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LUNAIRE ENVIRONMENTAL, INC.
4 Quality Street
P.O. Box 3246
Williamsport, PA 17701
Phone 717-326-1770

Operation and Maintenance Manual for CO_2 Incubators

Model Number: C10632H-4
Serial Number: L-1226
Customer Order Number: RGX 109537

$15.00

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INSTALLATION INSTRUCTIONS

READ THE FOLLOWING COMPLETELY BEFORE ATTEMPTING TO INSTALL OR OPERATE EQUIPMENT

DELIVERY: Inspect equipment and shipping crate immediately upon receipt. If any damage is apparent, please contact the transportation company immediately. Retain all shipping materials for inspection. Any claims for damage must start at the receiving point.

Check packing slip carefully to make sure all materials have been received as indicated on the packing ticket. Unless otherwise noted, your order HAS BEEN SHIPPED COMPLETE.

GENERAL INFORMATION: Your equipment has been fully operated, tested, and balanced in our plant prior to shipment. If certain components have been removed for shipping purposes, full re-assembly instructions will be enclosed. If in doubt, do not hesitate to call our factory for additional information.

CO_2 CONNECTIONS (CO_2 INLET) - MODEL C10632H-5,6,7 ONLY:
IMPORTANT: Do not use liquid CO_2! Use medical grade, DRY CO_2, 99.9 or 99.8% only. MAXIMUM PRESSURE: 7p.s.i. Connect to a TWO-STAGE GAS REGULATOR. Matheson model 8CGA0320 or equivalent. (These regulators attach to the pressurized CO_2 bottle. They consist of two gauges: One to indicate bottle pressure, the other to indicate and regulate line pressure.)

On the back of your Lunaire unit, you'll find a single, transparent tube marked "CO_2 INLET". This tube should be connected to a 2-stage gas regulator. Connect this tube if you wish, but DO NOT TURN ON CO_2. The CO_2 should not be turned

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on until you have set the "zero adjust" on your CO2 Control module, and this cannot be done until the unit has stabilized at desired operating temperature, for example 37°C.

WATER CONNECTIONS: Deionized or distilled water is required for operation of the equipment. Suitable inlet connections are provided. Water connections will require a free flow drain. These connections are marked on the back of the unit. The water connections must be complete and the water reservoir must be full before electrically energizing the unit.

DRAIN CONNECTIONS: Model C10632H-3,4,5,6 only. Proper drainage requires a level unit. When the unit is in place, water on the floor will run to the rear, and exit through the drain. The drain line must not run above outlet level.

POWER CONNECTIONS: All units are supplied with line cord and plug. Model C10632H-2 through 6 have a cord with a 230 volt, single phase 4 wire plug (plug this into a 30A receptacle, wired in accordance with national and local electrical codes). Models C10632H-1 and C10632H-7 have a 115 volt plug. Plug this into a 15 amp outlet. Make sure equipment is properly grounded in accordance with the codes.

GENERAL: Before energizing any equipment give it a visual inspection for loose components, fittings, etc. Place all operating switches in the "OFF" position before energizing.

OPERATING INSTRUCTIONS: Please follow instructions describing components and the proper operation of your equipment. Manufacturer's data describing special control systems are also enclosed.

In most cases, operation is simple and should proceed in a logical sequence.
IF IN DOUBT DO NOT HESITATE TO CALL OUR FACTORY.

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INSPECTION: IMPORTANT

Carefully inspect your Lunaire unit for any damage that may have occured during shipping. The carrier is responsible for the unit from the time it leaves Lunaire to the time it arrives on your dock. If you find any damage, contact the carrier.

Lunaire will do everything possible to assist you in settling a claim. When you contact Lunaire, please enclose a complete explanation, including a copy of the carrier's inspection report.

OPERATIONS AND MAINTENANCE MANUAL
FOR LUNAIRE MODEL B10632H-4

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COMPONENTS DESCRIPTIONS:

NOTE: When reading descriptions refer to control panel starting from the left. Components checked below are used in your incubator.

✓ MAIN: Power to unit is controlled by main switch.

✓ MAIN PILOT LIGHT: Indicates when main switch is in the ON position.

✓ MODEMATIC TEMPERATURE CONTROL: Displays the actual temperature inside the unit and controls temperature at desired setpoint.

INTEGRAL HEAT ON L.E.D.: Indicates when the solid-state control energizes the heater. Because this control is fully proportional, the L.E.D. will stay lit for a longer period during initial warm up and after door openings.

INTEGRAL TEMPERATURE ALARM: If the temperature rises 0.5°C, the "Hi Temp" L.E.D. will flash on and off and an audible alarm will sound. The "silence switch" will deactivate the alarm when placed in "silence" position.

When the "Hi Temp" L.E.D. flashes, power to all heaters is cut. When the temperature returns to normal, the main controller assumes control automatically.

MODEMATIC CO_2 CONTROL: Displays the actual CO_2 tension within the chamber and maintains desired setpoint. CO_2 L.E.D. indicates when CO_2 is being introduced into the incubator chamber.

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CO2 Alarm: If the CO2 tension deviates by more than 1% the diviation L.E.D. will be activated. With a setpoint of 5% tension, the deviation L.E.D. will remain energized until the CO_2 tension rises to 4% or exceeds 6%.

___ CO_2 SAMPLE: This capped port is connected to the inner chamber and allows a CO_2 sample to be obtained.

✓ MAUNUMATIC HUMIDITY PERCENT RH: A calibrated solid-state control maintains the room at the desired percentage of relative humidity. The reference dial has a dual scale: 40% to 100% and 10% to 50%.

✓ RANGE: The range switch selects the proper scale for humidity controller.

✓ HUMIDITY METER: Dual scale indicating meter displays % humidity inside chamber.

✓ MANUMATIC HUMIDITY INPUT: A fine tuning adjustment that allows the closest possible control of the humidity system.

✓ MONITOR TEMPERATURE LO LIMIT: A temperature controller with a reference dial that de-energizes the refrigerant circuit if temperature drops below the selected low limit temperature.

✓ REFRIGERATION: This switch energizes the compressor that allows cooling to begin. Whenever the unit is operated below 37°C, this switch must be on. Over 37°C, it must be off.

✓ REFRIGERATION PILOT LIGHT: Indicates the circuit controlling the compressor is energized.

✓ LO LIMIT PILOT LIGHT: Indicates when temperature is below setting on main controller and lo limit monitor has de-energized refrigerant flow circuit.

✓ DEFROST PILOT LIGHT: Indicates the refrigeration system is in one of its two defrost cycles.

___ HUMIDITY RECORDER: The humidity recorder prints a permanent record of humidity. The chart is a comparison of the wet

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bulb temperature and dry bulb temperature. The humidity is determined by reading the relative humidity that corresponds to the temperature readings. A chart is provided.

TEMPERATURE RECORDER: The temperature recorder prints a permanent record of temperature.

ABOUT THE CONTROLS:

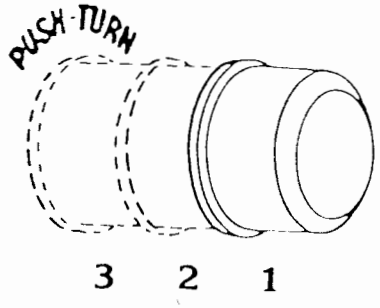
Modematic Controls- Lunaire units are uncomplicated in both operation and mechanics. The controls are almost self-explanatory. The most complicated controls are the Modematic modules, which use a three-stage setpoint adjustment. Far from being an unnecessary complication, the three-stage adjustment simplifies mechanics and eliminates accidental control manipulation.

How Modematics Work - The three stages.

Stage 1 - The illuminated numbers INDICATE THE TEMPERATURE OR CO_2 TENSION WITHIN THE INCUBATOR. The control knob is in neutral: turning it will not alter the setpoint.

STAGE 2 - The display INDICATES YOUR SETPOINT when the knob is pushed in halfway. Even though you can check your setpoint in stage two, you cannot alter it; turning the knob does nothing.

STAGE 3 - Only with the knob pushed in all the way can you ALTER THE SETPOINT.



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C10632H-4 SEQUENCE OF OPERATION

To start unit, energize the "MAIN POWER" switch. This will energize the heating, humidity, and circulation systems. Energize the refrigeration switch to start the cooling system.

TO HEAT:

Set digital temperature controller to desired setpoint. A pilot light will indicate the system is energized. The unit will now heat or cool to and maintain setpoint. Any setpoint below 40° C must include the cooling system. Use the silence switch to omit the Hi-Limit alarm.

TO COOL:

Set digital temperature control for desired temperature. Rotate LO LIMIT to full counter clockwise position. Energize the refrigeration switch. Cooling is indicated by the refrigeration pilot light. If refrigeration pilot is not energized, cooling system is in the defrost cycle. Cooling will resume when the defrost cycle ends. After stabilizing at setpoint for 1 hour, rotate LO LIMIT control clockwise slowly until LO LIMIT light is energized, then set just below alarm condition.

TO HUMIDIFY:

The humidification system shall be energized only after:

1. The water supply is connected and the reservoir on the steam generator is filled. Lifting the plastic float will start water flow.

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WARNING: FAILURE TO SUPPLY WATER TO STEAM GENERATOR RESERVOIR WILL RESULT IN DAMAGE TO THE UNIT. THIS WATER LEVEL WILL BE MAINTAINED BY MEANS OF A FLOAT IN THE RESERVOIR.

2. Set range switch to proper range.
3. Set humidity percent RH at desired setpoint.
4. Set humidity input switch at 4.
5. Gradually increase input switch until the desired level of humidity is maintained. This process usually takes 1 to 4 hours, depending on your desired temperature and humidity.
6. Only when operating above 40°C and 90% RH should the input switch be at the HI setting.

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CLEANING THE UNIT:

We recommend a cleaning with soap and water or alcohol. After cleaning, a laboratory disinfectant should be used to finish. Removal of SHELVES, SIDE PANELS, and often, the CO_2 sensor is typical. When all the shelves have been removed, the top can be removed by removing the three screws in front of, and just below, the gasket.

SIDE PANELS: The side panels are held in place by four stainless steel PINS. The two on the top are longer than the two on the bottom, so it is necessary to lift the side panel until it clears the bottom pins. Then swing the bottom of the panel out and down until the top clears the long pins.

THE CO_2SENSOR is bolted to the wall behind the top panel. If you think it's necessary to remove the sensor from the wall to clean, make sure you hold the sensor. If the sensor is left to hang by its lead, it could be damaged.

MODEMATIC CONTROLS: Modematic control modules are maintenance free. A built-in cabinet protects the modules from temperature fluctuation, dust, or accidental contact. Even though these protective cabinets greatly contribute to the reliability of the modules, an extra margin of safety is imperative. That's why all Modematic controls can be instantly replaced. Spare Modematic modules are available through your Lunaire representative or through the Lunaire plant.

REPLACING MODEMATIC CONTROLS: The modules are held in place by one SCREW, which is at the bottom center, directly under the "PUSH-TURN" KNOB. Turning this screw to the left will extract the module. It is necessary to continue turning this screw until the module is completely disengaged. Then the module can be pulled from its housing.

To install a module, locate GUIDE CHANNELS and slide the unit into the housing. Then turn the screw to the right until the module is completely drawn in.

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