

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:

- 10⁵/₈" diameter squirrel cage fan
- 2300 cubic feet per minute at ¼" 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 CO₂ 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, ¼ horsepower
- 3 fans (each: ¼ 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 7-9°C (45-48°F) for single story colonies with about 3 pounds of bees. Appropriate temperatures for smaller or larger colonies would be higher or lower, respectively.