Copeland Scroll Large Commercial Compressors

For AC chiller applications.

COPELAND

Copeland is the world's leading compressor manufacturer and committed to maximize system efficiency and protect the environment. With the continuous development of new large commercial scroll compressors in recent years, we have been the first in the market to offer our customers a complete range of scroll compressors with variety of refrigerant choice – R22, R407c, R134a and R410A, to take full benefit of superior scroll part load efficiency in large commercial applications like AC chillers.

Importance of part load efficiency

The energy consumption of an air-conditioning system is largely dependent on weather conditions involving the ambient temperature. Therefore, for real-time operational efficiency, it is important that AC chiller runs on part load conditions to match the capacity as per the changing building load in accordance to ambient temperature changes. This implies that the part load efficiency is just as important as chiller efficiency at the rating conditions.

Global energy standards on AC chillers

Previously, AC chillers were rated at just one rating point – the full load condition. However, as the system continues to develop and the awareness for energy conservation increases, several regulatory bodies are now:

1. The European Seasonal Energy Efficiency Ratio (ESEER)
2. The Integrated Part Load Value (IPLV):China (GB/T 18430.1-2007)

This trend to measure chillers on real-time operation is also gaining momentum in Asia and regulatory bodies are working to define energy standards that take into account both part and full load efficiency by considering parameters including building load profile, temperature profile etc.

IPLV standards explained

IPLV is a comprehensive index that measures AC chiller performance at different operational loading points while also considering changes in load requirements in real-time situations. Generally speaking, a chiller with higher IPLV has lower operation cost and vice versa. The table below explains the workings of the IPLV standard as implemented in China (GB/T 18430.1-2007).

China IPLV working conditions and methods of computation

Load Points	Air-cooled condenser dry bulb temperature °C	Water-cooled condenser water temperature °C	IPLV weight	The IPLV calculation formula IPLV =
100%	35	30	2.3%	100% Load COP x 0.023
75%	31.5	26	41.5%	+75% Load COP x 0.415
50%	28	23	46.1%	+50% Load COP x 0.461
25%	24	24	10.1%	+25% Load COP x 0.11

How to improve seasonal performance of chillers

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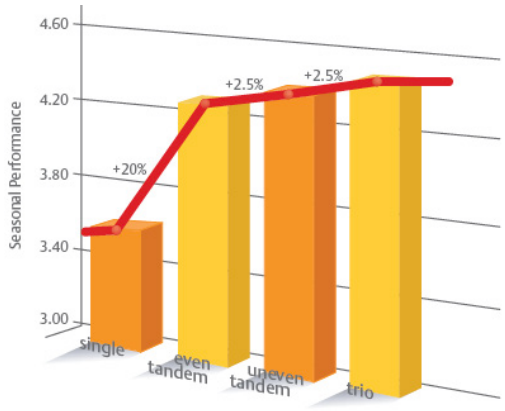
Multiple compressors is one of the most economical way to increase IPLV

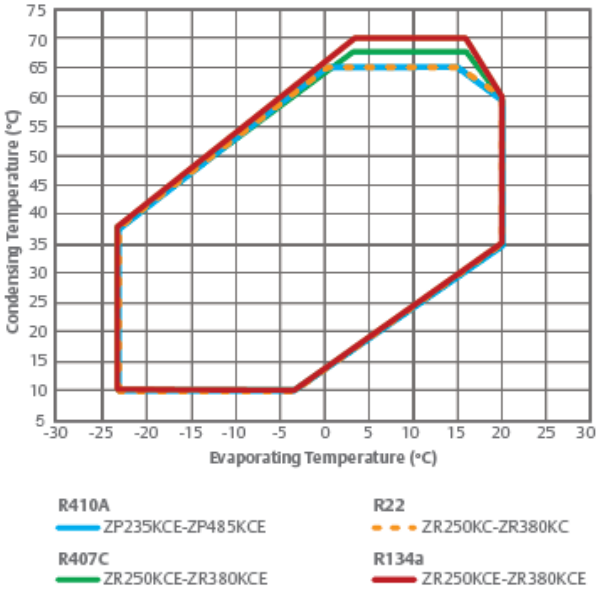


(Actual Seasonal Performance value is system design dependent)

Features and benefits

- Copeland qualified tandem and trio configuration for superior part load efficiency
- Copeland Scroll axial and radial compliance for superior reliability and efficiency
- Wide scroll range with multiple refrigerants

Operating envelope



Technical data

50 Hz

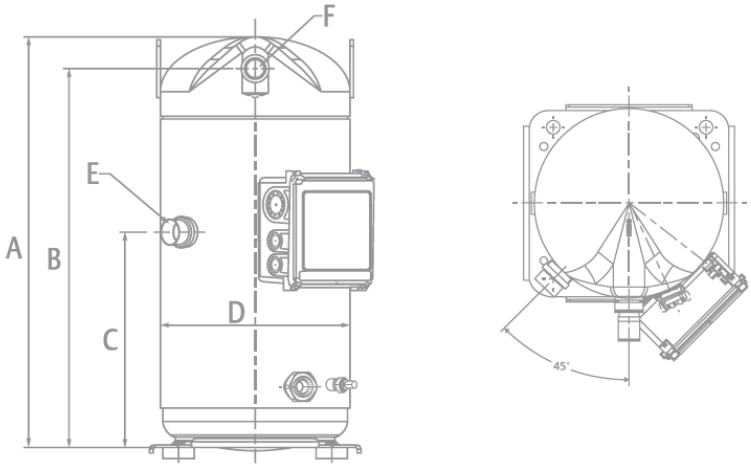
Compressor Model	Refrigerant	Nominal Cooling Capacity (kW)	Input Power (kW)	COP(W/W)	Btu/Wh	Sound Power (dBA)	Net Weight (kg)
ZR250KC-TWD	R22	60.0	17.7	3.37	11.5	83.0	139.3
ZR310KC-TWD	R22	74.0	22.0	3.37	11.5	85.0	160.1
ZR380KC-TWD	R22	92.5	26.5	3.49	11.9	88.0	176.9
ZP235KCE-TWD	R410A	57.0	17.6	3.25	11.1	82.0	140.6
ZP295KCE-TWD	R410A	71.5	22.0	3.25	11.1	85.0	160.1
ZP385KCE-TWD	R410A	92.5	28.5	3.25	11.1	85.0	176.9
ZP485KCE-TWD	R410A	117.0	36.1	3.25	11.1	89.0	200.0

60 Hz

Compressor Model	Refrigerant	Nominal Cooling Capacity (kW)	Input Power (kW)	COP(W/W)	Btu/Wh	Sound Power (dBA)	Net Weight (kg)
ZR250KC-TWD/C/7	R22	73.5	21.7	3.37	11.5	88.0	139.3
ZR310KC-TWD/C/7	R22	89.5	27.1	3.31	11.3	91.0	160.1
ZR380KC-TWD/C/7	R22	111.0	32.7	3.40	11.6	92.0	176.9
ZP235KCE-TWD/C/7	R410A	69.0	21.1	3.25	11.1	87.0	140.6
ZP295KCE-TWD/C/7	R410A	86.0	26.6	3.25	11.1	91.0	160.1
ZP385KCE-TWD/C/7	R410A	113.0	34.7	3.25	11.1	89.0	176.9
ZP485KCE-TWD	R410A	142.0	44.5	3.19	10.9	93.0	200.0

Dimensional drawing

Compressor Model	ZR250KC	ZR310KC	ZR380KC	ZP235KCE	ZP295KCE	ZP385KCE	ZP485KCE
A (mm)	717	715	715	717	715	715	746
B (mm)	667	659	659	667	659	659	690
C (mm)	333	375	375	333	375	375	406
Shell Diameter D (mm)	289	331	331	289	331	331	331
Suction Port Size E (inch)	1-5/8″	1-5/8″	1-5/8″	1-5/8″	1-5/8″	1-5/8″	1-5/8″
Discharge Port Size F (inch)	1-3/8″	1-3/8″	1-3/8″	1-3/8″	1-3/8″	1-3/8″	1-3/8″
Base Size (mm)	267 X 267	267 X 267	267 X 267	267 X 267	267 X 267	267 X 267	267 X 267



R22 Tandem	ZR250KC	ZR310KC)	ZR380KC
ZR250KC	●		
ZR310KC		●	
ZR380KC			●
Trio	●	●	●

R410A Tandem	ZP235KCE	ZP295KCE	ZP385KCE	ZP485KCE
ZP235KCE	●			
ZP295KCE		●		
ZP385KCE			●	
ZP485KCE				●
Trio	●	●	●	●

About Copeland

Copeland, a global provider of sustainable climate solutions, combines category-leading brands in compression, controls, software and monitoring for heating, cooling and refrigeration. With best-in-class engineering and design and the broadest portfolio of modulated solutions, we're not just setting the standard for compressor leadership; we're pioneering its evolution. Combining our technology with our smart energy management solutions, we can regulate, track and optimize conditions to help protect temperature-sensitive goods over land and sea, while delivering comfort in any space. Through energy-efficient products, regulation-ready solutions and expertise, \we're revolutionizing the next generation of climate technology for the better.

To learn more, visit **copeland.com**

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