

So You're Installing a Condensing Gas Rooftop Unit

PRO-TIPS FOR C-RTU INSTALLS

What's the difference between installing condensing (C-RTUs) and conventional gas RTUs? Mostly it's about careful attention to condensate management. The condensing furnace in C-RTUs requires considerations for piping, pumps, neutralizers, and freeze prevention – otherwise there's the risk that the unit will not function as efficiently as specified, and there's a threat that the original equipment manufacturer (OEM) may not honor their warranty.

Properly installing and maintaining condensate disposal equipment will ensure that customers achieve the benefits of high-efficiency condensing furnaces without the risk of disruption, damage, or code non-compliance. This guide provides current best practices for installing C-RTUs, by referencing code requirements, manufacturer instructions, and practical experience regarding the management of condensate produced by C-RTUs. Some of the “pro-tips” are equally applicable to conventional RTUs, and are included for thorough discussion on RTU installation.

PRO-TIPS FOR C-RTU INSTALLS *cont.*



1. **Comply with Code Requirements & OEM Install Specs**

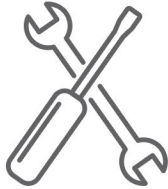
- Check with the local, region-specific requirements, as they vary by local jurisdiction. For example, the City of Portland always requires a neutralizer for condensate, as this is a requirement from Portland's Environmental Services Department
- The manufacturer's specifications explicitly state the recommended process for installing the C-RTU. Review this to ensure compliance with warranty requirements



2. **Get the Piping Right**

- Consider the building's other rooftop piping needs to ensure that there are no routing conflicts
- Use PVC/CPVC that meets appropriate ASTM/CSA specifications
- Configure drain lines such that future cleanout and clearing of blockages will not require the drain line to be cut
- Route drain lines inside curbs and inside the building when possible
- Provide a minimum slope of 2% for gravity-driven drainage. This is equal to a slope of 1/4" per foot
- Space support hangers or brackets at a minimum of every three feet along the run of a suspended pipe
- Provide a condensate trap (*at least 6" high*) directly after the C-RTU drain outlet in the conditioned space to prevent air from entering the unit

PRO-TIPS FOR C-RTU INSTALLS *cont.*



3. Install Condensate Pump for Drainage

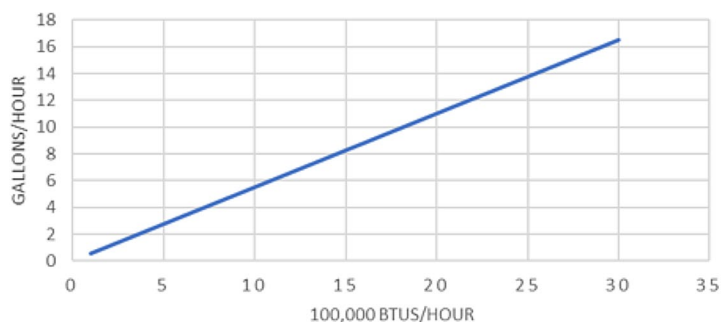
- Ensure that the pump is correctly sized to handle two to three times the volume of condensate that will be produced to avoid 100% run times during cold weather. A general estimate of peak condensate production is 1 gallon per hour for every 100,000 BTUs/hour of capacity
- Place the condensate pump up-stream of the neutralizer to avoid calcium deposit build-up in the pump
- Ensure that the pump is either rated to handle acidic condensate or has integrated neutralization capability
- Install fault detection such that when the pump fails the appliance or equipment will be prevented from operating
- If a curb adapter is used, ensure drainage or freeze protection are not affected



4. Neutralize the Condensate before Disposing

- Always provide means of neutralizing the condensate before depositing it in sanitary or drain lines
- A pH of 5 should be considered the maximum acidity level of condensate after neutralization
- Select a neutralizer that is rated to process the estimated flow rate produced at peak heating conditions
- Choose a neutralization media that contains a minimum of 90% calcium carbonate

GALLONS OF CONDENSATE PER HOUR



PRO-TIPS FOR C-RTU INSTALLS *cont.*



5. Plan for Freezing Temps and Freeze Protection

- Install outdoor condensing equipment on a curb; slab mounting is not recommended
- Install frost free traps immediately after the condensing unit drain output inside the conditioned space
- Install heat trace along the pipe where exposed to outside temperatures. In extremely cold areas install heat trace even when piping is routed inside the curb
- Do not drain the condensate onto the roof area



6. Organize Proper Proactive Maintenance

- Discuss the need for proper maintenance with the customer to avoid blockage
- Failure to regularly service neutralizers, pumps, and drain lines can lead to system failure and building damage
- Replace neutralization media annually to avoid blockage from build-up of dissolved media in piping
- Inspect and clean condensate pumps. Ensure that all calcium deposits are removed