Using Table 9C on Page 38 in Maria’s Restaurant Guide & Workbook, will the total latent capacity in Btuh for the XHP 10-86Z in operating in high speed with a return air wet bulb temperature of 67OF and a fan CFM of 4,800 with a 85OF outdoor dry bulb temperature be equal to or above a latent heat removal requirement of 12,000 Btuh?

From the chart: at 4,800 CFM & 85OF the sensible over total heat ratio is 0.97 thus, with a total capacity of 137,800 Btuh our latent capacity would be 137,800 × (1- 0.97) = 4,134 Btuh of latent heat capability

Thus, the equipment would not meet the requirements at that fan speed.

What if the fan speed in the problem above was lowered to provide 4,000 CFM?

From the chart: at 4,000 CFM & 85OF the sensible over total heat ratio is 0.90 thus, with a total capacity of 133,200 Btuh our latent capacity would be 133,200 × (1- 0.90) = 13,320 Btuh of latent heat capability

Thus, the equipment would meet 12,000 Btuh the requirements at that fan speed.

Using Table 9C on Page 38 in Maria’s Restaurant Guide & Workbook, find the motor design load in kW and W for the XHP 10-86Z in operating with an outdoor air temperature at the condenser of 85OF and a fan CFM of 4,000.

7.55 kW and 7,550 W

Figure 16 on page 41 shows a Psychrometric chart with the human comfort zone shown in red stripes. If we measured a room at 70 OF with a relative humidity of 30% would most people feel comfortable sitting in that room.

No, due to the low humidity the room would feel cold to most people.

Field Notes:

A comfortable temperature is subjective and a few people in a room may never be comfortable even when the room temperature and humidity are dead center on the comfort chart. Some will say it is too hot, others will say it is too cold. Thus, Technician’s should know where they are on the comfort chart before changing the temperature based on one complaint or, they may be back with six more!

One blower motor variable frequency drive (VFD) setting related problem commonly encountered is: At lower speeds, the blower may not provide the required minimum replacement air volumes for the hoods. Thus, the restaurant will become in a low pressure with regards to the outside (making the inswing doors hard to close due to the air they are sucking in).

One Compressor motor variable frequency drive (VFD) related problem commonly encountered where a constant volume of airflow is required to make up for kitchen hood exhaust air is: due to the higher velocity of air with regards to the refrigerant in the coil the ability to remove moisture from the air being brought in is greatly decreased under most operating conditions (resulting in a much higher humidity inside the building tan is outside and possibly a wet dog or mold smell in the building).