

**OPERATING INSTRUCTIONS FOR
MODELS P2, P3, P33
WITH
JUMO dTRON 316 CONTROLLER
AND TLK38 CUT OUT
(240V)**

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1.0 GENERAL DESCRIPTION

Model P2	150 litre chamber capacity
Model P3	320 litre chamber capacity
Model P33	730 litre chamber capacity

1.1 HEATING AND INSULATION

Even heating throughout the entire chamber is ensured by the LEEC patented heating element. The low wattage element is bonded to the outer surface of the chamber walls ensuring quick heat conduction and low heating element temperature, only a few degrees above the incubator operating temperature.

A further development is the moulding technique employed in construction of the chamber. The chamber, complete with its heating element and other components, is placed in a mould and encased in semi-rigid closed cell polyurethane foam under pressure. This technique not only excludes the atmosphere and possible condensation from reaching the element, but also guarantees leak proof insulation of the highest quality. Additional insulation is provided by 25mm of expanded polystyrene.

1.2 CONTROLS

A Jumo dTRON 316 Microprocessor Controller accurately controls the temperature of the incubator. The controller uses the signal from a PT100 sensor located in the chamber to control the current supplied to the heaters. The temperature sensor positioned so that response to change is very fast. The controller displays both target and actual chamber temperatures.

1.3 OVER TEMPERATURE SAFETY CUT OUT

A TLK38 digital over temperature safety cutout is fitted. The cut out is normally set to 2°C higher than the chamber operating temperature. In the event of the chamber temperature climbing above the target temperature, this cut out will disconnect the heaters.

1.4 CIRCULATION FAN(S)

Fan circulation is the key to accurate temperature performance. It is also useful when the chamber is heavily loaded. The fan(s) are located at the top of the chamber. Air is drawn up through the chamber, circulated around the full width ducting, and returned to the chamber floor. The fan(s) also improve temperature recovery after door opening.

1.5 COOLING COILS

Cooling coils are necessary when working near or below ambient temperatures, or when heat-dissipating apparatus is used inside the chamber. A coil of copper tubing is located in the air duct around the fan blade to give maximum efficiency. The coil should be connected to a source of cooled liquid at 5° to 10°C below the required working temperature. The LEEC Self Contained Refrigeration Unit is recommended for this purpose.

2.0 INSTALLATION

2.1 CONNECTION TO THE ELECTRICAL SUPPLY

Your LEEC incubator has a factory fitted UK style moulded plug. The wiring inside the plug and mains cable is colour coded as follows: -

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

2.2 Your LEEC incubator requires a 240V 50Hz mains supply.

A 5 Amp fuse is fitted to the plug. A secondary 5 Amp internal fuse is fitted to the rear of the cabinet, which provides additional protection.



A qualified electrician or other competent person must carry out any electrical work required to install the incubator.



Do not place the incubator in direct sunlight or near a heat source.



Make sure the incubator is not standing on its electrical supply cable.



Before any cleaning or maintenance work is carried out, the mains supply must be switched off and the plug removed from the electrical socket.

3.0 TEMPERATURE SETTING PROCEDURE



JUMO 316

3.1 JUMO TEMPERATURE CONTROLLER

The target temperature set point (SP) is displayed in green and the actual chamber temperature is displayed in red. The yellow **3** LED on the controller shows when current is being supplied to the heaters.

3.2 TEMPERATURE SETTING PROCEDURE

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

The incubator will be factory set to operate +37.0°C unless otherwise specified. Allow the temperature to stabilise before use.

3.3 DIGITAL OVER TEMPERATURE SAFETY CUT OUT



TLK38

A TLK38 digital over temperature safety cut out provides essential over temperature protection for the products inside the chamber. When an over temperature situation occurs, a buzzer will sound and the cut out will disconnect the heaters. The cut out will automatically re-connect the heaters when the chamber has cooled down. 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 +37.0°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 +39°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, press the **P** button to store the new value in permanent memory.
- 4) Press the **P** button again.

4.0 COOLING COIL

The incubator is fitted with a cooling coil that allows you to work at or below ambient temperature. The connections are at the rear of the incubator.

- 4.1 To use this facility, a supply of cold water or other coolant with a temperature approximately 5°C below the required working temperature must be circulated through the cooling coils. A static head of a few inches will provide sufficient flow.
- 4.2 The LEEC Self Contained Refrigeration Unit is purpose-built to supply this cooled liquid. The thermostatically controlled unit has a built in circulating pump which feeds a cooled liquid round the incubator cooling coils.

5.0 MAINTENANCE

- 5.1 No routine maintenance is necessary but regular cleaning of the inner chamber is essential. Cleaning of the exterior can be done with a mild soap solution. Dry the exterior surfaces after cleaning.
- 5.2 Although made from zinc treated steel and finished in corrosion resistant enamels, these incubators are **not** designed for high humidity work.