# Copeland™ ZR Scroll Compressor Range Range for R513A, R407C and R134a

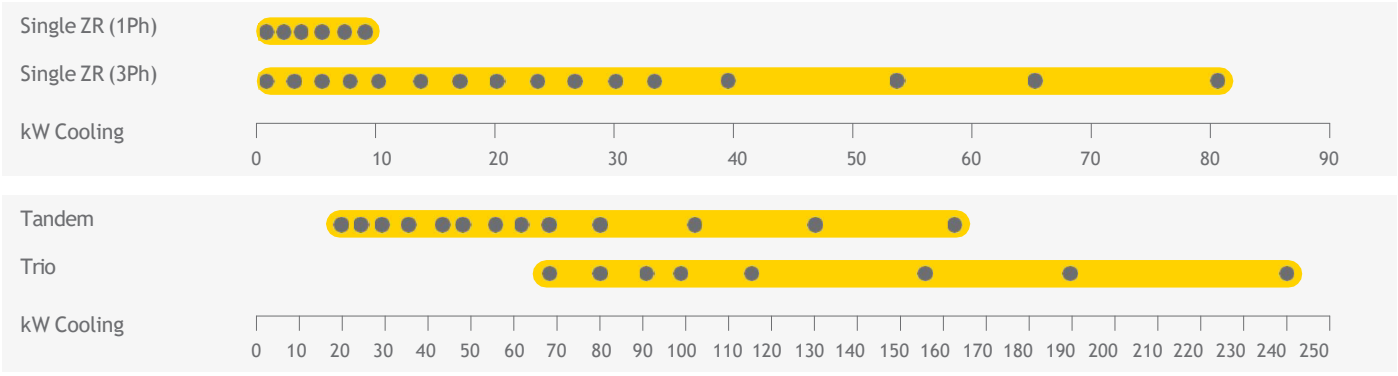
ZR Copeland scroll compressor were developed or comfort and process/precision cooling applications using R513A, R407C and R134a.

Applied in the air conditioning and comfort industry for water chillers, rooftops and close control unit applications, scroll compressors are now the most used compression technology replacing reciprocating and screw compressors due to its undeniable superiority. Several, fully Copeland qualified, multiple compressor assemblies (tandem and trio) are available to allow the use of Copeland scroll compressors into large capacity systems (ex. up to 500kW air cooled chillers) able to deliver optimal comfort, low operating cost with higher seasonal efficiency (SEER). To support the new market needs of customers, Emerson offers scroll compressors for R513A, a low-pressure refrigerant with a low GWP of 631. These ranges are able to reach 5K Superheat which allows better system performance optimization and cost.

The range of products goes from the ZR24 (2hp) to the ZR380 (30hp) for R407C and R134a and from ZR24KRE (2hp) to ZR190KRE (15hp) for R513A, R407C and R134a.

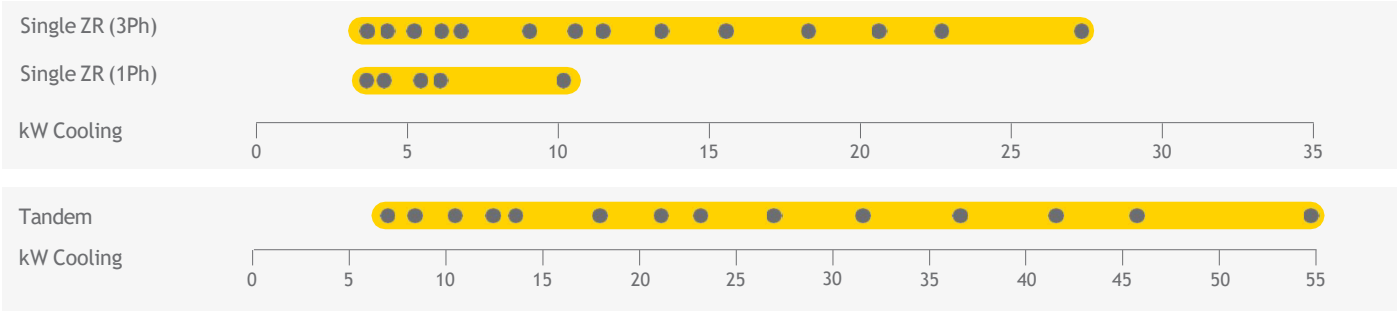
ZR scroll compressor

## ZR Scroll Compressor Line-up R407C




Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

## ZR Scroll Compressor Line-up R513A




Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

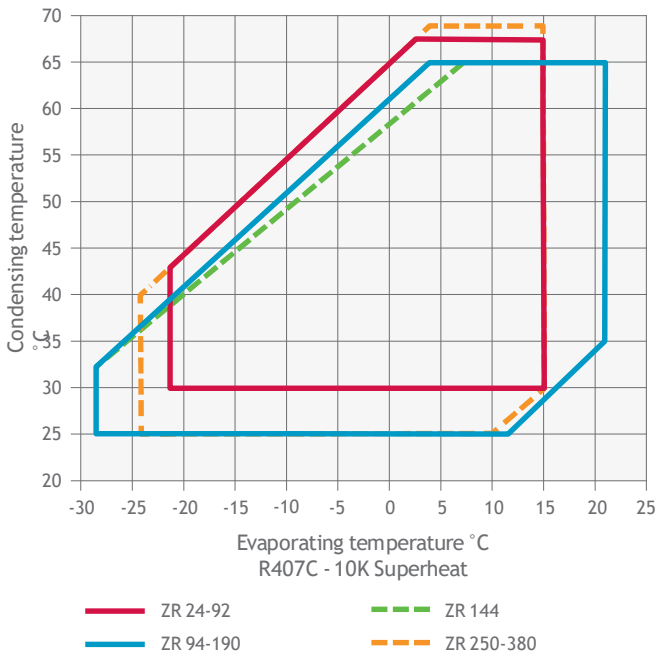
## Features and Benefits

- Copeland scroll axial and radial compliance for superior reliability and efficiency
- Wide scroll line-up for R407C, R134a and R513A
- Low TEWI (Total Equivalent Warming Impact)
- Low sound and vibration level
- Low oil circulation rate
- Copeland qualified tandem and trio configurations for superior seasonal efficiency (SEER)

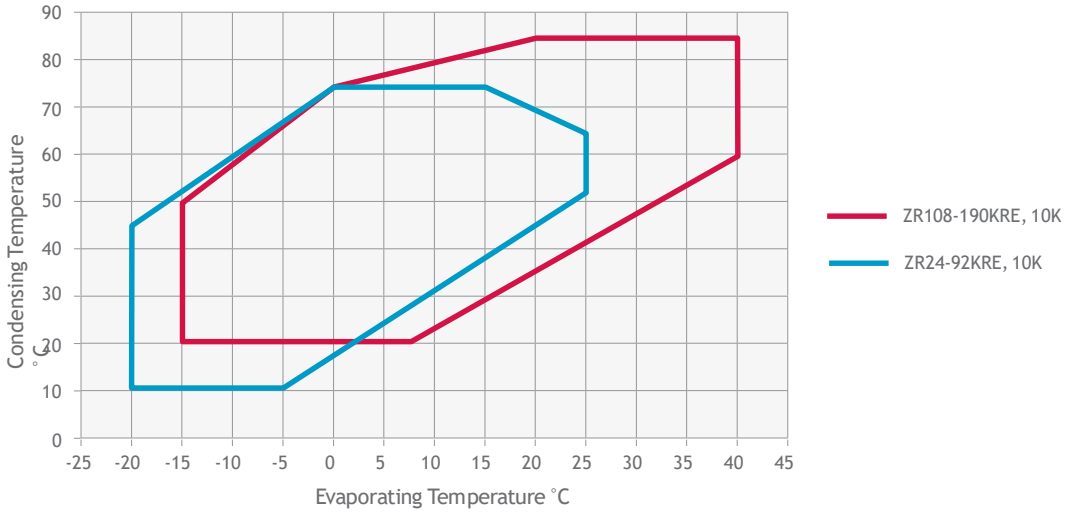
## Maximum Allowable Pressure (PS)

- ZR24 to ZR81:
  Low side PS 21 bar(g) / High side PS 29 bar(g)
- ZR108 to ZR380:
  Low side PS 20 bar(g) / High side PS 32 bar(g)

## Operating Envelope R407C



# Operating Envelope R513A




# Technical Overview ZR*KRE

| Models | Nominal hp | R513A/R134a Capacity (kW) | R407C Capacity (kW) | EER | Displacement (m³/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 (dBA) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| ZR24KRE | 2.0 | 3.5 | 5.0 | 3.0 | 5.9 | 3/4 | 1/2 | 0.7 | 239/245/364 | 25 | PFJ | TFD | 13 | 5 | 58 | 26 | 54 |
| ZR28KRE | 2.5 | 4.2 | 5.9 | 2.9 | 6.8 | 3/4 | 1/2 | 1.1 | 239/245/364 | 26 | PFJ | TFD | 13 | 5 | 61 | 32 | 57 |
| ZR36KRE | 3.0 | 5.2 | 7.6 | 3.1 | 8.6 | 3/4 | 1/2 | 1.2 | 239/245/387 | 27 | PFJ | TFD | 16 | 6 | 82 | 40 | 55 |
| ZR42KRE | 3.5 | 6.2 | 8.9 | 3.2 | 10.0 | 3/4 | 1/2 | 1.1 | 239/245/400 | 28 | PFJ | TFD | 20 | 7 | 97 | 46 | 56 |
| ZR48KRE | 4.0 | 6.9 | 10.3 | 3.1 | 11.4 | 7/8 | 1/2 | 1.5 | 239/245/417 | 29 | PFJ | TFD | 24 | 10 | 114 | 50 | 57 |
| ZR61KRE | 5.0 | 9.0 | 13.0 | 3.2 | 14.4 | 7/8 | 1/2 | 1.9 | 246/257/438 | 38 | | TFD | | 13 | | 66 | 58 |
| ZR69KRE | 5.5 | 10.2 | 14.3 | 3.2 | 16.2 | 7/8 | 1/2 | 1.9 | 246/257/438 | 43 | PFJ | | 36 | | 150 | | 59 |
| ZR72KRE | 6.0 | 10.6 | 15.4 | 3.4 | 17.1 | 7/8 | 1/2 | 1.9 | 246/257/438 | 39 | | TFD | | 13 | | 74 | 61 |
| ZR81KRE | 6.5 | 11.6 | 16.6 | 3.2 | 18.8 | 7/8 | 3/4 | 1.8 | 246/257/443 | 39 | | TFD | | 14 | | 101 | 61 |
| ZR92KRE | 8.0 | 13.5 | 18.8 | 3.2 | 21.4 | 7/8 | 3/4 | 1.9 | 246/257/443 | 44 | | TFD | | 16 | | 102 | 65 |
| ZR108KRE | 9.0 | 15.6 | 23.0 | 3.2 | 24.9 | 1 3/8 | 7/8 | 3.4 | 281/284/533 | 60 | | TFD | | 18 | | 111 | 63 |
| ZR125KRE | 10.0 | 18.2 | 27.0 | 3.3 | 29.1 | 1 3/8 | 7/8 | 3.4 | 281/284/533 | 61 | | TFD | | 20 | | 118 | 63 |
| ZR144KRE | 12.0 | 20.5 | 30.9 | 3.2 | 33.2 | 1 3/8 | 7/8 | 3.3 | 281/284/533 | 61 | | TFD | | 22 | | 118 | 64 |
| ZR160KRE | 13.0 | 22.8 | 33.4 | 3.1 | 36.4 | 1 3/8 | 7/8 | 3.3 | 281/284/552 | 65 | | TFD | | 28 | | 140 | 68 |
| ZR190KRE | 15.0 | 27.2 | 39.3 | 3.1 | 43.3 | 1 3/8 | 7/8 | 3.4 | 281/285/552 | 66 | | TFD | | 35 | | 174 | 71 |

Conditions EN12900 : Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
* 1 Ph: 230V/ 50Hz
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Technical Overview ZR*KCE

| Models | Nominal hp | R407C Capacity (kW) | EER | Displacement (m³/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 (dBA) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 3 Ph** | 3 Ph** | 3 Ph** | |
| ZR108KCE | 9.0 | 23.0 | 3.4 | 25.0 | 1 3/8 | 7/8 | 3.3 | 281/285/533 | 60 | TFD | 18 | 111 | 63 |
| ZR125KCE | 10.0 | 27.0 | 3.4 | 29.1 | 1 3/8 | 7/8 | 3.3 | 264/285/533 | 61 | TFD | 20 | 118 | 63 |
| ZR144KCE | 12.0 | 30.9 | 3.4 | 33.2 | 1 3/8 | 7/8 | 3.3 | 281/285/533 | 61 | TFD | 22 | 118 | 64 |
| ZR160KCE | 13.0 | 33.4 | 3.2 | 36.4 | 1 3/8 | 7/8 | 3.4 | 281/285/552 | 65 | TFD | 28 | 140 | 67 |
| ZR190KCE | 15.0 | 39.3 | 3.2 | 43.3 | 1 3/8 | 7/8 | 3.4 | 281/285/552 | 66 | TFD | 35 | 174 | 69 |
| ZR250KCE | 20.0 | 52.2 | 3.2 | 56.6 | 1 5/8 | 1 3/8 | 4.7 | 427/376/726 | 139 | TWD | 42 | 225 | 72 |
| ZR310KCE | 25.0 | 65.0 | 3.2 | 71.4 | 1 5/8 | 1 3/8 | 6.8 | 447/390/724 | 160 | TWD | 52 | 272 | 74 |
| ZR380KCE | 30.0 | 80.1 | 3.4 | 87.5 | 1 5/8 | 1 3/8 | 6.3 | 447/427/724 | 177 | TWD | 63 | 310 | 77 |

Conditions EN12900 : Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition
Models ZR22K3E-ZR48K3E, ZR61KSE and ZR61KCE-ZR81KCE are available as service compressors

# Capacity Data

| Condensing Temperature 50°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R513A | Cooling Capacity (kW) | | | | | | | R513A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZR24KRE | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.4 | 5.3 | ZR24KRE | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| ZR28KRE | 1.6 | 2.1 | 2.7 | 3.4 | 4.2 | 5.1 | 6.2 | ZR28KRE | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| ZR36KRE | 2.1 | 2.7 | 3.4 | 4.2 | 5.2 | 6.4 | 7.8 | ZR36KRE | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| ZR42KRE | 2.4 | 3.1 | 4.0 | 5.0 | 6.2 | 7.5 | 9.1 | ZR42KRE | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| ZR48KRE | 2.8 | 3.6 | 4.5 | 5.6 | 6.9 | 8.5 | 10.3 | ZR48KRE | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| ZR61KRE | 3.5 | 4.6 | 5.9 | 7.3 | 9.0 | 11.0 | 13.2 | ZR61KRE | 2.9 | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 | 2.9 |
| ZR69KRE** | 4.0 | 5.2 | 6.6 | 8.2 | 10.2 | 12.4 | 14.9 | ZR69KRE** | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| ZR72KRE | 4.2 | 5.4 | 6.9 | 8.6 | 10.6 | 12.9 | 15.5 | ZR72KRE | 3.3 | 3.3 | 3.2 | 3.2 | 3.2 | 3.2 | 3.22 |
| ZR81KRE | 4.8 | 6.1 | 7.6 | 9.4 | 11.6 | 14.2 | 17.1 | ZR81KRE | 3.8 | 3.8 | 3.8 | 3.7 | 3.7 | 3.7 | 3.7 |
| ZR92KRE | 5.7 | 7.1 | 8.9 | 11.0 | 13.5 | 16.4 | 19.8 | ZR92KRE | 3.8 | 3.9 | 4.0 | 4.1 | 4.2 | 4.4 | 4.5 |
| ZR108KRE | 6.3 | 7.7 | 10.0 | 12.6 | 15.6 | 19.1 | 23.1 | ZR108KRE | 4.8 | 4.8 | 4.9 | 4.9 | 4.9 | 5.0 | 5.0 |
| ZR125KRE | 6.8 | 9.0 | 11.7 | 14.7 | 18.2 | 22.3 | 27.0 | ZR125KRE | 5.5 | 5.7 | 5.7 | 5.7 | 5.8 | 5.8 | 5.9 |
| ZR144KRE | 8.2 | 10.3 | 13.2 | 16.6 | 20.5 | 25.1 | 30.4 | ZR144KRE | 6.4 | 6.4 | 6.4 | 6.4 | 6.5 | 6.5 | 6.6 |
| ZR160KRE | 8.0 | 11.5 | 14.8 | 18.5 | 22.8 | 27.9 | 33.8 | ZR160KRE | 7.2 | 7.3 | 7.3 | 7.4 | 7.4 | 7.5 | 7.5 |
| ZR190KRE | 10.1 | 13.7 | 17.6 | 22.0 | 27.2 | 33.2 | 40.2 | ZR190KRE | 9.0 | 8.7 | 8.7 | 8.7 | 8.8 | 8.9 | 9.0 |

Conditions: Suction Superheat 10K / Subcooling 0K
** Single Phase only
Preliminary data

| Condensing Temperature 50°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R134a | Cooling Capacity (kW) | | | | | | | R134a | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZR108KCE | | 8.1 | 10.3 | 12.8 | 15.7 | 19.1 | 23.0 | ZR108KCE | | 4.6 | 4.6 | 4.7 | 4.7 | 4.7 | 4.7 |
| ZR125KCE | | 9.1 | 11.8 | 14.8 | 18.3 | 22.3 | 26.9 | ZR125KCE | | 5.3 | 5.4 | 5.4 | 5.4 | 5.5 | 5.5 |
| ZR144KCE | | 11.2 | 14.3 | 17.5 | 21.0 | 24.8 | 29.0 | ZR144KCE | | 6.1 | 6.3 | 6.3 | 6.3 | 6.3 | 6.4 |
| ZR160KCE | | 11.1 | 14.5 | 18.3 | 22.7 | 27.8 | 33.6 | ZR160KCE | | 6.8 | 6.9 | 6.9 | 7.0 | 7.0 | 7.2 |
| ZR190KCE | | 13.6 | 17.5 | 22.0 | 27.2 | 33.1 | 40.1 | ZR190KCE | | 8.5 | 8.5 | 8.6 | 8.6 | 8.6 | 8.7 |
| ZR250KCE | | 18.4 | 23.2 | 28.9 | 35.5 | 43.3 | 52.2 | ZR250KCE | | 10.9 | 10.9 | 11.0 | 11.1 | 11.2 | 11.4 |
| ZR310KCE | | 22.3 | 28.3 | 35.2 | 43.3 | 52.8 | 63.7 | ZR310KCE | | 13.3 | 13.5 | 13.6 | 13.7 | 13.9 | 14.1 |

Conditions: Suction Superheat 10K / Subcooling 0K

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407C | Cooling Capacity (kW) | | | | | | | R407C | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZR24KRE | | 2.6 | 3.3 | 4.1 | 5.0 | 6.1 | 7.3 | ZR24KRE | | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 |
| ZR28KRE | | 3.0 | 3.8 | 4.8 | 5.9 | 7.2 | 8.6 | ZR28KRE | | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 |
| ZR36KRE | | 4.0 | 5.0 | 6.2 | 7.6 | 9.2 | 11.0 | ZR36KRE | | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| ZR42KRE | | 4.6 | 5.9 | 7.3 | 8.9 | 10.8 | 12.8 | ZR42KRE | | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 | 2.8 |
| ZR48KRE | | 5.4 | 6.8 | 8.4 | 10.3 | 12.5 | 14.9 | ZR48KRE | | 3.2 | 3.2 | 3.2 | 3.2 | 3.1 | 3.1 |
| ZR61KRE | | 7.1 | 8.8 | 10.8 | 13.0 | 15.6 | 18.7 | ZR61KRE | | 4.0 | 4.0 | 4.0 | 4.1 | 4.1 | 4.1 |
| ZR69KRE** | | 7.8 | 9.6 | 11.8 | 14.3 | 17.3 | 20.6 | ZR69KRE** | | 4.9 | 4.8 | 4.7 | 4.5 | 4.3 | 4.1 |
| ZR72KRE | | 8.0 | 10.1 | 12.5 | 15.4 | 18.6 | 22.2 | ZR72KRE | | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 |
| ZR81KRE | | 8.2 | 10.6 | 13.3 | 16.6 | 20.3 | 24.6 | ZR81KRE | | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.4 |
| ZR92KRE | | 9.6 | 12.2 | 15.2 | 18.8 | 22.9 | 27.6 | ZR92KRE | | 6.0 | 6.1 | 6.2 | 6.2 | 6.2 | 6.2 |
| ZR108KCE/KRE | | 12.2 | 15.3 | 18.9 | 23.0 | 27.9 | 33.4 | ZR108KCE/KRE | | 6.8 | 6.8 | 6.9 | 6.9 | 6.9 | 6.9 |
| ZR125KCE/KRE | | 14.0 | 17.7 | 22.0 | 27.0 | 32.6 | 39.1 | ZR125KCE/KRE | | 8.0 | 8.0 | 8.0 | 8.1 | 8.1 | 8.1 |
| ZR144KCE/KRE | | | 20.1 | 25.2 | 30.9 | 37.4 | 44.8 | ZR144KCE/KRE | | | 9.1 | 9.1 | 9.1 | 9.1 | 9.2 |
| ZR160KCE/KRE | | 15.9 | 20.8 | 26.7 | 33.4 | 41.3 | 50.3 | ZR160KCE/KRE | | 10.3 | 10.3 | 10.3 | 10.3 | 10.4 | 10.4 |
| ZR190KCE/KRE | | 19.8 | 25.5 | 31.9 | 39.3 | 47.7 | 57.3 | ZR190KCE/KRE | | 12.2 | 12.3 | 12.3 | 12.3 | 12.4 | 12.5 |
| ZR250KCE | | 27.5 | 34.5 | 42.7 | 52.2 | 63.2 | 75.8 | ZR250KCE | | 15.9 | 16.0 | 16.1 | 16.3 | 16.4 | 16.6 |
| ZR310KCE | | 33.5 | 42.4 | 52.8 | 65.0 | 79.1 | 95.4 | ZR310KCE | | 20.0 | 20.0 | 20.0 | 20.2 | 20.4 | 20.6 |
| ZR380KCE | | 40.1 | 51.8 | 64.9 | 80.1 | 97.6 | 118.0 | ZR380KCE | | 23.9 | 24.1 | 24.3 | 24.4 | 24.6 | 24.9 |

Conditions: Suction Superheat 10K / Subcooling 0K

## ZR*KRE Tandem Model Overview

| Model | Tandem Assembly | Cooling Capacity (kW) | | |
|---|---|---|---|---|
| | | R407C | R513A | R134a |
| Even Tandem | | | | |
| ZRT 48 KRE | 2 x ZR24 KRE | 10.0 | 7.0 | 7.2 |
| ZRT 56 KRE | 2 x ZR28 KRE | 11.8 | 8.4 | 8.3 |
| ZRT 72 KRE | 2 x ZR36 KRE | 15.2 | 10.4 | 10.5 |
| ZRT 84 KRE | 2 x ZR42 KRE | 17.7 | 12.4 | 12.1 |
| ZRT 96 KRE | 2 x ZR48KRE | 20.6 | 13.8 | 13.2 |
| ZRT 122 KRE | 2 x ZR61KRE | 26.0 | 18.0 | 17.5 |
| ZRT 144 KRE | 2 x ZR72KRE | 30.7 | 21.2 | 21.0 |
| ZRT 162 KRE | 2 x ZR81KRE | 33.1 | 23.2 | 23.6 |
| ZRT 184 KRE | 2 x ZR92KRE | 37.5 | 27.0 | 26.7 |
| ZRT 216 KRE | 2 x ZR108KRE | 45.3 | 31.6 | 31.3 |
| ZRT 250 KRE | 2 x ZR125KRE | 53.2 | 36.8 | 36.5 |
| ZRT 288 KRE | 2 x ZR144KRE | 60.9 | 41.6 | 42.0 |
| ZRT 320 KRE | 2 x ZR160KRE | 65.8 | 45.8 | 45.4 |
| ZRT 380 KRE | 2 x ZR190KRE | 77.4 | 54.8 | 54.3 |

Conditions EN 12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
Tandem Assemblies by System Manufacturers. Emerson can provide full technical support.
Preliminary data

## ZR*KCE Tandem Model Overview

| Model | Tandem Assembly | Cooling Capacity (kW) | |
|---|---|---|---|
| | | R407C | R134a |
| Even Tandem | | | |
| ZRT 216 KCE | 2 x ZR108KCE | 46.0 | 31.3 |
| ZRT 250 KCE | 2 x ZR125KCE | 54.0 | 36.5 |
| ZRT 288 KCE | 2 x ZR144KCE | 61.8 | 42.0 |
| ZRT 320 KCE | 2 x ZR160KCE | 66.8 | 45.4 |
| ZRT 380 KCE | 2 x ZR190KCE | 78.6 | 54.4 |
| ZRT 500 KCE | 2 x ZR250KCE | 104.0 | 71.0 |
| ZRT 620 KCE | 2 x ZR310KCE | 130.0 | 84.4 |
| ZRT 760 KCE | 2 x ZR380KCE | 163.0 | 110.8 |
| Uneven Tandem | | | |
| ZRU 315 KCE | ZR125KCE + ZR190KCE | 66.3 | 45.5 |
| ZRU 350 KCE | ZR160KCE + ZR190KCE | 72.7 | 49.9 |
| ZRU 440 KCE | ZR190KCE + ZR250KCE | 91.5 | 62.7 |
| ZRU 500 KCE | ZR190KCE + ZR310KCE | 99.8 | 69.4 |
| ZRU 560 KCE | ZR250KCE + ZR310KCE | 112.7 | 77.7 |
| ZRU 690 KCE | ZR310KCE + ZR380KCE | 140.6 | 97.6 |

Conditions EN 12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
Tandem Assemblies by System Manufacturers. Emerson can provide full technical support.

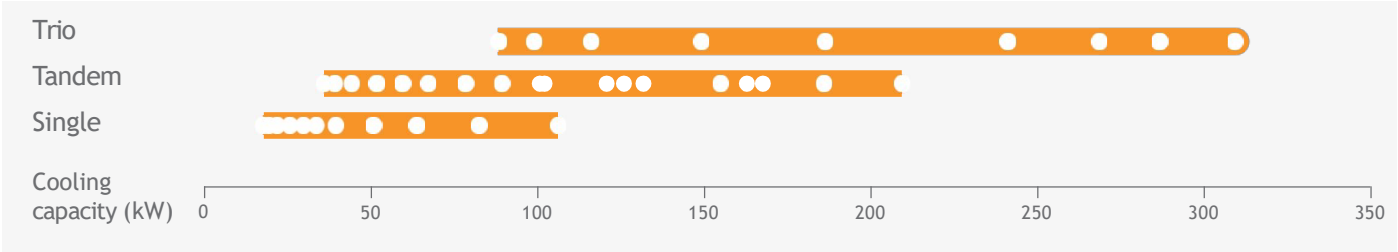
# Copeland™ YP Scroll Compressor Range for R32

The new YP compressors are designed for R32. Thanks to advanced Emerson technologies, they reach the same field of application as equivalent Copeland scroll compressors with R410A. This is achieved without liquid injection or economizer. A dedicated scroll set minimizes the discharge temperature caused by the high heat of compression of the R32 refrigerant. R32 has a GWP of 675 and has been used for many years as main ingredient of R410A and is widely available.

YP compressors can be used for cooling only systems, as well as for reversible systems up to 700kW.

YP Copeland scroll compressor

## YP Scroll Compressor Line-up R32



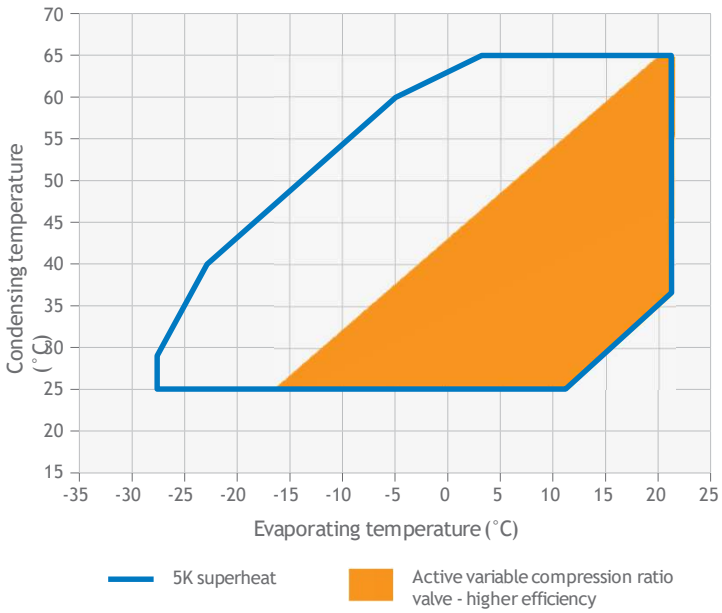

## Features and Benefits

- Designed for R32
- Wide operating envelope
- Low leak discharge check valve
- High part load efficiency thanks to a variable compression ratio valve
- IP 54 terminal box
- Leak free hermetic design
- Tandem and trio capabilities
- Axial and radial compliance
- Emerson integrated solution ready

## Maximum Allowable Pressure (PS)

- YP137, YP154 and YP182
  Low side PS 30.4 bar(g) / High Side PS 49 bar(g)
- YP83 to YP122, YP154, YP385 and YP485
  Low side PS 30.4 bar(g) / High Side PS 50 bar(g)

## Operating Envelope R32



# Technical Overview

| Models | Nominal hp - TonR* | Cooling Capacity (kW) | COP | Stub Suction (inch) | Stub Discharge (inch) | Oil Quanti ty (l) | Length/ Width/ Height z(mm) | PED Category | Net Weight (kg) | Motor Version/ Code | Maximum Operating Current (A) | Locked Rotor Current (A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 3 Ph** | 3 Ph** | 3 Ph** |
| YP83K1T | 7 | 18.8 | 3.2 | 7/8 | 3/4 | 1.8 | 253/258/443 | 2 | 43 | TFD | 14 | 83 |
| YP91K1T | 8 | 20.1 | 3.1 | 7/8 | 3/4 | 1.8 | 258/263/443 | 2 | 41 | TFD | 16 | 92 |
| YP104K1T | 9 | 23.4 | 3.3 | 1 1/8 | 7/8 | 2.5 | 259/270/559 | 2 | 48 | TFD | 18 | 128 |
| YP122K1T | 10 | 27.1 | 3.3 | 1 1/8 | 7/8 | 2.5 | 259/270/559 | 2 | 49 | TFD | 21 | 139 |
| YP137K1T | 12 | 30.4 | 3.2 | 1 3/8 | 7/8 | 3.3 | 271/285/551 | 3 | 68 | TFD | 24 | 147 |
| YP154K1T | 13 | 34.8 | 3.3 | 1 3/8 | 7/8 | 3.3 | 271/285/551 | 3 | 67 | TFD | 26 | 141 |
| YP182K1T | 15 | 40.6 | 3.3 | 1 3/8 | 7/8 | 3.3 | 271/285/551 | 3 | 68 | TFD | 31 | 186 |
| YP233K1T | 20 | 52.1 | 3.3 | 2 1/4 | 1 1/8 | 4.4 | 402/407/692 | 3 | 92 | TED | 35 | 240 |
| YP293K1T | 25 | 65.1 | 3.3 | 2 1/4 | 1 1/8 | 4.4 | 402/317/692 | 3 | 92 | TED | 45 | 287 |
| YP385K1T | 30 | 84.1 | 3.3 | 1 5/8 | 1 3/8 | 6.3 | 459/423/715 | 3 | 177 | TED | 81 | 343 |
| YP485K1T | 40 | 108.0 | 3.4 | 1 5/8 | 1 3/8 | 6.3 | 459/423/746 | 3 | 190 | TED | 111 | 536 |

Conditions EN12900 R32: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
TonR* : Ton of refrigeration at 60Hz
** 3 Ph: 380-420V/ 50Hz

# Capacity Data

| Condensing Temperature +50°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R32 | Cooling Capacity (kW) | | | | | | | R32 | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| YP83K1T | | | 13.1 | 15.8 | 18.8 | 22.2 | 26.0 | YP83K1T | | | 5.8 | 5.8 | 5.9 | 5.9 | 5.9 |
| YP91K1T | | | 13.9 | 16.8 | 20.1 | 23.9 | 28.2 | YP91K1T | | | 6.3 | 6.4 | 6.5 | 6.5 | 6.4 |
| YP104K1T | | | 16.2 | 19.5 | 23.4 | 27.8 | 32.8 | YP104K1T | | | 7.0 | 7.1 | 7.1 | 7.1 | 7.0 |
| YP122K1T | | | 18.9 | 22.7 | 27.1 | 32.1 | 37.8 | YP122K1T | | | 8.1 | 8.2 | 8.2 | 8.2 | 8.2 |
| YP137K1T | | | 21.2 | 25.5 | 30.4 | 36.1 | 42.5 | YP137K1T | | | 9.5 | 9.6 | 9.6 | 9.6 | 9.5 |
| YP154K1T | | | 24.3 | 29.2 | 34.8 | 41.2 | 48.4 | YP154K1T | | | 10.4 | 10.6 | 10.7 | 10.6 | 10.4 |
| YP182K1T | | | 28.4 | 34.1 | 40.6 | 48.0 | 56.4 | YP182K1T | | | 12.3 | 12.4 | 12.5 | 12.5 | 12.4 |
| YP233K1T | | | 36.8 | 43.9 | 52.1 | 61.4 | 72.0 | YP233K1T | | | 15.0 | 15.3 | 15.6 | 15.8 | 16.0 |
| YP293K1T | | | 45.9 | 54.9 | 65.1 | 76.8 | 90.0 | YP293K1T | | | 18.8 | 19.2 | 19.5 | 19.8 | 20.0 |
| YP385K1T | | | 59.6 | 71.0 | 84.1 | 99.7 | 118.5 | YP385K1T | | | 25.2 | 25.3 | 25.4 | 25.5 | 25.5 |
| YP485K1T | | | 75.7 | 90.8 | 108.0 | 128.0 | 150.0 | YP485K1T | | | 31.4 | 31.8 | 32.2 | 32.6 | 33.0 |

Conditions: Suction Superheat 10K / Subcooling 0K

# Tandem Model Overview

| Model | Tandem Assembly | Cooling Capacity (kW) |
|---|---|---|
| Even Tandem YPT | | |
| YPT 166 K | 2 x YP 83 K1T | 38 |
| YPT 182 K | 2 x YP 91 K1T | 40 |
| YPT 208 K | 2 x YP 104 K1T | 47 |
| YPT 244x K | 2 x YP 122 K1T | 54 |
| YPT 274 K | 2 x YP 137 K1T | 61 |
| YPT 308 K | 2 x YP 154 K1T | 70 |
| YPT 464 K | 2 x YP 182 K1T | 81 |
| YPT 446 K | 2 x YP 233 K1T | 104 |
| YPT 586 K | 2 x YP 293 K1T | 130 |
| YPT 770 K | 2 x YP 385 K1T | 168 |
| YPT 970 K | 2 x YP 485 K1T | 216 |

| Model | Tandem Assembly | Cooling Capacity (kW) |
|---|---|---|
| Uneven Tandem YPU | | |
| YPU 291 K | YP137 K1T + YP154 K1T | 65 |
| YPU 336 K | YP154 K1T + YP182 K1T | 75 |
| YPU 415 K | YP182 K1T + YP233 K1T | 93 |
| YPU 526 K | YP233 K1T + YP293 K1T | 117 |
| YPU 678 K | YP293 K1T + YP385 K1T | 149 |
| YPU 870 K | YP385 K1T + YP485 K1T | 192 |

Conditions EN 12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

Tandem assemblies by system manufacturers. Emerson can provide full technical support.

# Copeland™ ZP Scroll Compressor Range for R410A

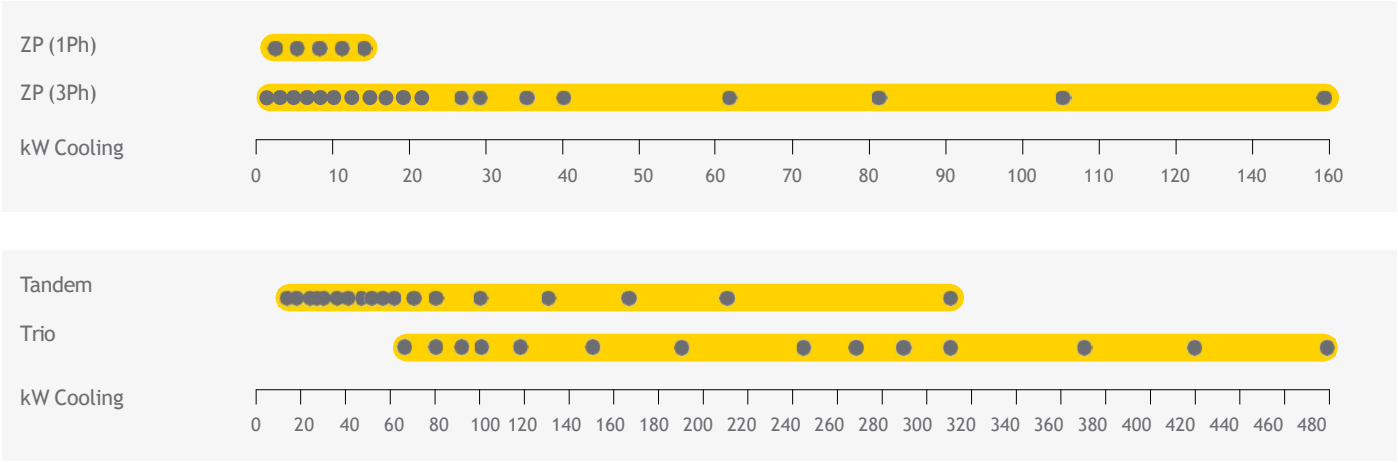
ZP Copeland scroll compressors, for R410A, for comfort and process precision cooling applications. Emerson has been the pioneer in launching the first complete line-up of R410A commercial scroll compressors.

ZP Copeland scroll compressors are perfectly suitable for air-cooled chiller systems up to 900kW (1100 kW if water-cooled) featuring high comfort and superior seasonal efficiency (SEER / SEPR / SCOP). Whether used in stand-alone, tandem or trio configurations, the broad ZP Copeland scroll line-up meets today's market requirements with unmatched flexibility, efficiency and proven reliability.

ZP104, ZP122 and ZP143KCE compressors for light commercial systems have a reduced footprint and weight for more compact systems. Their high efficiency helps to reduce operating costs.

ZP scroll compressor

## ZP Scroll Compressor Line-up




Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

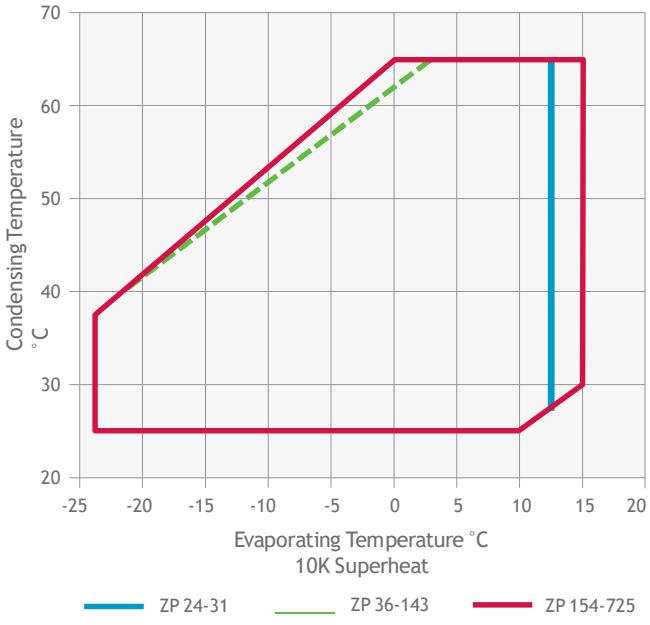
## Features and Benefits

- Copeland qualified tandem and trio (now also uneven configurations for superior seasonal efficiency (SEER / SEPR / SCOP)
- Copeland scroll axial and radial compliance for superior reliability and efficiency
- Extended 5K operating envelope suitable for heat pump applications
- Low TEWI (Total equivalent warming impact)
- Wide scroll line-up for R410A
- Low sound and vibration level
- Low oil circulation rate

## Maximum Allowable Pressure (PS)

- ZP24 to ZP91:
  Low side PS 29.5 bar(g) / High side PS 45 bar(g)
- ZP104 to ZP725:
  Low side PS 29.5 bar(g) / High side PS 45 bar(g)

## Operating Envelope R410A



# Technical Overview

| Models | Nominal hp | Capacity (kW) | EER | Displacement ($m^3/h$) | 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 (dBA) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| ZP24K5E | 1.9 | 5.1 | 2.8 | 4.0 | 3/4 | 1/2 | 0.7 | 236/236/387 | 22 | PFJ | TFD | 13 | 5 | 60 | 28 | 55 |
| ZP29K5E | 2.2 | 6.0 | 2.8 | 4.8 | 3/4 | 1/2 | 0.7 | 246/246/387 | 23 | PFJ | TFD | 16 | 6 | 67 | 38 | 55 |
| ZP31K5E | 3.0 | 6.5 | 2.8 | 5.1 | 3/4 | 1/2 | 0.7 | 243/243/388 | 22 | PFJ | TFD | 17 | 7 | 67 | 38 | 55 |
| ZP36K5E | 2.6 | 7.6 | 2.9 | 6.0 | 7/8 | 1/2 | 1.2 | 243/243/506 | 32 | PFJ | TFD | 20 | 7 | 87 | 46 | 57 |
| ZP42K5E | 3.5 | 8.9 | 2.9 | 6.9 | 7/8 | 1/2 | 1.2 | 246/246/418 | 31 | PFJ | TFD | 21 | 8 | 98 | 43 | 57 |
| ZP54K5E | 4.6 | 11.5 | 3.0 | 8.9 | 7/8 | 1/2 | 1.2 | 246/246/418 | 34 | PFJ | TFD | 31 | 10 | 128 | 52 | 59 |
| ZP61K5E | 5.0 | 13.4 | 3.0 | 10.0 | 7/8 | 1/2 | 1.2 | 246/246/445 | 35 | | TFD | | 11 | | 67 | 57 |
| ZP72KCE | 6.0 | 15.3 | 3.0 | 11.7 | 7/8 | 1/2 | 1.7 | 246/246/455 | 45 | | TFD | | 15 | | 75 | 59 |
| ZP83KCE | 7.0 | 17.7 | 3.1 | 13.5 | 7/8 | 1/2 | 1.8 | 246/246/443 | 40 | | TFD | | 15 | | 101 | 61 |
| ZP91KCE | 7.5 | 19.3 | 3.1 | 14.7 | 1 1/4 | 1 1/4 | 1.8 | 243/248/443 | 41 | | TFD | | 16 | | 101 | 61 |
| ZP104KCE | 9.0 | 22.7 | 3.2 | 16.8 | 1 1/8 | 7/8 | 2.5 | 297/262/559 | 49 | | TFD | | 18 | | 128 | 60 |
| ZP122KCE | 10.0 | 26.5 | 3.2 | 19.6 | 1 1/8 | 7/8 | 2.5 | 297/262/559 | 49 | | TFD | | 22 | | 139 | 61 |
| ZP143KCE | 12.0 | 31.6 | 3.2 | 23.1 | 1 1/8 | 7/8 | 2.8 | 270/262/559 | 49 | | TFD | | 25 | | 146 | 61 |
| ZP154KCE | 13.0 | 33.1 | 3.2 | 24.9 | 1 3/8 | 7/8 | 3.3 | 281/285/552 | 65 | | TFD | | 31 | | 140 | 66 |
| ZP182KCE | 15.0 | 39.0 | 3.2 | 29.1 | 1 3/8 | 7/8 | 3.3 | 281/285/552 | 66 | | TFD | | 34 | | 174 | 66 |
| ZP233KZE | 20.0 | 50.6 | 3.3 | 36.6 | 1 5/8 | 1 1/8 | 4.4 | 315/315/661 | 92 | | TED | | 38 | | 241 | 72 |
| ZP293KZE | 25.0 | 63.3 | 3.3 | 45.7 | 1 5/8 | 1 1/8 | 4.4 | 315/315/661 | 92 | | TED | | 49 | | 288 | 72 |
| ZP385KCE | 30.0 | 82.4 | 3.2 | 60.8 | 1 5/8 | 1 3/8 | 6.3 | 448/392/715 | 178 | | TWD | | 65 | | 310 | 74 |
| ZP485KCE | 40.0 | 105.0 | 3.2 | 77.3 | 1 5/8 | 1 3/8 | 6.3 | 368/345/756 | 190 | | TWD | | 83 | | 408 | 78 |
| ZP725KCE | 60.0 | 159.5 | 3.2 | 115.5 | 2 1/8 | 1 3/8 | 6.3 | 483/460/864 | 260 | | FED | | 123 | | 666 | 82 |

Conditions EN12900 : Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

* 1 Ph: 230V/ 50Hz

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

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

# Capacity Data

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | Cooling Capacity (kW) | | | | | | | R410A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZP24K5E | | 2.7 | 3.4 | 4.2 | 5.0 | 6.0 | | ZP24K5E | | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | |
| ZP29K5E | | 3.1 | 4.0 | 4.9 | 6.0 | 7.3 | | ZP29K5E | | 2.3 | 2.2 | 2.2 | 2.2 | 2.1 | |
| ZP31K5E | | 3.2 | 4.2 | 5.3 | 6.5 | 7.9 | | ZP31K5E | | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 | |
| ZP36K5E | | 4.1 | 5.1 | 6.3 | 7.6 | 9.1 | 10.8 | ZP36K5E | | 2.8 | 2.7 | 2.7 | 2.6 | 2.6 | 2.5 |
| ZP42K5E | | 4.5 | 5.8 | 7.3 | 8.9 | 10.7 | 12.8 | ZP42K5E | | 3.3 | 3.2 | 3.1 | 3.0 | 3.0 | 2.9 |
| ZP54K5E | | 5.8 | 7.5 | 9.3 | 11.5 | 13.9 | 16.6 | ZP54K5E | | 4.0 | 3.9 | 3.9 | 3.8 | 3.8 | 3.8 |
| ZP61K5E | | 7.2 | 9.0 | 11.1 | 13.4 | 16.0 | 18.9 | ZP61K5E | | 4.6 | 4.5 | 4.5 | 4.4 | 4.4 | 4.4 |
| ZP72KCE | | 8.6 | 10.5 | 12.7 | 15.3 | 18.2 | 21.5 | ZP72KCE | | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 |
| ZP83KCE | | 9.8 | 12.1 | 14.7 | 17.7 | 21.1 | 25.1 | ZP83KCE | | 5.7 | 5.8 | 5.8 | 5.8 | 5.8 | 5.9 |
| ZP91KCE | | 10.6 | 13.2 | 16.1 | 19.3 | 22.9 | 27.0 | ZP91KCE | | 6.1 | 6.1 | 6.1 | 6.2 | 6.2 | 6.2 |
| ZP104KCE | | 12.6 | 15.6 | 18.9 | 22.7 | 27.0 | 31.9 | ZP104KCE | | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 |
| ZP122KCE | | 14.8 | 18.3 | 22.1 | 26.5 | 31.5 | 37.2 | ZP122KCE | | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.4 |
| ZP143KCE | | 17.1 | 21.4 | 26.3 | 31.6 | 37.6 | 44.1 | ZP143KCE | | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 |
| ZP154KCE | | 18.7 | 23.0 | 27.7 | 33.1 | 39.3 | 46.3 | ZP154KCE | | 10.3 | 10.3 | 10.4 | 10.5 | 10.6 | 10.7 |
| ZP182KCE | | 22.2 | 27.1 | 32.7 | 39.0 | 46.2 | 54.6 | ZP182KCE | | 12.0 | 12.1 | 12.2 | 12.3 | 12.4 | 12.5 |
| ZP233KZE | | 28.5 | 34.9 | 42.2 | 50.6 | 60.1 | 70.8 | ZP233KZE | | 15.2 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 |
| ZP293KZE | | 36.1 | 44.0 | 53.1 | 63.3 | 74.8 | 87.6 | ZP293KZE | | 19.4 | 19.5 | 19.4 | 19.4 | 19.3 | 19.3 |
| ZP385KCE | | 46.3 | 56.6 | 68.6 | 82.3 | 98.1 | 116.0 | ZP385KCE | | 25.4 | 25.3 | 25.4 | 25.6 | 25.9 | 26.3 |
| ZP485KCE | | 60.2 | 73.1 | 88.0 | 105.0 | 125.0 | 147.0 | ZP485KCE | | 31.1 | 31.5 | 32.0 | 32.5 | 33.2 | 34.0 |
| ZP725KCE | | 91.7 | 111.0 | 135.5 | 159.0 | 188.0 | 222.0 | ZP725KCE | | 49.7 | 50.0 | 50.3 | 50.5 | 50.9 | 51.3 |

Conditions: Suction Superheat 10K / Subcooling 0K

# Tandem Model Overview

| Model | Nominal hp | Cooling Capacity (kW) | Even Tandem | Uneven Tandem |
|---|---|---|---|---|
| Tandem ZPT - Tandem Uneven ZPU | | | | |
| ZPT 72 K5E | 2 x 3 | 16 | • | |
| ZPT 84 K5E | 2 x 3.5 | 18 | • | |
| ZPT 108 K5E | 2 x 4 | 23 | • | |
| ZPT 122 K5E | 2 x 5 | 26 | • | |
| ZPT 144 KCE | 2 x 6 | 31 | • | |
| ZPT 166 KCE | 2 x 6.5 | 35 | • | |
| ZPT 182 KCE | 2 x 8 | 39 | • | |
| ZPT 208 KCE | 2 x 9 | 45 | • | |
| ZPT 244 KCE | 2 x 10 | 53 | • | |
| ZPT 286 KCE | 2 x 12 | 63 | • | |
| ZPT 308KCE | 2 x 13 | 67 | • | |
| ZPU 336 KCE | 13 + 15 | 73 | | • |
| ZPT 364 KCE | 2 x 15 | 79 | • | |
| ZPU 417 K | 15 + 20 | 90 | | • |
| ZPT 466 KZE | 2 x 20 | 101 | • | |
| ZPU 477 K | 15 + 25 | 103 | | • |
| ZPU 530 KZE | 20 + 25 | 114 | | • |
| ZPT 586 KZE | 2 x 25 | 125 | • | |
| ZPU 680 K | 25 + 30 | 146 | | • |
| ZPT 770 KCE | 2 x 30 | 165 | • | |
| ZPU 870 KCE | 30 + 40 | 187 | | • |
| ZPT 970 KCE | 2 x 40 | 209 | • | |
| ZPU 111 MCE | 30 + 60 | 240 | | • |
| ZPU 121 MCE | 40 + 60 | 262 | | • |
| ZPT 145 MCE | 60 + 60 | 317 | • | |

System using ZP235 or ZP295 (20 or 25 hp) shall use ZP233KZE and ZP293KZE
Conditions EN 12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
Tandem assemblies by system manufacturers. Emerson can provide full technical support.

# Copeland™ ZPD & ZRD Digital Scroll Compressor Ranges for R513A, R410A and R407C

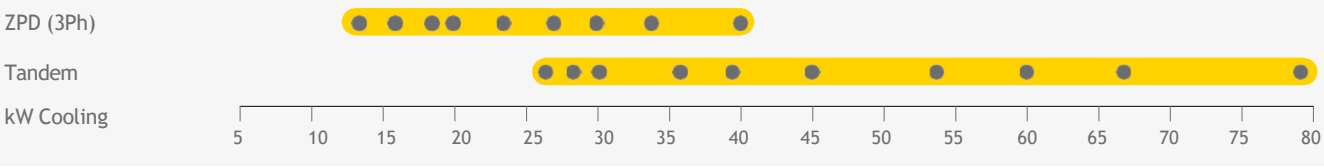
Stepless capacity modulation in air conditioning applications: flexible solution for R513A, R407C and R410A.

In many cooling and heating systems, the load and the operating conditions vary over a wide range thus requiring the use of capacity modulation. Digital scroll assures stepless modulation down to 10% of the nominal capacity, enabling precise temperature control, superior comfort and energy saving.

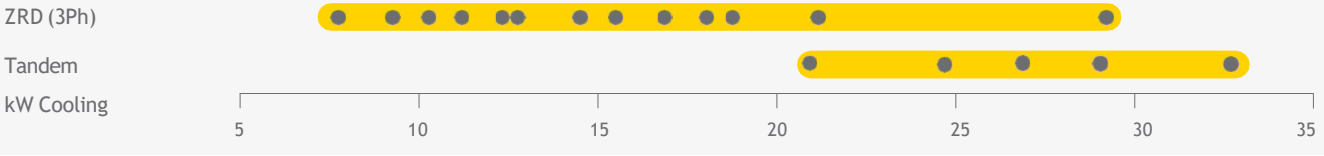
Digital scroll compressors are the preferred choice for process cooling, refrigeration racks, refrigeration units, VRF, rooftop and air handling unit systems.

ZPD & ZRD
scroll digital compressor

## ZPD Digital Scroll Compressor Line-up R410A

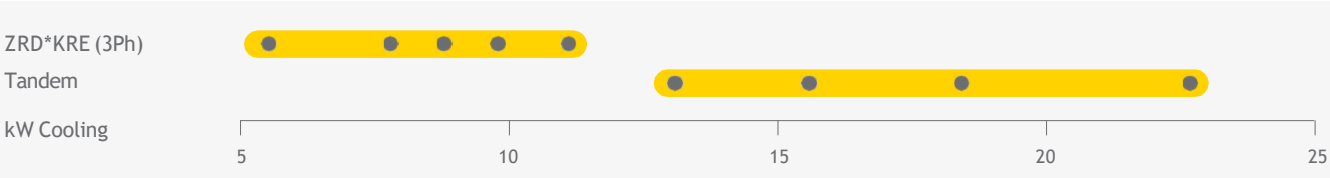



## ZRD Digital Scroll Compressor Line-up R407C




Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

## ZRD*KRE Digital Scroll Compressor Line-up R513A




Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

## Features and Benefits

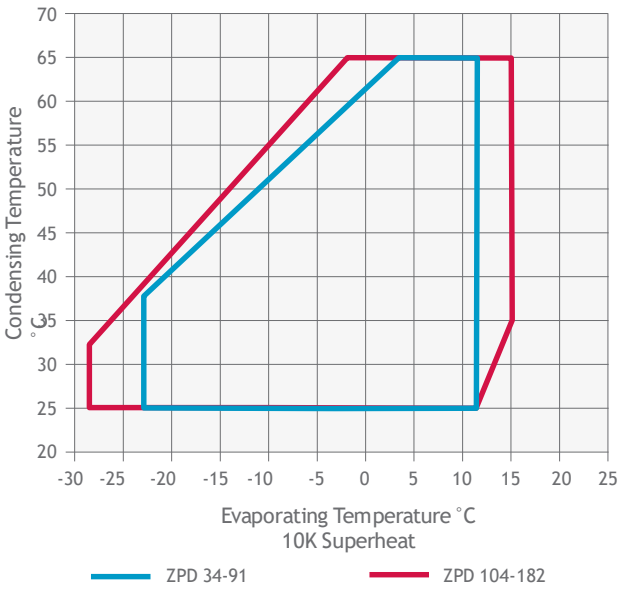
- Wide modulation range from 10% to 100% for immediate load adjustment, close temperature comfort, optimal comfort
- No complex electronics, a quasi-drop-in solution for fast time to market, no EMI/EMC problems, easy installation and maintenance
- No impact on system mechanical balance: no vibration and resonance phenomenon, no frame / piping redesign necessary

## Maximum Allowable Pressure (PS)

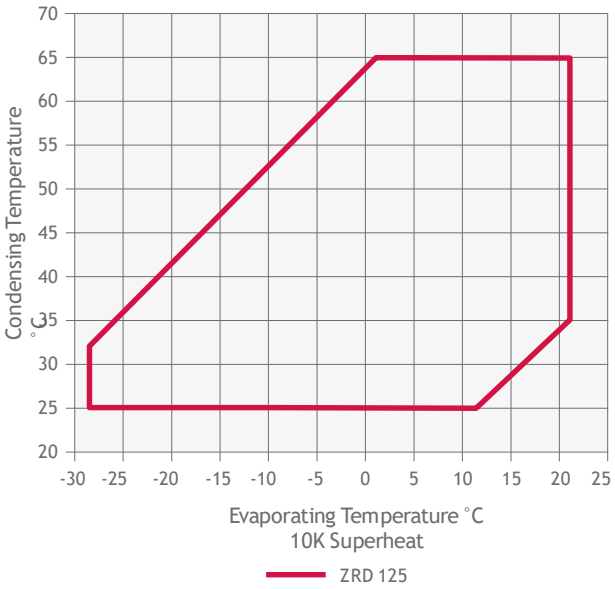
- Digital ZRD42 to ZRD81:
  Low Side PS 20 bar(g) / High Side PS 29.5 bar(g)
- Digital ZRD94 to ZRD125:
  Low Side PS 20 bar(g) / High Side PS 32 bar(g)
- Digital ZPD42 to ZPD91:
  Low Side PS 28 bar(g) / High Side PS 43 bar(g)
- Digital ZPD103 to ZPD182:
  Low Side PS 29.5 bar(g) / High Side PS 45 bar(g)

# Operating Envelope

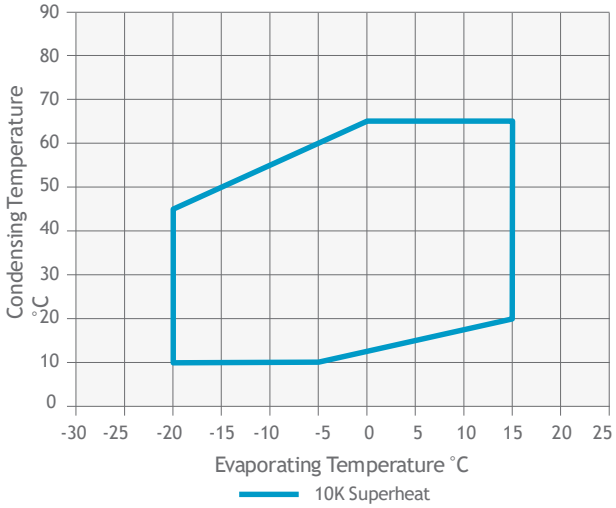
## ZPD - R410A




## ZRD - R407C




## ZRD - R513A



## Technical Overview - ZPD R410A Models

| Models | Nominal hp | Capacity (kW) | EER | Displacement (m³/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* | |
| ZPD61KCE | 5.0 | 13.2 | 3.0 | 10.1 | 7/8 | 1/2 | 1.9 | 241/246/484 | 41 | TFD | 12 | 64 | 63 |
| ZPD72KCE | 5.0 | 15.3 | 2.9 | 11.6 | 7/8 | 1/2 | 1.9 | 241/246/484 | 40 | TFD | 15 | 75 | 67 |
| ZPD83KCE | 6.5 | 17.7 | 3.0 | 13.5 | 7/8 | 1/2 | 1.8 | 246/253/481 | 40 | TFD | 16 | 101 | 64 |
| ZPD91KCE | 8.0 | 19.2 | 3.1 | 14.7 | 7/8 | 3/4 | 1.8 | 246/253/481 | 40 | TFD | 16 | 101 | 69 |
| ZPD104KCE | 9.0 | 22.7 | 3.1 | 16.7 | 1 1/8 | 7/8 | 2.5 | 270/262/605 | 61 | TFD | 18 | 128 | 63 |
| ZPD122KCE | 10.0 | 26.3 | 3.1 | 19.7 | 1 1/8 | 7/8 | 2.5 | 270/262/605 | 62 | TFD | 21 | 139 | 63 |
| ZPD137KCE | 12.0 | 29.4 | 3.1 | 22.1 | 1 3/8 | 7/8 | 3.3 | 293/285/533 | 62 | TFD | 25 | 118 | 63 |
| ZPD154KCE | 13.0 | 33.1 | 3.1 | 24.9 | 1 3/8 | 7/8 | 3.3 | 314/285/552 | 65 | TFD | 27 | 140 | 66 |
| ZPD182KCE | 15.0 | 39.0 | 3.1 | 29.1 | 1 3/8 | 7/8 | 3.3 | 314/285/552 | 67 | TFD | 34 | 173 | 68 |

Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

* 3 Ph: 380-420V/ 50Hz

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

## Technical Overview - ZRD*KRE R407C, R134a and R513A Models

| Models | Nominal hp | R513A/R134a Capacity (kW) | R407C Capacity (kW) | EER | Displacement (m³/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 (dBA) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| ZRD36KRE | 3.0 | 5.2 | 7.7 | 3.2 | 8.3 | 3/4 | 1/2 | 1.2 | 239/244/435 | 30 | PFJ | TFD | 17 | 7 | 97 | 40 | 57 |
| ZRD48KRE | 4.0 | 7.0 | 10.3 | 3.1 | 11.4 | 7/8 | 1/2 | 1.4 | 239/244/466 | 30 | | TFD | | 10 | | 48 | 64 |
| ZRD61KRE | 5.0 | 8.9 | 12.4 | 3.2 | 14.4 | 7/8 | 1/2 | 1.9 | 246/257/481 | 38 | | TFD | | 11 | | 64 | 65 |
| ZRD72KRE | 6.0 | 10.6 | 15.4 | 3.1 | 17.1 | 7/8 | 1/2 | 1.9 | 246/257/481 | 40 | | TFD | | 12 | | 74 | 63 |
| ZRD92KRE | 8.0 | 13.4 | 18.8 | 3.1 | 21.4 | 7/8 | 3/4 | 1.9 | 246/257/481 | 43 | | TFD | | 16 | | 102 | 64 |

Conditions EN12900 : Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

* 1 Ph: 230V/ 50Hz

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

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

Preliminary data

## Technical Overview - ZRD*KCE R407C Models

| Models | Nominal hp | Capacity (kW) | EER | Displacement | Stub Suction | Stub Discharge | Oil Quantity | 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* | |
| ZRD125KCE | 11.0 | 27.6 | 3.3 | 28.8 | 1 3/8 | 7/8 | 3.3 | 293/285/533 | 62 | TFD | 20 | 118 | 64 |

Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

* 3 Ph: 380-420V/50Hz

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

# Capacity Data

| Condensing Temperature 50°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | Cooling Capacity (kW) | | | | | | | R410A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZPD61KCE | | 7.3 | 9.0 | 10.9 | 13.2 | 15.7 | | ZPD61KCE | | 4.2 | 4.3 | 4.4 | 4.4 | 4.5 | |
| ZPD72KCE | | 8.6 | 10.5 | 12.7 | 15.2 | 18.1 | | ZPD72KCE | | 4.9 | 5.0 | 5.1 | 5.2 | 5.2 | |
| ZPD83KCE | | 9.8 | 12.1 | 14.7 | 17.7 | 21.1 | | ZPD83KCE | | 5.9 | 6.0 | 6.0 | 6.0 | 6.0 | |
| ZPD91KCE | | 10.6 | 13.2 | 16.0 | 19.2 | 22.8 | | ZPD91KCE | | 6.2 | 6.2 | 6.2 | 6.3 | 6.3 | |
| ZPD104KCE | | 13.0 | 15.8 | 19.0 | 22.7 | 26.9 | | ZPD104KCE | | 7.0 | 7.0 | 7.1 | 7.2 | 7.3 | |
| ZPD122KCE | | 15.1 | 18.3 | 22.0 | 26.3 | 31.2 | | ZPD122KCE | | 8.0 | 8.1 | 8.2 | 8.3 | 8.4 | |
| ZPD137KCE | | 16.0 | 20.0 | 24.4 | 29.4 | 35.1 | | ZPD137KCE | | 9.6 | 9.5 | 9.4 | 9.4 | 9.3 | |
| ZPD154KCE | | 18.7 | 23.0 | 27.7 | 33.1 | 39.2 | 46.3 | ZPD154KCE | | 10.3 | 10.3 | 10.4 | 10.5 | 10.6 | 10.7 |
| ZPD182KCE | | 23.2 | 27.9 | 33.1 | 39.0 | 45.8 | 53.7 | ZPD182KCE | | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 12.7 |

Conditions: Suction Superheat 10K / Subcooling 0K

| Condensing Temperature 50°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R513A / R134a | Cooling Capacity (kW) | | | | | | | R513A / R134a | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRD36KRE | 2.1 | 2.7 | 3.4 | 4.3 | 5.2 | 6.3 | 7.5 | ZRD36KRE | 1.5 | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| ZRD48KRE | 2.9 | 3.7 | 4.6 | 5.7 | 7.0 | 8.5 | 10.2 | ZRD48KRE | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 |
| ZRD61KRE | 3.6 | 4.6 | 5.8 | 7.2 | 8.9 | 10.8 | 13.1 | ZRD61KRE | 2.5 | 2.6 | 2.6 | 2.7 | 2.8 | 2.9 | 2.9 |
| ZRD72KRE | 4.3 | 5.6 | 7.0 | 8.7 | 10.6 | 12.9 | 15.5 | ZRD72KRE | 2.9 | 3.0 | 3.1 | 3.3 | 3.4 | 3.5 | 3.7 |
| ZRD92KRE | 5.4 | 6.9 | 8.7 | 10.9 | 13.4 | 16.3 | 19.6 | ZRD92KRE | 3.7 | 3.9 | 4.0 | 4.2 | 4.3 | 4.4 | 4.4 |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary data

For capacity data for R450A please refer to Emerson's Select Software

| Condensing Temperature 50°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407C | Cooling Capacity (kW) | | | | | | | R407C | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRD36KRE | | 4.1 | 5.2 | 6.3 | 7.7 | 9.2 | | ZRD36KRE | | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | |
| ZRD48KRE | | 5.4 | 6.8 | 8.4 | 10.3 | 12.5 | | ZRD48KRE | | 3.2 | 3.2 | 3.2 | 3.2 | 3.1 | |
| ZRD61KRE | | 6.3 | 8.0 | 10.0 | 12.4 | 15.1 | | ZRD61KRE | | 3.9 | 4.0 | 4.0 | 4.0 | 4.0 | |
| ZRD72KRE | | 8.0 | 10.1 | 12.5 | 15.4 | 18.6 | | ZRD72KRE | | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | |
| ZRD92KRE | | 9.6 | 12.2 | 15.2 | 18.8 | 22.9 | | ZRD92KRE | | 6.0 | 6.1 | 6.2 | 6.2 | 6.2 | |
| ZRD125KCE | | 14.3 | 18.1 | 22.5 | 27.6 | 33.3 | 39.4 | ZRD125KCE | | 8.2 | 8.3 | 8.4 | 8.4 | 8.6 | 8.7 |

Conditions: Suction Superheat 10K / Subcooling 0K

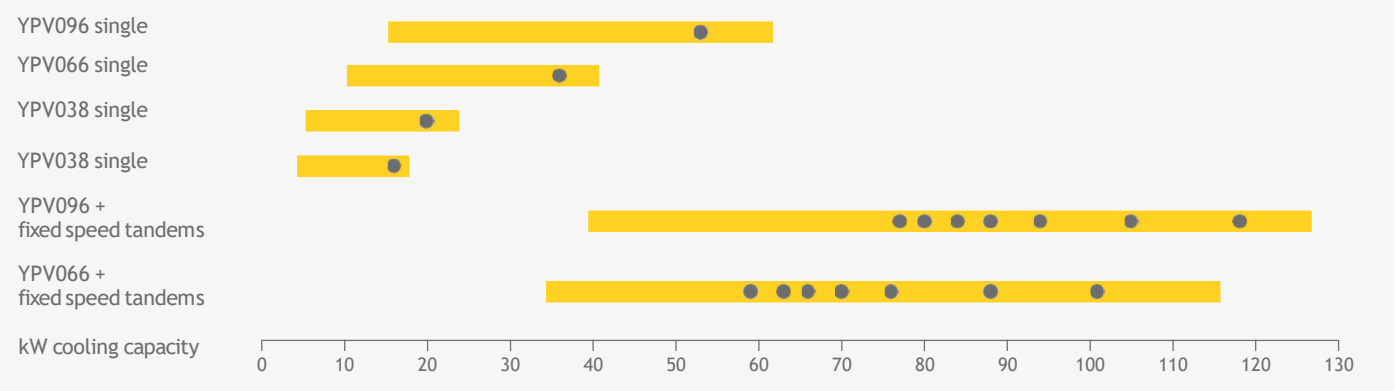
# Copeland™ YPV Variable Speed Scroll Compressor Range for R32 with Inverter Drive

The new YPV variable speed compressors are designed for R32, a widely available refrigerant with a GWP of 675. These scroll compressors deliver maximum efficiency and superior performances to comply or exceed the most stringent EcoDesign directive targets. Thanks to advanced Emerson technologies, YPV compressors reach the same field of application as equivalent Copeland scroll compressors with R410A.

The outstanding efficiency of YPV across different load- and operating conditions reflects in a lower total lifecycle cost of the system, in diverse applications such as commercial comfort - with hydronic cooling, reversible units or rooftops - industrial chillers or close control units.

Copeland YPV variable speed scroll compressor and drive

## YPV Variable Speed Scroll Compressor Line-up R32




## Features and Benefits

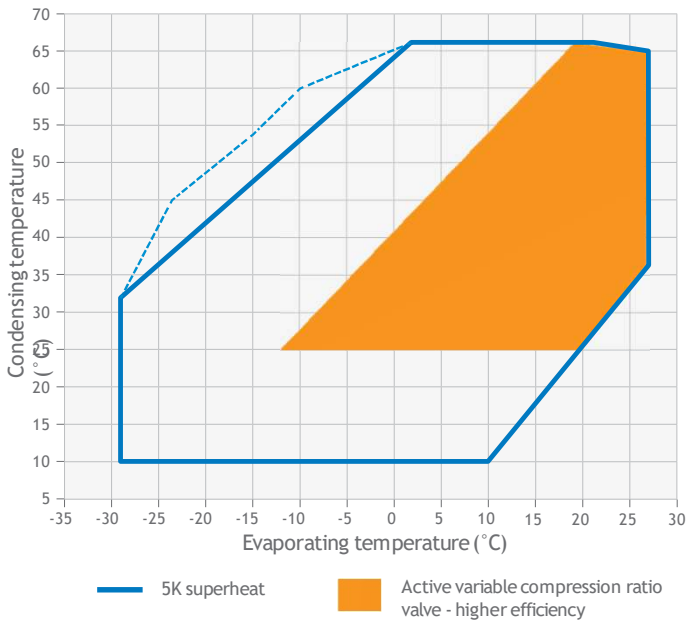
- Designed for R32
- Wide operating envelope for cooling and heating
- Outstanding efficiency, thanks to variable speed high performance motors and to Emerson variable compression ratio valve
- Capability to tandemize YPV066-096 models with YP fixed speed scrolls for maximum flexibility in system design - no need for an oil separator
- Low leak discharge check valve
- Axial and radial compliance
- Emerson integrated solution ready

## Maximum Allowable Pressure (PS)

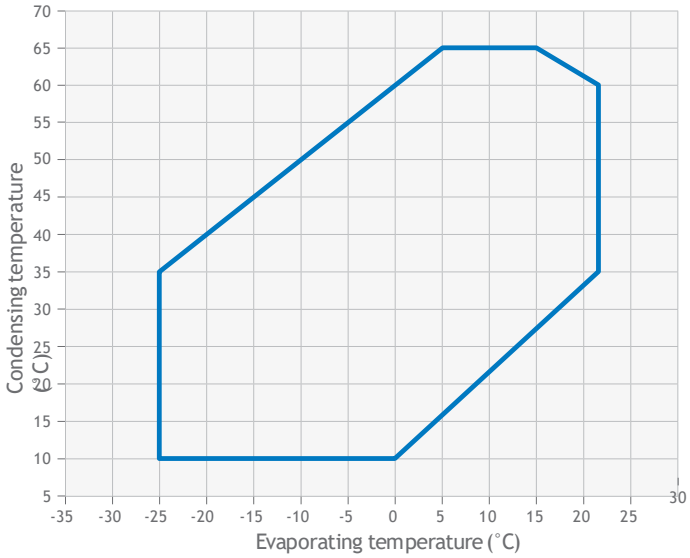
- YPV066 – 096:
  Low side PS 30.4 bar(g) / High Side PS 50.0 bar(g)

# Operating Envelope

## YPV066/096 - R32




## YPV030/038 - R32




5K superheat

Active variable compression ratio valve - higher efficiency

* The operating envelope may vary depending on the compressor speed. Please refer to the Select software

# Technical Overview

| Compressor | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Models | Cooling Capacity (kW) | | | EER* | Stub Suction (inch) | Stub Discharge (inch) | Oil Quantity (l) | Length/ Width/Height (mm) | PED Category | Net Weight (kg) |
| | Min | Max | Nominal | | | | | | | |
| YPV030LT | 2.9 | 19.3 | 16.0 | 3.1 | 3/4 | 1/2 | 1.2 | 196/207/376 | 2 | 18 |
| YPV038LT | 3.5 | 24.6 | 20.4 | 3.1 | 3/4 | 1/2 | 1.2 | 196/207/376 | 2 | 20 |
| YPV0661T | 9.1 | 42.0 | 35.6 | 3.2 | 1 1/4 | 7/8 | 2.5 | 273/262/559 | 3 | 41 |
| YPV0961T | 14.1 | 62.7 | 53.1 | 3.2 | 1 1/8 | 7/8 | 2.5 | 268/246/559 | 3 | 45 |

*Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K, 6000 rpm

| Inverter Drive** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Models | Matched Compressor | Power Input (kW) | Amps (A) | Cooling | Net Weight (kg) | 3Ph 400V | Comm. | Depth/Width/ Height (mm)* |
| | | Max | Max | | | | | |
| EV3150B | YPV066 | 15.0 | 27.0 | Air | 7.4 | ✓ | Modbus | 180/250/380 |
| EV3185B | YPV096 | 18.5 | 38.0 | | 14.0 | ✓ | | 180/250/380 |

* Standard voltage air-cooled version including fins
** No matched inverter drive with models YPV030-LT - YPV038-LT

# Capacity Data

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R32 | | Cooling Capacity (kW) | | | | | | | R32 | | Power Input (kW) | | | | | | |
| | | Evaporating Temperature (°C) | | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | | -15 | -10 | -5 | 0 | +5 | +10 | +15 |
| YPV030LT | Max | | 11.6 | 14.1 | 16.9 | 20.1 | 23.8 | 28.1 | YPV030LT | Max | | 5.9 | 6.1 | 6.3 | 6.4 | 6.5 | 6.5 |
| | Min | | 2.7 | 2.7 | 3.7 | 3.1 | 3.7 | 4.3 | | Min | | 2.0 | 1.6 | 1.6 | 1.2 | 1.1 | 1.1 |
| YPV038LT | Max | | 14.9 | 18.1 | 21.6 | 25.8 | 30.5 | 35.8 | YPV038LT | Max | | 7.7 | 7.9 | 8.1 | 8.3 | 8.4 | 8.5 |
| | Min | | 4.3 | 3.9 | 4.9 | 3.7 | 4.5 | 5.4 | | Min | | 2.8 | 2.2 | 2.2 | 1.7 | 1.6 | 1.6 |
| YPV0661T | Max | 21.3 | 25.2 | 30.3 | 36.6 | 44 | 52.5 | 62.2 | YPV0661T | Max | 13.2 | 13.4 | 13.7 | 14.0 | 14.2 | 14.5 | 14.7 |
| | Min | 6.9 | 6.2 | 7.3 | 8.8 | 10.6 | 12.6 | 15.0 | | Min | 4.3 | 3.4 | 3.5 | 3.5 | 3.5 | 3.4 | 3.4 |
| YPV0961T | Max | 31.7 | 37.6 | 45.2 | 54.6 | 65.6 | 78.4 | 92.9 | YPV0961T | Max | 19.2 | 19.6 | 20.0 | 20.3 | 20.7 | 21.1 | 21.5 |
| | Min | 10.3 | 9.2 | 11.0 | 13.2 | 15.8 | 18.8 | 22.3 | | Min | 6.2 | 4.8 | 4.9 | 4.9 | 4.8 | 4.7 | 4.5 |

Condition: Suction Superheat 5K, Subcooling 4K

Preliminary Data

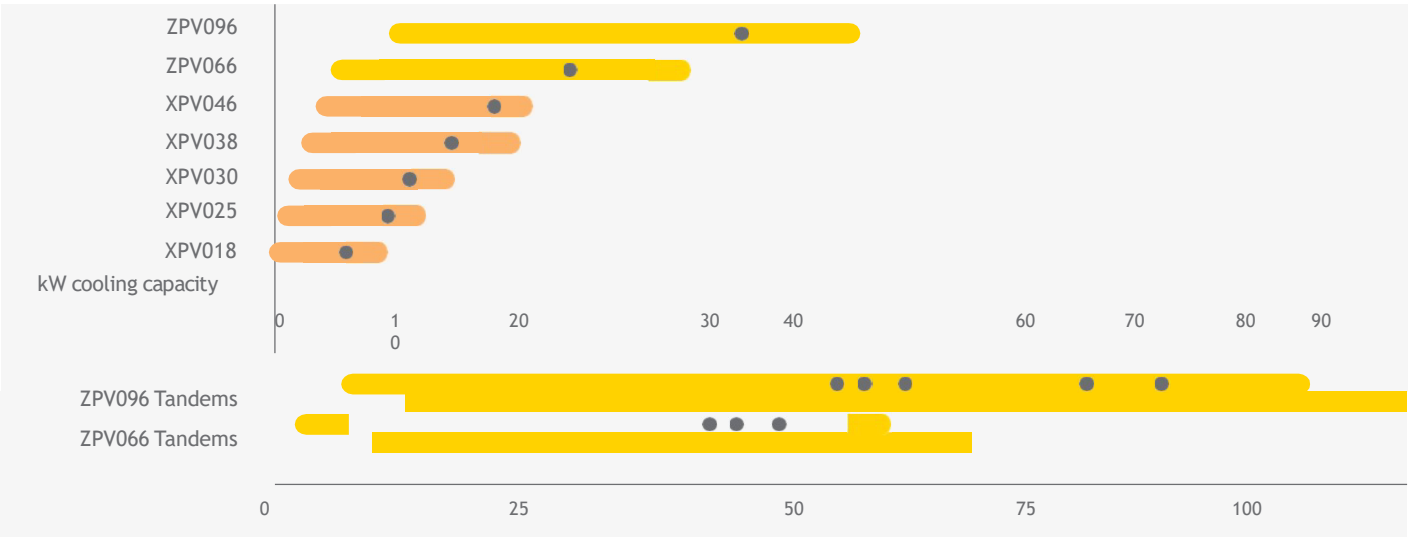
# Copeland™ XPV & ZPV Variable Speed Scroll Compressor Ranges for R410A with Inverter Drive

Copeland XPV and ZPV variable speed scroll compressors for R410A are designed to deliver maximum cooling and heating efficiency when you need it most. Equipped with the latest variable speed technology, they allow system manufacturers and building owners to achieve superior performance when designing reversible chillers, heat pumps, precision cooling systems or rooftops.

In addition to Copeland market-proven robustness, the new XPV and ZPV ranges with their qualified inverter drive meet and exceed the level of reliability expected for these applications.

ZPV066 variable speed scroll compressor and drive

## XPV and ZPV Variable Speed Scroll Compressor Line-up



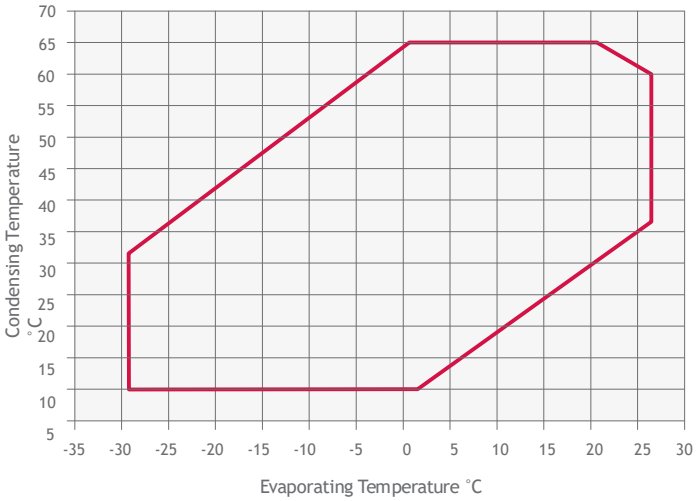

## Features and Benefits

- Highest part load efficiency in its class enabling significant energy savings and standards compliance
- Wide speed range for enhanced part load efficiency and dehumidification: 900 -7,200 RPM (15-120Hz)
- Capability to be tandemized with fixed speed compressors for maximum flexibility in system design
- Both compressor and drive are Copeland approved for reduced design time, cost and speed to market
- BPM motor technology for highest efficiency
- Sound reduction technology for reversible chiller transition and defrost

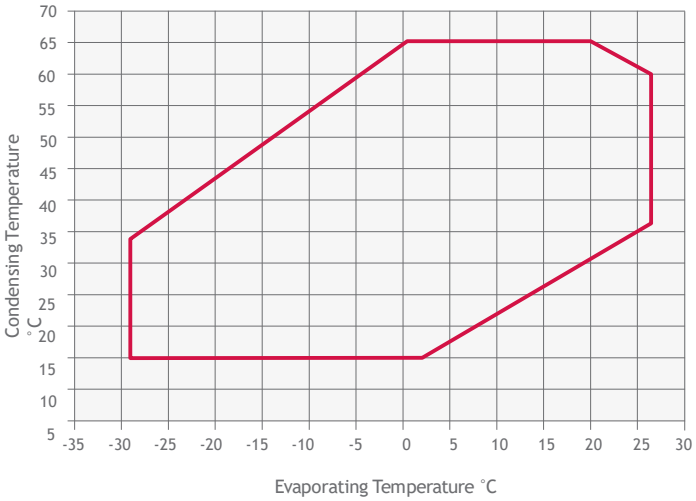
## Maximum Allowable Pressure (PS)

- XPV018-025 and XPV046
  Low Side PS 28 bar(g) / High Side PS 45 bar(g)
- XPV030-038
  Low Side PS 29.5 bar(g) / High Side PS 43.3 bar(g)
- ZPV066 - 096
  Low Side PS 29.5 bar(g) / High Side PS 45 bar(g)

## ZPV Operating Envelope R410A*




## XPV Operating Envelope R410A*




Note: * The operating envelope may vary depending on the compressor speed. Please refer to the Select software

# Technical Overview

| Compressor | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Models | Cooling Capacity (kW) | | | EER* | Displacement ($cm^3$) | Stub Suction (inch) | Stub Discharge (inch) | Oil Quantity (l) | Length/ Width/ Height (mm) | Net weight (kg) | Sound Pressure @1 m - dB(A)** |
| | Min | Max | Nominal | | | | | | | | |
| XPV0182E | 1.3 | 10.4 | 8.2 | 3.0 | 18.0 | 3/4 | 1/2 | 0.7 | 194/216/335 | 16 | 61 |
| XPV0252E | 1.8 | 14.5 | 11.1 | 3.0 | 25.0 | 3/4 | 1/2 | 0.7 | 194/216/335 | 16 | 66 |
| XPV0303E | 2.2 | 17.4 | 13.5 | 3.1 | 30.0 | 3/4 | 1/2 | 1.2 | 194/217/379 | 19 | 64 |
| XPV0383E | 2.7 | 22.5 | 17.5 | 3.1 | 38.0 | 3/4 | 1/2 | 1.2 | 194/217/379 | 20 | 64 |
| XPV0462E | 6.2 | 24.0 | 20.5 | 3.2 | 46.0 | 3/4 | 1/2 | 1.2 | 229/198/388 | 22 | n.a. |
| ZPV0662E | 8.5 | 39.0 | 29.1 | 3.1 | 63.0 | 1 1/8 | 7/8 | 2.5 | 273/262/559 | 40 | 72 |
| ZPV0962E | 13.0 | 58.1 | 43.5 | 3.1 | 96.0 | 1 1/8 | 7/8 | 2.5 | 273/262/559 | 44 | 75 |

Conditions EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
*at Nominal Speed (5400 RPM)
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition
Preliminary Data

| Inverter Drive | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Models | Matched Compressor | Power Input (kW) | Amps (A) | Cooling | Net Weight (kg) | 1ph 230V | 3Ph 400V | Comm. | Depth/ Width/ Height (mm)* |
| | | Max | Max | | | | | | |
| ED3015AU | XPV018 | 3.8 | 15 | Air / Liquid | 2.8 | ✓ | | Modbus RTU and analog board for 0-10V | 205/240/144 |
| ED3020AU | XPV025 | 5.0 | 20 | | 3.6 | ✓ | | | 205/250/180 |
| ED3018BU | XPV025 / XPV030 | 5.0 | 18 | | 4.4 | | ✓ | | 205/250/183 |
| ED3022B | XPV038/ XPV046 | 8.0 | 22 | | 5.2 | | ✓ | | 233/316/150 |
| EV3150B | ZPV066 | 15.0 | 27 | Air | 7.4 | | ✓ | | 180/250/380 |
| EV3185B | ZPV096 | 18.5 | 38 | | 14.0 | | ✓ | | 180/250/380 |

*Standard voltage air-cooled version including fins

# Capacity Data

| Condensing Temperature +50 °C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | | Cooling Capacity (kW) | | | | | | | R410A | | Power Input (kW) | | | | |
| | | Evaporating Temperature (°C) | | | | | | | | | Evaporating Temperature (°C) | | | | |
| Model | | -15 | -10 | -5 | 0 | +5 | +10 | +15 | Model | | -15 | -10 | +5 | +10 | +15 |
| XPV0182E | Max | 5.8 | 7.0 | 8.4 | 10.1 | 12.0 | 14.1 | 16.5 | XPV0182E | Max | 3.6 | 3.7 | 3.7 | 3.7 | 3.7 |
| | Min | 1.5 | 1.6 | 1.7 | 1.7 | 2.0 | 2.4 | 2.9 | | Min | 1.0 | 1.0 | 0.8 | 0.8 | 0.8 |
| XPV0252E | Max | 7.2 | 8.8 | 10.8 | 13.2 | 15.8 | 18.8 | 22.2 | XPV0252E | Max | 4.8 | 4.9 | 5.2 | 5.2 | 5.2 |
| | Min | 2.2 | 2.4 | 2.4 | 2.4 | 2.9 | 3.4 | 4.1 | | Min | 1.4 | 1.4 | 1.1 | 1.1 | 1.0 |
| XPV0303E | Max | 8.9 | 10.7 | 12.9 | 15.6 | 18.8 | 22.5 | 26.7 | XPV0303E | Max | 5.5 | 5.6 | 5.9 | 6.0 | 6.0 |
| | Min | 2.2 | 2.5 | 1.5 | 1.9 | 2.3 | 2.7 | 3.7 | | Min | 1.8 | 1.6 | 1.0 | 1.0 | 1.0 |
| XPV0383E | Max | 11.3 | 13.6 | 16.4 | 19.8 | 23.8 | 28.5 | 33.8 | XPV0383E | Max | 7.0 | 7.1 | 7.5 | 7.5 | 7.6 |
| | Min | 2.8 | 3.2 | 1.9 | 2.4 | 2.9 | 3.4 | 4.6 | | Min | 2.2 | 2.0 | 1.2 | 1.2 | 1.3 |
| XPV0462E | Max | 13.6 | 16.4 | 19.8 | 23.9 | 28.8 | 34.4 | 40.8 | XPV0462E | Max | 8.1 | 8.3 | 8.7 | 8.7 | 8.7 |
| | Min | 3.6 | 4.5 | 2.2 | 2.8 | 3.3 | 4.0 | 5.1 | | Min | 2.7 | 2.6 | 1.4 | 1.4 | 1.4 |
| ZPV0662E | Max | 19.1 | 23.3 | 28.2 | 34.0 | 40.6 | 48.2 | 56.8 | ZPV0662E | Max | 13.2 | 13.5 | 14.3 | 14.5 | 14.7 |
| | Min | 6.2 | 4.9 | 6.0 | 7.1 | 8.3 | 9.8 | 11.5 | | Min | 4.2 | 3.0 | 2.9 | 2.8 | 2.8 |
| ZPV0962E | Max | 28.0 | 34.3 | 41.7 | 50.4 | 60.4 | 71.8 | 84.6 | ZPV0962E | Max | 18.2 | 18.7 | 20.0 | 20.4 | 20.8 |
| | Min | 9.1 | 7.5 | 9.0 | 10.8 | 12.8 | 15.2 | 18.0 | | Min | 5.7 | 4.1 | 4.1 | 4.1 | 4.0 |

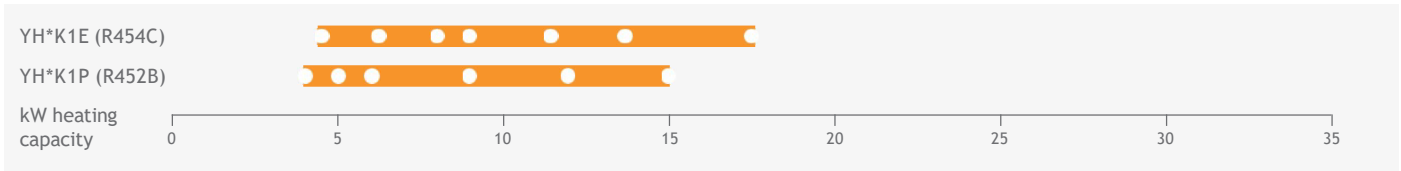
Condition: Suction Superheat 5K, Subcooling 4K

# Copeland™ YH Fixed Speed Scroll Compressor Range for A2L Refrigerants R454C and R452B

The new Copeland YH scroll compressors are designed for multiple applications such as air-to-water and brine-to-water heat pumps, process and close control cooling, as well as air conditioning. They have a dedicated design to support the market needs of customers for medium and low-pressure refrigerants with a low GWP. They are suitable for very aggressive refrigerants containing HFO molecule. YH compressors comply with the PED class requirements related to A2L refrigerants.

YH scroll compressor

## YH Scroll Compressor Line-Up R454C and R452B




Conditions: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

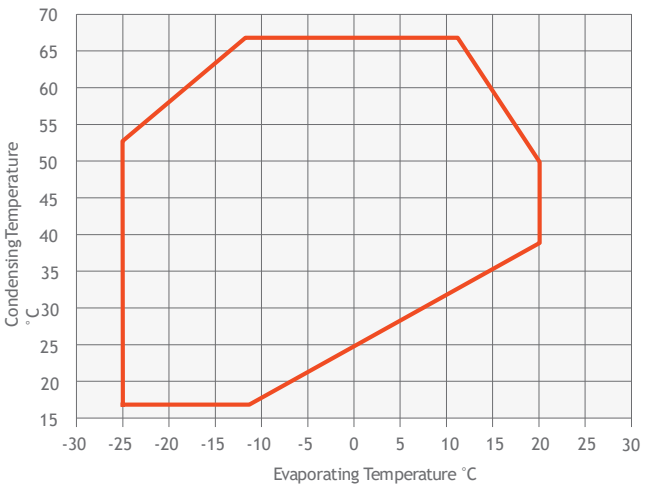
## Features and Benefits

- Multi-refrigerant compressor: optimized for operation with A2L refrigerants with a low GWP R454C (148) and R452B (698) compared to R407C (1774)
- PED class II certified
- Fully hermetic compressor design
- Wide operating envelope for heat pump applications
- Low super heat
- Tandem-ready version available for all sizes
- F-gas compliant

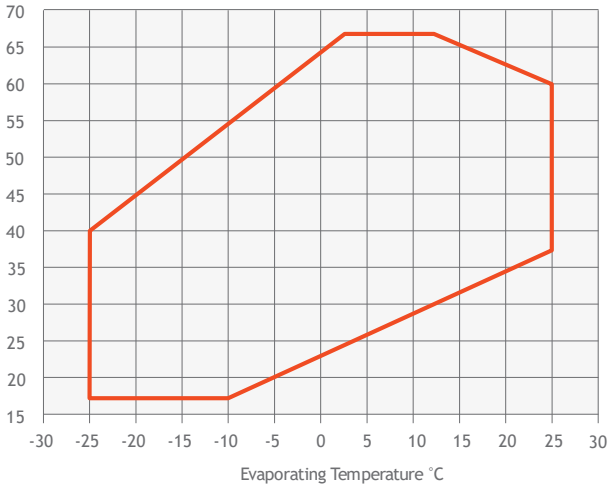
## Maximum Allowable Pressure (PS)

- R454C models
  Low side PS 28 bar(g) / High Side PS 49 bar(g)
- R452B models
  Low side PS 28 bar(g) / High Side PS 46 bar(g)

## YH*K1E Operating Envelope R454C




## YH*K1P Operating Envelope R452B



# Technical Overview

| R454C | Nominal hp | Heating Capacity (kW) | Displacement (m³/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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 3 Ph** | 3 Ph** | 3 Ph** |
| YH04K1E | 2.0 | 4.4 | 5.8 | 3/4 | 1/2 | 1.3 | 253/248/365 | 23.0 | TFMN | 5 | 26 |
| YH06K1E | 2.5 | 6.1 | 8.0 | 3/4 | 1/2 | 1.5 | 253/248/387 | 27.2 | TFMN | 6 | 32 |
| YH07K1E | 3.5 | 7.7 | 10.0 | 3/4 | 1/2 | 1.5 | 253/248/401 | 28.1 | TFMN | 8 | 46 |
| YH09K1E | 4.0 | 8.7 | 11.4 | 7/8 | 1/2 | 1.5 | 253/248/417 | 28.6 | TFMN | 9 | 50 |
| YH11K1E | 5.0 | 10.9 | 14.3 | 7/8 | 1/2 | 1.9 | 255/261/442 | 37.3 | TFMN | 11 | 64 |
| YH13K1E | 6.0 | 12.9 | 16.7 | 7/8 | 1/2 | 1.9 | 255/261/442 | 39.5 | TFMN | 13 | 74 |
| YH16K1E | 8.0 | 16.4 | 21.4 | 7/8 | 3/4 | 1.9 | 255/261/442 | 39.5 | TFMN | 16 | 102 |

Conditions: Evaporating -7°C, Condensing 50°C, Superheat 5K, Subcooling 4K
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

| R452B | Nominal hp | Heating Capacity (kW) | Displacement (m³/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) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| YH04K1P | 1.8 | 4.0 | 3.4 | 3/4 | 1/2 | 1.3 | 227/194/388 | 21.3 | PFZ | TFM | 11 | 5 | 52 | 28 | n/a |
| YH05K1P | 2.0 | 4.7 | 4.0 | 3/4 | 1/2 | 1.5 | 227/194/388 | 21.3 | PFZ | TFM | 13 | 5 | 60 | 28 | |
| YH06K1P | 2.7 | 6.3 | 5.1 | 7/8 | 1/2 | 1.5 | 242/242/418 | | PFZ | TFM | 17 | 6 | 83 | 43 | |
| YH09K1P | 3.5 | 8.5 | 6.9 | 7/8 | 1/2 | 1.5 | 242/242/418 | 33.0 | PFZ | TFM | 23 | 7 | 108 | 52 | |
| YH12K1P | 4.5 | 10.9 | 8.9 | 7/8 | 1/2 | 1.9 | 242/242/418 | 35.0 | PFZ | TFM | 28 | 10 | 130 | 62 | |
| YH15K1P | 5.0 | 14.4 | 11.7 | 7/8 | 1/2 | 1.9 | 245/249/442 | 39.5 | | TFM | | 13 | | 75 | |

Conditions: Evaporating -7°C, Condensing 50°C, Superheat 5K, Subcooling 4K
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data

| Condensing Temperature +50°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454C | Heating Capacity (kW) | | | | | | | R454C | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 | Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 |
| YH04K1E | | 3.4 | 4.0 | 4.7 | 5.5 | 6.4 | 8.6 | YH04K1E | 1.4 | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 3.1 |
| YH06K1E | | 4.8 | 5.6 | 6.5 | 7.6 | 8.9 | 12.1 | YH06K1E | 1.9 | 1.9 | 2.0 | 2.1 | 2.1 | 2.3 | 0.8 |
| YH07K1E | | 6.0 | 7.0 | 8.2 | 9.5 | 11.1 | 15.1 | YH07K1E | 2.4 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 4.4 |
| YH09K1E | | 6.9 | 8.0 | 9.3 | 10.8 | 12.6 | 17.1 | YH09K1E | 2.7 | 2.8 | 2.9 | 3.0 | 3.0 | 3.1 | 1.0 |
| YH11K1E | | 8.5 | 9.9 | 11.6 | 13.6 | 15.8 | 21.3 | YH11K1E | 3.3 | 3.4 | 3.5 | 3.6 | 3.8 | 4.0 | 6.7 |
| YH13K1E | | 10.0 | 11.7 | 13.7 | 16.0 | 18.7 | 25.2 | YH13K1E | 3.8 | 3.9 | 4.1 | 4.3 | 4.4 | 4.6 | 1.6 |
| YH16K1E | | 12.8 | 14.9 | 17.4 | 20.3 | 23.6 | 31.9 | YH16K1E | 4.9 | 5.1 | 5.3 | 5.4 | 5.6 | 6.0 | |

Conditions: Suction Superheat 5K / Subcooling 4K

| Condensing Temperature +50°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R452B | Heating Capacity (kW) | | | | | | | R452B | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 | Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 |
| YH04K1P | | 3.2 | 3.7 | 4.2 | 4.9 | 5.6 | 7.5 | YH04K1P | | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.5 |
| YH05K1P | | 3.7 | 4.3 | 5.0 | 5.8 | 6.7 | 8.8 | YH05K1P | | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 | 1.7 |
| YH06K1P | | 5.0 | 5.8 | 6.6 | 7.6 | 8.8 | 11.6 | YH06K1P | | 2.1 | 2.1 | 2.2 | 2.2 | 2.1 | 2.1 |
| YH09K1P | | 6.8 | 7.8 | 9.0 | 10.4 | 11.9 | 15.6 | YH09K1P | | 2.7 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 |
| YH12K1P | | 8.5 | 10.0 | 11.5 | 13.3 | 15.3 | 20.1 | YH12K1P | | 3.4 | 3.5 | 3.6 | 3.6 | 3.6 | 3.6 |
| YH15K1P | | 11.4 | 13.2 | 15.2 | 17.5 | 20.1 | 26.4 | YH15K1P | | 4.4 | 4.6 | 4.7 | 4.8 | 4.9 | 5.0 |

Conditions: Suction Superheat 5K / Subcooling 4K

# Copeland™ ZH Fixed Speed Scroll Compressor Range for R410A and R407C

## Copeland ZH Scroll Compressor Range

The ZH compressor range is optimized for reversible and heat pump applications. In addition to the existing R407C range, a complete new range optimized for R410A has been developed. Both ranges are based on three platform sizes and cover a capacity of 4kW to 38kW.

ZH heating compressors have been optimized for reversible heating systems, they deliver higher capacity and efficiency at low evaporating (heat source) temperatures and are therefore better adapted to heating requirements than standard air conditioning compressors. Due to their larger operating map they also require less additional heating (electrical or gas) to cover the full heating demand on the coldest days and therefore further improve the system seasonal efficiency.

ZH scroll compressor

## Copeland ZH Scroll Compressors with Enhanced Vapor Injection

ZH heating compressors with Enhanced Vapor Injection have been further optimized to ensure best-in-class performances in dedicated heating applications. This technology allows replacement of traditional boilers in new building and retrofit applications, without the need of substituting existing heating elements in the building.

ZH Copeland scroll heating compressors with Enhanced Vapor Injection have an additional port to inject vapor within the compression process. This improves system performances by increasing the heating capacity for a given compressor displacement. Additional benefits are the reduction of the gas discharge temperature and the extension of the operating envelope which enable the production of high temperature water at all working conditions.

ZHI heating compressors reach the same high standards of durability and reliability as other Copeland scroll compressors. This includes the ability to handle relatively large amounts of liquid, which is known to damage or cause compressor failures. Fewer moving parts, robust running gear and low vibration due to balanced compression mechanism make the ZH range of Copeland scroll compressors the most reliable solution available in the heat pump market.

## ZH Nomenclature Guidelines

ZH**K4E
Qualified for R407C/R134a
without enhanced vapor injection - ** capacity in Btu/h

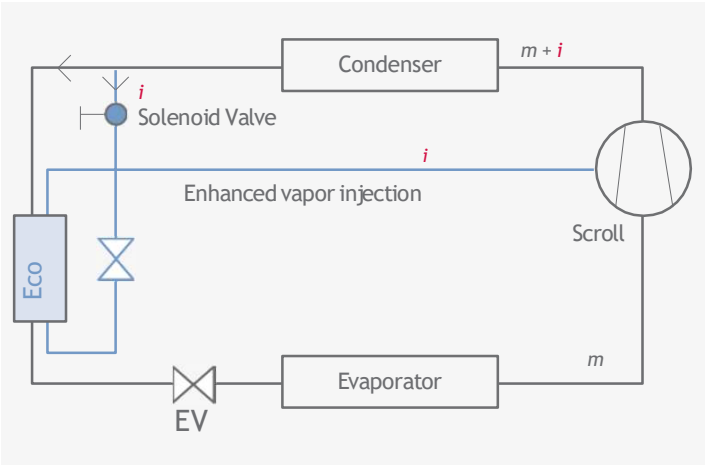
ZH**KVE
Qualified for R407C only
enhanced vapor injection - ** capacity in kW

ZH**KRE
Qualified for R513A
without enhanced vapour injection ** capacity in kW

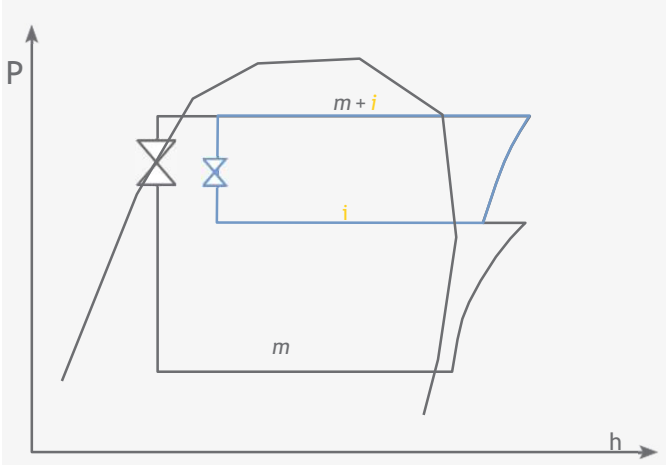
ZH**K1P
Qualified for R410A only
without enhanced vapor injection - ** capacity in kW

ZHI**K1P
Qualified for R410A only
enhanced vapor injection - ** capacity in kW

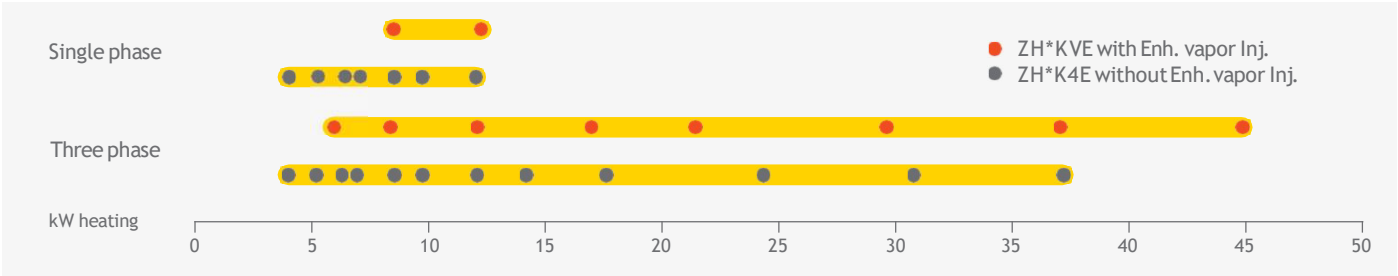
## Enhanced Vapor Injection: System Design




## Enhanced Vapor Injection: Enthalpy Diagram

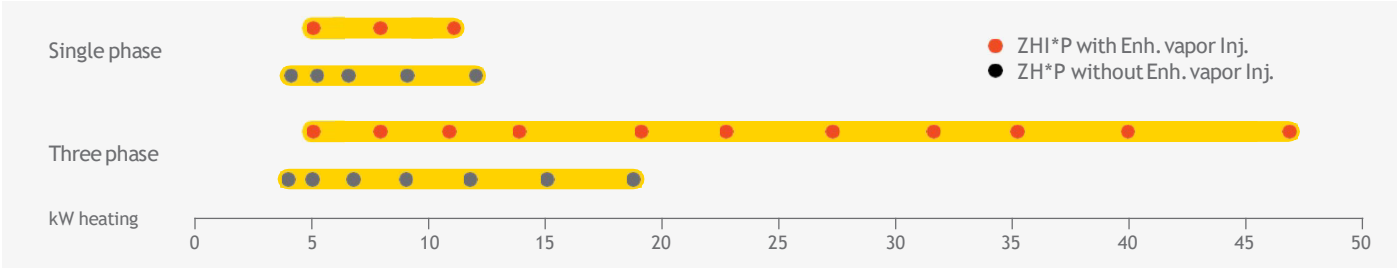


## ZH*K4E /ZH*KVE Scroll Compressor Line-up R407C



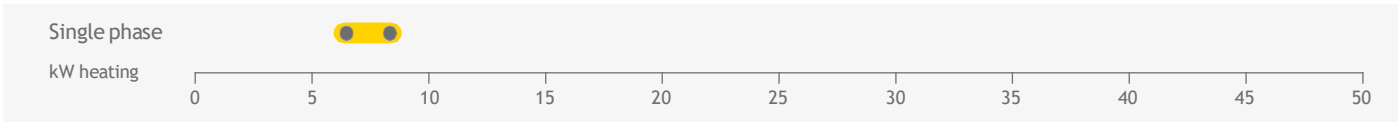

Conditions: Evaporating -7°C, Condensing 50°C, 4K Subcooling, 5K Superheat

## ZH*P /ZHI*P Scroll Compressor Line-up R410A




Conditions: Evaporating -7°C, Condensing 50°C, 4K Subcooling, 5K Superheat

## ZH*KRE Scroll Compressor Line-up R513A



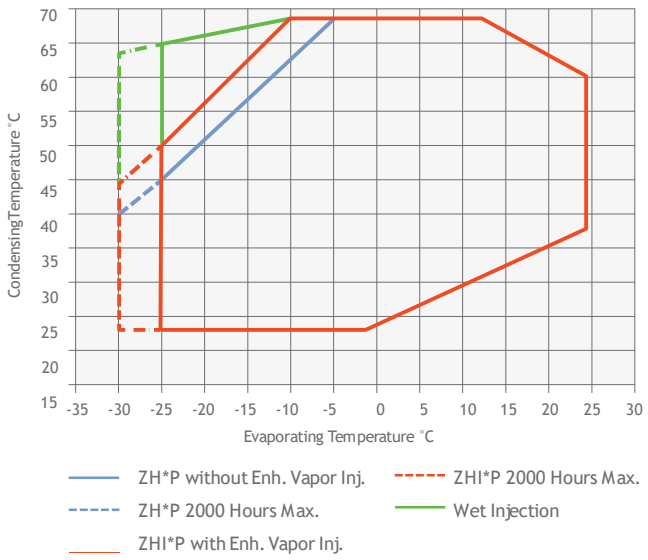

## Features and Benefits

- Copeland™ scroll axial and radial compliance for high reliability
- High efficiency and increased heating capacity
- High water temperature for all applications
- Low sound and low vibration level
- Tandem combination for superior seasonal efficiency
- Enhanced Vapor Injection technology for best seasonal efficiency

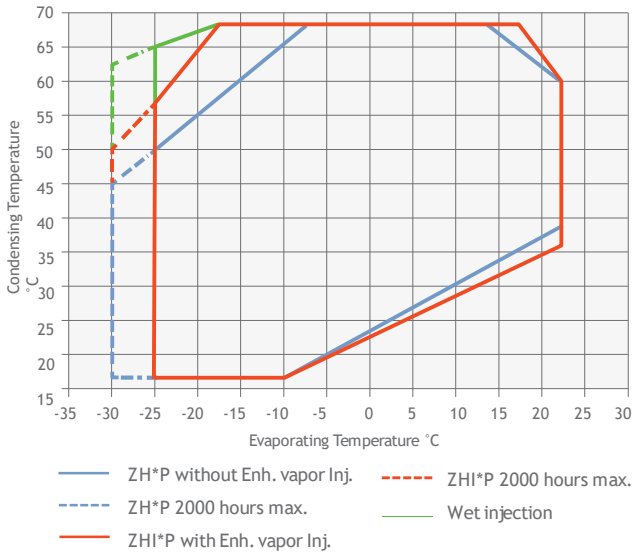
## Maximum Allowable Pressure (PS)

- ZH(I)04K1P to ZH(I)23K1P:
  Low Side PS 28 bar(g) / High Side PS 45 bar(g)
- ZHI27K1P to ZHI46K1P:
  Low Side PS 29.5 bar(g) / High Side PS 53 bar(g)
- ZH12K4E to ZH45K4E:
  Low Side PS 20 bar(g) / High Side PS 32 bar(g)
- ZH56K4E to ZH11M4E:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)
- ZH09KVE to ZH18KVE:
  Low Side PS 20 bar(g) / High Side PS 32 bar(g)
- ZH24KVE to ZH48KVE:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)

## Operating Envelope R410A Heating




## Operating Envelope R407C Heating




Refer to Emerson's Select Software for individual model operating envelopes and other refrigerants.

# Technical Overview

| R410A | Nominal hp | Capacity (kW) | COP | Displacement ($m^3/h$) | 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) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| ZH04 K1P | 1.8 | 4.2 | 2.8 | 3.4 | 3/4 | 1/2 | 0.7 | 229/198/388 | 22 | PFZ | TFM | 9 | 5 | 50 | 28 | 62 |
| ZH05 K1P | 2.0 | 5.0 | 2.8 | 4.0 | 3/4 | 1/2 | 0.7 | 229/198/388 | 22 | PFZ | TFM | 13 | 5 | 60 | 28 | 62 |
| ZH06 K1P | 2.7 | 6.6 | 2.9 | 5.1 | 7/8 | 1/2 | 1.2 | 242/242/418 | 31 | PFZ | TFM | 17 | 6 | 83 | 44 | 62 |
| ZH09 K1P | 3.5 | 9.0 | 3.1 | 6.9 | 7/8 | 1/2 | 1.2 | 242/242/418 | 33 | PFZ | TFM | 23 | 7 | 108 | 52 | 62 |
| ZH12 K1P | 4.5 | 11.4 | 3.0 | 8.9 | 7/8 | 1/2 | 1.2 | 242/242/418 | 35 | PFZ | TFM | 28 | 10 | 130 | 62 | 65 |
| ZH15 K1P | 5.0 | 15.1 | 3.1 | 11.7 | 7/8 | 1/2 | 1.9 | 245/249/442 | 39 | | TFM | | 13 | | 75 | 67 |
| ZH19 K1P | 6.5 | 18.7 | 3.2 | 14.8 | 7/8 | 3/4 | 1.9 | 239/244/443 | 39 | | TFM | | 17 | | | 67 |
| ZHI05 K1P | 1.9 | 5.2 | 3.0 | 3.4 | 3/4 | 1/2 | 0.7 | 229/198/388 | 22 | PFZ | TFM | 14 | 4 | 60 | 28 | 63 |
| ZHI08 K1P | 2.8 | 8.2 | 3.1 | 5.1 | 7/8 | 1/2 | 1.2 | 242/242/418 | 31 | PFZ | TFM | 19 | 6 | 108 | 43 | 63 |
| ZHI11 K1P | 3.6 | 10.8 | 3.2 | 6.9 | 7/8 | 1/2 | 1.2 | 242/242/418 | 31 | PFZ | TFM | 25 | 9 | 130 | 52 | 65 |
| ZHI14 K1P | 4.6 | 13.9 | 3.3 | 8.9 | 7/8 | 1/2 | 1.2 | 242/242/418 | 34 | | TFM | | 11 | | 70 | 65 |
| ZHI18 K1P | 5.0 | 17.9 | 3.4 | 11.7 | 7/8 | 1/2 | 1.9 | 249/245/443 | 41 | | TFM | | 15 | | | 67 |
| ZHI23 K1P | 6.5 | 22.8 | 3.4 | 14.8 | 7/8 | 3/4 | 1.9 | 239/244/443 | 41 | | TFM | | 19 | | | 67 |
| ZHI27 K1P | 9.0 | 27.0 | 3.3 | 16.8 | 1 3/8 | 7/8 | 3.3 | 280/280/533 | 63 | | TFD | | 21.0 | | 118 | 77 |
| ZHI32 K1P | 10.0 | 31.7 | 3.2 | 19.8 | 1 3/8 | 7/8 | 3.3 | 280/280/533 | 63 | | TFD | | 26.0 | | 140 | 75 |
| ZHI35 K1P | 12.0 | 35.6 | 3.2 | 22.1 | 1 3/8 | 7/8 | 3.3 | 280/284/568 | 63 | | TFD | | 32.5 | | 174 | 76 |
| ZHI40 K1P | 13.0 | 39.7 | 3.3 | 24.9 | 1 3/8 | 7/8 | 3.3 | 284/280/568 | 64 | | TFD | | 33.0 | | 174 | 76 |
| ZHI46 K1P | 15.0 | 46.6 | 3.3 | 29.1 | 1 3/8 | 7/8 | 3.4 | 284/280/568 | 64 | | TWD | | 37.4 | | 168 | 78 |

Conditions: Evaporating -7°C, Condensing 50°C, Superheat 5K, Subcooling 4K
* 1 Ph: 230V/ 50Hz
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

| R407C | Nominal hp | Capacity (kW) | COP | Displacement ($m^3/h$) | 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) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| ZH12K4E | 1.7 | 3.7 | 3.0 | 4.7 | 3/4 | 1/2 | 0.7 | 272/193/388 | 21 | PFZ | | 10 | | 44 | | 53 |
| ZH15K4E | 2.0 | 4.6 | 3.0 | 5.8 | 3/4 | 1/2 | 1.3 | 243/243/364 | 23 | PFJ | TFD | 12 | 4 | 61 | 26 | 60 |
| ZH06KVE | 2.5 | 6.1 | 3.3 | 5.8 | 3/4 | 1/2 | 1.3 | 243/243/364 | 28 | | TFM | | 4 | | 26 | 58 |
| ZH19K4E | 2.5 | 5.9 | 3.0 | 7.3 | 3/4 | 1/2 | 1.5 | 243/242/387 | 25 | PFJ | TFD | 17 | 6 | 74 | 32 | 60 |
| ZH09KVE | 3.0 | 8.3 | 3.3 | 8.0 | 3/4 | 1/2 | 1.5 | 243/243/386 | 30 | PFZ | TFD | 21 | 7 | 97 | 40 | 62 |
| ZH21K4E | 3.0 | 6.5 | 3.1 | 8.0 | 3/4 | 1/2 | 1.5 | 243/242/387 | 27 | PFJ | TFD | 19 | 5 | 76 | 32 | 61 |
| ZH26K4E | 3.5 | 8.2 | 3.1 | 10.0 | 3/4 | 1/2 | 1.5 | 243/242/400 | 28 | PFJ | TFD | 21 | 7 | 97 | 46 | 64 |
| ZH13KVE | 4.0 | 11.9 | 3.4 | 11.7 | 7/8 | 1/2 | 1.9 | 244/241/438 | 38 | PFJ | TFD | 30 | 10 | 160 | 74 | 68 |
| ZH30K4E | 4.0 | 9.5 | 3.1 | 11.7 | 7/8 | 1/2 | 1.9 | 247/241/438 | 38 | PFJ | TFD | 25 | 8 | 108 | 64 | 65 |
| ZH38K4E | 5.0 | 11.7 | 3.2 | 14.4 | 7/8 | 1/2 | 1.9 | 247/241/438 | 38 | PFZ | TFD | 31 | 10 | 150 | 64 | 66 |
| ZH18KVE | 6.0 | 16.8 | 3.4 | 17.1 | 7/8 | 1/2 | 1.9 | 244/241/438 | 40 | | TFD | | 14 | | 101 | 65 |
| ZH45K4E | 6.0 | 14.0 | 3.2 | 17.1 | 7/8 | 1/2 | 1.9 | 250/246/438 | 40 | | TFD | | 12 | | 74 | 67 |
| ZH24KVE | 7.5 | 21.5 | 3.3 | 20.9 | 1 3/8 | 7/8 | 4.0 | 368/321/525 | 93 | | TWD | | 18 | | 99 | 75 |
| ZH56K4E | 7.5 | 17.4 | 3.1 | 20.9 | 1 3/8 | 7/8 | 4.0 | 357/321/497 | 93 | | TWD | | 17 | | 99 | 75 |
| ZH33KVE | 10.0 | 29.7 | 3.4 | 29.0 | 1 3/8 | 7/8 | 4.0 | 368/321/525 | 93 | | TWD | | 24 | | 127 | 73 |
| ZH75K4E | 10.0 | 24.2 | 3.2 | 28.8 | 1 3/8 | 7/8 | 4.0 | 357/321/497 | 93 | | TWD | | 21 | | 127 | 75 |
| ZH40KVE | 13.0 | 37.3 | 3.4 | 35.5 | 1 3/8 | 7/8 | 4.1 | 368/321/532 | 95 | | TWD | | 30 | | 167 | 75 |
| ZH92K4E | 13.0 | 30.7 | 3.3 | 35.6 | 1 3/8 | 7/8 | 4.1 | 356/320/505 | 95 | | TWD | | 25 | | 167 | 75 |
| ZH48KVE | 15.0 | 45.0 | 3.5 | 42.8 | 1 5/8 | 1 1/8 | 4.1 | 368/323/579 | 112 | | TWD | | 36 | | 198 | 77 |

Conditions: Evaporating -7°C, Condensing 50°C, Superheat 5K, Subcooling 4K
* 1 Ph: 230V/ 50Hz
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

| R513A | Nominal hp | Capacity (kW) | COP | Displacement | 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) *** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1 Ph* | 1 Ph* | 1 Ph* | |
| ZH21KRE | 2.0 | 3.1 | 2.1 | 8.0 | 3/4 | 1/2 | 1.5 | 243/242/387 | 27 | PFJ | 19 | 76 | 61 |
| ZH26KRE | 3.0 | 3.1 | 2.1 | 10.0 | 3/4 | 1/2 | 1.5 | 243/242/400 | 28 | PFJ | 21 | 97 | 63 |

Conditions: Evaporating -7°C, Condensing 50°C, Superheat 5K, Subcooling 4K
* 1 Ph: 230V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | Heating Capacity (kW) | | | | | | | R410A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 | Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 |
| ZH04 K1P | n.a. | 3.3 | 3.9 | 4.5 | 5.2 | 6.0 | 7.6 | ZH04 K1P | n.a. | 1.4 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| ZH09 K1P | n.a. | 7.1 | 8.2 | 9.5 | 10.9 | 12.5 | 16.4 | ZH09 K1P | n.a. | 2.8 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 |
| ZH12 K1P | n.a. | 9.2 | 10.5 | 12.1 | 13.9 | 15.9 | 21.0 | ZH12 K1P | n.a. | 3.7 | 3.7 | 3.8 | 3.8 | 3.8 | 3.8 |
| ZH15 K1P | n.a. | 12.0 | 13.8 | 15.9 | 18.4 | 21.1 | 27.7 | ZH15 K1P | n.a. | 4.7 | 4.9 | 5.0 | 5.1 | 5.2 | 5.2 |
| ZH19 K1P | n.a. | 15.2 | 17.5 | 20.2 | 23.2 | 26.7 | 35.1 | ZH19 K1P | n.a. | 6.0 | 6.2 | 6.3 | 6.4 | 6.5 | 6.5 |
| Models With Enhanced Vapor Injection | | | | | | | | | | | | | | | |
| ZHI05 K1P | 2.6 | 4.2 | 4.8 | 5.4 | 6.1 | 6.9 | 8.6 | ZHI05 K1P | 1.7 | 1.7 | 1.7 | 1.8 | 1.8 | 1.8 | 1.7 |
| ZHI08 K1P | 5.0 | 6.7 | 7.6 | 8.4 | 9.4 | 10.5 | 13.1 | ZHI08 K1P | 2.5 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.4 |
| ZHI11 K1P | 6.4 | 9.0 | 10.1 | 11.3 | 12.6 | 14.0 | 17.2 | ZHI11 K1P | 3.2 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.1 |
| ZHI14 K1P | 8.5 | 11.6 | 13.0 | 14.5 | 16.2 | 18.1 | 22.3 | ZHI14 K1P | 3.9 | 4.1 | 4.2 | 4.2 | 4.2 | 4.2 | 4.0 |
| ZHI18 K1P | 10.8 | 14.9 | 16.7 | 18.7 | 20.9 | 23.2 | 28.7 | ZHI18 K1P | 5.1 | 5.3 | 5.4 | 5.4 | 5.4 | 5.3 | 5.2 |
| ZHI23 K1P | 13.8 | 19.0 | 21.3 | 23.9 | 26.6 | 29.7 | 36.7 | ZHI23 K1P | 6.6 | 6.8 | 6.9 | 6.9 | 6.9 | 6.8 | 6.6 |
| ZHI27 K1P | 14.2 | 22.1 | 25.1 | 28.4 | 31.8 | 35.5 | 43.8 | ZHI27 K1P | 7.9 | 8.2 | 8.2 | 8.1 | 8.1 | 7.9 | 7.5 |
| ZHI32 K1P | 16.4 | 26.1 | 29.5 | 33.2 | 37.1 | 41.4 | 51.1 | ZHI32 K1P | 8.7 | 9.7 | 9.8 | 9.8 | 9.7 | 9.6 | 9.4 |
| ZHI35 K1P | 19.5 | 29.2 | 33.1 | 37.3 | 41.9 | 46.7 | 57.4 | ZHI35 K1P | 11.0 | 10.8 | 10.9 | 11.0 | 11.1 | 11.2 | 11.1 |
| ZHI40 K1P | 21.7 | 32.5 | 36.9 | 41.7 | 47.0 | 52.7 | 65.6 | ZHI40 K1P | 12.0 | 12.0 | 12.1 | 12.1 | 12.2 | 12.2 | 12.3 |
| ZHI46 K1P | 26.1 | 38.7 | 43.5 | 48.7 | 54.3 | 60.4 | 74.0 | ZHI46 K1P | 13.2 | 14.0 | 14.1 | 14.1 | 14.1 | 14.1 | 14.0 |

Conditions: Suction Superheat 5K / Subcooling 4K

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407C | Heating Capacity (kW) | | | | | | | R407C | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 | Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 |
| ZH12K4E | n.a. | 2.8 | 3.3 | 3.9 | 4.6 | 5.4 | 7.5 | ZH12K4E | n.a. | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1.4 |
| ZH15K4E | n.a. | 3.6 | 4.3 | 5.0 | 5.8 | 6.8 | 9.2 | ZH15K4E | n.a. | 1.5 | 1.5 | 1.6 | 1.6 | 1.6 | 1.9 |
| ZH21K4E | n.a. | 5.1 | 5.9 | 6.9 | 8.1 | 9.6 | 13.2 | ZH21K4E | n.a. | 2.0 | 2.1 | 2.1 | 2.2 | 2.3 | 2.4 |
| ZH26K4E | n.a. | 6.3 | 7.4 | 8.7 | 10.3 | 12.1 | 16.5 | ZH26K4E | n.a. | 2.5 | 2.6 | 2.7 | 2.7 | 2.8 | 3.0 |
| ZH30K4E | n.a. | 7.3 | 8.6 | 10.1 | 11.9 | 14.0 | 19.2 | ZH30K4E | n.a. | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.4 |
| ZH38K4E | n.a. | 9.0 | 10.6 | 12.5 | 14.6 | 17.2 | 23.4 | ZH38K4E | n.a. | 3.5 | 3.6 | 3.8 | 3.9 | 4.0 | 4.2 |
| ZH45K4E | n.a. | 10.8 | 12.7 | 14.9 | 17.4 | 20.3 | 27.2 | ZH45K4E | n.a. | 4.2 | 4.3 | 4.5 | 4.6 | 4.7 | 5.1 |
| ZH56K4E | n.a. | 13.4 | 15.8 | 18.6 | 21.8 | 25.5 | 34.1 | ZH56K4E | n.a. | 5.3 | 5.5 | 5.7 | 6.0 | 6.2 | 6.8 |
| ZH75K4E | n.a. | 18.5 | 21.9 | 25.8 | 30.3 | 35.5 | 47.6 | ZH75K4E | n.a. | 7.0 | 7.4 | 7.7 | 8.0 | 8.2 | 8.5 |
| ZH92K4E | n.a. | 23.4 | 27.8 | 32.8 | 38.5 | 45.1 | 60.3 | ZH92K4E | n.a. | 8.5 | 9.0 | 9.5 | 10.0 | 10.4 | 11.2 |
| ZH11M4E | n.a. | 28.4 | 33.6 | 39.5 | 46.3 | 54.3 | 72.7 | ZH11M4E | n.a. | 10.3 | 10.9 | 11.5 | 11.9 | 12.5 | 13.4 |
| Models With Enhanced Vapor Injection | | | | | | | | | | | | | | | |
| ZH06KVE | 3.3 | 4.9 | 5.7 | 6.5 | 7.4 | 8.4 | 10.8 | ZH06KVE | 1.7 | 1.8 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 |
| ZH09KVE | 4.1 | 6.6 | 7.6 | 8.7 | 9.9 | 11.2 | 14.3 | ZH09KVE | 2.1 | 2.4 | 2.4 | 2.5 | 2.6 | 2.6 | 2.6 |
| ZH13KVE | 5.7 | 9.5 | 10.9 | 12.5 | 14.3 | 16.2 | 20.7 | ZH13KVE | 3.0 | 3.4 | 3.5 | 3.5 | 3.6 | 3.6 | 3.7 |
| ZH18KVE | 8.0 | 13.5 | 15.4 | 17.6 | 20.0 | 22.6 | 28.7 | ZH18KVE | 4.2 | 4.8 | 4.9 | 5.0 | 5.1 | 5.1 | 5.2 |
| ZH24KVE | 9.7 | 17.0 | 19.6 | 22.5 | 25.5 | 28.9 | 36.7 | ZH24KVE | 5.2 | 6.2 | 6.4 | 6.6 | 6.7 | 6.8 | 7.0 |
| ZH33KVE | 14.3 | 23.7 | 27.2 | 31.1 | 35.3 | 40.0 | 50.7 | ZH33KVE | 7.0 | 8.2 | 8.5 | 8.8 | 9.1 | 9.3 | 9.6 |
| ZH40KVE | 18.1 | 29.6 | 34.1 | 39.1 | 44.7 | 50.9 | 65.5 | ZH40KVE | 8.9 | 10.2 | 10.6 | 11.0 | 11.3 | 11.7 | 12.4 |
| ZH48KVE | 21.1 | 35.6 | 41.1 | 47.2 | 54.1 | 61.8 | 80.4 | ZH48KVE | 10.0 | 12.2 | 12.7 | 13.2 | 13.5 | 14.0 | 15.1 |

Conditions: Suction Superheat 5K / Subcooling 4K

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R513A | Heating Capacity (kW) | | | | | | | R513A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 | Model | -30 | -15 | -10 | -5 | 0 | +5 | +15 |
| ZH21KRE | | 3.4 | 4.0 | 4.8 | 5.6 | 6.6 | 9.0 | ZH21KRE | | 1.4 | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 |
| ZH26KRE | | 4.5 | 5.3 | 6.2 | 7.2 | 8.4 | 11.5 | ZH26KRE | | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.2 |

Conditions: Suction Superheat 5K / Subcooling 4K
Single phase only

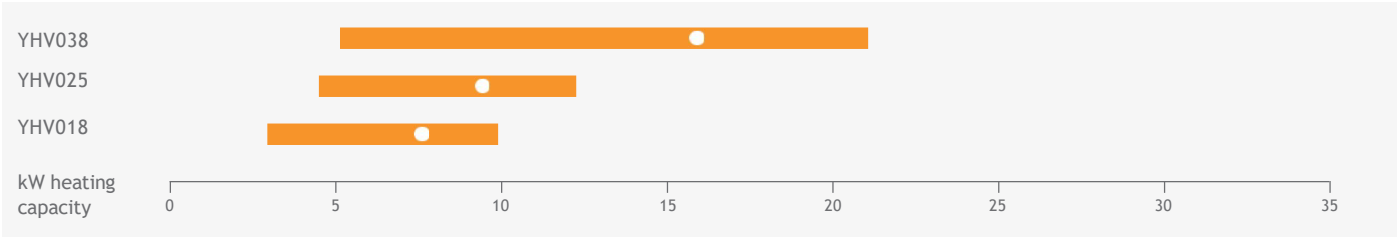
# Copeland™ YHV Variable Speed Scroll Compressor Range for A2L Refrigerants R452B / R454B with Inverter Drive

The new YHV compressor range is designed to support system manufacturers build brine-to-water or air-to-water heat pumps that meet the requirements of the F-gas phasedown. These scrolls are qualified to reach a wide operating envelope without the need of enhanced vapor injection (EVI).

The matched inverter drives are qualified per EN60335-1 and available for 1ph and 3ph power supply. YHV*2P compressors and their matched drives belong to PED category II and therefore comply with stringent quality requirements: they are hermetically sealed and electrical connections are not source of ignition. This solution is offered to system manufacturers as a CE certified package for faster time to market and for the highest level of compressor protection.

YHV scroll variable speed compressor and drive

## YHV Variable Speed Scroll Compressor Line-Up




Conditions: Heating kW Evaporating -7°C, Condensing 50°C, 5K Superheat, 4K Subcooling

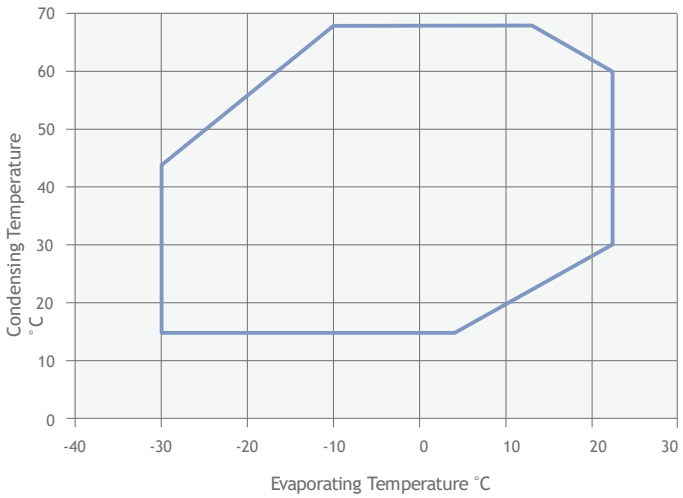
## Features and Benefits

- Speed range from 15 to 120 Hz
- Drive available in air-cooled and flat plate version
- Axial and radial compliance for reliability
- Compressor model with 3-feet for compact units
- Pre-compliant solution to relevant application standards (EN378, EN60335), to facilitate system development
- F-gas compliant

## Maximum Allowable Pressure (PS)

- Low side PS 28 bar(g) / High Side PS 49 bar(g)

## Operating Envelope R454B



# Technical Overview

| Compressor | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Models | Heating Capacity (kW) | | | COP* | Displacement ($cm^3$) | Stub Suction (inch) | Stub Discharge (inch) | Oil Quantity (l) | Length/ Width/ Height (mm) | Net Weight (kg) | Sound Pressure @1 m - dB(A)** |
| | Min | Max | Nominal Capacity | | | | | | | | |
| YHV0182P | 2.6 | 10.1 | 6.2 | 2.0 | 18 | 3/4 | 1/2 | 0.7 | 194/216/335 | 15 | 61 |
| YHV0252P | 3.9 | 12.4 | 8.4 | 2.1 | 25 | 3/4 | 1/2 | 0.7 | 194/216/335 | 16 | 65 |
| YHV0382P | 5.4 | 21.4 | 12.6 | 2.2 | 38 | 3/4 | 1/2 | 1.2 | 216/194/385 | 20 | 64 |

Conditions: Evaporating -7°C, Condensing 50°C, Superheat 10K, Subcooling 0K
*at Nominal Speed (90Hz)
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

| Inverter Drive | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Models | Matched Compressor | Power input (kW) | Amps (A) | Cooling | Net Weight (kg) | 1Ph 230V | 3Ph 400V | Comm. | Length/ Width/ Height (mm)* |
| | | Max | Max | | | | | | |
| ED3011AU | YHV018 | 2.6 | 11 | Air / Liquid | 2.8 | √ | n.a. | Modbus | 205/240/143 |
| ED3015AU | YHV025 | 3.8 | 15 | | 2.8 | √ | n.a. | | 205/240/143 |
| ED3020AU | YHV025-38 | 5.5 | 20 | | 3.6 | √ | n.a. | | 205/250/180 |
| ED3013BU | YHV018 | 4.4 | 13 | | 3.4 | n.a. | √ | | 205/250/183 |
| ED3018BU | YHV025-38 | 6.0 | 18 | | 4.4 | n.a. | √ | | 205/250/183 |

*Air-cooled version including fins

# Capacity Data

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R452B | | Heating Capacity (kW) | | | | | | | R452B | | Power Input (kW) | | | | | | |
| | | Evaporating Temperature (°C) | | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Models | | -15 | -10 | -5 | 0 | 5 | +10 | +15 | Models | | -15 | -10 | -5 | 0 | 5 | +10 | +15 |
| YHV0182P | Max | 7.8 | 9.0 | 10.3 | 11.9 | 13.4 | 14.2 | 14.9 | YHV0182P | Max | 3.2 | 3.3 | 3.3 | 3.4 | 3.3 | 3.1 | 2.8 |
| | Min | 3.2 | 3.7 | 4.3 | 4.9 | 5.6 | 6.4 | 7.2 | | Min | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 |
| YHV0252P | Max | 10.5 | 12.3 | 14.2 | 16.3 | 18.5 | 19.6 | 20.6 | YHV0252P | Max | 4.2 | 4.5 | 4.6 | 4.7 | 4.7 | 4.3 | 4.0 |
| | Min | 5.2 | 5.1 | 5.8 | 6.7 | 7.7 | 8.8 | 10.0 | | Min | 2.6 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 |
| YHV0382P | Max | 12.9 | 16.1 | 18.6 | 21.4 | 24.6 | 27.7 | 28.3 | YHV0382P | Max | 4.7 | 5.6 | 5.8 | 5.9 | 6.1 | 6.1 | 5.4 |
| | Min | 6.6 | 7.7 | 8.8 | 10.2 | 11.7 | 13.3 | 15.2 | | Min | 2.6 | 2.7 | 2.7 | 2.7 | 2.8 | 2.8 | 2.8 |

Conditions: Suction Superheat 10K / Subcooling 0K

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454B | | Heating Capacity (kW) | | | | | | | R454B | | Power Input (kW) | | | | | | |
| | | Evaporating Temperature (°C) | | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Models | | -15 | -10 | -5 | 0 | 5 | +10 | +15 | Models | | -15 | -10 | -5 | 0 | 5 | +10 | +15 |
| YHV0182P | Max | 7.7 | 9.9 | 10.0 | 11.5 | 13.0 | 13.8 | 14.5 | YHV0182P | Max | 3.2 | 4.5 | 3.3 | 3.3 | 3.3 | 3.0 | 2.8 |
| | Min | 3.1 | 3.6 | 4.1 | 4.7 | 5.4 | 6.2 | 7.0 | | Min | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.3 | 1.3 |
| YHV0252P | Max | 10.4 | 11.9 | 13.8 | 15.8 | 17.9 | 19.0 | 20.0 | YHV0252P | Max | 4.3 | 4.4 | 4.5 | 4.6 | 4.6 | 4.3 | 3.9 |
| | Min | 4.3 | 4.9 | 5.7 | 6.5 | 7.5 | 8.6 | 9.7 | | Min | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 |
| YHV0382P | Max | 13.2 | 15.7 | 18.1 | 20.9 | 24.0 | 27.0 | 27.7 | YHV0382P | Max | 5.2 | 5.5 | 5.7 | 5.9 | 6.0 | 6.0 | 5.3 |
| | Min | 6.4 | 7.5 | 8.6 | 9.9 | 11.3 | 12.9 | 14.7 | | Min | 2.6 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |

Conditions: Suction Superheat 10K / Subcooling 0K

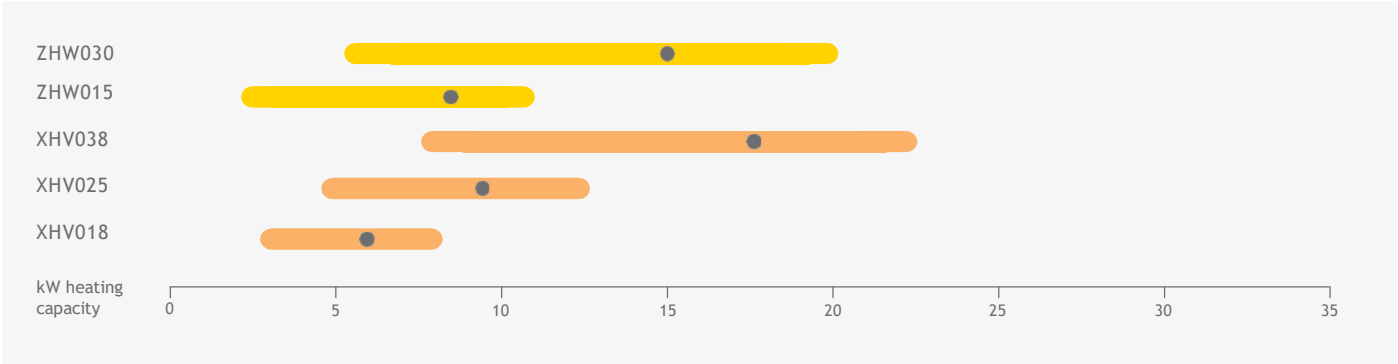
# Copeland™ XHV & ZHW Variable Speed Scroll Compressor Ranges for R410A With Inverter Drive

XHV and ZHW variable speed scroll compressors for R410A, for outstanding performance for cooling and heating applications.

XHV and ZHW compressors deliver outstanding performances, both in new building and retrofit applications. Variable speed Copeland scroll compressors feature a state-of-the-art brushless permanent magnet motor matched with a highly efficient drive and vapor injection technology (ZHW only). In addition to Copeland market-proven robustness, XHV and ZHW compressors with the qualified inverter drive meet and exceed the level of reliability expected for these demanding applications.

ZHW scroll variable speed compressor and drive

## XHV & ZHW Variable Speed Scroll Compressor Line-Up

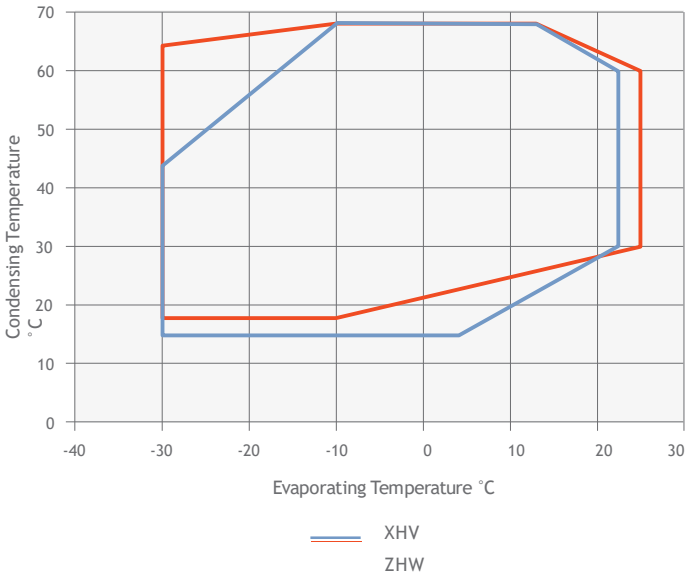



Conditions: Cooling kW Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
Heating kW Evaporating -7°C, Condensing 50°C, 5K Superheat, 4K Subcooling

## Features and Benefits

- Highest efficiency throughout the operating envelope and speed range
- Envelope and speed management information for the system controller (real-time communication via Modbus RS485)
- Enhanced Vapor Injection technology for best seasonal efficiency (ZHW)
- High water temperature for all applications
- Compliance with electromagnetic-compatibility (EMC) and electromagnetic-interference (EMI) requirements for residential applications
- VDE certification for ZHW compressor matched with Emerson inverter drive
- Wide speed range 15-120Hz
- Mutually optimized and qualified scroll and drive

## Operating Envelope R410A




## Maximum Allowable Pressure (PS)

- ZHW:
  Low side PS 28 bar(g) / High side PS 45 bar(g)
- XHV:
  Low side PS 28 bar(g) / High side PS 45 bar(g)

# Technical Overview

| Compressor | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | Heating Capacity (kW) | | | COP* | Displacement ($cm^3$) | Stub Suction (inch) | Stub Discharge (inch) | Oil Quantity (l) | Length/ Width/ Height (mm) | Net Weight (kg) | Sound Pressure @1 m - dB(A)** |
| | Min | Max | Nominal Capacity | | | | | | | | |
| ZHW0152P | 2.7 | 10.4 | 6.1 | 2.9 | 15.0 | 3/4 | 1/2 | 1.7 | 229/198/394 | 20 | 68 |
| ZHW0302P | 5.5 | 19.8 | 11.8 | 3.2 | 30.0 | 3/4 | 1/2 | 1.7 | 229/198/394 | 20 | 68 |
| XHV0181P | 2.6 | 10.7 | 6.4 | 3.0 | 18.0 | 3/4 | 1/2 | 0.7 | 218/198/334 | 15 | 61 |
| XHV0251P | 3.7 | 14.8 | 8.6 | 3.1 | 25.0 | 3/4 | 1/2 | 0.7 | 218/198/334 | 16 | 65 |
| XHV0382P | 5.5 | 22.8 | 13.0 | 3.1 | 38.0 | 3/4 | 1/2 | 1.2 | 218/198/384 | 20 | 64 |

Conditions: Evaporating -7°C, Condensing 50°C
*@ Nominal Speed (90Hz)
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

| Inverter Drive | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Matched Compressor | Power Input (kW) | Amps (A) | Cooling | Net Weight (kg) | 1Ph 230V | 3Ph 400V | Comm. | Length/Width/ Height (mm)* |
| | | Nominal | Nominal | | | | | | |
| EV2055M | ZHW015 | 5.5 | | Air / Liquid | 3.6 | √ | √ | Modbus | 228/260/119 |
| EV2080M | ZHW030 | 8.0 | | | 5.1 | √ | √ | | 228/260/156 |
| ED3015AU | XHV018-25 | 3.8 | 15 | Air / Liquid | 2.8 | √ | n.a. | Modbus | 205/240/143 |
| ED3020AU | XHV025-38 | 5.5 | 20 | | 3.6 | √ | n.a. | | 205/250/180 |
| ED3013BU | XHV018-25 | 4.4 | 13 | | 3.4 | n.a. | √ | | 205/250/183 |
| ED3018BU | XHV025-38 | 6.0 | 18 | | 4.4 | n.a. | √ | | 205/250/183 |
| ED3022B | XHV038 | 8.8 | 22 | Air | 5.2 | n.a. | √ | | 233/316/150 |

*Air-cooled version including fins

# Capacity Data

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | | Heating Capacity (kW) | | | | | | | R410A | | Power Input (kW) | | | | | | |
| | | Evaporating Temperature (°C) | | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | | -30 | -15 | -10 | -5 | 0 | +5 | +15 | Model | | -30 | -15 | -10 | -5 | 0 | +5 | +15 |
| ZHW0152P | Max | 6.0 | 8.6 | 9.7 | 11.0 | 12.0 | 12.0 | 12.4 | ZHW0152P | Max | 3.1 | 3.3 | 3.3 | 3.4 | 3.2 | 2.9 | 2.4 |
| | Min | 2.0 | 2.6 | 2.8 | 2.9 | 3.1 | 3.1 | 3.8 | | Min | 1.3 | 1.1 | 1.1 | 1.0 | 0.9 | 0.9 | 0.9 |
| ZHW0302P | Max | 11.3 | 16.3 | 18.5 | 20.8 | 22.6 | 22.6 | 23.7 | ZHW0302P | Max | 5.7 | 6.0 | 6.1 | 6.1 | 5.7 | 5.4 | 4.4 |
| | Min | 4.2 | 5.2 | 5.8 | 5.9 | 6.6 | 6.6 | 8.1 | | Min | 2.4 | 2.0 | 2.0 | 1.9 | 1.7 | 1.7 | 1.7 |

Condition: Suction Superheat 10K, Subcooling 4K

| Condensing Temperature +50 °C | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R410A | | Heating Capacity (kW) | | | | | | | R410A | | Power Input (kW) | | | | | | |
| | | Evaporating Temperature (°C) | | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | | -20 | -15 | -10 | -5 | 0 | +5 | +15 | Model | | -20 | -15 | -10 | -5 | 0 | +5 | +15 |
| XHV0181P | Max | 7.7 | 8.7 | 9.9 | 11.3 | 12.9 | 14.4 | 16.2 | XHV0181P | Max | 3.4 | 3.5 | 3.6 | 3.7 | 3.7 | 3.6 | 3.1 |
| | Min | 2.2 | 2.4 | 2.5 | 2.6 | 2.5 | 2.8 | 3.7 | | Min | 1.0 | 1.0 | 1.0 | 0.9 | 0.8 | 0.8 | 0.8 |
| XHV0251P | Max | 10.3 | 11.8 | 13.6 | 15.7 | 18.1 | 20.4 | 22.8 | XHV0251P | Max | 4.5 | 4.7 | 4.9 | 5.0 | 5.1 | 5.1 | 4.4 |
| | Min | 3.2 | 3.4 | 3.6 | 3.7 | 3.5 | 4.0 | 5.0 | | Min | 1.4 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| XHV0382P | Max | 15.8 | 18.1 | 20.9 | 24.1 | 27.8 | 31.4 | 35.0 | XHV0382P | Max | 6.9 | 7.1 | 7.4 | 7.6 | 7.8 | 7.8 | 6.7 |
| | Min | 4.7 | 5.1 | 5.5 | 5.6 | 5.4 | 6.1 | 7.7 | | Min | 2.1 | 2.1 | 2.0 | 1.9 | 1.6 | 1.6 | 1.6 |

Condition: Suction Superheat 5K, Subcooling 4K

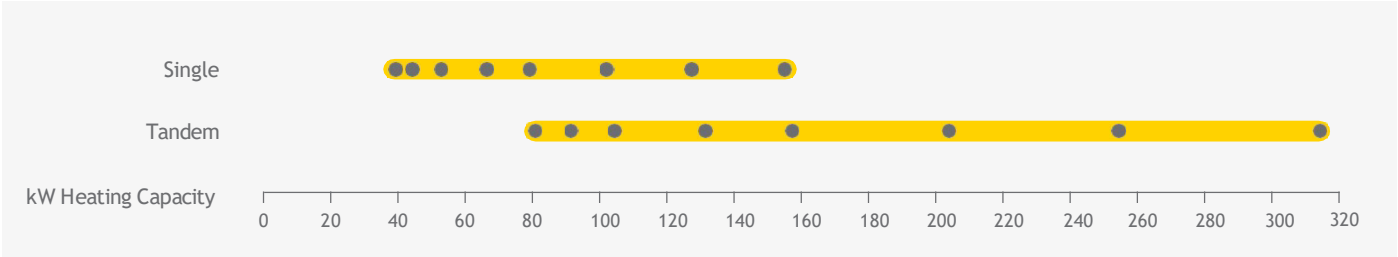
# ZH Copeland™ Scroll for Heat Recovery and High Condensing Applications for R134a

ZH*KCE R134a Copeland scroll compressors were developed for the recovery and reuse of available heat. For example, the heat generated by processes or machining cooling equipment can be recovered and not wasted. This contributes to reducing the total energy cost of installations. On a water-cooled chiller, heat recovery on the condensing water loop can be used to produce high temperature water for sanitary or premise heating. With a typical evaporating temperature between 20°C and 40°C and condensing up to 85°C, ZH*KCE scrolls offer many opportunities of heat recovery.

The range of products goes from the ZH40KCE (7.5hp) to the ZH150 (30hp) which can be tandemized.

ZH*KCE scroll compressor for heat recovery

## ZH*KCE Scroll Compressor Line-Up R134a




Conditions: Evaporating 40°C, Condensing 85°C, Superheat 10K, Subcooling 5K

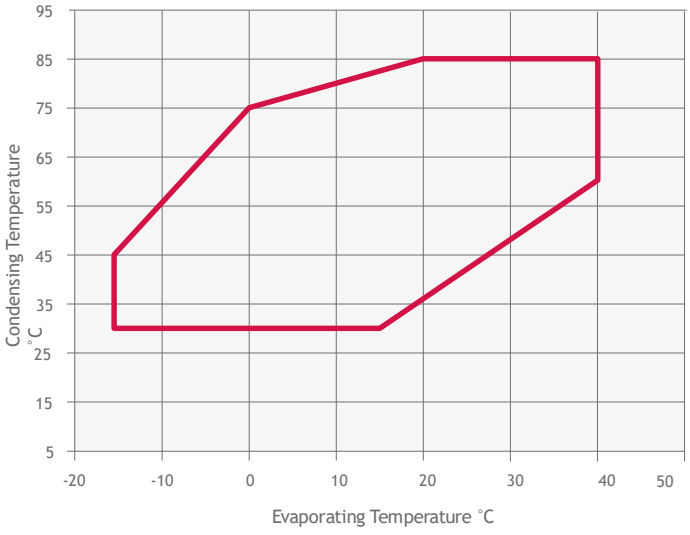
## Features and Benefits

- Copeland scroll axial and radial compliance for superior reliability and efficiency
- Wide scroll line-up R134a with 8 models and tandem
- Low sound and vibration level
- Low oil circulation rate
- Copeland qualified tandem

## Typical Applications

- Heat recovery on the dry cooler water circuit of a water-cooled chiller to produce sanitary water or other heating
- Re-inject energy to district heating network and avoid wasting it
- Process industry where the water returning from the machinery comes back between 20 and 40°C
- Food industry where one areas needs cooling and another heating at the same time
- Air-to-water heat pump, even during the warm season
- Exhaust air heat recovery system
- Heat recovery on Fluegas

## Operating Envelope R134a




## Maximum Allowable Pressure (PS)

- Low side PS 20 bar(g) / High side PS 32 bar(g)

# Technical Overview

| Models | Nominal hp | Heating Capacity (kW) | Heating COP | Displacement (m³/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* | |
| ZH40KCE | 7.5 | 39.0 | 4.3 | 22.1 | 1 1/8 | 7/8 | 2.7 | 264 / 285 / 476 | 57 | TFD | 19 | 95 | 63 |
| ZH45KCE | 9.0 | 44.0 | 4.6 | 24.9 | 1 3/8 | 7/8 | 3.4 | 264 / 285 / 533 | 60 | TFD | 21 | 111 | 63 |
| ZH50KCE | 10.0 | 50.9 | 4.5 | 29.1 | 1 3/8 | 7/8 | 3.4 | 264 / 285 / 533 | 61 | TFD | 23 | 118 | 63 |
| ZH64KCE | 13.0 | 63.7 | 4.3 | 36.4 | 1 3/8 | 7/8 | 3.4 | 264 / 285 / 552 | 65 | TFD | 27 | 140 | 68 |
| ZH75KCE | 15.0 | 76.0 | 4.2 | 43.4 | 1 3/8 | 7/8 | 3.4 | 264 / 285 / 552 | 66 | TFD | 35 | 174 | 71 |
| ZH100KCE | 20.0 | 96.1 | 4.0 | 56.6 | 1 5/8 | 1 3/8 | 4.7 | 432 / 376 / 694 | 140 | TWD | 42 | 225 | 72 |
| ZH125KCE | 25.0 | 120.0 | 4.1 | 71.4 | 1 5/8 | 1 3/8 | 6.8 | 447 / 392 / 717 | 160 | TWD | 53 | 272 | 74 |
| ZH150KCE | 30.0 | 148.8 | 4.2 | 87.5 | 1 5/8 | 1 3/8 | 6.3 | 447 / 427 / 717 | 177 | TWD | 67 | 310 | 76 |

Conditions Evaporating 40°C - Condensing 85°C - Superheat 5K - Subcooling 4K
* 3 Ph: 380-420V/ 50Hz
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition
For equivalent models to ZH45-75KCE with R513A, please refer to models ZR108-190KRE on pages 11.

# Capacity Data

| Condensing Temperature +80 °C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R134a | Heating Capacity (kW) | | | | | | | R134a | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Models | +10 | +15 | +20 | +25 | +30 | +35 | +40 | Models | +10 | +15 | +20 | +25 | +30 | +35 | +40 |
| ZH40KCE | 16.9 | 19.7 | 22.9 | 26.5 | 30.7 | 35.6 | 41.1 | ZH40KCE | 8.3 | 8.3 | 8.2 | 8.1 | 8.1 | 8.1 | 8.1 |
| ZH45KCE | 20.2 | 23.2 | 26.5 | 30.5 | 35.0 | 40.3 | 46.5 | ZH45KCE | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 |
| ZH50KCE | 23.1 | 26.6 | 30.6 | 35.2 | 40.5 | 46.7 | 53.8 | ZH50KCE | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 |
| ZH64KCE | 28.7 | 33.1 | 38.1 | 43.9 | 50.7 | 58.4 | 67.3 | ZH64KCE | 13.5 | 13.5 | 13.4 | 13.4 | 13.5 | 13.5 | 13.6 |
| ZH75KCE | 34.8 | 39.9 | 45.8 | 52.6 | 60.5 | 69.7 | 80.3 | ZH75KCE | 16.2 | 16.2 | 16.2 | 16.2 | 16.3 | 16.4 | 16.7 |
| ZH100KCE | 46.4 | 52.6 | 59.9 | 68.3 | 77.9 | 88.9 | 101.5 | ZH100KCE | 21.1 | 21.3 | 21.4 | 21.5 | 21.5 | 21.5 | 21.6 |
| ZH125KCE | 57.6 | 65.4 | 74.4 | 84.8 | 96.9 | 111.0 | 127.0 | ZH125KCE | 27.6 | 26.6 | 26.6 | 26.5 | 26.4 | 26.3 | 26.3 |
| ZH150KCE | 71.0 | 80.7 | 91.9 | 105.0 | 120.0 | 137.0 | 157.0 | ZH150KCE | 30.7 | 31.2 | 31.5 | 31.8 | 32.0 | 32.3 | 32.5 |

Conditions: Suction Superheat 5K / Subcooling 4K

# ZRH(V) & YRH(V) Copeland™ Scroll Horizontal Compressor Ranges for R513A, R454C, R407C and R134a

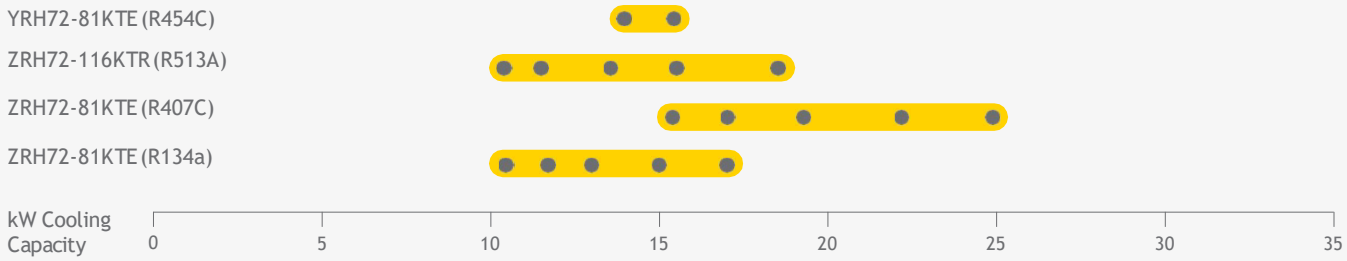
Air conditioning for passenger comfort is a pre-requisite in today's public transport vehicles. At the same time, maximization of passenger space and streamlining of high speed trains increasingly impose limitations on height.

ZRH compressors are based on the unique Copeland scroll design and provide the same reliability as a standard Copeland scroll. An additional oil pump covers the specific needs of transport air conditioning and of horizontal compressor arrangement in general.

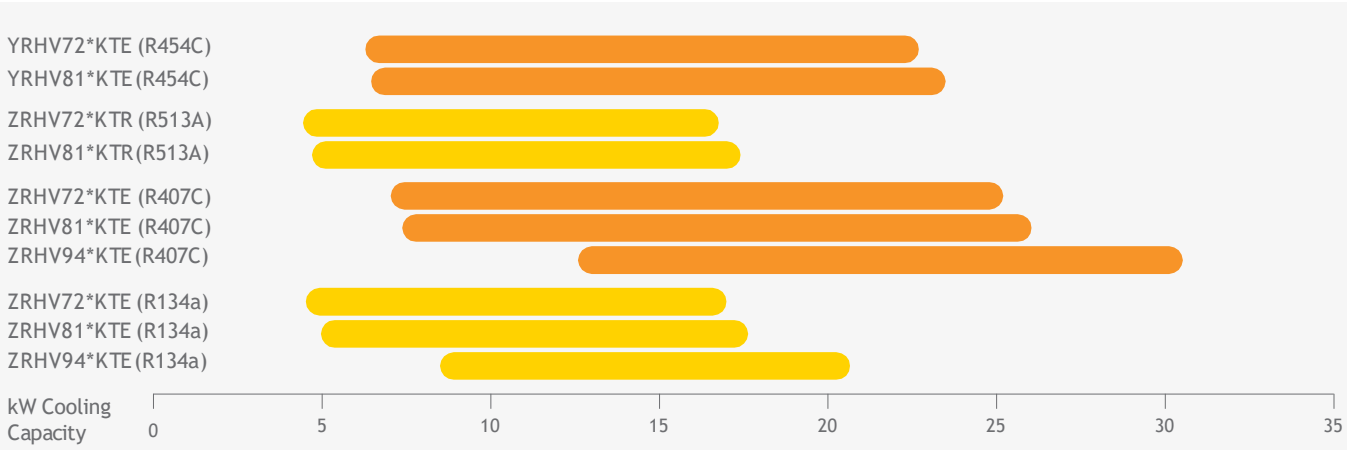
The low profile design and modulation capabilities of the ZRH compressor range are the ideal response to these market needs.

ZRH horizontal scroll compressor

## ZRH & YRH Scroll Compressors Line-up R513A, R454C, R407C and R134a




## ZRHV & YRHV Variable Speed Scroll Compressors Line-up R513A, R454C, R407C and R134a




Conditions: EN12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K

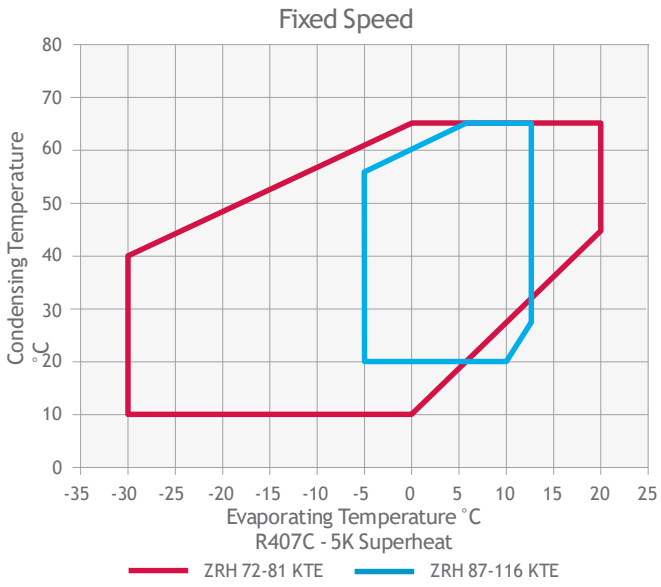
## Features and Benefits

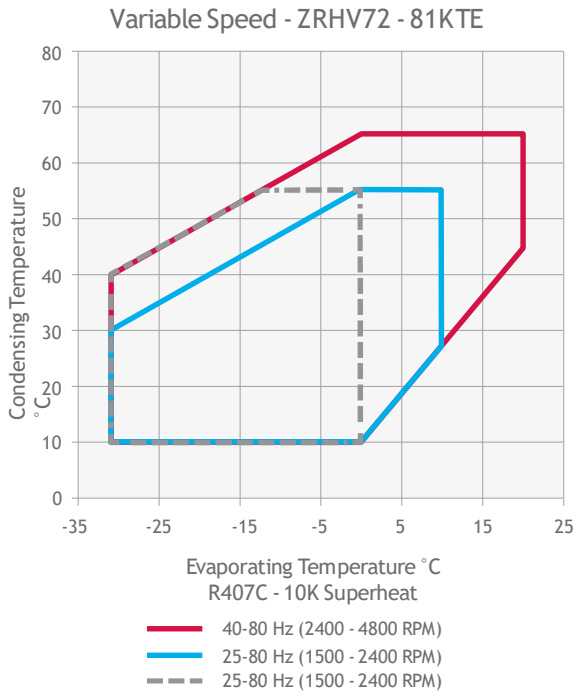
- Compact and low weight
- Horizontal design below 200mm height
- Copeland Scroll compliance for superior reliability and efficiency
- Two oil-pumps
- Hermetic design for leak-free operation
- Wide operating envelope for heat pump and cooling applications
- 25 - 100 Hz capacity modulation range for precise control and increase of the seasonal performance
- IP56 terminal box

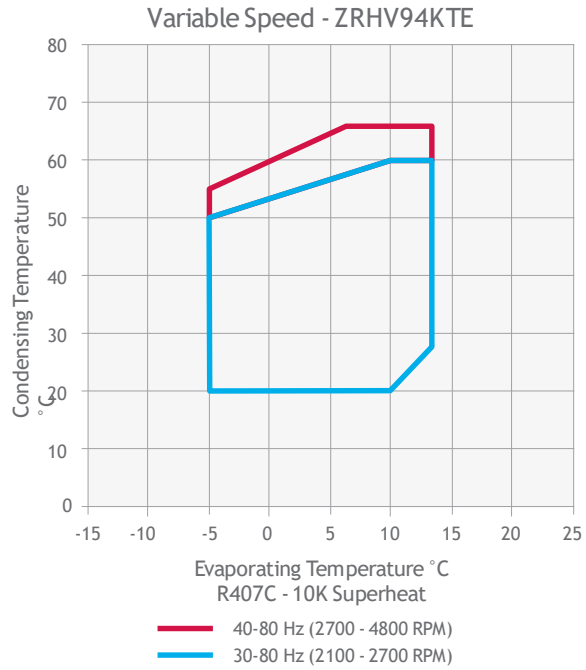
## Maximum Allowable Pressure (PS)

Low Side PS 20 bar(g) / High Side PS 32 bar(g)

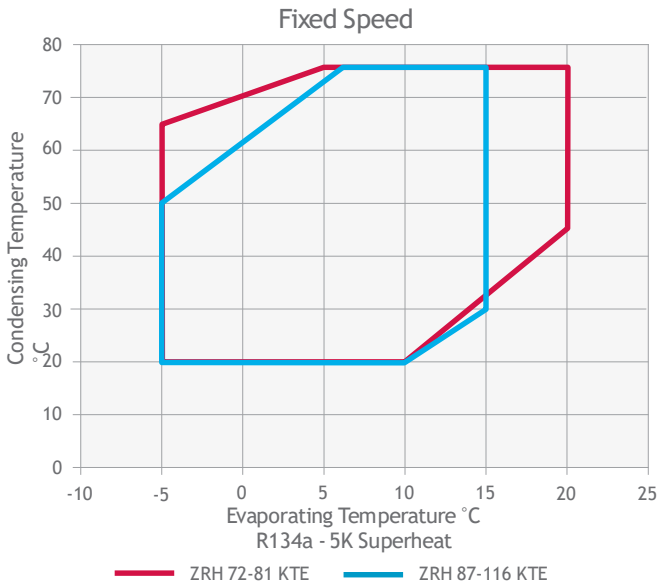
## Operating Envelope R407C

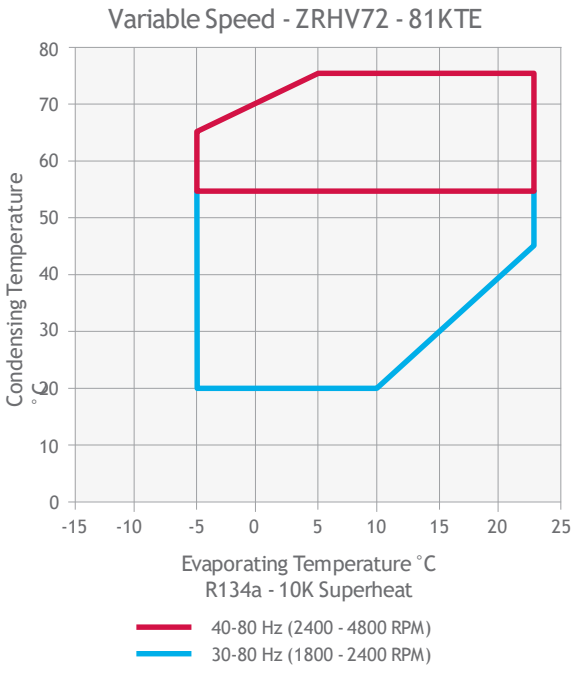


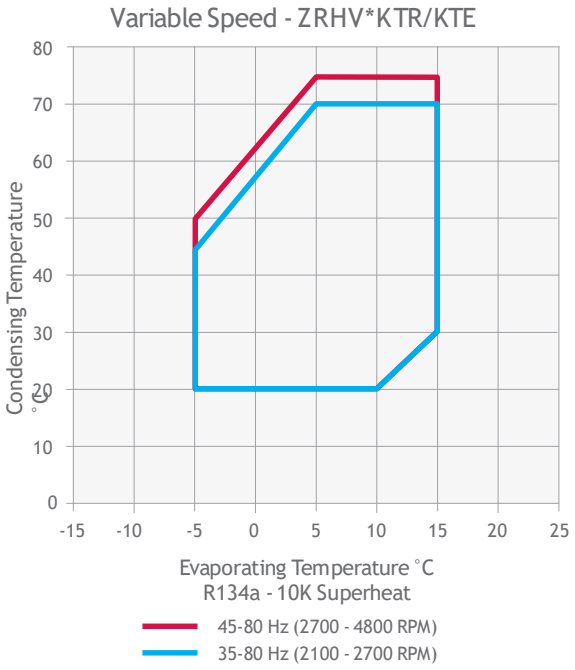



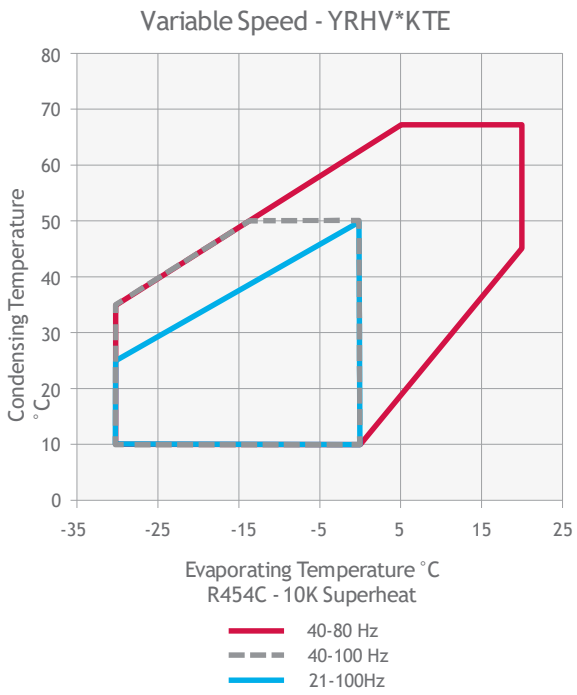

## Operating Envelope R134a



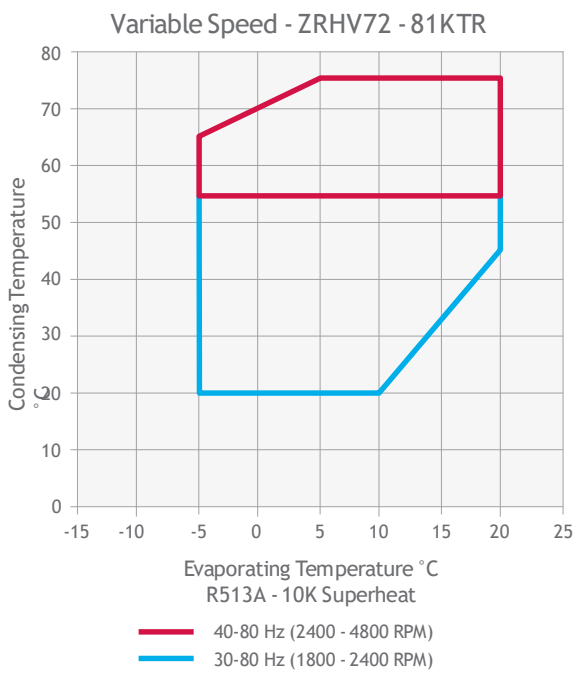



## Operating Envelope R454C




## Operating Envelope R513A



# Technical Overview - Fixed Speed Models

| Models | Nominal hp | Displacement ($m^3/h$) | 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* | |
| ZRH72KTE/KTR | 6.0 | 17.1 | 7/8 | 3/4 | 2.6 | 567/290/191 | 49 | TFD | 12 | 92 | 61 |
| ZRH81KTE/KTR | 6.8 | 18.8 | 7/8 | 3/4 | 2.7 | 567/290/191 | 49 | TFD | 12 | 92 | 61 |
| ZRH87KTE/KTR | 7.5 | 22.1 | 1 3/8 | 7/8 | 1.6 | 586/314/245 | 60 | TFD | 16 | 95 | 63 |
| ZRH100KTE/KTR | 9.0 | 24.9 | 1 3/8 | 7/8 | 1.6 | 586/314/245 | 63 | TFD | 18 | 111 | 63 |
| ZRH116KTE/KTR | 10.0 | 29.1 | 1 3/8 | 7/8 | 1.6 | 586/314/245 | 64 | TFD | 20 | 118 | 63 |
| YRH72KTE | 6.0 | 17.1 | 7/8 | 3/4 | 2.6 | 567/291/191 | 49 | TFD | 12 | 92 | 61 |
| YRH81KTE | 6.8 | 18.8 | 7/8 | 3/4 | 2.7 | 567/291/191 | 49 | TFD | 13 | 92 | 61 |

Conditions: EN12900 - HT: Evaporating +5°C, Condensing +50°C, suction Superheat 10K, Subcooling 0K
*TFD: 3Ph 380-420V/50Hz - 460/60Hz; TF5 200-220V/50Hz, 200-230V/60Hz
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data - Fixed Speed Models

| Condensing Temperature +50 °C | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407C | Cooling Capacity (kW) | | | | | | R407C | Power Input (kW) | | | | |
| | Evaporating Temperature (°C) | | | | | | | Evaporating Temperature (°C) | | | | |
| Model | -10 | -5 | 0 | +5 | +10 | +15 | Model | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRH72KTE | 8.1 | 10.1 | 12.5 | 15.3 | 18.6 | 22.4 | ZRH72KTE | 4.8 | 4.8 | 4.8 | 4.83 | 4.9 | 5.0 |
| ZRH81KTE | 9.0 | 11.2 | 13.9 | 17.0 | 20.5 | 24.7 | ZRH81KTE | 5.2 | 5.2 | 5.3 | 5.3 | 5.4 | 5.4 |
| ZRH87KTE | | 11.8 | 15.2 | 19.2 | 23.9 | | ZRH87KTE | | 6.2 | 6.3 | 6.3 | 6.3 | |
| ZRH100KTE | | 14.2 | 17.9 | 22.1 | 26.9 | | ZRH100KTE | | 6.8 | 6.9 | 7.0 | 7.0 | |
| ZRH116KTE | | 16.0 | 20.0 | 24.9 | 30.6 | | ZRH116KTE | | 8.1 | 8.2 | 8.2 | 8.2 | |

Conditions: Suction Superheat 10K / Subcooling 0K

| Condensing Temperature +50 °C | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R134a | Cooling Capacity (kW) | | | | | | R134a | Power Input (kW) | | | | |
| | Evaporating Temperature (°C) | | | | | | | Evaporating Temperature (°C) | | | | |
| Model | -10 | -5 | 0 | +5 | +10 | +15 | Model | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRH72KTE | | 6.8 | 8.5 | 10.4 | 12.7 | 15.3 | ZRH72KTE | | 3.2 | 3.3 | 3.3 | 3.4 | 3.4 |
| ZRH81KTE | | 7.6 | 9.5 | 11.7 | 14.2 | 17.0 | ZRH81KTE | | 3.5 | 3.6 | 3.6 | 3.7 | 3.7 |
| ZRH87KTE | | 8.0 | 10.3 | 13.0 | 16.2 | 20.0 | ZRH87KTE | | 4.3 | 4.3 | 4.3 | 4.3 | 4.5 |
| ZRH100KTE | | 9.6 | 12.1 | 15.0 | 18.3 | 22.1 | ZRH100KTE | | 4.7 | 4.8 | 4.8 | 4.8 | 4.9 |
| ZRH116KTE | | 10.9 | 13.6 | 16.9 | 20.7 | 25.0 | ZRH116KTE | | 5.6 | 5.6 | 5.6 | 5.7 | 5.7 |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary Data

| Condensing Temperature +50 °C | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R513A | Cooling Capacity (kW) | | | | | | R513A | Power Input (kW) | | | | |
| | Evaporating Temperature (°C) | | | | | | | Evaporating Temperature (°C) | | | | |
| Model | -10 | -5 | 0 | +5 | +10 | +15 | Model | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRH72KTR | | 6.9 | 8.6 | 10.6 | 12.9 | 15.5 | ZRH72KTR | | 3.4 | 3.5 | 3.5 | 3.5 | 3.6 |
| ZRH81KTR | | 7.7 | 9.7 | 11.9 | 14.4 | 17.3 | ZRH81KTR | | 3.8 | 3.9 | 3.9 | 3.9 | 3.9 |
| ZRH87KTR | | 8.6 | 10.9 | 13.5 | 16.6 | | ZRH87KTR | | 4.3 | 4.4 | 4.4 | 4.4 | |
| ZRH100KTR | | 10.0 | 12.5 | 15.4 | 18.8 | | ZRH100KTR | | 4.8 | 4.9 | 4.9 | 4.9 | |
| ZRH116KTR | | 11.8 | 14.8 | 18.2 | 22.1 | | ZRH116KTR | | 5.6 | 5.7 | 5.7 | 5.8 | |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary Data

| Condensing Temperature +50 °C | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454C | Cooling Capacity (kW) | | | | | | R454C | Power Input (kW) | | | | |
| | Evaporating Temperature (°C) | | | | | | | Evaporating Temperature (°C) | | | | |
| Model | -10 | -5 | 0 | +5 | +10 | +15 | Model | -10 | -5 | 0 | +5 | +10 | +15 |
| YRH72KTE | 7.7 | 9.5 | 11.7 | 14.2 | 17.2 | 20.5 | YRH72KTE | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| YRH81KTE | 8.6 | 10.5 | 12.9 | 15.7 | 18.9 | 22.6 | YRH81KTE | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | 5.0 |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary Data

# Technical Overview - Variable Speed Models

| Models | Capacity (kw) | EER | Displacement (m³/h) 50Hz | 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)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | | | | | | | | 3 Ph* | 3 Ph* | 3 Ph* | |
| YRHV72KTE | 6.5 | 3.1 | 20.6 | 7/8 | 3/4 | 2.7 | 567/291/191 | 49 | TX7 | 22 | 92 | 70 |
| YRHV81KTE | 6.8 | 3.1 | 22.6 | 7/8 | 3/4 | 2.7 | 567/291/191 | 49 | TX7 | 26 | 92 | 70 |
| ZRHV72KTE/KTR | 7.2 | 3.1 | 20.6 | 7/8 | 3/4 | 2.7 | 567/291/191 | 49 | TX7 | 22 | 92 | 70 |
| ZRHV81KTE/KTR | 7.6 | 3.1 | 22.6 | 7/8 | 3/4 | 2.7 | 567/291/191 | 49 | TX7 | 26 | 92 | 70 |
| ZRHV94KTE | 17.4 | 3.1 | 26.7 | 1 3/8 | 7/8 | 1.6 | 586/314/245 | 60 | TF7 | 24 | 145 | 73 |

Conditions: EN12900 R407C - HT: Evaporating +5°C, Condensing +50°C, Suction Superheat 10K, Subcooling 0K
**TF7 For VFD Control 380/3/75Hz V/F curve
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data - Variable Speed Models

Condensing Temperature +50°C

| R407C | | Cooling Capacity (kW) Evaporating Temperature (°C) | | | | | | R407C | | Power Input (kW) Evaporating Temperature (°C) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | -10 | -5 | 0 | +5 | +10 | +15 | Model | | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRHV72KTE/KTR | Max | 15.8 | 19.8 | 24.7 | 25.0 | 30.3 | 36.2 | ZRHV72KTE/KTR | Max | 11.0 | 11.2 | 11.3 | 8.2 | 8.3 | 8.3 |
| | Min | 5.9 | 4.7 | 5.9 | 7.2 | 8.7 | 17.0 | | Min | 4.1 | 2.6 | 2.6 | 2.5 | 2.5 | 4.2 |
| ZRHV81KTE/KTR | Max | 18.0 | 22.3 | 27.4 | 25.9 | 31.1 | 37.1 | ZRHV81KTE/KTR | Max | 8.5 | 8.6 | 8.7 | 8.8 | 9.0 | 9.2 |
| | Min | 6.3 | 4.6 | 6.0 | 7.6 | 9.4 | 18.4 | | Min | 4.6 | 3.1 | 3.1 | 3.0 | 3.0 | 4.5 |
| ZRHV94KTE | Max | | 18.9 | 24.6 | 31.4 | 38.9 | | ZRHV94KTE | Max | | 10.0 | 10.5 | 10.6 | 10.8 | |
| | Min | | 7.8 | 10.1 | 12.9 | 15.9 | | | Min | | 4.4 | 4.6 | 4.6 | 4.7 | |

Conditions: Suction Superheat 10K / Subcooling 0K

Condensing Temperature +50°C

| R134a | | Cooling Capacity (kW) Evaporating Temperature (°C) | | | | | | R134a | | Power Input (kW) Evaporating Temperature (°C) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | -10 | -5 | 0 | +5 | +10 | +15 | Model | | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRHV72KTE | Max | 11.0 | 13.7 | 16.8 | 20.4 | 24.6 | 24.3 | ZRHV72KTE | Max | | 5.5 | 5.6 | 5.6 | 5.7 | 5.7 |
| | Min | 3.1 | 3.9 | 4.8 | 5.8 | 11.4 | 11.4 | | Min | | 1.8 | 1.7 | 1.7 | 1.7 | 2.8 |
| ZRHV81KTE | Max | 12.4 | 15.5 | 19.0 | 23.1 | 27.8 | 24.9 | ZRHV81KTE | Max | | 6.1 | 6.2 | 6.2 | 6.2 | 6.3 |
| | Min | 3.1 | 4.0 | 5.1 | 6.3 | 12.3 | 12.3 | | Min | | 2.1 | 2.1 | 2.0 | 2.0 | 3.0 |
| ZRHV94KTE | Max | 13.0 | 16.9 | 21.4 | 26.4 | 31.4 | 31.4 | ZRHV94KTE | Max | | 6.9 | 7.2 | 7.3 | 7.5 | 8.0 |
| | Min | 8.0 | 6.7 | 8.8 | 10.9 | 12.9 | 12.9 | | Min | | 3.5 | 3.2 | 3.2 | 3.2 | 3.5 |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary Data

Condensing Temperature +50°C

| R513A | | Cooling Capacity (kW) Evaporating Temperature (°C) | | | | | | R513A | | Power Input (kW) Evaporating Temperature (°C) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | -10 | -5 | 0 | +5 | +10 | +15 | Model | | -10 | -5 | 0 | +5 | +10 | +15 |
| ZRHV72KTR | Max | | 13.8 | 16.5 | 19.3 | 23.0 | 26.4 | ZRHV72KTR | Max | | 13.8 | 16.5 | 19.3 | 23.0 | 26.4 |
| | Min | | 5.7 | 7.1 | 6.5 | 8.7 | 9.6 | | Min | | 5.7 | 7.1 | 6.5 | 8.7 | 9.6 |
| ZRHV81KTR | Max | | 15.3 | 17.8 | 21.7 | 24.7 | 29.4 | ZRHV81KTR | Max | | 15.3 | 17.8 | 21.7 | 24.7 | 29.4 |
| | Min | | 6.2 | 7.8 | 7.2 | 8.8 | 10.6 | | Min | | 6.2 | 7.8 | 7.2 | 8.8 | 10.6 |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary Data

Condensing Temperature +50°C

| R454C | | Cooling Capacity (kW) Evaporating Temperature (°C) | | | | | | R454C | | Power Input (kW) Evaporating Temperature (°C) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | -10 | -5 | 0 | +5 | +10 | +15 | Model | | -10 | -5 | 0 | +5 | +10 | +15 |
| YRHV72KTE | Max | 15.5 | 19.1 | 23.4 | 26.4 | 31.1 | 34.8 | YRHV72KTE | Max | 10.7 | 10.6 | 10.5 | 9.2 | 8.6 | 7.9 |
| | Min | 4.0 | 4.7 | 5.9 | 7.2 | 7.7 | 12.6 | | Min | 3.0 | 2.6 | 2.5 | 2.4 | 2.3 | 2.9 |
| YRHV81KTE | Max | 16.5 | 20.3 | 24.6 | 27.7 | 32.4 | 36.3 | YRHV81KTE | Max | 10.3 | 10.2 | 10.1 | 9.8 | 9.4 | 8.7 |
| | Min | 4.0 | 4.7 | 6.1 | 7.6 | 9.3 | 14.5 | | Min | 3.5 | 3.1 | 3.0 | 2.8 | 2.7 | 3.3 |

Conditions: Suction Superheat 10K / Subcooling 0K
Preliminary Data

# Refrigeration Applications

# Refrigeration Applications

Emerson offers a wide range of solutions for commercial refrigeration applications. With its long-lasting expertise in semi- hermetic reciprocating compressor technology as well as in scroll technology, we can meet the requirements for most applications - at the small end just like at the large end of commercial refrigeration.

Completed by the various offerings in the segment of refrigeration units, Emerson is able to offer the best solution and performance, whether you are looking for applications in foodservice or processing, supermarkets, hypermarkets, petrol stations or refrigerated warehousing.

Emerson prime focus for its semi-hermetic reciprocating technology is at the large end of commercial refrigeration. Here aspects such as reliability, serviceability and capacity modulation are of importance and they are perfectly provided by Emerson semi-hermetic reciprocating compressors. Innovations like Discus™ and Stream technologies, digital modulation and Copeland™ Compressor Electronics technology for advanced protection and preventive maintenance keep semi-hermetic at the forefront of compressor technology.

Especially when compact equipment, energy efficiency and reliability are musts, scroll technology is the preferred choice for refrigeration applications. With developments such as vapor injection and digital modulation, scroll has become the leading technology and is widely recognized in the refrigeration market.

Whatever the chosen technology and product solution, Emerson's range meets the specific refrigeration needs covering the entire spectrum of medium and low temperature applications whether using standard HFCs, low GWP or natural refrigerants.

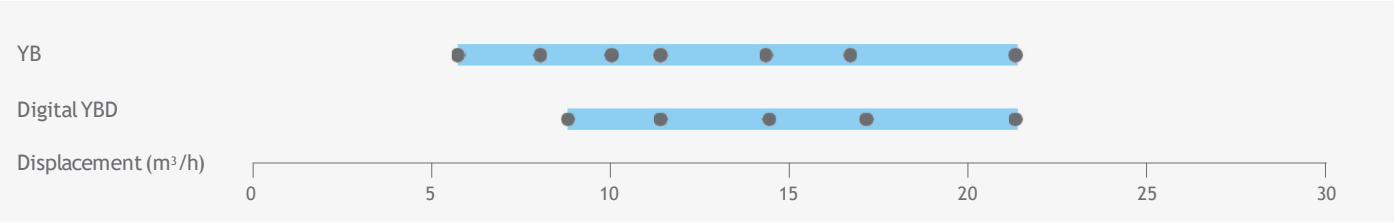
# Copeland™ YB and YBD Scroll Compressor Ranges for Medium Temperature Refrigeration for Low GWP Refrigerants Classified as A2L

The standard and digital models from the new Copeland YB*K1E scroll series for medium temperature applications feature an optimized design for F-Gas compliant low GWP A2L refrigerants. The scroll compressor was optimized internally and externally to create the most reliable compressor with refrigerants with a high HFO content.

These compressors, available with displacements from 5.8 to 21.4 m³/h are designed to provide seasonal efficiencies 15% higher than traditional semi-hermetic compressors. These compressors are extremely quiet and can be fitted with an external sound shell for an additional 10 - 12 dBA sound reduction, which makes them best choice for refrigeration applications in urban and domestic areas.

YB scroll compressor

## YB & YBD Scroll Compressors Line-up




## Features and Benefits

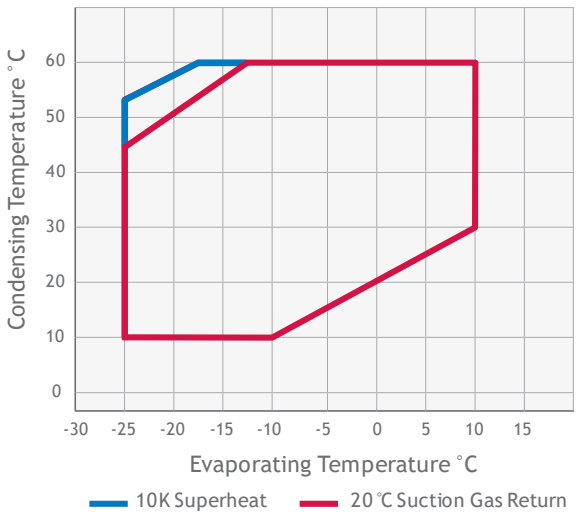
- One model for multiple A2L refrigerants: R455A, R454A, R454C, as well as R1234yf for YB models. These compressors are also designed to operate with previous A1 refrigerants: R448A/R449A, R407A/F, R450A, R513A, R134a and R404A.
- Fully hermetic design to avoid risk of refrigerant leakage
- Flexibility in terms of required capacity: multiple design options
- Extremely quiet operation, specially adapted to applications in urban and domestic areas
- Copeland scroll digital technology for simple, stepless 10 to 100% capacity modulation
- Light weight and compact design
- Wide operating envelope with 10°C low condensing limit

## Maximum Allowable Pressure (PS)

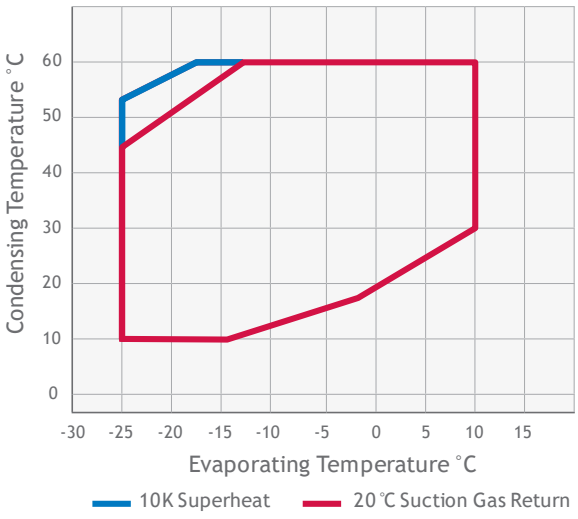
- Low Side PS 23.5 bar (g)
- High Side PS 38 bar (g)

## Operating Envelopes

### YB*1E - R455A

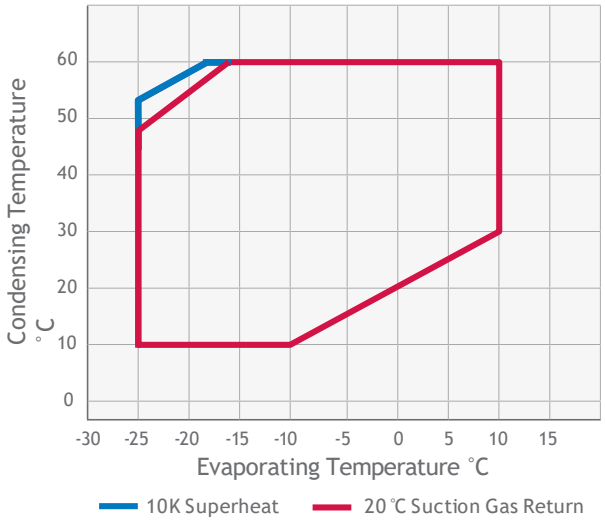



### YBD*1E - R455A

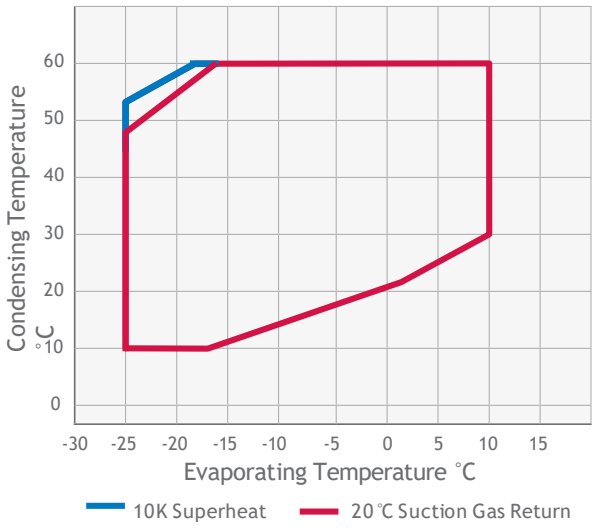


# Operating Envelopes

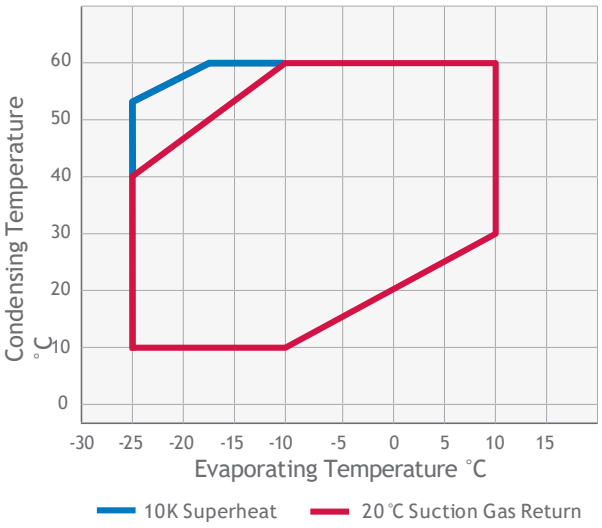
## YB*1E - R454C



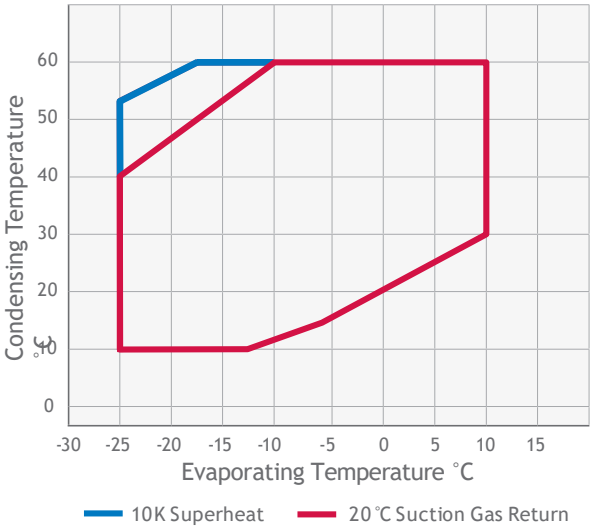

## YBD*1E - R454C



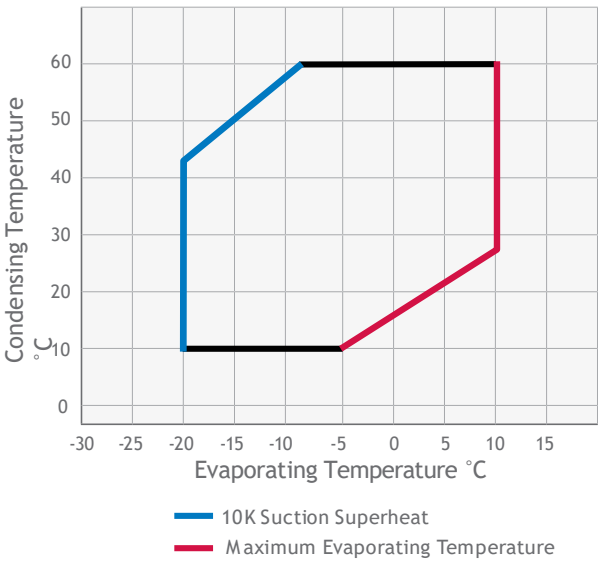

## YB*1E - R454A




## YBD*1E - R454A




## YB*1E - R1234yf



# Technical Overview

| Models | Nominal hp | Displacement ($m^3/h$) | Brazed Suction (inch) | Brazed Discharge (inch) | Oil Quantity (l) | Length/Width/ Height (mm) | Net Weight (kg) | Motor Version/ Code | Maximum Operating Current (A) | Locked Rotor Current (A) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 3 Ph* | 3Ph* | 3 Ph* |
| YB12K1E | 2.0 | 5.8 | 3/4 | 1/2 | 1.3 | 253/248/365 | 23 | TFMN | 4 | 26 |
| YB17K1E | 2.5 | 8.0 | 3/4 | 1/2 | 1.5 | 253/248/387 | 27 | TFMN | 6 | 32 |
| YB21K1E | 3.5 | 10.0 | 3/4 | 1/2 | 1.5 | 253/248/401 | 28 | TFMN | 7 | 46 |
| YB24K1E | 4.0 | 11.4 | 3/4 | 1/2 | 1.5 | 253/248/417 | 29 | TFMN | 8 | 50 |
| YB31K1E | 5.0 | 14.3 | 7/8 | 1/2 | 1.9 | 255/261/442 | 37 | TFMN | 10 | 64 |
| YB36K1E | 6.0 | 16.7 | 7/8 | 1/2 | 1.9 | 255/261/442 | 40 | TFMN | 12 | 74 |
| Digital Models | | | | | | | | | | |
| YBD17K1E | 3.0 | 8.8 | 3/4 | 1/2 | 1.2 | 253/248/435 | 30 | TFMN | 7 | 40 |
| YBD24K1E | 4.0 | 11.4 | 7/8 | 1/2 | 1.4 | 253/248/466 | 30 | TFMN | 10 | 48 |
| YBD31K1E | 5.0 | 14.4 | 7/8 | 1/2 | 1.9 | 255/261/481 | 38 | TFMN | 11 | 64 |
| YBD36K1E | 6.0 | 17.1 | 7/8 | 1/2 | 1.9 | 255/261/481 | 40 | TFMN | 12 | 74 |

* 3 Ph: 380-420V/ 50Hz

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R455A | Cooling Capacity (kW) | | | | | | | R455A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| YB12K1E | | | 1.7 | 2.2 | 2.7 | 3.3 | 4.0 | YB12K1E | | | 1.1 | 1.2 | 1.3 | 1.3 | 1.4 |
| YB17K1E | | | 2.5 | 3.1 | 3.8 | 4.6 | 5.6 | YB17K1E | | | 1.6 | 1.6 | 1.7 | 1.8 | 1.8 |
| YB21K1E | | | 3.1 | 3.9 | 4.8 | 5.8 | 7.0 | YB21K1E | | | 2.0 | 2.1 | 2.1 | 2.2 | 2.3 |
| YB24K1E | | | 3.6 | 4.4 | 5.4 | 6.5 | 7.9 | YB24K1E | | | 2.3 | 2.4 | 2.4 | 2.5 | 2.6 |
| YB31K1E | | | 4.4 | 5.5 | 6.8 | 8.2 | 10.0 | YB31K1E | | | 2.7 | 2.8 | 2.9 | 3.1 | 3.2 |
| YB36K1E | | | 5.2 | 6.5 | 8.0 | 9.7 | 11.8 | YB36K1E | | | 3.1 | 3.3 | 3.5 | 3.6 | 3.7 |
| Digital Models | | | | | | | | | | | | | | | |
| YBD17K1E | | | 2.7 | 3.4 | 4.1 | 5.0 | 6.1 | YBD17K1E | | | 1.8 | 1.8 | 1.9 | 5.0 | 2.0 |
| YBD24K1E | | | 3.5 | 4.4 | 5.3 | 6.5 | 7.9 | YBD24K1E | | | 2.3 | 2.4 | 2.4 | 6.5 | 2.6 |
| YBD31K1E | | | 4.4 | 5.5 | 6.7 | 8.2 | 9.9 | YBD31K1E | | | 2.7 | 2.8 | 3.0 | 8.2 | 3.2 |
| YBD36K1E | | | 5.3 | 6.6 | 8.1 | 9.9 | 12.0 | YBD36K1E | | | 3.2 | 3.4 | 3.5 | 9.9 | 3.8 |

Conditions: Suction Gas Return 20°C /Subcooling 0K

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454C | Cooling Capacity (kW) | | | | | | | R454C | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| YB12K1E | | | 1.7 | 2.1 | 2.0 | 3.1 | 3.8 | YB12K1E | | | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 |
| YB17K1E | | | 2.4 | 2.9 | 2.9 | 4.3 | 5.3 | YB17K1E | | | 1.5 | 1.5 | 1.5 | 1.6 | 1.7 |
| YB21K1E | | | 3.0 | 3.7 | 3.7 | 5.5 | 6.7 | YB21K1E | | | 1.9 | 1.9 | 1.9 | 2.1 | 2.1 |
| YB24K1E | | | 3.4 | 4.2 | 4.1 | 6.2 | 7.6 | YB24K1E | | | 2.1 | 2.2 | 2.2 | 2.3 | 2.4 |
| YB31K1E | | | 4.2 | 5.2 | 5.2 | 7.7 | 9.5 | YB31K1E | | | 2.5 | 2.6 | 2.6 | 2.8 | 3.0 |
| YB36K1E | | | 5.0 | 6.2 | 6.1 | 9.2 | 11.3 | YB36K1E | | | 2.9 | 3.1 | 3.1 | 3.3 | 3.5 |
| Digital Models | | | | | | | | | | | | | | | |
| YBD17K1E | | | 2.6 | 3.2 | 3.9 | 1.8 | 5.8 | YBD17K1E | | | 1.7 | 1.7 | 1.7 | 1.8 | 1.8 |
| YBD24K1E | | | 3.3 | 4.1 | 5.1 | 2.3 | 7.5 | YBD24K1E | | | 2.1 | 2.2 | 2.3 | 2.3 | 2.4 |
| YBD31K1E | | | 4.2 | 5.2 | 6.4 | 2.9 | 9.4 | YBD31K1E | | | 2.5 | 2.7 | 2.8 | 2.9 | 3.0 |
| YBD36K1E | | | 5.0 | 6.2 | 7.7 | 3.4 | 11.4 | YBD36K1E | | | 3.0 | 3.1 | 3.3 | 3.4 | 3.5 |

Conditions: Suction Gas Return 20°C / Subcooling 0K

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454A | Cooling Capacity (kW) | | | | | | | R454A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| YB12K1E | | | 1.9 | 2.4 | 3.0 | 3.7 | 4.4 | YB12K1E | | | 1.3 | 1.3 | 1.4 | 1.5 | 1.5 |
| YB17K1E | | | 2.7 | 3.4 | 4.2 | 5.1 | 6.2 | YB17K1E | | | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 |
| YB21K1E | | | 3.4 | 4.3 | 5.3 | 6.5 | 7.9 | YB21K1E | | | 2.2 | 2.3 | 2.4 | 2.4 | 2.5 |
| YB24K1E | | | 3.9 | 4.9 | 6.0 | 7.3 | 8.8 | YB24K1E | | | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 |
| YB31K1E | | | 4.9 | 6.1 | 7.5 | 9.2 | 11.1 | YB31K1E | | | 3.0 | 3.1 | 3.3 | 3.4 | 3.5 |
| YB36K1E | | | 5.8 | 7.2 | 8.9 | 10.9 | 13.2 | YB36K1E | | | 3.5 | 3.7 | 3.8 | 4.0 | 4.1 |
| Digital Models | | | | | | | | | | | | | | | |
| YBD17K1E | | | 3.0 | 3.7 | 4.6 | 5.6 | 6.8 | YBD17K1E | | | 2.0 | 2.0 | 2.1 | 2.1 | 2.2 |
| YBD24K1E | | | 3.9 | 4.9 | 6.0 | 7.3 | 8.8 | YBD24K1E | | | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 |
| YBD31K1E | | | 4.9 | 6.1 | 7.6 | 9.2 | 11.2 | YBD31K1E | | | 3.0 | 3.1 | 3.3 | 3.4 | 3.5 |
| YBD36K1E | | | 5.9 | 7.4 | 9.1 | 11.2 | 13.5 | YBD36K1E | | | 3.6 | 3.7 | 3.9 | 4.1 | 4.2 |

Conditions: Suction Gas Return 20°C / Subcooling 0K

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R1234yf | Cooling Capacity (kW) | | | | | | | R1234yf | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| YB12K1E | | | | | 1.6 | 2.0 | 2.5 | YB12K1E | | | | | 0.8 | 0.9 | 0.9 |
| YB17K1E | | | | 1.8 | 2.2 | 2.8 | 3.5 | YB17K1E | | | | 1.1 | 1.1 | 1.2 | 1.2 |
| YB21K1E | | | | 2.2 | 2.8 | 3.6 | 4.4 | YB21K1E | | | | 1.4 | 1.4 | 1.5 | 1.5 |
| YB24K1E | | | | 2.5 | 3.2 | 4.0 | 5.0 | YB24K1E | | | | 1.6 | 1.6 | 1.7 | 1.7 |
| YB31K1E | | | | 3.2 | 4.0 | 5.0 | 6.2 | YB31K1E | | | | 1.9 | 1.9 | 2.0 | 2.1 |
| YB36K1E | | | | 3.7 | 4.7 | 5.9 | 7.3 | YB36K1E | | | | 2.2 | 2.3 | 2.4 | 2.5 |

Conditions: Suction Superheat 10K, Subcooling 0K

# Copeland™ ZB and ZBD Scroll Compressor Ranges for Medium Temperature Refrigeration Using R407A/F/C, R448A/R449A, R404A, R134a, R450A and R513A

Emerson offers ZB compressors with a wide displacement range from 5.9 m³/h to 87.5 m³/h. It includes ZBD digital compressors models that offer continuous capacity modulation technology.

Copeland scroll compressors have 3 times less moving parts than reciprocating compressors and feature a scroll compliance mechanism which makes them particularly robust and reliable under severe conditions including liquid slugging.

They have the advantage of light weight and compactness, making them ideal for the usage in refrigeration units, compact refrigeration systems or special process units.

The summit series from 7 to 15 hp is designed to provide seasonal efficiencies 15% higher than traditional semi-hermetic compressors. These compressors are extremely quiet and can be fitted with an external sound shell for an additional 10 dBA sound reduction.

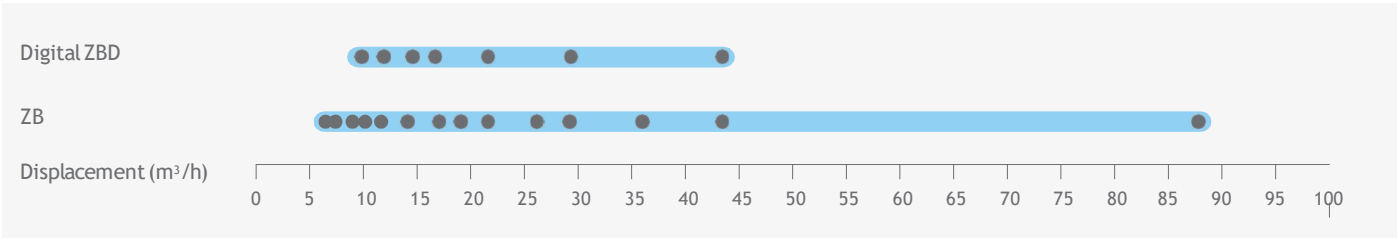
ZB compressor for
medium temperature refrigeration
with and without sound shell

## ZBD Digital Scroll Compressors

Based on the unique Copeland compliant scroll design, the digital modulation operates on a simple mechanism. Capacity control is achieved by separating the scroll sets axially over a small period of time. It is a simple mechanical solution allowing precise temperature control and system efficiency and it requires no other components.

Digital scroll technology provides continuous, stepless modulation from 10% to 100% with no operating envelope restriction. As a result, system pressures and temperatures are tightly controlled. These compressors provide optimum performance for refrigeration units, refrigeration packs, process and agricultural units.

## ZB and ZBD Compressor Line-up




## Features and Benefits

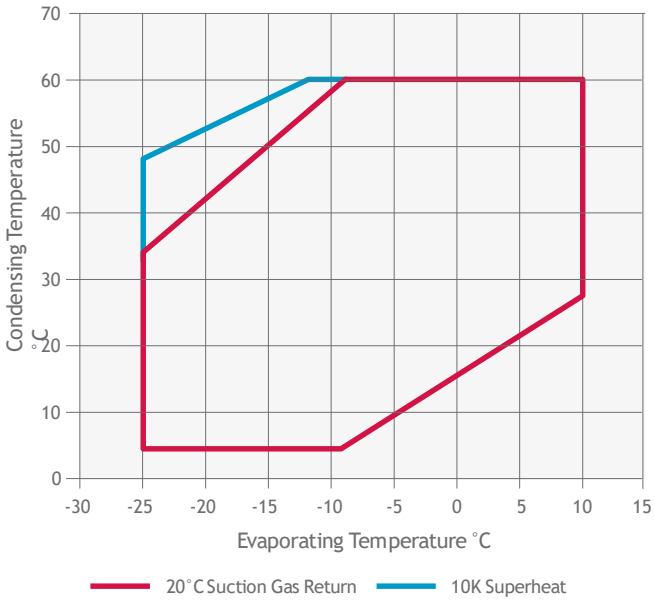
- Copeland scroll axial and radial compliance for superior reliability and efficiency
- Wide operating envelope with 10°C condensing limit and fast pull-down capabilities
- High seasonal efficiencies as scrolls are designed at the condition where equipment runs most of the time
- Light weight and compactness, up to half the weight of equivalent semi-hermetic compressors
- Availability of optional sound shell on all models providing an additional 10 dBA sound attenuation for silent operation
- Includes 12 digital scroll compressor models for simple, stepless 10 to 100% capacity modulation
- One model for multiple refrigerants R407A/F/C, R448A/R449A, R404A, R134a, R450A and R513A

## Maximum Allowable Pressure (PS)

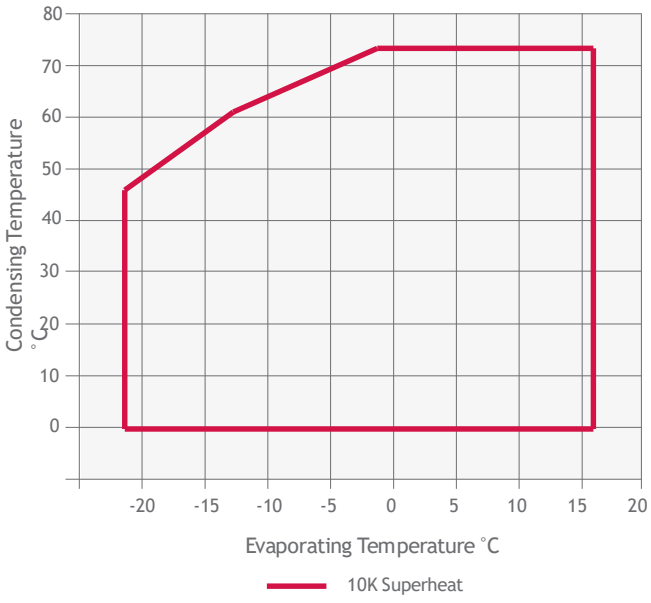
- ZB15 to ZB45:
  Low Side PS 21 bar(g) / High Side PS 32 bar(g)
- ZB50 to ZB220:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)
- Digital ZBD:
  Low Side PS 21 bar(g) / High Side PS 28.8 bar(g)
- Summit ZBD:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar (g)

# Operating Envelope

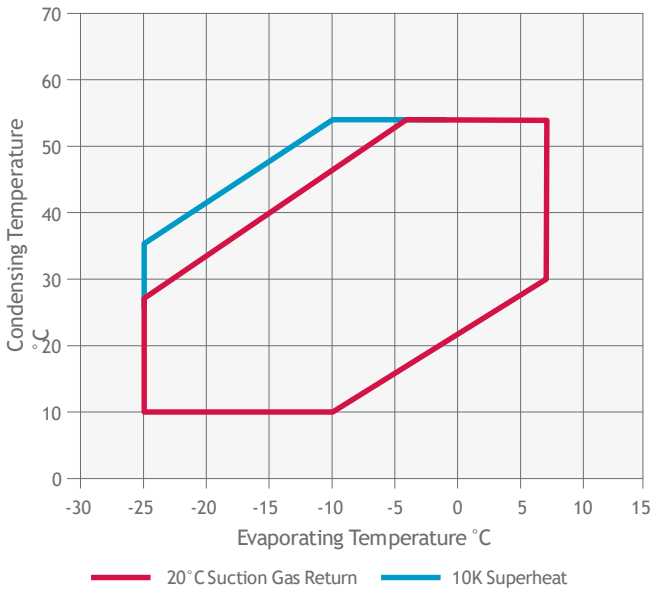
## ZB - R448A/R449A



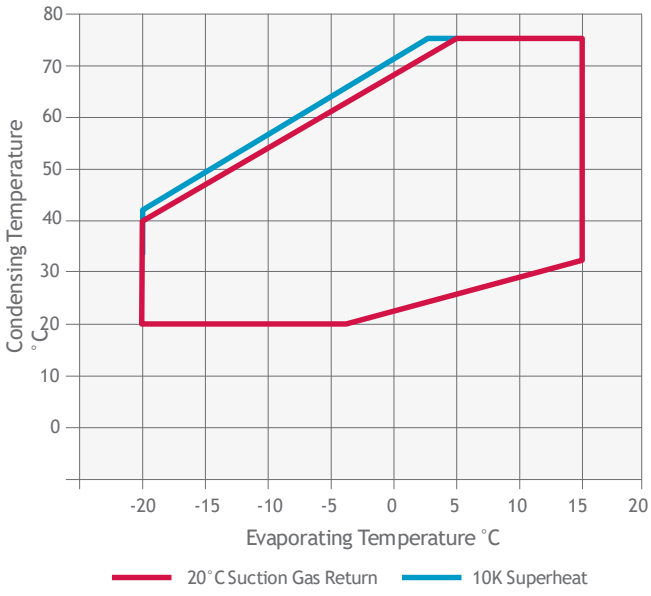

## ZBD - R134a




## ZB - R407A




## ZB - R134A



# Technical Overview

| Models | Nominal hp | Displacement ($m^3/h$) | Rotalock suction (inch) | Rotalock 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)*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| ZB15KCE | 2.0 | 5.9 | 1 1/4 | 1 | 1.3 | 241/241/369 | 25 | PFJ | TFD | 12 | 4 | 58 | 26 | 55 |
| ZB19KCE | 2.5 | 6.8 | 1 1/4 | 1 | 1.5 | 242/242/369 | 27 | PFJ | TFD | 12 | 6 | 61 | 32 | 55 |
| ZB21KCE | 3.0 | 8.6 | 1 1/4 | 1 | 1.2 | 243/244/391 | 29 | PFJ | TFD | 16 | 7 | 82 | 40 | 58 |
| ZB26KCE | 3.5 | 10.0 | 1 1/4 | 1 | 1.5 | 243/244/405 | 28 | PFJ | TFD | 18 | 8 | 97 | 46 | 60 |
| ZB29KCE | 4.0 | 11.4 | 1 1/4 | 1 | 1.5 | 246/246/423 | 29 | | TFD | | 10 | | 50 | 58 |
| ZB38KCE | 5.0 | 14.4 | 1 1/4 | 1 | 1.9 | 242/242/438 | 37 | PFJ | TFD | 32 | 12 | 142 | 65 | 61 |
| ZB42KCE | 5.5 | 16.2 | 1 1/4 | 1 | 1.9 | 251/246/438 | 43 | PFJ | | 35 | | 150 | | 62 |
| ZB45KCE | 6.0 | 17.1 | 1 1/4 | 1 | 1.9 | 242/242/438 | 39 | | TFD | | 13 | | 74 | 61 |
| ZB48KCE | 6.5 | 18.8 | 1 1/4 | 1 1/4 | 1.8 | 246/250/442 | 39 | | TFD | | 14 | | 101 | 62 |
| ZB57KCE | | 21.4 | 1 1/4 | 1 1/4 | 1.9 | 246/256/442 | 39 | | TFD | | 15 | | 102 | 68 |
| **ZB Summit Models** | | | | | | | | | | | | | | |
| ZB66K5E | 10.0 | 25.7 | 1 3/4 | 1 1/4 | 3.4 | 280/280/534 | 60 | | TFD | | 17 | | 111 | 66 |
| ZB76K5E | 12.0 | 28.8 | 1 3/4 | 1 1/4 | 3.4 | 280/280/534 | 61 | | TFD | | 20 | | 118 | 67 |
| ZB95K5E | 13.0 | 36.4 | 1 3/4 | 1 1/4 | 3.4 | 280/280/552 | 65 | | TFD | | 28 | | 140 | 69 |
| ZB114K5E | 15.0 | 43.4 | 1 3/4 | 1 1/4 | 3.4 | 280/280/552 | 66 | | TFD | | 33 | | 174 | 72 |
| ZB220KCE | 30.0 | 87.5 | 2 3/4 | 1 3/4 | 6.3 | 448/392/715 | 176 | | TWM | | 69 | | 310 | 78 |
| **Digital Models** | | | | | | | | | | | | | | |
| ZBD21KCE | 3.0 | 8.3 | 1 1/4 | 1 | 1.2 | 243/243/432 | 30 | PFJ | TFD | 16 | 6 | 97 | 40 | 62 |
| ZBD29KCE | 4.0 | 11.4 | 1 1/4 | 1 | 1.4 | 245/243/463 | 32 | | TFD | | 7 | | 48 | 58 |
| ZBD38KCE | 5.0 | 14.4 | 1 1/4 | 1 | 1.9 | 246/250/481 | 38 | | TFD | | 11 | | 64 | 67 |
| ZBD45KCE | 6.0 | 17.1 | 1 1/4 | 1 | 1.9 | 241/246/481 | 39 | | TFD | | 12 | | 74 | 61 |
| ZBD57KCE | 7.5 | 21.4 | 1 1/4 | 1 1/4 | 1.9 | 246/257/481 | 43 | | TFD | | 15 | | 102 | 68 |
| ZBD76K5E | 10.0 | 28.8 | 1 3/4 | 1 1/4 | 3.4 | 299/280/534 | 61 | | TFD | | 24 | | 118 | 66 |
| ZBD114K5E | 15.0 | 43.3 | 1 3/4 | 1 1/4 | 3.4 | 299/280/552 | 68 | | TFD | | 33 | | 174 | 71 |

* 1Ph: 230V/ 50Hz
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407A | Cooling Capacity (kW) | | | | | | | R407A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| ZB15KCE | | | | 2.1* | 2.8 | 3.5 | 4.2 | ZB15KCE | | | | 1.5* | 1.5 | 1.5 | 1.5 |
| ZB19KCE | | | | 2.4* | 3.2 | 4.0 | 5.0 | ZB19KCE | | | | 1.5* | 1.6 | 1.6 | 1.6 |
| ZB21KCE | | | | 3.0* | 4.0 | 5.1 | 6.3 | ZB21KCE | | | | 2.0* | 2.0 | 2.0 | 2.1 |
| ZB26KCE | | | | 3.6* | 4.7 | 5.8 | 7.1 | ZB26KCE | | | | 2.3* | 2.3 | 2.3 | 2.4 |
| ZB29KCE | | | | | 5.3 | 6.5 | 8.0 | ZB29KCE | | | | | 2.6 | 2.6 | 2.6 |
| ZB38KCE | | | | 5.4* | 7.2 | 8.9 | 11.0 | ZB38KCE | | | | 3.2* | 3.3 | 3.3 | 3.4 |
| ZB42KCE** | | | | 6.1* | 7.9 | 9.8 | 12.0 | ZB42KCE** | | | | 3.9* | 3.9 | 3.9 | 3.9 |
| ZB45KCE | | | | 6.3* | 8.2 | 10.2 | 12.4 | ZB45KCE | | | | 3.9* | 4.0 | 4.0 | 4.0 |
| ZB48KCE | | | | | 9.5 | 11.7 | 14.3 | ZB48KCE | | | | | 4.5 | 4.6 | 4.5 |
| ZB57KCE | | | | 8.2* | 10.6 | 13.1 | 15.8 | ZB57KCE | | | | 4.4* | 4.6 | 4.8 | 4.9 |
| ZB Summit Models | | | | | | | | | | | | | | | |
| ZB66K5E | | | | 9.2* | 12.4 | 15.6 | 19.3 | ZB66K5E | | | | 5.5* | 5.5 | 5.7 | 5.8 |
| ZB76K5E | | | | 10.6* | 14.2 | 18.1 | 22.4 | ZB76K5E | | | | 6.5* | 6.5 | 6.7 | 6.9 |
| ZB95K5E | | | | 12.9* | 17.7 | 22.5 | 27.8 | ZB95K5E | | | | 8.3* | 8.3 | 8.5 | 8.7 |
| ZB114K5E | | | | 14.8* | 20.5 | 26.3 | 32.8 | ZB114K5E | | | | 10.2* | 10.2 | 10.3 | 10.5 |
| Digital Models | | | | | | | | | | | | | | | |
| ZBD21KCE | | | | 3.4* | 4.3 | 5.2 | 6.3 | ZBD21KCE | | | | 1.8* | 1.9 | 1.9 | 2.0 |
| ZBD29KCE | | | | 4.2* | 5.5 | 6.8 | 8.4 | ZBD29KCE | | | | 2.6* | 2.6 | 2.6 | 2.6 |
| ZBD38KCE | | | | 5.5* | 7.3 | 9.1 | 11.2 | ZBD38KCE | | | | 3.4* | 3.4 | 3.4 | 3.5 |
| ZBD45KCE | | | | 6.1* | 8.1 | 10.1 | 12.5 | ZBD45KCE | | | | 3.8* | 3.8 | 3.8 | 3.9 |
| ZBD57KCE | | | | 8.4* | 11.1 | 13.8 | 17.0 | ZBD57KCE | | | | 5.2* | 5.2 | 5.3 | 5.3 |
| ZBD76K5E | | | 8.2* | 11.3 | 14.5 | 18.4 | 22.8 | ZBD76K5E | | | 7.5* | 7.1 | 7.1 | 7.3 | 7.5 |
| ZBD114K5E | | | 10.8* | 15.6 | 20.5 | 26.3 | 32.8 | ZBD114K5E | | | 10.3* | 10.2 | 10.2 | 10.3 | 10.5 |

Conditions: Suction Gas Return 20°C /Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K
** Single Phase Only
Preliminary Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407F | Cooling Capacity (kW) | | | | | | | R407F | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| ZB15KCE | | | | | 2.6* | 3.4 | 4.2 | ZB15KCE | | | | | 1.6* | 1.6 | 1.6 |
| ZB19KCE | | | | | 3.2* | 4.2 | 5.1 | ZB19KCE | | | | | 1.9* | 1.9 | 1.9 |
| ZB21KCE | | | | | 3.9* | 5.0 | 6.2 | ZB21KCE | | | | | 2.2* | 2.2 | 2.3 |
| ZB26KCE | | | | | 4.5* | 5.8 | 7.2 | ZB26KCE | | | | | 2.6* | 2.6 | 2.6 |
| ZB29KCE | | | | | 5.4* | 7.0 | 8.7 | ZB29KCE | | | | | 2.8* | 2.9 | 2.8 |
| ZB38KCE | | | | 5.2* | 6.9* | 8.9 | 11.0 | ZB38KCE | | | | 3.7* | 3.7* | 3.7 | 3.7 |
| ZB42KCE** | | | | 5.9* | 7.8* | 10.1 | 12.5 | ZB42KCE** | | | | 4.0* | 4.0* | 4.0 | 4.1 |
| ZB45KCE | | | | 6.0* | 8.1* | 10.5 | 13.0 | ZB45KCE | | | | 4.1* | 4.2* | 4.3 | 4.2 |
| ZB48KCE | | | | 7.0* | 9.3* | 12.1 | 15.0 | ZB48KCE | | | | 4.7* | 4.8* | 4.9 | 4.9 |
| ZB57KCE | | | | 8.5* | 10.9* | 13.8 | 16.9 | ZB57KCE | | | | 5.0* | 5.1* | 5.1 | 5.2 |
| ZB Summit Models | | | | | | | | | | | | | | | |
| ZB66K5E | | | | 9.5* | 13.0* | 16.9 | 20.9 | ZB66K5E | | | | 5.8* | 5.8* | 5.9 | 6.1 |
| ZB76K5E | | | | 10.9* | 14.9* | 19.6 | 24.2 | ZB76K5E | | | | 6.9* | 6.8* | 7.0 | 7.2 |
| ZB95K5E | | | | 13.2* | 18.6* | 24.4 | 30.1 | ZB95K5E | | | | 8.7* | 8.8* | 8.9 | 9.1 |
| ZB114K5E | | | | 15.2* | 21.5* | 28.5 | 35.4 | ZB114K5E | | | | 10.6* | 10.7* | 10.8 | 11.0 |
| Digital Models | | | | | | | | | | | | | | | |
| ZBD21KCE | | | | | | 5.1 | 6.3 | ZBD21KCE | | | | | | 2.0 | 2.0 |
| ZBD29KCE | | | | | 5.8* | 7.3 | 8.9 | ZBD29KCE | | | | | 2.9* | 2.9 | 2.9 |
| ZBD38KCE | | | | 5.7* | 7.1* | 8.9 | 10.8 | ZBD38KCE | | | | 3.0* | 3.3* | 3.5 | 3.6 |
| ZBD45KCE | | | | 6.4* | 8.4* | 10.8 | 13.2 | ZBD45KCE | | | | 3.7* | 3.9* | 4.1 | 4.3 |
| ZBD57KCE | | | | 8.5* | 10.8* | 13.8 | 17.0 | ZBD57KCE | | | | 5.2* | 5.2* | 5.3 | 5.3 |
| ZBD76K5E | | | | 11.5* | 15.2 | 19.3 | 23.9 | ZBD76K5E | | | | 7.5* | 7.4 | 7.6 | 7.9 |
| ZBD114K5E | | | | 15.8* | 21.5 | 27.6 | 34.4 | ZBD114K5E | | | | 10.7* | 10.7 | 10.8 | 11.0 |

Conditions: Suction Gas Return 20°C /Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K
** Single Phase Only
Preliminary Data

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R448A/ R449A | Cooling Capacity (kW) | | | | | | | R448A/ R449A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| ZB15KCE | | | 1.6* | 2.2 | 2.9 | 3.6 | 4.4 | ZB15KCE | | | 1.6* | 1.5 | 1.5 | 1.5 | 1.4 |
| ZB19KCE | | | 2.0* | 2.6 | 3.3 | 4.1 | 5.1 | ZB19KCE | | | 1.6* | 1.6 | 1.6 | 1.6 | 1.6 |
| ZB21KCE | | | 2.4* | 3.3 | 4.2 | 5.2 | 6.4 | ZB21KCE | | | 2.1* | 2.1 | 2.1 | 2.1 | 2.1 |
| ZB26KCE | | | 2.6* | 3.8 | 4.8 | 5.9 | 7.2 | ZB26KCE | | | 2.4* | 2.4 | 2.4 | 2.4 | 2.4 |
| ZB29KCE | | | 3.3* | 4.5 | 5.5 | 6.8 | 8.3 | ZB29KCE | | | 2.6* | 2.6 | 2.6 | 2.7 | 2.7 |
| ZB38KCE | | | 3.9* | 5.7 | 7.2 | 8.9 | 10.9 | ZB38KCE | | | 3.4* | 3.4 | 3.4 | 3.4 | 3.4 |
| ZB42KCE** | | | 4.4* | 6.4 | 8.1 | 10.1 | 12.3 | ZB42KCE** | | | 3.9* | 3.9 | 3.9 | 3.9 | 3.9 |
| ZB45KCE | | | 4.5* | 6.6 | 8.5 | 10.5 | 12.8 | ZB45KCE | | | 3.9* | 3.9 | 3.9 | 3.9 | 3.9 |
| ZB48KCE | | | 5.3* | 7.6 | 9.7 | 12.1 | 14.7 | ZB48KCE | | | 4.5* | 4.5 | 4.5 | 4.5 | 4.5 |
| ZB57KCE | | | 6.4* | 8.6 | 10.8 | 13.4 | 16.4 | ZB57KCE | | | 4.4* | 4.5 | 4.7 | 4.9 | 5.1 |
| ZB Summit Models | | | | | | | | | | | | | | | |
| ZB66K5E | | | 6.8* | 9.4* | 12.6 | 15.8 | 19.3 | ZB66K5E | | | 5.8* | 5.8* | 5.8 | 5.8 | 5.8 |
| ZB76K5E | | | 8.0* | 11.1* | 14.9 | 18.6 | 22.7 | ZB76K5E | | | 6.5* | 6.6* | 6.6 | 6.6 | 6.7 |
| ZB95K5E | | | 8.8* | 13.2* | 18.2 | 22.8 | 27.8 | ZB95K5E | | | 8.6* | 8.6* | 8.6 | 8.6 | 8.7 |
| ZB114K5E | | | 10.5* | 15.5* | 21.5 | 27.3 | 33.7 | ZB114K5E | | | 10.4* | 10.3* | 10.3 | 10.3 | 10.4 |
| ZB220KCE | | | | 32.4* | 43.1 | 53.7 | 65.7 | ZB220KCE | | | | 20.3* | 20.3 | 20.4 | 20.6 |
| Digital Models | | | | | | | | | | | | | | | |
| ZFD13KVE EVI | 3.3 | 4.2 | 5.2 | 6.3 | 7.6 | 9.0 | 10.6 | ZFD13KVE EVI | 2.3 | 2.3 | 2.4 | 2.5 | 2.7 | 2.8 | 2.8 |
| ZFD18KVE EVI | 4.8 | 6.0 | 7.4 | 9.0 | 10.8 | 12.9 | 15.2 | ZFD18KVE EVI | 3.4 | 3.6 | 3.8 | 4.0 | 4.3 | 4.5 | 4.7 |
| ZFD25KVE EVI | 6.2 | 7.7 | 9.5 | 11.4 | 13.5 | 15.7 | 18.1 | ZFD25KVE EVI | 3.9 | 4.2 | 4.5 | 4.8 | 5.1 | 5.3 | 5.5 |
| ZFD41K5E | 7.4 | 9.4 | 11.8 | 14.6 | 17.9 | 21.7 | 26.2 | ZFD41K5E | 5.4 | 5.8 | 6.2 | 6.8 | 7.4 | 8.1 | 8.9 |
| ZFD41K5E EVI | 9.9 | 12.5 | 15.6 | 19.0 | 22.8 | 27.9 | 31.9 | ZFD41K5E EVI | 6.8 | 7.3 | 7.8 | 8.4 | 9.0 | 9.7 | 10.4 |

Conditions: Suction Gas Return 20°C / Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K
** Single Phase Only
Preliminary Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R404A | Cooling Capacity (kW) | | | | | | | R404A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| ZB15KCE | | | 1.9 | 2.4 | 3.0 | 3.7 | 4.5 | ZB15KCE | | | 1.7 | 1.7 | 1.6 | 1.6 | 1.5 |
| ZB19KCE | | | 2.3 | 2.9 | 3.5 | 4.2 | 5.1 | ZB19KCE | | | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| ZB21KCE | | | 3.0 | 3.7 | 4.5 | 5.5 | 6.6 | ZB21KCE | | | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 |
| ZB26KCE | | | 3.5 | 4.3 | 5.3 | 6.4 | 7.6 | ZB26KCE | | | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| ZB29KCE | | | 4.0 | 4.9 | 6.0 | 7.2 | 8.6 | ZB29KCE | | | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 |
| ZB38KCE | | | 5.1 | 6.3 | 7.7 | 9.3 | 11.2 | ZB38KCE | | | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 |
| ZB42KCE** | | | 5.7 | 7.1 | 8.7 | 10.6 | 12.7 | ZB42KCE** | | | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| ZB45KCE | | | 6.0 | 7.4 | 9.1 | 11.0 | 13.2 | ZB45KCE | | | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| ZB48KCE | | | 6.9 | 8.6 | 10.5 | 12.7 | 15.2 | ZB48KCE | | | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 |
| ZB57KCE | | | 7.9 | 9.7 | 11.9 | 14.3 | 17.1 | ZB57KCE | | | 4.7 | 4.9 | 5.2 | 5.4 | 5.5 |
| ZB Summit Models | | | | | | | | | | | | | | | |
| ZB66K5E | | | 9.1 | 11.4 | 13.9 | 16.8 | 20.1 | ZB66K5E | | | 6.2 | 6.2 | 6.2 | 6.3 | 6.4 |
| ZB76K5E | | | 10.5 | 13.1 | 16.2 | 19.7 | 23.6 | ZB76K5E | | | 7.2 | 7.2 | 7.3 | 7.4 | 7.5 |
| ZB95K5E | | | 10.7* | 16.0 | 20.1 | 24.5 | 29.3 | ZB95K5E | | | 9.3* | 9.2 | 9.3 | 9.3 | 9.4 |
| ZB114K5E | | | 12.5* | 18.7 | 23.4 | 28.7 | 34.7 | ZB114K5E | | | 11.3* | 11.3 | 11.3 | 11.4 | 11.4 |
| ZB220KCE | | | 28.5* | 39.2 | 47.7 | 57.5 | 68.9 | ZB220KCE | | | 21.4* | 21.8 | 22.0 | 22.2 | 22.4 |
| Digital Models | | | | | | | | | | | | | | | |
| ZFD13KVE EVI | 4.0 | 4.9 | 6.0 | 7.2 | 8.5 | 10.0 | 11.7 | ZFD13KVE EVI | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.4 | 3.5 |
| ZFD18KVE EVI | 6.1 | 7.3 | 8.7 | 10.4 | 12.3 | 14.4 | 16.9 | ZFD18KVE EVI | 4.0 | 4.3 | 4.5 | 4.6 | 4.8 | 5.0 | 5.1 |
| ZFD25KVE EVI | 7.7 | 9.3 | 11.2 | 13.2 | 15.3 | 17.5 | 19.7 | ZFD25KVE EVI | 4.8 | 5.1 | 5.4 | 5.7 | 6.0 | 6.3 | 6.6 |
| ZFD41K5E EVI | 12.5 | 15.0 | 18.1 | 21.5 | 25.4 | 29.5 | 33.9 | ZFD41K5E EVI | 7.9 | 8.4 | 8.8 | 9.3 | 9.7 | 10.1 | 10.6 |
| ZFD41K5E | 8.6 | 10.6 | 13.0 | 15.7 | 18.9 | 22.6 | 27.0 | ZFD41K5E | 6.3 | 6.7 | 7.1 | 7.5 | 7.9 | 8.4 | 8.8 |

Conditions: Suction Gas Return 20°C / Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K
** Single Phase Only

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R134a | Cooling Capacity (kW) | | | | | | | R134a | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| ZB15KCE | | | | 1.4 | 1.7 | 2.2 | 2.7 | ZB15KCE | | | | 0.9 | 0.9 | 0.9 | 0.9 |
| ZB19KCE | | | | 1.6 | 2.0 | 2.5 | 3.1 | ZB19KCE | | | | 1.1 | 1.1 | 1.1 | 1.1 |
| ZB21KCE | | | | 2.0 | 2.5 | 3.2 | 4.0 | ZB21KCE | | | | 1.3 | 1.3 | 1.3 | 1.3 |
| ZB26KCE | | | | 2.3 | 2.9 | 3.7 | 4.6 | ZB26KCE | | | | 1.5 | 1.5 | 1.5 | 1.5 |
| ZB29KCE | | | | 2.5 | 3.2 | 4.0 | 5.0 | ZB29KCE | | | | 1.7 | 1.7 | 1.7 | 1.7 |
| ZB38KCE | | | | 3.2 | 4.2 | 5.4 | 6.7 | ZB38KCE | | | | 2.1 | 2.1 | 2.1 | 2.2 |
| ZB42KCE** | | | | 3.8 | 4.8 | 6.0 | 7.5 | ZB42KCE** | | | | 2.5 | 2.5 | 2.5 | 2.4 |
| ZB45KCE | | | | 4.0 | 5.1 | 6.4 | 8.0 | ZB45KCE | | | | 2.4 | 2.4 | 2.5 | 2.5 |
| ZB48KCE | | | | 4.8 | 6.0 | 7.5 | 9.1 | ZB48KCE | | | | 2.8 | 2.8 | 2.9 | 2.9 |
| ZB57KCE | | | | 5.0 | 6.4 | 8.1 | 10.1 | ZB57KCE | | | | 3.4 | 3.4 | 3.4 | 3.5 |
| **ZB Summit Models** | | | | | | | | | | | | | | | |
| ZB66K5E | | | | 6.0 | 7.5 | 9.5 | 11.8 | ZB66K5E | | | | 3.8 | 3.7 | 3.8 | 3.8 |
| ZB76K5E | | | | 6.9 | 8.6 | 10.8 | 13.5 | ZB76K5E | | | | 4.4 | 4.4 | 4.4 | 4.5 |
| ZB95K5E | | | | 8.2 | 10.8 | 13.8 | 17.1 | ZB95K5E | | | | 5.4 | 5.5 | 5.5 | 5.6 |
| ZB114K5E | | | | 9.6 | 12.7 | 16.3 | 20.4 | ZB114K5E | | | | 6.6 | 6.6 | 6.7 | 6.7 |
| ZB220KCE | | | | | 27.3 | 34.1 | 42.1 | ZB220KCE | | | | | 13.0 | 13.2 | 13.5 |
| **Digital Models** | | | | | | | | | | | | | | | |
| ZBD21KCE | | | | 2.0* | 2.7 | 3.3 | 4.0 | ZBD21KCE | | | | 1.2* | 1.3 | 1.4 | 1.4 |
| ZBD29KCE | | | | 2.5* | 3.3 | 4.2 | 5.2 | ZBD29KCE | | | | 1.7* | 1.7 | 1.7 | 1.7 |
| ZBD38KCE | | | | 3.2* | 4.4 | 5.5 | 6.8 | ZBD38KCE | | | | 1.9* | 2.1 | 2.2 | 2.3 |
| ZBD45KCE | | | | 3.8* | 5.1 | 6.4 | 7.9 | ZBD45KCE | | | | 2.3* | 2.4 | 2.5 | 2.6 |
| ZBD57KCE | | | | 4.7* | 6.4 | 8.1 | 10.1 | ZBD57KCE | | | | 3.4* | 3.4 | 3.4 | 3.5 |
| ZBD76K5E* | | | | 6.2 | 7.9 | 10.0 | 12.6 | ZBD76K5E | | | | 5.3 | 5.3 | 5.4 | 5.4 |
| ZBD114K5E* | | | | 8.1 | 11.1 | 14.6 | 18.7 | ZBD114K5E | | | | 7.4 | 7.4 | 7.4 | 7.5 |

*Conditions: Suction Superheat 10K, Subcooling 0K
** Single Phase Only

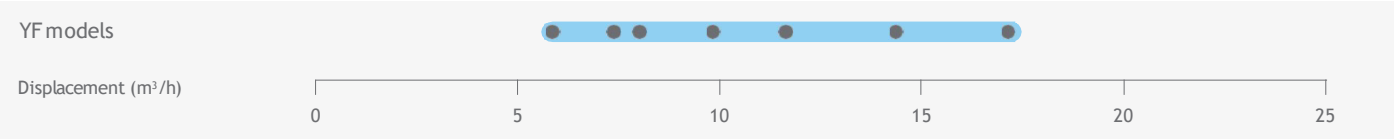
# Copeland™ YF Scroll Compressor Range for Low Temperature Refrigeration for Low GWP Refrigerants Classified as A2L

The new Copeland YF*K1E scroll compressors for low temperature applications feature an optimized design for F-Gas compliant low GWP A2L refrigerants. The scroll compressor was optimized internally and externally to create the most reliable compressor with refrigerants with a high HFO content.

These compressors, available with displacements from 5.9 to 25.1 m³/h are designed to provide seasonal efficiencies 15% higher than traditional semi-hermetic compressors. These compressors are extremely quiet and can be fitted with an external sound shell for an additional 10 - 12 dBA sound reduction, which makes them best choice for refrigeration applications in urban and domestic areas.

YF scroll compressor

## YF Scroll Compressors Line-up




## Features and Benefits

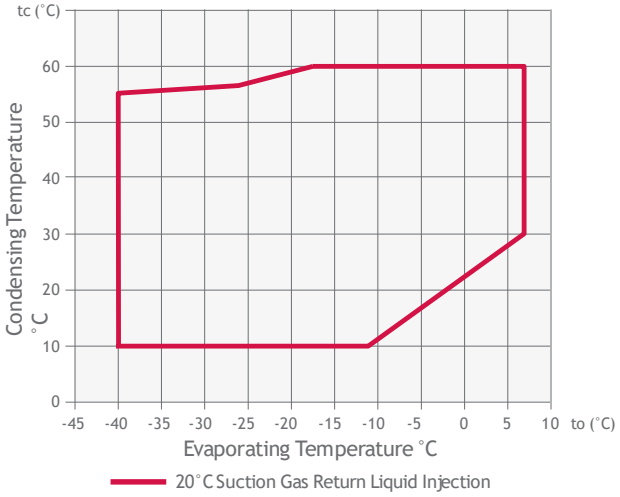
- One model for multiple refrigerants: R455A, R454A, R454C
- Fully hermetic design to avoid risk of refrigerant leakage
- Flexibility in terms of required capacity: multiple design options
- Extremely quiet operation, specially adapted to applications in urban and domestic areas
- Light weight and compact design

## Maximum Allowable Pressure (PS)

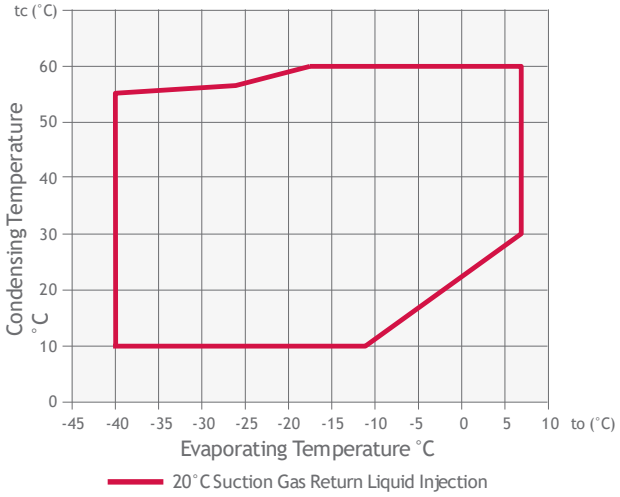
- Low Side PS 23.5 bar (g)
- High Side PS 38 bar (g)

## Operating Envelope

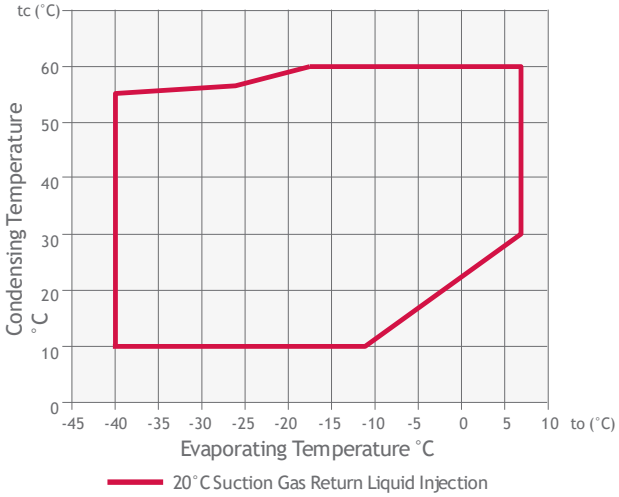
### YF*1E - R455A




### YF*1E - R454C




### YF*1E - R454A



# Technical Overview

| Models | Nominal hp | Displacement ($m^3/h$) | Rotalock Suction (inch) | Rotalock 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** | |
| YF05K1E | 2.0 | 5.9 | 3/4 | 1/2 | 1.3 | 253/248/369 | 25 | TFD | 5 | 26 | 57 |
| YF06K1E | 2.5 | 7.3 | | | 1.5 | 253/248/391 | 27 | TFD | 6 | 32 | 59 |
| YF07K1E | 2.8 | 8.0 | 3 4 | 1/2 | 1.5 | 253/248/391 | 27 | TFD | 6 | 40 | 62 |
| YF09K1E | 3.5 | 9.9 | 3/4 | 1/2 | 1.5 | 253/248/405 | 28 | TFD | 7 | 46 | 63 |
| YF10K1E | 4.0 | 11.7 | 7/8 | 1/2 | 1.9 | 258/263/442 | 38 | TFD | 8 | 52 | 65 |
| YF13K1E | 5.0 | 14.4 | 7/8 | 1/2 | 1.9 | 258/263/442 | 39 | TFD | 10 | 64 | 65 |
| YF15K1E | 6.0 | 17.1 | 7/8 | 1/2 | 1.9 | 258/263/442 | 41 | TFD | 13 | 74 | 67 |

** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R455A | Cooling Capacity (kW) | | | | | | | R455A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| Models with Liquid Injection Only | | | | | | | | | | | | | | | |
| YF05K1E | 1.2 | 1.5 | 1.9 | 2.4 | 2.9 | 3.5 | 4.2 | YF05K1E | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 |
| YF06K1E | 1.5 | 1.9 | 2.4 | 2.9 | 3.6 | 4.3 | 5.2 | YF06K1E | 1.2 | 1.3 | 1.3 | 1.4 | 1.4 | 1.5 | 1.5 |
| YF07K1E | 1.6 | 2.1 | 2.6 | 3.2 | 3.9 | 4.7 | 5.7 | YF07K1E | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 |
| YF09K1E | 2.0 | 2.5 | 3.2 | 3.9 | 4.8 | 5.9 | 5.7 | YF09K1E | 1.6 | 1.7 | 1.8 | 1.9 | 1.9 | 2.0 | 2.1 |
| YF10K1E | 2.4 | 3.0 | 3.8 | 4.7 | 5.7 | 6.9 | 7.1 | YF10K1E | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 |
| YF13K1E | 2.9 | 3.7 | 4.6 | 5.7 | 6.9 | 8.5 | 8.3 | YF13K1E | 2.3 | 2.4 | 2.6 | 2.7 | 2.8 | 2.9 | 3.0 |
| YF15K1E | 3.4 | 4.3 | 5.4 | 6.7 | 8.2 | 10.0 | 12.0 | YF15K1E | 2.8 | 2.9 | 3.0 | 3.1 | 3.3 | 3.4 | 3.5 |

Conditions: Suction Gas Return 20°C /Subcooling 0K
Preliminary Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454C | Cooling Capacity (kW) | | | | | | | R454C | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| Models with Liquid Injection Only | | | | | | | | | | | | | | | |
| YF05K1E | 1.1 | 1.4 | 1.7 | 2.2 | 2.7 | 3.2 | 3.9 | YF05K1E | 0.9 | 0.9 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 |
| YF06K1E | 1.4 | 1.7 | 2.1 | 2.7 | 3.3 | 4.0 | 4.8 | YF06K1E | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 |
| YF07K1E | 1.5 | 1.9 | 2.3 | 2.9 | 3.6 | 4.4 | 5.3 | YF07K1E | 1.2 | 1.3 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 |
| YF09K1E | 1.8 | 2.3 | 2.9 | 3.6 | 4.4 | 5.4 | 6.5 | YF09K1E | 1.5 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.9 |
| YF10K1E | 2.2 | 2.8 | 3.4 | 4.2 | 5.2 | 6.4 | 7.7 | YF10K1E | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 |
| YF13K1E | 2.7 | 3.4 | 4.2 | 5.2 | 6.3 | 7.7 | 9.3 | YF13K1E | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 |
| YF15K1E | 3.2 | 4.0 | 5.0 | 6.1 | 7.5 | 9.1 | 11.0 | YF15K1E | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 | 3.0 | 3.2 |

Conditions: Suction Gas Return 20°C /Subcooling 0K
Preliminary Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R454A | Cooling Capacity (kW) | | | | | | | R454A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| Models with Liquid Injection Only | | | | | | | | | | | | | | | |
| YF05K1E | 1.4 | 1.7 | 2.1 | 2.6 | 3.2 | 3.9 | 4.6 | YF05K1E | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 |
| YF06K1E | 1.7 | 2.1 | 2.7 | 3.3 | 4.0 | 4.8 | 5.7 | YF06K1E | 1.4 | 1.5 | 1.5 | 1.6 | 1.7 | 1.7 | 1.8 |
| YF07K1E | 1.9 | 2.3 | 2.9 | 3.6 | 4.3 | 5.3 | 6.3 | YF07K1E | 1.6 | 1.6 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 |
| YF09K1E | 2.3 | 2.9 | 3.6 | 4.4 | 5.4 | 6.5 | 7.8 | YF09K1E | 1.9 | 2.0 | 2.1 | 2.2 | 2.2 | 2.3 | 2.4 |
| YF10K1E | 2.7 | 3.4 | 4.3 | 5.2 | 6.4 | 7.7 | 9.2 | YF10K1E | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 |
| YF13K1E | 3.4 | 4.2 | 5.2 | 6.4 | 7.8 | 9.4 | 11.4 | YF13K1E | 2.7 | 2.8 | 2.9 | 3.1 | 3.2 | 3.3 | 3.4 |
| YF15K1E | 4.0 | 5.0 | 6.2 | 7.6 | 9.2 | 11.2 | 13.4 | YF15K1E | 3.2 | 3.3 | 3.5 | 3.6 | 3.8 | 3.9 | 4.1 |

Conditions: Suction Gas Return 20°C /Subcooling 0K
Preliminary Data

# Copeland™ ZF and ZFD Scroll Compressor Ranges for Low Temperature Refrigeration Using R407A/F, R448A/R449A and R404A

Emerson developed the ZF range to provide the best performance in low temperature. The range has a wide application envelope as it can operate from -40°C evaporating temperature to +7°C. They have been optimized in their design to perfectly fit frozen food application requirements. Thanks to their scroll compliance mechanism, these scroll compressors feature particularly high tolerance to liquid slugging.

The range consists of:

- The ZF*K4E models that operate with liquid injection in order to control discharge temperature and increase the operating envelope.
- The ZF*KVE models that are optimized for vapor injection with use of a sub-cooler. This boosts refrigeration system's cooling capacity and efficiency.
- The Summit ZF*K5E models that operate both with liquid injection or vapor injection.

These compressors are qualified for R407A/F, R448A/R449A, R404A and R134a for certain models.

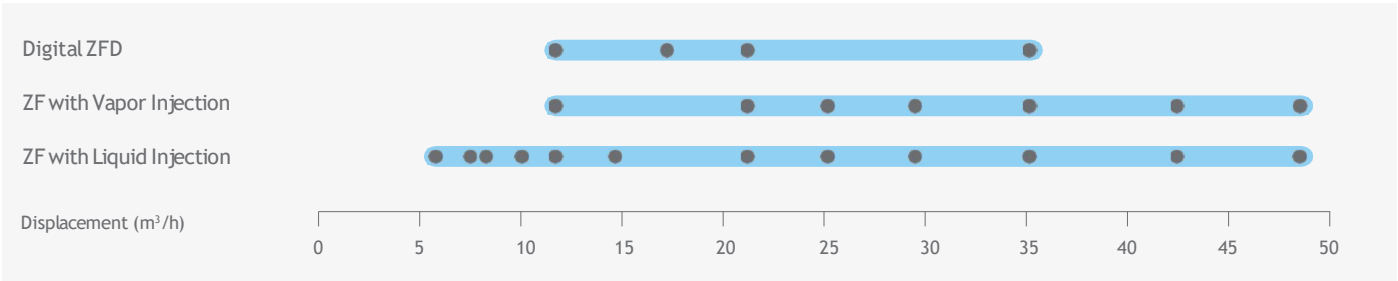
ZF compressor for low temperature refrigeration with and without sound shell

## ZFD Digital Scroll Compressors

Based on the unique Copeland compliant scroll design, the digital modulation operates on a simple mechanism. Capacity control is achieved by separating the scroll sets axially over a small period of time. It is a simple mechanical solution allowing precise temperature control and system efficiency and it requires no other components.

Digital scroll technology provides continuous, stepless modulation from 10% to 100% with no operating envelope restriction. As a result, system pressures and temperatures are tightly controlled. These compressors provide optimum performance for refrigeration units, refrigeration packs, process and agricultural units.

## ZF and ZFD Compressor Line-Up




## Features and Benefits

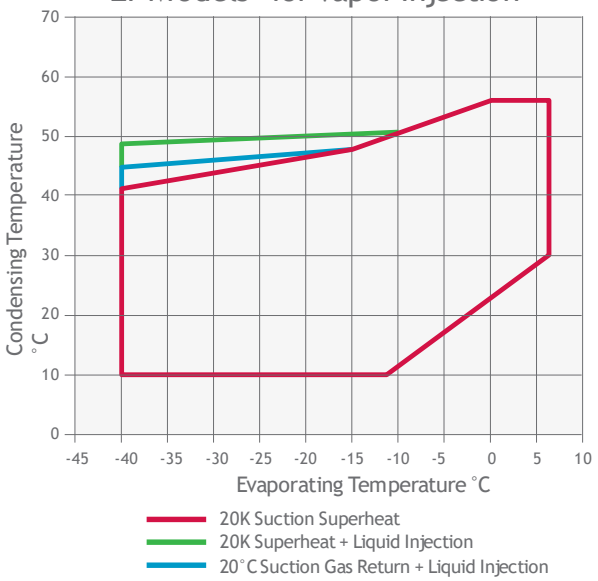
- Wide operating envelope with 10°C low condensing temperature to minimize energy consumption
- One model for multiple refrigerants
- Light weight and compactness, up to half the weight of equivalent semi-hermetic compressor
- Optional sound shell allowing up to 10 dBA sound attenuation
- ZF models with liquid injection
  - Easy, efficient and reliable injection via Discharge Temperature Control valve (DTC)
- ZF models with enhanced vapor injection
  - Seasonal efficiencies compared to Emerson's best semi-hermetic compressors
  - Improved system capacity and efficiency by 40% and 25% respectively, making them the most efficient compressors on the market.
  - Possibility to reduce the equipment and component sizes by using smaller compressors

## Maximum Allowable Pressure (PS)

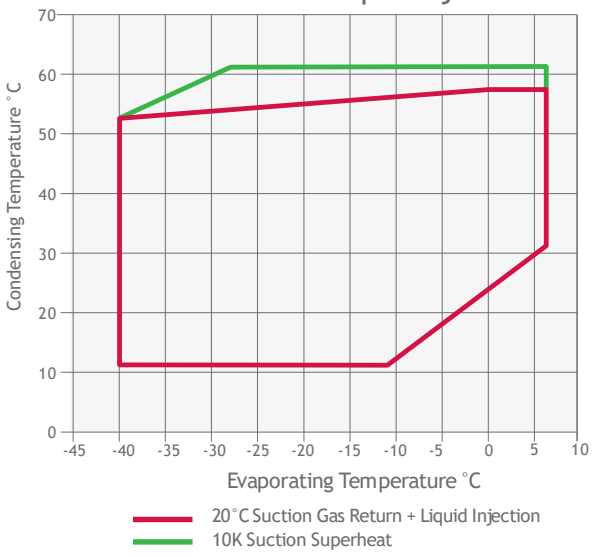
- ZF06 to ZF18 (K4E/KVE):
  Low Side PS 21 bar(g) / High Side PS 32 bar(g)
- ZF25 to ZF54 (K5E):
  Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)
- Digital ZFD:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)

## Operating Envelope R407A

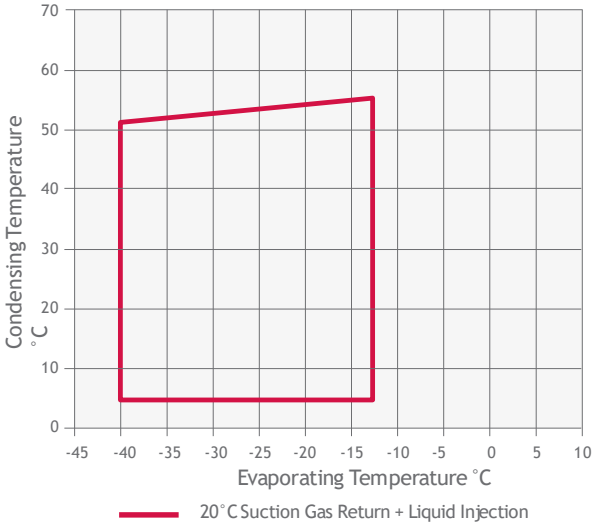
### ZF Models - for Vapor Injection




### ZF Models - for Liquid Injection

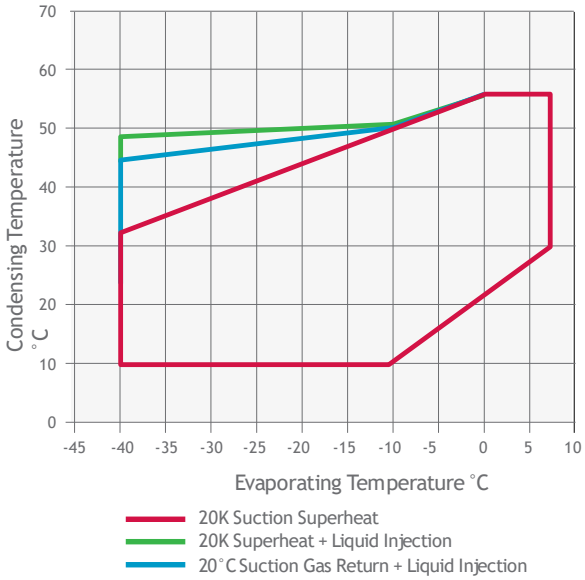



### ZFD Models

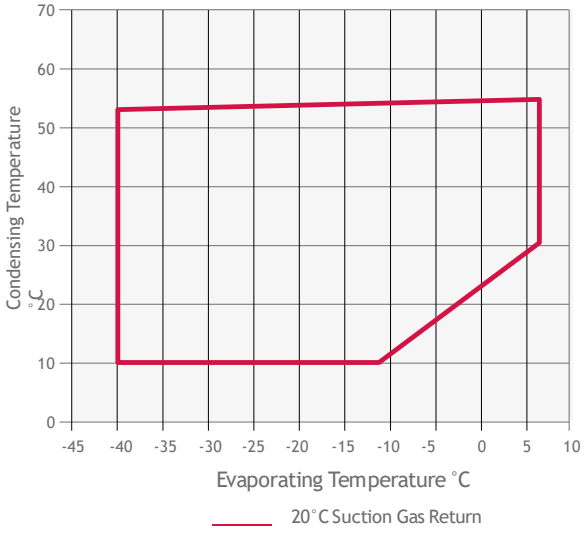



## Operating Envelope R407F

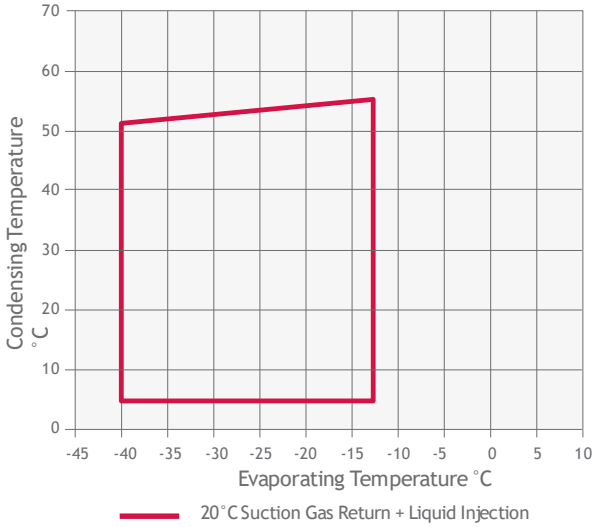
### ZF Models - for Vapor Injection




### ZF Models - for Liquid Injection

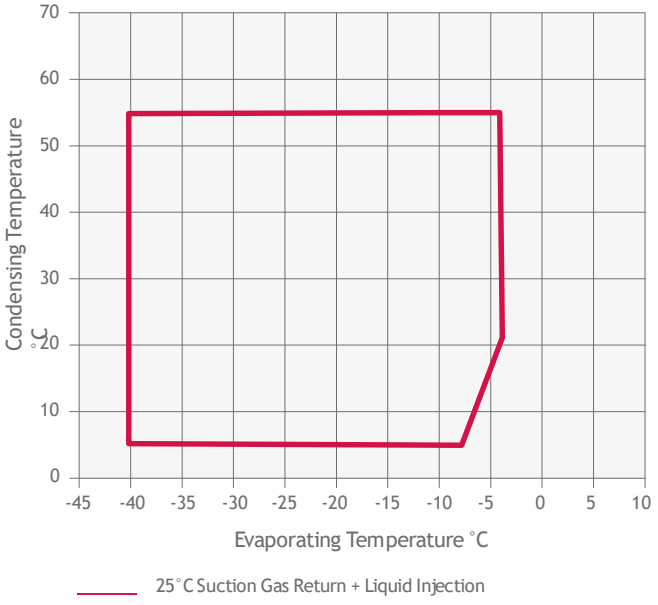



### ZFD Models



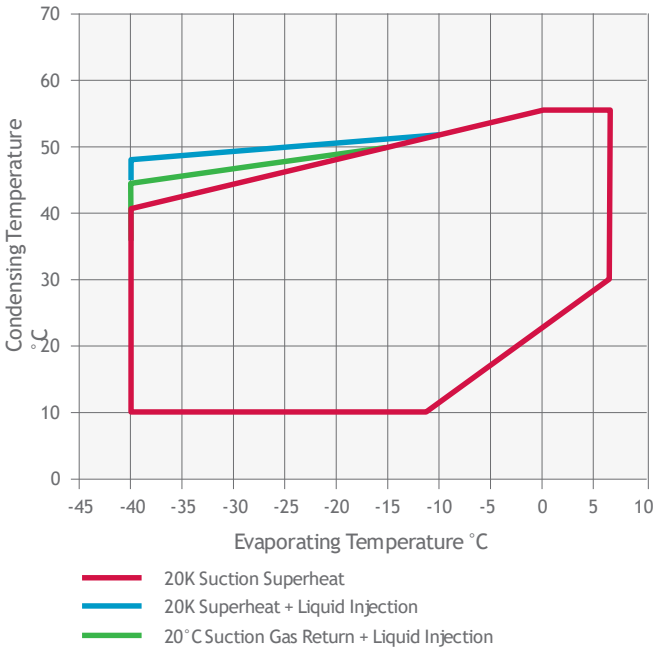
# Operating Envelope R448A/R449A

## ZF Models - for Liquid Injection




For individual model details please refer to Select Software.

## For ZFD Digital Models




# Technical Overview

| Models | Nominal hp | Displacement ($m^3/h$) | Rotalock Suction (inch) | Rotalock 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** | |
| **Models with Liquid Injection only** | | | | | | | | | | | |
| ZF06K4E | 2.0 | 5.9 | 1 1/4 | 1 | 1.3 | 243/245/369 | 25.4 | TFD | 5 | 26 | 57 |
| ZF08K4E | 2.5 | 7.3 | 1 1/4 | 1 | 1.5 | 243/245/391 | 27.2 | TFD | 6 | 32 | 59 |
| ZF09K4E | 2.8 | 8.0 | 1 1/4 | 1 | 1.5 | 243/244/391 | 27.0 | TFD | 6 | 40 | 62 |
| ZF11K4E | 3.5 | 9.9 | 1 1/4 | 1 | 1.5 | 243/244/405 | 28.0 | TFD | 7 | 46 | 63 |
| ZF13K4E | 4.0 | 11.8 | 1 1/4 | 1 | 1.9 | 246/251/442 | 38.0 | TFD | 8 | 51 | 65 |
| ZF15K4E | 5.0 | 14.5 | 1 1/4 | 1 | 1.9 | 246/251/442 | 39.0 | TFD | 10 | 64 | 65 |
| ZF18K4E | 6.0 | 17.1 | 1 1/4 | 1 | 1.9 | 246/251/442 | 41.0 | TFD | 12 | 74 | 67 |
| **Models with Vapor Injection only** | | | | | | | | | | | |
| ZF13KVE | 4.0 | 11.7 | 1 1/4 | 1 | 1.9 | 246/251/442 | 38.0 | TFD | 9 | 64 | 63 |
| ZF18KVE | 6.0 | 17.1 | 1 1/4 | 1 | 1.9 | 246/251/442 | 39.5 | TFD | 13 | 74 | 67 |
| **Models which can have Liquid or Vapor Injection** | | | | | | | | | | | |
| ZF25K5E | 7.5 | 21.4 | 1 1/4 | 1 1/4 | 1.9 | 246/257/452 | 39.5 | TFD | 16 | 102 | 70 |
| ZF34K5E | 10.0 | 29.1 | 1 3/4 | 1 1/4 | 3.4 | 280/280/534 | 63.1 | TFD | 25 | 100 | 68 |
| ZF41K5E | 13.0 | 35.3 | 1 3/4 | 1 1/4 | 3.4 | 280/280/534 | 63.1 | TFD | 29 | 118 | 69 |
| ZF49K5E | 15.0 | 42.4 | 1 3/4 | 1 1/4 | 3.4 | 280/280/552 | 66.2 | TFD | 30 | 139 | 72 |
| ZF54K5E | 17.0 | 48.3 | 1 3/4 | 1 1/4 | 3.4 | 363/312/552 | 66.2 | TFD | 31 | 168 | 78 |
| **Digital Models** | | | | | | | | | | | |
| ZFD13KVE EVI | 4.0 | 11.7 | 1 1/4 | 1 | 1.9 | 246/250/481 | 38 | TFD | 9 | 64 | 65 |
| ZFD18KVE EVI | 6.0 | 17.1 | 1 1/4 | 1 | 1.9 | 300/299/481 | 43 | TFD | 13 | 74 | 67 |
| ZFD25KVE EVI | 7.5 | 21.4 | 1 1/4 | 1 1/4 | 1.9 | 246/250/481 | 43 | TFD | 16 | 102 | 70 |
| ZFD41K5E | 10.0 | 35.3 | 1 3/4 | 1 1/4 | 3.4 | 310/280/534 | 66 | TFD | 20 | 118 | 73 |
| ZFD41K5E EVI | 13.0 | 35.3 | 1 3/4 | 1 1/4 | 3.4 | 310/280/534 | 66 | TFD | 20 | 118 | 72 |

** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407A | Cooling Capacity (kW) | | | | | | | R407A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| **Models with Liquid Injection Only** | | | | | | | | | | | | | | | |
| ZF06K4E | 1.2 | 1.5 | 1.9 | 2.3 | 2.8 | 3.5 | 4.2 | ZF06K4E | 1.2 | 1.2 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 |
| ZF08K4E | 1.4 | 1.9 | 2.4 | 3.0 | 3.6 | 4.4 | 5.3 | ZF08K4E | 1.4 | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 |
| ZF09K4E | 1.6 | 2.0 | 2.6 | 3.2 | 3.9 | 4.8 | 5.9 | ZF09K4E | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 1.9 |
| ZF11K4E | 2.0 | 2.6 | 3.2 | 4.0 | 4.9 | 6.0 | 7.3 | ZF11K4E | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.2 | 2.3 |
| ZF13K4E | 2.2 | 2.9 | 3.6 | 4.5 | 5.6 | 6.8 | 8.3 | ZF13K4E | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | 2.8 |
| ZF15K4E | 2.7 | 3.5 | 4.4 | 5.5 | 6.8 | 8.4 | 10.2 | ZF15K4E | 2.7 | 2.8 | 2.9 | 3.1 | 3.2 | 3.4 | 3.6 |
| ZF18K4E | 3.3 | 4.3 | 5.4 | 6.7 | 8.3 | 10.2 | 12.4 | ZF18K4E | 3.3 | 3.4 | 3.5 | 3.6 | 3.8 | 3.9 | 4.1 |
| **Models with Vapor Injection Only** | | | | | | | | | | | | | | | |
| ZF13KVE | 3.1 | 3.9 | 4.9 | 5.9 | 7.2 | 8.7 | 10.4 | ZF13KVE | 2.4 | 2.4 | 2.5 | 2.6 | 2.7 | 2.7 | 2.7 |
| ZF18KVE | 4.9 | 6.0 | 7.3 | 8.8 | 10.8 | 13.3 | 16.4 | ZF18KVE | 3.4 | 3.5 | 3.6 | 3.7 | 3.9 | 4.1 | 4.4 |
| **Models which can have Liquid or Vapor Injection** | | | | | | | | | | | | | | | |
| ZF25K5E | 4.3 | 5.5 | 6.9 | 8.6 | 10.7 | 13.2 | 16.0 | ZF25K5E | 4.0 | 4.2 | 4.5 | 4.7 | 4.9 | 5.2 | 5.4 |
| ZF25K5E (EVI) | 6.1 | 7.7 | 9.4 | 11.4 | 13.5 | 15.8 | 18.2 | ZF25K5E (EVI) | 4.3 | 4.4 | 4.6 | 4.8 | 5.0 | 5.3 | 5.5 |
| ZF34K5E | 5.9 | 7.6 | 9.6 | 12.1 | 15.0 | 18.3 | 22.3 | ZF34K5E | 5.1 | 5.5 | 5.9 | 6.2 | 6.6 | 6.9 | 7.3 |
| ZF34K5E (EVI) | 8.0 | 9.9 | 12.1 | 14.6 | 17.4 | 20.7 | 24.2 | ZF34K5E (EVI) | 5.3 | 5.5 | 5.7 | 5.9 | 6.1 | 6.3 | 6.4 |
| ZF41K5E | 7.3 | 9.3 | 11.7 | 14.5 | 17.9 | 21.8 | 26.4 | ZF41K5E | 6.2 | 6.7 | 7.1 | 7.6 | 8.0 | 8.4 | 8.9 |
| ZF41K5E (EVI) | 10.1 | 12.6 | 15.5 | 18.7 | 22.1 | 25.8 | 29.7 | ZF41K5E (EVI) | 6.7 | 6.9 | 7.2 | 7.4 | 7.6 | 7.8 | 8.0 |
| ZF49K5E | 8.6 | 11.2 | 14.1 | 17.7 | 21.9 | 26.8 | 32.5 | ZF49K5E | 7.6 | 8.2 | 8.7 | 9.2 | 9.7 | 10.2 | 10.7 |
| ZF49K5E (EVI) | 12.1 | 15.1 | 18.4 | 22.3 | 26.8 | | | ZF49K5E (EVI) | 8.0 | 8.3 | 8.5 | 8.8 | 9.1 | | |
| ZF54K5E | 9.5 | 12.2 | 15.4 | 19.3 | 23.8 | | | ZF54K5E | 8.1 | 8.6 | 9.3 | 10.0 | 10.8 | | |
| ZF54K5E (EVI) | 14.5 | 17.8 | 21.6 | 26.1 | 31.4 | | | ZF54K5E (EVI) | 9.7 | 10.1 | 10.4 | 10.7 | 11.1 | | |
| **Digital Models** | | | | | | | | | | | | | | | |
| ZFD13KVE EVI | 3.1 | 4.1 | 5.2 | 6.4 | 7.7 | 9.2 | 10.9 | ZFD13KVE EVI | 2.7 | 2.8 | 2.8 | 2.9 | 2.9 | 3.0 | 3.1 |
| ZFD18KVE EVI | 4.9 | 6.0 | 7.3 | 8.8 | 10.8 | 13.3 | 16.4 | ZFD18KVE EVI | 3.4 | 3.5 | 3.6 | 3.7 | 3.9 | 4.1 | 4.4 |
| ZFD25KVE EVI | 6.1 | 7.7 | 9.4 | 11.4 | 13.5 | 15.8 | 18.2 | ZFD25KVE EVI | 4.3 | 4.4 | 4.6 | 4.8 | 5.0 | 5.3 | 5.5 |
| ZFD41K5E | 7.3 | 9.3 | 11.8 | 14.6 | | | | ZFD41K5E | 6.2 | 6.7 | 7.2 | 7.5 | | | |
| ZFD41K5E EVI | 10.1 | 12.6 | 15.5 | 18.7 | 22.1 | 25.8 | 23.7 | ZFD41K5E EVI | 6.7 | 6.9 | 7.2 | 7.4 | 7.6 | 7.8 | 8.0 |

Conditions: Suction Gas Return 20°C /Subcooling 0K

Preliminary Data

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407F | Cooling Capacity (kW) | | | | | | | R407F | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| **Models with Liquid Injection Only** | | | | | | | | | | | | | | | |
| ZF06K4E | 1.2 | 1.5 | 1.9 | 2.3 | 2.8 | 3.5 | 4.2 | ZF06K4E | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 |
| ZF08K4E | 1.4 | 1.9 | 2.4 | 3.0 | 3.6 | 4.4 | 5.3 | ZF08K4E | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 1.9 |
| ZF09K4E | 1.6 | 2.0 | 2.6 | 3.2 | 3.9 | 4.8 | 5.9 | ZF09K4E | 1.6 | 1.6 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| ZF11K4E | 2.0 | 2.6 | 3.2 | 4.0 | 4.9 | 6.0 | 7.3 | ZF11K4E | 1.9 | 2.0 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 |
| ZF13K4E | 2.2 | 2.9 | 3.6 | 4.5 | 5.6 | 6.8 | 8.3 | ZF13K4E | 2.4 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 |
| ZF15K4E | 2.7 | 3.5 | 4.4 | 5.5 | 6.8 | 8.4 | 10.2 | ZF15K4E | 2.8 | 3.0 | 3.1 | 3.2 | 3.4 | 3.5 | 3.8 |
| ZF18K4E | 3.3 | 4.3 | 5.4 | 6.7 | 8.3 | 10.2 | 12.4 | ZF18K4E | 3.5 | 3.6 | 3.7 | 3.8 | 4.0 | 4.1 | 4.3 |
| **Models with Vapor Injection Only** | | | | | | | | | | | | | | | |
| ZF13KVE | 3.3 | 4.3 | 5.4 | 6.7 | 8.1 | 9.7 | 11.5 | ZF13KVE | 2.8 | 2.9 | 3.0 | 3.0 | 3.1 | 3.2 | 3.3 |
| ZF18KVE | 4.9 | 6.1 | 7.6 | 9.3 | 11.3 | 13.5 | 16.0 | ZF18KVE | 3.8 | 4.0 | 4.1 | 4.2 | 4.4 | 4.5 | 4.7 |
| **Models which can have Liquid or Vapor Injection** | | | | | | | | | | | | | | | |
| ZF25K5E | 4.5 | 5.8 | 7.3 | 9.1 | 11.3 | 13.8 | 16.8 | ZF25K5E | 4.2 | 4.4 | 4.7 | 4.9 | 5.2 | 5.4 | 5.7 |
| ZF25K5E (EVI) | 6.4 | 8.0 | 9.9 | 11.9 | 14.2 | 16.6 | 19.1 | ZF25K5E (EVI) | 4.5 | 4.7 | 4.9 | 5.1 | 5.3 | 5.5 | 5.8 |
| ZF34K5E | 6.2 | 8.0 | 10.1 | 12.7 | 15.7 | 19.3 | 23.4 | ZF34K5E | 5.6 | 5.8 | 6.0 | 6.2 | 6.4 | 6.6 | 6.8 |
| ZF34K5E (EVI) | 8.3 | 10.4 | 12.7 | 15.4 | 18.4 | 21.7 | 25.4 | ZF34K5E (EVI) | 5.3 | 5.5 | 5.7 | 5.9 | 6.1 | 6.3 | 6.4 |
| ZF41K5E | 7.6 | 9.7 | 12.3 | 15.2 | 18.8 | 22.9 | 27.7 | ZF41K5E | 6.5 | 7.0 | 7.5 | 8.0 | 8.4 | 8.9 | 9.3 |
| ZF41K5E (EVI) | 10.6 | 13.3 | 16.3 | 19.6 | 23.2 | 27.1 | 31.2 | ZF41K5E (EVI) | 7.0 | 7.3 | 7.5 | 7.7 | 8.0 | 8.2 | 8.4 |
| ZF49K5E | 9.1 | 11.7 | 14.8 | 18.6 | 23.0 | 28.1 | 34.2 | ZF49K5E | 8.0 | 8.6 | 9.1 | 9.6 | 10.2 | 10.7 | 11.2 |
| ZF49K5E (EVI) | 14.1 | 17.1 | 20.5 | 24.5 | 28.9 | | | ZF49K5E (EVI) | 9.1 | 9.7 | 10.3 | 10.8 | 11.3 | | |
| ZF54K5E | 9.9 | 12.6 | 15.8 | 19.5 | 23.9 | | | ZF54K5E | 8.5 | 9.1 | 9.8 | 10.5 | 11.3 | | |
| ZF54K5E (EVI) | 15.2 | 18.7 | 22.7 | 27.4 | 33.0 | | | ZF54K5E (EVI) | 10.2 | 10.6 | 10.9 | 11.3 | 11.6 | | |
| **Digital Models** | | | | | | | | | | | | | | | |
| ZFD13KVE EVI | 3.3 | 4.3 | 5.4 | 6.7 | 8.1 | 9.7 | 11.4 | ZFD13KVE EVI | 2.8 | 2.9 | 3.0 | 3.0 | 3.1 | 3.1 | 3.2 |
| ZFD18KVE EVI | 4.9 | 6.1 | 7.6 | 9.3 | 11.3 | 13.5 | 16.0 | ZFD18KVE EVI | 3.8 | 4.0 | 4.1 | 4.2 | 4.4 | 4.5 | 4.7 |
| ZFD25KVE EVI | 6.4 | 8.0 | 9.9 | 11.9 | 14.2 | 16.6 | 19.1 | ZFD25KVE EVI | 4.5 | 4.7 | 4.9 | 5.1 | 5.3 | 5.5 | 5.8 |
| ZFD41K5E | 7.3 | 9.3 | 11.8 | 14.6 | | | | ZFD41K5E | 6.2 | 6.7 | 7.2 | 7.5 | | | |
| ZFD41K5E EVI | 23.5 | 29.8 | 37.2 | 45.9 | | | | ZFD41K5E KVE | 6.4 | 6.6 | 6.8 | 7.1 | | | |

Conditions: Suction Gas Return 20°C / Subcooling 0K

Preliminary Data

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R448A/ R449A | Cooling Capacity (kW) | | | | | | | R448A/ R449A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| **Models with Liquid Injection Only** | | | | | | | | | | | | | | | |
| ZF06K4E | 1.2 | 1.5 | 1.9 | 2.4 | 2.9 | 3.6 | 4.3 | ZF06K4E | 1.3 | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 | 1.6 |
| ZF08K4E | 1.4 | 1.8 | 2.3 | 2.9 | 3.5 | 4.4 | 5.3 | ZF08K4E | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 1.9 |
| ZF09K4E | 1.7 | 2.1 | 2.6 | 3.3 | 4.0 | 4.9 | 5.9 | ZF09K4E | 1.5 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| ZF11K4E | 2.1 | 2.6 | 3.3 | 4.0 | 4.9 | 6.0 | 7.2 | ZF11K4E | 2.0 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.6 |
| ZF13K4E | 2.4 | 3.1 | 3.9 | 4.8 | 5.9 | 7.2 | 8.6 | ZF13K4E | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.8 |
| ZF15K4E | 3.0 | 3.8 | 4.8 | 5.9 | 7.2 | 8.6 | 10.3 | ZF15K4E | 2.8 | 2.8 | 3.0 | 3.1 | 3.3 | 3.4 | 3.6 |
| ZF18K4E | 3.6 | 4.7 | 5.9 | 7.2 | 8.8 | 10.7 | 12.9 | ZF18K4E | 3.6 | 3.6 | 3.6 | 3.6 | 3.7 | 3.9 | 4.0 |
| **Models with Vapor Injection Only** | | | | | | | | | | | | | | | |
| ZF13KVE | 3.2 | 4.1 | 5.1 | 6.2 | 7.5 | 9.0 | 10.6 | ZF13KVE | 2.5 | 2.6 | 2.7 | 2.8 | 2.8 | 2.9 | 2.9 |
| ZF18KVE | 4.9 | 6.0 | 7.4 | 9.0 | 10.9 | 13.0 | 15.5 | ZF18KVE | 3.4 | 3.7 | 3.9 | 4.0 | 4.1 | 4.2 | 4.3 |
| **Models which can have Liquid or Vapor Injection** | | | | | | | | | | | | | | | |
| ZF25K5E | 4.9 | 6.1 | 7.6 | 9.4 | 11.4 | 13.8 | 16.6 | ZF25K5E | 3.8 | 3.9 | 4.1 | 4.3 | 4.5 | 4.8 | 5.0 |
| ZF25K5E (EVI) | 6.1 | 7.7 | 9.4 | 11.3 | 13.4 | 15.6 | 17.9 | ZF25K5E (EVI) | 4.0 | 4.3 | 4.6 | 4.9 | 5.2 | 5.4 | 5.6 |
| ZF34K5E | 6.1 | 7.8 | 9.8 | 12.1 | 14.9 | 18.1 | 21.7 | ZF34K5E | 5.1 | 5.3 | 5.4 | 5.7 | 6.0 | 6.3 | 6.7 |
| ZF34K5E (EVI) | 8.1 | 10.3 | 12.7 | 15.5 | 18.6 | 22.1 | 26.0 | ZF34K5E (EVI) | 5.7 | 6.1 | 6.5 | 7.0 | 7.5 | 8.1 | 8.7 |
| ZF41K5E | 7.4 | 9.4 | 11.8 | 14.6 | 17.8 | 21.5 | 25.8 | ZF41K5E | 5.8 | 6.1 | 6.5 | 7.0 | 7.7 | 8.4 | 9.4 |
| ZF41K5E (EVI) | 9.8 | 12.5 | 15.5 | 18.9 | 22.6 | 26.9 | 31.6 | ZF41K5E (EVI) | 7.0 | 7.5 | 8.0 | 8.6 | 9.2 | 9.9 | 10.7 |
| ZF49K5E | 9.1 | 11.6 | 14.6 | 18.1 | 22.2 | 27.0 | 32.5 | ZF49K5E | 7.7 | 7.8 | 8.0 | 8.4 | 8.9 | 9.4 | 10.0 |
| ZF49K5E (EVI) | 11.8 | 14.8 | 18.2 | 22.1 | 26.6 | | | ZF49K5E (EVI) | 8.6 | 9.1 | 9.6 | 10.2 | 10.9 | | |
| ZF54K5E | 10.0 | 12.7 | 15.9 | 19.8 | 24.3 | | | ZF54K5E | 8.0 | 8.6 | 9.3 | 10.1 | 10.9 | | |
| ZF54K5E (EVI) | 14.1 | 17.4 | 21.4 | 25.9 | 31.2 | | | ZF54K5E (EVI) | 10.5 | 11.1 | 11.7 | 12.4 | 13.3 | | |
| **Digital Models** | | | | | | | | | | | | | | | |
| ZFD13KVE EVI | 4.0 | 4.9 | 6.0 | 7.2 | 8.5 | 10.0 | 11.7 | ZFD13KVE EVI | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.4 | 3.5 |
| ZFD18KVE EVI | 6.1 | 7.3 | 8.7 | 10.4 | 12.3 | 14.4 | 16.9 | ZFD18KVE EVI | 4.0 | 4.3 | 4.5 | 4.6 | 4.8 | 5.0 | 5.1 |
| ZFD25KVE EVI | 7.7 | 9.3 | 11.2 | 13.2 | 15.3 | 17.5 | 19.7 | ZFD25KVE EVI | 4.8 | 5.1 | 5.4 | 5.7 | 6.0 | 6.3 | 6.6 |
| ZFD41K5E EVI | 12.5 | 15.0 | 18.1 | 21.5 | 25.4 | 29.5 | 33.9 | ZFD41K5E EVI | 7.9 | 8.4 | 8.8 | 9.3 | 9.7 | 10.1 | 10.6 |
| ZFD41K5E | 8.6 | 10.6 | 13.0 | 15.7 | 18.9 | 22.6 | 27.0 | ZFD41K5E | 6.3 | 6.7 | 7.1 | 7.5 | 7.9 | 8.4 | 8.8 |

Conditions: Suction Gas Return 20°C /Subcooling 0K
Preliminary Data

# Copeland™ ZS, ZB & ZF*KA Small Scroll Compressor Range for Medium and Low Temperature Applications

As an extension to the existing ZB*KCE and ZF*K4E scroll range, the new Copeland ZS*KA, ZB*KA and ZF*KA scroll compressors represent the latest innovation in scroll technology for refrigeration equipment covering a small size displacement range of 2.4 $m^3/h$ to 6.7 $m^3/h$.

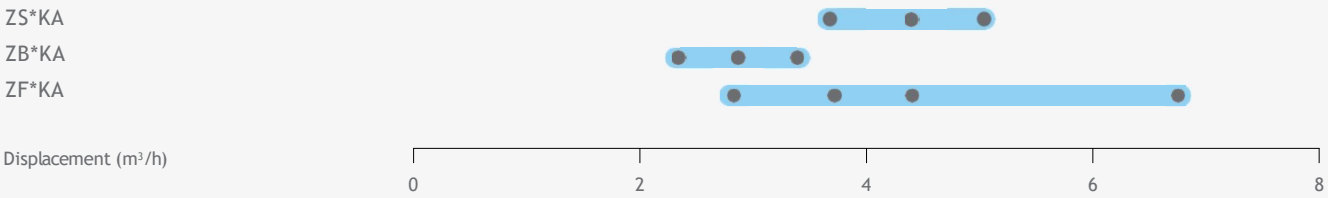
ZS*KA and ZB*KA models are intended for medium temperature refrigeration type systems, and are ideally suited for applications such as walk-in coolers, reach-in coolers, cold rooms, display cases and milk tank units. The ZB*KA scrolls cover a range from 0.7hp to 1.3hp, while ZS*KA cover 1.3hp to 1.8hp.

ZF* KA models are suitable for low temperature type systems such as walk-in freezers and reach-in freezers. They cover a range from 1hp to 2.5hp.

ZS, ZB and ZF* KA are multi-refrigerant capable and feature low sound and low vibration, which is particularly important in the retail and food service sector and recommended for supermarkets, restaurants, convenience stores and milk cooling operations. Their compact design provides seasonal efficiencies up to 28% higher than the equivalent hermetic reciprocating compressors. They are qualified for today's HFC as well as new low GWP refrigerants and HFO blends.

ZS*KA Copeland scroll compressor range for medium temperature refrigeration applications

## Compressor Line-up




## Features and Benefits

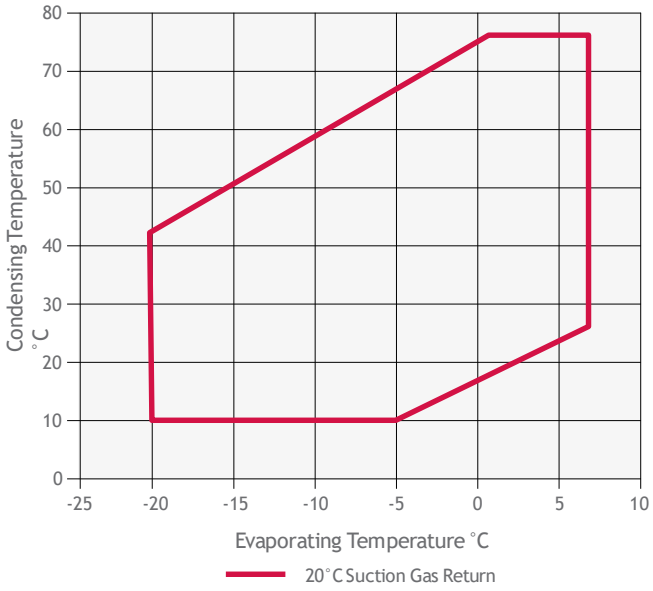
- Copeland scroll axial and radial compliance for superior reliability and efficiency
- High seasonal efficiencies as scrolls are designed at the condition where equipment runs most of the time
- Up to 15% efficiency advantage over hermetic reciprocating compressors at rating conditions, and up to 28% improvement at lower condensing temperatures
- Availability of optional sound shell on all models providing up to 10 dBA additional sound attenuation for silent operation
- Wide operating ranges: from -25°C to 10°C covering a minimum condensing limit of 10°C for ZS*KA and ZB*KA and -40°C to -12°C for ZF*KA
- Qualified for R407A/F/C, R448A, R449A, R404A and R134a refrigerants

## Maximum Allowable Pressure (PS)

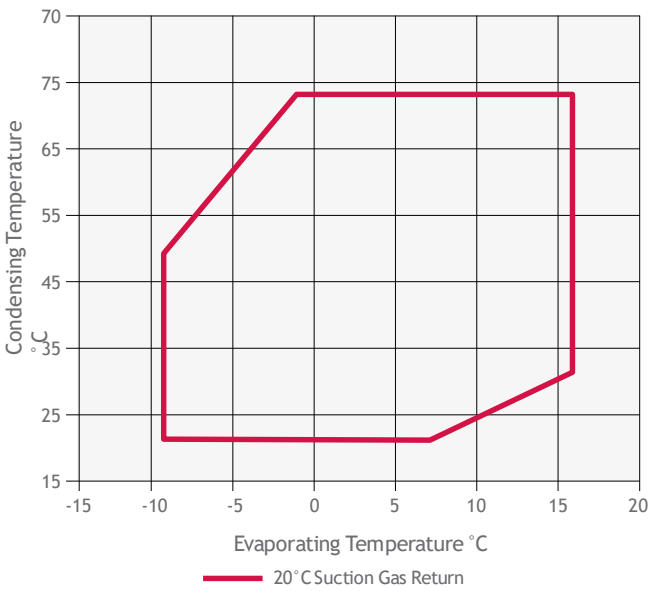
- ZS09 to ZS13KA:
  Low Side PS 21.6 bar(g) / High Side PS 31.9 bar(g)
- ZB06 to ZB08KA:
  Low Side PS 21.0 bar(g) / High Side PS 28.8 bar(g)
- ZF03 to ZF07KA:
  Low Side PS 21.0 bar(g) / High Side PS 28.8 bar(g)

# Operating Envelope

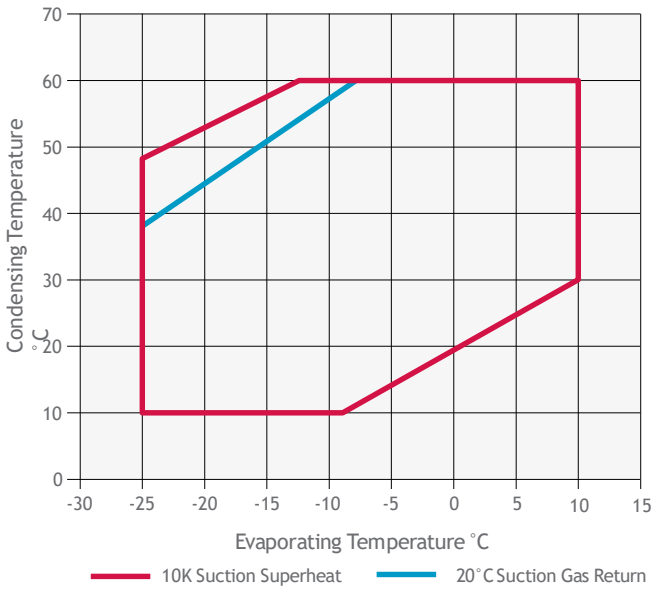
## ZS*KA - R134a



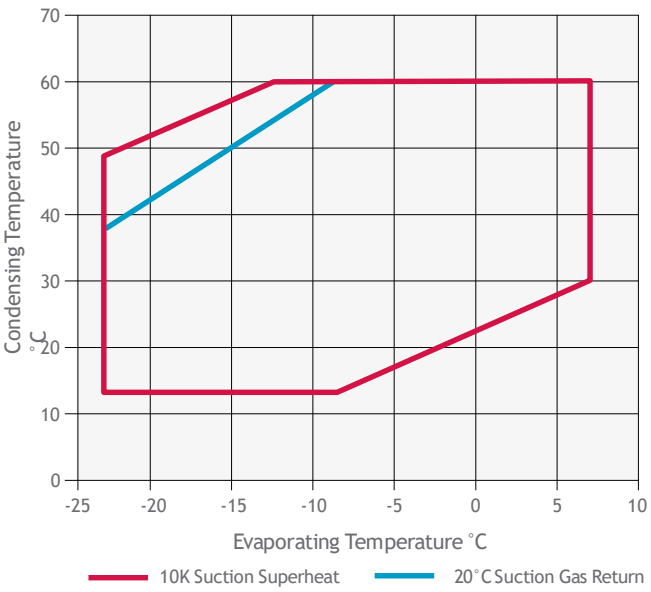

## ZB*KA - R134a



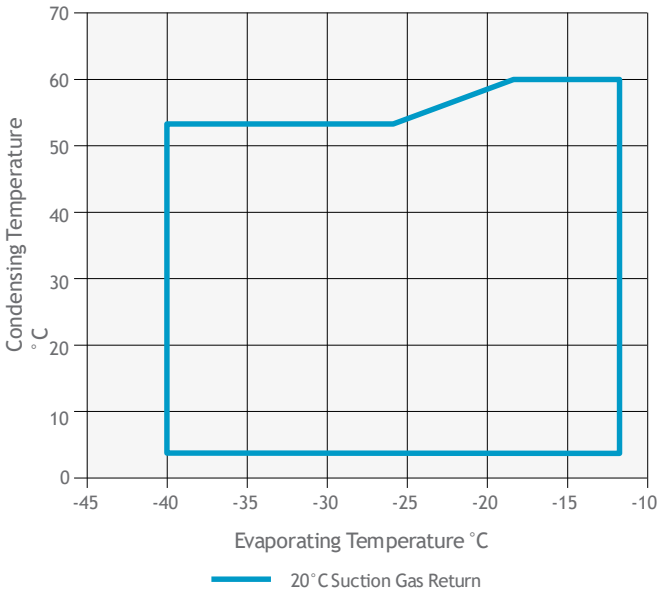

## ZS*KA - R448A/R449A




## ZB*KA - R448A/R449A




## ZF*KA - R448A/R449A



# Technical Overview

| Models | Nominal hp | Displacement ($m^3/h$) | Rotalock Suction (inch) | Rotalock 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)*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | 1 Ph* | 3 Ph** | |
| **Medium Temperature** | | | | | | | | | | | | | | |
| ZB06KAE | 0.8 | 2.4 | 3/4 | 1/2 | 0.7 | 246/246/380 | 21 | PFJ | TFD | 5 | 2 | 32 | 15 | 59 |
| ZB07KAE | 1.0 | 2.9 | 3/4 | 1/2 | 0.7 | 246/246/380 | 23 | PFJ | TFD | 6 | 2 | 45 | 20 | 59 |
| ZB08KAE | 1.2 | 3.4 | 3/4 | 1/2 | 0.7 | 246/246/380 | 23 | PFJ | TFD | 7 | 2 | 45 | 20 | 59 |
| ZS09KAE | 1.3 | 3.7 | 3/4 | 1/2 | 0.7 | 246/246/399 | 22 | PFJ | TFD | 7 | 3 | 45 | 27 | 58 |
| ZS11KAE | 1.5 | 4.4 | 3/4 | 1/2 | 0.7 | 246/246/399 | 22 | PFJ | TFD | 9 | 3 | 45 | 27 | 58 |
| ZS13KAE | 1.8 | 5.0 | 3/4 | 1/2 | 0.7 | 246/246/399 | 22 | PFJ | TFD | 10 | 4 | 54 | 29 | 59 |
| **Low Temperature** | | | | | | | | | | | | | | |
| ZF03KAE | 1.0 | 2.8 | 3/4 | 1/2 | 0.7 | 246/246/387 | 22 | PFJ | TFD | 5 | 2 | 40 | 20 | 40 |
| ZF04KAE | 1.3 | 3.7 | 3/4 | 1/2 | 0.7 | 246/246/387 | 22 | PFJ | TFD | 6 | 3 | 45 | 27 | 45 |
| ZF05KAE | 1.5 | 4.4 | 3/4 | 1/2 | 0.7 | 246/246/387 | 22 | PFJ | TFD | 7 | 5 | 45 | 27 | 45 |
| ZF07KAE | 2.5 | 6.7 | 3/4 | 1/2 | 0.7 | 246/246/387 | 23 | PFJ | TFD | 11 | 4 | 79 | 27 | 79 |

* 1Ph: 230V/ 50Hz
** 3 Ph: 380-420V/ 50Hz
*** @ 1m: sound pressure level at 1m distance from the compressor, free field condition

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407A | Cooling Capacity (kW) | | | | | | | R407A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| **Medium Temperature** | | | | | | | | | | | | | | | |
| ZB06KAE | | | | 0.9 | 1.1 | 1.4 | 1.7 | ZB06KAE | | | | 0.6 | 0.6 | 0.6 | 0.6 |
| ZB07KAE | | | | 1.0 | 1.3 | 1.7 | 2.1 | ZB07KAE | | | | 0.7 | 0.7 | 0.7 | 0.8 |
| ZB08KAE | | | | 1.2 | 1.5 | 1.9 | 2.3 | ZB08KAE | | | | 0.8 | 0.8 | 0.9 | 0.9 |
| ZS09KAE | | 0.9 | 1.2 | 1.5 | 1.8 | 2.2 | 2.6 | ZS09KAE | | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 |
| ZS11KAE | | 1.1 | 1.4 | 1.7 | 2.1 | 2.6 | 3.1 | ZS11KAE | | 0.9 | 0.9 | 1.0 | 1.0 | 1.0 | 1.1 |
| ZS13KAE | | 1.2 | 1.6 | 2.0 | 2.4 | 2.9 | 3.6 | ZS13KAE | | 1.0 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 |
| **Low Temperature** | | | | | | | | | | | | | | | |
| ZF03KAE | 0.5* | 0.6* | 0.8* | 0.9* | 1.2* | | | ZF03KAE | 0.6* | 0.6* | 0.7* | 0.7* | 0.7* | | |
| ZF04KAE | 0.6* | 0.8* | 1.1* | 1.4* | 1.7* | | | ZF04KAE | 0.7* | 0.8* | 0.8* | 0.9* | 0.9* | | |
| ZF05KAE | 0.8* | 1.0* | 1.3* | 1.6* | 2.0* | | | ZF05KAE | 0.9* | 1.0* | 1.0* | 1.0* | 1.0* | | |
| ZF07KAE | 1.3* | 1.6* | 2.0* | 2.5* | 3.1* | | | ZF07KAE | 1.3* | 1.4* | 1.4* | 1.5* | 1.6* | | |

Conditions: Suction Gas Return 20°C /Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K

| Condensing Temperature 40°C | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R407F | Cooling Capacity (kW) | | | | | | | R407F | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| **Medium Temperature** | | | | | | | | | | | | | | | |
| ZB06KAE | | | | 0.9 | 1.1 | 1.4 | 1.7 | ZB06KAE | | | | 0.6 | 0.6 | 0.6 | 0.6 |
| ZB07KAE | | | | 1.0 | 1.3 | 1.7 | 2.1 | ZB07KAE | | | | 0.7 | 0.7 | 0.7 | 0.8 |
| ZB08KAE | | | | 1.2 | 1.5 | 1.9 | 2.3 | ZB08KAE | | | | 0.8 | 0.8 | 0.9 | 0.9 |
| ZS09KAE | | | 1.2* | 1.5 | 1.9 | 2.3 | 2.7 | ZS09KAE | | | 0.8* | 0.8 | 0.9 | 0.9 | 0.9 |
| ZS11KAE | | | 1.4* | 1.8 | 2.2 | 2.7 | 3.3 | ZS11KAE | | | 1.0* | 1.0 | 1.1 | 1.1 | 1.1 |
| ZS13KAE | | | 1.6* | 2.1 | 2.6 | 3.1 | 3.7 | ZS13KAE | | | 1.1* | 1.2 | 1.2 | 1.2 | 1.3 |
| **Low Temperature** | | | | | | | | | | | | | | | |
| ZF03KAE | 0.5* | 0.6* | 0.8* | 1.0* | 1.2* | | | ZF03KAE | 0.6* | 0.6* | 0.7* | 0.7* | 0.8* | | |
| ZF04KAE | 0.6* | 0.8* | 1.1* | 1.4* | 1.7* | | | ZF04KAE | 0.7* | 0.8* | 0.8* | 0.9* | 1.0* | | |
| ZF05KAE | 0.8* | 1.0* | 1.3* | 1.6* | 2.0* | | | ZF05KAE | 0.9* | 1.0* | 1.0* | 1.0* | 1.0* | | |
| ZF07KAE | 1.3* | 1.6* | 2.0* | 2.5* | 3.1* | | | ZF07KAE | 1.3* | 1.4* | 1.4* | 1.5* | 1.6* | | |

Conditions: Suction Gas Return 20°C /Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K

# Capacity Data

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R448A / R449A | Cooling Capacity (kW) | | | | | | | R448A/ R449A | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| Medium Temperature | | | | | | | | | | | | | | | |
| ZB06KAE | | | | 0.9 | 1.2 | 1.4 | 1.7 | ZB06KAE | | | | 0.6 | 0.6 | 0.6 | 0.6 |
| ZB07KAE | | | | 1.1 | 1.4 | 1.7 | 2.1 | ZB07KAE | | | | 0.7 | 0.7 | 0.8 | 0.8 |
| ZB08KAE | | | | 1.2 | 1.5 | 1.9 | 2.3 | ZB08KAE | | | | 0.8 | 0.9 | 0.9 | 0.9 |
| ZS09KAE | | 0.9 | 1.1 | 1.4 | 1.7 | 2.1 | 2.5 | ZS09KAE | | 0.7 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 |
| ZS11KAE | | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 3.1 | ZS11KAE | | 0.8 | 0.9 | 1.0 | 1.0 | 1.0 | 1.0 |
| ZS13KAE | | 1.4 | 1.8 | 2.3 | 2.8 | 3.4 | 4.1 | ZS13KAE | | 1.1 | 1.3 | 1.4 | 1.4 | 1.5 | 1.5 |
| Low Temperature | | | | | | | | | | | | | | | |
| ZF03KAE | 0.5* | 0.7* | 0.8* | 1.0* | 1.3* | | | ZF03KAE | 0.7* | 0.7* | 0.7* | 0.7* | 0.7* | | |
| ZF04KAE | 0.7* | 0.9* | 1.1* | 1.4* | 1.8* | | | ZF04KAE | 0.7* | 0.8* | 0.8* | 0.9* | 1.0* | | |
| ZF05KAE | 0.8* | 1.1* | 1.3* | 1.7* | 2.1* | | | ZF05KAE | 1.0* | 1.0* | 1.0* | 1.0* | 1.0* | | |
| ZF07KAE | 1.3* | 1.7* | 2.1* | 2.6* | 3.2* | | | ZF07KAE | 1.3* | 1.4* | 1.4* | 1.5* | 1.6* | | |

Conditions: Suction Gas Return 20°C / Subcooling 0K
*Conditions: Suction Superheat 10K, Subcooling 0K

| Condensing Temperature 40°C | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R134a | Cooling Capacity (kW) | | | | | | | R134a | Power Input (kW) | | | | | | |
| | Evaporating Temperature (°C) | | | | | | | | Evaporating Temperature (°C) | | | | | | |
| Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 | Model | -35 | -30 | -25 | -20 | -15 | -10 | -5 |
| Medium Temperature | | | | | | | | | | | | | | | |
| ZB06KAE | | | | | 0.7 | 0.9 | 1.1 | ZB06KAE | | | | | 0.4 | 0.4 | 0.4 |
| ZB07KAE | | | | | 0.8 | 1.0 | 1.3 | ZB07KAE | | | | | 0.5 | 0.5 | 0.5 |
| ZB08KAE | | | | | 0.9 | 1.2 | 1.5 | ZB08KAE | | | | | 0.5 | 0.6 | 0.6 |
| ZS09KAE | | | | 0.9 | 1.1 | 1.4 | 1.7 | ZS09KAE | | | | 0.5 | 0.6 | 0.6 | 0.6 |
| ZS11KAE | | | | 1.1 | 1.3 | 1.7 | 2.0 | ZS11KAE | | | | 0.6 | 0.7 | 0.7 | 0.7 |
| ZS13KAE | | | | 1.2 | 1.5 | 1.9 | 2.3 | ZS13KAE | | | | 0.7 | 0.8 | 0.8 | 0.8 |

Conditions: Suction Gas Return 20°C / Subcooling 0K

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

Copeland ZO scroll compressors have been designed for use in R744 ($CO_2$) low temperature refrigeration systems. These compressors are suitable for usage in $CO_2$-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.

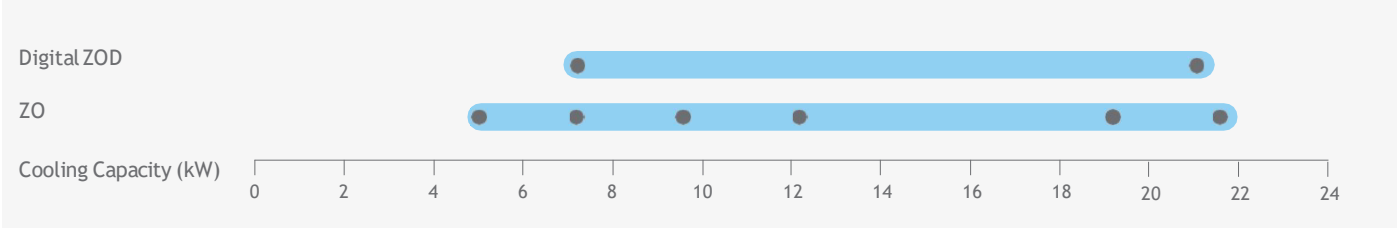
In comparison with HFC refrigerants, the specific properties of R744 require changes in the design of the refrigeration system. The range of Copeland ZO scroll compressors has been particularly designed to exploit the characteristics of the R744 refrigeration system. Efficiency, reliability and liquid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

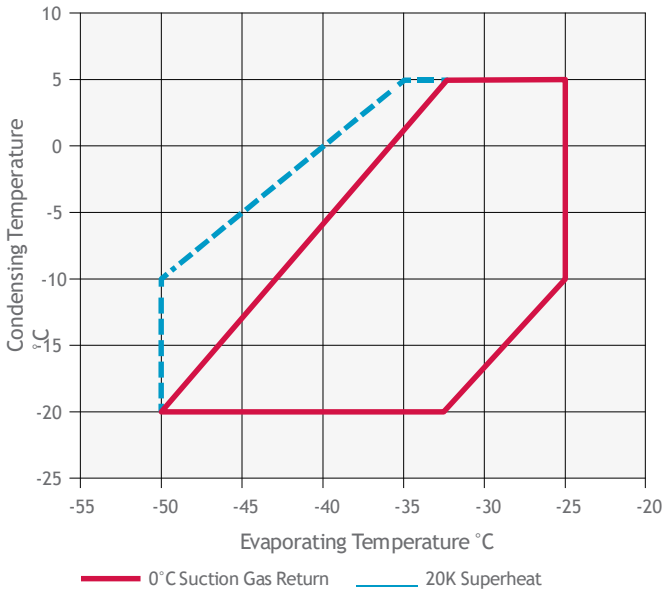
## Features and Benefits

- Optimized for high efficiency in $CO_2$-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 (m³/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 |
| **Digital Models** | | | | | | | | | | | |
| 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 |
| **Digital Models** | | | | | | | | | |
| 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

# Sound Shell for Copeland™ Scroll Compressors
# Quiet Operation in Sound Critical Environment

Environmental noise has become a serious problem that can lead to potential contentious situations. It is particularly true for refrigeration applications where kitchen equipment or compressor packs are often source of disturbing noise in domestic areas. Emerson put sound minimisation at the centre of any of its new compressor development along reliability, seasonal efficiency, size and weight reduction.

A large portion of equipment acoustic emissions come from condensers and compressors and in some critical sound sensitive applications the refrigeration installations need to be acoustically insulated. Simple solutions are now available to contain sound emissions. Emerson has developed a dedicated sound shell for all Copeland scroll compressors from 2-15 hp. It completely encapsulates the compressor, minimizing sound leaks while cooling performance remains uncompromised.

Groundbreaking design techniques and materials, derived from the automotive industry, were utilized to design the sound shell. The use of low pressure reaction injection moulded parts (top cap cover, terminal box cover and compressor base plate) allows a 10-12 dBA sound attenuation.

It is a significant improvement over conventional sound jackets available from other suppliers that reduce sound by 3-6 dBA depending on the application. Particular attention was also paid in the design stage to ensure ease of mounting in retrofit, service and new installation situations.

## Sound Shell for Copeland Scroll


1.3 to 2 hp Scroll


2 to 4 hp Scroll


4 to 6 hp Scroll


4 to 6 hp Scroll ZF with DTC


4 to 6 hp Digital Scroll


Summit Series 7 to 15 hp scroll


Summit Series Digital Scroll

## Technical Overview

| | Small Scroll | Summit Scroll | | | Summit Digital Scroll | |
|---|---|---|---|---|---|---|
| | All Sizes | Small Size | Medium Size | Large Size | Small Size | Medium Size |
| **Technical Data** | | | | | | |
| **Sound Attenuation** | **10 - 12 dBA** | | | | | |
| Total weight (kg) | 3.4 | 4.8 | 4.9 | 5.1 | 5.3 | 5.6 |
| Mantle thickness | 25mm | | | | | |
| Flammability | Conforms to IEC 60335-1 §30 | | | | | |
| Material | | | | | | |
| Mantle | Green felt layer (cotton + binder 1.2 kg/m²) | | | | | |
| | Heavy layer (PVC 4.5 kg/m²) | | | | | |
| | Closure by use of Velcro fastening - High frequency welded on PVC layer | | | | | |
| Base Plate | PU SRIM - Low pressure reaction injection moulding technology | | | | | |
| Top cap cover | PU SRIM - Low pressure reaction injection moulding technology | | | | | |
| | Inside insulation green felt and aluminium film | | | | | |
| | High temperature insulation ring | | | | | |
| Terminal box cover | PU SRIM - Low pressure reaction injection moulding technology | | | | | |