

**OPERATING INSTRUCTIONS  
FOR LEEC HUMIDITY CABINET  
MODELS SFC2C/RH AND SFC3C/RH  
FITTED WITH  
JUMO dTRON 316 TEMPERATURE CONTROLLER,  
JUMO dTRON 316 HUMIDITY CONTROLLER,  
AND TLK38 OVER TEMPERATURE CUT OUT  
(240V)**

**PLEASE TAKE TIME TO READ THIS MANUAL**

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## 1.0 GENERAL DESCRIPTION

LEEC 'Ultrasonic Type' Humidity Cabinets provide the user with extremely accurate temperature & humidity control.

### 1.1 HEATING

Low wattage heater elements 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 is switched on, the compressor runs continuously. The solenoid valve will open and close automatically when cooling is required.

### 1.3 TEMPERATURE CONTROL



A Jumo dTRON 316 microprocessor temperature controller accurately controls the chamber temperature. This controller uses the signal from a PT100 sensor located in the chamber to control the current supplied to the heaters and also the cooling system's solenoid valve. Adjusting the SetPoint (SP) on the controller sets the temperature. A separate digital temperature display unit sets the over temperature safety cut out which is normally this is set to 2°C above the operating temperature.

### 1.4 OVER TEMPERATURE SAFETY CUT OUT



A TLK38 digital over temperature safety cut out is fitted to protect the contents of the chamber from accidental overheating. In an over temperature situation, the TLK38 will disconnect the heaters and sound an alarm buzzer. The heaters will automatically reconnect and will start heating again when the temperature falls below the safety cut out set point. **The over temperature safety cut out is normally set to 3° higher than the required chamber temperature.**

### 1.5 CIRCULATING FAN

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

### 1.6 HUMIDITY

A wide range of relative humidities can be maintained by selecting the appropriate value on the Jumo dTRON 316 Humidity Controller. Humidity is generated by a LEEC ultrasonic fine mist generator. The built-in refrigeration system is used to de-humidify the chamber air as necessary.

## 2.0 INSTALLATION

2.1 Connect the 3-core cable to a 240V, 50Hz mains supply as follows:

- **Brown to Live**
- **Blue to Neutral**
- **Green/Yellow to Earth**

2.2 The apparatus is internally protected by a fuse, which isolates the cabinet from the electrical supply if excessive current is drawn. The fuse holder is located at the rear of the cabinet.

### 2.3 ULTRASONIC HUMIDIFIER

The ultrasonic humidifier is packed separately inside the chamber. It is designed to slide into the holder at the top of the chamber. See section 4 for more details.

### 2.4 DEMINERALISED WATER SUPPLY

The cabinet will have been supplied with a plastic water reservoir which should be  $\frac{3}{4}$  filled with demineralised water. It should be positioned above the top of the cabinet and connected to the nozzle on the rear of the cabinet with the tubing supplied. **Ensure all connections are secure.** Refer to the important note in section 4.3 regarding use of distilled or de-ionised water.

### 2.5 CONDENSATE DRAIN

A condensate drain point is fitted at the rear right hand side of the cabinet. Remove the metal screw-on cap and place a suitable drip tray underneath the drain point to catch any excess water.

### 2.6 CABINET LEVELLING

Ensure that the cabinet is sited such that any condensate, which may form on the chamber floor, will run towards the drain point. Failure to do this can leave free water lying on the floor of the cabinet. This will give unstable humidity levels under certain operating conditions.

### 3.0 TEMPERATURE SETTING PROCEDURE

Switch the incubator on using the POWER switch located on the left of the control panel.

If you are working at temperatures close to or below ambient, the fridge system must be switched ON to provide the necessary cooling. However, temperatures well above ambient will not require any cooling, so the fridge could be switched OFF if required.

### 3.1 JUMO dTRON 316 TEMPERATURE CONTROLLER



The 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** key, enters the programming mode.
- ▲** - **Increases** the chamber temperature set point.
- ▼** - **Decreases** the chamber temperature set point.
- EXIT** - **Exits** the programming mode.

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

There are some yellow numbers at the bottom of the display, which will illuminate when certain functions are being performed. The yellow numbers represent:

- 3** - **Heating**  
If the yellow **3** is ON, heat is being supplied to the chamber. If the yellow **3** is FLASHING, the target temperature has been reached and the heaters are being pulsed to maintain a stable temperature. If the yellow **3** is OFF, heat is not being supplied to the chamber
- 5** - **Cooling**  
If the yellow **5** is ON, cooling is being supplied to the chamber. If the yellow **5** is OFF, cooling is not being supplied to the chamber.

**IMPORTANT:** **Allow the temperature to stabilise before putting into use.**

### 3.2 **TLK38 DIGITAL OVER TEMPERATURE SAFETY CUT OUT**

An independent over temperature safety cut out disconnects the heaters in event of an accidental over temperature situation. **The over temperature safety cut out is normally set to 3° higher than the required chamber temperature.**

To adjust the cut out set point, proceed as follows:

- Press the **P** button once.
- **AL 1** (plus a temperature) will be displayed. That temperature is the cut out set point.
- Use the **▲** button to increase the cut out set point or the **▼** button to decrease the cut out set point.
- Press the **P** button once to store the new cut out set point.
- Press the **P** button again.

*(You may notice that **AL 2** and a temperature of 0 was briefly displayed. Ignore this. It has no function on this incubator).*

### 3.3 **OVER TEMPERATURE BUZZER**

After an over temperature situation has occurred, a buzzer sounds and the heaters automatically cut out. The heaters are self-resetting and will cut in again when the temperature falls below the safety cut out. The buzzer will remain on until the chamber temperature falls below the safety cut out set point.

#### 4.0 HUMIDITY CONTROL

Connect the plastic water reservoir to the brass connector, which is located at the top of the cabinet at the rear with the supplied plastic tubing.

If you do not require the humidity system on during your tests, **switch the RH switch OFF**, and **increase the target RH level on the humidity controller to 100%**. (This will prevent the system from trying to de-humidify by cooling).

#### 4.1 FITTING THE ULTRASONIC HUMIDIFIER

Stand the ultrasonic humidifier on the chamber floor in the centre. Connect the black waterproof electrical connector to the black waterproof plastic socket on the back of the humidifier. Connect the blue water pipe to the water inlet fitting on the side of the humidifier by push the water pipe into the metal fitting.

To release the water pipe, push the metal collar in, and pull the water pipe out.

#### 4.2 JUMO dTRON 316 HUMIDITY CONTROLLER



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

- PGM** - **Program** key, enters the programming mode.
- ▲** - **Increases** the chamber humidity set point.
- ▼** - **Decreases** the chamber humidity set point.
- EXIT** - **Exits** the programming mode.

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

There are some yellow numbers at the bottom of the display, which will illuminate when certain functions are being performed. The yellow numbers represent:

- 1** - **Humidifying**  
If the yellow **1** is ON, humidity is being added to the chamber.
- 5** - **De-humidifying**  
If the yellow **5** is ON, the chamber is de-humidifying.

**IMPORTANT:** **Allow the humidity to stabilise before putting into use.**

4.3 **LOW WATER ALARM**

The humidity generator inside the cabinet has its own internal water reservoir. This reservoir is kept to a predetermined level by being topped up from the main reservoir tank automatically. If the water level in the humidifier fails to recover to the normal level (due to interruption of the water supply), the humidifier will automatically go into a 'safe mode' (i.e. the generator will switch off) and the audible/visual low water alarm on the main control panel will activate after a short delay period. It is normal for the alarm to sound during initial filling.

**NOTE:** *Only use demineralised water and replenish as required. Use of distilled water or tap water will cause permanent damage to the humidifier. Such damage is not covered by the LEEC warranty.*

5.0 **MAINTENANCE**

No routine maintenance is necessary but regular cleaning of the inner chamber is essential. Occasionally remove any fluff build up from the condenser with a vacuum. ***Keep all ventilation grilles clear at all times.***

5.1 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. The service ports are intended for passing probes through.