

# Quick Facts:



## Inverter Scroll & Digital Scroll Compressors

Recent advances in compressor technology have opened new doors for increased energy efficiency, and unit control. These advances have allowed Addison to design our equipment to give our customers new opportunities in the markets and applications they serve.

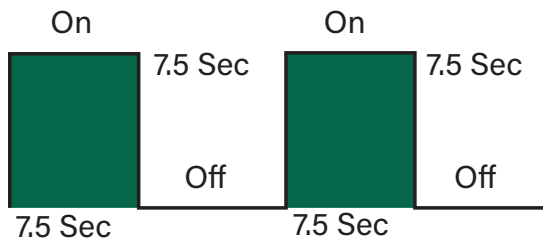
Two of these technologies that Addison has integrated into our product line are inverter controlled variable-speed scroll, and digital scroll compressors. Each has unique advantages over older fixed speed compressor technology.

### Technology - Digital:

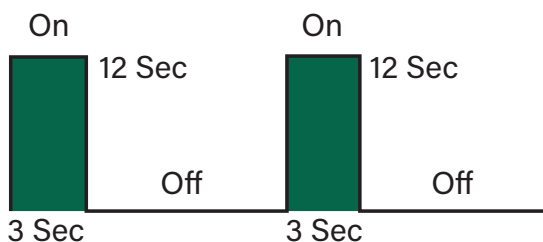
Digital scrolls operate on a 15 second cycle. During the cycle, they utilize a unique bypass port to unload the scroll set for a fixed amount of time to determine modulation. For example, if you needed 50% of capacity, the compressor would operate for 7.5 seconds, and then disengage the scroll set for 7.5 seconds.



### 50% Modulation:

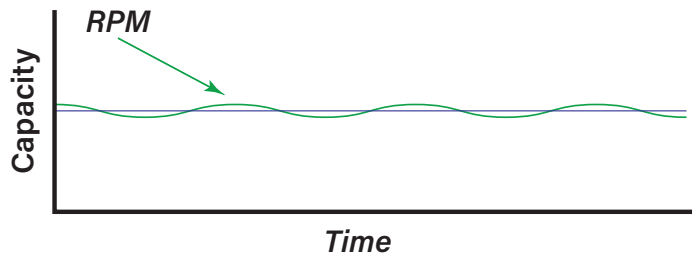


### 20% Modulation:



### Technology - Inverter:

Inverter controlled variable-speed scrolls operate by changing the frequency of the power going to the compressor to control RPM. This allows the control to speed up, or slow down the compressor in 1% increments to exactly match required capacity. This allows for precise temperature and capacity control across the entire system.

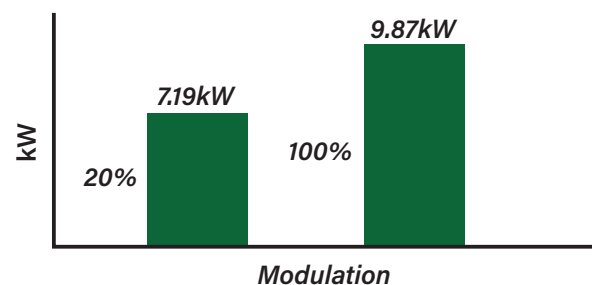


An additional advantage is that variable-speed compressors are soft starting. The normal in-rush current associated with fixed-speed compressors is eliminated.

### Energy - Digital:

In a typical 30-Ton DOAS application, modulation down to 20% is possible.

In this configuration, a digital compressor on the primary circuit at full load draws 9.87kW. At 20% modulation, while the motor is still spinning at full RPM, the compressor draws a blended 7.19kW. This results in a **27%** energy savings over full load.



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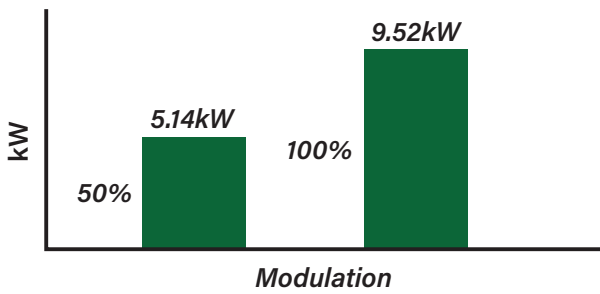
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### Energy - Inverter:

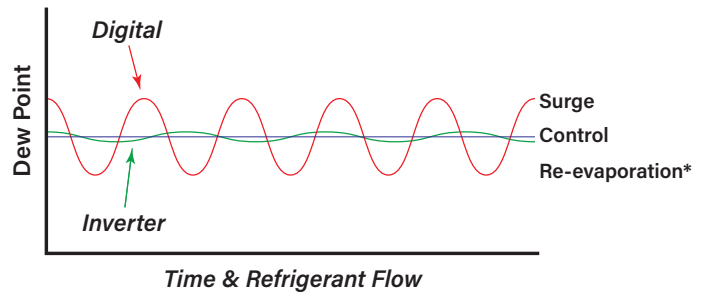
In a typical 30-Ton DOAS application, modulation down to approximately 50% is possible.

In this configuration, a variable-speed compressor on the primary circuit at full load draws 9.52kW, which is similar to the digital scroll. At 50% modulation, while the motor is still spinning at less RPM, the compressor draws 5.14kW. This results in a **46%** energy savings over full load.



### Other Points to Consider:

A potential disadvantage with digital scrolls are that during their modulating "off" time, refrigerant stops flowing in the system as the compressor stops pumping. Depending on conditions, this could potentially allow moisture on the evaporator coil to re-evaporate, and be introduced into the air stream. Additionally, discharge temperatures could rise during longer cycles as well.



\* Potential for re-evaporation depending on conditions.

In consideration of our 30-Ton unit example, modulation of the variable-speed compressor down to its lower limit would represent approximately 7-Tons of capacity, or 23% of total system capacity. Even though this is higher capacity than a digital compressor, the energy savings are even more pronounced for more capacity.

When looking at most DOAS applications, even at lighter load conditions, appropriate capacity for both dew point control, and reheat, needs to be available. While the digital compressor can modulate lower, it could have to ramp up quickly to provide enough capacity for both functions.

Questions? Contact your local Addison representative, or visit our website to see how we can assist you with your next project or comfort challenge.

