

**University of Guelph, Honey Bee Research Centre**  
**Honey Bee Colony Overwintering Room**

**General Description**

Room Size: 40 ft long, 8 feet wide, 9 feet high.

320 square feet of floor space

2880 cubic feet

Insulation: R15 walls

R22 ceiling

Vapour barrier inside insulation on all walls and ceiling

Entry: 1) light locked entrance from inside of building

2) man door to exterior and loading dock

Lighting: 3 x 40 Watt **red** lights

Ventilation: - 10 $\frac{5}{8}$ " diameter squirrel cage fan

- 2300 cubic feet per minute at  $\frac{1}{4}$ " back-pressure

(Dayton Blower: 1725 rpm, 208 Volts, 7.0 Amps, 1 phase)

- intake port: 12" diameter galvanized duct, painted flat black inside

- circulation duct: 30 feet long ,12" reinforced polyethylene duct with perforations equaling the area of the intake port.

- thermostat mounted beside intake with sensor mounted outside

- fan pressurizes room and forces heavy CO<sub>2</sub> laden air out wooden floor ducts (8"x8") and then out 8" galvanized duct. This metal duct is painted flat black inside.

**Refrigeration**

Compressor: - Bohn Refrigeration Model DBH3H2EC23P

- 230 Volts, 17 Amps, 3 horsepower, 1 phase

Condenser: - Bohn Refrigeration Model MAB365OF

- 115 Volts, 12 Amps,  $\frac{1}{4}$  horsepower

- 3 fans (each:  $\frac{1}{4}$  horsepower, 1 phase, 4.0 Amps)

Heating: - 2x Q Mark heaters – Marley Electric Co. Model MUH03-21

- 12 Amps each

- 208/230 Volts each

- 2600 Watts each

- 1 phase

- 8" fan on each heater (0.25 Amps each)

- Controls:
1. electrical heat thermostat
  2. cooling thermostat
  3. fan time clock
  4. fan override switch
  5. electrical heat disconnect (heater #1)
  6. electrical heat disconnect (heater #2)
  7. electrical heat relay
  8. ventilation fan relay
  9. 10 Amp control fuse
  10. fan disconnect
  11. intake fan thermostat with sensor mounted inside and outside

## Operation

Ventilation: Timer turns on fan every 30 minutes. All air in room is exhausted under pressure in 1.5 minutes, then fan shuts off.

## Temperature Control

- 1) If outside air is **cooler** than desired inside temperature:
  - thermostat with inside and outside temperature sensors turns on fan to cool room with outside air
  - fan still exhausts all air every 30 minutes
- 2) If outside air is **warmer** than desired inside temperature:
  - air conditioning system cools and circulates inside air
  - fan still exhausts all air every 30 minutes

## Alarm System

Thermostatically controlled alarm is activated if room temperature changes  $\pm 5^{\circ}\text{C}$  from desired temperature, due to power outage or equipment failure.

## Installations

Cook and Beals Inc. (Loup City, Nebraska, USA) supplied and installed all equipment with help from F.M. Electric Ltd. and Share-Temp Refrigeration, both of Guelph, Ontario.

NOTE: The operating temperature would be  $7\text{-}9^{\circ}\text{C}$  ( $45\text{-}48^{\circ}\text{F}$ ) for single story colonies with about 3 pounds of bees. Appropriate temperatures for smaller or larger colonies would be higher or lower, respectively.