

ELECTRICITY – MEASURE TO MANAGE in Air Conditioners segment

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ABSTRACT:-

In the domestic electricity consumption, out of the total say 20 units per day consumption, more than 10 units is consumed by the AC. If the same is monitored by just retrofitting single phase Static Watt-hour meter costing just Rs.400/- , then we can have, day to day control of AC electricity consumption in domestic and commercial segments, instead of annoying over inflated Electricity bill after a month. **We are talking of Smart Metering etc to adapt in future and practically what we can do now is to retrofit to our AC, an ISI branded static Watt-hour single phase rated 5 to 30 Amps costing only Rs.400/- nowadays.**

WHY AC METERING NEEDED NOW?

Energy measurement is the first step towards the energy management, whether daily or weekly or monthly logging of consumption depends on the usage and how the individual responds proactively. We must know what the AC is daily consumption compared to the total consumption per day either in domestic or commercial segment. Also if more than one AC is there in premises, **Relative Condition Monitoring of daily AC KWH of two or more AC will prompt or provoke the consumer why the daily KWH difference between two or more AC in premises? The difference in KWH daily readings will catalyze the Energy conscious consumer to conserve energy, promptly.**



Word of Caution:- This KWH meter image does not promote / canvass its brand. Because of the price affordability at Rs.400/- and availability thro e-commerce site, its image is displayed here.

In fact, before I advocated previously that each existing AC to be fitted externally with hour meter costing Rs.300/-. But the addition of hour meter at the indoor to the new generation, already installed AC is cumbersome. But for old window and split AC, this hour meter can be easily added on to the compressor thermostat circuit at the indoor.

Also we suggested that AC OEMs can add this hour meter as an integral part of the indoor AC. This will show AC machine total Run hours and the AC compressor cutin-cutout hours to show the AC user how effectively he uses his AC in his premises. When we buy star rated AC for 20 K + Rs, they must integrate this hour meter in their indoor unit. **In AC usage, everyone is accountable to Local & Global Warming. First the AC user, the same user as electricity consumer, the AC OEM giving before, the energy-inefficient AC, and of courses the Govt, to promote Energy conservation in AC, Star rated AC sale and reduce the taxes on 5 Star AC & other gadgets.**

Now that the hour costs Rs.400/- now and single phase AC KWH meter also costs the same (Before it was costing Rs.1000 & above) Now It is more prudent and easy for the AC consumer to assess his AC health by monitoring its daily consumption for the same given run hours. **But it is always better to assess AC health by knowing both the parameters like AC compressor Run Hours, AC machine Run Hours, and AC KWH in its Run hours to condition monitor AC efficiency.**

WHY AC DAILY POWER CONSUMPTION VARIES?

Even the same AC runs for nearly fixed hours of the day, still the AC consumption in domestic or commercial segment varies due to many factors namely:-

1. AC indoor temperature settings are set from 20°C to 26°C now suiting to individual needs.
2. AC evaporator filter gets clogged, goes unnoticed; and to clean the same once in two weeks.
3. Condenser coils getting choked over a period of few months to years, to clear it first.
4. AC outdoor unit can be torched under the Sun or we can comfort the same by weather roofing.
5. The refrigerant leaks minutely over a period when not noticed; AC runs more hours to cool.
6. The AC compressor run hours vary due to operating for more hours or more people inside.
7. The conditioned air when leaking out of premises, forces the AC compressor run fully.
8. Heat source like fridge, Deep freezer has come inside premises; increase the AC run hours.
9. Higher ambient outside and Solar heat ingress from the roof increase the AC run hours.

PRACTICAL WAY OF DAILY MONITORING:-

Please find below, the technical details of Rs.400/- rated Static Watt-hour meter as taken from snapdeal.com. The consumer can choose any similar branded meter of this type near this price to suit to his needs.

1. 1 phase,2 wire , Accuracy Class: 1.0
2. Conformation with IS:13779, Original ISI rated.
3. Current: 5 – 30 Ampere AC as load current.
4. Reference voltage: 240 Volts, Reference frequency: 50 Hz
5. Display: Electromechanical counter with one decimal
6. Surge resistant and tamper proof with magnetic shielding
7. Sustained accuracy over long period of time
8. Low power consumption
9. High insulation and dielectric strength
10. LED indication for current reversal tampering and phase availability
11. Durable Polycarbonate enclosure which is UV protected, flame retardant

HOW THIS METER IS HOOKED UP?

This KWH meter needs to be fixed between the MCB Isolator to the AC stabilizer inside the conditioned area. Or, if the user has only one AC, the same can be fixed near the EB Mains distribution board from where, the user has run a heavy conductor cable to match the AC load. In offices, IT, ITES work spaces where individual machines are working, this can be fixed near the indoor unit at a readable level from the floor.

APPLICATIONS OF RELATIVE MONITORING:-

1. Relative condition monitoring of Air conditioners if more than fixed inside premises.
2. When the AC is serviced, the daily KWH reduction before and after the service done
3. When ACs are serviced, to give more attention to service to Excess power consuming AC.
4. Same area cabins and same size AC why still the varying KWH consumption can be studied.

5. KWH reduction can be noticed instantly on every AC in-house efficiency improvements.
6. In case of overcharging, KWH consumption increases first to show impending breakdown.
7. If the stabilizer malfunctions or due to heavy voltage variations, the KWH varies.
8. If two AC at the same premises are 3 star and 5 star, the 5 star savings can be confirmed by monitoring.

GOVT to MANDATE the “Monitor to Target Energy Reduction” program:-

1. The Govt has taken the initiatives to the AC conservation and thro the Star Labelling program has spread the AC energy consumption awareness. But the Govt gave the carrot only till now to the consumer and not the carrot & stick to them. It has promoted 5 Star ratings in AC; and year after year, BEE is changing the AC star ratings now, improving the 5 Star Efficiency ratings.
2. **Showcasing the Energy Conservation is the first thing. But Prompting the AC user with KWH meter, is more of “DO IT YOURSELF TO CONFIRM YOUR ACHIEVED SAVINGS”. We have to catalyze the energy efficiency practices by forcing the consumer to practice.**
3. The proof of pudding is in the Eating. The Govt has showcased the AC efficiency norms. But same Govt must mandate each of the AC consumers to verify with this type of affordable KWH meter to his existing AC. On condition monitoring his AC daily, weekly and monthly, each consumer will start saving electricity in his AC. The same consumer will showcase his savings to his neighbors, friends, surrounding him; this attitude will multiply and improves the people efficient culture.
4. **So to cultivate the Energy efficient People culture among AC users, the Govt to make it compulsory to fix KWH meter in each & every existing AC.** Then each AC user will monitor his AC consumption to target reduction in his existing AC first. He will try to improve his AC efficiency first. Later he will automatically switch over to 5 star rated AC.
5. **The energy experts in BEE & in the Ministry said in 2012, that Energy-efficient electrical appliances (majority is AC only) used in household and commercial establishments can save about 20,000 MW megawatt of power per year, resulting in savings of Rs 1.2 lakh crore in capital investment on new power plants. India spent Rs 23,000 crore in clean energy programmes till 2011.** BEE says in 2012, that around 1.15 crore labeled air conditioners have been sold across the country during the past five years.
6. When the new AC consumer is buying his AC, he must be mandated to buy this KWH meter along with AC to fix during installation. Similar to the agriculture segment, the farmer is mandated to buy capacitor along with his new purchase of motor. This gives saving to him and reduction in T & D loss in rural sector.
7. When the consumer has decided to spend Rs.20,000 + towards his new AC, Over the Counter, he can be convinced to buy this static KWH low cost meter for monitoring sake.
8. Ultimately the AC user after installing this retrofit KWH meter to his AC after few months /years of run,
 - a. He will be first shocked to find his AC's guzzling power consumption all these years.
 - b. Next, he will find relief in implementing in his AC, the zero cost energy efficient running practices.
 - c. Next, he will be delighted to see more savings after implementing low cost ECON measures to his AC.
 - d. Later, the consumer will be Happy to share & showcase his KWH savings achieved in his AC to others.
9. All the above Govt suggestions will become a reality practically today, if this one step as well is enforced by the Govt TODAY to promote consumer's existing & new AC efficiency in domestic & commercial segments.

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