

# Copeland scroll multiples for commercial air conditioning and chiller applications

Today's commercial air conditioning applications are as varied as the customers you serve. Each has its own set of challenges and demands, but several requirements remain constant. Your customers deserve innovative technologies that leverage proven reliability methods and offer consistently high performance. Downtime is not an option for their business – or for your reputation. When it comes to offering innovative, reliable, high performing compressors, Copeland scroll continues to set the industry standard.



## Step modulation

Connecting multiple compressors with a manifold, commonly known as tandems (2) and trios (3), is an efficient form of stepped modulation. 'Multiples' offer improved part-load efficiencies, such as Integrated Energy Efficiency Ratio (IEER) and Integrated Part Load Value (IPLV), while maximizing full-load efficiency (EER). Multiples leverage the breadth of technologies by offering combinations that include fixed capacity Copeland scroll, Copeland scroll digital, Copeland scroll two-stage, or Copeland scroll variable speed

compressors. These combinations offer a simple solution to deliver continuous capacity modulation while providing exceptional part-load efficiencies.

When Copeland first pioneered the use of scroll technology, the industry was forever changed. Copeland scroll compressors remain at the forefront of HVACR applications and provide the industry's broadest product line, with single compressor configurations ranging from 1-40 HP and multiple compressor configurations ranging from 3-120 HP.

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System capacity can be modulated by using multiple refrigeration circuits or by using multiple compressors in single-circuit systems. In a four-circuit system, commonly used in packaged rooftops, individual compressors can be turned on and off to achieve a specific output. Six to eight compressors per unit can be used, which means, depending on the even or uneven combination, up to 12 capacity steps available to match the load by cycling the compressors on and off, which will multiply with a two-stage, digital or variable speed compressor.

### ***Advantages of stepped modulation***

- Efficiency: High system efficiency at both full-load and part-load
- Installation costs: Least expensive form of modulation
- Reliability: Comparable to fixed compressor systems
- Flexibility: Wide and smooth system lineup with a limited number of compressor models
- Oil management: No extra oil management hardware needed
- Electromagnetic interference issues: None
- Stepped capacity modulation for precise load matching which enables OEMs to boost system part load efficiency levels to meet new energy standards and aggressive DOE challenges

### ***Industry standards***

Industry standards introduce part-load efficiency requirements for light commercial split, package and rooftop systems by adding IEER to the ASHRAE 90.1 standard. In addition, voluntary industry standards ASHRAE 189.1, Energy Star and CEE standards also specify improved part-load efficiency. One way to meet these standards is by applying multiple compressors in the system design to deliver step capacity modulation for precise load matching and high part load efficiency levels.



For more information about available compressor combinations visit [copeland.com/multiples](https://copeland.com/multiples)

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