

## FAQ

# Venting

Every piece of equipment has different venting guidelines. Please refer to your manufacturer’s and your local jurisdiction’s venting requirements for more detail.

**Question: Which flue material can I use for my unit?**

**Answer:** All flue material listed to UL 1738 certified for Category II and IV appliances are acceptable for AERCO equipment.

**Q: What are UL 1738 equipment categories?**

**A:** UL 1738 breaks up the venting systems for gas-burning appliances into four categories: Category I, Category II, Category III, and Category IV. These categories are differentiated by their expected vent pressure and expected flue gas temperatures. Flue gas temperature is indicative of whether or not condensation will form in the vent. The following table lists the characteristics of each equipment category.

	Positive Vent Pressure	Condensation in Vent
Category I		
Category II		x
Category III	x	
Category IV	x	x

**Q: Why does my municipality prohibit the use of PVC flue materials?**

**A:** At operating temperatures greater than 140°F, PVC will begin to melt, which may cause warping and sagging of the flue. Any damage to the integrity of the flue risks improper expulsion, back pressure issues, and leaking of the flue into the mechanical space. It is important to be aware of your unit’s exhaust temperatures, which are typically dependent on the unit’s setpoint. PVC is also highly toxic when burned.

**Q: What if my building’s walls are combustible?**

**A:** Wall and roof penetrations must follow all applicable codes and the vent manufacturer’s instructions. Vents must never be installed at less than required clearances to combustible materials, as enumerated in UL, NFPA, CSA B149.1-10 or local codes, “Double-wall” or “Thimble” assemblies are required when vents penetrate combustible walls or roofs.

**Q: What if my flue is larger than the exhaust connection on my unit?**

**A:** An adapter can be used directly at the exhaust manifold to connect the flue to the unit. These are typically sourced from the flue manufacturer. Depending on the adapter, it can be connected to the exhaust manifold by a hose clamp or a Viton caulk or other high temp RTV sealant.

**Q: What if my system is in a noise sensitive area like a school or hospital?**

**A:** Mufflers are available to mitigate the noise out of the flue. Note that upsizing the vent may also result in less noise through the flue.

**Q: Why does my boiler sound like it's howling?**

**A:** Howling sounds or tones may indicate that your boiler is being starved of combustion air (CA). This may be due to poor CA calibration, blocked flue or CA inlet, clogged air filter, or a poor layout.

**Q: What if I don't have enough room air for all my equipment?**

**A:** CA can either be ducted directly to the unit or taken from the mechanical space. Louvers may be used to supply air to the mechanical room. Louvers must be sized per NFPA 54 requirements to provide adequate air volume to all equipment in the mechanical space at full fire.

**Q: What if I can only have one penetration through the wall?**

**A:** When only one penetration is available through the wall or roof, the flue may be manifolded, and the CA may be taken from the mechanical room. A concentric flue vent may also be used, provided the flue manufacturer is able to fabricate one large enough for your system.

**Q: How do I know if my vent is sized properly?**

**A:** The flue duct should be sized to be within the maximum equivalent length and pressure drop limits listed by the unit manufacturer. All manufacturer guidelines should be adhered to.

**Q: What if I have existing venting?**

**A:** Existing venting may be used for new equipment, provided its layout and materials adhere to the manufacturer's and local jurisdiction's venting requirements.

**Q: What if I have an existing chimney?**

**A:** An existing chimney may be used for venting; however, it may have to be lined with proper flue material according to manufacturer's and local jurisdiction's codes.

**Q: Is there a chance of condensate settling in my ductwork?**

**A:** Per NFPA 54, the flue must be pitched up toward termination a minimum of ¼" per foot of run. This pitch prevents condensate from settling in the joints of the vent and corroding the flue material. Drain tees should be installed every 20' of horizontal run and at the base of every common vertical run. When utilizing a side-wall termination, it is advised to have a diameter increase or a steeper pitch near the wall penetration to prevent condensate transport and spraying at the termination during high fire operation.

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**Q: What if I cannot keep my CA vent sloped upward?**

**A:** Low spots in the CA are allowed provided the CA duct is sized accordingly to overcome the resistance of the low spots. It is also important to use a bird screen at termination to prevent animals from entering the duct. When using a bird screen termination, it is recommended to use a termination tee to allow for proper free area.

**Q: Is there a risk of my CA being contaminated by other sources?**

**A:** There is always a risk of CA contamination. Contamination can occur from many things, including flue recirculation, refrigerant, nitrate, sulfate, or water softener exposure, among others. The CA intake should be placed away from these contaminants. Per NFPA 54, the flue must terminate a minimum of 3' above or 10' horizontally removed from any building air intake to avoid flue recirculation. Compliance with the NFPA minimum does not eliminate flue gas recirculation in all cases. Always strive to maximize separation and reduce potential contamination in your installation design. Wind blocked areas, parking garages, loading docks, and areas where salt or refrigerant is used should be avoided when placing the CA intake. Prevailing winds should also be considered.

**Q: Why am I experiencing pitting in my condensate drainage?**

**A:** Corrosion in the aluminum or stainless-steel condensate drainage is likely caused by CA contamination. This may lead to a heat exchanger failure if not quickly diagnosed. It is important to check for likely causes of CA contamination and perform a heat exchanger inspection.

**Q: How do I fit my flue termination?**

**A:** For condensing equipment, it is recommended to fit your termination with a velocity cone to promote proper expulsion of the flue. Velocity, or exit, cones help to expel the flue gas more quickly, diluting it with air and dispersing it before it can condense on nearby mechanical equipment or structures and cause damage or corrosion.

**Q: What if I have a high wind application?**

**A:** At high wind sites, it is recommended to use a termination tee on the air inlet and flue outlet to avoid wind interference and prevent flame loss.

**Q: What if I cannot terminate vertically through the roof?**

**A:** Horizontal termination through a side wall is acceptable provided the flue terminates in an open area. Discharges in corners or located directly behind vegetation may cause the flue pressures to fluctuate and result in flame instability. Vents must not terminate over public walkways or areas where condensate or vapor could create a nuisance or be detrimental to the operation of regulators, meters, or related equipment. Side wall termination must be a minimum of 6" from the exterior wall.

**Q: What if my vent is too long?**

**A:** The pressure drop needs to be considered for proper burner operation and boiler heating capacity. The maximum allowable pressure drop in the vent system will be specific to the unit manufacturer. Draft controls may be necessary per manufacturer approval.

**Q: Am I able to use draft controls in my venting?**

**A:** When expected draft measurements are within the boiler manufacturer's allowable values, it is not recommended to use draft controls. For extremely long stacks or stacks with little vertical height, draft inducers may be recommended per manufacturer review.

**Q: How do I size my draft controls?**

**A:** The draft control provider is responsible for all calculations to maintain pressures within the tolerances listed by the boiler manufacturer.

**Q: Where should my draft controls be placed?**

**A:** For common vented layouts, it is best to place draft controls in the common vent rather than the individual vent. All layouts should be evaluated on a case-by-case basis to determine best placement for draft controls.

**Q: What is a draft damper?**

**A:** Dampers are used to control overdraft within the flue. They do this by oscillating to maintain proper pressure drop. Modulating the position of the damper maintains a constant draft.

**Q: What kind of damper can I use?**

**A:** Draft dampers for AERCO equipment must be sealed to prevent flue gases from being expelled into the mechanical room. Barometric dampers should not be used as they are typically unsealed. For modulating equipment, faster actuators are necessary and limited damper positions are used to prevent negative impacts on combustion processes. Typically, the damper positioning range is set between 80-90% open and 30-50% closed.

**Q: What is a draft fan or an exhaust fan?**

**A:** Similar to a booster pump, a draft fan is used to induce a draft within the flue by pulling the exhaust gases out of the flue. By doing so, the draft fan creates the proper amount of draft/back pressure in the boiler combustion chamber promoting proper combustion.



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