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Standard Operating Procedure

Procedure: Isotemp Oven OV700G

Department: Bioeconomy Institute

Building/ Room Number: Biorenewables Research Laboratory (BRL) 1114

Supervisor: Jacqulyn Baughman

Procedure Overview: An Isotemp oven is a laboratory product designed to be used for programmed tasks or simple, routine heating tasks. For example: drying glassware or drying samples which contain water or other solvents for further analysis or testing purposes. The isotemp oven in lab 1114 is an OV700G.

Health and safety information for materials used: This Isotemp Oven is not explosion proof. Do not use in the presence of flammable or combustible materials; fire or explosion may result. Unit contains components that may ignite such materials. There are potential hazards for electrical shock and burns. Always disconnect power during maintenance. Be sure the ovens are plugged into grounded outlets. Closed toe shoes and safety glasses are required at all times while in the lab regardless of the task being completed. When working with hot surfaces use heat resistant gloves and attempt to use tools rather than directly touching the hot equipment. Lastly, in all situations when it appears handling these dangerous materials is necessary, try to find safer alternatives.

Safety Precautions: Fumes and spillage from acidic solutions cause corrosion of the stainless steel chamber. Care should be taken to maintain a neutral PH at all times. The heater for the unit is in the bottom of the unit. Surface temperatures at the bottom cover of the unit may be higher than set point temperature. For example: A plastic container on the heater cover may be hot enough to melt/burn the container at settings below the melting point of plastic. Do not place items on the heat cover.

Hazard Control Measures:

- Safety glasses
- Lab coat
- Nitrile gloves
- Hot gloves
- Tongs
- Closed toe shoes

Safety Features: Precision ovens incorporate a variety of safety features. A safety backup is built into the controller software: if the primary heater control fails, the backup will maintain control at 5°C above the set point. An alarm LED then indicates that the backup controller is operating the oven. A circuit breaker protects the oven from power surges. If primary backup heater controls fail, an independent Over Temperature Device will disengage the heater operation.

Waste Disposal Procedures: Bio-oil should be disposed in a EH&S designated waste satellite container. Make sure to put the waste in its own container within the EH&S secondary container.

Decontamination Procedures: Any foreign objects can be removed from inside the oven while wearing gloves. The shelves and other inside parts can be wiped with a cloth and a non-abrasive conventional household cleaner. Never use caustic cleaning agents such as soap suds, phosphoric acid, bleaching solutions or scrubbing power.

Spill Containment and cleanup procedures: Bio oil spills can be cleaned up with paper towels and general cleaning solution. In the case of a large spill, a spill kit should be used. Other chemicals may require different forms of removal.

Using substances requiring special procedures: No

Written By: Gabriel Domingues & Matt Schul **Date:** 6/23/2014

Approved By: Jacqulyn Baughman **Date:** 6/25/2014

Detailed procedures, operating instructions, and emergency contact information list is attached.

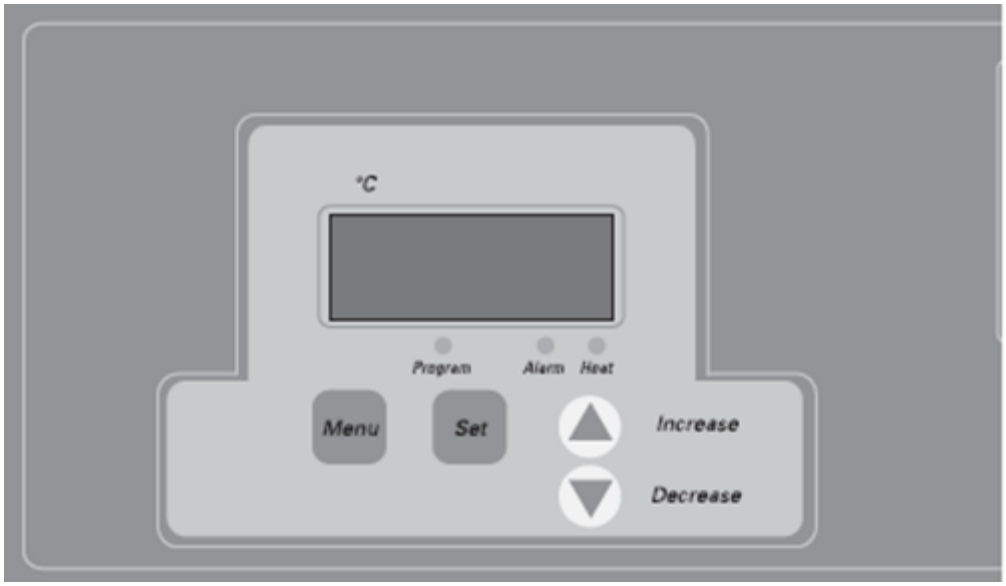
Equipment Description
Isotemp ovens inlet air through a port located under the oven floor. Heat generated convection then gently moves the air in a vertical circulation pattern. Exhaust air is vented through a port at the oven top. The temperature is controllable and displayed. Temperature readouts and control parameters are shown on red LEDs. Three additional LEDs indicate when heater power is being applied, an error condition is encountered, or the temperature is being set.

Pre-Analysis Checklist

1. Make sure you have your required safety equipment of glasses, closed toe shoes, gloves, and laboratory coat.
2. Check the machine for any previous samples left inside.
3. Remove any dust or other foreign objects from inside the oven with a soft towel or cloth.
4. Install the shelf in desired location.
5. Make sure the machine is plugged in.
6. The oven is now ready for operation. No preliminary adjustments or calibrations are required.

Power Switch

The 3050 Series ovens feature a front panel mounted power switch which is a combination power switch and circuit breaker, eliminating the need for separate fusing. The circuit breaker will interrupt power in the event of an oven heater malfunction. Press the “I” (upper) half of the rocker-type power switch to the in position to turn the oven on. Press the “0” (lower) half to the in position to turn off oven power. To reset the breaker, first place the switch to the off position, then return it to the on position



Equipment Operation

1. Place the power switch in the **ON** position. All 8s will flash as a test of the display.

2. Press and hold the **SET** button.

3. Observe the set temperature in the display window (Celsius).

4. To decrease the set temperature, press **DECREASE** while holding **SET**.

5. To increase the set temperature, press **INCREASE** while holding **SET**.

6. When the desired set temperature is shown, release the **INCREASE** or **DECREASE** keys. Finally, release the **SET** key. The oven automatically begins to control at the set temperature.

7. When desired temperature is reached place samples or glassware appropriately inside the oven.

8. When samples are ready or glassware is dry remove them from inside the oven using hot gloves, then move on to shutdown procedure.

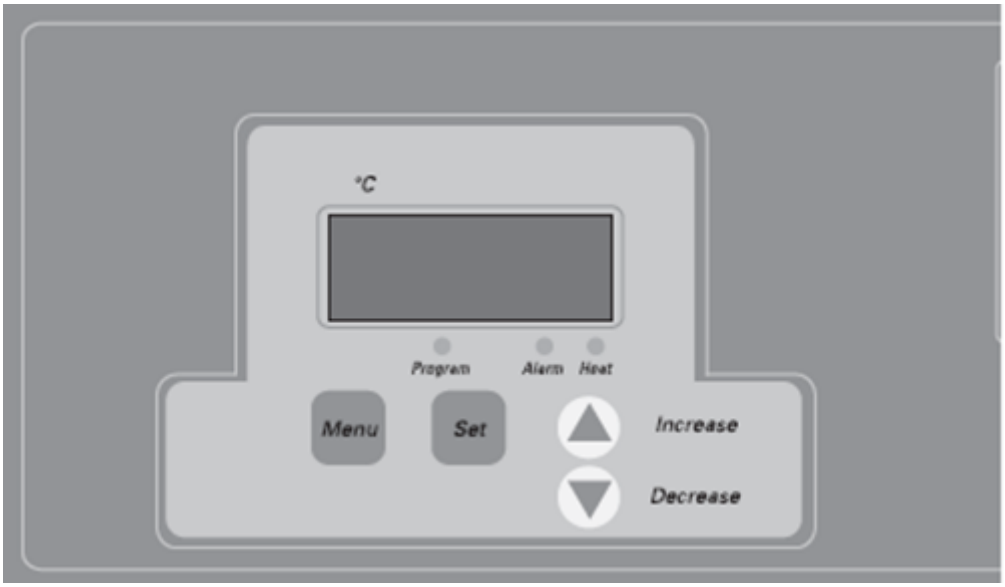
Temperature Display Offset

The offset feature permits the operator to measure and calibrate such that the display will indicate the temperature at a specific point or zone within the oven.

1. Press **MENU** button until screen reads **"CAL"** to access entry of a temperature display offset.
2. Press and hold the **SET** button while pressing **INCREASE** or **DESCREASE** in order to change offset temperature to desired Celsius number.
3. Release the **SET** button.
4. Press **MENU** once to return to normal temperature control.

NOTE: To rapidly increase or decrease the set temperature press and hold the appropriate arrow key. To slowly increment or decrement the set temperature one degree at a time, press and immediately release the arrow key.

Controls



Temperature Display: In the normal operating mode, shows the current oven temperature. During programming, indicates the oven set temperature target.

Heat Indicator: Lights up when power is being supplied to the oven heater.

Alarm Indicator: Lights up if the actual oven temperature exceeds the alarm temperature. The alarm temperature is factory-adjusted to be 5°C above the set temperature.

Program Indicator: Lights when the control temperature is being set.

Shutdown Operation

It is important to leave the lab cleaner after completing an experiment than it was before you started the experiment. As a general note/ leave the lab clean when you go home for the day. Put your tools away/ sweep and mop up messes/ throw away trash/ empty trash cans as needed/ and take care of any safety hazards which may be present.

- Allow oven to cool down below 100° Celsius before turning off and unplugging.
- Make sure samples/glassware are put away and stored properly (using hot gloves if samples or glassware are still warm)
- Make sure workspace is cleaned
- **Do Not** leave the oven running over night.
- If leaving oven running overnight or long periods of time/ leave note for other lab employees listing: Name/ Sample/ Time/ Temperature/ What to do with sample when removed.

Emergency Contacts
In case of emergency the following people should be contacted:

Jacqulyn Baughman
Lab Supervisor
Cell: (515) 505-9509

Patrick Hall
Research Associate II
Office: 515-294-4984

Marjorie Rover
Lab Manager
Office: (515) 294-2984 Cell: (319) 230-1163

Ryan Smith
BEI Program Coordinator
Office: (515) 294-6244 Cell: (515) 203-1640 Home: (719) 660-2262

Patrick Johnston
Assistant Scientist III
Office: (515) 509-0027 Cell: (515) 509-0027 Home: (319) 231-9140

Dr. Robert Brown
BEI/CSET Director
Office: (515) 294-7934 Cell: (515) 520-1337 Home (515) 460-3434

If the emergency is minor, please contact responsible graduate student or lab supervisor. If there is a serious emergency or life threatening emergency please contact 911 followed immediately by contacting Jacqulyn Baughman and/or Robert Brown. If there is a chemical spill too large to be cleaned using a typical spill kit contact Environmental Health and Safety.

Approved Trainers:
Patrick Hall, Matt Schul, Gabriel Domingues

Training Sign-Off:

Trainee	Date	Trainer