

**OPERATING INSTRUCTIONS FOR
LEEC HUMIDITY CABINETS
MODELS SFC2C AND SFC3C
WITH JUMO dTRON 316 CONTROLLER
& TLK38 OVER / UNDER TEMP CUT OUT**

CONTENTS

- 1.0 GENERAL DESCRIPTION**
- 2.0 INSTALLATION**
- 3.0 TEMPERATURE SETTING PROCEDURE**
- 4.0 HUMIDITY CONTROL**
- 5.0 MAINTENANCE**

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LEEC Limited
Private Road No 7
Colwick Industrial Estate
Nottingham
NG4 2AJ
United Kingdom

Tel: +44 (0)115 961 6222
Fax: +44 (0)115 961 6680

E-mail: sales@leec.co.uk
Web: www.leec.co.uk

1.0 GENERAL DESCRIPTION

These cooled laboratory humidity cabinets provide the user with extremely accurate and safe temperature control over a wide temperature range.

1.1 HEATING

Low wattage heaters are attached to the outer surface of the inner chamber in such a manner as to ensure even heating throughout the chamber.

1.2 COOLING

Direct expansion coils are coupled to a hermetic condensing unit via a solenoid valve. When the refrigeration switch (located on the left of the control panel) is switched on, the compressor runs continuously.

1.3 TEMPERATURE CONTROL



The temperature is accurately controlled by a JUMO dTRON 316 microprocessor temperature controller. The controller uses the signal from a PT100 sensor located in the chamber to control the current supplied to the heaters. The temperature can be easily adjusted (see section 3 for full details).

1.4 TLK38 OVER & UNDER TEMPERATURE SAFETY CUT OUT



A TLK38 digital cut out protects the contents of the chamber. When the chamber temperature goes out of limits, the appropriate cut out will operate an audible alarm and visible red neon. Two reset buttons are provided below the cut out for you to manually reset the out-of-limit system.

1.5 CIRCULATING FAN

Air is drawn through the chamber by a circulating fan located in the top and returned to the base via a full width duct at the rear of the chamber. A door micro switch stops the fan when the door is opened.

1.6 HUMIDITY

A wide range of fixed relative humidities can be achieved by adding a suitable saturated salt solution directly into the base of the chamber. See section 4 for more details.

2.0 INSTALLATION

2.1 The incubator has a factory fitted UK style, 13 Amp fused, moulded plug and requires a 240V 50Hz supply. The wiring inside the plug and mains flex is colour coded as follows:

- **BROWN** = **LIVE**
- **BLUE** = **NEUTRAL**
- **GREEN / YELLOW** = **EARTH**

The green POWER light will illuminate when the supply is connected and the POWER switch is in the ON position.

2.2 The incubator is internally protected by a 10 Amp fuse. The fuse holder is located on the rear of the cabinet and is clearly labelled as FUSE.

2.3 REFRIGERATION PRECAUTIONS!

- The incubator should be left to settle for 2 hours after final positioning before it is switched for the first time to allow the refrigerant to settle.
- Do not place the incubator in front of a window in direct sunlight.
- A qualified electrician or other competent person must carry out any electrical work required to install your incubator.
- Make sure that your incubator is not standing on its electrical cable.
- There are parts in your incubator that heat up. Always ensure there is adequate ventilation, as failure to do so can result in component failure. Keep all vent grilles clear.
- Before any cleaning or maintenance work is carried out, the mains supply must be switched off and the plug removed from the socket.

3.0 TEMPERATURE SETTING PROCEDURE

Switch the incubator on using the POWER switch located at the left hand side of the control panel (press the RESET button to cancel the buzzer if it sounds after initial switch on). The COOLING system will need to be ON, unless you wish to use your incubator as a HEAT ONLY humidity cabinet. This is important for the correct operation of the humidity cabinet.

3.1 The JUMO dTRON 316 microprocessor temperature controller on your incubator has two LED displays. The upper display, which is red, represents the actual chamber temperature. The lower display, which is green, represents the target temperature. The controller has 4 buttons marked as follows:



- PGM** - **Program** button (enters the Programming Mode).
- ▲** - **Increases** the chamber temperature.
- ▼** - **Decreases** the chamber temperature.
- EXIT** - **Exits** the Programming Mode.

The **yellow 3 LED** on the temperature controller shows when **heat** is being supplied. The **yellow 5 LED** on the temperature controller shows when **cooling** is being supplied.

3.2 The incubator operating temperature or set point (SP) can be altered by simply pressing either the ▲ button to increase the temperature or the ▼ button to decrease the temperature. When the required temperature has been entered, release all buttons and the green display will blink once to confirm that a new target temperature has been stored.

3.3 TLK38 OVER & UNDER TEMPERATURE SAFETY CUT OUT



A TLK38 digital safety cut out unit provides essential over & under temperature protection for the products inside the chamber. The cut out has buttons labelled as follows:

- P** - Enters the programming mode.
- U** - *No function.*
- ▲** - **INCREASES** the displayed value.
- ▼** - **DECREASES** the displayed value.

3.4 **SETTING AN OVER TEMPERATURE CUT OUT VALUE**

If, for example, you would like to operate your incubator at +20.0°C, an over temperature cut out value needs to be programmed into the cut out. We recommend that the cut out value is set to **2 degrees higher** than your chamber temperature. In the example above, the over temperature cut out set point needs to be set +22°C. To do this follow steps 1 - 3 below:

- 1) Press the **P** button **once only**. Flashing **AL1** will be displayed plus a value (the **over temperature** cut out value).
- 2) Press the **▲** button to increase the **over temperature** cut out value or the **▼** button to decrease the **over temperature** cut out value.
- 3) Once the value of your choice is displayed, release all buttons and after a short delay the new value will be stored and retained in permanent memory.

3.5 **SETTING AN UNDER TEMPERATURE CUT OUT VALUE**

If, for example, you would like to operate your incubator at +20.0°C, an under temperature cut out value needs to be programmed into the cut out. We recommend that the cut out value is set to **2 degrees lower** than your chamber temperature. In the example above, the under temperature cut out set point needs to be set +18°C. To do this follow steps 1 - 3 below:

- 1) Press the **P** button **twice**. Flashing **AL2** will be displayed plus a value (the **under temperature** cut out value).
- 2) Press the **▲** button to increase the **under temperature** cut out value or the **▼** button to decrease the **under temperature** cut out value.
- 3) Once the value of your choice is displayed, release all buttons and after a short delay the new value will be stored and retained in permanent memory.

3.6 **OVER & UNDER TEMP NEON'S, BUZZER & RESET BUTTONS**

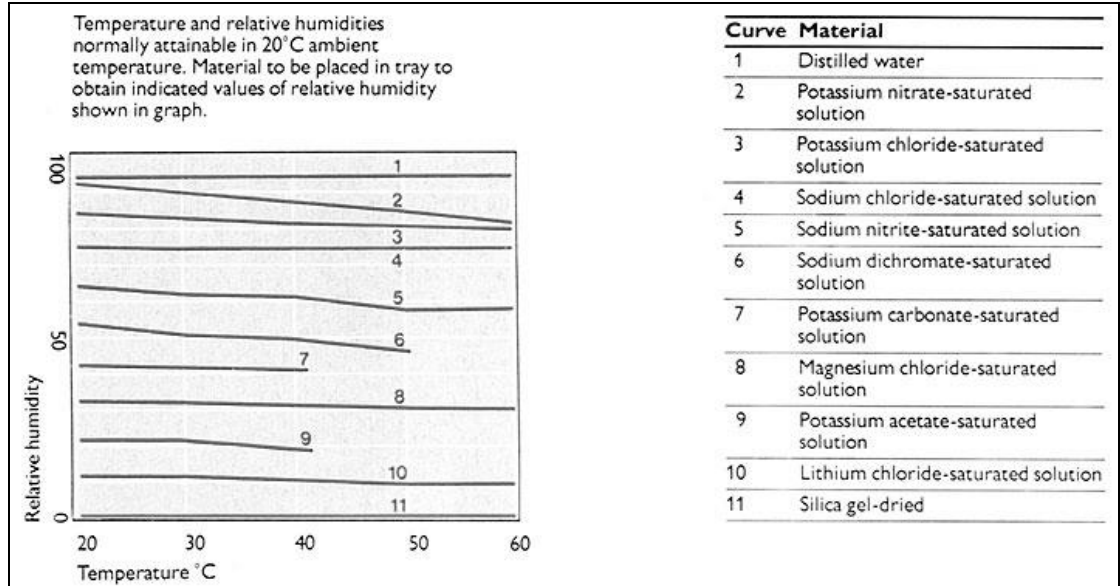
If the temperature in the incubators chamber goes above it's upper set point, the buzzer will sound and the over temperature neon will illuminate. The heaters will automatically disconnect to prevent further over heating. The buzzer & neon will remain on until a member of staff has acknowledged the alarm. To reset the buzzer & alarm, press the reset button along side the illuminated neon.

- 3.7 If the temperature in the incubators chamber drops below it's lower set point, the buzzer will sound and the under temperature neon will illuminate. The refrigeration system will automatically disconnect to prevent further over cooling. The buzzer & neon will remain on until a member of staff has acknowledged the alarm. To reset the buzzer & alarm, press the reset button along side the illuminated neon.

Allow the chamber temperature to stabilise before placing products inside the chamber.

4.0 HUMIDITY CONTROL

A wide range of fixed and relative humidities can be achieved by adding suitable saturated salt solutions to the base reservoir. The relative humidity of air in contact with saturated salt solutions reaches known equilibrium values at certain temperatures.



Salts Graph

The graph above shows the temperatures and relative humidities for several of the more common saturated salts. The distilled water/saturated salt solution should be topped up regularly and should fully cover the floor at all times. Do not allow the water/saturated salt solution to evaporate or the humidity control will be affected.

Allow the chamber temperature and humidity to stabilise before placing products inside the chamber.

5.0 MAINTENANCE

No routine maintenance is necessary but regular cleaning of the inner chamber is essential.

5.1 Keep ventilation grilles clear and unobstructed.

5.2 The chamber should be regularly de-frosted as a substantial build up of ice in the air circulation duct will restrict the airflow and affect the incubators performance. It is recommended that the service ports on the right of the incubator remain sealed with the threaded red bungs supplied to reduce the tendency for humidity in the air to condense out in the chamber.