

Ventilation Windows from Horn Group Aps.

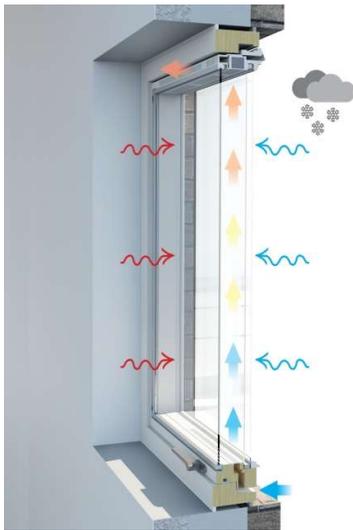
Houses and buildings are built tighter. This has increased the demand for solutions to provide fresh air in to buildings other than through balance ventilation systems.

Approximately 10 years ago Horn-Group invented the concept of the intelligent open window called the Ventilation Window and have taken out a patent on the air flow valves required to accommodate for enough air regulated to meet modern building standards. The Ventilation Window is not only a window but an energy solution providing fresh pre-heated air, a superb indoor climate and considerable costs savings both on energy, installation and the day to day costs of running the system.

The Horn Ventilation Window is a double window construction also known as "Russian Windows" as known as far back as to the winter palace in Sct. Peterborough. We at Horn Group have just put it in to a regulated system to meet modern building requirements. The Ventilation Window allows fresh air to enter the window and travel up between the two layers of glass to be lead in to the building through the Climawin (Pat.) air flow valves. Wax actuators (non-electronic) ensures – depending on outside temperature and the temperature between the glasses, to regulate the amount of air and have a constant change of air in the building with a minimum of heat loss.

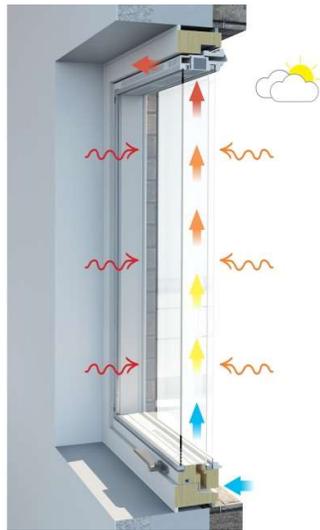
The air flow valves have a permanent minimum opening which always secures pre-heated air coming through. It opens gradually when the room between the two glasses is heated by the sun or by the heat loss through the inside window. With an outside temperature of 22 degrees plus the window turns self cooling.

Minimal position:



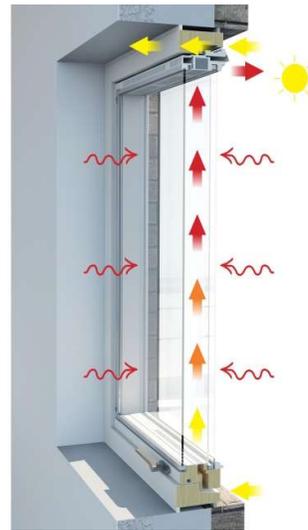
In minimal position the window deliver a gentle but constant pre-heated stream of air.

Normal position:



In normal position the Window delivers an optimal pre-heated Air supply to the building.

Self cooling position:



In self cooling position the Window deliver fresh outside air directly and the Air flow cools the glasses.

Tests and measuring on buildings in Denmark and Germany have shown a 30% difference in temperature from the outside to the inside of the Ventilation window without the use of blinds. Winter measurements show the pre-heated air temperature increase on an average by 7-12 degrees in a CEN-size 1230x1480 window.

The Horn Ventilation Windows functions and capabilities are thoroughly tested by the Fraunhofer institute in Germany. Together with Danish University of Aalborg we have developed energy frame calculation programme based on hourly all year weather data. Due to the dynamics of the construction this programme often proves costs savings

on energy of 25% on the buildings collective costs for both cooling and heating. Danish authorities recognise our programmes results to be used side by side with standard energy frame calculation systems.

The Ventilation Window looks as, is installed and maintained like other windows. Experience show that in many buildings it is a big advantage to combine The Ventilation Window with mechanical suction systems or an air/water heat pump. The Ventilation Window can also be combined with standard windows in order to keep down costs and only ventilate the adequate amount of pre-heated fresh air required.

A Ventilation Window with one set of valves delivers 14,3m³ of fresh air per hour in normal condition. By combining it with mechanical suction system the amount of air is easily increased but at the cost of reducing the pre-heating effect. This is an advantage for short periods where more fresh air is required - for example in schools.

The Horn-Group Aps. Is a 100% Danish owned company producing a limited range of windows with or without ventilation and the Climawin thermostatic air flow valve. We grant licenses to suppliers of windows who wish to add to their range an own-name Ventilation window. A license includes access to our energy calculation system.

Horn Group Aps. consist of 3 divisions:

Horn Vinduer – producing a limited range of wooden windows primarily for the Scandinavian market.

Horn Air Valve Systems – producing the semi-passive and electronic Air Flow Valves systems and software. This system is offered on license to window manufacturers with in an interest in adding an intelligent ventilated window to their range. They then benefit from the technology already available to fit most windows and is fully documented for energy calculation systems.



Horn Intelligent Ventilation Window: Our own brand name for the unique window concept. We offer complete IVW's for markets where we currently have no licences.



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