

Arctic Dual Hood for Heat Recovery Ventilation Information Sheet

Basic Information

The Arctic Dual Hood is a combined intake/exhaust vent for heat recovery ventilators (HRVs) in cold climates. It enables routing the HRV intake and exhaust through a single wall penetration. While conventional combined intake/exhaust vents for HRVs tend to freeze up in cold climates, the Arctic Dual Hood uses a unique geometry that significantly reduces this issue. It is intended for use at flow rates up to 110 CFM. The cross-contamination between the exhaust and intake was shown to be below the ASHRAE Standard 62.2 limit of 10%.

Principle of Operation

Conventional combined intake/exhaust vents for HRVs tend to freeze up in cold climates. Since the exhaust air typically has a lot of moisture in it, condensation occurs when it mixes with the outside cold air at the vent's exhaust grille. In cold temperatures, this results in ice being built up on the exhaust grille that eventually blocks the airflow. The Arctic Dual Hood for Heat Recovery Ventilation utilizes a unique geometry that prevents the exhaust grille from being directly exposed to outside temperatures. This geometry includes a hood over the exhaust portion of the vent. Despite the heat recovery inside the HRV, the exhaust air is still warmer than the outside air and thus fills the space inside the hood due to its higher buoyancy before escaping and mixing with the outside air. As a result, a large portion of the mixing occurs in the open air (as opposed to on the grille) and thus the ice particles being formed in the process of the condensation are carried away by the airstream as opposed to sticking to the grille. Normally, a hood over the exhaust portion of the vent would result in cross-contamination due to the exhaust airstream being directed towards the intake, but this is mitigated by utilizing a deflection plate in the geometry of the Arctic Dual Hood that deflects the exhaust airstream away from the intake.

Installation

The Arctic Dual Hood for Heat Recovery Ventilation is compatible with the Broan Tandem Transition Kit (to be purchased separately). The Broan Tandem Transition Kit needs to be in place (all parts except for the actual hood) before installing the Arctic Dual Hood. The Arctic Dual Hood then mounts directly onto the Broan wall mounting plate that is installed as a part of the Broan Tandem Transition Kit. The top two screws that mount the Broan wall mounting plate onto a wall must be out before snapping the Arctic Dual Hood into the Broan wall mounting plate. The top two screws of the Broan wall mounting plate are then screwed into the wall through both the Arctic Dual Hood and the Broan wall mounting plate. In normal situations, the two bottom screws of the Broan wall mounting plate are screwed into the wall before the Arctic Dual Hood is snapped in, and thus those two bottom screws only hold the Broan wall mounting plate (the back of the Arctic Dual Hood has pockets for the screw heads to allow the Arctic Dual Hood to sit flush on the Broan wall mounting plate). Where added security is needed, such as in windy locations, it is recommended to drill screw holes through the Arctic Dual Hood and use washers (field supplied) to run the two bottom screws through both the Arctic Dual Hood as well as the Broan wall mounting plate.

Literature with Additional Details

R. Bickford, "Developing a combined intake and exhaust vent for heat recovery ventilation in cold climates," M.S. thesis, University of Alaska Fairbanks, 2022, available at <https://scholarworks.alaska.edu/handle/11122/13070>

T. Marsik, R. Bickford, "Intake/exhaust vent with hood," U.S. Patent Application Publication No. US 2023/0194111 A1, U.S. Patent and Trademark Office, 2023, available at <https://image-ppubs.uspto.gov/dirsearch-public/print/downloadPdf/20230194111>