

# Thermal Energy / BTU Meter - the need for & installation care

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Construction industry in India is booming, modern buildings are coming up all over India to accommodate call centres, malls, cineplexes, offices and residences. All new-age buildings have one thing in common - central airconditioning. It is no more a luxury but has become a necessity.

Most of these buildings have multiple occupants with different working hours and usage patterns. The problem that arises is of billing for the airconditioning usage. Earlier, builders usually used to charge on per sq. ft. basis, which is okay as long as the usage patterns are the same. However call centres work 24 hours a day, 7 days a week, whereas an office in the same building may work for 8 hours a day and 5 days a week only. The occupancy and equipment load of a call-centre, restaurant or cineplex is normally much more than that of a normal office.

Similar is the case with residential apartments. Some apartments may be continuously occupied and some occasionally or not at all.

None of the occupants is ever willing to pay for service on an average basis if it is not used by him at all or he, intentionally keeps the airconditioning running all the time, just like farmers who keep their tubewells running all the time because state electricity boards charge them a flat monthly fee, which is a sheer waste of resources, especially in today's context when everybody, all over the world, is talking about conserving resources.

Thermal energy is a product of water flow rate and temperature difference across the heat exchange device, like an AHU, integrated over time.

Thermal Energy (BTU) meter is a device used to measure thermal energy usage in water-based air conditioning systems. It consists of a flow meter, two temperature sensors and an integrator.

Temperature sensors and an integrator require little maintenance; however precautions must be taken to avoid damage to the flow meter. Installation of the flow meter and temperature sensor also needs care.

Precautions listed below are, almost, an absolute must for proper functioning of the Thermal Energy metering system.

1. Availability of space to install equipment is always at a premium but flow - meters require atleast 10 pipe dia upstream and 5 pipe dia downstream of unobstructed flow for proper functioning and recording.
2. A strainer must be installed before a flow-meter to ensure it is kept clean.
3. A by-pass must be provided across a flow-meter to facilitate system flushing.
4. Flow-meter must not be installed in the pipe-line unless the whole water system has been thoroughly flushed and cleaned – a spacer pipe piece may be used till then.
5. Water must not flow back through the flow-meter to prevent entrance of water-borne debris as the strainer

is provided only upstream of flow-meter. It may not be a bad idea to add a non-return valve in the circuit.

6. Thermowells for temperature sensors must be located before the division of the water stream and well after the merging of the water streams. Water should have thoroughly mixed before reaching the temperature sensor.

7. Thermowells should be filled with light mineral oil to facilitate proper temperature sensing.

8. Remember point 1 as it is most important for accurate metering. ❖

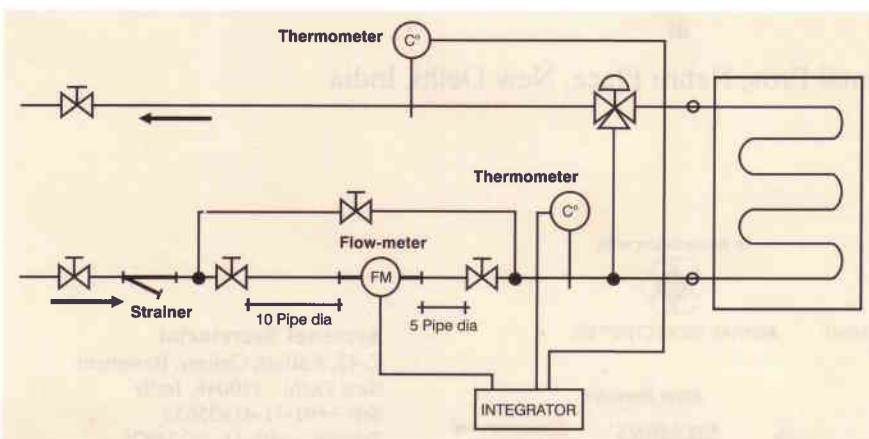


Figure 1 : Schematic of a typical thermal energy meter installation.