Experiences with the Coolbot

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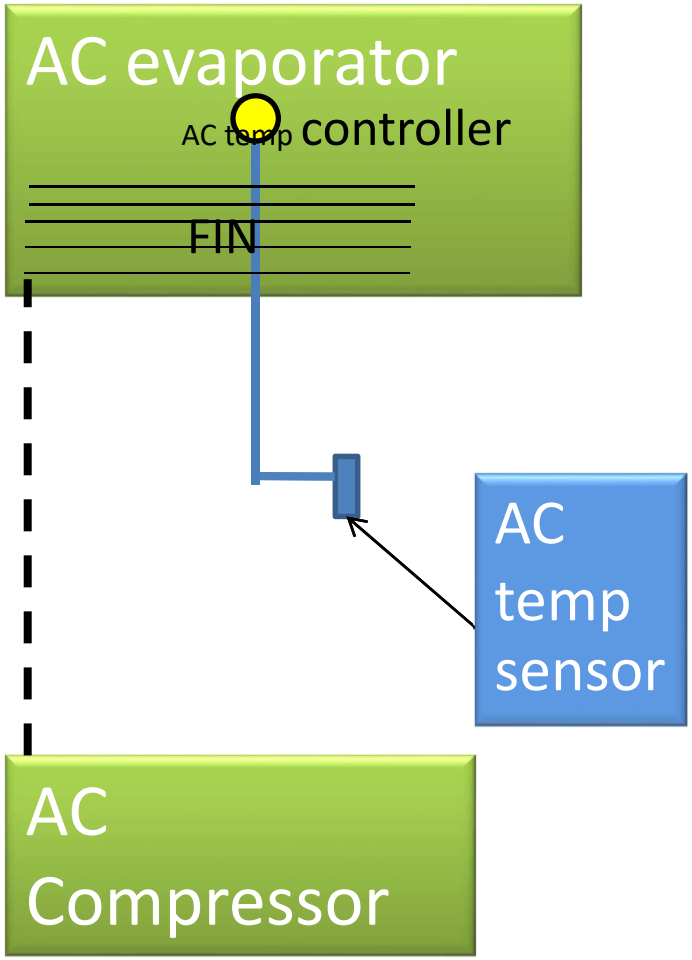
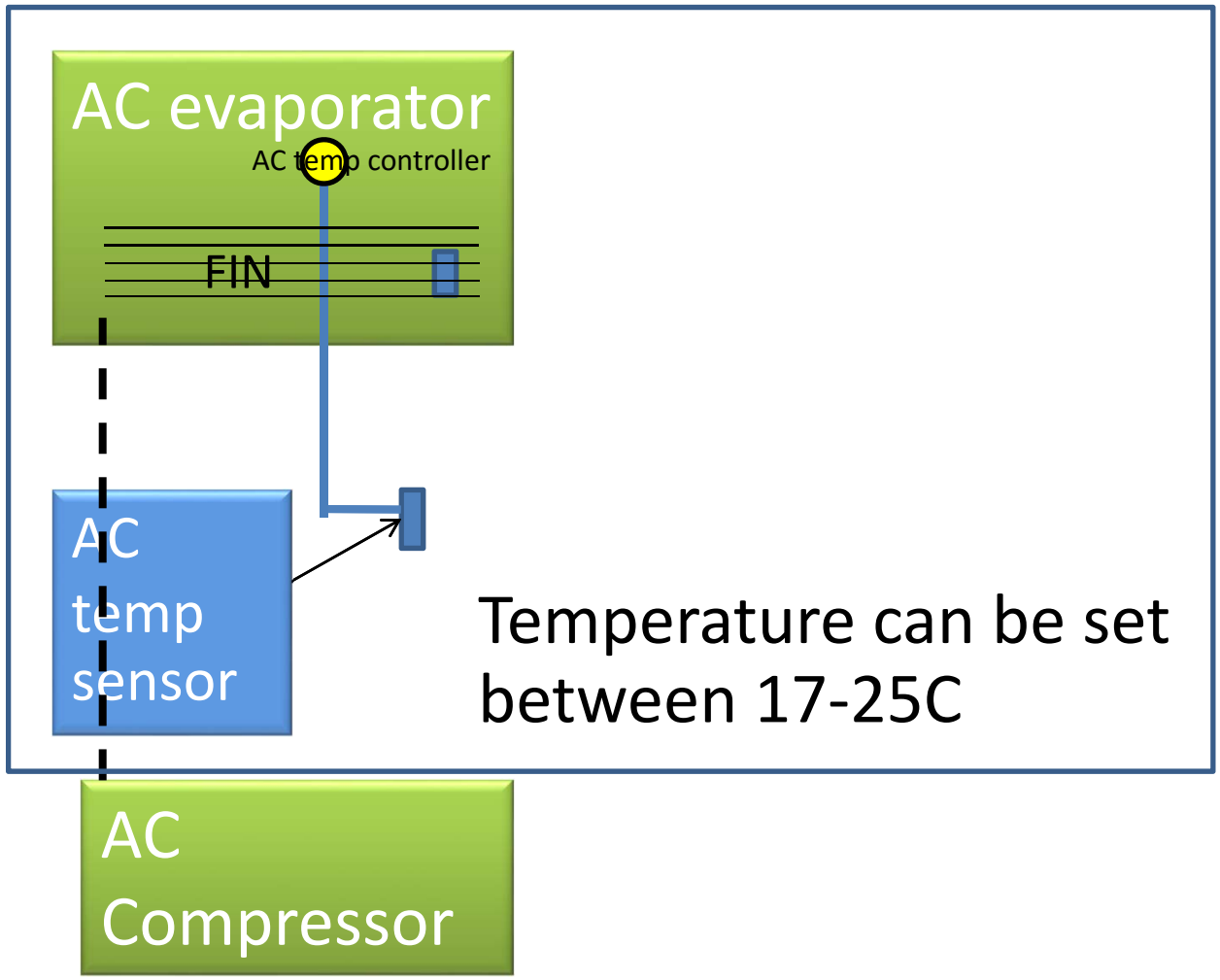
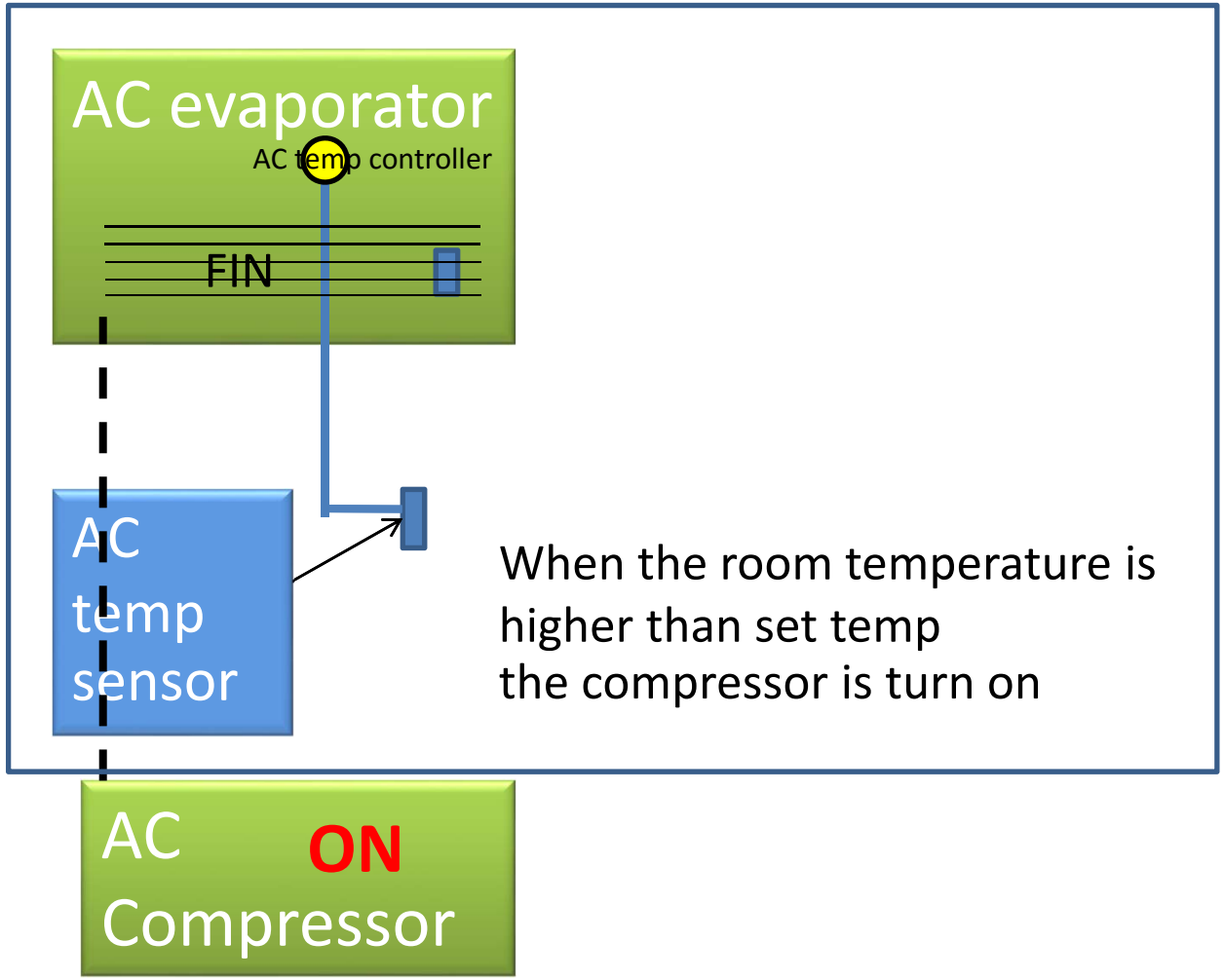
- The idea is to use the home air-conditioner unit instead of the regular cold room unit
- Five times cheaper for the cooling unit cost
- Not the room
- Not the energy cost


AC evaporator
AC temp controller
FIN
AC temp sensor
AC Compressor

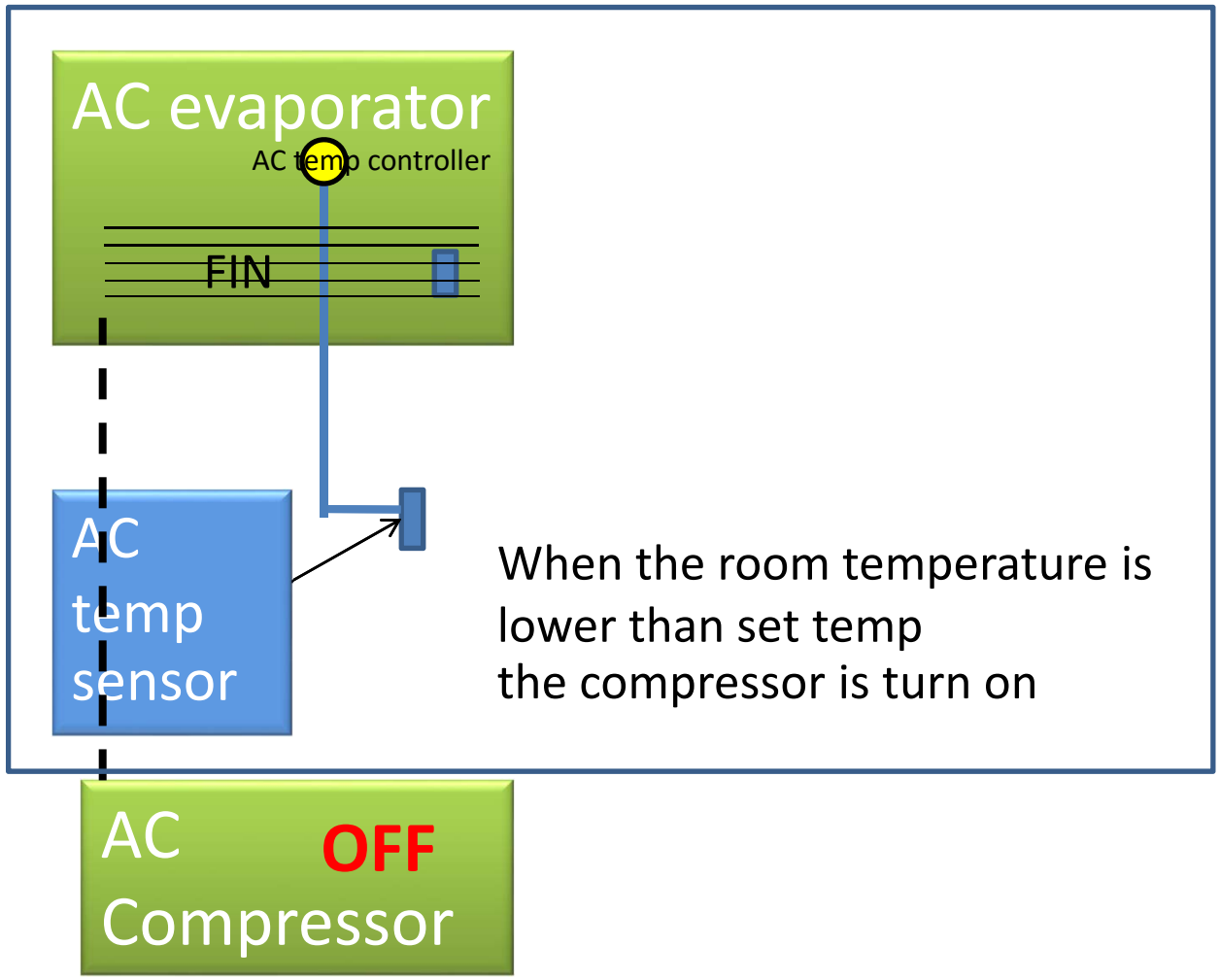
Air conditioner diagram



Air conditioner diagram



Air conditioner diagram



Air conditioner + Coolbot diagram

AC evaporator

AC temp controller

FIN

Coolbot

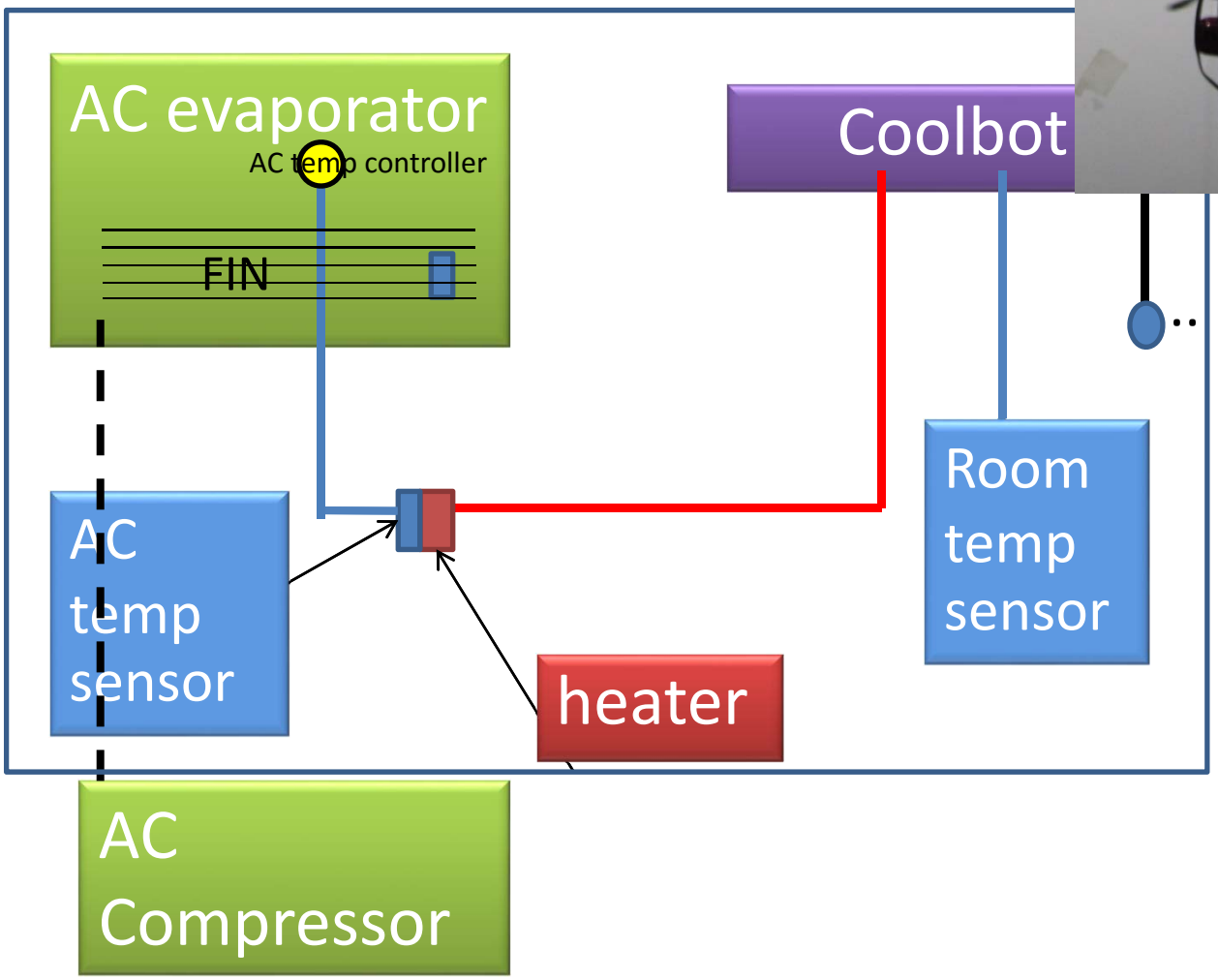
E-plug

AC temp sensor

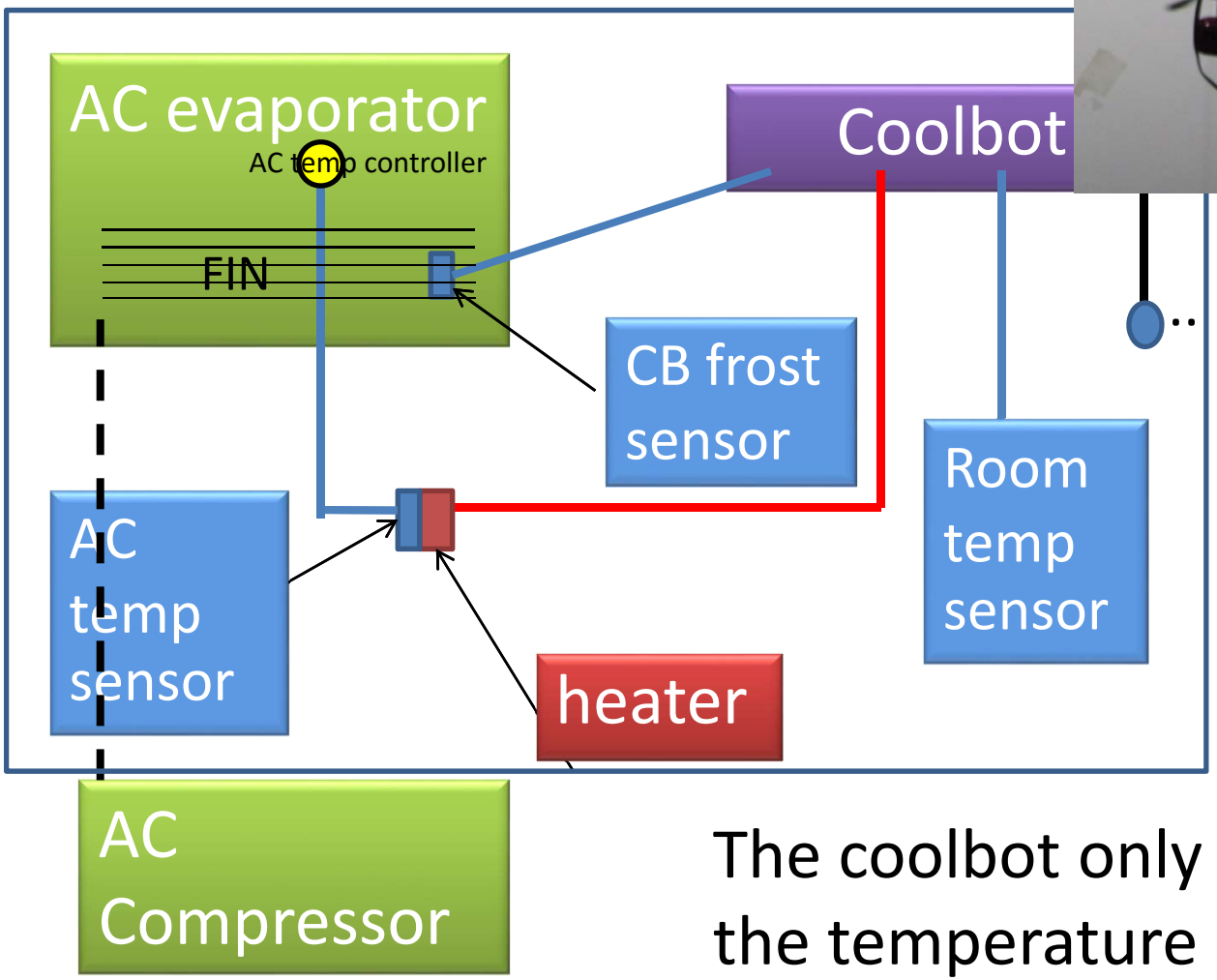
Room temp sensor

AC Compressor

Air conditioner + Coolbot diagram

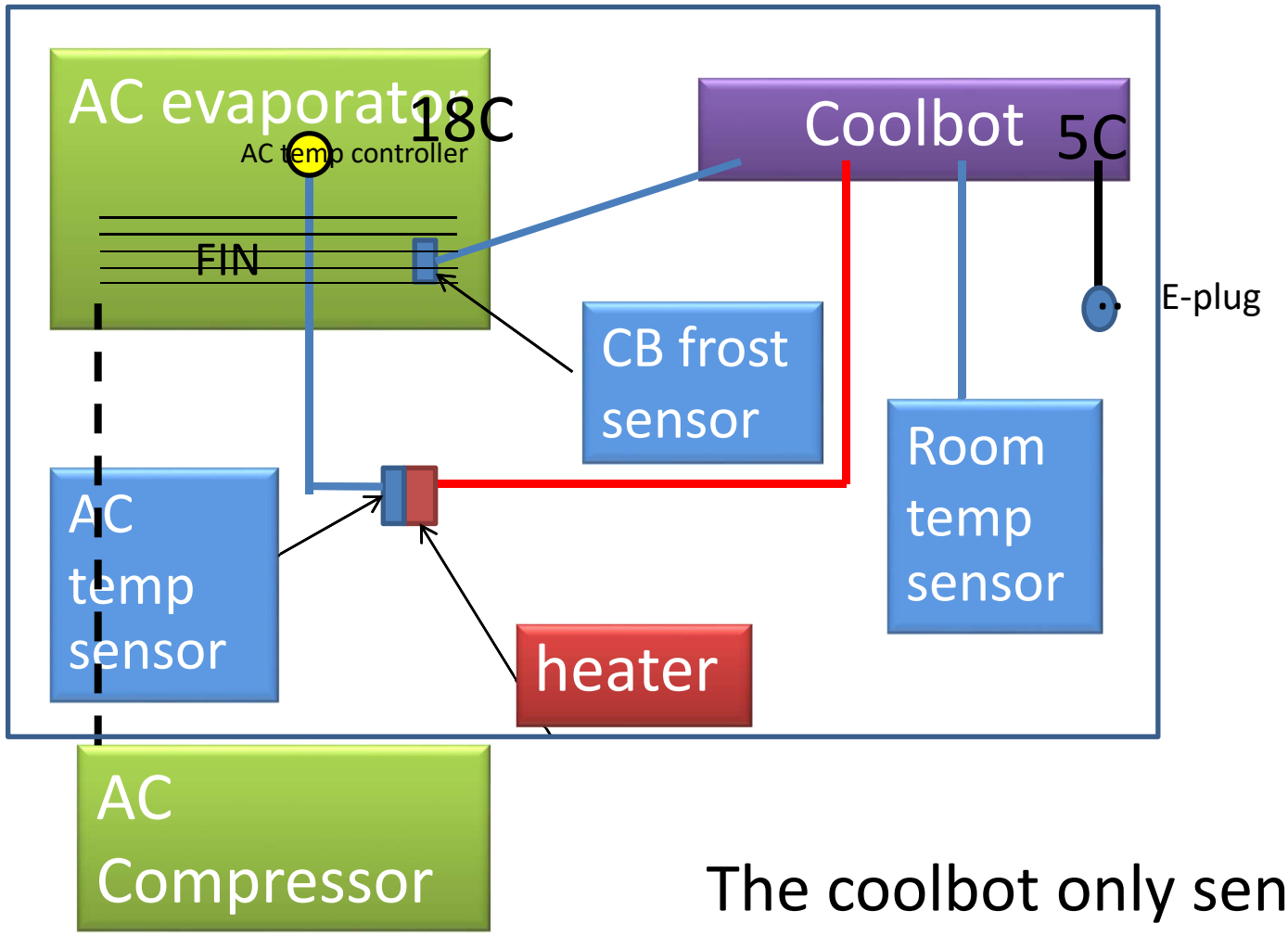


Air conditioner + Coolbot diagram



The coolbot only senses the temperature and control the heater

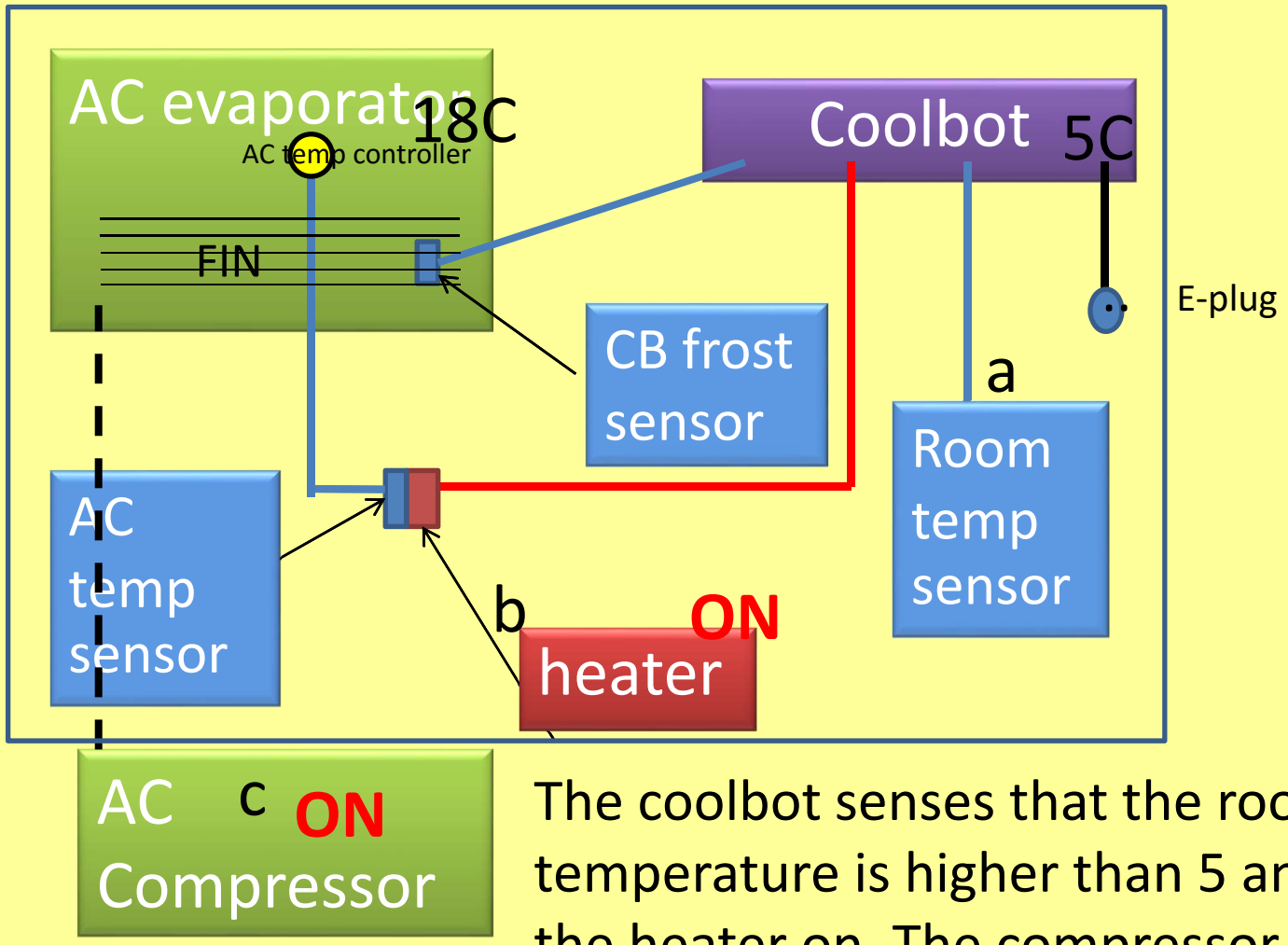
Air conditioner + Coolbot diagram



The coolbot only senses the temperature and control the heater

Air conditioner + Coolbot diagram

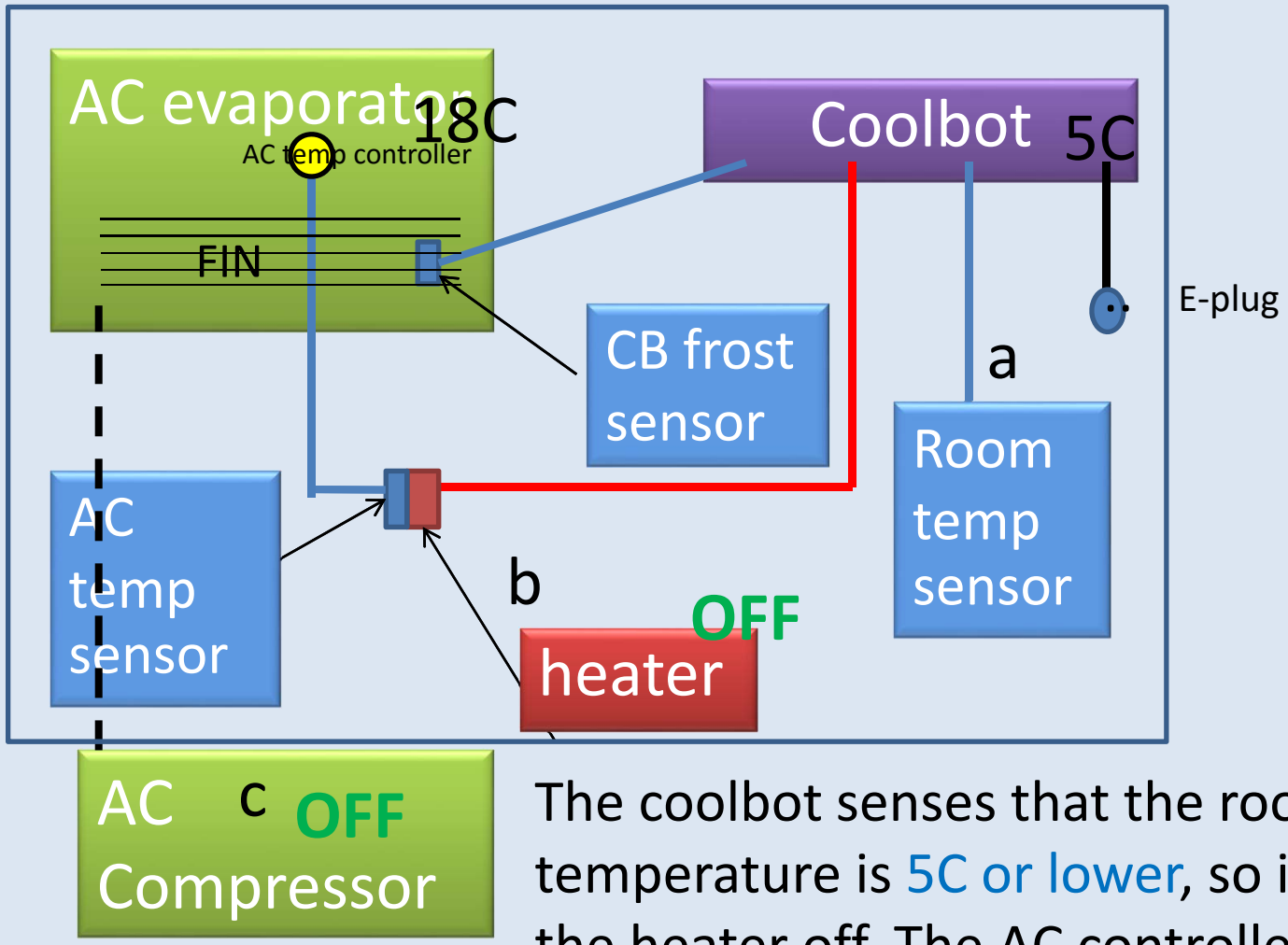
6-18C



The coolbot senses that the room temperature is higher than 5 and keep the heater on. The compressor is also on because its sensor is heated above 18C.

Air conditioner + Coolbot diagram

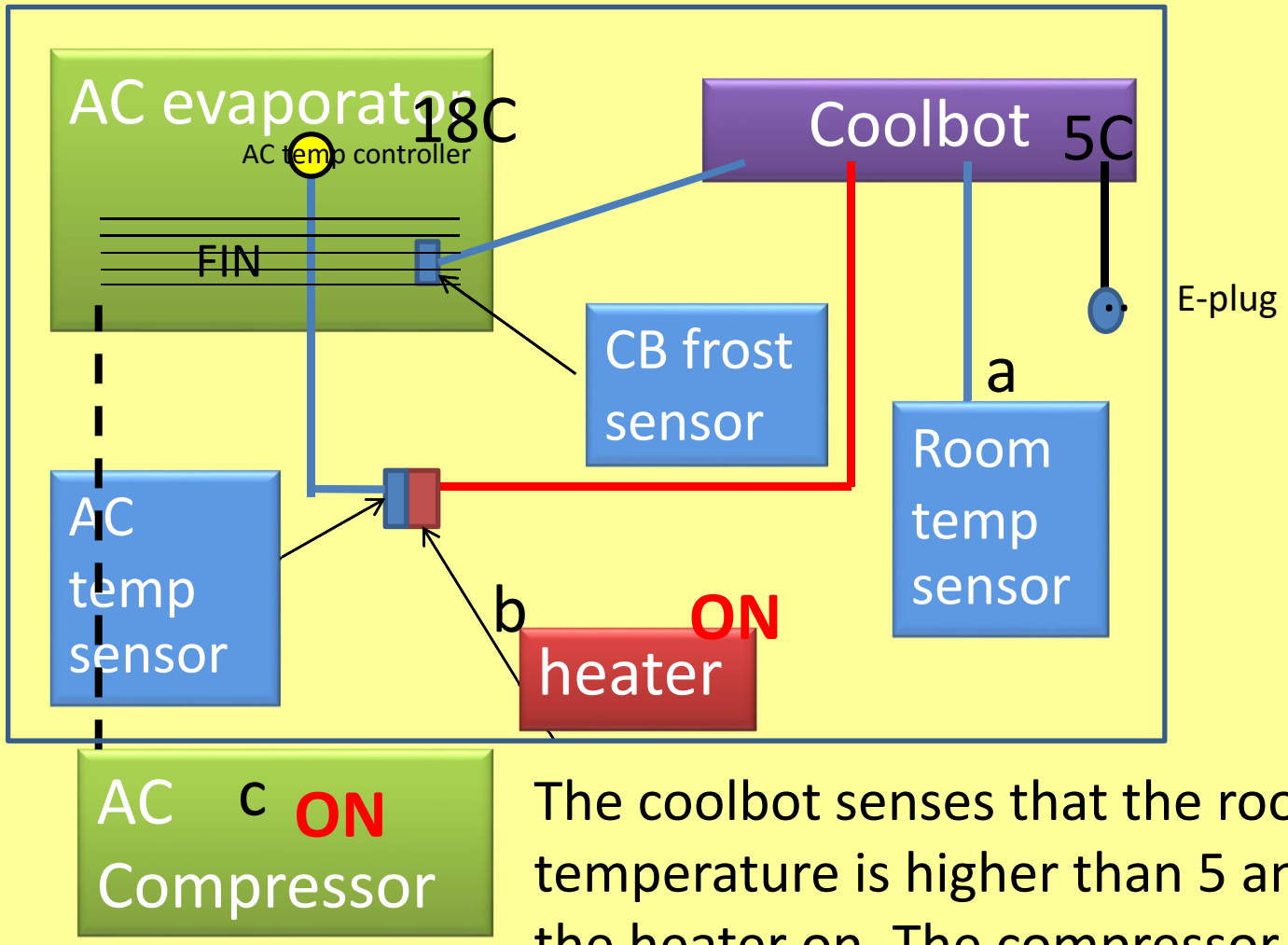
5C or below



The coolbot senses that the room temperature is 5C or lower, so it turn the heater off. The AC controller now senses that the room is below 18C, so it turn off the compressor.

Air conditioner + Coolbot diagram

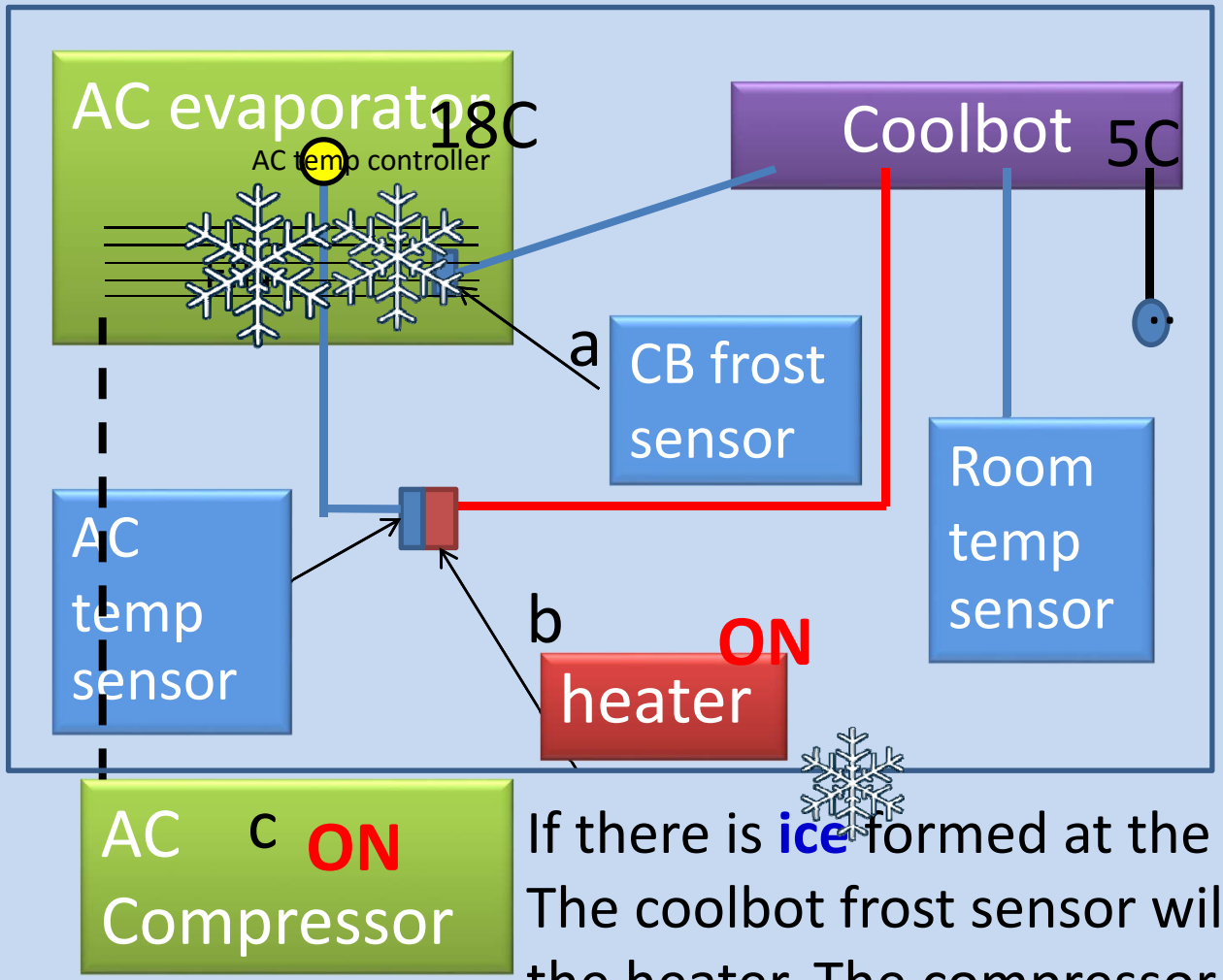
higher than 5C



The coolbot senses that the room temperature is higher than 5 and let the heater on. The compressor is also on because its sensor is heated above 18C

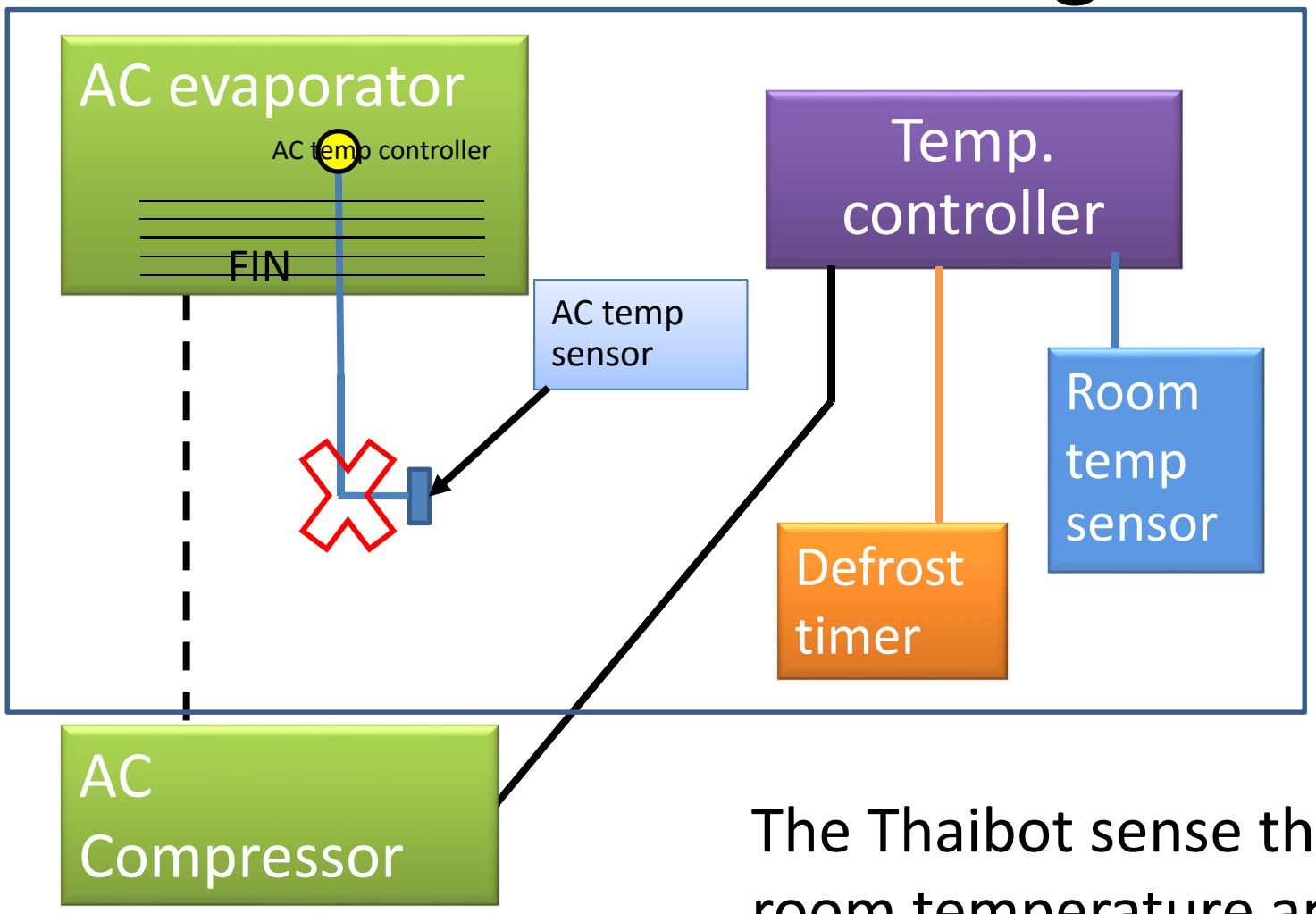
Air conditioner + Coolbot diagram

Ice formed



If there is ice formed at the evaporator fin,
The coolbot frost sensor will turn on the the heater. The compressor is also on because its sensor is heated.

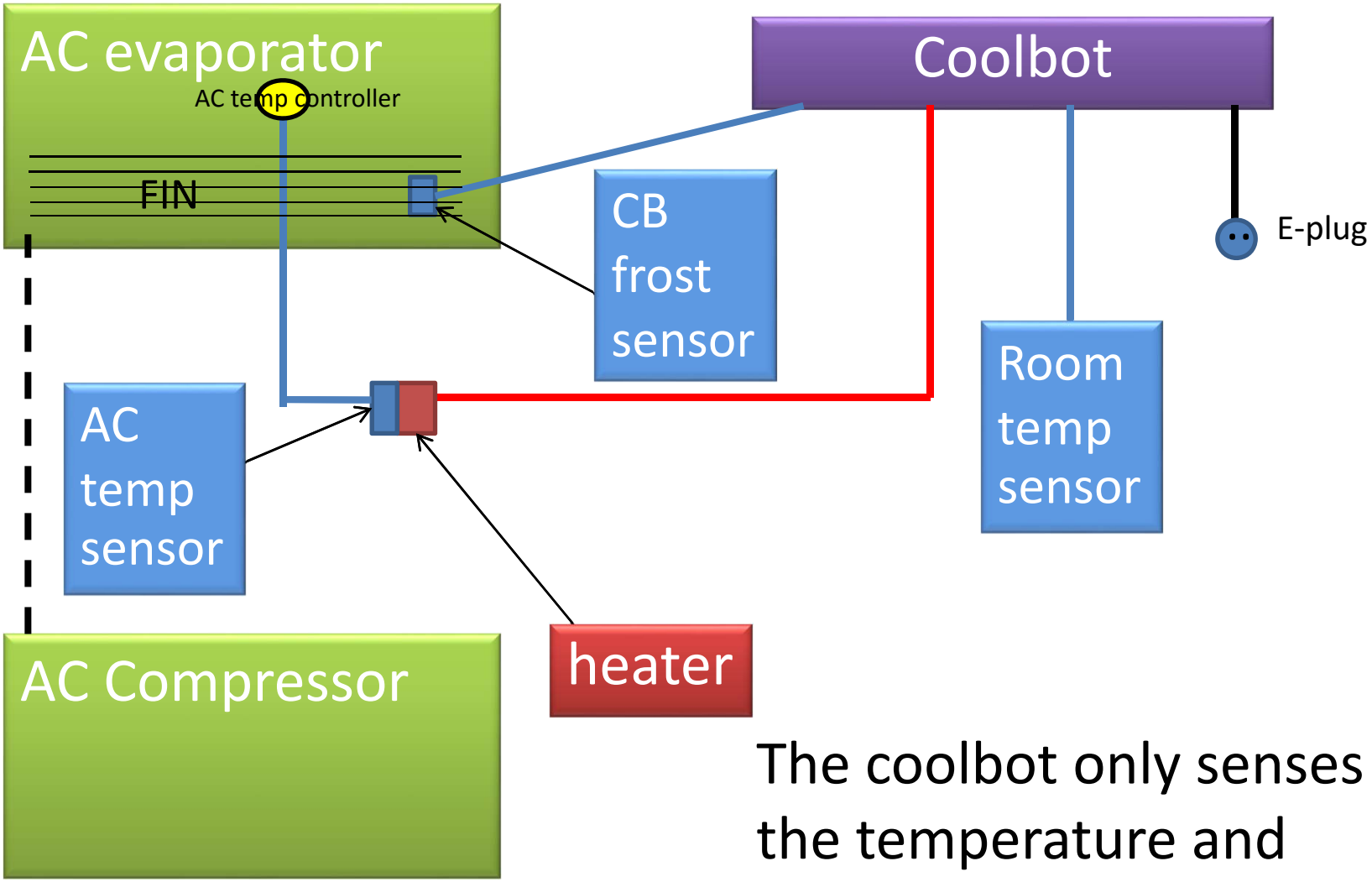
Thaibot diagram



The Thaibot sense the room temperature and control the compressor

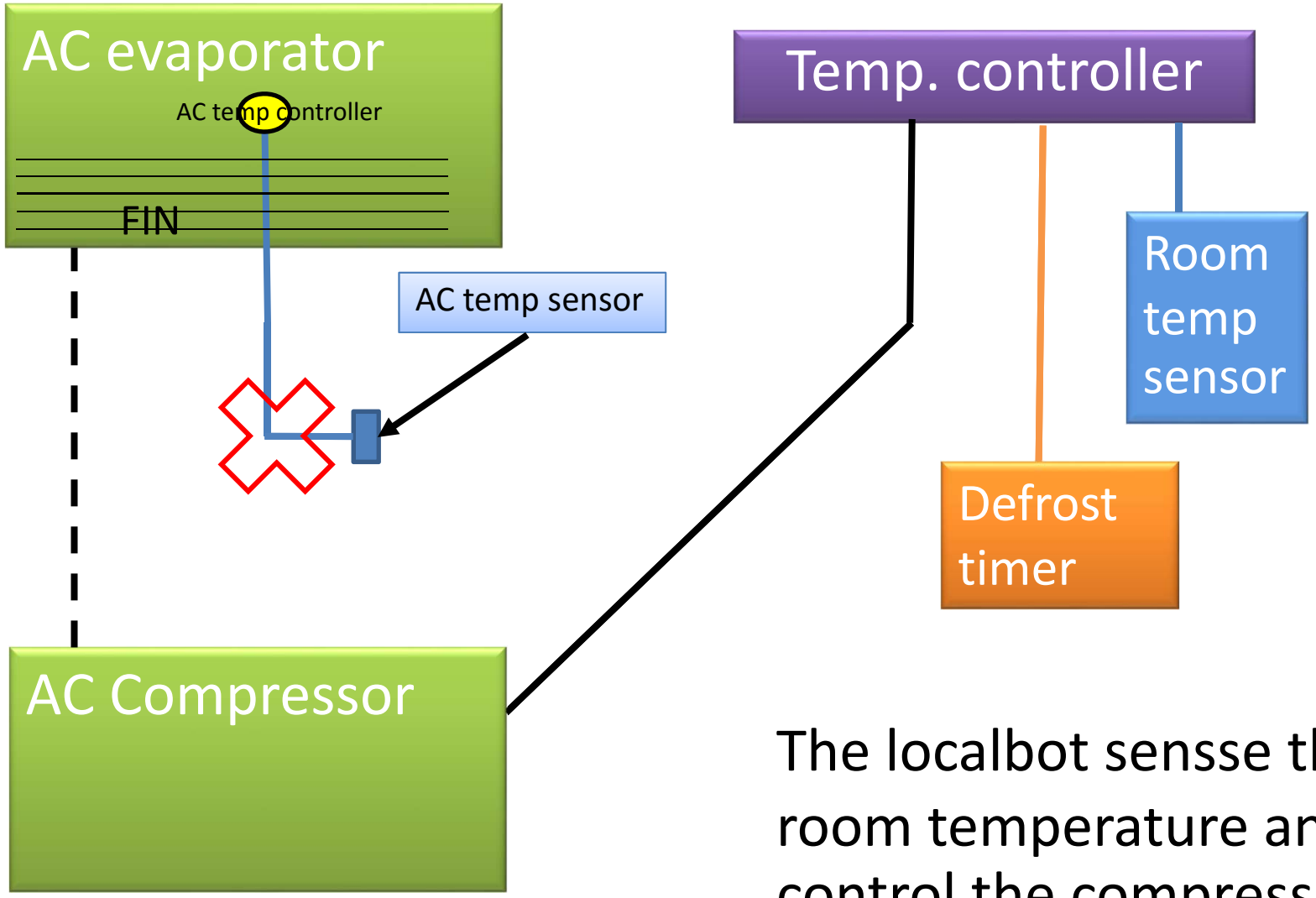
Comparing:
Coolbot room (A) and localbot room (B)

Coolbot diagram



The coolbot only senses the temperature and control the heater

Localbot diagram



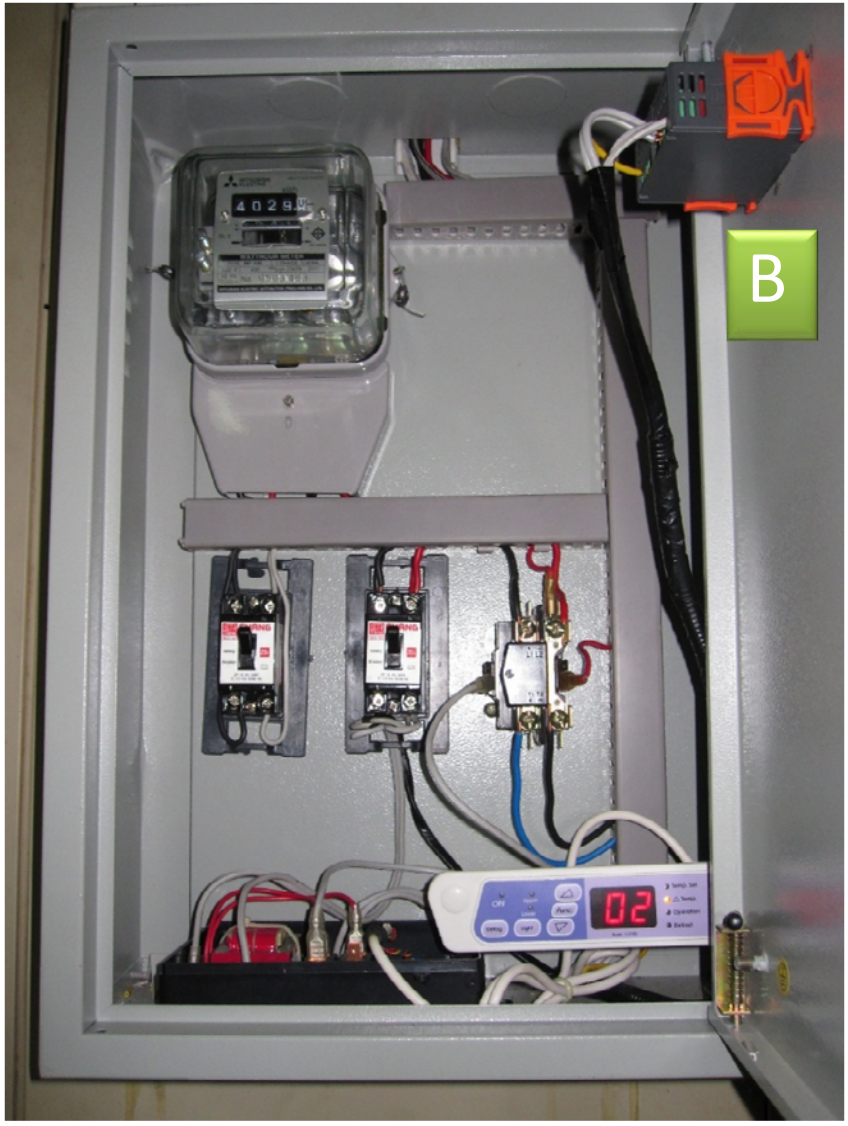
The localbot sensse the room temperature and control the compressor

Comparing:
Coolbot room (A) and localbot room (B)

Cool room inside view

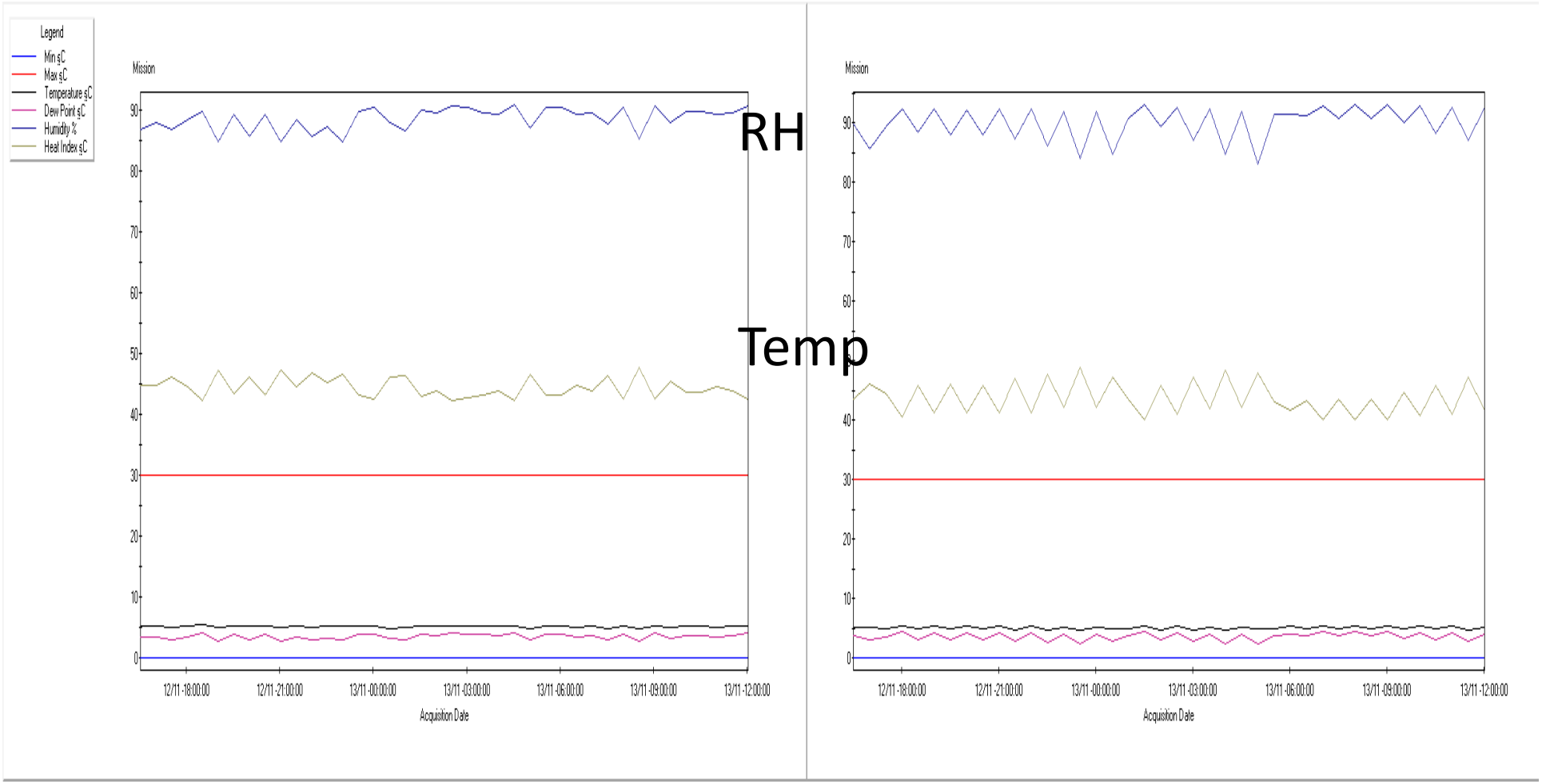
Cool room with Coolbot (A) and cool room with local modification (B)

Cool room controller



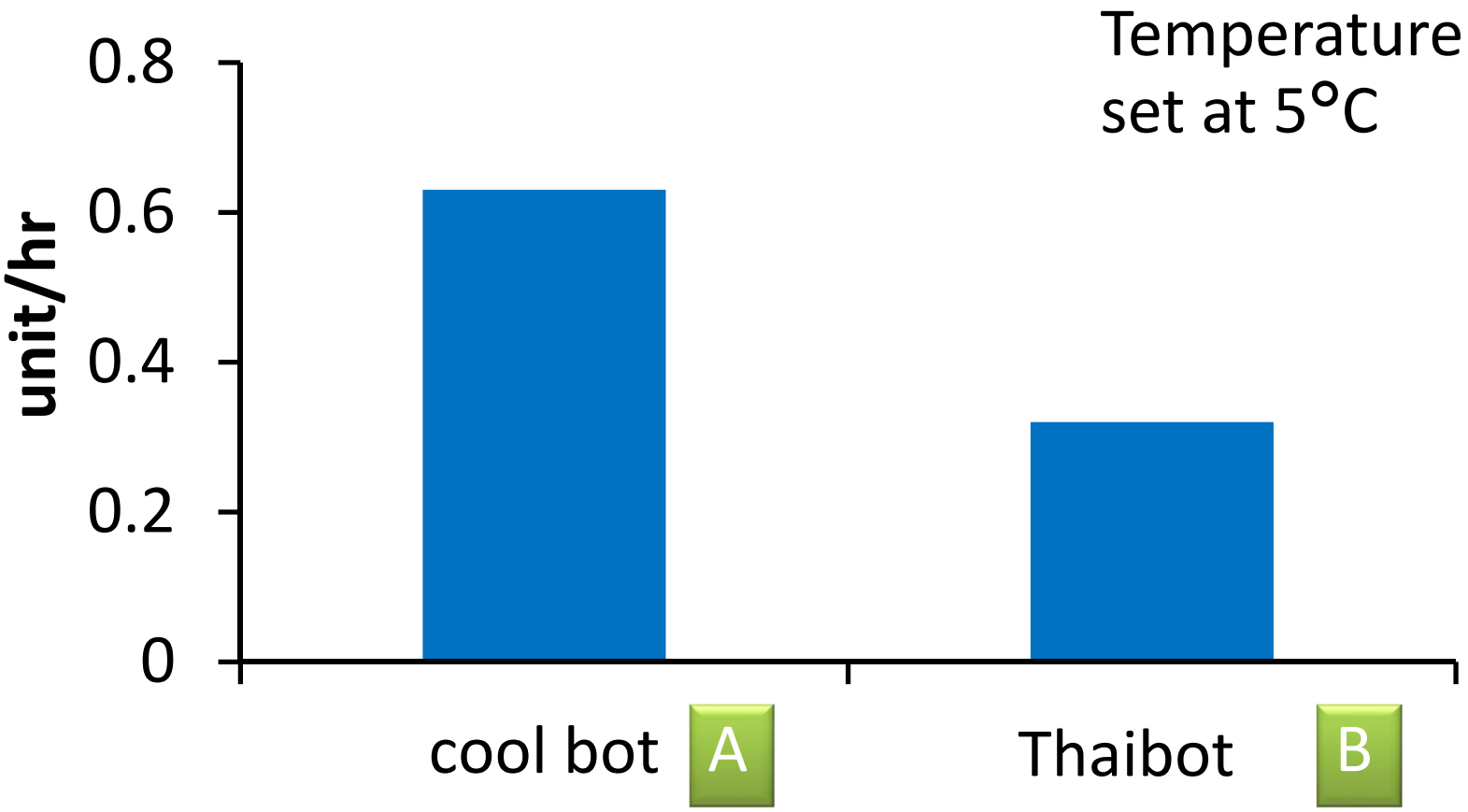
Controller costs US $300 in both cases

Coolbot vs localbot

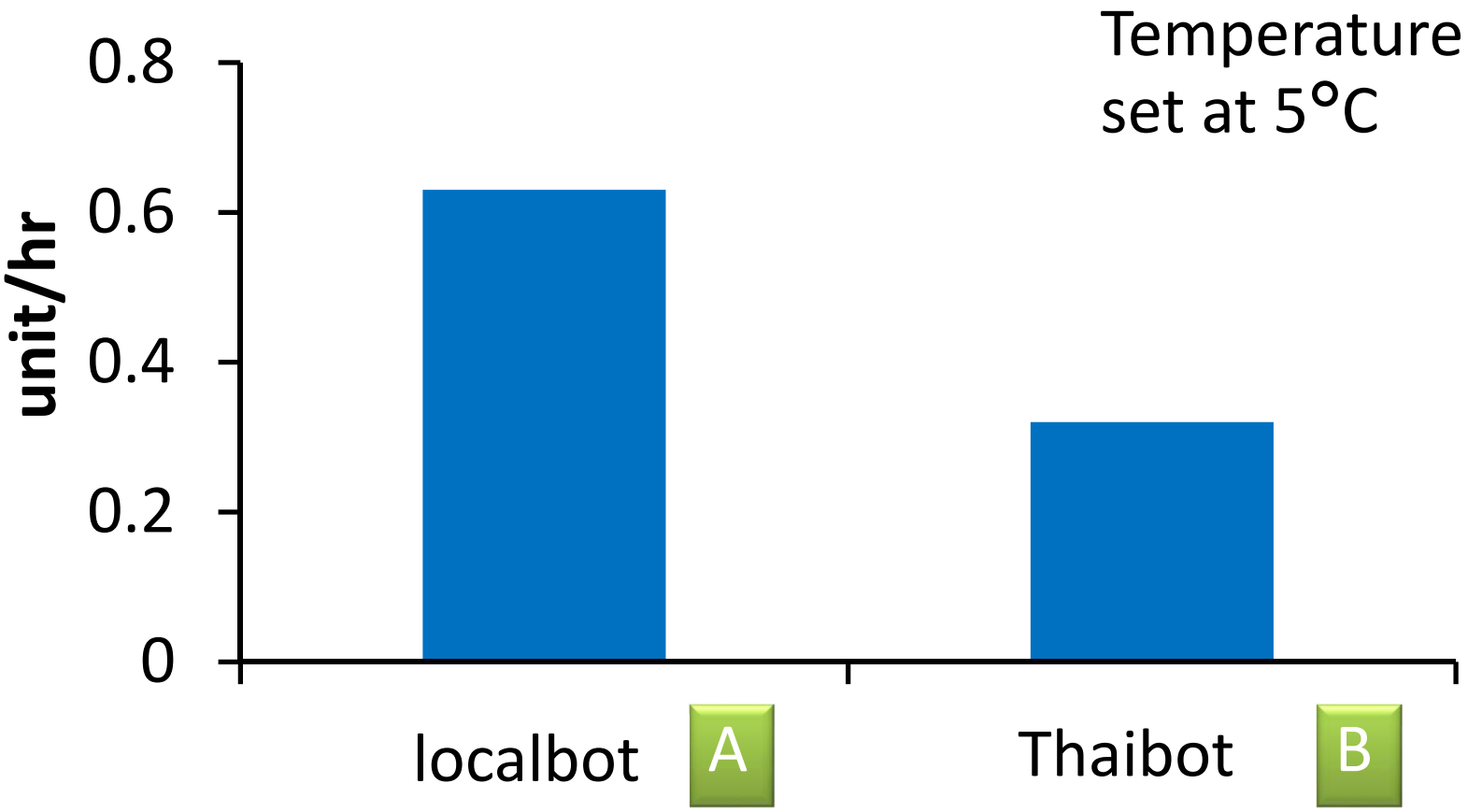


Coolbot room (A) and localbot room (B)

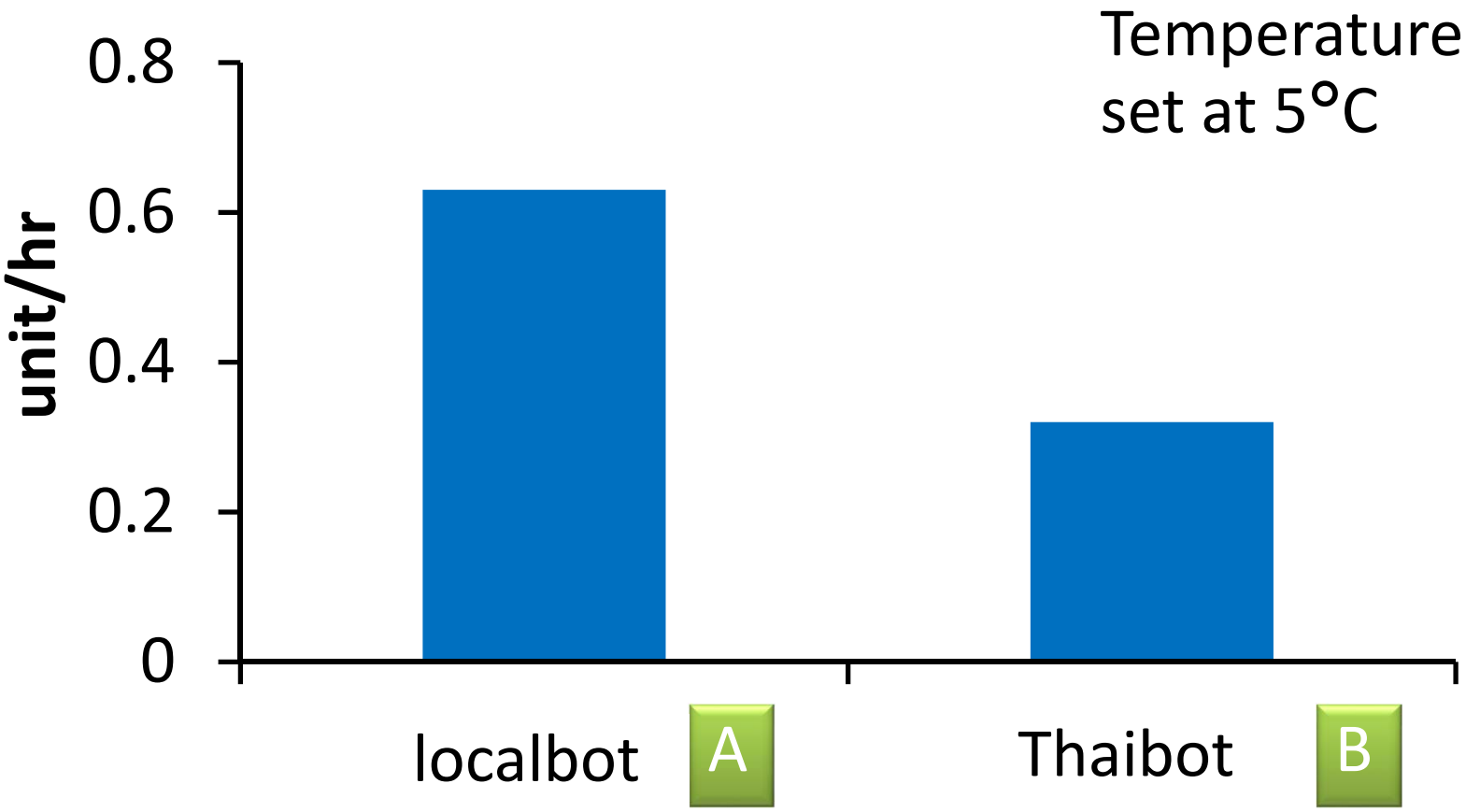
Energy consumption ??



Energy consumption ??



Energy consumption ??



Too low refrigerant

1. Coolbot is easier to use, not more expensive
2. Installation of the AC unit is very important

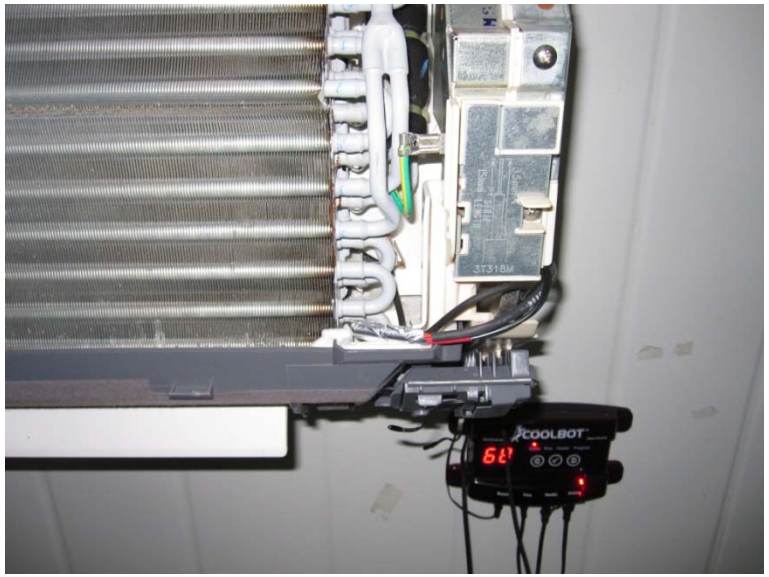
The evaporator of AC is smaller than that of the cold room

The temperature of AC evaporator is colder than temperature of regular cold room evaporator

More water condensed and moved out of the room (14%)

3. Need to add moisture or using plastic bag

KU Postharvest lab



Work well but the insulation is still expensive


USAID
FROM THE AMERICAN PEOPLE
HortCRSP
UCDAVIS
UNIVERSITY OF CALIFORNIA
Coolbot Technology
The low cost cold room. You can do it yourself!
Conventional
Coolbot
Cold room 2x1x2m
3,500
2,000
Refrigeration unit 9000BTU
2,700
550
Control unit (Cool bot)
300
2,850
Room temp sensor
Test insulation:
Styrofoam & fiber glass

4. Styrofoam and fiber glass insulation is not enough for long term use

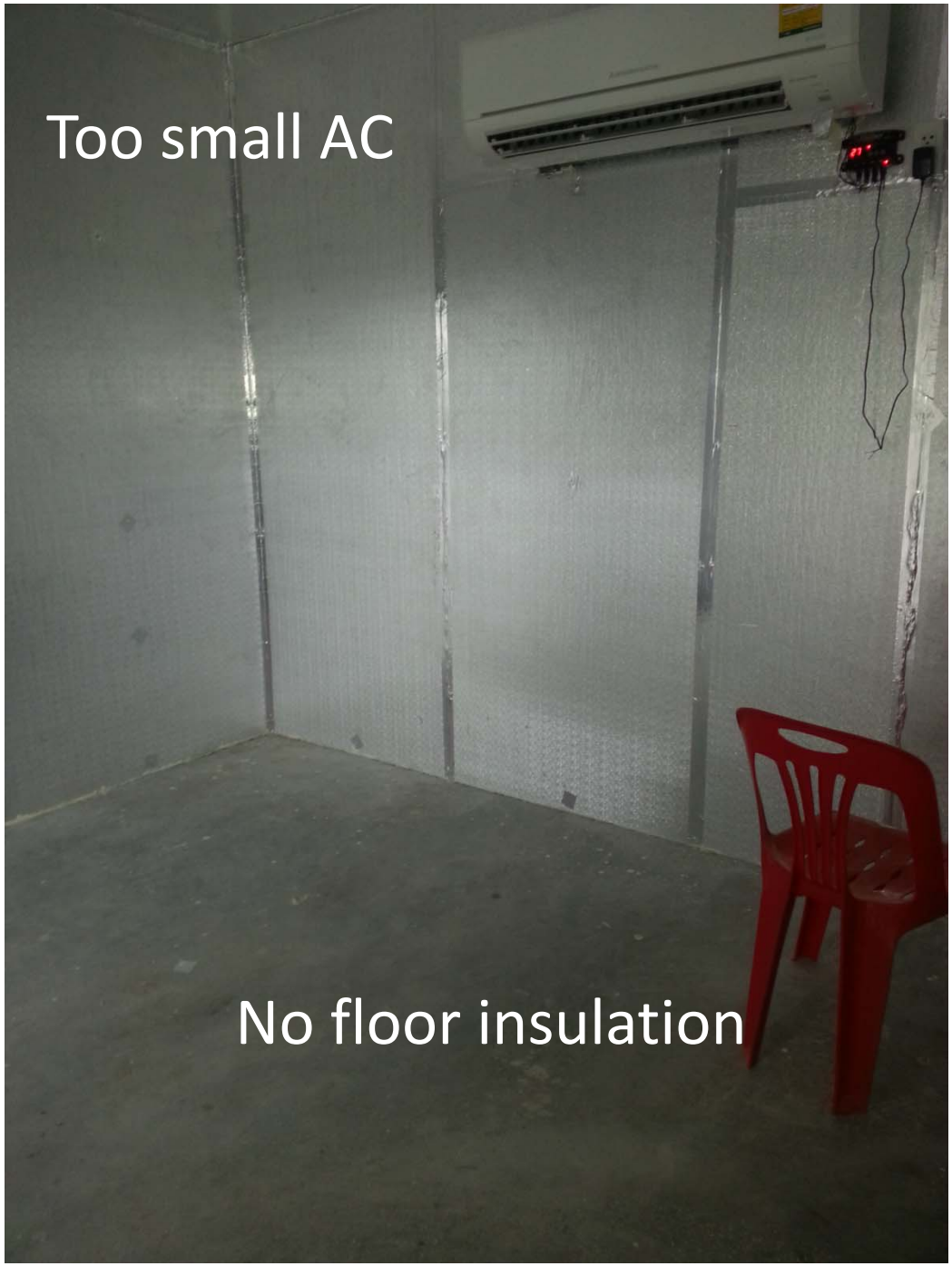
Nakhon Si-thammarat Community Enterprise

Rambutan and mangosteen grower group


One inch polyurethane
Insulation panel

One inch polyurethane insulation


Poor door insulation



5. Electricity was not stable

6. Cable was too small

Work on insulation is needed to get affordable cold room

Knock down cool room

Chanthaburi Horticultural Research Center

Being tested now

Parts after knocked down

Acknowledgement:

- HortCRSP
- Kasetsart University
- Nakhon Si-Thammarat Community Enterprise
- Chanthaburi Horticultural Research Center

We are Fresh!!!