EB AIR INDUCTION UNITS FAQ's

The following are frequently asked questions (FAQ's) on Induction Units. To assist in finding an answer to your question, the FAQ's have been put into the following points,

To gain the most benefit from the FAQ's, please take the time to read them all. This will provide a far better understanding of the induction systems in general including characteristics and performance.

A. What is an Induction System?

An Induction system is a combination air-water system that uses the energy conveyed by two fluid streams to achieve the required cooling or heating in a space. The air supplied by the central air handler to the Induction Units is called primary air.

The primary air is supplied to the Induction Unit at a constant volume. Within the Induction Unit the primary air is discharged from the primary air plenum into a mixing chamber through a series of nozzles. A zone of pressure is created within the mixing chamber, thereby inducing room air through the secondary water coil into the mixing plenum.

The induced room air is called secondary air. The secondary air mixes with the primary air, and the mixed supply air is supplied to the room. The temperature of the primary air is normally reset with the outdoor air temperature to offset losses/gains through the building envelope.

In the cooling mode the primary air is normally satisfying a portion of the room's sensible and latent load. The secondary water coil within the Induction Unit is supplied with chilled water to generate remaining sensible and latent load of the occupied space.

B. What are Common Applications of Induction Units?

In the past induction HVAC systems were very popular in North America and elsewhere in the world. They were the preferred perimeter system choice in larger buildings due to the relatively small size of the central air handlers and ductwork system required.

Common applications included offices, universities, hospitals, and libraries. After the energy crisis in the 1970's induction systems fell into disfavor due to their relatively high fan energy consumption, as well as noise level concerns resulting from the system are high operating static pressure requirements.

These disadvantages were associated with the induction nozzle technology available at that time. Induction systems in new construction remain popular in some parts of Europe, but in North America are generally only used when renovating/refurbishing buildings within existing induction systems.

C. How does an Induction System with EB Air units compare with those using Induction Units from others?

Both systems will generally have the same installed refrigeration and heating and as a result, common chiller and boiler plants. The main differences are in the air handling systems. With reduced fan operating pressures and with potentially lower primary airflows the fan energy savings of EB Air induction systems over standard induction systems can be very large.

D. To upgrade the existing induction system with all new EB Air Induction Units, what are the benefits?

EB AIR's nozzle technology can be used to address many of the shortcomings of existing induction systems, whether they are related to issues concerning floor space/appearance, noise levels, cooling capacities and energy consumption.

The major differences in the Induction Units offered by EB Air relates to the use of EB Air aerodynamic nozzles. Through this technology EB Air Induction Units offer many advantages over induction units offered by others including:

- **Significantly lower fan operating pressures** — EB Air Induction Units are typically sized at relatively low inlet static pressures (typically 125 Pa Compared to the 250 — 750 Pa needed by units from others). This has a major impact on the fan power consumption of the system. By using EB Air units the load on central air handlers can be reduced dramatically

- **Less primary airflow** — With the new EB Air units it is often possible to reduce the amount of primary air needed (within the constraints of the ventilation air requirement) to provide the same amount of cooling capacities further reducing fan power consumption.

- **Lower noise levels** — the unit noise levels are dramatically reduced due to the performance of the nozzles, as well as from the reduced fan operating pressures. Noise reductions of 5 — 15 NC are typical.

- **Increase in usable floor space/improved appearance** — In addition to the floor/wall mounted models, EB AIR offers ceiling and bulkhead-mounted Active Chilled Beams. Often times these models can replace the existing floor/wall-mounted Induction Units gaining floor space and improving the room's appearance. The need to replace the expensive custom enclosures along the buildings perimeter is also eliminated.

- **Faster payback** – Any investment made to upgrade tenant occupancy in any existing building can be recouped within a short time by using the new EB Air Induction units. Moreover compared to earlier units, new units need less or no maintenance at all. Reduction of supplementary cooling is also seen as a major avenue to cost reduction.

- **Flexibility** – New EB Air units can be both floor and ceiling mounted. Due to diversity provided, large retail/ commercial space on the floor can be freed up thus entailing more rentable revenue to building owners. Also these units can be fitted in any existing enclosures thus saving large amounts toward customizing /investing on new enclosures.

E. How important is it to accurately commission the water serving the Induction Unit?

Accurate commissioning is very important. Over 70% or more of total cooling capacity is delivered by the Induction Unit's secondary water coil. Also, the water through coils is generally relatively low flows and velocities.

A drop in water flow rate to the unit from that used in the design can have a significant impact on the capacity delivered by the unit. We recommend commissioning the waterside for each unit using a balancing valve/circuit setter or automatic flow control valve at each unit to ensure the unit receives the design water flow. Also air side can be adjusted with factory set balancing damper to accurately adjust incoming CFM to air flow pressure.