

Treated Fresh Air for Window Air Conditioners

All areas occupied by people must be supplied with ventilation air is a moot point. Normally enough fresh air must be supplied so as to replace all the air in a room at least once every hour. This is only for bedrooms, office cabins and other areas occupied by a couple of persons doing light work or sleeping. The demand goes up sharply if there is high occupancy, such as theatres, or there is strenuous activity such as gymnasiums or if there is a lot of pollution.

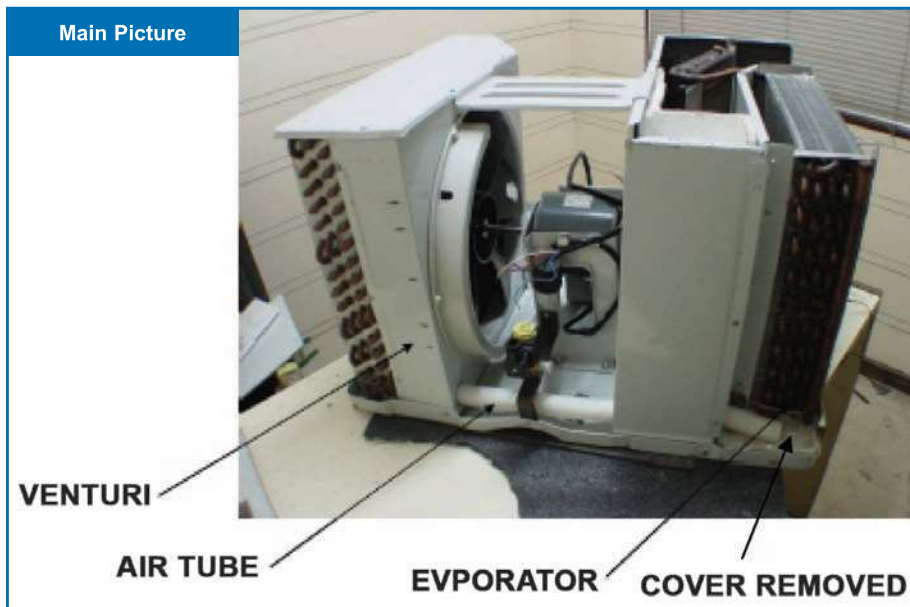


Contrary to popular belief, the main purpose of ventilation air in air conditioned space is not to provide oxygen - one needs very little of it for breathing. It

is to get rid of the carbon dioxide produced while breathing and also polluting vapours etc, constantly emitted by carpets, paint, furniture and other objects.

In high concentrations, carbon

dioxide can cause disorientation, dizziness and even brain damage leading to coma and death in extreme cases. High concentrations of polluting vapours (Volatile organic compounds, VOCs) give rise to "Sick Building Syndrome" that can cause illness or even cancer.



CO ₂ Concentration Level	Recommendation
350 - 450 PPM	Healthy normal outside level
700 - 1000 PPM	Ventilation operation
2500 - 5000 PPM	Adverse health effects expected
5000 PPM	Time weighted average exposure limit - 8 Hours

ASHRAE Standard 62 - 89 for Ventilation Regulation

According to ASHRAE, each person needs CFM fresh air, but CO₂ levels should not exceed 1000 PPM.

However, since ambient air adds considerable extra cooling load, most window and split air conditioner suppliers do not make any provision for adding treated fresh air in quantity recommended by ASHRAE to their air supply. Split units in particular can be said to give "Hundred per cent guarantee of zero percent fresh air".

The feeling of breathlessness, headaches or bleary eyes that one gets every morning after spending the night in a tightly closed bedroom could be traced to lack of fresh air.

Here is a simple fix that would allow any window air conditioner to supply treated fresh air under positive pressure to the bedroom or office cabin where it is fitted.

You can do the job yourself if you are handy with tools. Else it would be wiser to get it done by a mechanic.

You will need a hole saw similar to the one shown in Fig. 1 below, capable of making a hole of about 25 mm diameter in the venturi. Drill the hole carefully, so that the drill does not go up to the condenser coil & damage it.

You will also need a good quality

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corrugated plastic tube of proper length as shown in Fig. 2 that will connect the venturi to the evaporator section as shown in the main picture.

You can then take the corrugated tube and gently push it in through the hole. Then slide the other end through the drain slot at the bottom of the evaporator cover. In the main photo, the cover has been removed to show this end. It is not necessary to remove it in actual practice.

That is it. Insert the unit back into its cover, plug it in and start. The fresh air will flow in mixed with the cold air and the room will turn garden fresh. You will feel the difference in the morning, I do.

One word of caution, some suppliers or service providers might refuse service or void their warranty. It would be advisable to get their approval beforehand. ■



Fig. 1: Hole Saw



Fig. 2: The corrugated plastic tube



Surendra H Shah, Mechanical Engineer from Clemson University, USA, has major HVAC projects to his credit like Air India Terminal, SBI Building, Oberoi Towers, MSEB Prakashgad Mumbai, SriLanka Oberoi, a housing complex at Baghdad Iraq. He started Pan Asia Corporation, for his many innovative energy saving products, some of which are patented now. He designed wind towers for CII-Sohrabji Godrej Green Building Center in Hyderabad, the country's first Platinum rated LEEDS building. He combines the techniques used in cooling of heritage structures such as the Taj Mahal with modern technology. It needs only 150 watts to extract three tons of solar heat load. In an air conditioned pharma warehouse it has reduced its cooling load from 57 tons to 24 tons. The Mumbai University Institute of Chemical Technology recognized him for heat pump air dryer that has a C.O.P of 6.7 made for their lab. His inventions are: An AC with EER of over 15, a packaged AC with its own integral ice thermal storage. He has won a BRY-AIR award and U.S. Patent for it. He is a life member ISHRAE, IIID and SESI. He is also a visiting faculty at Rachana ansad's Institute of Environmental Architecture.