

# Copeland™ ZO & ZOD Scroll Compressor Ranges for R744-Subcritical Refrigeration

Copeland ZO scroll compressors have been designed for use in R744 (CO<sub>2</sub>) low temperature refrigeration systems. These compressors are suitable for usage in CO<sub>2</sub>-subcritical cascade and booster systems.

Increasing environmental concerns about potential direct emissions from HFC-based refrigeration systems into the atmosphere have led to the revival of R744 in the European refrigeration market. Regionally, this trend is reinforced by legislation and taxation schemes which favor the usage of refrigerant R744.

In comparison with HFC refrigerants, the specific properties of R744 require changes in the design of the refrigeration system. The range of Copeland ZO scroll compressors has been particularly designed to exploit the characteristics of the R744 refrigeration system. Efficiency, reliability and liquid handling advantages of the Copeland scroll technology equally apply.

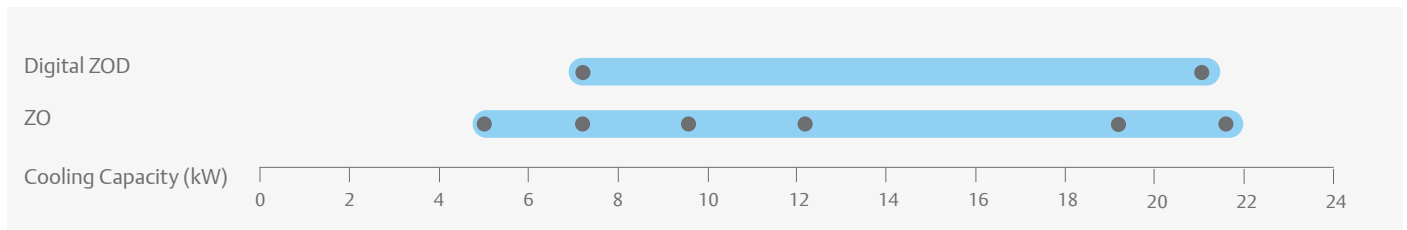
The optimized design of ZO compressors effectively address the challenges of R744 systems, i.e. high pressure levels, higher mass flow for a given displacement while securing proper lubrication.

The range consists of 6 models including 2 digital models for 10 to 100% continuous cooling capacity modulation.



ZO compressor for low temperature refrigeration

## ZO and ZOD Compressor Line-up



Conditions EN12900 R744: Evaporating -35°C, Refrigeration -5°C, Suction Superheat 10K, Subcooling 0K

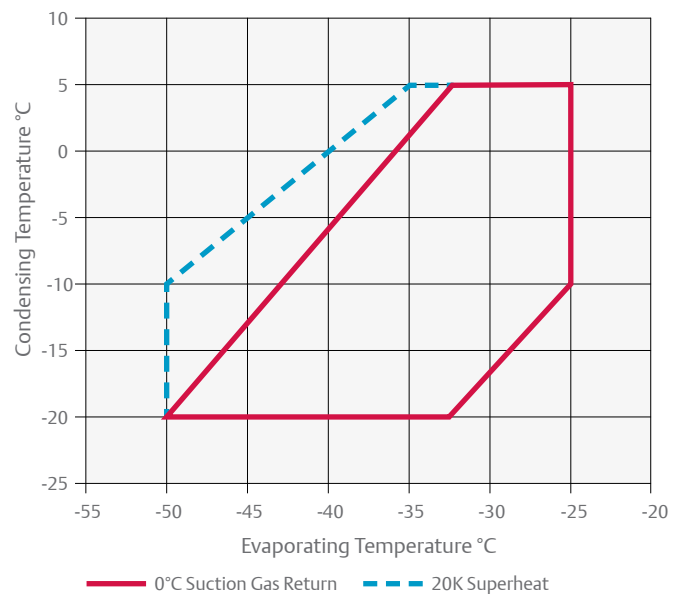
## Features and Benefits

- Optimized for high efficiency in CO<sub>2</sub>-subcritical cascade and booster systems
- High condensing temperature limit allowing for optimized overall system design
- Compact design minimizing required machine room space
- Half the weight of equivalent semi-hermetic compressors
- Optional sound shell allowing 10 dBA sound attenuation
- High bearing reliability and lubrication of all critical parts under all conditions including liquid slugging
- Availability of a digital model offering simple, stepless 10 to 100% capacity modulation

## Maximum Allowable Pressure (PS)

- ZO: Low Side PS 30 bar(g) / High Side PS 52 bar(g)
- Digital ZOD: Low Side PS 30 bar(g) / High Side PS 45 bar(g)

## Operating Envelope R744



For individual model details please refer to Select Software.

## Technical Overview

Models	Nominal hp	Displacement (m <sup>3</sup> /h)	Stub Suction (inch)	Stub Discharge (inch)	Oil Quantity (l)	Length/Width/height (mm)	Net Weight (kg)	Motor Version/ Code	Maximum Operating Current (A)	Locked Rotor Current (A)	Sound Pressure @1 m - dB(A) ***
								3 Ph **	3 Ph **	3 Ph **	
ZO21K5E	1.5	2.6	1 1/4	1	1.0	228/228/388	22	TFD	3.6	27	52
ZO34K3E	2.0	4.1	1 1/4	1	1.4	242/242/381	30	TFD	5.5	26	54
ZO45K3E	2.5	5.4	1 1/4	1	1.4	242/242/403	31	TFD	6.2	35	56
ZO58K3E	3.5	6.9	1 1/4	1	1.4	242/242/417	32	TFD	8.0	48	56
ZO88KCE	5.0	10.1	1 1/4	1	1.9	245/249/440	40	TFD	11.8	64	60
ZO104KCE	6.0	11.7	1 1/4	1	1.9	242/242/461	40	TFD	15.0	74	61
<b>Digital Models</b>											
ZOD34K3E	2.0	4.07	1 1/4	1	1.4	242/242/377	30	TFD	5.5	26	55
ZOD104KCE	6.0	11.7	1 1/4	1	1.9	241/246/484	41	TFD	15.0	75	67

\*\* 3 Ph: 380-420V/ 50Hz

\*\*\* @ 1m: sound pressure level at 1m distance from the compressor, free field condition

## Capacity Data

Condensing Temperature: -10°C									
R744	Cooling Capacity (kW)				R744	Power Input (kW)			
	Evaporating Temperature (°C)					Evaporating Temperature (°C)			
Model	-45	-40	-35	-30	Model	-45	-40	-35	-30
ZO21K5E	3.2	4.1	5.1	6.2	ZO21K5E	1.2	1.2	1.2	1.1
ZO34K3E	4.8	6.2	7.8	9.7	ZO34K3E	1.8	1.8	1.8	1.7
ZO45K3E	7.0	8.8	10.9	13.3	ZO45K3E	2.3	2.3	2.3	2.2
ZO58K3E	8.9	11.2	13.9	17.0	ZO58K3E	3.0	3.0	2.9	2.8
ZO88KCE	13.3	17.0	21.0	25.4	ZO88KCE	4.5	4.5	4.4	4.2
ZO104KCE	15.9	19.7	24.1	29.2	ZO104KCE	4.9	5.0	5.1	5.2
<b>Digital Models</b>									
ZOD34K3E	5.1	6.4	7.9	9.7	ZOD34K3E	1.8	1.8	1.8	1.7
ZOD104KCE	15.6	19.1	23.2	27.9	ZOD104KCE	5.0	5.0	5.1	5.3

Conditions: 10 K Superheat