

ASK THE INSPECTOR COLUMN FOR AUGUST 5, 2015  
HEADLINE: CENTRAL AIR CONDITIONING

An exasperated reader wrote this week, saying, “We have finally admitted that the current heat wave is getting the better of us and are going to install central air conditioning.....Help!! The current heat wave certainly appears to be settling in for the summer; the fourteen day forecast does not appear to show much relief.

First lets understand some of the terms related to a central air conditioning system; CAC for short. There are two main components; the “A” coil, which is fitted into the furnace ducting, generally located just above the furnace - four inches to be exact. The other part is the compressor, which includes the coils necessary to create the cooling. This is the cabinet that sits outside your home. There are two kinds of refrigerant that flow through these coils. The original refrigerant was Freon or R-22 and the newer refrigerant is called Puron or R410A. Freon contains chlorine compounds, which, if released into the atmosphere during normal wear and tear or equipment failure, has a negative effect on the ozone layer and contributes to global warming; hence this refrigerant is no longer permitted for sale in new units.

Puron does not contain the same ozone depleting properties as did R-22. CAC units with P410 are able to absorb more heat and release it better; hence the unit runs cooler, which should translate into a longer life span. In order to operate with Puron, CACs function at a higher pressure and are built to handle this pressure. A couple of HVAC contacts have expressed to me that the old life span of around 15 years for an R-22 unit should easily be eclipsed with the Puron units to at least 20 years and likely more than that. It’s still too early to tell for sure.

The government issues a Seasonal Energy Efficiency Rating (SEER) for room and CACs. In 2009, the base was set at SEER 13 for non-Energy Star units and SEER 14 for Energy Star units. Some companies have CAC units near the SEER 26 mark. Lennox has one with a solar option to support the operational costs. The high end rating usually recommends a multiple speed or variable speed fan installation in the furnace.

Most air conditioners are rated by tonnage. As a rough estimate, one ton of cooling capacity is needed for approximately 800 to 1,000 sq. ft. A 2-ton CAC would, therefore, cool the average 1,600 to 2,000 sq. ft. home. The vast majority of homes use a 1 ½ ton or a 2 ton unit. You can expect to pay anywhere from \$2,500 and up for a standard 1 ½ ton unit, plus installation.

It is important to size the unit to your home, as an oversized unit will cycle on and off during its operation and decrease its efficiency. This could lead to premature compressor failure. A larger unit will cool the home too quickly, causing the system to shut down before the home is sufficiently dehumidified. This can make your home feel cold and clammy. One suggestion, and I actually did this in a former home, was to use a larger “A” coil; one size up. The logic was that a larger air surface in the coil gave better efficiency. For example on a 1.5 ton CAC unit use a 2 ton coil in the furnace plenum, assuming it will fit.

Where do you put the unit? Check the local by-laws. In some municipalities there are regulations regarding where these units can be installed. I am aware of more than one unit that was installed in Kingston too close to the lot line and had to be moved after neighbours complained. They can be noisy during operation, although the newer model mini-split units are very quiet. Locating near a window or door is also not a good idea. Try for a shaded spot, if possible, but not surrounded by trees and shrubs as the unit needs air to operate. If at all possible, have your contractor install the cabinet on a metal frame or wall bracket that is attached to the foundation. While some technicians claim these brackets will come loose, an annual check should alleviate this concern. CAC units must be level and I often see the cabinet sitting on a patio stone that has settled considerably.

If your furnace is a single speed unit, talk to your CAC technician about the possibility and cost of a two-speed fan for your furnace. CAC units often need more airflow than is required for heating. Cool air is lot denser than warm air and some homes, especially older homes, lack sufficient duct capacity. If the home is a two storey, as older homes often are, it can mean quite a difference in temperature between floors. Ask your HVAC Tech about the possibility of in-duct fans that come on in sequence with the furnace; this may help the air movement.

To will help with the efficiency, when the unit is being installed, try and keep the refrigerant lines as short as possible. Your CAC unit will require a designated power supply and your installer may have to add a separate disconnect if your electrical panel is full. When you get your estimates, make sure the contractor includes all the necessary extras: wall bracket, electrical upgrades, changes in the duct work and entrance through your wall should be included in the quote.

Once your system is installed and running, it will require some regular maintenance. The number one thing I see with CAC systems is that people forget the furnace filter. This should be changed, at minimum, every two months and, during this present heat wave, I would check it after a month. If your filter becomes blocked, it can cause the coil in the CAC unit to freeze up; not good for the system. Keep the area around the exterior compressor cabinet clear. Remove any leaves and grass clippings that may become attached to the unit. If you are careful, a garden hose on mist or lower pressure works here.

Lastly, prepare your CAC system for winterizing. Turn the unit off at the main disconnect. We are seeing more and more units with the insulated covers that are prematurely rusting the cabinets. Every year, I hear a couple of my HVAC trade friends “chuckling” about the client who forgot to remove the cover before turning his A/C on. Forgetting can be an expensive mistake. Instead of using the insulated cover to protect it from the weather, cut a piece of ¼ inch plywood to fit over the top and hold it down with a ½ brick or medium sized stone. When turned on, a modern unit will usually move enough air that the plywood cover will slip away, should you forget to remove it.

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