

From: Ann Rodriguez <[REDACTED]>
To: "jeffrey E." <jeevacation@gmail.com>
Subject: Fwd: Larger unit in master bedroom
Date: Tue, 27 Oct 2015 14:35:52 +0000

Ann R.
Begin forwarded message:

From: reefcoservices <[REDACTED]>
Date: October 27, 2015 at 10:06:17 AM AST
To: Ann Rodriguez <[REDACTED]>
Cc: richardkahn12 <[REDACTED]>
Subject: Larger unit in master bedroom

Hello Anna,

You have asked me to upgrade the master bedrooms AC to a larger one so that the temperature can be lowered to 62 degrees Fahrenheit. I can do that, however there are some issues that occur when this is done and which need to be addressed.

A properly functioning and properly sized central air conditioning unit should be able to maintain the temperature of your house at any **reasonable** temperature you select. The amount of cooling available is related to the size of the system, insulation in the house, and the **outside air temperature**. Residential A/C units are manufactured, designed and sized to make the room temp 20-25 degrees below the outside temp. So if the outside temp is 95 deg., then the room should be able to cool efficiently to 70. As the outside temp increases then the inside increases proportionally.

When an air conditioner runs, it has two functions. First, it lowers the temperature of the air, and secondly, it removes moisture from the air. To be able to perform this second job, the AC has to run for a while. As the air passes over the evaporator coil, it encounters a very cold surface. Ideally, when the air passes over that cold surface, the air temperature drops approximately 20° F.

In regions where we have higher relative humidity (like in the Caribbean, for most of the year), the other important process that happens when the air hits the coil is that the temperature of the coil is below the dew point of the air. As a result, water vapor condenses on the coil. Yet, here lies the concern. Water vapor condenses on coils in over-sized air conditioners, too, but there has to be enough condensation on the coil for the water to begin dripping down into the pan below the coil. Even then, you're not there yet. You still have to have enough water in the pan for it drain to the outside.

Until the water that condenses actually makes it to the outside, you haven't really dehumidified the air. This is because that water on the coil can evaporate and return into the air in the home, which causes the moisture to stay in the room, effecting furniture, electronics, etc. Additionally, fungi can grow on the walls, in furniture, and closets.

Over-sized air conditioners do not run for a long time because they satisfy the cooling load quickly and then turn off. Properly sized air conditioners run longer, so if you want your air conditioner to dehumidify your home as well as cool it, you do not want to oversize the unit.

The process that wears out the equipment is frequently starting it up and shutting it down. The more this happens, the shorter the life of the equipment. When an AC is over-sized, it starts up and shuts down a lot more because it runs for only a short time to meet the thermostat set point. Then a few minutes later, it turns on again and runs for another short period of time. Over the course of a day, an over-sized air conditioner can have a lot more start-ups and shut-downs than a properly sized air conditioner. Which indicates that you will probably be repairing it more often and replacing it sooner.

I have installed low temp. systems before in hospitals and laboratories, but we use a vapor barrier in the floor, walls, and ceilings. Then we have to add make up air to the room due to the lack of air exchange because of the vapor barriers. After this, all the air is run through a dehumidifier before it is discharged into the room. Those rooms can be cooled to the 50s and with all of the added precautions taken just mentioned, it's not a problem. To do that here in the Caribbean, with our outside temperatures and humidity, to a concrete room is asking for some problems.

However, If you still wish to proceed, I will come out and assess what will be needed to install a larger unit in the master bedroom.

Regards,

David Van Drieson