NOTES:
1. Power source is assumed to be 240 VAC two phase connected to a 20 AMP breaker (min).
2. The assembly is a single unit intended for a single 4'x4'x8' cabinet. Capacity can be expanded by building multiple cabinets and duplicating this circuit.
3. At the time of design no ready source for a DPST temperature switch was known so two SPST switches are shown.
4. A Type K Thermocouple is shown in the attached, but most PID Controllers allow a variety of temperature inputs to be used. Alternate wiring may be required, consult the PIC Controller manual. Consider a temperature sensor with higher mass as rapid response is not necessary and a higher mass sensor will limit noise in the signal to the controller. Sensor should be fixed to the cabinet to prevent vibration.
5. A door switch (magnetic or proximity) could be included to shut off the fan motor when the door is opened. It would be wired in series with the power supply to the fan motor.
6. Initial PID control settings found to work in 2012 were: P=2, i=55, d=41.
7. Most PID controllers also include alarm outputs which could alert the user to extreme conditions (either too cold or too hot) if wired to a warning light or speaker.
<table>
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<tr>
<th>QTY</th>
<th>UNIT</th>
<th>DESCRIPTION / LINK</th>
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</table>
| 1   | each | Oast Cabinet with hinged door  
See UVM Extension "Modular Hop Oast" |
| 1   | each | Main 220 VAC switch, 20 Amp rating  
DPDT Stays Switched - like McMaster Carr #8001K85  
http://www.mcmaster.com/#standard-toggle-pilot-switches/=g4qocr |
| 1   | each | ¼ hP Fan motor (110 VAC) |
| 1   | each | Fan Blade & Hub Assembly  
Multi-Wing P/N 22/8-8/25/PAG/3HLJA 0.625 3T3C/AR  
Built to spec: http://www.multi-wing.net |
| 1   | each | Heater  
Chromalox P/N 393-306035-497 – 3000 Watt @ 240 VAC or similar  
Built to spec: http://www.chromalox.com |
| 1   | each | PID Controller  
ColdfusionX - TET612 PID Controller, OMEGA CN740 or similar  
| 2   | each | Solid State Relay – 220 VAC 25 Amp  
Fotek P/N SSR-25 DA or similar  
Specs: http://www.fotek.com.hk/page1e.htm  
| 1   | each | Door Switch (DPST)  
Sensasys Thermal Switch – P/N 2511L002-140 L-155 – Open 140 °F / Close 120 °F. Rated for 25 A at 220 VAC or similar  
| 1   | each | Temperature Sensor  
PT100 Platinum Thermistor / RTD or Type K  
Available: http://www.ebay.com/sch/i.html?_nkw=pt100+probe&_sticky=1&_sop=15&_sc=1 |

As req’d | Wire |

NOTE: Quantities listed are for a single cabinet. Capacity can be expanded by building multiple cabinets.
The University of Vermont Extension Hops Project
Northwest Crops and Soils Team

CABINET
Hops Oast (Drier)

NOTE: Motor should be wired to have fan push air upward. This promotes mixing and air inlet through the 4 spiral inlets.