|
| L/H Swing Door Assembly | S3125/D01L | |
| R/H Swing Door Assembly | S3125/D01R | |
| Side Door Assembly | S3525/D01R | |
| Top Hinge (L/H & R/H doors) | S2000/122 | |
| Top Hinge (side door) | B3100/122 | |
| Bottom Hinge | B3100/388 | |
| Door Gasket (L/H & R/H doors) | GKT9776 | |
| Door Gasket (side door) | GKT9779 | |
| Vertical Thermal Break | S3000/765 | |
| Horizontal Thermal Break | S2000/766 | |
| Torsion Bar Assembly | REF5679 | |
| Capstan | TUR5100 | |
| Door Bush | PLM5075 | |

Refrigeration Unit Assembly

| Description | SKOPE Part No. | Customer Part No. |
|-----------------------------|----------------|-------------------|
| Refrigeration Unit Assembly | S3020D-160ZC | |
| Condenser Coil | CLS0149 | |
| Evaporator Coil | CLS8297 | |
| Drier | DRY8783 | |
| Compressor - Danfoss SC18G | CPR6109 | |
| Compressor Start Capacitor | ELC2369NC | |
| Compressor Relay | ELR6372NC | |
| Suction Line Assembly | S2000/378 | |
| Evaporator Fan Motor | ELM9614 | |
| Condenser Fan Motor | ELM9917 | |
| Condenser R/H Fan Blade | FAN7355 | |
| Condenser Fan Motor Bracket | S2000/235 | |
| Cond'r Fan Motor Capacitor | ELC9142NC | |

Electronic Controller Box Assembly

| Description | SKOPE Part No. | Customer Part No. |
|--|-----------------|-------------------|
| Electronic controller box assembly | S2060D/R80-160 | |
| Temperature probe (CAREL only) | UB80AA/E49C | |
| SKOPE CAREL Controller Changeover (service kit for replacement of Dixell controller) | UB40AAD/R80-SP1 | |
| SKOPE CAREL Controller Assembly (including flexible cord and probes) | UB40AAD/R80-160 | |
| SKOPE CAREL ir33 Controller (controller only) | ELZ3333AP-160 | |

5 Installation

Positioning the Cabinet

Cabinet Location The location of the cabinet may be the single most important decision that will extend its life and ensure economical, high performance. We recommend that you put the cabinet in the coolest place possible because it will use less power and last longer.

Allow adequate space for the doors to open and close properly. Ensure the cabinet sits on a level surface so that the door shuts and correctly seals. Level footing also prevents the condensate tray from overflowing.

Ventilation For efficient operation of the cabinet, adequate clearance must be maintained for ventilation. The condenser grill requires space for ventilation and access.

The maximum recommended operating ambient temperature is 40°C for four swing door models (4SW), and 32°C for four sliding door models (4SL).

Power Cord The cabinet has a flexible power cord fitted with a 3-pin plug, which exits the rear of the cabinet at floor level. Pull the power cord around so that it's not trapped before you position the cabinet.

Shelves

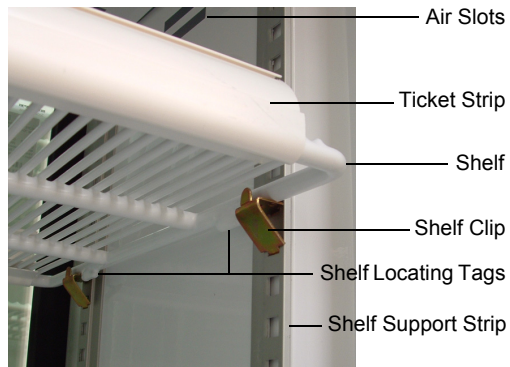
The SKOPE SL295 Speed Lane Cabinet has three cabinet shelves. The narrow shelf sits on the floor of the cabinet while the two wider shelves may be positioned at different heights to suit various products. The wider shelves are held in place with four shelf clips.

Merchandising ticket strips are also provided and can be clipped to the front edges of all three shelves.

To fit the shelves

1. Unpack the shelves, shelf clips and ticket strips from inside the cabinet.
 2. Fit the merchandising ticket strips to the shelves (as required).
 3. Place the narrow shelf on the floor of the cabinet.
-

4. Establish the desired position for the adjustable height shelves and securely engage a shelf clip in each of the shelf support strips.



5. Fit the shelves onto the shelf support clips, ensuring the shelf locating tags are facing the side of the cabinet with air slots.
-

6 Replacement Procedures

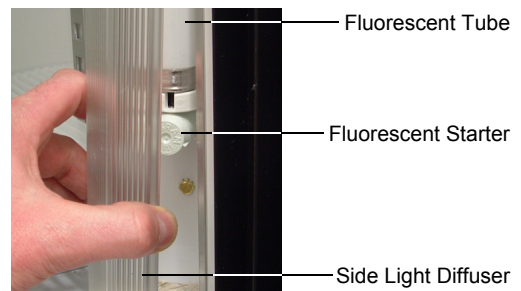
Lighting

The cabinet has four interior side lights, each fitted with one 18 Watt T8 fluorescent tube (OSRAM L 18W/860 Daylight, Ø26 x 588mm) (SKOPE part no. ELL9387) and one fluorescent starter (SKOPE part no. ELZ2840). The lighting is on a fused circuit. The 5A fuse is located on the electrical panel, inside the refrigeration unit compartment (see page 39).

To replace a fluorescent tube

1. Disconnect the cabinet from the mains power supply.

2. Remove the side light diffuser, by compressing the back section of the diffuser until it disengages from the aluminium housing and then push the diffuser back.



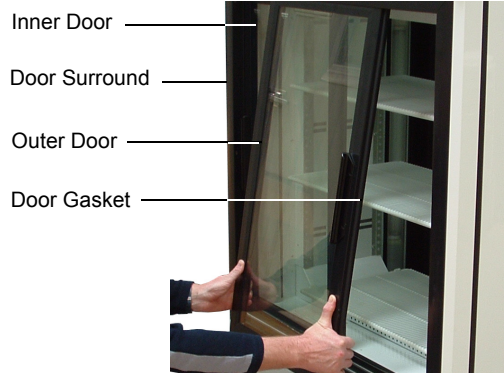
3. The fluorescent tube and starter can now be removed. Revolve the tube until the pin position allows withdrawal.
 4. When refitting the diffuser, engage the back section into the housing, and then compress and snap the front section of diffuser back into place working down the full length of the light. **Note:** The two front light diffusers are slightly longer than the two rear light diffusers.
-

Sliding Doors

Removal The sliding doors may be removed from the cabinet, to assist with cleaning the interior of the cabinet and cleaning the sliding door tracks.

To remove the door

1. Open the outer door to the centre of the cabinet, then lift the door up and swing the bottom out from the door surround.
2. While supporting the door, disconnect the tension spring from the adjustable rack located at the top of the door surround (be careful not to stretch the tension spring).



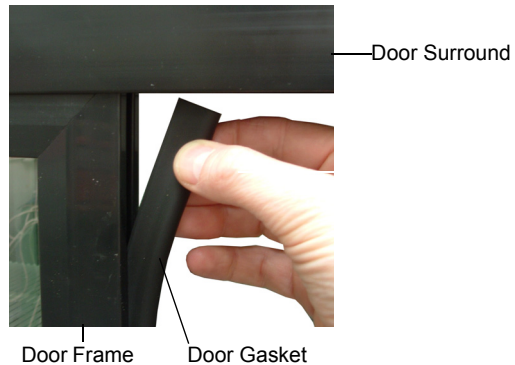
3. Carefully lower the door to the floor.
 4. The inner door is removed the same way.
 5. When refitting the doors, ensure the tension springs are reconnected with the correct closing tension (see page 36).
-

Gasket Each sliding door has a vertical gasket which slots into a groove in the outer side of the door frame. The doors also have a sealing strip between the two doors, attached to the inner door frame.

To replace the door gasket

1. Open the door.

2. Peel the gasket away from the door frame.



3. Fit the new gasket into the outer groove in the door frame.
-

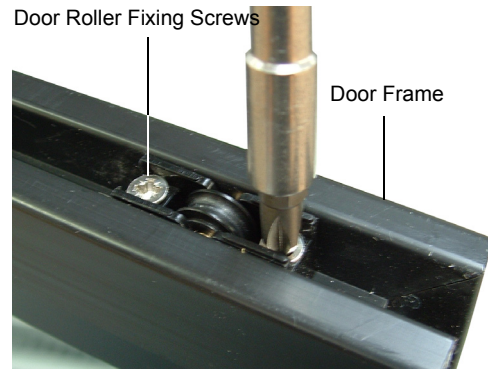
Rollers Each sliding door has two rollers which are recessed into the bottom of the door frame extrusion.

To replace the door rollers

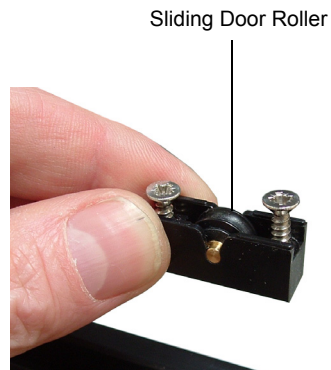
1. Remove the door from the cabinet (see above).

Continued over page

2. Turn the door upside down and unscrew the two screws holding each roller in place.



3. Fit the new replacement roller.

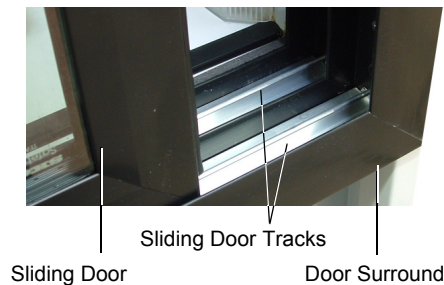


4. Refit the door to the cabinet.

Tracks The sliding doors sit on two aluminium tracks which sit in the bottom of the door surround.

To ensure the sliding doors open and close smoothly, the door tracks should be kept clear of any dirt build-up. The tracks are designed to be easily removed for cleaning and maintenance purposes.

Figure 5: Sliding door tracks



To remove the door tracks

1. Remove the door from the cabinet (see 'Removal' on page 34).

2. Lift each track up to remove from the door surround.



3. Wipe the tracks with a cloth, and also check inside the bottom of the door surround to ensure it is clear of any dirt build-up.
4. Ensure both the door tracks are fitted before refitting the doors.

Closing Tension Automatic door closure is by means of an adjustable tension spring attached to the top of each door. The closing tension can be adjusted by moving the tension spring to a different position on the adjustable rack in the top of the door surround (see Figure 6 below).

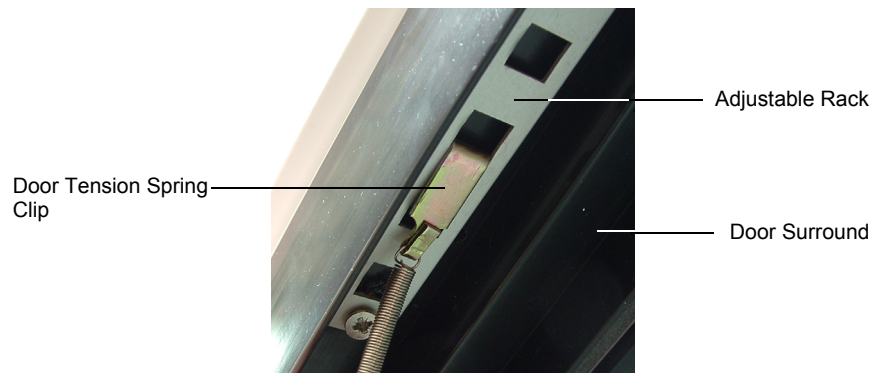


Figure 6: Sliding door tension spring

To adjust the door closing tension

1. Remove the door from the cabinet (see page 34).
 2. While supporting the door, disconnect the tension spring from the adjustable rack underneath the top door surround (be careful not to stretch the tension spring).
 3. Move the spring clip to a different slot on the adjustable rack. Moving the spring closer to the outside of the cabinet will increase the door closing tension, while moving the spring towards the centre of the cabinet will decrease closing tension.
 4. Refit the doors and check the closing tension of both the doors.
-
-

Swing Doors

Removal For servicing, the swing doors can be removed from the cabinet.

To remove a door

1. Disconnect the cabinet from the mains power supply.
 2. Remove the cabinet front kick panel from the same side as the door you want to remove.
 3. Slowly release tension on the door capstan, by turning the capstan with a $\text{\O}2.5\text{mm}$ steel rod, and removing the split pin from the bottom hinge bracket (see Figure 7 on page 38).
 4. Unscrew the bottom hinge. **Important:** ensure the weight of the door is fully supported, before removing the bottom hinge.
 5. The door and hinge can now be removed from the cabinet.
-

To refit a door

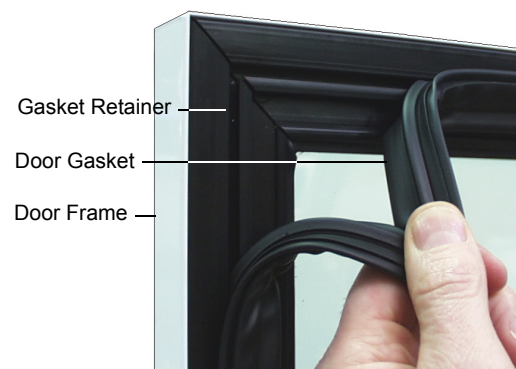
1. Lift the door onto the top hinge pin. The weight of the door will need supporting, until the bottom hinge is fitted.
 2. Locate the bottom hinge onto the door capstan and then screw the hinge to the cabinet.
 3. Check alignment with the other doors and adjust as necessary.
 4. Re-tension the door (see page 38).
-

Alignment If the swing doors are out of alignment, they can be realigned by releasing the bottom hinge brackets, which are provided with slots allowing alignment adjustment, enabling the bottom of the doors to be moved sideways.

Gasket The door gasket clips into the door gasket retainer extrusion and may be removed for repair or replacement.

To remove a swing door gasket

1. Pull the corner of the gasket out of the retainer extrusion
2. Continue peeling the gasket away from the retainer until the gasket is completely removed.



3. When fitting a new door gasket use hot air (from a hair drier) to help shape and realign the gasket in the retainer.
-

Closing Tension The swing doors have internal torsion bars, pretensioned at the factory, which enable the doors to self-close. If necessary, the door closing tension can be further adjusted by rotating the capstan mounted in the bottom hinge bracket (see Figure 7 below).

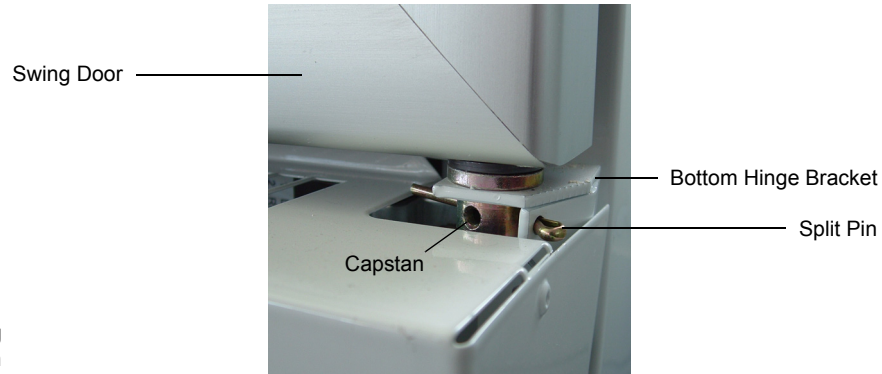


Figure 7: Swing door tension

To adjust the door closing tension

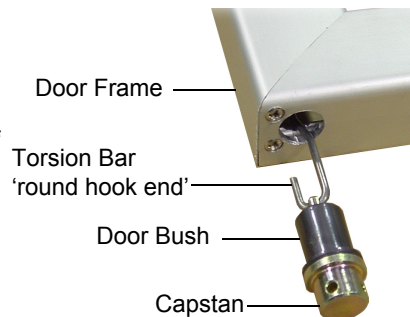
1. Slowly release tension on the capstan, by turning the capstan with a Ø2.5mm steel rod, and removing the split pin.
2. With the aid of another Ø2.5mm steel rod, increase the tension by turning the capstan in the direction that the door closes.
3. Once adequate tension has been achieved, re-insert the 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 airtight seal with the cabinet.
5. In the event the door tension can no longer be adjusted, the torsion bar may need replacing (see below).

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

To replace the torsion bar

1. Remove the door from the cabinet (see page 37).
2. 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.
3. Remove the existing capstan and bush from the old torsion bar.

4. Thread the capstan, complete with the bush, over the 'round hook' end of the new torsion bar. Ensure the aluminium tube moves freely up and down the torsion bar.



5. Fit the new torsion bar assembly into the door frame. When the torsion bar is correctly installed, the capstan should not turn.
6. Lightly tap the bottom of the capstan into the hinge hole, until the bush is flush with the door frame.
7. Refit the door to the cabinet, and adjust the closing tension.

Electrics

Cabinet Electrical Panel The cabinet electrical panel houses two fluorescent light ballasts, four ENSTO sockets, an RFI capacitor, fused connector block and mains terminal block. The components are mounted on the back of the electrical panel, screwed to the wall of the cabinet, inside the refrigeration unit compartment.

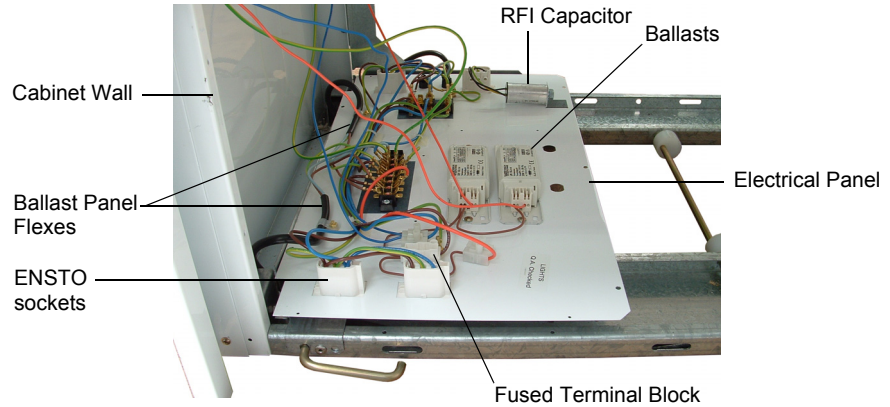


Figure 8: Cabinet electrics

To access the cabinet electrical panel

1. Disconnect the cabinet from the mains power supply.
2. Remove the refrigeration unit (see page 41).
3. Undo the five fixing screws holding the cabinet electrical panel onto the cabinet wall.
4. Swing the panel down to expose the electrical components.
5. When refitting the electrical panel, ensure the wires are clear of sharp edges and all five fixing screws are refitted.

Auxillary Electrical Panels The fluorescent ballasts for the two right hand side cabinet interior lights are housed behind two auxillary electrical panels, located inside the refrigeration unit compartment. The auxillary electrical panels are fitted in the corners of the cabinet wall immediately below the corresponding fluorescent lights.

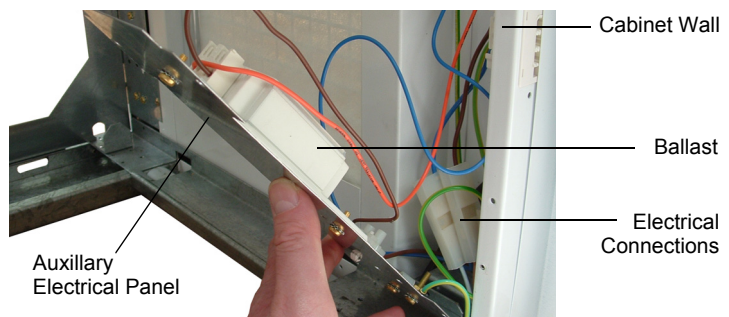


Figure 9: Auxillary electrical panel

To access the cabinet electrical panel

1. Disconnect the cabinet from the mains power supply.
2. Remove the refrigeration unit (see page 41).
3. Undo the four fixing screws holding the corresponding auxillary panel onto the cabinet wall.
4. Swing the panel down to expose the ballast and electrical connections.
5. When refitting the auxillary panels, ensure the wires are clear of sharp edges and all four fixing screws are refitted.

Refrigeration Unit

Introduction The SKOPE bottom mounted refrigeration unit is a self-contained module which aligns with port holes on the floor of the cabinet interior. Refrigerated air is directed up a duct inside the cabinet and returns through a bottom air grille.

The condenser coil can be accessed for routine cleaning by opening the condenser grille on the side of the cabinet (see 'Cleaning the Condenser Coil' below).

For servicing the refrigeration unit can be unplugged and pulled completely out from the cabinet (see "Removing the Refrigeration Unit" on page 41).

The refrigeration unit is electronically controlled by a controller mounted on the front of the refrigeration unit evaporator box.

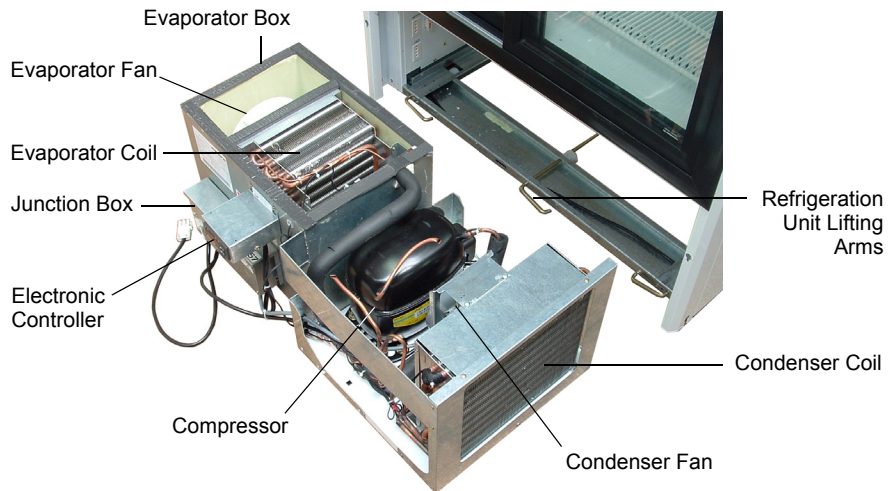


Figure 10: Tension spring

Cleaning the Condenser Coil The condenser coil and air filter **MUST** be kept clean for efficient and reliable operation. To ensure trouble free performance, it is recommended that every two months the cabinet be isolated from mains power supply and a vacuum cleaner used to remove dust and fluff from the condenser coil and air filter. The condenser coil and air filter are located behind the condenser grille on the side of the cabinet.



Figure 11: Condenser coil

To access the condenser coil

1. Disconnect the cabinet from the mains power supply.
2. Undo the 1/4 turn screw at the top of the condenser grille.
3. Swing the condenser grille down and remove the air filter.

Continued over page

-
4. The condenser coil is now accessible for cleaning.
-
5. After cleaning the condenser coil and air filter, replace the air filter and close the condenser grille.
-
6. Re-tighten the 1/4 turn screw.
-

Removing the Refrigeration Unit

For servicing purposes, the refrigeration unit can be completely removed from the cabinet.

To remove the refrigeration unit

-
1. Disconnect the cabinet from the mains power supply.
-
2. Remove the cabinet front kick panel, by lifting up to disengage from the two side keyhole fixing screws.
-

3. Unplug the refrigeration unit plug from the cabinet electrical panel on the left hand side of the unit compartment.



-
4. Rotate the three refrigeration unit lifting arms to the DOWN position (this lowers the unit down from the cabinet).

Refrigeration Unit Lifting Arm



UP Position

Refrigeration Unit Lifting Arm



DOWN Position

-
5. Pull the refrigeration unit out from the unit compartment.
Important: Be careful not to damage any electrical cables.
-
6. When refitting the unit, ensure the electrical cables are clear of sharp edges.
-
7. Push the unit back as far as it will go and rotate the unit lifting arms to the UP position (this raises the unit up to the cabinet).
-

Unit Wiring Junction Box

The refrigeration unit junction box houses the capacitors and flex terminations for the evaporator and condenser fan motors. The unit wiring junction box is located on the front of the refrigeration unit. Access to the junction box is required if replacing either of the fan motors. The refrigeration unit wiring diagram is attached to the inside of the junction box lid.

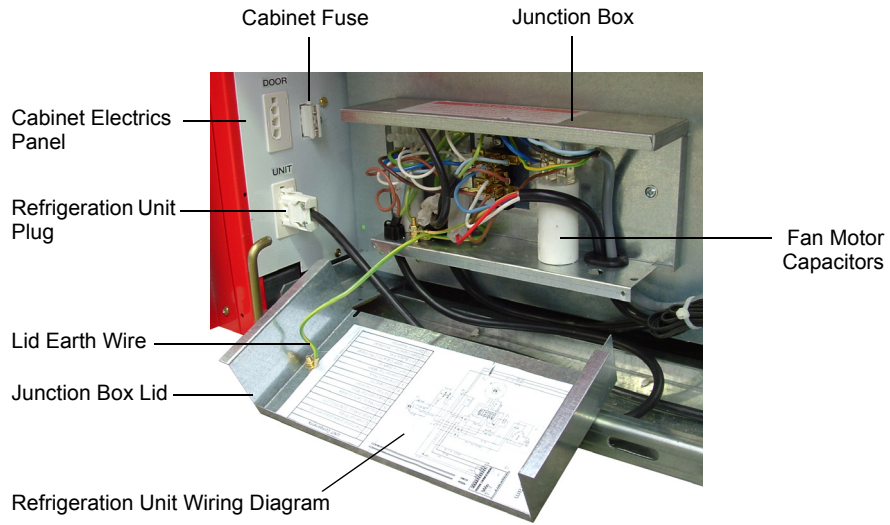


Figure 12: Unit wiring junction box

To access the unit wiring junction box

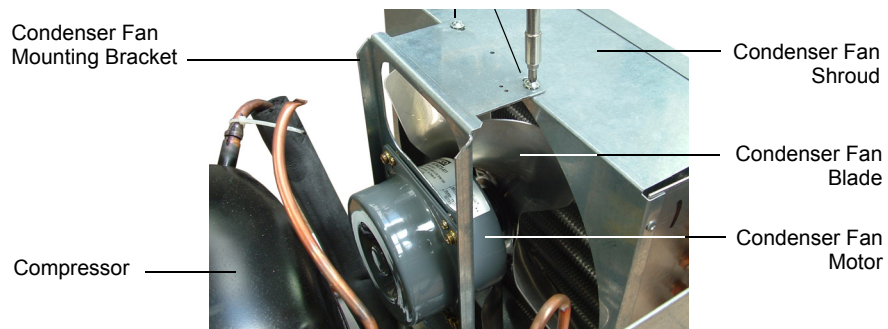
1. Disconnect the cabinet from the mains power supply.
2. Remove the cabinet front kick panel, by lifting up to disengage from the two side keyhole fixing screws.
3. Remove the junction box lid by undoing the two bottom screws (the Earth wire remains attached).
4. When refitting the junction box lid, ensure all wires are contained inside the box clear of any sharp edges.

Condenser Fan

The condenser fan is located inside the refrigeration unit compartment and is accessed by pulling the refrigeration unit out from the cabinet.

To replace the condenser fan motor

1. Disconnect the cabinet from the mains power supply.
2. Pull the refrigeration unit out from the cabinet (see page 41).
3. Disconnect the condenser fan motor flex terminals from inside the unit wiring junction box and pull the flex out of the junction box (see page 42).
4. Undo the two top fixing screws holding the fan mounting bracket onto the fan shroud and lift the bracket off the shroud.



Continued over page

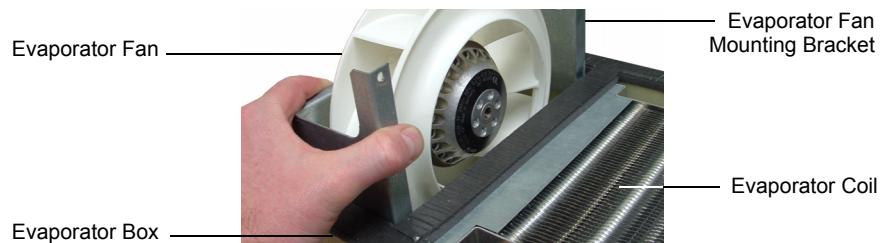
-
5. The fan blade and fan motor can now be removed from the mounting bracket.
 6. Fitting the new fan motor is a reversal of the above instructions.
-

Evaporator Fan

The evaporator fan is located inside the refrigeration unit compartment, inside the evaporator box, and is accessed by pulling the refrigeration unit out from the cabinet.

To replace the evaporator fan motor

1. Disconnect the cabinet from the mains power supply.
 2. Pull the refrigeration unit out from the cabinet (see page 41).
 3. Disconnect the evaporator fan motor flex terminals from inside the unit wiring junction box (see page 42).
 4. Using a short screwdriver, undo the two fixing screws holding the fan mounting bracket inside the evaporator box.
 5. Lift the fan out of the evaporator box while at the same time pulling the motor flex through the hole in the side of the box.
-



6. Fitting the new evaporator fan is a reversal of the above instructions.
Important: Ensure the putty around the flex entry hole in the unit wiring junction box is replaced.
-

Defrost

The electronic controller initiates a compressor timed off defrost every six hours. Defrost termination is primarily by temperature with time as a back up. If any ice build up occurs on the evaporator coil ensure:

- ▣ Cabinet is operating within ambient specifications.
- ▣ Refrigerant charge is correct.
- ▣ Electronic controller is programmed correctly and operating correctly.

Pressure Temperature Chart

| Temperature | | R134a | | R404A | |
|-------------|-----|-------|-------|-------|------|
| °F | °C | KPa | psig | KPa | psig |
| 5.0 | -15 | 63 | 9.1 | 261 | 38 |
| 6.8 | -14 | 69 | 10.0 | 274 | 40 |
| 8.6 | -13 | 77 | 11.0 | 288 | 42 |
| 10.4 | -12 | 84 | 12.0 | 302 | 44 |
| 12.2 | -11 | 91 | 13.0 | 316 | 46 |
| 14.0 | -10 | 99 | 14.0 | 331 | 48 |
| 15.8 | -9 | 107 | 16.0 | 346 | 50 |
| 17.6 | -8 | 116 | 17.0 | 361 | 52 |
| 19.4 | -7 | 124 | 18.0 | 377 | 55 |
| 21.2 | -6 | 133 | 19.0 | 393 | 57 |
| 23.0 | -5 | 142 | 21.0 | 410 | 59 |
| 24.8 | -4 | 151 | 22.0 | 427 | 62 |
| 26.6 | -3 | 161 | 23.0 | 445 | 65 |
| 28.4 | -2 | 171 | 25.0 | 463 | 67 |
| 30.2 | -1 | 181 | 26.0 | 481 | 70 |
| 32.0 | 0 | 192 | 28.0 | 500 | 73 |
| 33.8 | 1 | 202 | 29.0 | 519 | 75 |
| 35.6 | 2 | 213 | 31.0 | 539 | 78 |
| 37.4 | 3 | 225 | 33.0 | 559 | 81 |
| 39.2 | 4 | 237 | 34.0 | 580 | 84 |
| 41.0 | 5 | 249 | 36.0 | 601 | 87 |
| 42.8 | 6 | 261 | 38.0 | 623 | 90 |
| 44.6 | 7 | 274 | 40.0 | 645 | 94 |
| 46.8 | 8 | 287 | 42.0 | 668 | 97 |
| 48.2 | 9 | 300 | 44.0 | 691 | 100 |
| 50.0 | 10 | 314 | 46.0 | 715 | 104 |
| 53.6 | 12 | 342 | 50.0 | 776 | 113 |
| 57.2 | 14 | 372 | 54.0 | 828 | 120 |
| 60.8 | 16 | 403 | 58.0 | 881 | 128 |
| 64.4 | 18 | 436 | 63.0 | 938 | 136 |
| 68.0 | 20 | 471 | 68.0 | 996 | 145 |
| 77.0 | 25 | 565 | 83.0 | 1154 | 167 |
| 86.0 | 30 | 670 | 97.0 | 1327 | 193 |
| 95.0 | 35 | 787 | 114.0 | 1518 | 220 |
| 104.0 | 40 | 916 | 133.0 | 1728 | 251 |
| 113.0 | 45 | 1060 | 154.0 | 1957 | 284 |
| 122.0 | 50 | 1218 | 177.0 | 2207 | 320 |
| 131.0 | 55 | 1391 | 202.0 | 2479 | 360 |
| 140.0 | 60 | 1581 | 229.0 | 2774 | 402 |
| 149.0 | 65 | 1789 | 259.0 | 3093 | 449 |
| 158.0 | 70 | 2016 | 292.0 | - | - |

Electronic Controller

The electronic controller is attached to the front of the refrigeration unit, behind the cabinet front panel.

Depending on the date of manufacture, the cabinet 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 6). Check the label on top of the controller to verify the controller type.

Variations All SKOPE cabinets 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. Refer to page 47 for replacement instructions.

Controller Connections

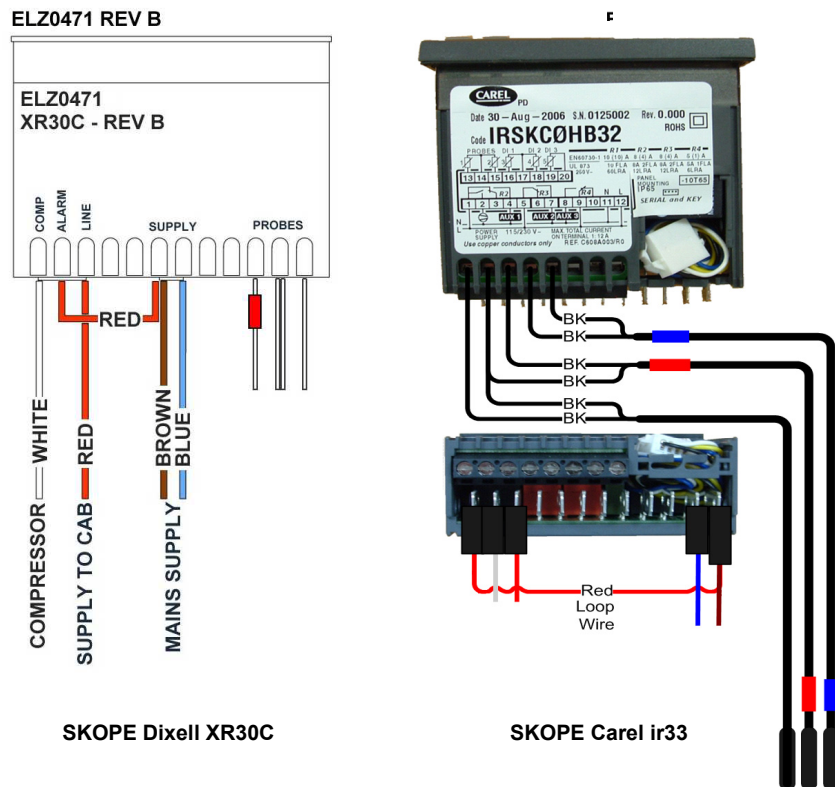


Figure 13: Controller Wiring

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 programme and if necessary perform a 'Controller Reset' (see the controller section beginning on page 12).

| NTC Probe Resistance | |
|----------------------|--------------------|
| Temperature | Resistance (Ohms)* |
| -10°C | 42.5 |
| -5°C | 34.0 |
| 0°C | 27.3 |
| 5°C | 22.1 |
| 10°C | 18.0 |
| 20°C | 12.1 |
| 30°C | 8.3 |
| 40°C | 5.8 |
| 50°C | 4.2 |

* Tolerance:
plus or minus 2.4%

Spare Parts For a complete list of spare parts refer to "Refrigeration Unit Assembly" on page 30. When replacing a SKOPE customised Dixell controller, order the changeover kit: UB40AAD/R80-SP1; when replacing a SKOPE CAREL ir33 controller order a standalone controller: ELZ3333AP-160 or the controller assembly: UB40AAD/R80-160.

| Part Description | Part Number |
|--|-----------------|
| SKOPE CAREL Controller Changeover (service kit for replacement of Dixell controller) | UB40AAD/R80-SP1 |
| SKOPE CAREL Controller Assembly (including flexible cord and probes) | UB40AAD/R80-160 |
| SKOPE CAREL ir33 Controller (controller only) | ELZ3333AP-160 |

Replacing the Controller Because the controllers are customised and unique to SKOPE, they cannot be replaced with standard Dixell or CAREL controllers and must be replaced with the correct SKOPE pre-programmed replacement controller. For information on replacing a Dixell controller with a CAREL controller, refer over page.

To remove and replace the controller

1. Isolate the cabinet from the mains power supply and remove the front panel (see "Removing the Refrigeration Unit" on page 41).
 2. Remove the controller housing from the front of the refrigeration unit.
 3. Remove the fixing screws from the sides of the controller housing and lift the lid off to expose the controller connections.
 4. Disconnect the terminals from the rear of the controller and then remove the controller from the housing.
 5. When re-fitting the controller, ensure the terminals engage firmly into the rear of the controller and the housing lid is screwed down to hold the controller firmly in place.
 6. Perform a 'Controller Reset' (see page 17) and select appropriate 'bn' programme. This is **important** because if not done, the cabinet will operate as 'bn0' and will fail.
-
-

To remove and replace the controller (From SKOPE customised Dixell controller to SKOPE customised CAREL controller):

Note: Full instructions are provided with the service kit when ordered as a spare part.

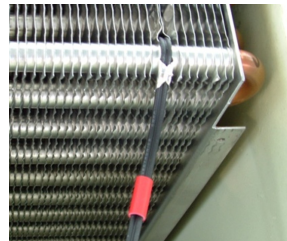
1. Isolate the cabinet from the mains power supply.
2. Remove the existing controller (see steps 2 - 4 on the previous page).
3. Fit new controller. Refer to "Controller Connections" on page 45 for wiring details.
4. Replace probes. The control, Evaporator Coil and Condenser Coil probes must be replaced with CAREL specific probes (provided with service kit).

- Dixell and CAREL probes are not interchangeable
- CAREL SKOPE ir33 and 'standard' CAREL ir33 controllers are NOT interchangeable.

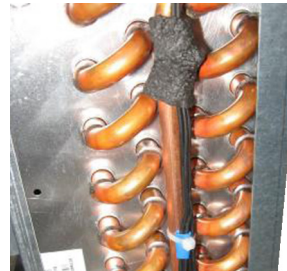
4a. **Control probe** - Secured on bracket inside evaporator box. The control probe must be fitted to the bracket inside the evaporator box.



4b. **Evaporator Coil Probe** - Evaporator Coil. The evaporator coil probe (fitted with a red sleeve) is fed between the first and second rows of the evaporator coil, eight coil fins from the inlet and at a depth of 220mm.



4c. **Insulated Condenser Coil Probe** - Condenser Coil. The condenser probe (fitted with a blue sleeve) is secured to the condenser coil and insulated with cork tape.



5. Perform a 'Controller Reset' (see page 17) and select 'bn1' program. This is **important** because if not done, the cabinet will operate as 'bn0' and will fail.
6. Update parameters as required. Refer to the below table for controller program and parameter changes.

| Controller Program Number | Set Point - St (°C) | Calibration Probe 1 - /c1 (°C) | Compressor Off Time - C2 | High Alarm - AH (°C) |
|---------------------------|---------------------|--------------------------------|--------------------------|----------------------|
| 160 | 2.0 | 0.0 | 3 | 10 |

7 Troubleshooting

Diagnostic Table

For problems with the cabinet and refrigeration unit, use the following table to assist with diagnostics.

| Problem | Possible Cause | Repair |
|--|---|--|
| • Cabinet not operating / no controller display, lights etc. not going | • Loss of power supply. | • Check mains power supply. |
| | Refrigeration shut-down. • High pressure switch has shut-down refrigeration system and cabinet lighting. | • Check and clean the condenser coil (see page 40). • Check that the operating ambient is not too high (see page 31). |
| | • Cabinet supply fuse blown. | • Check the cabinet fuse on the cabinet electrical panel (see page 39). • Determine reason for failure. |
| | • Fluorescent tube failed. | • Replace with tube of same wattage and colour rendering. |
| | • Ballast or Starter failed. | • Replace with component of same type and rating. |
| • Compressor will not start - no hum. | • Loose connections at light supply fittings. | • Check all connections (ballast and lamp holders). |
| | • Overload protector tripped. | • Refer to electrical section. |
| | • Faulty electronic controller, | • Repair or replace control. |
| | • Thermostat off, due to cold location. | • Relocate control. |
| • Compressor will not start - hums but trips on overload protector. | • Wiring improper, or loose. | • Check wiring against diagram. |
| | • Improperly wired. | • Check wiring against diagram. |
| | • Low voltage to unit. | • Determine reason and correct. |
| | • Start capacitor defective on CSIR or CSR motor. | • Determine reason and replace. |
| | • Run capacitor defective on PSC motor. | • Determine reason and replace. |
| | • Relay failing to close. | • Determine reason and correct. Replace if necessary. |
| | • Compressor motor has a winding open or shorted. | • Check resistance values. Replace compressor if necessary. |
| • Internal mechanical trouble in compressor. | • Replace compressor. | |

Continued over page

| | | |
|--|--|---|
| <ul style="list-style-type: none"> Compressor starts, but does not switch off - start winding. | <ul style="list-style-type: none"> Improperly wired. | <ul style="list-style-type: none"> Check wiring against diagram. |
| | <ul style="list-style-type: none"> Low voltage to unit. | <ul style="list-style-type: none"> Determine reason and correct. |
| | <ul style="list-style-type: none"> Relay failing to open, due to welded contacts or relay incorrectly mounted. | <ul style="list-style-type: none"> Determine reason and correct. Replace if necessary. |
| | <ul style="list-style-type: none"> Run capacitor defective on CSR motor. | <ul style="list-style-type: none"> Determine reason and replace. |
| | <ul style="list-style-type: none"> Excessively high discharge pressure. | <ul style="list-style-type: none"> Clean condenser. Check power input. Possible overcharge, insufficient condenser cooling, or non-condensable gasses. |
| | <ul style="list-style-type: none"> Compressor motor has winding open or shorted. Check continuity and resistance. | <ul style="list-style-type: none"> Replace compressor if faulty. |
| | <ul style="list-style-type: none"> Internal mechanical trouble in compressor (tight). May be lubrication. | <ul style="list-style-type: none"> Replace compressor. |
| <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Check wiring diagram. Check for added fan motors etc., connected to wrong side of protector. |
| | <ul style="list-style-type: none"> Low voltage to unit. | <ul style="list-style-type: none"> Determine reason and correct. |
| | <ul style="list-style-type: none"> Overload protector defective. | <ul style="list-style-type: none"> Check current, replace protector. |
| | <ul style="list-style-type: none"> Run capacitor defective on CSR motor. | <ul style="list-style-type: none"> Determine reason and replace. |
| | <ul style="list-style-type: none"> Excessive discharge pressure. | <ul style="list-style-type: none"> Check condenser, check ventilation, check for restrictions in refrigeration system. |
| | <ul style="list-style-type: none"> Suction pressure too high. | <ul style="list-style-type: none"> Check for possibility of misapplication. |
| | <ul style="list-style-type: none"> Compressor too hot - insufficient suction gas cooling. | <ul style="list-style-type: none"> Check refrigerant charge (fix leak), add if necessary. Check return vapour temperature and suction superheat. |
| <ul style="list-style-type: none"> Unit runs OK, but short cycles. | <ul style="list-style-type: none"> Faulty compressor or electrics. | <ul style="list-style-type: none"> Repair or replace. |
| | <ul style="list-style-type: none"> Electronic controller requires adjustment, or incorrectly positioned probes. | <ul style="list-style-type: none"> Adjust or relocate controller sensor probe. |

Continued over page

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

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