SIP No. 2000

Subject: **Heat Recovery Ventilators**

Date: **November 2007 (Revised January 2015)**

Reducing air leaks in a structure is central to achieving maximum energy performance. Many building strategies such as house wraps, vapor retarders, rigid insulation sheathing, tapes, and sealants are designed to reduce air leakage. R-Control SIPs are one of the best building systems available to provide low air leakage and overall building energy efficiency.

Moisture, fumes from adhesives, smoking, and other gases and particulants can become trapped within the structure. When these pollutants accumulate to high levels they could potentially contribute to an unhealthy living environment.

Heat Recovery Ventilators (HRVs) allow a structure to remain efficient while also providing fresh air at a low operating cost. Indoor air pollutants are continuously being taken away and replaced with fresh air. This provides a healthier living environment while retaining energy savings.

A brief synopsis of how HRVs work to effectively improve indoor air quality follows:

What Is An HRV?

An HRV is a unit that can continually exchange stale inside air for fresh outside air, while also using the heat (or cold) from the exhaust air to raise or lower the temperature of the incoming air. A large percentage of the heat in the exhausted air can be recaptured. This efficiency allows a constant flow of fresh air, but doesn't require a separate heating unit to heat all the fresh incoming air.

What Installation is Required?

HRVs require some planning before construction. The main unit should be placed in a temperature controlled area, basement, mechanical room, etc. Ductwork is typically run from rooms such as bathrooms, laundries, and kitchens to the HRV. These areas are chosen for their typically high levels of odor and humidity. Insulated ductwork is then run from the HRV to the exterior of the building. A separate system of fresh air ductwork is run from the exterior of the building to the unit and continued to the fresh air drop, often a return air of a furnace.

How Do They Work?

Stale air is drawn from the bath, laundry, and kitchen to the HRV, and is ducted through the HRV to the outdoors. Meanwhile, fresh outside air is drawn to the HRV, then ducted to the inside fresh air drop point. As the two separate streams of air pass each other within the HRV, they are separated by a medium that provides a conductor for the heat to be exchanged from the hot air to the cold air. The incoming fresh air is warmed by the transfer of heat from the inside air and is then ducted into the living area or furnace air supply.

Excessive moisture can also be controlled with an HRV. As the air streams pass the medium, condensate will appear on the exhaust side of the medium. The condensate forms because the warm moisture-laden exhaust air cannot hold as much moisture after its heat has been drawn through the medium. The excess moisture is removed and drained away.

How Can They Benefit The Sunbelt?

In areas where warm, humid outside air exists, an HRV will allow fresh air to be introduced to the building while controlling the humidity level. The two airstreams will follow the same routes as before, but as they pass within the unit, heat is drawn from the warm, humid outside air. Its ability to hold moisture decreases as it cools. Condensate is left behind as before, except that the condensate forms on the opposite side of the medium. Thus, the fresh incoming air is cooled and dried before being introduced into the living area. The air exchanger must be equipped with a desiccant system for sunbelt areas.

R-Control Warranty and Ventilation

The R-Control warranty requires that a mechanical ventilat-

ing system be installed in the R-Control structure in order for the R-Control warranty to be valid.

The humidity level in a structure should be controlled to <40% in winter and <60% in summer. Higher levels of moisture could lead to condensation problems.

The information in this bulletin is being provided to assist you in achieving proper design, installation and operation. Please consult a local HVAC engineer and contractor, or reference ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) Standards for design and installation of HRVs as part of a complete HVAC design. Refer to Technical Bulletin sip no. 2051 for additional information on HVAC system design.

CLICK HERE FOR
QUOTE

sales@rcontrolsips.com
www.rcontrolsips.com

Copyright © 2025 R-Control SIPS, LLC.
All rights reserved. Printed in USA.

R-CONTROL SIPS
1450 N. Waco St.
Hillsboro, Texas 76645
254-324-7477
(SIPS)