



Cooled Incubators Series 1, 3 & 4

Instruction Manual

Instruction Manual for LMS Cooled Incubators

Series 1, 3 & 4

Series 1 Models

305 - 60 litre capacity

303 - 180 litre capacity

250 - 250 litre capacity

Series 3 Models

100 - 90 litre capacity

200 - 227 litre capacity

300 - 290 litre capacity

400 - 450 litre capacity

Series 4 Models

600 - 600 litre capacity

1200 - 1200 litre capacity

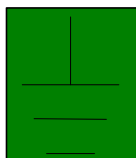
INTRODUCTION

We thank you for purchasing a LMS Cooled Incubator, which we trust, will give you many years of satisfactory service.

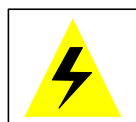
Manufactured in the United Kingdom using the finest materials and modern production techniques your Cooled Incubator has already undergone extensive testing in our factory.

For correct operation it is essential that you observe the operating and maintenance instructions in this manual.

EXPLANATION OF SYMBOLS USED



Electrical Earthing Point



Electrical Hazard Warning
(Mains Electrical Supply Within)

Aux. Circuit

Exhibited where an internal power socket is fitted

General Safety Instructions

The physical and chemical properties of your load should be carefully considered with regard to the effect this may have on the LMS Cooled Incubator. They are **not** internally sparkfree (available on certain models) or explosion proof. Therefore solvents and/or chemicals which may form a flammable mixture together with air are unsuitable for these cabinets; otherwise considerable damage can occur.

Transportation

Series 1: If these cabinets have to be carried it is recommended that at least 2 people assist and that gloves should be used on all occasions. The cabinet should be kept upright.

Series 3 & 4: These cabinets are supplied on pallets and it is recommended that these are moved by pallet truck or fork lift by competent persons, including someone to assist in stabilizing the load. The cabinet should be kept upright.

Serial Number Plate

The Serial Number Plate contains the year of manufacture, in the following format: -

xxxx/99x = year of manufacture 1999

xxxx/01x = year of manufacture 2001

LMS COOLED INCUBATORS

Quick Start Instructions

Commissioning

- Remove all packing materials (CARE: door keys wrapped in shelf packaging).
- Check for signs of external damage (this must be reported to the supplier immediately).
- Check supply voltage and cycles to ensure it is in accordance with your supply.
- Before connecting to the mains, please allow the Incubator to stand for a minimum period of 24 hours to allow the refrigerant to settle after transportation (CARE: failure to comply with this instruction may cause damage to this instrument and invalidate the guarantee).
- After 24 hours you may switch the incubator on and start your application.
- Please ensure refrigeration switch on the rear of the unit is switched on.
- Maintain a minimum 100mm air gap around the incubator and ensure it is not situated in direct sunlight.

Temperature Control

- The digital controller has been factory tuned for optimum performance and set at 20°C.

To obtain the required temperature:

Press and hold the * button, this will display the set point (with the programmable temperature controller the set point is the lower of the two displays in orange) – press either the ? to increase or ? to decrease. When the desired set point is reached release the * button. The incubator will now start to react to your new set point temperature.

Temperature Controller with Programming

It is necessary to write a program before a program can be run. There are no stored programs within the temperature controller at delivery unless this has been specified otherwise. See general programming information Section 5

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Section 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

The standard range of LMS cooled incubators comprises of nine models, all of which are available with a range of optional extras to suit individual requirements. A further two models, 410XAL and 610XAL, which have special built in features, are also available. Details on request.

1.2 CONSTRUCTION

The outer case of all models in Series 1 and 3 is of sheet steel finished in white stoved enamel. Foam insulation is used, to ensure maximum insulation against external ambient temperature. The internal liner of models in Series 1 is of a high impact vacuum formed plastic with a minimum of crevices, and all corners are radiused. Models in Series 3 have an unobstructed working space fabricated from polished stainless steel complete with multi position plastic moulded shelf supports, which allow the three white plastic coated steel shelves to be randomly positioned to suit individual requirements.

All cooled Incubators within the LMS Series 1 and 3 range incorporate both a door lock and magnetic gasket with all control features being set into a control panel and positioned so as to minimise the risk of accidental alteration. Series 4 models have both a stainless steel exterior and interior and come with 5 stainless steel shelves (model 600) and 10 stainless steel shelves (model 1200).

1.3 TEMPERATURE CONTROL

The temperature control method utilises a controller offering digital selection and readout of temperature.

1.4 COOLING

Cooling is provided by a hermetically sealed refrigeration system which can be independently switched off for defrosting purposes, or for operation at temperatures 10°C or more above ambient. All LMS Cooled Incubators comply with the latest CFC-free regulations.

1.5 AIR FLOW

A full air flow system is used. The airflow being at low velocity but high volume.

Section 2

INITIAL EXAMINATION AND INSTALLATION

2.1 COMMISSIONING

- (i) Remove all packing materials.
- (ii) Check for signs of external damage (this **MUST** be reported immediately to the Carrier and Supplier).
- (iii) Check that the electrical supply details on the information Rating Plate, which is fitted to the rear panel, are in accordance with the available electrical supply.
- (iv) All cooled incubators are supplied with a 3 pin moulded plug, which if not suitable may be replaced by an electrician or other competent person. Connect conductors as follows: **BROWN** to live, **BLUE** to neutral, **GREEN/YELLOW** to earth.
- (v) Position the cooled incubator so that approximately 100mm of free space exists around the cooled incubator.
- (vi) Adjust levelling foot or feet (depending on model) so that the cooled incubator sits firmly. Lockable castors (where fitted) **MUST** be locked.
- (vii) Please ensure that the refrigeration switch, which is fitted on the rear panel on the right hand side, is in the **ON** position (down).
- (viii) After the cooled incubator has been sited **allow 24 hours before switching on.**

2.2. CONTROLS – Common to All Models

2.2.1 Fuse

A 1.25" TYPE F cartridge fuse in a screw fitting carrier is located at the rear of the control compartment adjacent to the Serial Number plate on which the fuse value is indicated.

2.2.2. Refrigeration Switch

To the rear of the control compartment on the right hand side is the refrigeration isolator switch. This switch should always be in the **ON** position (down) except (A) when the cooled incubator is to be used at prolonged periods set at an operating temperature of 10°C or more above ambient, or (B) when defrosting the cooled incubator.

2.2.3 Non-Adjustable Overheat Protection Device

This device is fitted within the air mixing chamber to safeguard the cooled incubator should a fault condition of overheating develop. Operation of this device will be indicated by the Red 'safety' neon light on the front panel being illuminated. In the event of this happening the cooled incubator must be switched off until the reason for the fault condition is established and the fault itself is rectified.

2.3 **TEMPERATURE CONTROLLER**

The Digital Controller has been factory tuned for optimum performance. To obtain the required operational temperature press and hold the * button, the set point temperature will be displayed (with the programmable temperature controller the set point temperature, is the lower of the two displays, in orange). To alter the set point temperature press and hold the * button and press either the σ or τ buttons as required, σ to increase temperature, τ to decrease. When the desired set point temperature is achieved, release the * button. The interior temperature of the cooled incubator will now be displayed and will gradually adjust until the set point temperature is reached.

2.4 **INDICATOR & CONTROL LAYOUT**

Series 1 and 3

The Red 'safety' neon only illuminates when an over temperature fault condition occurs – see Section 2.2.3.

The Temperature Controller display will be continuously illuminated whilst the cooled incubator is connected to a mains electrical supply.

Series 4

The Red 'safety' neon only illuminates when an over temperature fault condition occurs – see Section 2.2.3.

The Green neon light and Temperature Controller display will be continuously illuminated whilst the cooled incubator is connected to a mains electricity supply.

Section 3

OPTIONAL EXTRAS WHERE FITTED
ALL NON PROGRAMMABLE MODELS

3.0 AUTOMATIC TEMPERATURE CYCLING

On these models, the digital controllers are mounted either side of a time clock and will be illuminated in turn according to the time clock settings. (NB – On changeover the controller will briefly indicate 18.8.8 for few seconds – this is quite normal).

Changing from one controller to the other is done automatically by a time switch which can be one revolution every 24 hours or one revolution every 7 days, depending on whether a 24 hour or 7 day clock is fitted.

After removing the time switch cover, time settings can be adjusted by pulling outwards the segments and reinserting them according to requirements.

To set the time initially, the clock hands can be turned forwards in time (clockwise) but not backwards (anti clockwise).

3.1 AUTOMATIC DEFROST

On Series 3 and optionally on Series 1, the cabinet is set to defrost for a duration of 10 minutes in every 6 hours. This defrost will give a slight rise in air temperature. If this rise should create any problems the defrost can be over-ridden by the defrost isolator switch at the back of the electrics compartment. On Series 4 the defrost occurs 4 times every 24 hours; duration is controlled by the ice build up internally.

On Series 1 and Series 3 cabinets, any defrost water drains away to a tray mounted on the compressor. On Series 4 cabinets the water drains into a tray (supplied) which must be fitted in the special tracks mounted underneath the cooled incubator during installation. On all models this water evaporates harmlessly away.

3.2 HIGH/LOW ALARM OPTION

The high/low alarm is a manually adjusted alarm option fitted to the instrument's front panel.

In the event of an alarm condition, the following action will be taken:

An audible alarm will sound and a secondary safety system will be activated, preventing the cooled incubator temperature from rising above or falling below the set alarm limits.

3.3 **INNER PERSPEX DOOR**

On incubators fitted with this feature and depending on the temperature difference between the inner working chamber and the space between the inner and outer doors, some slight twisting may occur.

3.4 **CHART RECORDER**

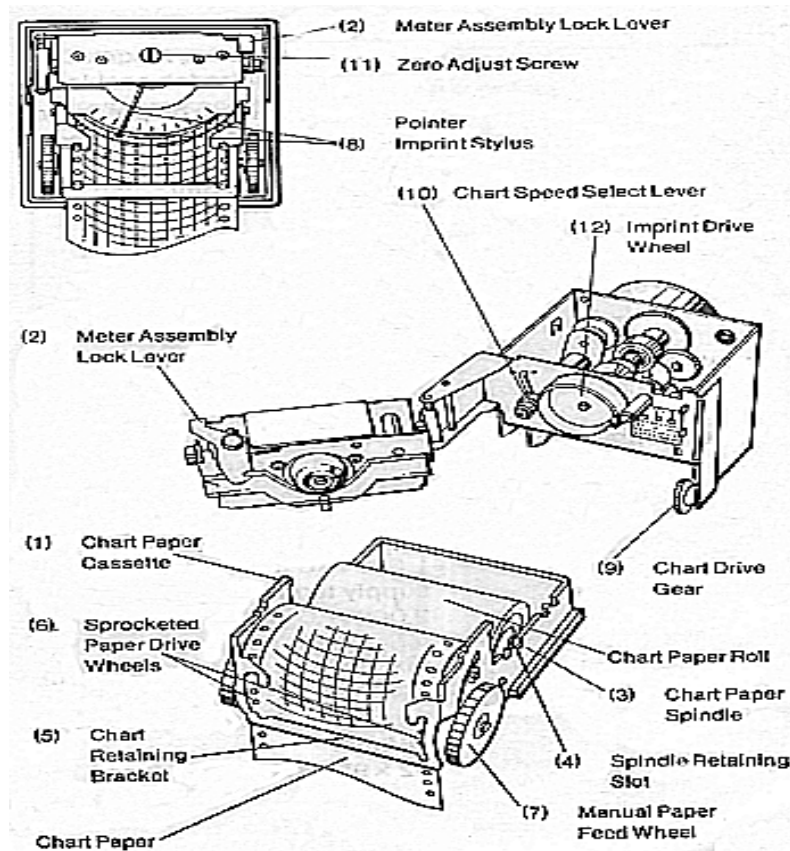
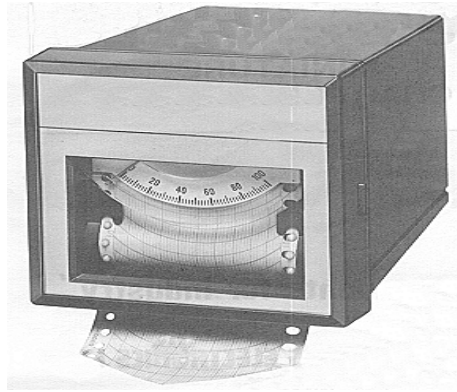
Chart Paper Loading (see below)

1. Remove front bezel by simultaneously pressing the retaining catches on each side.
2. To gain access to the chart paper cassette (1). First unlock the meter assembly by moving the locking lever (2) to the left and hinge outwards. Remove cassette by gripping firmly and pulling forward.
3. To load chart paper. First fit spindle (3) into new roll of chart paper. Clip roll into spindle retaining slots (4) on the cassette with the paper unrolling from the bottom. With the chart retaining bracket (5) lifted, feed the paper onto the sprocketed paper driving wheels (6). Close chart retaining bracket (5) and check paper feed by operating the manual feed wheel (7).
4. Replace cassette to engage chart drive gear (9) and close hinged meter assembly ensuring that the locking lever (2) latches closed.

Caution: Take care not to damage the meter pointer or imprint stylus when closing the meter assembly.

Operation (see figure below)

Load chart paper as previously described. If required, the meter pointer/stylus (8) can be set to mechanical zero, with power off, by carefully turning the zero adjustment screw (11).



Note that the stylus may not move freely if the recorder is in the imprint section of its operating cycle with the stylus pressed against the chart paper. In this case the recorder chart motor should be operated for a few seconds until the imprint pressure is released, or the imprint drive wheel (12) can be manually rotated. The chart paper can be manually advanced by operating the manual paper feeding wheel (7) to set the desired zero time position.

Section 4

MAINTENANCE & REPAIR

4.1 EQUIPMENT RATINGS

220/240V AC, 50 Hz. Up to 11 amps max. (see rating plate for details). The cooled incubator is designed to operate in an environment from +10°C to 30°C with a relative humidity from 5 - 85% RH non-condensing. Correct functionality of the cooled incubator or its safety features cannot be guaranteed if it is used outside these ratings.

4.2 REPLACEMENT OF FLUORESCENT LAMPS (WHEN FITTED)

This must be carried out with the mains power switched off and by a competent person or engineer. Replacement lamps must be of the same size, wattage and voltage as originals.

4.3 ROUTINE MAINTENANCE

It is recommended that the cooled incubator be inspected annually by a competent service engineer. The exterior and interior surfaces can be maintained in as new condition using standard non-abrasive or non-corrosive cleaners. Solvent based cleaners must not be used. Switch off during all cleaning operations. Allow drying before switching on. On Series 3 and 4 cabinets, the condenser should be brushed clean every six months.

A complete defrost is recommended periodically depending on application

To effect a defrost complete the following: -

- A. Switch off the cooled incubator at the mains switch.
- B. Allow the cooled incubator's interior to attain ambient temperature by opening the door.
- C. If necessary, to speed up defrosting, start a heating cycle by setting the temperature to 35°C and turning the refrigeration off.
- D. Allow the cabinet to completely dry-out inside before reusing (the process usually takes 24 hrs). Please ensure that the cabinet door remains open during this process.

Section 5

TERMS AND CONDITIONS **FOR LMS GUARANTEE**

1. Damage on delivery must be reported in writing immediately to LMS.
2. Equipment must be installed as per instructions.
3. Equipment must be used, serviced and maintained as per instructions.
4. Equipment must not be modified electronically or in relation to the refrigeration/air flow system unless LMS agreement is obtained.
5. Equipment malfunction under the terms of the guarantee must be reported to LMS.
6. LMS reserves the right to repair or replace damaged on delivery or malfunctioning equipment.
7. If it is found subsequently that the purchaser of the equipment was responsible for the damage/malfunction a charge will be made by LMS including any carriage charges.
8. If it is necessary to return equipment to LMS, the equipment must be packaged so as to prevent any damage.
9. Guarantee is for 2 years and cannot be passed on to a subsequent equipment owner.
10. To register for the 2 year Guarantee please complete and return the enclosed Guarantee Card.

In all cases please quote the following details: -

Model

Serial No.

These details may be obtained from the Serial Number plate on the back of the instrument.

FOR SPARES AND SERVICING

Please contact:

LMS Ltd.
The Modern Forge
Amherst Hill
Riverhead
Sevenoaks, Kent
TN13 2EL

Tel. 01732 451866
Fax. 01732 450127
Email: sales@lms.ltd.uk
www.lms.ltd.uk

DECONTAMINATION

Before you call the service engineer



**Before the service engineer arrives
or you return the instrument for service**

- 1** Has the system been in contact with any:
- 1.** hazardous chemicals
 - 2.** biological hazards
 - 3.** radiological hazards

If the answer to any of the above is YES, or if you are unsure of the answer, the system **MUST** be decontaminated/disinfected according to the manufacturers/suppliers protocol before the engineer will work on the system.

If the problem with the system does not allow full or even partial decontamination, written precautions should be available for the engineer to follow until decontamination can be effected?

- 2** Has a Decontamination/Permit to Work form been completed?

Before work commences on site

- 3** Is the Authorised Officer or a Senior member of staff available to advise the engineer and sign off the jobsheet?
- 4** Are the following available:

visitors laboratory coat	disinfectant
gloves	hand wash basin
eye protection	safety shower

These are your legal responsibilities under the Health & Safety at Work Act.

Produced by the BLWA Service Managers Group