



Copeland Scroll™ multiples
for commercial air conditioning and chiller applications



Setting the standard

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 Emerson 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.



Example

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

COPELAND SCROLL COMPRESSORS

- More than 100 million installations worldwide
- Over 3 million Copeland Scroll™ two-stage and Copeland Scroll Digital™ compressors installed
- More than 30 years experience as the leader in scroll compression technology

Industrial 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.



About Emerson

Emerson (NYSE: EMR), headquartered in St. Louis, Missouri (USA), is a global technology and engineering company providing innovative solutions for customers in industrial, commercial, and residential markets. Our Emerson Automation Solutions business helps process, hybrid, and discrete manufacturers maximize production, protect personnel and the environment while optimizing their energy and operating costs. Our Emerson Commercial and Residential Solutions business helps ensure human comfort and health, protect food quality and safety, advance energy efficiency, and create sustainable infrastructure. For more information visit Emerson.com.

Copeland Scroll compressor nomenclature example

Z	P	DX		4	2	K	5	E	-	T	F	D		-	1	3	0
Z Scroll Family Series	AC, R-410A	D	X	Nominal Capacity at Rating Condition	Capacity Multiplier K = 1,000 M = 10,000	Model Variation 4, 5, C	Oil type E = POE Oil = AK/DA or 3MA	P = Single Phase Motor T = Three Phase Motor		F = Internal Inherent Protection W = External Protection Module E = CoreSense Module X = Internal and External Protection Combination TW* + TF* (Tandems Only) Y = Tandems/Trio TE* + TW*	Code	60 Hz.	50 Hz.		1	3	0
		D = Digital S = Two-Stage V = Variable Speed	T = Even Tandem U = Uneven Tandem Y = Trio								D 460-3	50 Hz. 380-420-3	5 200-230-3				

For more information about available compressor combinations visit Climate.Emerson.com/modulation

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