

# Application Note 1033

## Indoor Fan Continuous Operation

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## Indoor Fan Runs Continuously

The indoor fans on all inverter Heat Pumps manufactured by Mitsubishi Electric are designed to operate continuously. This is different to the way other types of systems operate by having their fans turn off while a zone is satisfied. This Application Note explains why indoor fans on Mitsubishi Electric indoor units do not stop when the indoor unit reaches setpoint.

## Continuous Temperature Sensing

As the return air from the zone enters the IDU it passes over a sensor allowing the system to continually measure the zone temperature. With this constant measurement the controls system can make slight adjustments, as necessary, to the expansion valve to keep the IDU operating at a low capacity.

This results in the zone temperature being maintained within one degree of setpoint throughout the day. Instead of temperature swings from too hot to too cold in the zone the occupants remain much more comfortable.

## Stratification elimination

Another benefit to having the fan always on is that it helps to break room stratification. This keeps the unit from short cycling due to hot air rising during thermal off periods, and having the system be less efficient. This would also lead to hot and cold spots developing in the zone.

## Constant Filtration

Running the fan continuously also keeps air moving across the filters which helps to clean the air and maintain a healthy environment.

## Dehumidification

In cooling mode the coil surface is maintained around 40°F. As the air passes through the coil at this temperature the air in direct contact with the coil readily gives up its moisture, which is dehumidification. Even if the average temperature of the entire mass of air is not low enough to hit dew point, a portion of the air is definitely going to. At low loads this is very often enough dehumidification to keep the zone at comfortable humidity levels. There is also a reduced chance of biological growth with results in a healthier environment.

## More Efficient Energy Usage

The fact that the fan does not start as often reduces the starting amp draw on the fan motor, saving energy.

Most of the Mitsubishi Electric indoor fans run for less than 1 amp making them very efficient. Turning off the fan while the compressor runs would defeat the purpose of the inverter because an IDU cycling on and off would cause the compressor to cycle on and off as well. When the compressor cycles on it would run at a

higher speed than it would if left at the much higher efficient part load. The inverter was designed to run to match the load of the day only using the energy needed for that day.

### **Conclusion and Recommendation**

Sensing room temperature, breaking room stratification, elimination of hot and cold spots, filtering the air, dehumidification producing more comfort and healthier air, drawing less current by not starting so often and using only the amount of energy for the load of the day are all the reasons for running the fan constantly to make you as comfortable as you can be with the most efficient units on the market today.

We strongly recommend that the fan runs continuously in order to get each benefit that was designed into one of the most efficient A/C and heat pumps on the market today.