

Condensing Gas Rooftop Unit (C-RTU) Installation Tips and Best Practices



Post Falls, ID

This guide references code requirements, manufacturer instructions and practical experience to provides tips and best practices for installing C-RTUs.

C-RTU installation is very similar to the installation of conventional gas rooftop units (RTUs). However, C-RTUs require careful attention to condensate management, including specific approaches to piping, pumps, neutralizers, and freeze prevention. Properly managed condensate will ensure efficient C-RTU operation without the risk of disruption, damage or code non-compliance. Improperly managed condensate may result in the voiding of the original equipment manufacturer's (OEM's) warranty.

NOTE: All C-RTU tips and best practices that do not pertain to condensate management can be applied to RTU installation.



TIP 1: Comply with Local Code Requirements and the OEM's Installation Specifications

- Be sure to check with the local, region-specific requirements, which may vary by jurisdiction. For example, the City of Portland requires a neutralizer for condensate.
- Closely follow the OEM's installation specifications to ensure compliance with warranty requirements.



TIP 2: Get the Piping Right

- Avoid routing conflicts by considering the building's other piping needs.
- Use PVC/CPVC or PEX pipe that meets appropriate specifications from the American Society for Testing and Materials (ASTM) or the Canadian Standards Association (CSA).
- Configure drain lines so they will not have to be cut to accommodate the future clearing of blockages.
- Avoid the need for freeze protection by, when possible, routing drain lines inside roof curbs and inside the building.
- Provide a minimum slope of 1% (1/8-inch per foot) for gravity-driven drainage. Where space allows, the preferred slope is 2% (1/4-inch per foot).
- Space support hangers or brackets at a minimum of every 3 feet along the run of a suspended pipe.
- Provide a trap, at least 6 inches high, directly after the C-RTU.

Renton, WA





TIP 3: When Required, Install a Condensate Pump for Drainage

- Install a gravity drainage system when possible. Gravity drainage systems are simpler, less expensive, less prone to failure, and require less maintenance than pumped drainage systems. However, when the nearest drainage location is 50 feet or more from the C-RTU, it may be necessary to use a pumped drainage strategy.
- When necessary, ensure the pump is correctly sized to handle 2–3 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 1/3-gallon per hour for every 100,000 BTUs per hour of capacity.
- Avoid calcium deposit build-up in the pump by placing the condensate pump upstream of the neutralizer.
- Ensure that the pump is either rated to handle acidic condensate or has integrated neutralization capability.
- Install fault detection so that the equipment is prevented from operating when the pump fails.
- If using a curb adapter, ensure drainage or freeze protection are not affected.



TIP 4: Neutralize the Condensate before Disposing

- Always provide means of neutralizing the condensate before it discharges to a sanitary drain.
- A pH of 5 is the maximum advisable acidity level of condensate after neutralization. Always check with local jurisdiction for specific pH requirements.
- Select a neutralizer that is rated to process the estimated flow rate produced at peak heating conditions.



TIP 5: Plan for Freezing Temperatures and Freeze Protection

- Install outdoor condensing equipment on an insulated curb. Slab mounting is not recommended.
- Install frost-free traps inside the conditioned space immediately after the condensing unit drain output.
- Install heat trace along the pipe where pipes are exposed to outside temperatures. In extremely cold areas, heat trace may be required even when piping is routed inside the curb.
- Do not drain the condensate onto the roof area.



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TIP 6: Organize Proper Proactive Maintenance

- Avoid future blockage, system failure and building damage by discussing the need for proper maintenance with the customer. Maintenance needs include:
 - Regular service of neutralizers, pumps, and drain lines.
 - Annual replacement of neutralization media.
 - Regular inspection and cleaning of condensate pumps.
 - Removal of all calcium deposits if a pump is installed after neutralization.



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