

**Answer to question from Tech Talk No. 15** – if you have a compression tank (no barrier between the air and fluid), air removed by the separator can be directed up to and controlled in the tank rather than eliminated by an auto air vent.

In January 2003, I wrote a short technical note that was sent out to my client list at the time about the performance of small direct drive squirrel cage fans. Here's the whole story.

I used to sell packaged rooftop heat/cool units. On one project that had several 2-ton units, I got a call from the contractor saying the balance report showed the units were low on airflow. No operational issues; just not quite enough air to meet the spec.

What to do? The fans were small direct drive squirrel cage units, so we couldn't adjust or change any pulleys to get more airflow. The air filters were already so feeble you could read a newspaper through them and the systems were so simple there was nothing that could reasonably be done to reduce the static pressure.

I decided to look at the possibility of swapping out the fan/motor assembly to what came with the next larger size unit, a 2.5-ton. To my surprise, the only difference was that the 2.5-ton had a higher hp motor, and *it was listed at the same rpm as the 2-ton unit*. Qu'elle surprise, which is the Parisian equivalent of WTF (which wasn't an acronym until about 2008).

We had both motors in stock in our parts department, so I went and looked at them. They were identical except for part number and horsepower rating. Now I was really baffled.

I phoned the manufacturer and talked to one of their engineering people who explained the mystery. He told me that the same fan with a larger motor would push more air because there would be less slip and it would run at a higher rpm. He mailed me (this was in the late 70's) the Original Equipment Manufacturer (OEM) fan curve that had multiple curves for the different hp motors, all at the same nominal rpm. I still remember the name of the vendor – Torrington.

I gave the contractor a motor for a 2.5-ton unit to put in one of the 2-ton units and it increased the airflow enough to satisfy the balancer.

About a month after the original tech note went out, I got an email from a fellow who had had the tech note forwarded to him and it had helped him solve a similar problem with some fan-coils. He was grateful, and it made my day.

My final thought here is that when one of the larger motors failed, the service tech would likely come in with the *unit model number* to get a replacement and get the smaller motor. I wonder if anyone ever noticed the reduction in airflow.