

# COMFORT YOUR AC TO CONSERVE OUR ELECTRICITY!

- In India, the recent years' statistics show that THREE OUT OF FOUR Air Conditioners sold in the market now, are SPLIT AIR CONDITIONERS ONLY instead of Window ACs. Air conditioner that is running fully for more hours daily now, is one of the main reasons for EB supply-demand widening crisis in the states & nationally today. We face a situation of poor supply and excess demand in summer months of year.
- Apart from drop in efficiency in generation at power plants, the excess demand is due to rise of Air conditioner loads in domestic, commercial segments. The only way to reduce the supply demand gap in electricity is to optimize the use of AC in our premises.
- The Split AC system needs condition monitoring of four parameters in the system namely, the Input power parameters, Freon system settings, output temperature parameters and lastly, the compressor Run hours. The input voltages need to be stabilized, the Freon system pressure to be maintained in the mid region of operating values, and the output temperature say to the conditioned premises to be as high as possible at 27 °C just 10 degrees less than the human body temperature at 37° C. When all first three parameters are normal & optimum, then the same will be monitored in the daily run hours of AC compressor; to reduce and maintain with smooth & little daily variations.

## AIR CONDITIONER - VOLTAGE INPUTS to be stabilized:-

- The present day Air conditioning compressors are rated at the volts from 220 to 240 volts in single phase and 380 to 420 volts in three phase versions. So we need to give only 230 volts (single phase) and 400 volts (three phase) in our voltage regulators to our AC. The regulator can be automatic voltage stabilizer, servo stab etc. Our Automatic stabilizers available in the market need to be corrected to give output setting of 220 to 240 Volts AC only for the input volts of 180 to 270 Volts variation in single phase. A fridge or AC compressor running at 230 volts instead of 250 volts is safe and saving in power too!
- Next, the power cuts happening now in the city make the AC stabilizer indispensable. Whenever power cut is over and on resumption, high voltage comes in first and only after loading from the consumer ends, the voltage drops say from 270 to 220 volt for example. This is hazardous to our appliances.
- Especially in some areas, the night voltage stays high above 250 volts, where as in day time it is normal. Fridge, AC & TV are the equipments used for more hours now. So it is better to install a matching stabilizer to each of the above. The stabilizer to have time delay in giving output to gadgets.
- Time delay stabilizers for AC is the need of the hour now as we find in many premises, the AC burns out due to heavy switching surges during EB power cut resumptions. Additionally we can think of spike suppressor or surge protection devices - SPD circuit to be retrofitted in between the AC and the Mains power supply to avoid heavy transients hitting AC etc. The SPD short circuit the heavy transient volts directly to earth thro fault proof earth point or grid. Nowadays the Maintenance free earthing rods give fool proof protection for decades and are affordable now. Many industries and commercial users have changed over to Maintenance Free Earthing protections already now.

## AIR CONDITIONER - FREON SYSTEM TO OPERATE IN MID-SAFE RANGE:-

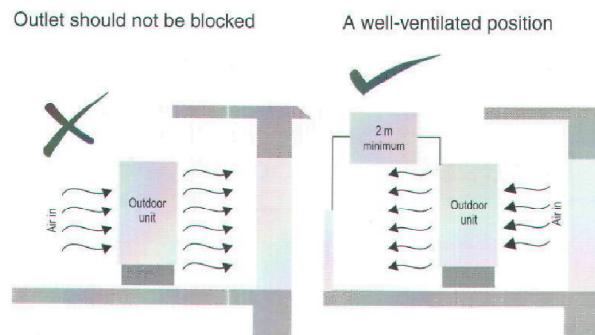
- All along, we have used window AC and we are now changing over to split AC culture. Here AC OEM can hook up Rs.100/- worth Freon pressure gage at the suction end of AC compressor, and locate the same to be displayed in the outdoor unit. This routine pressure monitoring shows the system is healthy and gas is neither excess-charged nor leaked out.
- Take the case of reputed AC users like Telecom buildings, Railways etc the clients insist on fixing R 22 Freon gauges in the AC Freon suction & discharge of compressor circuit. When installed, the OEM dealer charges Freon gas and checks for suction and discharge pressures of 70 psi & 240 psi in the normal operating ranges. Even if the

AC OEM used the latest Eco-Friendly gas RC 134 A in his machine, this pressure parameter has to be checked periodically.

- Due to long years of running, and due to minute leaks etc, in the AC, the Freon gas gets leaked out and the system goes under charging, the AC compressor will be loaded for 8 hours instead of 6 hours during the 8 hour daily AC workings. **Now you know why your AC consumes 100 units more per month (it can be due to undercharged / leaked condition at less than 50 psi at the suction of the AC compressor as well!)**

### AC OUTDOOR TOO NEEDS AN UMBRELLA:-

- One of the major differences between 5 star and 3 star Split AC is that the heat transfer area on the outdoor unit is more than that of the 3 star AC. The existing AC user can think of improving his 3 star by improving in his outdoor unit, the heat transfer area by frequent cleaning, comforting routines and by the weather proof umbrella shed.
- Can we think of just giving sun shade like protection & cross ventilation to the AC High side in the open terrace? This can give up to 10 % savings depending on the hot weather and radiated heat from near surroundings. Just like humans, the man under the Sun struggles more; the AC machine under the sun is loaded more.
- To make the cooling from AC better, AC housing is to be externally protected from the direct Sun. We can try light- roofing colored sheets or metal corrugated contoured sheets to fix on the AC top giving ample head room. This helps to avoid radiated heat from sheet and is easy during maintenance removal etc. Under the Sun shade the AC performs better than when it is kept under the direct Sun. Telecom buildings in India mandatorily have this AC sunshade in their open terrace & we can follow their standards.



1. Outdoor AC needs top cover & spacing all around and to be grouted on anti vibration rubber pads
2. Courtesy Blue Star – the Dos & Don'ts' of outdoor unit location for better ventilation.
3. Window AC fixed with small Sun shade, but it needs more head room above the AC machine.

### CONDITIONED AREA TEMPERATURE:-

- Our body temperature is 37°C we have to set our Air Conditioners at is 10° minus our body temp. 27°C (instead of 20° C setting now). Cool air breeze is better to health than Cold blast of air & 15 % power savings. Please don't keep too cool temperature setting in AC when the surroundings are warm & hot. Live with the Surroundings. When you enter from outer to inner area say from 40 ° to 20 °C area, this frequent in & out affects our body health in the long run.
- Please reduce your comfort levels with less Air conditioner usage time and simultaneously use fans etc using evaporative cooling. Positive cross ventilation is important to improve indoor air quality in your premises. You are aware now that the power crisis subsides in winter months.



Image - Thermal Images of air throw area with partly choked & choke free indoor filter; and dusty air filter.

- Clean the air-conditioner filter every week or month depending on usage. Clean the fins once in a month. A dirty air filter reduces airflow and may damage the unit. Clean filters enable the unit to cool down quickly and use less energy. Dirty filter makes you sick too. **Partly choked filters extend the AC compressor run hours more.**
- Using ceiling fan or table / pedestal fan allows you to set the AC thermostat higher because the air movement will cool the room. AC without room fan will make the cooled air throw at one area and hot pockets in other areas in the room are not medically good to us. Practically felt, it is really the Smaller blade ceiling fan Plus AC mild cooling are comforting the humans now.
- **The ceiling fan is a luxury but a necessity to the poor man. But to rich man, the Air conditioner is not a luxury but it alone need not be always a necessity. The rich man can combine the poor man's AC that is the ceiling fan along with his AC and can get better comfort at reduced power bills.**
- While buying AC or during its warranty period, please discuss with the vendor about how to reduce AC power consumption. Please team up with the vendor to religiously conserve the AC power, after all, you are only going to pay for higher electricity bills due to poor installation, running maintenance and wrong operating practices.

#### DAILY RUN HOUR METER CONDITION MONITORS YOUR A.C.:-

- **It is prudent to add Run hour meter (costs Rs300/-) to show AC compressor run hours and not the total AC ON time. The hour meter to be added in series with AC thermostat circuit to compressor and to be fixed near or on the indoor blower.** The hour meter will run for 2000 Watt AC compressor run hours and not for 100 Watt Ac blower run hours. This will show how much the savings you have achieved in your AC compressor run hour reduction daily based on the energy conservation measures.
- In our old running AC we can retrofit AIRCON SAVER and achieve up to 25 % reduction in run hours. This is an electronic thermostat controlled by micro controller chip not allowing the compressor to saturate but operating dynamically. This is costing RS.7000/- (why this AC saver price very costly? More vendors to produce AC saver to reduce the price by half!) If the AC is running healthy & oversized for the existing premises, the savings is more and the same is seen in the reduction of daily AC compressor run hours after retrofitting the same.
- Please bear in mind, if the AC is healthy only, power savings is possible. If the AC is having defects, please correct the same first, comfort the machine and this will automatically achieve power savings in AC. If we are not able to overhaul, change wetted parts in our existing AC circuit to achieve power savings. It is a wise move now to exchange your old inefficient with 5 star rated AC to achieve more savings to counter the hike in power cost.

- **As part of Standards & Labeling program, BEE can include this run hour meter as part of the Star rated gadgets as the Energy Efficiency Practices lies with the consumer only after the initiatives from Govt. to buy 5 Star gadgets. As per the BEE star rating tables on Air-conditioners, 1 Star rated AC 1.5 Ton consumes 10 UNITS FOR 8 hours usage per day and compared to that, the 5 Star rated AC consumes only 7 units per day.**
- **CONCLUSION:-**
- Electricity power demand reduction in each consumer premises in their AC usage will solve the India's national power crisis problem. Compared to the hike in cost & gestation of improving generation of electricity, the short cut solution to our electricity supply – demand crisis in the national & in the state electricity distribution is to target the consumer usage patterns first & foremost and optimize our Air Conditioner consumption now.
  - **Since the Excess Energy consumption has been a collective Liability for all of us since Yesterday;**
  - **NOW, the Energy Conservation MUST be a collective Responsibility for all of us from Today.**
  - **Energy Generation will be a collective Objective to all of us from today onwards for a Better Tomorrow.**
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  - **For more details please visit:- [www.energymeasuretosave.com](http://www.energymeasuretosave.com) / [www.poweronprojects.in](http://www.poweronprojects.in).**