

Display Series

SKF Range

SKOPE Top Mounted Vertical Freezers



User Manual

PRN7691 Rev. 4.0 April 2008 edition

SKOPE[®]
Refrigeration

ASSEMBLY INSTRUCTIONS

1. Lift the SKOPE Cyclone® Freezer unit onto the cabinet top. Steps or platform about 1 metre high are suggested. NOTE: Cyclone® unit weights are: SKF650 = 57.5 kg, SKF1000 = 78.5 kg.
2. Remove wooden packing from unit where applicable.
3. Take care to avoid damaging sealing strips & cabinet supply flex.
4. Fix unit to cabinet top by screwing the two fixing screws provided firmly down. The unit should be flush with the back of the cabinet when positioned correctly.
5. Check seal against cabinet top - ensure there are NO gaps!
6. Fit side panels onto cabinet by sliding the two slots under the screws on the cabinet top. These screws should be raised approx. 1.5mm off the cabinet top.
7. Fit mains flex through the exit hole in the top of the sign back.
8. Clip sign back into place, and connect 'cabinet' and 'sign' plugs into power supply sockets, where applicable.
9. Fit the Microprocessor cable and four coloured cables into processor, where applicable.
10. Connect illuminated sign into sign power socket. Clip sign unit or plain facia panel into place.
11. Proceed with installation as outlined in 'Positioning of Machine'.

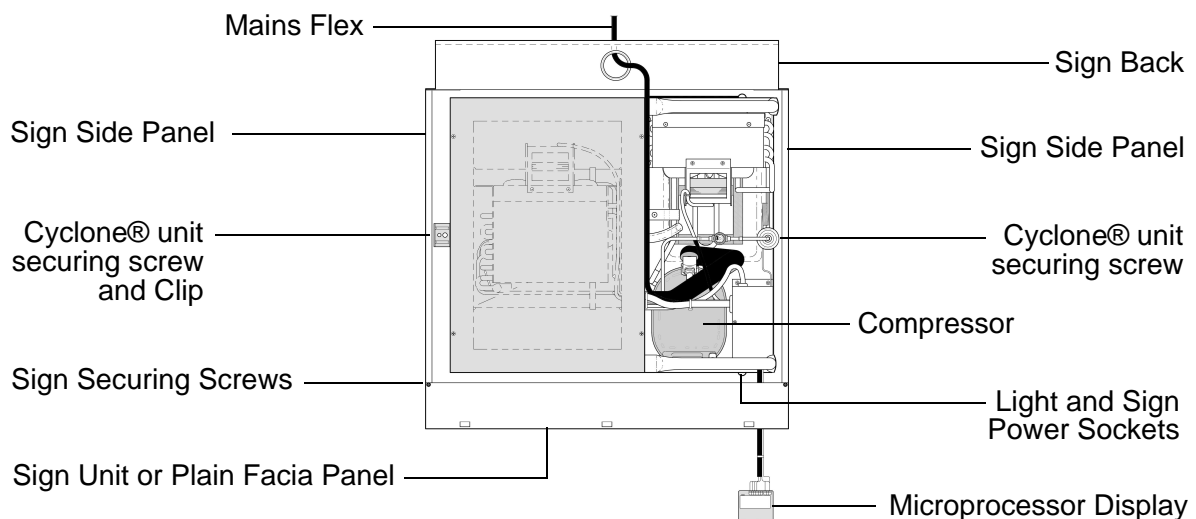


Figure 1: Top view of Cabinet (SKF650 shown)

POSITIONING OF MACHINE

The mains flex exits below the rear panel behind the refrigeration unit. The flex should be retrieved before the machine is positioned, when walls and partitions may make access difficult.

When positioning the machine, a gap must be left between the top of the sign panels and ceiling, of at least 200mm. Adequate ventilation must be provided above the SKOPE Cyclone® unit for efficient operation. The air surrounding the unit must not exceed 40°C.

Avoid direct sunlight, warm draughts etc. When siting the machine adequate allowance should be made for door opening. The doors have internal torsion bars which are pre-tensioned at the factory and the machine must be positioned on a level surface for the door/s to shut and seal correctly and to prevent the condensate tray from overflowing.

The operation of this machine is controlled by a pre-programmed Microprocessor Controller. For more detailed service information please refer to the relevant SKOPE service manual.

VENTILATION

Adequate ventilation is essential. Freezer cabinet must have the Sign Back or Duct Kit fitted. This ensures that fresh air is drawn through the condenser. Failure to fit either of these components will void warranty.

Positioning the cabinet back closer than 100mm to wall will result in freezer unit failure.

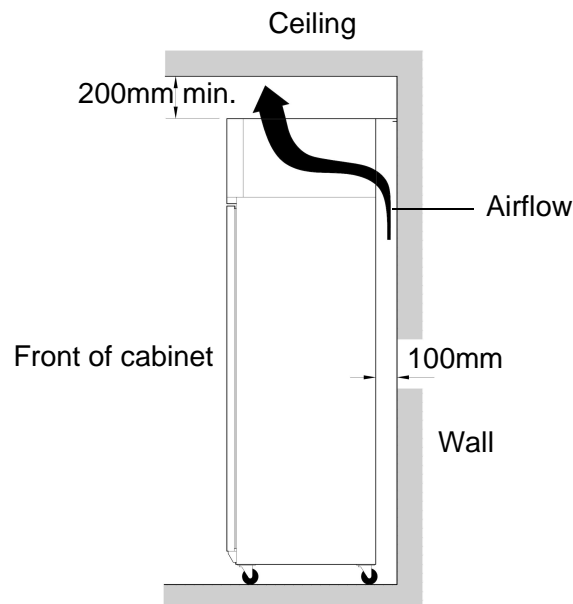


Figure 2: Ventilation

OPERATION OF MACHINE

Plug in machine and check operation of refrigeration unit and lights. The condenser fan runs continuously through out all operations of the machine. (this may be verified by checking for air movement around the top right hand side of the cabinet).

The compressor should switch off when cabinet internal air reaches the preset “set point” temperature.

The evaporator fan/s which circulate the cabinet air will not operate until the defrost thermostat bulb senses a temperature of -8°C. On initial start up the fan should come on after a delay of approximately 4 minutes (verified by air blowing out of the bottom duct and the green LED).

Defrost

The first defrost will occur in 6 hours. During a defrost cycle (indicated by the green defrost LED (item 7) on the control panel) the compressor and the evaporator fan will switch off. Four elements inside the evaporator box will then melt away any ice build up.

The duration of a defrost cycle depends on the quantity of ice build up (usually about 10 minutes). A maximum of 20 minutes is preset. Defrost cycles are pre-programmed at 6 hour intervals.

During and after each defrost, the display will read the temperature detected before the defrost cycle. The display will then show the return air temperatures as the machine cycles during normal operation.

Defrosts should occur during off-peak periods to maximise the efficiency of the machine. This can be achieved by switching the power off, then on again, so that the subsequent 6 hourly cycle defrosts will not coincide with peak periods.

Notes:

- A power cut would reset the defrost cycles.
- This machine has an over temperature cut-out inside the refrigeration unit evaporator box. This is to safe guard the possibility of the defrost elements remaining on under fault conditions (set at 55°C).
- The lights which illuminate the top sign and cabinet interior are permanently on, where applicable.
- Ensure the door gasket/s form a good seal with the cabinet.

LOADING

Shelves may be positioned at different heights to suit various products. Always ensure that the shelf clips are securely engaged in each of the shelf support strips. Support strips are marked '+' for easy location of shelf clips. For even cooling and efficient operation, allow air space around packages etc. Do not allow products to overhang the front of the shelf as this could prevent the door from shutting or cause glass breakage. Leave an airspace of at least 75mm (3") above packages etc. on the top shelf.

CLEANING

When necessary, wash both interior and exterior of cabinet with soapy water. Exterior of cabinet may be waxed with automobile polish for extra protection.

Caution:

The machine must be disconnected from the mains supply before cleaning the condenser.

Important:

Condenser coil **MUST** be kept clean for efficient and reliable operation. Clean with a brush and vacuum cleaner regularly.

Access to the condenser coil is gained over the top of the sign, or by removing the sign. To remove the sign, undo the two screws which hold the top of sign to the sign side panels. The sign unit can then be lifted vertically, unplugged and removed.

SERVICE INSTRUCTIONS

Servicing should be carried out by an authorized Service Agent. Brief instructions are located on top of the refrigeration unit.

CAREL ELECTRONIC CONTROLLER

Display and Key Functions

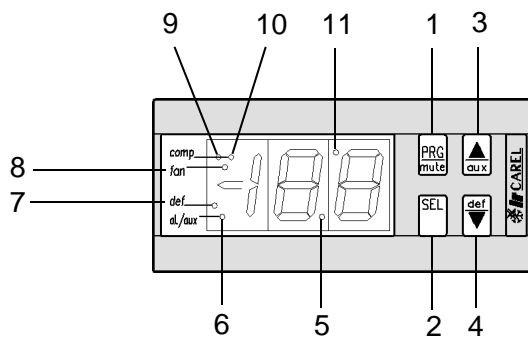






Figure 3: Controller Display

| | | |
|-----------|---|--|
| 1 |  | <p>Silences alarm buzzer.</p> <p>Allows entry to frequent parameters section, if pressed for 5 seconds.</p> <p>Allows entry to configuration parameters section, if pressed simultaneously with 'SEL' for 5 seconds.</p> <p>Locks in new parameters, and exits parameter sections.</p> <p>Activates reset procedure.</p> |
| 2 |  | <p>Displays setpoint in run mode.</p> <p>Displays selected parameter in parameter mode.</p> <p>Allows entry to configuration parameters section if pressed simultaneously with 'PRG' for 5 seconds.</p> |
| 3 |  | <p>Adjustment locked out</p> <p>Alters parameters in parameter mode.</p> <p>Activates and deactivates continuous refrigeration mode with 'def' key.</p> |
| 4 |  | <p>Adjustment locked out</p> <p>Activates manual defrost cycle.</p> <p>Alters parameters in parameter mode.</p> <p>Activates and deactivates continuous refrigeration mode with 'aux' key.</p> |
| 5 | | Decimal point indicator. |
| 6 | | Unused. |
| 7 | | Defrost cycle on indicator |
| 8 | | Evaporator fan on indicator. |
| 9 | | Continuous refrigeration mode on indicator (fast freeze). |
| 10 | | Compressor on indicator. |
| 11 | | Remote controller indicator. |

CAREL ELECTRONIC CONTROLLER

Operation of Controller

The operation of this cabinet is controlled by a pre-programmed microprocessor. The Microprocessor display indicates the temperature of the cabinet ambient probe, except during a defrost where the temperature of the cabinet probe is locked in, and during an alarm condition.

The display also has LED indicators showing the activation of the compressor, the fan and the defrost. At alarm activation, the display indicates the type of alarm signal; and an audible alarm sounds. The alarm can be muted at the controller.

Controller Components

| Component | Description |
|-------------------------|---|
| Microprocessor: | Located behind ventilated unit cover. |
| Controller Module: | Located in control box. Performs processor switching. |
| Module Connector Cable: | Flat black cable connecting module to microprocessor. |
| Probes: | 2 x NTC probes are used. |

- A controlling probe located on a receptacle in the evaporator box, called a 'Cabinet Ambient Probe'.
- An evaporator probe located within the evaporator coil, referred to as a 'Defrost Probe'.

CAREL ELECTRONIC CONTROLLER

Alarms and Signals

| SIGNAL | DESCRIPTION |
|-------------------------------------|---|
| EO on | Indicates faulty ambient probe. |
| EI blinking | Indicates faulty defrost probe. |
| IA blinking | Indicates unit has high pressure fault. Note: At alarm initiation, check condenser radiator for blockage, and clean if necessary. To reset alarm, cabinet must be replugged into power supply. |
| LO blinking | Indicates low temperature alarm. |
| HI blinking | Indicates high temperature alarm. |
| EA, EB or EE blinking | Indicates data acquisition failure. The controller requires re-programming. |
| Ed blinking | Indicates defrost timed out. |

Note:

Alarm **HI** may activate during cabinets initial pull down cycle, after being first powered up. Alarm may be muted; and will automatically reset when cabinet passes alarm setpoint.

Changing Controller Settings

Access / Entry:

1. Press and hold PRG and SEL simultaneously for more than 5 seconds, until **00** is displayed.
2. Press aux (up) until **22** is displayed.
3. Press SEL to confirm selection. The first parameter **IC** is displayed.

Turn Keypad On:

1. Follow Access / Entry above, until the first parameter **IC** is displayed.
2. Press def (down) two times, until **H2** is displayed.
3. Press SEL to display the 'value' of the parameter.
4. Press aux (up) to increase or def (down) too decrease, until **01** is displayed.
5. Press SEL to accept the 'value'.
6. Press PRG to lock in new value and to exit program.

CAREL ELECTRONIC CONTROLLER

Setpoint

| | |
|------------------|-------|
| Factory setting: | -21°C |
| Maximum: | -18°C |
| Minimum: | -21°C |

- Press SEL key for 1 second and the 'Setpoint' will be displayed. On releasing the key, the display will flash.
- To alter the 'Setpoint', press aux (up) or def (down).
- Press SEL to lock in the value and return to cabinet temperature.

Manual Defrost

Press def (down) key for more than 5 seconds to manually initiate a defrost.

Continuous Refrigeration

Press aux (up) and def (down) together, (down key first) to initiate a 'Continuous Refrigeration' mode. The compressor will run without interruption to the parameter 'cc' (6 hours: SKOPE programme). Its purpose is to achieve a fast product pull-down.

Display Function

During run mode, the display shows the value measured by the 'Cabinet Ambient Probe'. In alarm status, the display indicates the relative alarm code.

Buzzer Off

Press mute key to silence the buzzer. The alarm display remains while the alarm condition exists.

Parameters

Warning:

- The following parameters (Table 1: pp.10,11) are set exclusively for the SKOPE freezer program, with its dedicated CAREL controller.
- Any alteration from this program may adversely effect the operation of the freezer.
- For full specifications, a detailed CAREL controller manual is available.

CAREL ELECTRONIC CONTROLLER

Parameters

| SKOPE Parameters for CAREL Controller IR32POLBRO | | | | | | | |
|--|-----|------------|------|-----|-----|-----|--|
| SETPOINT: -21°C (cycling -21°C to -18°C) | | | | | | | |
| SKOPE Settings | | | Type | Min | Max | Def | PARAMETER |
| PA | 22 | | C | 00 | 199 | 22 | Password |
| PROBE PARAMETERS | | | | | | | |
| /0 | 0 | NTC probe | n.a. | 0 | 1 | 0 | Type of probe used (NTC or PTC). Available after 'Reset Procedure' |
| /C | 2.0 | 2°C | F | -20 | 20 | 0 | Calibration offset for cabinet temperature display |
| /2 | 04 | - | C | 1 | 15 | 4 | Probe reading stability (lower the number, faster the response) |
| /3 | 08 | - | C | 1 | 15 | 8 | Probe reading speed (lower the number, slower the response) |
| /4 | 00 | probe | C | 0 | 100 | 0 | Designation as controlling probe |
| /5 | 00 | °C | C | 0 | 1 | 0 | Units of temperature measurement |
| /6 | 00 | Yes | C | 0 | 1 | 0 | Decimal point display |
| CYCLE PARAMETERS | | | | | | | |
| rd | 3.0 | 3°C | F | 0.1 | 20 | 2 | Refrigeration differential |
| r1 | -26 | -26°C | C | -40 | r2 | -40 | Minimum allowable setpoint |
| r2 | -16 | -16°C | C | r1 | 199 | 90 | Maximum allowable setpoint |
| r3 | 01 | Yes | C | 0 | 1 | 0 | Enabling of ED alarm (defrost interrupted because maximum duration has been reached, parameter dP) 0=No, 1=Yes |
| r4 | 3.0 | 3 | C | 0 | 20 | 3 | Not used. Must be 3 |
| r5 | 01 | Yes | C | 0 | 1 | 0 | Enabling of minimum / maximum temperature monitoring |
| rt | - | - | F | 0 | 199 | - | Actual interval in maximum / minimum temperature reading |
| rH | - | - | F | -50 | +90 | - | Maximum temperature reading in the 'rt' interval |
| rL | - | - | F | -50 | +90 | - | Minimum temperature reading in the 'rt' interval |
| COMPRESSOR PARAMETERS | | | | | | | |
| c0 | 01 | 1 minute | C | 0 | 15 | 0 | Compressor and evaporator fan start delay at power on |
| c1 | 03 | 3 minutes | C | 0 | 15 | 0 | Minimum time between compressor starts |
| c2 | 03 | 3 minutes | C | 0 | 15 | 0 | Minimum compressor OFF time |
| c3 | 00 | 0 | C | 0 | 15 | 0 | Minimum compressor ON time |
| c4 | 99 | 99 minutes | C | 0 | 100 | 0 | Compressor backup for 'Ambient' probe failure (On for c4, off for 15 min) |
| cc | 04 | 4 hours | C | 0 | 15 | 4 | Duration of 'Continuous Refrigeration Mode' |
| c6 | 02 | 2 hours | C | 0 | 15 | 2 | Duration of alarm override after 'Continuous Refrigeration Mode' |
| DEFROST PARAMETERS | | | | | | | |
| d0 | 00 | Electric | C | 0 | 1 | 0 | Type of defrost |
| dl | 06 | 6 hours | F | 0 | 199 | 8 | Time interval between defrosts |
| dt | 12 | 12°C | F | -40 | 199 | 4 | Defrost termination temperature |
| dP | 22 | 22 minutes | F | 1 | 199 | 30 | Maximum defrost time |
| d4 | 00 | No | C | 0 | 1 | 0 | Defrost at cabinet plug in |
| d5 | 00 | No | C | 0 | 199 | 0 | Defrost delay at cabinet plug in |
| d6 | 01 | Yes | C | 0 | 1 | 1 | Lock in temperature display during defrost |
| dd | 03 | 3 minutes | F | 0 | 15 | 2 | Defrost drip time, before compressor and evaporator fan start |
| d8 | 01 | 1 hour | F | 0 | 15 | 1 | Continuation of d6 at defrost end (until setpoint or d8 elapses) |
| d9 | 00 | No | C | 0 | 1 | 0 | Compressor protection times observed at defrost (c1, c2, c3) |
| d/ | - | - | F | n.a | n.a | n.a | Evaporator temperature (via defrost probe) is displayed |
| dC | 00 | hrs / mins | C | 0 | 1 | 0 | Time basis for parameter 'dl' and 'dp' |

Table 1: CAREL Controller Parameters - continued on next page

CAREL ELECTRONIC CONTROLLER

Parameters

| SKOPE Parameters for CAREL Controller IR32POLBRO | | | | | | | |
|--|------|--------------|------|-----|-----|-----|---|
| SETPOINT: -21°C (cycling -21°C to -18°C) | | | | | | | |
| SKOPE Settings | | | Type | Min | Max | Def | PARAMETER |
| | | | | | | | ALARM PARAMETERS |
| AO | 1.0 | 1.0°C | C | 0.1 | 20 | 0.2 | Alarm and fan differential |
| AL | 10 | -32°C /-31°C | F | 0 | 199 | 10 | Low temp alarm (On=Setpoint -AL-A0) (Off=Setpoint -AL) |
| AH | 09 | -11°C /-12°C | F | 0 | 199 | 10 | High temp alarm (On=Setpoint +AH+A0) (Off=Setpoint +AH) |
| Ad | 60 | 60 minutes | C | 0 | 199 | 120 | Alarm delay time |
| A4 | 01 | On | C | 0 | 5 | 0 | Immediate external alarm i.e. High pressure switch trip* |
| A5 | 00 | - | C | 0 | 5 | 0 | Not used. must be 0 |
| A6 | 99 | 99 minutes | C | 0 | 100 | 0 | Compressor run lock time due to A4 function. Compressor will still cycle with HP switch |
| A7 | 00 | - | C | 0 | 199 | 0 | Not used. must be 0 |
| | | | | | | | FAN PARAMETERS |
| F0 | 02 | On | C | 0 | 1 | 0 | Evaporator fan control type (controlled by Evaporator Defrost Probe). Must be 2 |
| F1 | 14.0 | -8°C /-7°C | F | 0 | 20 | 5 | Evaporator fan start temperature (On=Setpoint +F1 -A0) (Off=Setpoint +F1) |
| F2 | 00 | No | C | 0 | 1 | 1 | Evaporator fan off while compressor is off |
| F3 | 01 | Yes | C | 0 | 1 | 1 | Evaporator fan off during defrost |
| Fd | 01 | 1 minute | F | 0 | 15 | 1 | Evaporator Fan delay after defrost |
| | | | | | | | OTHER SELECTIONS |
| H0 | 00 | - | C | 0 | 15 | 0 | Serial address |
| H1 | 00 | - | C | 0 | 1 | 1 | Not used. Must be 0 |
| H2 | 00 | No | C | 0 | 3 | 1 | Enable keypad and remote control (must be '01' to enable) |
| H3 | 00 | 00 | C | 0 | 199 | 0 | Password for remote control |

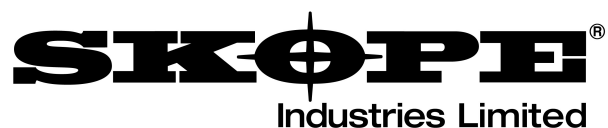
* High Pressure trip is maintained as alarm status by latching relay. To reset, the freezer must be unplugged and then replugged into the power supply.

Parameter Modification (if keypad is enabled)

1. Press aux (up) or def (down) to show the code of the parameter that has to be changed.
2. Press SEL to display the selected parameter value.
3. Press aux (up) or def (down) to increase or decrease the value.
4. Press SEL to temporarily confirm the new value, and display its code.
5. Repeat above procedures to alter further parameters.

Press PRG to lock in the new parameters and exit parameter modification procedure.

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