

**INSTRUCTIONS FOR  
LT601/RH & LT1201/RH  
COOLED HUMIDITY CABINETS  
FITTED WITH  
JUMO 316 MICROPROCESSOR CONTROLLERS  
AND EAT100 OVER TEMPERATURE  
SAFETY CUT OUT.  
(includes /RHX models)**

**PLEASE READ THIS MANUAL BEFORE USE**

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## **1.0 CABINET FEATURES**

The LT601/RH and LT1201/RH Cooled Humidity Cabinets are constructed from stainless steel. They have highly efficient Polyurethane foam insulation. The refrigeration & electrical control system is located on top of the main body, behind the electronic control panel.

### **1.1 HEATING & COOLING**

The unique temperature control system ensures exceptionally good temperature performance. A powerful built in refrigeration system provides cooling and low wattage electric heaters provide heating. Door micro switches stop the internal fans when the door(s) is opened to minimise temperature disturbance.

### **1.2 TEMPERATURE CONTROLLER**

The temperature is accurately controlled by a Jumo dTRON 316 microprocessor controller. The Jumo dTRON 316 uses a signal from a PT100 sensor, which is located inside the chamber. The controllers purpose is to control the cooling system switching and the current supplied to the heaters.

### **1.3 EAT100 DIGITAL OVER TEMPERATURE CUT OUT**

An EAT100 digital over temperature cut out protects the products in the LT601/RH & LT1201/RH chamber by allowing the user to set an over temperature safety cut out value. If the chamber overheats, the cut out will disconnect the heating system. A red neon will illuminate to indicate that the protection device has operated. A reset button is provided for the user to manually reset the heaters.

### **1.4 HUMIDITY CONTROLLER**

The humidity level (%RH) inside the chamber is accurately controlled by a Jumo dTRON 316 microprocessor controller. The Jumo dTRON 316 uses a signal from a Vaisala humidity sensor, which is located inside the chamber. A wide range of relative humidities can be maintained by programming a value into the humidity controller. The humidifier(s) turn the water into mist by vibrating it ultrasonically. The refrigeration system dehumidifies the chamber air as necessary.

### **1.5 ULTRASONIC HUMIDIFIER**

The LT601/RH is supplied with one ultrasonic humidifier and the LT1201/RH is supplied with two. Each humidifier has two connections to it – a black plastic waterproof connector for the electrical supply and a plastic tube to carry the water. Water will travel down the supply tube by gravity and fill the ultrasonic humidifier reservoirs automatically when the %RH switch is on.

### **1.6 WATER RESERVOIR**

A plastic water reservoir is provided which needs to be connected to the brass water inlet nozzle(s), which are located at the rear of the cabinet. Plastic tubing is provided for this purpose. The reservoir must only be filled with demineralised water. The LT601/RH and LT1201/RH will automatically take water from the reservoir and add humidity to the chamber via the ultrasonic humidifier(s).

### **1.7 DRAIN TAP AND DRIP TRAY**

A drain tap is provided underneath the cabinet to allow excess condensate water to drain out of the chamber. The tap is located underneath the cabinet's door sill. A black lever is provided to open or close the tap. Place the drip tray underneath the tap.

## 2.0 INSTALLATION & PRECAUTIONS

The LT601/RH and LT1201/RH are factory fitted with a UK 3 pin plug. The wires in the plug and supply cable are colour coded as follows:

- Brown = Live
- Blue = Neutral
- Green / Yellow = Earth

The LT601/RH and LT1201/RH require a 240V 50Hz supply. The mains plug is fitted with a 13 Amp fuse.

### WATER AND ELECTRICAL CONNECTIONS

Connect the demineralised water supply tank(s) to the inlet(s) at the rear of the cabinet. Connect the plastic water tubing (inside the chamber) to the nozzle(s) on the ultrasonic humidifier(s), and the black electrical connector(s) to the black plastic socket(s) on the side of the humidifier(s).

### **IMPORTANT!**

Make sure that the water reservoir is placed higher than the water inlet nozzle. A static head of a few inches should be enough. NEVER place the water reservoir on top of the incubator.

Do not place the humidifier over the drain hole(s) at the bottom of the chamber.

### POINTS TO NOTE:

- Before the cabinet is switched on, it should be left for 6 hours after final positioning to allow the refrigerant to settle.
- Do not place the cabinet in direct sunlight.
- A qualified electrician or other competent person must carry out any electrical work required to install the cabinet.
- Make sure that the cabinet is not standing on its electrical supply cable.
- Keep all ventilation grilles clear. The compressor gives off heat when operating. Always ensure there is adequate ventilation around the cabinet. Failure to do so may result in component failure.
- Before any cleaning or maintenance work is carried out, the mains supply must be switched off and the plug removed from the electrical socket.
- Do not obstruct the drain hole(s) at the bottom of the chamber.

### 3.0 INITIAL SET UP PROCEDURE

Switch the cabinet on using the POWER switch located on the left hand side of the control panel. The green neon inside the switch will illuminate when the supply is connected, and the switch is in the down (ON) position.

- 3.1 Switch the HEATING system ON. (If the HEATING switch is off, the cabinet will not be able to add heat to the chamber).
- 3.2 Switch the COOLING system ON. (If the COOLING switch is off, the cabinet will not be able to cool down or de-humidify the chamber).
- 3.3 Switch the HUMIDITY system ON. (If the HUMIDITY switch is off, the cabinet will not be able to add humidity to the chamber).
- 3.4 The chamber circulating fan(s) and humidifiers will only operate when the outer door(s) are closed.
- 3.5 **OVER TEMPERATURE SAFETY CUT OUT**



An EAT100 digital over temperature safety cut out with a red LED display provides over temperature protection for the contents of the chamber. The cut out has a red push button that allows the user to adjust the over temperature cut out value. The display will be blank in normal use (it will only illuminate when the red button is pressed).

### 3.6 SETTING THE OVER TEMPERATURE CUT OUT VALUE

If, for example, you would like your cabinet to operate at a chamber temperature of +20°C, an over temperature cut out value will need to be programmed into the cut out. We recommend that the over temperature cut out value is set to 2 degrees higher than the chamber operating temperature. In this example, the over temperature cut out set point needs to be set to +22°C.

To set this follow steps 1 to 3 below:

- 1) Press & hold the red push button. The display will illuminate.
- 2) Whilst holding the red push button down, rotate the small black knob clockwise to increase the displayed value or the anti-clockwise to decrease the displayed value.
- 3) Once the value of your choice is displayed, release the red push button. The display will go blank but the new value will be stored and retained in permanent memory.

### 3.7 OVER TEMPERATURE NEON & RESET BUTTON

If the chamber overheats, a red neon will illuminate and a buzzer will sound. The heaters will automatically disconnect to prevent further overheating. The neon and buzzer will remain on until the user has acknowledged the alarm. To reset the system, press the black reset button next to the red neon.

## 4.0

### SETTING THE TEMPERATURE



The Jumo dTRON 316 microprocessor temperature controller fitted to the LT601/RH and LT1201/RH has a three colour LED display. The upper display (red) represents the actual chamber temperature. The lower display (green) represents the target temperature. The controller has 4 buttons marked as follows:

- ▲ - **Increases** the chamber temperature
- ▼ - **Decreases** the chamber temperature
- PGM** - Enters the **programming** mode (Engineer use only)
- EXIT** - **Exits** the programming mode (Engineer use only)

4.1 To adjust the chamber temperature, simply press the ▲ button to increase the temperature or the ▼ button to decrease the temperature. The green display will blink once to confirm the parameter has been stored.

4.2 The Jumo dTRON 316 controller has several yellow indicators on the display. The yellow indicators may be on, off or flashing. The indicators represent:

**Yellow 3** - **Heating**  
If the yellow **3** is displayed, the chamber is **heating**.

**Yellow 5** - **Cooling**  
If the yellow **5** is displayed, the chamber is **cooling**.

Failures caused by the user entering the engineer-only programming mode are excluded from the warranty offered.

## 5.0 SETTING THE HUMIDITY



The Jumo dTRON 316 microprocessor humidity controller fitted to the LT601/RH and LT1201/RH has a three colour LED display. The upper display (red) represents the actual chamber humidity. The lower display (green) represents the target humidity. The controller has 4 buttons marked as follows:

- ▲ - **Increases** the chamber humidity
- ▼ - **Decreases** the chamber humidity
- PGM** - Enters the **programming mode** (Engineer use only)
- EXIT** - **Exits** the programming mode (Engineer use only)

5.1 To adjust the chamber humidity, simply press the ▲ button to increase the chamber RH level or the ▼ button to decrease the chamber RH level. The green display will blink once to confirm the parameter has been stored.

5.2 The Jumo dTRON 316 controller has several yellow indicators on the display. The yellow indicators may be on, off or flashing. The indicators represent:

**Yellow 1** - **Humidifying**  
If the yellow **1** is displayed, the chamber is **humidifying**.

**Yellow 5** - **De-humidifying**  
If the yellow **5** is displayed, the chamber is **de-humidifying**.

### 5.3 LOW WATER ALARM

The ultrasonic humidifier(s) inside the cabinet has its own internal water reservoir, which is kept to a preset level automatically. This is topped up by the main water reservoir. If the water in the humidifier falls below the 'safe level' (due to interruption of the water supply), the humidifier will automatically go into 'standby' (the humidifier will switch itself off) and the audible / visual **LOW WATER!** alarm on the main control panel will activate.

#### **WARNING!**

Only use demineralised water. Use of distilled or tap water will cause permanent damage to the ultrasonic humidifier. Such damage is not covered by the LEEC warranty.

## 6.0 MAINTENANCE

The chamber should be defrosted if there is a build up of ice in the air duct. Ice will restrict the airflow and severely affect the cabinet's performance. To defrost, choose one of the following methods:

- 1) Switch the humidity system OFF, switch the refrigeration system OFF and raise the chamber temperature to +50°C for several hours. Defrost water should drain to the base of the chamber and out through the drain tap into the tray. Be prepared to empty the tray frequently.
- 2) Switch the cabinet off completely, disconnect it from the electrical supply and leave the outer door(s) propped open over night. Defrost water should drain to the base of the chamber and out through the drain tap into the tray. Be prepared to empty the tray frequently.

- 6.1 Regular cleaning & de-fluffing of the condenser is recommended. Keep all ventilation grilles clear & unrestricted. The inner chamber of your cabinet can be cleaned with a damp cloth and a mild detergent solution. The exterior can be cleaned with 3M Stainless Steel Spray Polish or approved equivalent.

**DO NOT USE BLEACH OR CHLORINE BASED CLEANERS ON STAINLESS STEEL SURFACES.**

**DO NOT USE SCOURING PADS OR ABRASIVE CLEANERS ON STAINLESS STEEL SURFACES.**

- 6.2 In the event of spillage of hazardous materials use the appropriate decontamination method as prescribed by the HSE or local Safety Officer. If you require any further advice, contact QED Scientific on (+44) 01663 735494.