

Analysis of Inverter over Natural AC power

Dr. Devkar Subhash Mahadeo

Prof. Sase Vishnu Prakashrao

Prof. Mulani Firoj Ismail

Prof. Shitole Jagdish Sudhakar

Prof. Dandale Sachin Gangadhar

Dattakala Shikshan Sanstha "Dattakala Group of Institution" Swami-Chincholi, Daund,

Pune, Maharashtra 413130. India.

Abstract and Figures

Interest for air-conditioning systems (ACs) has exponentially expanded worldwide throughout the most recent couple of decades. Countries with booming economies including Saudi Arabia report high growth of sales of room air conditioners. With the expanded (GDP) and warming climates, interest for room air-conditioning systems is required to additionally increment. Meeting the expanded need for electricity energy will be a challenge. Expanded utilization of energy-efficient air conditioners impactsly affects lowering the electricity demand. In an ordinary AC, the blower runs at a fixed speed and is either ON or OFF. In an inverter AC, the compressor is consistently on; however, power drawn relies upon the demand for cooling. The speed of the compressor is adjusted appropriately. In this paper, the energy consumption of non-inverter and an inverter AC of the same capacity was assessed in an average office room, under comparative operating conditions, to find the differences in the energy saving, Carbon Dioxide (CO₂) emission, and power consumption of air conditioner. Energy consumption was measured for about 108 days, which is from July 16th to October 31st, 24/7, and compared. The experiment is conducted with the same conditions and same capacity air conditioners (18,000 BTU). Results show that the day-by-day normal vitality utilization, the inverter will save up to 44% of electrical consumption compared to a non-inverter of 3471 kWh/year and 6230 kWh/year respectively. Furthermore, the Total Equivalent Warming Impact (TEWI) analysis shows that inverters can save 49% of CO₂ emissions.

ter AC. Inverter and non-inverter ACs are two different kinds of air conditioners that have their own pros and cons. The differences between them will be discussed in this article along with how they work, the advantages and disadvantages of each type, etc.

The main difference between an inverter and non-inverter AC lies in the compressor

The main difference between an inverter and non-inverter AC lies in their compressor speed. An inverter AC has a variable speed compressor, while a non-inverter AC has a fixed speed compressor. Variable speed compressors are more energy efficient than their fixed counterparts and make less noise as well.

An inverter air conditioner is a type of air conditioning unit that can adjust the compressor's motor speed to regulate the temperature. The use of an inverter switch allows for greater flexibility in terms of power usage. Inverter ACs are more energy efficient than

non-inverters because they can change their power consumption depending on how hot it is outside, or if you have multiple people in your home at any given time.

The inverter is connected to a number of other components including the battery and solar panel, which are used to power the system. It also receives information from sensors that monitor the health of your batteries and solar panels, so it can make sure they're functioning correctly. Inverters are responsible for managing the flow of power between your home's electricity grid and your battery bank or solar panels.

Another difference worth mentioning is that the refrigerant used in non-inverter AC emits harmful emission which adversely impacts the environment. Modern inverter ACs use efficient refrigerants such as R32 which provides better cooling capacity and also emits less harmful emissions to the environment.

Inverter ACs save up to 30% of electricity compared to non-inverters.

Inverter Air Conditioners are much more energy efficient than their non-inverter counterparts: they can save up to 30% on electricity compared to non-inverters.

Non-inverter air conditioners use the on/off method, where the compressor is switched on and off at regular intervals to maintain the desired temperature. This uses more energy than inverters and can result in more wear and tear on your system. Compressors that are non-inverters do not run at full speed all the time, making them less efficient than their inverter counterparts.

As said before, an inverter AC uses variable speed compressors, which have a wider range of speeds compared to on/off compressors used by non-inverters. This allows it to operate in more modes that take advantage of different conditions and load requirements, thereby improving its efficiency throughout a wide range of operating conditions.

Inverter air conditioners use a different method for cooling your space called pulse width modulation (PWM). Instead of switching on and off as with non-inverters, PWM technology modulates how long it takes for a compressor to start up again after shutting down—hence its name: pulse width modulation!

The PWM system allows the compressor to run at full speed all the time, which helps it cool your space more efficiently. It also has a longer lifespan due to less wear and tears on your equipment. This is a great advantage for you, as it means less maintenance and a longer lifespan. You'll also see lower energy bills when using an inverter air conditioner. The other major benefit of inverter technology is its ability to cool spaces faster than non-inverters.

Inverters are also more efficient at dehumidifying the air, which is important in high-humidity areas. They also have better temperature control than non-inverter ACs because they can vary the speed of their compressors to respond to changing conditions. This means that your AC will be able to maintain an optimal temperature throughout the day,

even when there are extreme fluctuations in outside temperature or humidity. In addition, inverter units are quieter than non-inverter models because they don't need to switch on and off as often.

Which type of AC should you buy?

Your choice of an air conditioner depends on your requirements, budget, and usage.

The main benefits of installing an inverter AC are that they're more energy efficient than non-inverters and they tend to be quieter while running at lower speeds than standard models. In general terms

- Inverters cost more upfront but save money on electricity bills over time; Non-inverters cost less for a purchase but the operating cost of a non-inverter AC is high;
- inverters tend to be more durable and have a longer lifespan, and the maintenance cost of an inverter AC is relative high; The lifespan of a non-inverter AC is comparatively less, but the maintenance cost of a non-inverter AC is low;
- The non-inverter ACs make a lot of noise during the operation and while switching ON or OFF; The inverter air conditioner produces no or little sound while operating;
- The temperature of the room with non-inverter AC may vary; Inverter AC maintains the room temperature stable;
- With the inverter AC, fast cooling is possible, but it is the opposite for non-inverters;
- At last, Inverters are more environment-friendly than non-inverters.

Conclusion

The best way to get the most out of your inverter AC is by taking good care of it and keeping the filter clean. Also, you should keep an eye on your electricity bill and make sure that your unit is running smoothly. If you need more information about TCL Air Conditioners. Check out **TCL's website** to learn more.

TCL Inverter ACs:

- **TCL Elite-Smart AI Ultra-Inverter Air Conditioner,**
- **TCL Elite-Turbo Ultra-Inverter Air Conditioner,**
- **TCL Elite-IECO AI Ultra-Inverter Air Conditioner,**
- **TCL GentleCool Series Air Conditioner.**