Comfort Applications

Comfort Applications

For decades, Emerson has driven advancement in the air conditioning and heat pump industry, leading the field with engineering products and systems that maximize the comfort of office and living spaces – while minimizing costs and inefficiencies.

Copeland Scroll™ compressors are designed to deliver the highest performance in residential and commercial applications. Thanks to the widest selection of scroll compressors optimized for air conditioning and heating, it has never been easier to match all desired applications with the highest efficiency and reliability. The capacity of our single scrolls ranges from 1.5 to 60hp and they can reach an overall capacity of 180 hp per circuit when combined in even and uneven tandems and trios. Whether your need is a cooling optimized, heating optimized or reversible unit, you will find the most advanced technology within our range.

One of the most important recent innovations for comfort applications has been the introduction of Variable Speed technology. It was first introduced with the ZHW compressors (featuring Enhanced Vapor Injection), as a solution for residential heat pump applications. Now we also offer the XHV range for cost-competitive heating systems. In addition to the ZHW and XHV ranges for residential applications, a wide range of models for reversible and low temperature commercial applications are available, from 18 to 96 cm^3: XPV and ZPV Variable Speed scroll compressors allow system manufacturers and building owners to achieve superior performance when designing reversible chillers, heat pumps, precision cooling systems or rooftops.

Emerson is introducing the next generation of 20 and 25hp ZP*KZE and 30 and 40 hp ZP*KPE compact scrolls for R410A with advanced monitoring features and optimized seasonal performance.

ZR Copeland Scroll™ Compressor Range for R407C and R134a

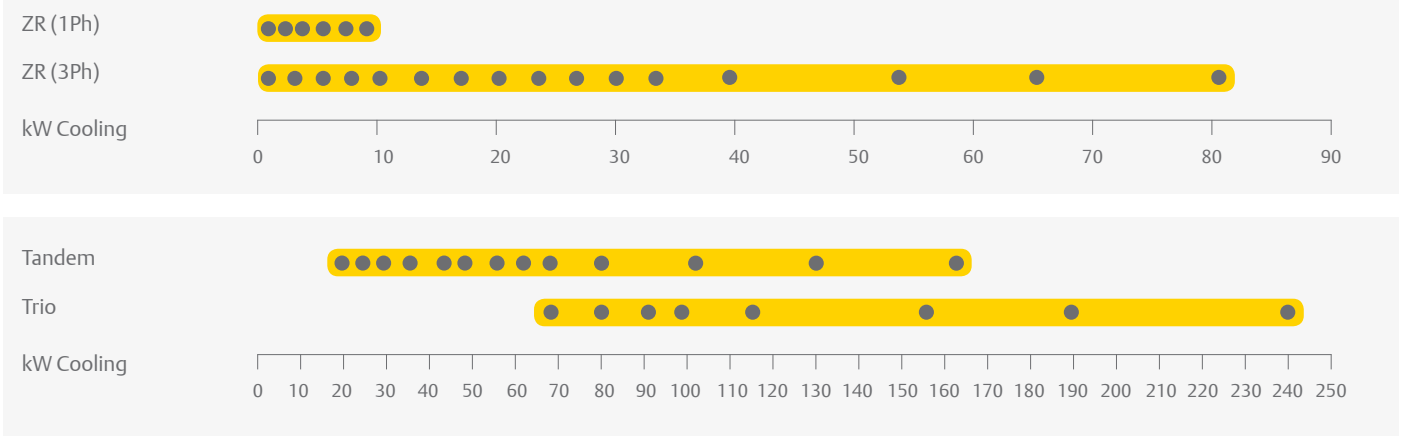
ZR Copeland Scroll compressors, for R407C and R134a, for comfort and process/precision cooling applications.

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 (ESEER).

The range of products goes from the ZR18 (1.5hp) to the ZR380 (30hp)

ZR Scroll Compressor

ZR Scroll Compressor Line-up R407C



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

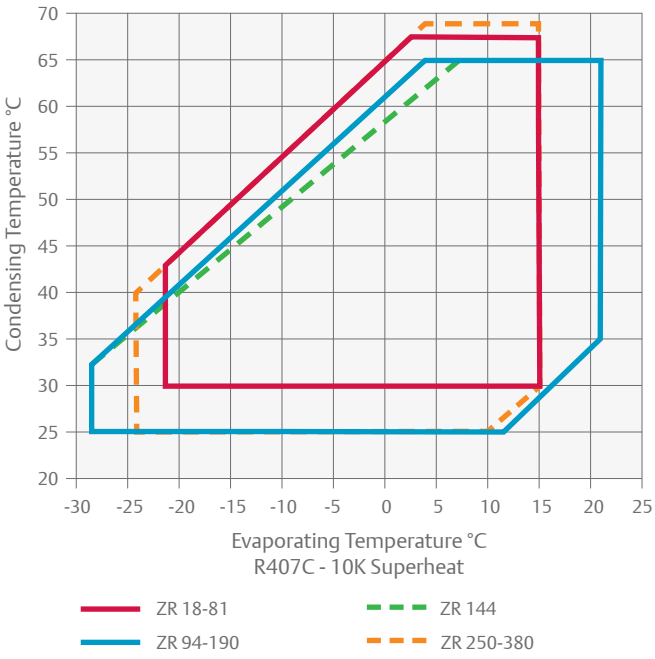
Features and Benefits

- Copeland Scroll axial and radial compliance for superior reliability and efficiency
- Wide scroll line-up for R407C and R134a
- 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 (ESEER)

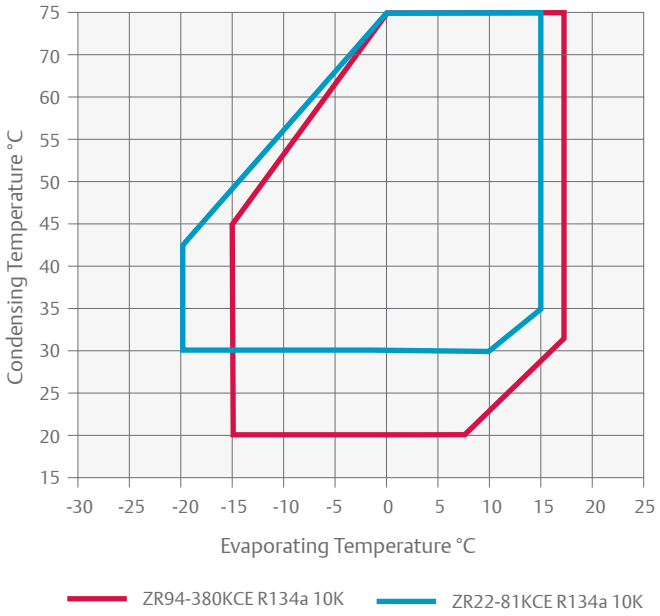
Maximum Allowable Pressure (PS)

- ZR18 to ZR81:
  Low side PS 20 bar(g) / High Side PS 29.5 bar(g)
- ZR94 to ZR380:
  Low side PS 20 bar(g) / High Side PS 32 bar(g)

Operating Envelope R407C



Operating Envelope R134a



Technical Overview

Models	Nominal hp	R407C 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**	
ZR18K5E	1.5	3.7	3.0	4.4	3/4	1/2	0.74	242/242/383	20	PFJ		10		35		54
ZR22K3E	2.0	4.5	2.9	5.3	3/4	1/2	1.00	242/242/363	22	PFJ	TFD	11	4	47	24	54
ZR28K3E	2.5	5.9	2.9	6.8	3/4	1/2	1.00	242/242/363	25	PFJ	TFD	15	5	61	32	54
ZR34K3E	2.8	7.0	3.0	8.0	3/4	1/2	1.10	242/242/386	26	PFJ	TFD	17	6	76	40	57
ZR40K3E	3.5	8.2	3.0	9.4	3/4	1/2	1.10	242/242/400	27	PFJ	TFD	23	7	100	v 46	57
ZR48K3E	4.0	10.1	3.1	11.4	7/8	1/2	1.36v	242/242/417	31	PFJ	TFD	23	10	114	50	57
ZR61KCE	5.0	12.5	3.1	14.4	7/8	1/2	1.66	241/247/438	43	PFJ	TFD	30	11	150	65	60
ZR61KSE	5.0	12.8	3.2	14.4	7/8	1/2	1.42	242/242/430	30	PFZ	TFM		11		59	61
ZR72KCE	6.0	14.8	3.2	17.1	7/8	1/2	1.77	242/242/438	39		TFD		13		74	61
ZR81KCE	6.8	16.7	3.2	18.7	7/8	3/4	1.77	242/242/443	39		TFD		15		101	61
ZR94KCE	8.0	20.6	3.3	22.1	1 1/8	7/8	2.65	264/285/476	57		TFD		16		t95	63
ZR108KCE	9.0	23.0	3.4	24.9	1 3/8	7/8	3.38	264/285/533	60		TFD		17		111	63
ZR125KCE	10.0	27.0	3.4	29.1	1 3/8	7/8	3.38	264/285/533	61		TFD		19		118	63
ZR144KCE	12.0	30.9	3.4	33.2	1 3/8	7/8	3.38	264/285/533	61		TFD		22		118	64
ZR160KCE	13.0	33.4	3.2	36.4	1 3/8	7/8	3.38	264/285/552	65		TFD		28		140	67
ZR190KCE	15.0	39.3	3.2	43.3	1 3/8	7/8	3.38	264/285/552	66		TFD		34		174	69
ZR250KCE	20.0	52.2	3.2	56.6	1 5/8	1 3/8	4.70	432/376/717	140		TWD		41		225	72
ZR310KCE	25.0	65.0	3.2	71.4	1 5/8	1 3/8	6.80	448/392/715	160		TWD		52		272	74
ZR380KCE	30.0	81.7	3.4	87.4	1 5/8	1 3/8	6.30	447/427/715	177		TWD		62		310	76

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 +40°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
ZR22K3E	1.4	1.8	2.3	2.9	3.6	4.4	5.3	ZR22K3E	0.9	0.9	0.9	0.9	0.9	0.8	0.8
ZR28K3E	1.8	2.3	3.0	3.8	4.7	5.7	6.9	ZR28K3E	1.1	1.2	1.1	1.1	1.1	1.1	1.1
ZR34K3E	2.2	2.9	3.6	4.5	5.5	6.7	8.1	ZR34K3E	1.4	1.4	1.4	1.3	1.3	1.3	1.3
ZR40K3E	2.5	3.3	4.2	5.2	6.4	7.8	9.3	ZR40K3E	1.6	1.5	1.5	1.5	1.5	1.5	1.5
ZR48K3E	3.1	4.0	5.1	6.3	7.8	9.5	11.5	ZR48K3E	1.8	1.8	1.8	1.8	1.8	1.8	1.8
ZR61KCE	4.0	5.2	6.5	8.1	9.9	12.1	14.6	ZR61KCE	2.1	2.1	2.2	2.2	2.2	2.2	2.3
ZR72KCE	4.8	6.2	7.8	9.7	11.9	14.5	17.4	ZR72KCE	2.6	2.6	2.6	2.6	2.6	2.6	2.7
ZR81KCE	5.5	7.0	8.8	10.8	13.2	16.0	19.2	ZR81KCE	2.8	2.9	2.9	2.9	2.9	3.0	3.0
ZR94KCE	5.3	7.5	10.5	13.0	15.9	19.2	23.0	ZR94KCE	3.4	3.4	3.4	3.4	3.4	3.4	3.5
ZR108KCE	7.3	9.3	11.7	14.3	17.5	21.3	25.7	ZR108KCE	3.7	3.8	3.8	3.8	3.8	3.9	3.9
ZR125KCE	8.3	10.7	13.5	16.7	20.5	24.9	30.1	ZR125KCE	4.3	4.4	4.4	4.4	4.4	4.5	4.5
ZR144KCE	10.4	13.3	16.5	20.0	23.7	27.8	32.4	ZR144KCE	4.7	4.9	4.9	5.0	5.0	5.2	5.5
ZR160KCE	10.1	13.3	16.9	21.0	25.7	31.2	37.5	ZR160KCE	5.5	5.5	5.5	5.6	5.7	5.8	5.9
ZR190KCE	12.3	16.0	20.2	25.0	30.7	37.2	44.7	ZR190KCE	6.8	6.9	6.9	7.0	7.0	7.1	7.3
ZR250KCE	16.1	20.5	25.6	31.8	39.0	47.4	57.2	ZR250KCE	8.6	8.7	8.9	9.0	9.1	9.2	9.4
ZR310KCE	20.0	25.6	32.1	39.7	48.6	59.0	71.1	ZR310KCE	10.6	10.8	10.9	10.0	11.2	11.5	11.7
ZR380KCE	25.5	32.2	40.1	49.4	60.3	73.0	87.8	ZR380KCE	12.6	12.9	13.1	13.4	13.6	14.0	14.4

Conditions: Suction Superheat 10K / Subcooling 0K

Condensing Temperature +40°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
ZR18K5E	1.8	2.3	2.8	3.5	4.2	5.1	6.1	ZR18K5E	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ZR22K3E	2.1	2.7	3.4	4.2	5.2	6.3	7.5	ZR22K3E	1.2	1.2	1.2	1.2	1.2	1.2	1.1
ZR28K3E	2.7	3.5	4.4	5.5	6.7	8.1	9.6	ZR28K3E	1.6	1.6	1.6	1.5	1.5	1.5	1.5
ZR34K3E	3.2	4.1	5.2	6.5	7.9	9.6	11.5	ZR34K3E	1.8	1.8	1.8	1.8	1.8	1.8	1.7
ZR40K3E	3.8	4.9	6.1	7.6	9.4	11.3	13.5	ZR40K3E	2.2	2.2	2.2	2.1	2.1	2.1	2.0
ZR48K3E	4.8	6.1	7.6	9.4	11.5	13.8	16.6	ZR48K3E	2.6	2.6	2.6	2.6	2.6	2.5	2.5
ZR61KSE	6.5	8.1	9.9	11.9	14.4	17.2	20.6	ZR61KsE	3.0	3.0	3.1	3.2	3.2	3.1	2.9
ZR72KCE	7.0	9.0	11.3	13.9	16.9	20.3	24.2	ZR72KCE	3.6	3.7	3.7	3.7	3.7	3.7	3.8
ZR81KCE	7.8	10.1	12.7	15.6	19.1	23.0	27.7	ZR81KCE	4.1	4.1	4.1	4.1	4.2	4.2	4.3
ZR94KCE	9.8	12.6	15.8	19.3	23.3	27.9	33.1	ZR94KCE	4.9	5.0	5.0	5.0	5.0	4.9	4.9
ZR108KCE	11.3	14.2	17.6	21.5	26.2	31.5	37.6	ZR108KCE	5.4	5.4	5.5	5.5	5.5	5.6	5.7
ZR125KCE	13.1	16.6	20.5	25.2	30.5	36.7	43.7	ZR125KCE	6.3	6.3	6.4	6.4	6.4	6.5	6.6
ZR144KCE	14.5	18.7	23.4	28.9	35.0	42.0	50.1	ZR144KCE	7.1	7.1	7.2	7.2	7.3	7.3	7.4
ZR160KCE	14.9	19.5	24.9	31.3	38.7	47.3	57.1	ZR160KCE	8.0	8.1	8.2	8.2	8.3	8.4	8.5
ZR190KCE	18.5	23.8	29.8	36.7	44.7	53.8	64.2	ZR190KCE	9.7	9.7	9.8	9.8	9.9	10.1	10.4
ZR250KCE	25.7	32.2	39.9	48.9	59.3	71.3	85.0	ZR250KCE	12.5	12.6	12.7	12.9	13.0	13.0	13.0
ZR310KCE	31.2	39.7	49.7	61.4	75.0	90.7	108.5	ZR310KCE	15.6	15.7	15.9	16.1	16.3	16.6	17.0
ZR380KCE	38.1	49.1	61.7	76.2	93.1	113.0	136.5	ZR380KCE	18.6	18.8	19.0	19.2	19.4	19.8	20.3

Conditions: Suction Superheat 10K / Subcooling 0K

Tandem Model Overview

Model	Nominal hp	Cooling Capacity R407C (kW)	Even Tandem	Uneven Tandem
Tandem ZRT - Tandem Uneven ZRU				
ZRT 96 K3E	2 x 4	20	•	
ZRT 122 KSE	2 x 5	25	•	
ZRT 144 KCE	2 x 6	30	•	
ZRT 162 KCE	2 x 6.5	33	•	
ZRT 188 KCE	2 x 8	41	•	
ZRT 216 KCE	2 x 9	46	•	
ZRT 250 KCE	2 x 10	52	•	
ZRT 288 KCE	2 x 12	59	•	
ZRU 315 KCE*	10 + 15	66		•
ZRT 320 KCE	2 x 13	67	•	
ZRU 350 KCE*	13 + 15	73		•
ZRT 380 KCE	2 x 15	78	•	
ZRU 440 KCE*	15 + 20	92		•
ZRT 500 KCE*	2 x 20	104	•	
ZRU 500 KCE*	15 + 25	104		•
ZRU 560 KCE*	20 + 25	117		•
ZRT 620 KCE*	2 x 25	130	•	
ZRU 690 KCE*	25 + 30	147		•
ZRT 760 KCE*	2 x 30	163	•	

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

* Tandem Assemblies by System Manufacturers. Emerson Can Provide Full Technical Support.

ZP Copeland Scroll™ Compressor Range for R410A

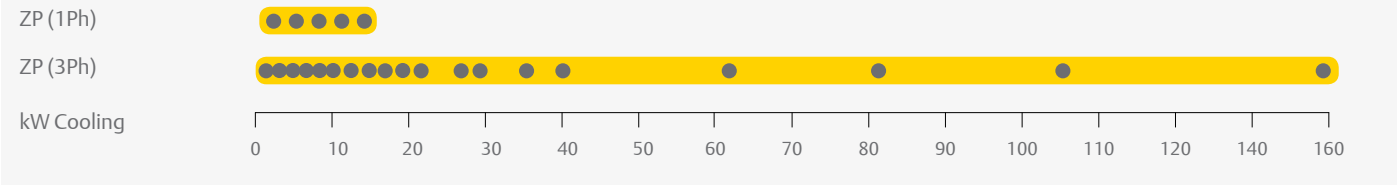
ZP Copeland Scroll compressors, for R410A, for comfort and process precision cooling applications. Emerson has been the pioneer in launching the first complete line-up of R410A commercial scroll compressors.

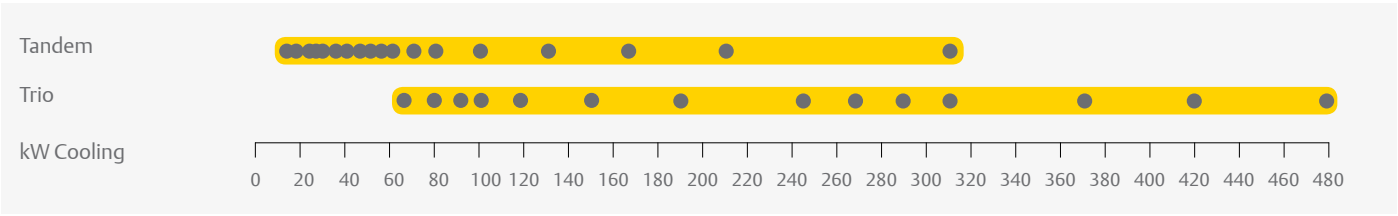
ZP Copeland Scroll compressors are perfectly suitable for air-cooled chiller systems up to 900kW (1100 kW if water-cooled) featuring high comfort and superior seasonal efficiency (ESEER). Whether used in stand-alone, tandem or trio configurations, the broad ZP Copeland Scroll line-up meets today's market 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

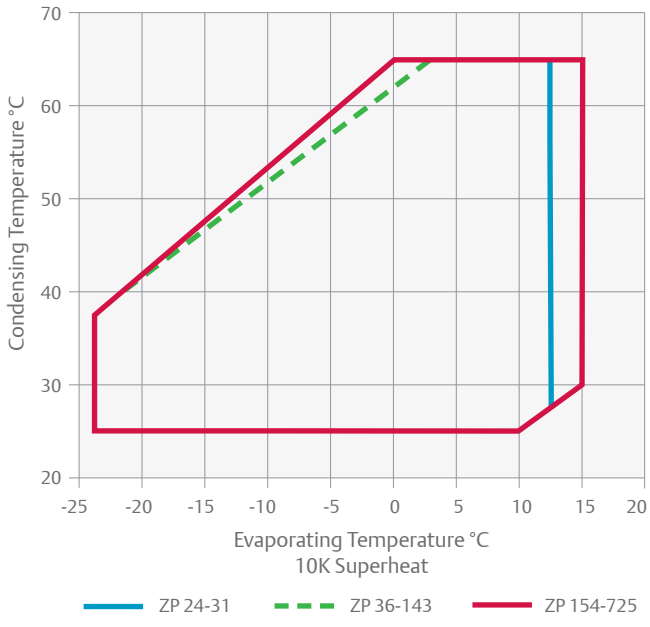
Features and Benefits

- Copeland qualified tandem and trio (now also uneven) configurations for superior seasonal efficiency (ESEER and EN14825: SEER and 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 28 bar(g) / High side PS 43 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)	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**	
ZP24K5E	1.9	5.1	2.8	3.9	3/4	1/2	0.74	242/242/387	22	PFJ	TFD	13	5	60	28	55
ZP29K5E	2.2	6.1	2.9	4.8	3/4	1/2	0.74	242/242/387	23	PFJ	TFD	16	6	67	38	55
ZP31K5E	3.0	6.5	2.8	5.0	3/4	1/2	0.74	242/242/388	23	PFJ	TFD	17	6	67	38	55
ZP36K5E	2.6	7.9	3.0	6.0	7/8	1/2	1.25	242/242/418	30	PFJ	TFD	22	7	98	46	57
ZP42K5E	3.4	9.0	2.9	6.9	7/8	1/2	1.25	242/242/418	31	PFJ	TFD	26	8	128	43	57
ZP54K5E	4.6	11.6	3.0	8.9	7/8	1/2	1.24	242/242/418	34	PFJ	TFD	31	10	115	51	59
ZP61K5E	5.0	13.3	3.0	10.0	7/8	1/2	1.24	246/246/443	35		TFD		12		64	60
ZP72KCE	6.0	15.3	3.0	11.7	7/8	1/2	1.77	246/246/443	40		TFD		15		75	64
ZP83KCE	6.5	17.7	3.1	13.4	7/8	1/2	1.77	246/246/443	40		TFD		15		101	61
ZP91KCE	7.5	19.3	3.1	14.7	7/8	3/4	1.77	246/248/446	41		TFD		16		101	61
ZP104KCE	9.0	22.7	3.2	16.8	1 1/8	7/8	2.51	264/284/476	48		TFD		18		128	63
ZP122KCE	10.0	26.5	3.2	19.5	1 1/8	7/8	2.51	293/258/559	49		TFD		22		139	63
ZP143KCE	12.0	31.6	3.2	23.1	1 3/8	7/8	2.75	297/262/559	49		TFD		25		145	64
ZP154KCE	13.0	33.5	3.2	24.8	1 3/8	7/8	3.38	329/298/552	65		TFD		31		140	65
ZP182KCE	15.0	39.6	3.2	29.1	1 3/8	7/8	3.38	264/284/552	66		TFD		34		174	66
ZP385KCE	30.0	82.4	3.2	60.8	1 5/8	1 3/8	6.30	448/392/715	178		TWD		65		310	74
ZP485KCE	40.0	105.0	3.2	77.3	1 5/8	1 3/8	6.30	391/447/746	190		TWD		82		408	78
ZP725KCE	60.0	160.0	3.2	115	2 1/8	1 3/8	6.30	459/483/863	250		FED		124		567	78

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

Capacity Data

Condensing Temperature +40°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	2.2	3.0	3.9	4.9	5.9	7.1		ZP24K5E	1.5	1.5	1.4	1.4	1.4	1.3	
ZP29K5E	2.9	3.9	4.9	6.0	7.3	8.6		ZP29K5E	1.8	1.8	1.7	1.7	1.7	1.6	
ZP31K5E	3.2	4.1	5.2	6.3	7.6	9.1		ZP31K5E	1.9	1.9	1.9	1.8	1.8	1.8	
ZP36K5E	4.1	5.1	6.3	7.7	9.2	11.0		ZP36K5E	2.2	2.1	2.1	2.1	2.1	2.1	
ZP42K5E	4.4	5.7	7.1	8.7	10.5	12.5		ZP42K5E	2.4	2.4	2.4	2.4	2.3	2.3	
ZP54K5E	6.0	7.5	9.3	11.3	13.5	16.0		ZP54K5E	3.1	3.1	3.0	3.0	2.9	2.9	
ZP61K5E	6.9	8.6	10.6	12.9	15.5	18.4	21.4	ZP61K5E	3.5	3.5	3.4	3.4	3.4	3.4	3.4
ZP72KCE	8.2	10.1	12.3	14.8	17.7	20.9		ZP72KCE	4.0	4.0	4.0	4.0	4.1	4.1	
ZP83KCE	9.4	11.6	14.2	17.1	20.4	24.2		ZP83KCE	4.5	4.5	4.5	4.6	4.6	4.7	
ZP91KCE	10.2	12.6	15.4	18.6	22.2	26.3	31.0	ZP91KCE	4.9	4.9	4.9	5.0	5.0	5.0	5.3
ZP104KCE	12.0	14.9	18.1	21.9	26.1	31.0	36.5	ZP104KCE	5.7	5.7	5.7	5.7	5.8	5.8	5.9
ZP122KCE	14.1	17.4	21.2	25.5	30.4	36.1	42.4	ZP122KCE	6.6	6.6	6.7	6.7	6.7	6.8	6.9
ZP143KCE	15.9	20.3	25.2	30.5	36.1	41.9	47.8	ZP143KCE	7.5	7.7	7.8	7.9	8.1	8.4	8.8
ZP154KCE	18.2	22.3	27.1	32.6	38.9	46.1	54.3	ZP154KCE	8.1	8.2	8.2	8.3	8.3	8.5	8.8
ZP182KCE	21.4	26.3	32.0	38.4	45.6	53.9	63.3	ZP182KCE	9.5	9.7	9.9	10.0	10.1	10.1	10.0
ZP385KCE	43.7	53.9	65.8	79.5	95.2	113.0	133.5	ZP385KCE	20.3	20.4	20.5	20.7	20.9	21.3	21.7
ZP485KCE	57.5	70.0	84.7	101.6	121.0	143.0	168.0	ZP485KCE	24.9	25.3	25.8	26.3	27.0	27.8	28.8
ZP725KCE	88.0	107.0	129.0	154.0	182.0	215.0	252.0	ZP725KCE	39.0	39.6	40.0	40.0	40.7	41.3	41.1

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

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 286KCE	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 KCE*	15 + 20	90		•
ZPT 470 KCE*	2 x 20	101	•	
ZPU 477 KCE*	15 + 25	103		•
ZPU 530 KCE*	20 + 25	114		•
ZPT 590 KCE*	2 x 25	127	•	
ZPU 680 KCE*	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 the new ZP232KZE and ZP292KZE (refer to next chapter)
Conditions EN 12900: Evaporating 5°C, Condensing 50°C, Superheat 10K, Subcooling 0K
* Tandem assemblies by system manufacturers. Emerson can provide full technical support.

ZP Copeland™ Scroll Air Conditioning Compressor Range, Optimized for Seasonal Performance

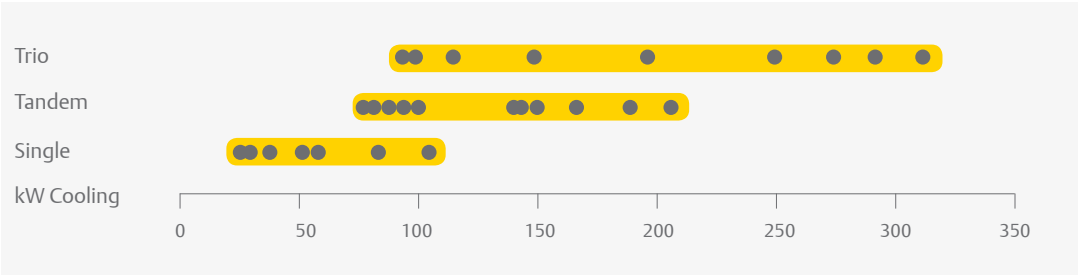
The new ZP*KZE and ZP*KPE scroll compressors for large chillers feature advanced monitoring capabilities and improved part-load cooling efficiency, thanks to VVR technology. This will help OEMs meet the minimum seasonal performance level required by the Ecodesign Directive.

The CoreSense Communications module they are equipped with ensures enhanced reliability, by providing real time compressor data to the system controller to provide temperature protection.

They are designed for reversible chillers, rooftop or air handling units with a cooling capacity between 30 and 400 kW.

ZP*KZE Scroll Compressor

ZP*KZE & ZP*KPE Compressor Line-up



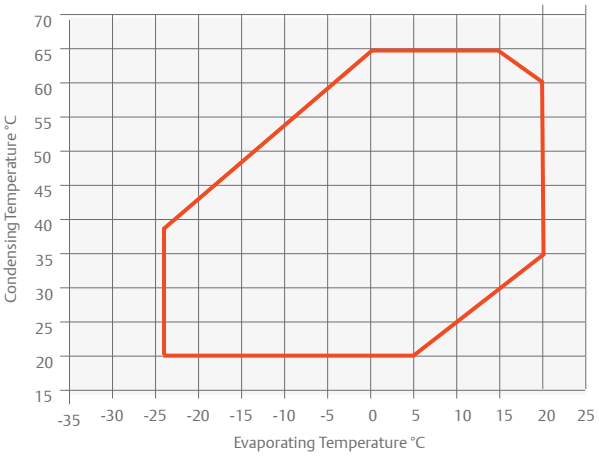
Multiple Copeland Scroll Nominal Cooling kW @(5/50) EN12900 - 1 Circuit

Features and Benefits

- High seasonal performance (SEER)
  5% improved SEER versus previous generation
- Flexibility & reduced complexity
  Wide range of even and uneven tandem and trio assemblies for a full system line-up with a reduced number of compressor models in stock.
- Enhanced reliability through electronics

The CoreSense Communications module provides realtime compressor data via RS485 Modbus that is used by the system controller to provide temperature protection.
This ensures greater reliability for demanding applications.

Operating Envelope R410A



Technical Overview

Models	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**	
ZP137KPE	12.0	29.0	3.2	22.1	1 3/8	7/8	3.3	264/285/552	65		TFD		25.0		118	65
ZP154KPE	13.0	33.0	3.1	24.9	1 3/8	7/8	3.3	264/285/552	65		TFD		31.0		140	65
ZP182KPE	15.0	39.0	3.1	29.1	1 3/8	7/8	3.3	326/295/552	66		TFD		34.0		174	66
ZP232KZE	20.0	50.6	3.3	36.6	1 5/8	1 1/8	4.4	344/292/661	90		TED		38.8		241	72
ZP292KZE	25.0	63.4	3.3	45.7	1 5/8	1 1/8	4.4	344/292/661	90		TED		48.6		287	73
ZP385KPE	30.0	82.9	3.2	60.8	1 5/8	1 3/8	6.3	447/427/724	177		TWD		65.4		310	74
ZP485KPE	40.0	105.0	3.2	77.3	1 5/8	1 3/8	6.3	368/345/756	190		TWD		82.6		408	78

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

Preliminary Data

Capacity Data

Condensing Temperature +40°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
ZP137KPE	15.4	19.2	23.4	28.1	33.6	39.9	47.1	ZP137KPE	7.4	7.4	7.4	7.4	7.4	7.4	7.5
ZP154KPE	17.6	21.8	26.7	32.2	38.5	45.6	53.6	ZP154KPE	8.7	8.6	8.6	8.4	8.4	8.4	8.5
ZP182KPE	21.0	26.1	31.7	38.1	45.3	53.4	62.6	ZP182KPE	10.2	10.1	10.1	10.0	10.0	9.9	9.8
ZP232KZE	27.2	33.5	40.6	48.8	58.1	68.6	89.5	ZP232KZE	12.1	12.2	12.2	12.3	12.3	12.3	12.4
ZP292KZE	34.6	42.4	51.3	61.3	72.5	85.0	98.8	ZP292KZE	15.6	15.6	15.7	15.7	15.7	15.7	15.7
ZP385KPE	45.5	55.6	67.3	80.8	96.3	113.8	133.7	ZP385KPE	20.5	20.5	20.5	20.6	20.8	21.1	21.5
ZP485KPE	58.5	71.1	85.6	102.3	121.3	142.9	167.4	ZP485KPE	25.8	25.8	25.9	26.1	26.4	26.7	27.2

Conditions: Suction Superheat 10K / Subcooling 0K

Preliminary Data

Tandem Model Overview

Model	Nominal hp	Cooling Capacity (kW)	Even Tandem	Uneven Tandem
Tandem ZPT - Tandem Uneven ZPU				
ZPT 274 K	2 x 12	58	•	
ZPT 308 K	2 x 13	67	•	
ZPU 336 K	13 + 15	72		•
ZPT 364 K	2 x 15	77	•	
ZPU 414 K	15 + 20	89		•
ZPT 464 K	2 x 20	101	•	
ZPU 474 K	15 + 25	102		•
ZPU 524 K	20 + 25	114		•
ZPT 584 K	2 x 25	125	•	
ZPU 677 K	25 + 30	146		•
ZPU 717 K	20 +40	155		•
ZPT 770 K	2 x 30	165	•	
ZPU 870 K	30 + 40	187		•
ZPT 970 K	2 x 40	209	•	

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

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

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

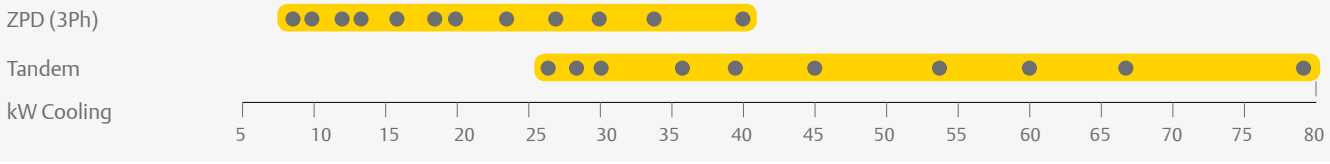
Stepless capacity modulation in air conditioning applications: flexible solution for R407C and R410A.

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.

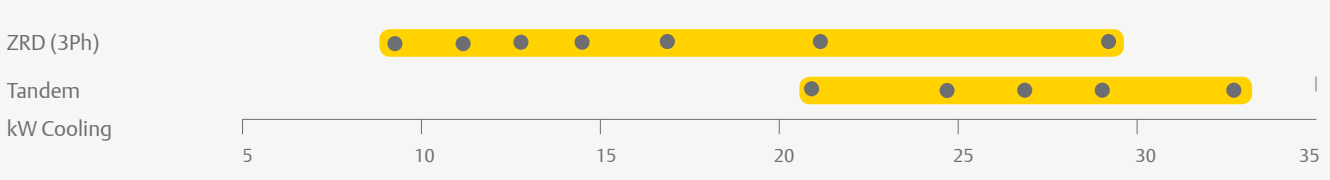
Digital Scroll compressors are the preferred choice for process cooling, refrigeration racks, refrigeration units, VRF, rooftop and air handling unit systems.

ZPD & ZRD Copeland Scroll Digital Compressor

ZPD & ZRD Digital Scroll Compressor Line-up R410A



ZPD & ZRD Digital Scroll Compressor Line-up R407C



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

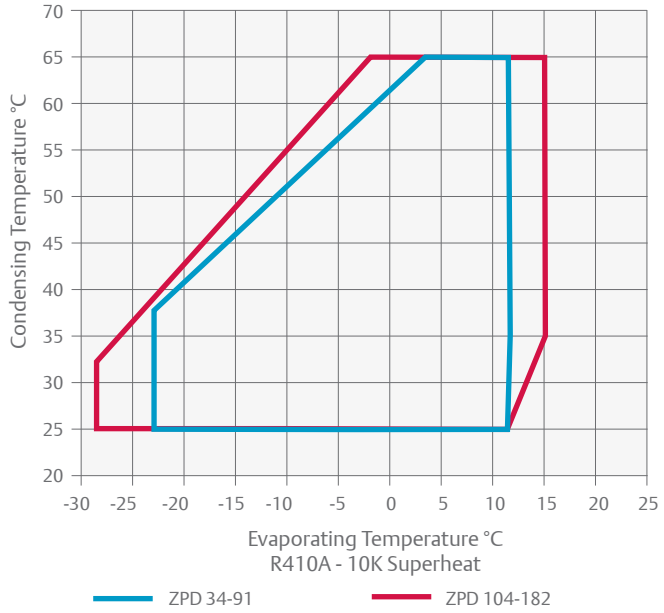
Features and Benefits

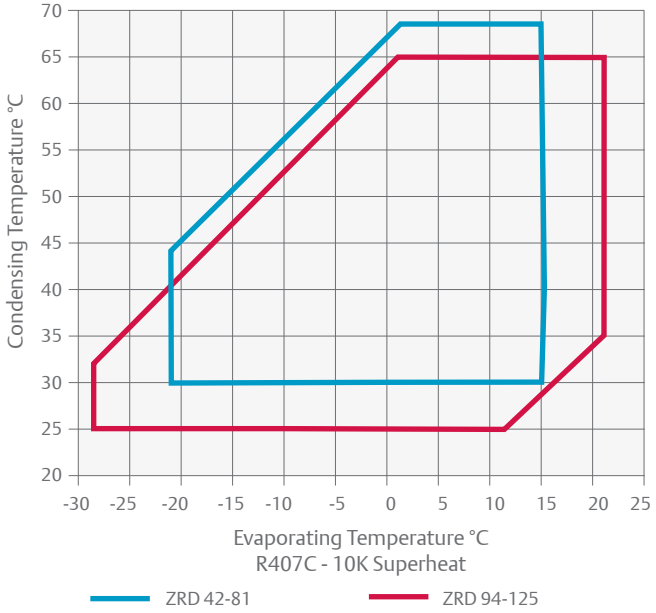
- Wide modulation range from 10% to 100% for immediate load adjustment, close temperature comfort, optimal comfort
- No complex electronics, a quasi-drop-in solution for fast time to market, no EMI/EMC problems, easy installation and maintenance
- No impact on system mechanical balance: no vibration 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 ZPD34 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 R410A/R407C





Technical Overview

Models	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 Presure @1 m - dB(A) **
										3 Ph*	3 Ph*	3 Ph*	
ZPD34KSE	3.0	7.3	2.8	5.7	7/8	1/2	1.24	243/243/448	31	TFM	12	64	66
ZPD42KSE	3.5	9.1	3.0	6.9	7/8	1/2	1.24	243/243/464	31	TFM	8	52	66
ZPD54KSE	4.5	11.5	3.0	8.9	7/8	1/2	1.24	236/236/479	35	TFM	10	62	67
ZPD61KCE	5.0	13.2	2.9	10.1	7/8	1/2	1.89	241/246/484	41	TFD	12	64	63
ZPD72KCE	5.0	15.2	2.9	11.6	7/8	1/2	1.89	241/246/484	40	TFD	15	75	67
ZPD83KCE	6.0	17.7	3.0	13.4	7/8	1/2	1.77	246/253/481	40	TFD	16	101	64
ZPD91KCE	7.5	19.2	3.1	14.7	7/8	3/4	1.80	246/253/481	40	TFD	16	101	69
ZPD104KCE	9.0	22.7	3.1	16.7	1 1/8	7/8	3.25	270/262/605	61	TFD	18	128	63
ZPD122KCE	10.0	26.3	3.1	19.7	1 1/8	7/8	3.25	270/262/605	62	TFD	21	139	63
ZPD137KCE	12.0	29.5	3.1	22.1	1 3/8	7/8	3.25	293/285/533	62	TFD	25	118	63
ZPD154KCE	13.0	33.1	3.1	24.8	1 3/8	7/8	3.25	314/285/552	65	TFD	27	140	66
ZPD182KCE	15.0	39.0	3.1	29.0	1 3/8	7/8	3.25	314/285/552	67	TFD	34	173	68

Conditions EN12900 R410A: 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	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 Presure @1 m - dB(A) **
										3 Ph*	3 Ph*	3 Ph*	
ZRD42KCE	3.5	8.9	2.9	9.9	3/4	1/2	1.24	241/241/462	31	TFD	7	46	60
ZRD48KCE	4.0	10.5	3.0	11.4	7/8	1/2	1.36	241/241/465	32	TFD	10	48	64
ZRD61KCE	5.0	12.5	3.0	14.3	7/8	1/2	1.89	241/246/481	38	TFD	9.6	64	65
ZRD72KCE	6.0	14.3	2.9	17.0	7/8	3/4	1.89	241/246/481	40	TFD	13	74	63
ZRD81KCE	6.0	17.0	3.1	18.7	7/8	3/4	1.89	241/246/481	41	TFD	15	100	67
ZRD94KCE	7.5	21.0	3.3	22.1	1 1/8	7/8	2.51	293/285/476	58	TFD	16	95	64
ZRD125KCE	10.0	27.7	3.3	28.8	1 3/8	7/8	3.25	293/285/533	61	TFD	20	118	64

Conditions EN12900 R410A: 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 +40°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
ZPD34KSE	3.9	5.0	6.2	7.6	9.2	11.0		ZPD34KSE	2.1	2.1	2.1	2.0	2.0	2.0	
ZPD42KSE	4.8	5.9	7.3	8.8	10.6	12.6		ZPD42KSE	2.3	2.3	2.4	2.4	2.4	2.3	
ZPD54KSE	6.5	7.9	9.5	11.4	13.5	16.0		ZPD54KSE	3.1	3.1	3.1	3.0	3.0	3.0	
ZPD61KCE	6.9	8.6	10.5	12.7	15.3	18.2		ZPD61KCE	3.3	3.4	3.5	3.5	3.6	3.6	
ZPD72KCE	8.2	10.1	12.3	14.8	17.6	20.9		ZPD72KCE	3.9	4.0	4.1	4.1	4.2	4.2	
ZPD83KCE	9.7	11.9	14.4	17.2	20.5	24.1		ZPD83KCE	4.5	4.6	4.7	4.7	4.8	4.9	
ZPD91KCE	10.1	12.6	15.3	18.5	22.1	26.2	30.9	ZPD91KCE	4.9	5.0	5.0	5.0	5.1	5.0	5.0
ZPD104KCE	12.3	15.1	18.3	21.9	26.1	30.8	36.2	ZPD104KCE	5.6	5.7	5.7	5.9	6.0	6.1	6.2
ZPD122KCE	14.2	17.5	21.2	25.4	30.3	35.8	42.0	ZPD122KCE	6.4	6.5	6.6	6.7	6.8	6.9	7.0
ZPD137KCE	15.5	19.4	23.7	28.7	34.2	40.3	47.2	ZPD137KCE	7.5	7.5	7.5	7.4	7.4	7.5	7.6
ZPD154KCE	17.8	22.0	26.6	31.9	38.0	45.0	53.0	ZPD154KCE	8.2	8.3	8.4	8.5	8.6	8.7	8.9
ZPD182KCE	22.3	26.8	32.0	37.9	44.6	52.5	61.6	ZPD182KCE	9.8	9.9	10.0	10.1	10.2	10.4	10.5

Conditions: Suction Superheat 10K / Subcooling 0K

Condensing Temperature +40°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
ZRD42KCE	4.3	5.4	6.7	8.3	10.1	12.2	14.6	ZRD42KCE	2.0	2.1	2.1	2.2	2.2	2.3	2.3
ZRD48KCE	4.9	6.4	8.0	10.0	12.3	15.0	18.1	ZRD48KCE	2.5	2.6	2.6	2.7	2.7	2.8	2.9
ZRD61KCE	6.1	7.7	9.5	11.7	14.2	17.3	21.0	ZRD61KCE	3.0	3.1	3.2	3.4	3.4	3.4	3.3
ZRD72KCE	3.5	6.0	8.9	12.3	16.2	20.6	25.6	ZRD72KCE	3.5	3.6	3.7	3.8	4.0	4.1	4.3
ZRD81KCE	8.0	10.2	12.8	15.8	19.2	23.2	27.7	ZRD81KCE	4.3	4.4	4.4	4.5	4.6	4.7	4.8
ZRD94KCE	10.0	12.7	16.0	19.8	24.1	28.9	34.5	ZRD94KCE	5.0	5.1	5.1	5.1	5.1	5.2	5.3
ZRD125KCE	13.2	16.9	21.3	26.3	31.7	37.6	43.7	ZRD125KCE	6.5	6.6	6.6	6.7	6.8	6.9	7.1

Conditions: Suction Superheat 10K / Subcooling 0K

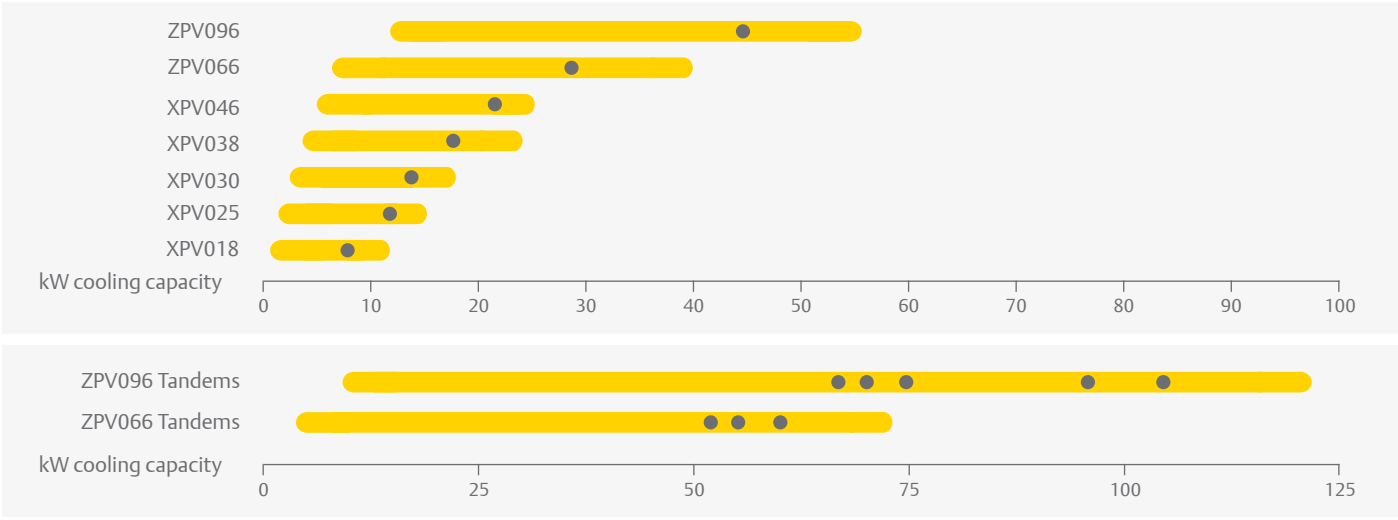
XPV & ZPV Copeland Scroll™ Variable Speed Compressor Ranges for R410A With Inverter Drive

Copeland Scroll™ XPV and ZPV Variable Speed compressors 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.

Copeland Scroll™ ZPV066 variable speed compressor and drive

XPV and ZPV Variable Speed Scroll Compressor Line-up



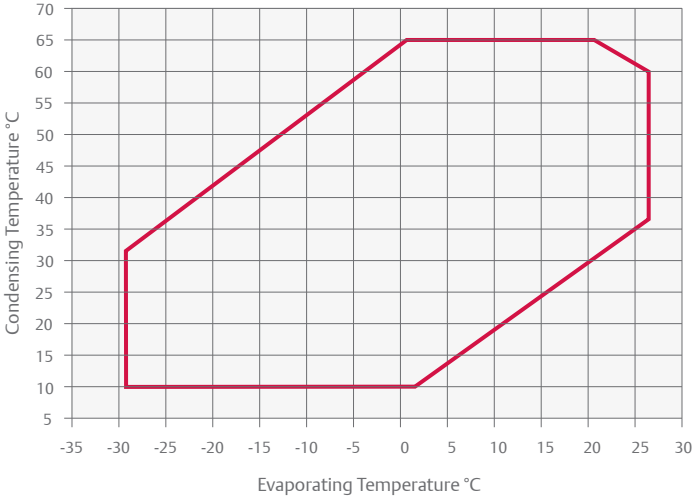
Features and Benefits

- 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

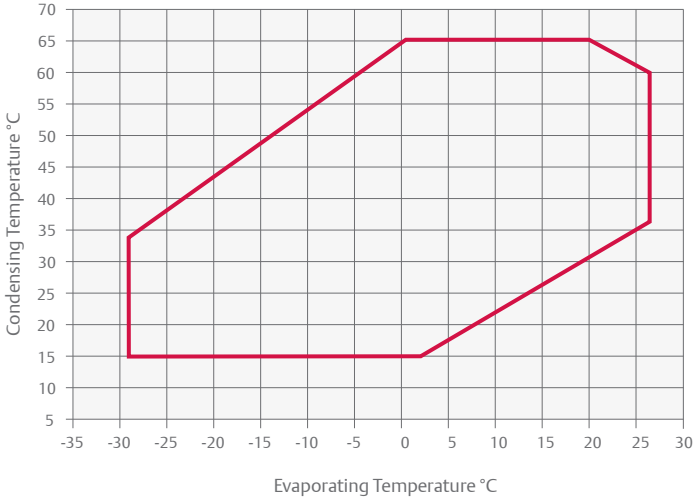
Maximum Allowable Pressure (PS)

- XPV018-046
  Low Side PS 29.5 bar(g) / High Side PS 45 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



Technical Overview

Compressor										
R410A	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								
XPV0182E	2.0	10.4	3.1	18.0	3/4	1/2	0.7	194/216/335	16	n.a.
XPV0252E	2.7	14.5	3.1	25.0	3/4	1/2	0.7	194/216/335	16	n.a.
XPV0302E	3.3	17.4	3.1	30.0	3/4	1/2	0.7	194/216/335	18	n.a.
XPV0382E	4.3	22.5	3.2	38.0	3/4	1/2	1.2	194/216/335	21	n.a.
XPV0462E	6.4	24.0	3.2	46.0	3/4	1/2	1.2	219/198/388	22	n.a.
ZPV0662E	8.3	39.0	3.0	63.0	1 1/8	7/8	2.5	273/262/559	40	73
ZPV0962E	12.9	53.3	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
*@ Nominal speed (90hz)
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition
Preliminary Data

Inverter Drive												
Model	Matched Compressor **	Capacity (kW)	Amps (A)	Cooling	Frequency (Hz)		Net Weight (kg)	1ph 230V	3Ph 400V	3Ph 230V	3Ph 575V	Comm.	Depth/ Width/ Height (mm)*
		Nominal	Nominal		Min	Max							
ED3015A	XPV018	3.8	15	Horizontal / Flatplate	15	120	3.6	√				Modbus RTU and Analog board for 0-10V	205/240/143.5
ED3020A	XPV025	5.0	20		15	120		√					180.5/205/255
ED3018B	XPV025 / XPV030	5.0	18		15	120			√				180.5/205/255
ED3022B	XPV038/ XPV046	8.0	22	Fan / Horizontal / Vertical / Flatplate	15	120			√				154/233/316
EVC1150	ZPV066	15.0		Fan Cooled	17	120	7.4		√	√	√		202/143/391
EVC1185	ZPV096	18.5			20	120	14.0		√	√	√		227/210/391

Conditions: Suction Superheat 5K, Subcooling 4K
*Standard voltage air-cooled version including fins
** Matching with XPV Ongoing

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
XPV0302E	Max	8.9	10.7	12.9	15.6	18.8	22.5	26.7	XPV0302E	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
XPV0382E	Max	11.3	13.6	16.4	19.8	23.8	28.5	33.8	XPV0382E	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
Preliminary Data

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

ZH Copeland 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

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

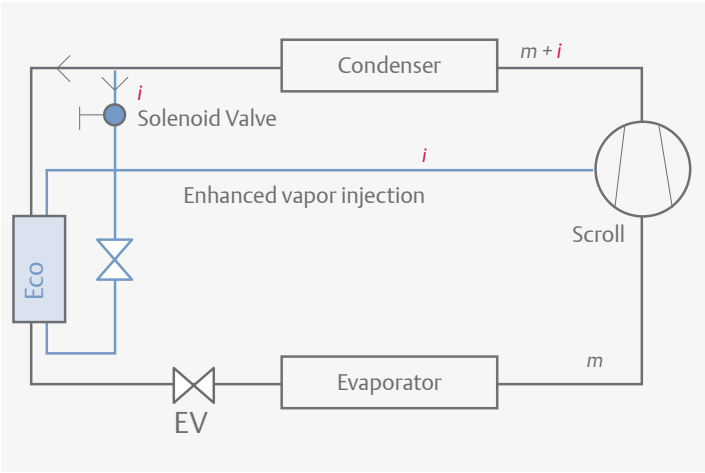
ZH**K4E
Qualified for R407C/R134a
without enhanced vapor injection - ** capacity in Btu/h

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

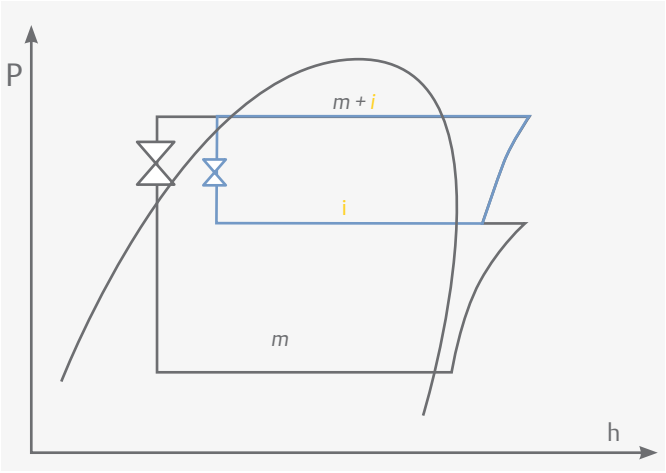
ZH**K1P
Qualified for R410A only
without enhanced vapor injection – ** capacity in kW

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

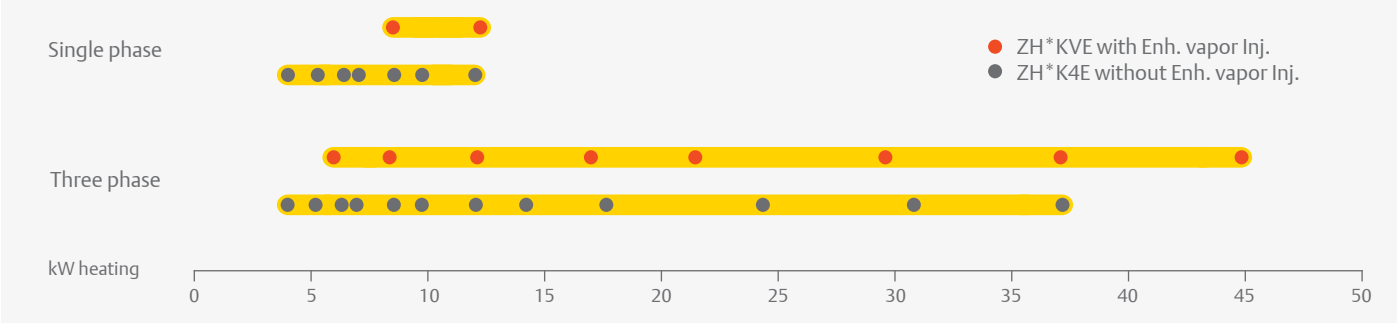
Enhanced Vapor Injection: System Design



Enhanced Vapor Injection: Enthalpy Diagram

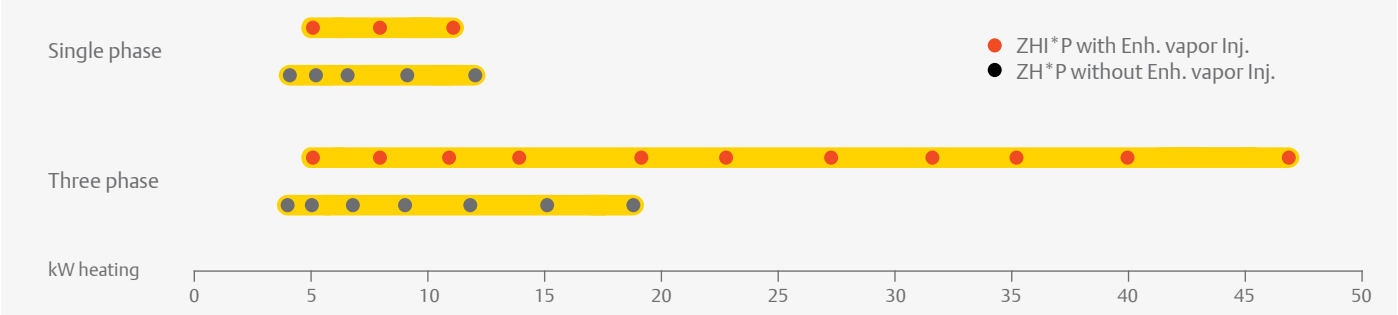


ZH*K4E / ZH*KVE Scroll Compressor Line-up R407C



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

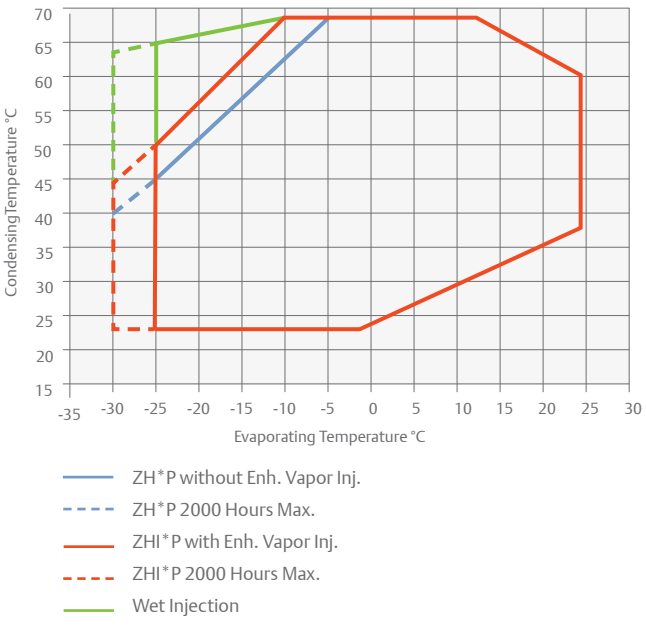
Features and Benefits

- 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

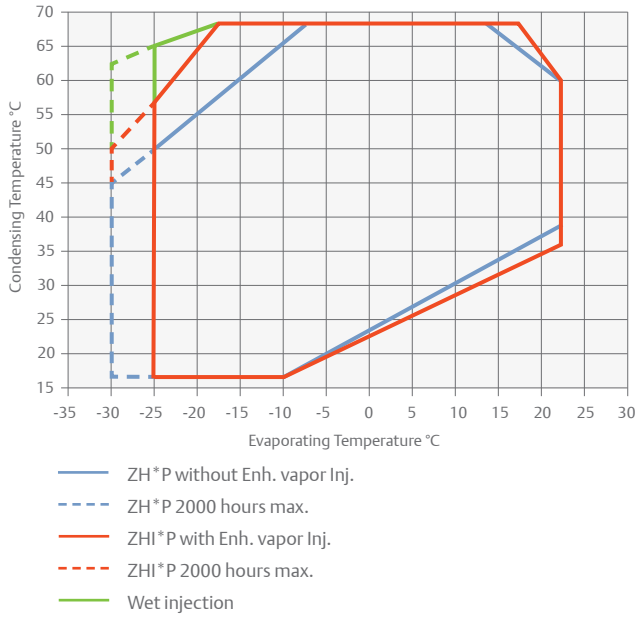
Maximum Allowable Pressure (PS)

- 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 selection 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	229/198/388	21	PFZ		10		44		53
ZH15K4E	2.0	4.6	3	5.8	3/4	1/2	1.3	243/242/364	23	PFJ	TFD	11.6	4.3	61	26	60
ZH21K4E	3.0	6.5	3.1	8.0	3/4	1/2	1.5	243/242/387	27	PFJ	TFD	16	5	76	32	59
ZH26K4E	3.5	8.2	3.1	10.0	3/4	1/2	3.1	243/242/400	28	PFJ	TFD	20	7	97	46	63
ZH30K4E	4.0	9.5	3.1	11.7	7/8	1/2	1.9	247/241/438	38	PFJ	TFD	25	8	108	52	62
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	63
ZH45K4E	6.0	14.0	3.2	17.1	7/8	1/2	1.9	250/246/438	36		TFD		12		74	64
ZH56K4E	7.5	17.4	3.1	20.9	1 3/8	7/8	4.0	357/321/497	93		TWD		17		99	69
ZH75K4E	10.0	24.2	3.2	28.8	1 3/8	7/8	4.0	357/321/497	93		TWD		21		127	70
ZH92K4E	13.0	30.7	3.3	35.6	1 3/8	7/8	4.1	356/320/505	95		TWD		25		167	72
ZH11M4E	15.0	37.0	3.3	42.8	1 5/8	7/8	4.1	357/321/579	112		TWD		32		198	72
ZH06KVE	2.5	6.2	3.3	5.8	3/4	1/2	1.3	243/243/364	27.5		TFM		4.4		26	62
ZH09KVE	3.0	8.2	3.3	8.0	3/4	1/2	1.5	243/243/386	30	PFZ	TFD	21	7	97	40	62
ZH13KVE	4.0	11.8	3.4	11.7	7/8	1/2	1.9	244/241/438	38	PFZ	TFD	30	10	160	64	65
ZH18KVE	6.0	16.7	3.4	17.1	7/8	1/2	1.9	244/241/438	41		TFD		14		101	67
ZH24KVE	7.5	21.3	3.3	20.9	1 3/8	7/8	4.0	368/321/525	93		TWD		18		99	73
ZH33KVE	10.0	29.5	3.4	29.0	1 3/8	7/8	4.0	368/321/525	93		TWD		24		127	73
ZH40KVE	13.0	37.0	3.4	35.5	1 3/8	7/8	4.1	368/321/532	103		TWD		30		167	73
ZH48KVE	15.0	44.7	3.4	42.8	1 5/8	7/8	4.1	368/323/579	112		TWD		36		198	76

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

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															
Model	-30	-15	-10	-5	0	+5	+15	Model	-30	-15	-10	-5	0	+5	+15
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															
Model	-30	-15	-10	-5	0	+5	+15	Model	-30	-15	-10	-5	0	+5	+15
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

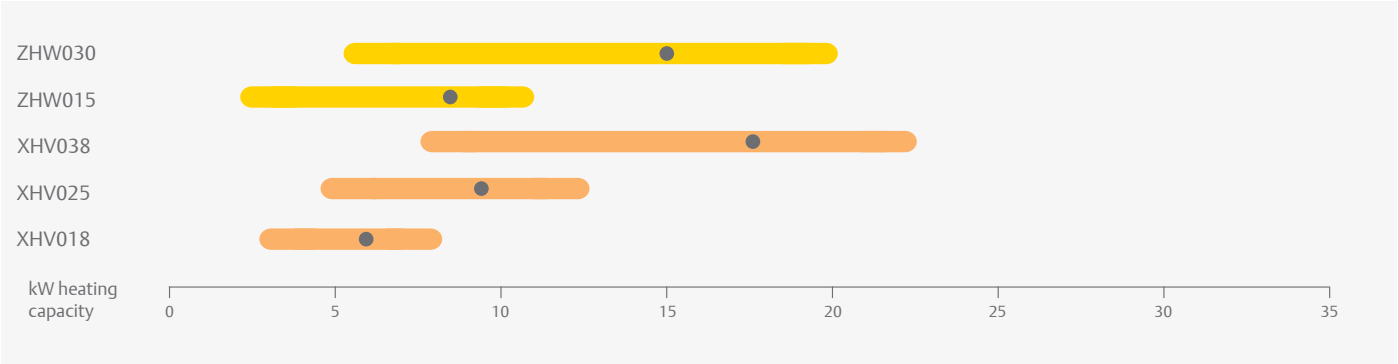
XHV & ZHW Copeland Scroll™ Variable Speed Compressor Ranges for R410A With Inverter Drive

XHV and ZHW Variable Speed scroll compressors for R410A, for outstanding performance for cooling and heating applications.

The new Emerson solution for variable speed applications with capacity modulated compressors. 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 Copeland Scroll Variable Speed Compressor and Drive

XHV & ZHW Variable Speed Scroll Compressor Line-Up

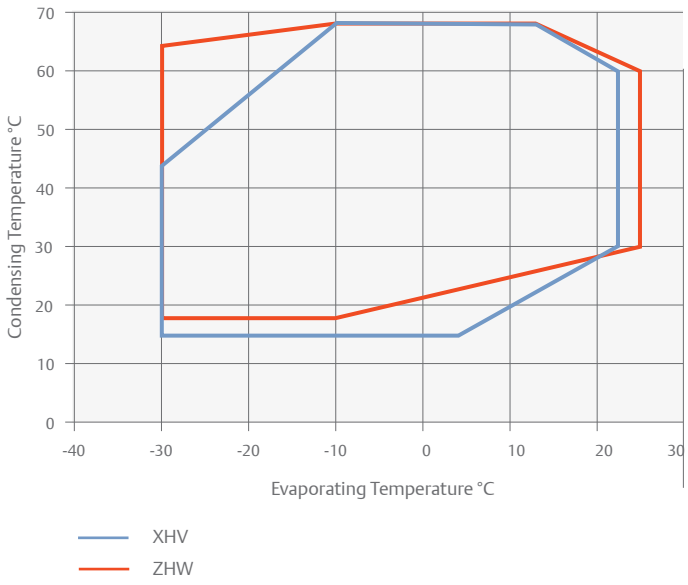


Conditions: Cooling kW evaporating 5°C, Condensing 50°C, cuperheat 10K, Subcooling 0K
Heating kW evaporating -7°C, Condensing 50°C, 4K Subcooling, 5K Superheat

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								
ZHW0152P	2.7	10.4	2.9	15.0	3/4	1/2	1.7	229/198/394	21	68
ZHW0302P	5.5	19.8	3.2	30.0	3/4	1/2	1.7	229/198/394	22	68
XHV0181P	2.9	8.2	2.9	18.0	3/4	1/2	0.7	218/198/334	14	n.a.
XHV0251P	3.9	12.4	2.9	25.0	3/4	1/2	0.7	218/198/334	15	n.a.
XHV0381P	5.5	22.9	3.1	38.0	3/4	1/2	1.2	218/198/414	21	n.a.

Conditions: Heating kW (-7/50)
*@ Nominal Speed (90Hz)
** @ 1m: sound pressure level at 1m distance from the compressor, free field condition
Preliminary Data

Inverter Drive										
Model	Matched Compressor	Power Input (kW)	Amps (A)	Cooling	Frequency (Hz)		Net Weight (kg)	1Ph 230V	3Ph 400V	Comm.	Length/Width/ Height (mm)*
		Nominal	Nominal		Min	Max					
EV2033M	ZHW015	3.3		Air / Liquid	15	120	3.6	√	n.a.	Modbus	228/260/156
EV2037M	ZHW015	3.7			15	120	3.6	√	n.a.		228/260/119
EV2055M	ZHW015-30	5.5			15	120	3.6	√	√		
EV2080M	ZHW030	8.0			15	120	5.1	√	√		228/260/156
ED3011A	XHV018	2.6	11		15	120	2.8	√	n.a.		205/240/143.5
ED3015A	XHV018-25	3.8	15		15	120	3.6	√	n.a.		205/240/143.5
ED3020A	XHV025-38	5.0	20		15	120	3.6	√	n.a.		205/250/180.5
ED3013B	XHV018-25	3.8	13		15	120	3.6	n.a.	√		205/250/183.5
ED3018B	XHV025-38	5.0	18		15	120	3.6	n.a.	√		205/250/183.5
ED3022B	XHV038	8.0	22		15	120	5.1	n.a.	√		n.a.

Conditions: Suction Superheat 5K, Subcooling 4K
*Air Cooled Version Including Fins
Preliminary Data

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	5.6	6.3	7.3	8.3	9.5	10.9	11.7	XHV0181P	Max	2.7	2.7	2.7	2.8	2.8	2.9	2.8
	Min	1.9	2.0	2.3	1.2	1.3	1.3	1.7		Min	1.2	1.1	0.9	0.5	0.4	0.4	0.5
XHV0251P	Max	9.3	10.5	12.0	13.8	15.8	18.1	19.6	XHV0251P	Max	4.3	4.4	4.4	4.5	4.6	4.6	4.6
	Min	3.0	3.3	3.8	1.9	2.1	2.2	2.9		Min	1.8	1.6	1.5	0.7	0.7	0.7	0.7
XHV0381P	Max	16.0	17.9	20.4	23.3	26.8	30.8	34.0	XHV0381P	Max	6.8	7.0	7.1	7.3	7.4	7.5	7.5
	Min	4.6	5.5	6.5	2.8	3.3	3.7	4.9		Min	2.5	2.4	2.4	1.1	1.1	1.1	1.1

Condition: Suction Superheat 5K, Subcooling 4K
Preliminary Data

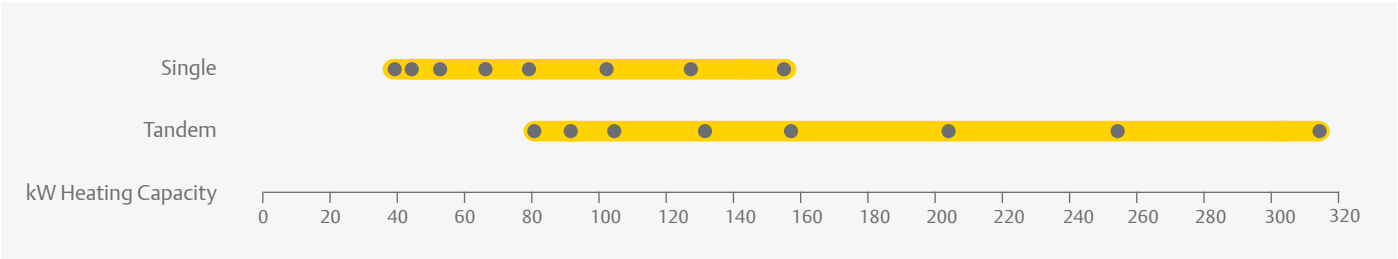
ZH Copeland Scroll™ for Heat Recovery and High Condensing Applications for R134a

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

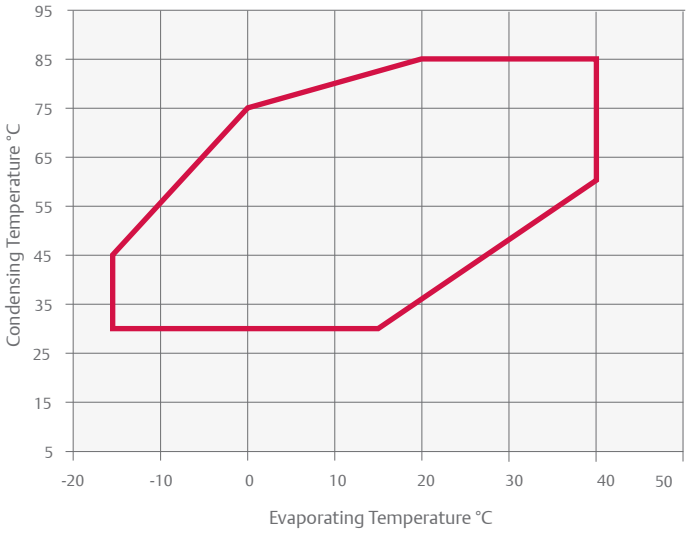
Features and Benefits

- 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)	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)**
										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	19.2	95	63
ZH45KCE	9.0	44.0	4.6	24.9	1 3/8	7/8	3.4	264 / 285 / 533	60	TFD	21.1	111	63
ZH50KCE	10.0	50.9	4.5	29.1	1 3/8	7/8	3.4	264 / 285 / 533	61	TFD	23.6	118	63
ZH64KCE	13.0	63.7	4.3	36.4	1 3/8	7/8	3.4	264 / 285 / 552	65	TFD	27.1	140	68
ZH75KCE	15.0	76.0	4.2	43.4	1 3/8	7/8	3.4	264 / 285 / 552	66	TFD	35.3	174	71
ZH100KCE	20.0	96.1	4.0	56.6	1 5/8	1 3/8	4.7	432 / 376 / 694	140	TWD	42.7	225	72
ZH125KCE	25.0	120.0	4.1	71.4	1 5/8	1 3/8	6.8	447 / 392 / 717	160	TWD	53.4	272	74
ZH150KCE	30.0	148.8	4.2	87.5	1 5/8	1 3/8	6.3	447 / 427 / 717	177	TWD	67.6	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

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

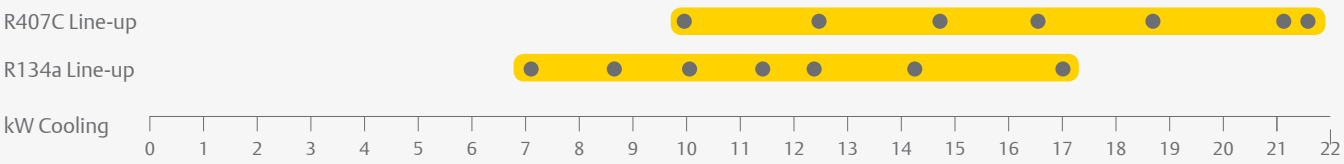
ZRH & ZRHV Copeland Scroll™ Horizontal Compressor Ranges for R407C and R134a, for the specific needs of transport air conditioning

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. The addition of an 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.

Horizontal Scroll Compressor

ZRH Scroll Compressors Line-up R407C and R134a



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

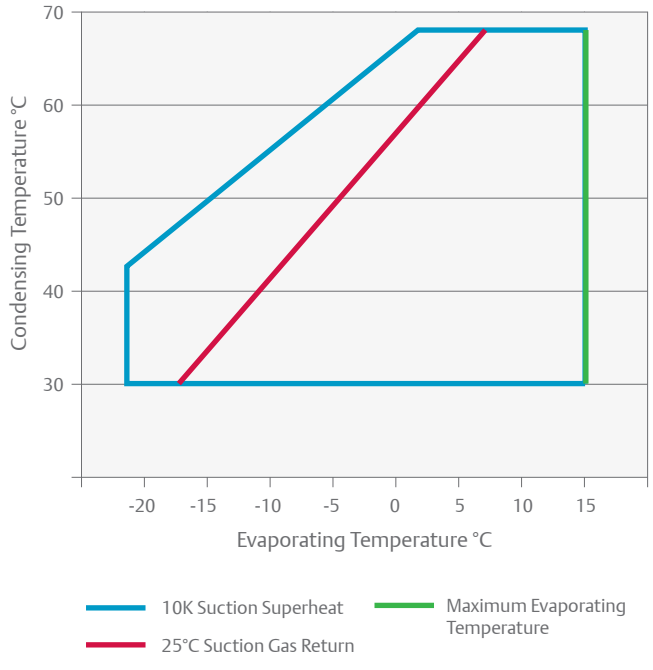
Features and Benefits

- Compactness and low weight
- Horizontal design with less than 250mm height
- Copeland Scroll compliance for superior reliability and efficiency
- Additional oil-pump
- Reduction of potential risk of refrigerant leakage through the drive shaft sealing
- Capacity modulation from 70% to 150% for Quest models ZRHV

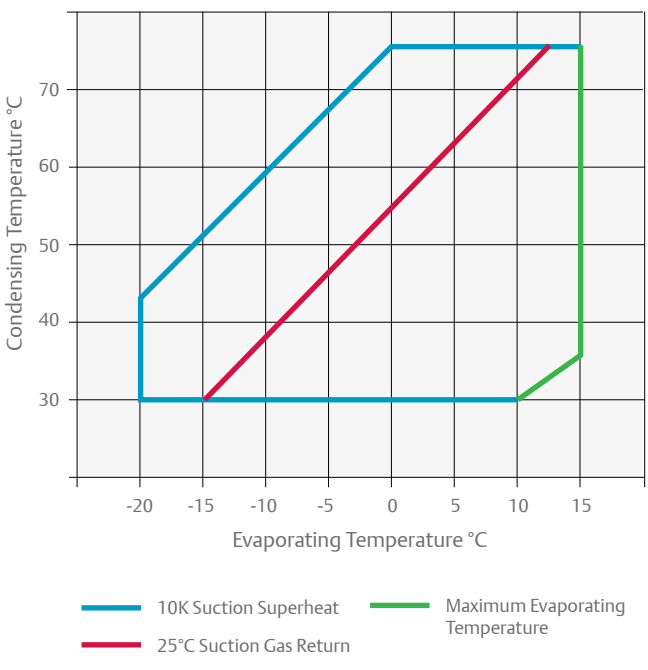
Maximum Allowable Pressure (PS)

Low Side PS 21 bar(g) / High Side PS 28.8 bar(g)

Operating Envelope R407C



Operating Envelope R134a



Technical Overview - Fixed Speed Models

Models	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)**
										3 Ph*	3 Ph*	3 Ph*	
ZRH49KJE	4.0	10.4	2.9	11.8	7/8	1/2	1.8	487/290/231	52	TFD	9	52	66
ZRH61KJE	5.0	13.2	3.1	14.5	7/8	1/2	1.8	487/290/231	53	TFD	12	64	67
ZRH72KJE	6.0	15.2	3.1	17.1	7/8	1/2	1.8	487/290/231	54	TFD	12	74	68
ZRH78KTE	7.0	16.7	3.0	19.8	1 3/8	7/8	1.6	585/313/250	60	TFD	14	100	74
ZRH87KTE	7.5	18.8	3.0	22.1	1 3/8	7/8	1.6	585/313/250	60	TFD	16	95	74
ZRH100KTE	9.0	21.5	3.1	24.9	1 3/8	7/8	1.6	585/313/250	63	TFD	18	111	74
ZRH116KTE	10.0	25.1	3.1	29.1	1 3/8	7/8	1.6	585/313/250	64	TFD	20	118	74

Conditions: EN12900 R407C - 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

Technical Overview - Variable Speed Models

Models	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)**
	Min	Max								3 Ph*	3 Ph*	3 Ph*	
ZRHV72KJE	13.3	22.0	2.8	17.1	7/8	1/2	1.8	487/290/231	53	TFD	15	100	66
ZRHV94KJE	18.6	32.9	2.8	23.9	1 3/8	7/8	1.6	584/305/230	60	TFD	21	140	73

Conditions: EN12900 R407C - 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														
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
ZRH49KJE	2.8	3.7	4.7	5.9	7.3	8.9	10.7	ZRH49KJE	2.0	1.1	2.2	2.3	2.4	2.5	2.6
ZRH61KJE	3.6	4.6	5.9	7.3	8.9	10.9	13.1	ZRH61KJE	2.3	2.5	2.6	2.7	2.8	2.9	3.1
ZRH72KJE	4.3	5.6	7.0	8.6	10.5	12.6	15.0	ZRH72KJE	2.6	2.8	3.0	3.1	3.0	3.4	3.5
ZRH78KTE	4.2	5.5	7.1	9.0	11.3	13.9	17.0	ZRH78KTE	3.5	3.6	3.7	3.8	3.8	3.9	4.0
ZRH87KTE	4.3	5.8	7.6	9.8	13.3	15.2	18.7	ZRH87KTE	3.9	4.0	4.0	4.1	4.1	4.1	4.0
ZRH100KTE	4.8	6.6	8.7	11.2	14.2	17.6	21.7	ZRH100KTE	4.2	4.4	4.4	4.5	4.4	4.5	4.5
ZRH116KTE	6.4	8.4	10.8	13.6	16.9	10.8	25.3	ZRH116KTE	5.5	5.6	5.6	5.6	5.5	5.5	5.5

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

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
ZRH49KJE		5.6	6.9	8.5	10.4	12.6	15.0	ZRH49KJE		3.1	3.3	3.4	3.5	3.6	3.8
ZRH61KJE		7.2	8.8	10.8	13.2	15.9	19.0	ZRH61KJE		3.8	4.0	4.2	4.3	4.5	4.6
ZRH72KJE		8.1	10.1	12.4	15.2	18.4	22.2	ZRH72KJE		4.3	4.5	4.7	4.9	5.0	5.1
ZRH78KTE			10.3	13.4	16.7	20.5		ZRH78KTE			5.4	5.5	5.5	5.5	
ZRH87KTE			15.6	14.8	18.8	23.5		ZRH87KTE			6.1	6.2	6.2	6.2	
ZRH100KTE			13.8	17.4	21.5	26.3		ZRH100KTE			6.7	6.8	6.9	6.9	
ZRH116KTE			16.1	20.2	25.1	30.8		ZRH116KTE			7.9	8.0	8.0	8.1	

Conditions: Suction Superheat 10K / Subcooling 0K

Capacity Data - Variable Speed Models

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
ZRHV72KJE	Max		8.5	10.6	13.0	15.8	18.9	22.3	ZRH49KJE	Max		4.8	5.1	5.4	5.7	6.0	6.3
	Min		5.1	6.3	7.8	9.5	11.3	13.4		Min		2.9	3.1	3.2	3.4	3.6	3.8
ZRHV94KJE	Max			12.4	15.2	18.5	22.2	26.2	ZRH61KJE	Max		0.0	6.0	6.3	6.7	7.0	
	Min			8.9	10.9	13.3	15.9	18.7		Min		0.0	4.3	4.5	4.8	5.0	

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

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
ZRHV72KJE	Max		11.8	14.8	18.2	22.1	26.5	31.2	ZRH49KJE	Max		6.8	7.2	7.5	7.9	8.4	8.9
	Min		7.1	8.9	10.9	13.3	15.9	18.7		Min		4.1	4.3	4.5	4.8	5.0	5.3
ZRHV94KJE	Max			17.3	21.3	25.9	31.0	36.7	ZRH61KJE	Max			8.4	8.8	9.3	9.8	10.4
	Min			12.4	15.3	18.6	22.2	26.2		Min			6.0	6.3	6.7	7.0	7.5

Conditions: Suction Superheat 10K / Subcooling 0K

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 the Discus™ and Stream technologies, digital modulation and CoreSense™ Diagnostics 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, the 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.

CoreSense™ Diagnostics is now also available as an option for the new scroll Summit series for medium and low temperature applications.

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.

ZS*KA Copeland Scroll™ Small Compressor Range for Medium Applications

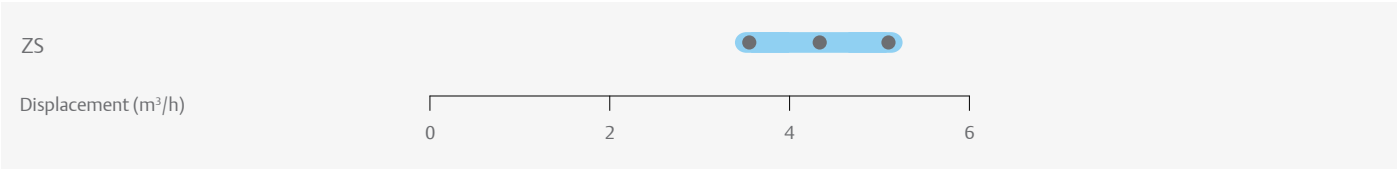
As an extension to the existing ZB*KCE scroll range, the new Copeland Scroll ZS*KA compressor range represents the latest innovation in scroll technology for refrigeration equipment covering a small size displacement range of 4 m^3/h to 5 m^3/h. As with other existing Copeland Scroll compressors scrolls, ZS*KA scrolls feature a scroll compliance mechanism which makes them particularly robust and reliable under severe conditions including liquid slugging.

ZS*KA models are intended for medium temperature refrigeration type systems, and are ideally suited for applications such as walk-ins, reach-ins, cold rooms, display cases, and milk tank units. They are multi-refrigerant capable and feature low sound and low vibration particularly important in the retail and food service sector and recommended for supermarket, restaurant, convenience store, and milk cooling operations.

The ZS*KA range from 1.3hp to 1.8hp is designed to provide seasonal efficiencies up to 28% higher than the equivalent hermetic reciprocating compressors. These compressors 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

ZS*KA Compressor Line-up



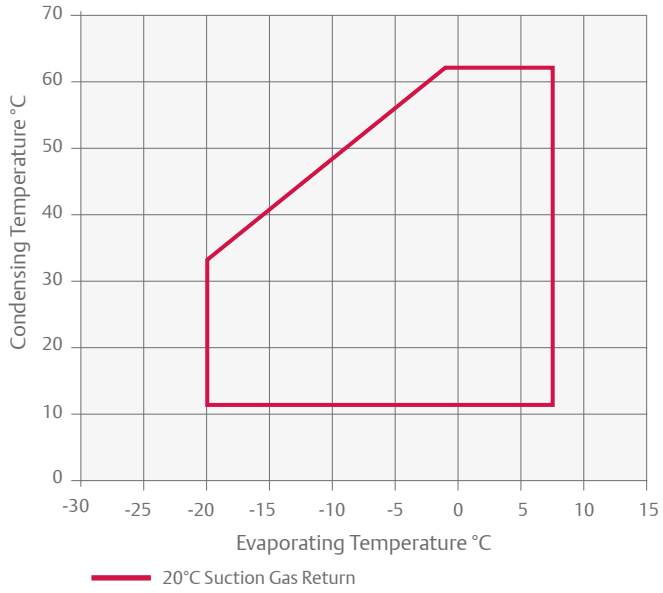
Features and Benefits

- 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 range from -25°C to 10°C covering a minimum condensing limit of 10°C
- Qualified for R407A/F/C, R448A, R449A, R404A and R134a refrigerants

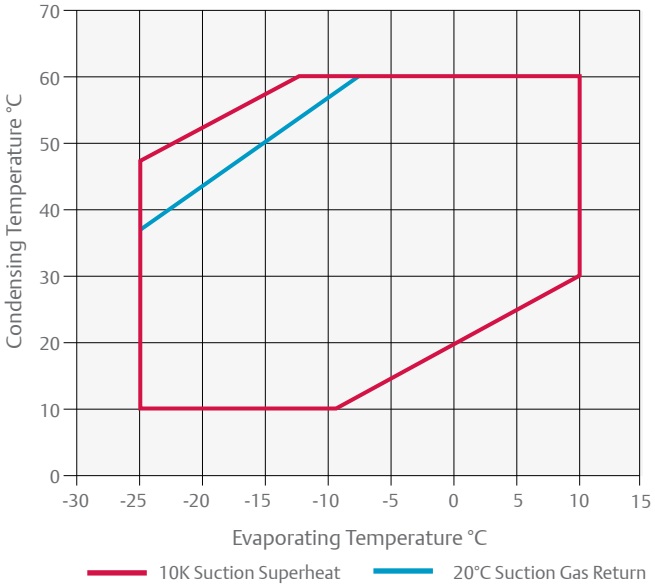
Maximum Allowable Pressure (PS)

- ZS09 to ZS13KA:
  Low Side PS 21.6 bar(g) / High Side PS 31.9 bar(g)

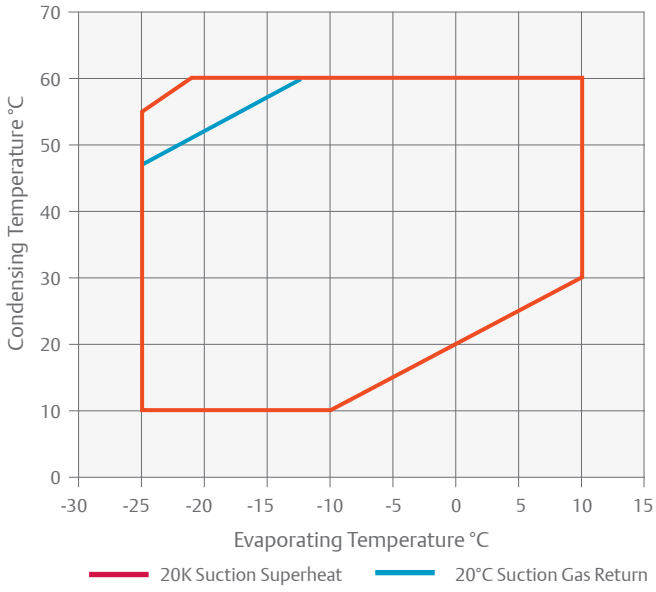
Operating Envelope ZS*KA R134a



Operating Envelope ZS*KA R448A/R449A



Operating Envelope ZS*KA R404A



For individual model details please refer to select software

Technical Overview

Models	Nominal hp	Displacement (m³/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														
ZS09KAE	1.3	3.7	3/4	1/2	0.7	246/246/387	22.2	PFJ	TFD	7.2	3.0	45.0	27.0	58.0
ZS11KAE	1.5	4.4	3/4	1/2	0.7	246/246/387	22.4	PFJ	TFD	8.7	3.3	45.0	27.0	58.0
ZS13KAE	1.8	5.0	3/4	1/2	0.7	246/246/387	21.4	PFJ	TFD	9.9	4.0	54.0	29.0	59.0

* 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															
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

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															
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

Conditions: Suction Gas Return 20°C / Subcooling 0K
*Conditions: Suction Superheat 10K, 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
Medium Temperature															
ZS09KAE			1.0*	1.5	1.9	2.3	2.7	ZS09KAE			0.8*	0.8	0.9	0.9	0.9
ZS11KAE			1.2*	1.8	2.2	2.7	3.3	ZS11KAE			1.0*	1.0	1.1	1.1	1.1
ZS13KAE			1.4*	2.1	2.6	3.1	3.7	ZS13KAE			1.1*	1.2	1.2	1.2	1.3

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

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
Medium Temperature															
ZS09KAE			1.1*	1.5	1.9	2.3	2.8	ZS09KAE			0.9*	0.9	1.0	1.0	1.0
ZS11KAE			1.3*	1.9	2.3	2.8	3.3	ZS11KAE			1.0*	1.1	1.1	1.2	1.2
ZS13KAE			1.5*	2.1	2.6	3.1	3.8	ZS13KAE			1.2*	1.3	1.3	1.4	1.4

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															
ZS09KAE			0.9	1.1	1.4	1.7	2.8	ZS09KAE			0.5	0.6	0.6	0.6	1.0
ZS11KAE			1.1	1.3	1.7	2.0	3.3	ZS11KAE			0.6	0.7	0.7	0.7	1.2
ZS13KAE			1.2	1.5	1.9	2.3	3.8	ZS13KAE			0.7	0.8	0.8	0.8	1.4

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

ZB Copeland 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 rage from 5.9 m³/h to 87.5 m³/h. It includes digital compressor models that offers 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.

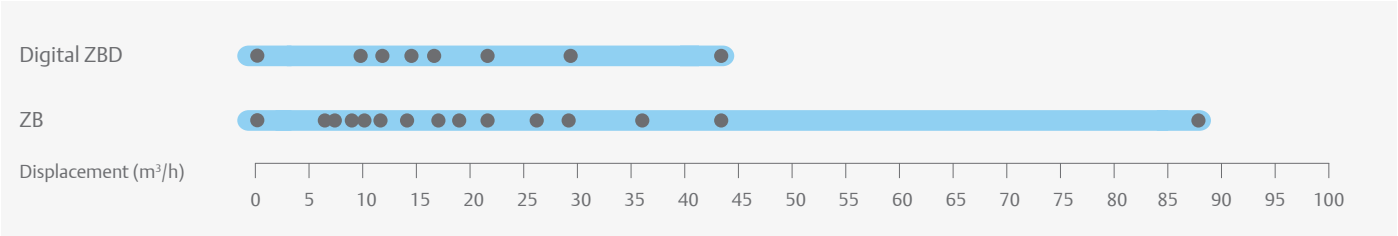
The Summit Series from 7 to 15 hp is designed to provide seasonal efficiencies 15% higher than traditional semi-hermetic compressors. These compressors are extremely quiet and can be fitted with an external sound shell for an additional 10 dBA sound reduction, which makes them best choice for refrigeration applications in urban and domestic areas.

The ZB range also features ZB220 (30hp), the largest refrigeration scroll available on the market. These compressors are qualified for R407A/F/C, R448A, R449A, R404A and R134a. CoreSense™ Diagnostics is now available as an option for the ZB Scroll Summit series (ZB66K5E, ZB76K5E, ZB95K5E and ZB114K5E) as well as for Summit Digital ZBD*K5E Series.

ZB Compressor for Medium Temperature Refrigeration With and Without Sound Shell

For more details on digital models please refer to page 58 in the catalogue.

ZB and ZBD Compressor Line-up



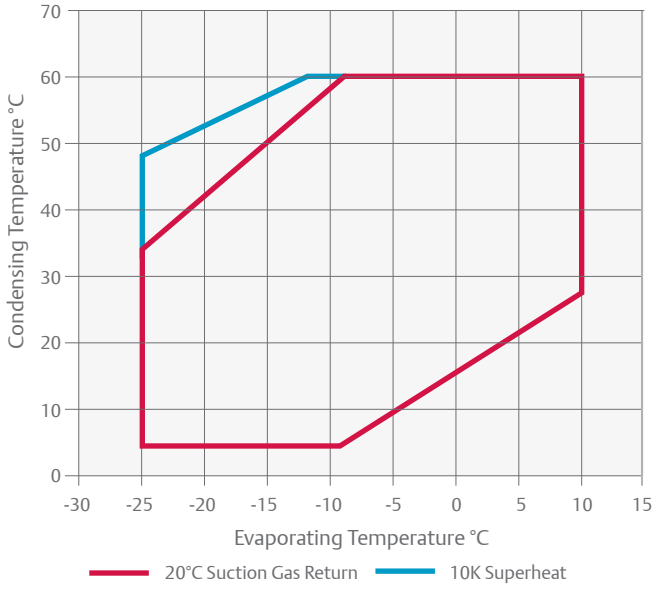
Features and Benefits

- 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

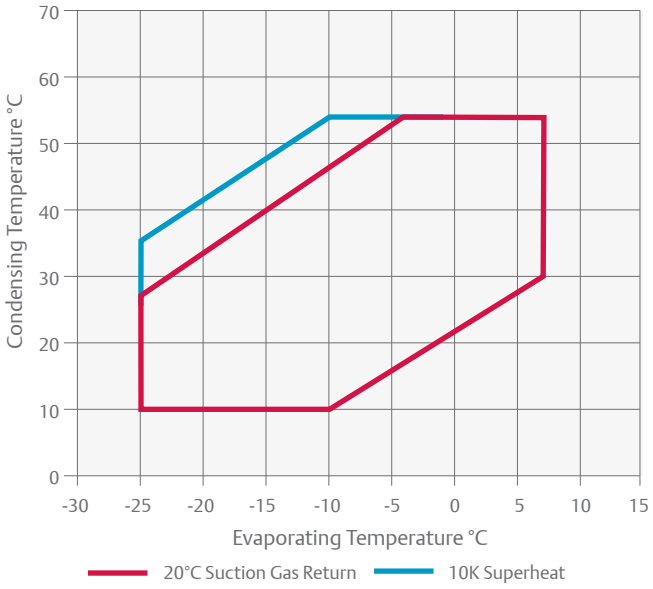
Maximum Allowable Pressure (PS)

- 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)

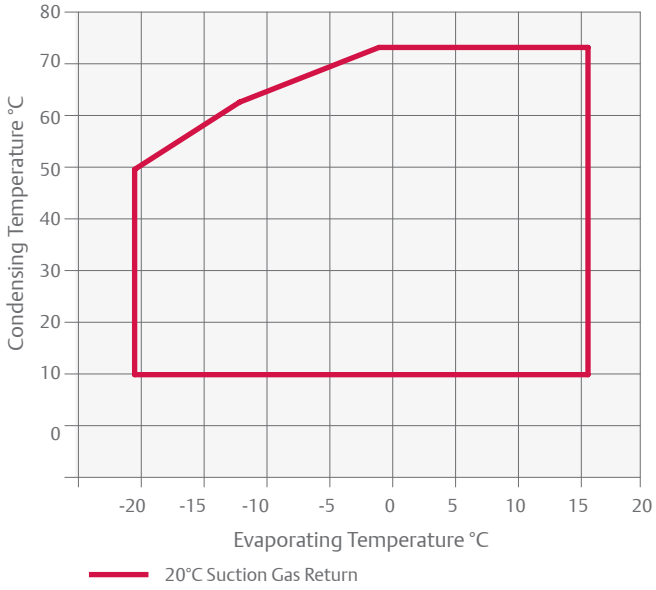
Operating Envelope R448A/R449A



Operating Envelope R407A



Operating Envelope R134a - for ZBD Digital Models



For individual model details please refer to select software.

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	25.4	PFJ	TFD	12.8	4.9	58.0	26.0	55.0
ZB19KCE	2.5	6.8	1 1/4	1	1.5	242/242/369	27.2	PFJ	TFD	12.8	6.5	61.0	32.0	55.0
ZB21KCE	3.0	8.6	1 1/4	1	1.2	243/244/391	29.0	PFJ	TFD	16.4	7.2	82.0	40.0	58.0
ZB26KCE	3.5	10.0	1 1/4	1	1.5	243/244/405	28.0	PFJ	TFD	18.0	8.9	97.0	46.0	60.0
ZB29KCE	4.0	11.4	1 1/4	1	1.5	246/246/423	28.6		TFD		10.0		50.0	58.0
ZB38KCE	5.0	14.4	1 1/4	1	1.9	242/242/438	37.4	PFJ	TFD	32.3	12.8	142.0	65.5	61.0
ZB42KCE	5.5	16.2	1 1/4	1	1.9	251/246/438	43.0	PFJ		35.7		150.0		62.0
ZB45KCE	6.0	17.1	1 1/4	1	1.9	242/242/438	39.5		TFD		13.1		74.0	61.0
ZB48KCE	6.5	18.8	1 1/4	1 1/4	1.8	246/250/442	39.0		TFD		14.0		101.0	62.0
ZB57KCE		21.4	1 1/4	1 1/4	1.9	246/256/442	39.5		TFD		15.9		102.0	68.0
ZB220KCE	30.0	87.5	2 3/4	1 3/4	6.3	448/392/715	176.0		TWM		69.0		310.0	78.0
ZB Summit Models														
ZB66K5E	10.0	25.7	1 3/4	1 1/4	3.4	280/280/534	59.9		TFD		17.5		111.0	66.0
ZB76K5E	12.0	28.8	1 3/4	1 1/4	3.4	280/280/534	61.2		TFD		20.4		118.0	67.0
ZB95K5E	13.0	36.4	1 3/4	1 1/4	3.4	280/280/552	64.9		TFD		28.2		140.0	69.0
ZB114K5E	15.0	43.4	1 3/4	1 1/4	3.4	280/280/552	66.2		TFD		33.5		174.0	72.0

* 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				2.6*	3.4	4.2	5.2	ZB19KCE				1.7*	1.8	1.8	1.8
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				4.2*	5.6	7.0	8.6	ZB29KCE				2.6*	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				7.3*	9.5	11.7	14.3	ZB48KCE				4.5*	4.5	4.6	4.5
ZB57KCE				8.4*	11.1	13.8	17.0	ZB57KCE				5.2*	5.2	5.3	5.3
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

Suction Gas Return 20°C / Subcooling 0K
*Suction Superheat 10K
** 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	4.0
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				7.9*	10.6*	13.7	16.8	ZB57KCE				4.7*	5.0*	5.3	5.5
ZB Summit Models															
ZB66K5E				9.5*	13.0*	16.9	20.9	ZB66K5E				5.8*	5.8*	5.9	6.1
ZB76K5E				10.9*	15.0*	19.6	24.2	ZB76K5E				6.9*	6.8*	7.0	7.2
ZB95K5E				13.3*	18.6*	24.4	30.1	ZB95K5E				8.8*	8.8*	8.9	9.1
ZB114K5E				15.3*	21.5*	28.5	35.4	ZB114K5E				10.7*	10.7*	10.8	11.0

Suction Gas Return 20°C / Subcooling 0K
*Suction Superheat 10K
** 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			1.5*	2.2	2.8	3.5	4.3	ZB15KCE			1.6*	1.5	1.5	1.4	1.4
ZB19KCE			1.9*	2.6	3.2	4.0	4.9	ZB19KCE			1.7*	1.7	1.7	1.7	1.7
ZB21KCE			2.5*	3.3	4.2	5.2	6.4	ZB21KCE			2.0*	2.0	2.0	2.0	2.0
ZB26KCE			2.9*	3.9	4.9	6.0	7.4	ZB26KCE			2.3*	2.4	2.4	2.4	2.4
ZB29KCE			3.3*	4.4	5.5	6.8	8.2	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	8.4	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			6.0*	8.7	11.0	13.6	16.5	ZB57KCE			4.3*	4.5	4.7	4.9	5.1
ZB220KCE				32.4*	43.1	53.7	65.7	ZB220KCE				20.3*	20.3	20.4	20.6
ZB Summit Models															
ZB66K5E			6.8*	9.4*	12.7	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			8.7*	8.6*	8.6	8.6	8.7
ZB114K5E			10.6*	15.6*	21.5	27.3	33.7	ZB114K5E			10.5*	10.3*	10.3	10.3	10.4

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

Capacity 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
ZB220KCE			28.5*	39.2	47.7	57.5	68.9	ZB220KCE			21.4*	21.8	22.0	22.2	22.4
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

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

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
ZB220KCE					27.3	34.1	42.1	ZB220KCE					13.0	13.2	13.5
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

Suction Gas Return 20°C / Subcooling 0K
** Single Phase Only

ZF Copeland 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:

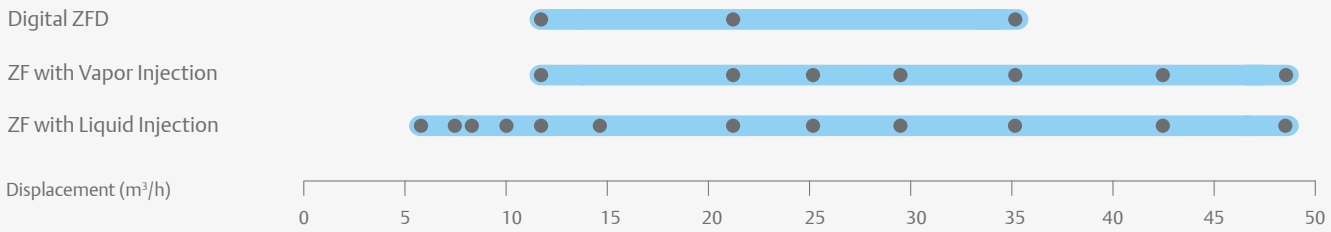
- The ZF*K4E models that operate with liquid injection in order to control discharge temperature and increase the operating envelope.
- The ZF*KVE models that are optimized for vapor injection with use of a sub-cooler. This boosts refrigeration system's cooling capacity and efficiency.
- The Summit ZF* 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. For more details on Digital Scroll models please refer to page 58 in the catalogue.

CoreSense™ Diagnostics is now available as an option for the ZF Scroll Summit series (ZF34K5E-ZF54K5E) as well as for Summit Digital ZFD41K5E.

ZF Compressor for Low Temperature Refrigeration With and Without Sound Shell

ZF and ZFD Compressor Line-Up



Features and Benefits

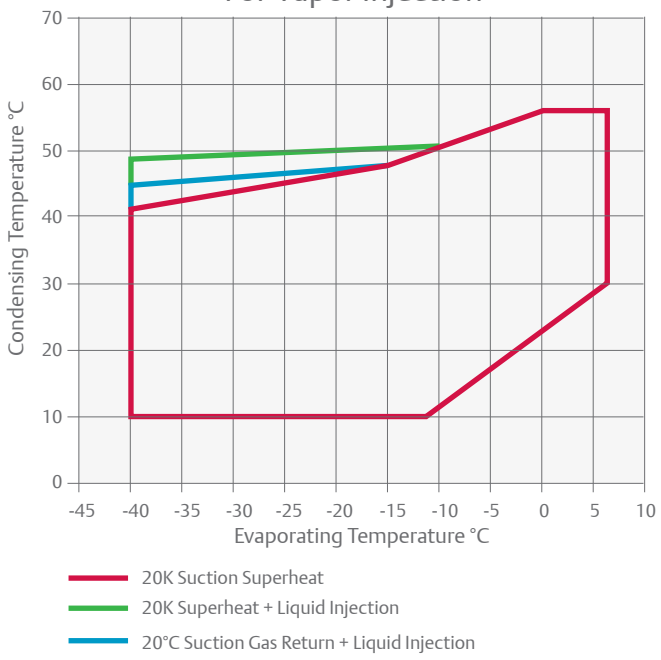
- Wide operating envelope with 10°C low condensing temperature to minimize energy consumption
- One model for multiple refrigerants
- Light weight and compactness, up to half the weight of equivalent semi-hermetic compressor
- Optional Sound Shell allowing up to 10 dBA sound attenuation
- ZF models with 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)

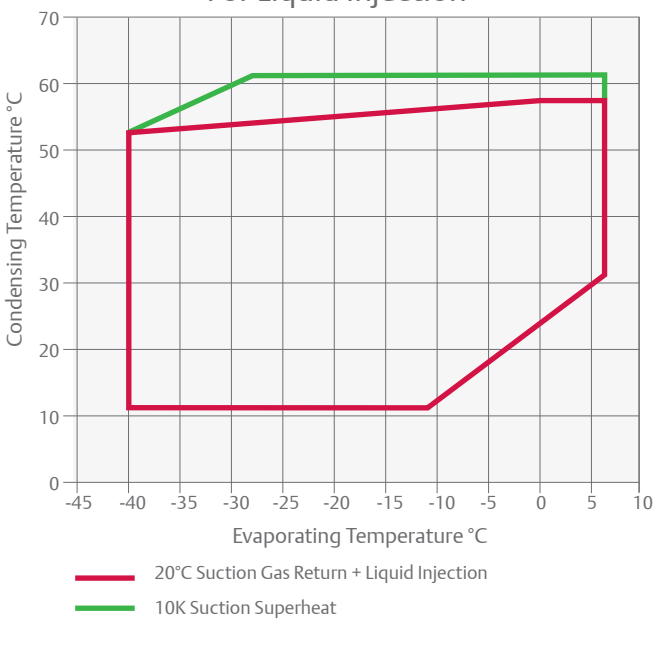
Operating Envelope R407A

For Vapor Injection



20K Suction Superheat
20K Superheat + Liquid Injection
20°C Suction Gas Return + Liquid Injection

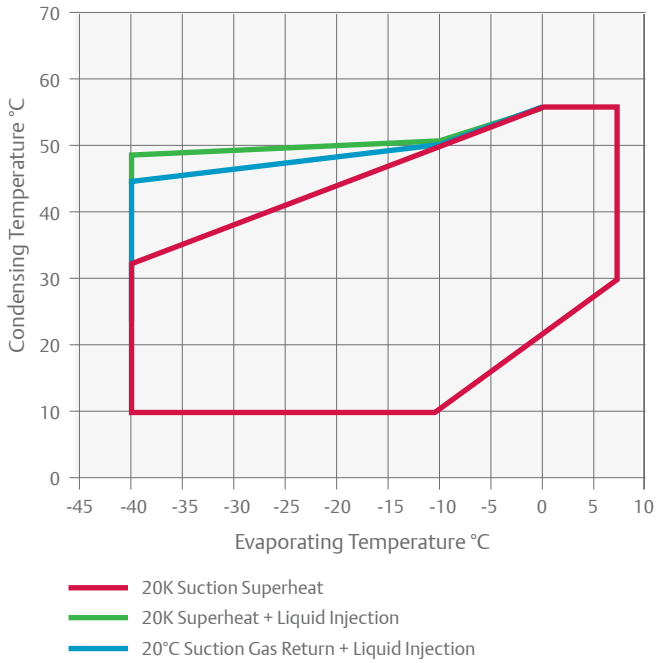
For Liquid Injection



20°C Suction Gas Return + Liquid Injection
10K Suction Superheat

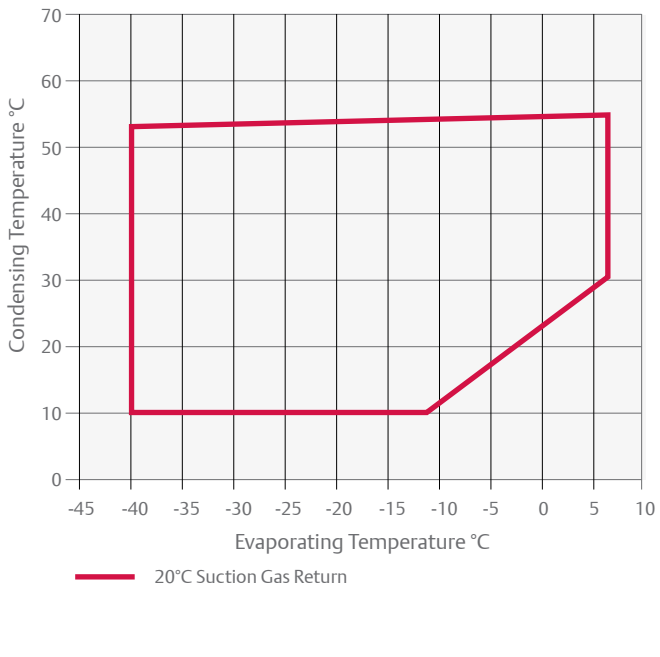
Operating Envelope R407F

For Vapor Injection



20K Suction Superheat
20K Superheat + Liquid Injection
20°C Suction Gas Return + Liquid Injection

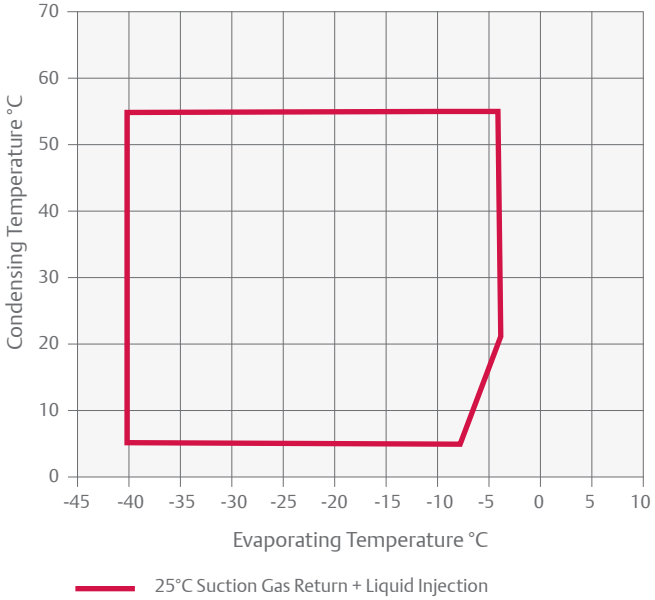
For Liquid Injection



20°C Suction Gas Return

Operating Envelope R448A/R449A

For Liquid Injection



For individual model details please refer to Select Software.

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											
ZF06K4E	2.0	5.9	1 1/4	1	1.3	243/245/369	25.4	TFD	5.0	26.0	57.0
ZF08K4E	2.5	7.3	1 1/4	1	1.5	243/245/391	27.2	TFD	6.0	32.0	59.0
ZF09K4E	2.8	8.0	1 1/4	1	1.5	243/244/391	27.0	TFD	6.0	40.0	62.0
ZF11K4E	3.5	9.9	1 1/4	1	1.5	243/244/405	28.0	TFD	7.1	46.0	63.0
ZF13K4E	4.0	11.8	1 1/4	1	1.9	246/251/442	38.0	TFD	8.0	51.5	65.0
ZF15K4E	5.0	14.5	1 1/4	1	1.9	246/251/442	39.0	TFD	10.0	64.0	65.0
ZF18K4E	6.0	17.1	1 1/4	1	1.9	246/251/442	41.0	TFD	12.5	74.0	67.0
ZF Summit Models with Liquid Injection											
ZF25K5E	7.5	21.4	1 1/4	1 1/4	1.9	246/257/452	39.5	TFD	16.0	102.0	70.0
ZF34K5E	10.0	29.1	1 3/4	1 1/4	3.4	280/280/534	63.1	TFD	25.0	100.0	68.0
ZF41K5E	13.0	35.3	1 3/4	1 1/4	3.4	280/280/534	63.1	TFD	29.0	118.0	69.0
ZF49K5E	15.0	42.4	1 3/4	1 1/4	3.4	280/280/552	66.2	TFD	30.0	139.0	72.0
ZF54K5E	17.0	48.3	1 3/4	1 1/4	3.4	363/312/552	66.2	TFD	31.0	168.0	78.0
Models with Enhanced Vapor Injection											
ZF13KVE EVI	4.0	11.7	1 1/4	1	1.9	246/251/442	38.0	TFD	9.0	64.0	63.0
ZF18KVE EVI	6.0	17.1	1 1/4	1	1.9	246/251/442	39.5	TFD	13.7	74.0	67.0

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

Capacity Data

Condensing Temperature 40°C														
Models with Liquid Injection														
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
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 Enhanced Vapor Injection															
ZF13KVE EVI	3.1	4.0	4.9	6.0	7.3	8.7	10.4	ZF13KVE EVI	2.3	2.3	2.4	2.5	2.6	2.7	2.7
ZF18KVE EVI	4.9	6.0	7.3	8.8	10.8	13.3	16.4	ZF18KVE EVI	3.4	3.5	3.6	3.7	3.9	4.1	4.4
ZF Summit Models - with Liquid 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
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
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
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
ZF54K5E	9.4	12.0	15.0	18.6	22.7			ZF54K5E	7.3	7.9	8.4	9.0	9.6		
ZF Summit Models - with Enhanced Vapor Injection															
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 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 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 EVI	12.1	15.1	18.4	22.3	26.8			ZF49K5E EVI	8.0	8.3	8.5	8.8	9.1		

Suction Gas Return 20°C / Subcooling 0K

Preliminary Data

Capacity Data

Condensing Temperature 40°C															
Models with Liquid Injection															
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**
ZF06K4E	1.2	1.6	2.0	2.4	3.0	3.6	4.4	ZF06K4E	1.3	1.3	1.3	1.4	1.4	1.5	1.6
ZF08K4E	1.5	2.0	2.5	3.1	3.8	4.6	5.5	ZF08K4E	1.5	1.5	1.6	1.6	1.7	1.8	1.9
ZF09K4E	1.7	2.1	2.7	3.4	4.2	5.1	6.2	ZF09K4E	1.6	1.6	1.6	1.7	1.8	1.9	2.0
ZF11K4E	2.1	2.7	3.4	4.2	5.2	6.3	7.7	ZF11K4E	1.9	2.0	2.0	2.1	2.2	2.3	2.4
ZF13K4E	2.4	3.0	3.8	4.7	5.9	7.2	8.7	ZF13K4E	2.4	2.4	2.5	2.6	2.7	2.8	2.9
ZF15K4E	2.9	3.7	4.7	5.8	7.2	8.8	10.8	ZF15K4E	2.8	3.0	3.1	3.2	3.4	3.5	3.8
ZF18K4E	3.5	4.5	5.7	7.0	8.7	10.7	13.0	ZF18K4E	3.5	3.6	3.7	3.8	4.0	4.1	4.3
Models with Enhanced Vapor Injection															
ZF13KVE EVI	3.3	4.3	5.4	6.7	8.1	9.7	11.5	ZF13KVE EVI	2.8	2.9	3.0	3.0	3.1	3.2	3.3
ZF18KVE EVI	4.9	6.1	7.6	9.3	11.3	13.5	16.0	ZF18KVE EVI	3.8	4.0	4.1	4.2	4.4	4.5	4.7
ZF Summit Models - with Liquid 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
ZF34K5E	6.2	8.0	10.1	12.7	15.7	19.3	23.4	ZF34K5E	5.4	5.8	6.1	6.5	6.9	7.3	7.6
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
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
ZF54K5E	9.9	12.6	15.8	19.5	23.9			ZF54K5E	7.7	8.2	8.8	9.4	10.1		
ZF Summit Models - with Enhanced Vapor Injection															
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 EVI	8.3	10.4	12.7	15.4	18.4	21.7	25.4	ZF34K5E EVI	5.6	5.8	6.0	6.2	6.4	6.6	6.8
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 EVI	14.1	17.1	20.5	24.5	28.9			ZF49K5E EVI	9.1	9.7	10.3	10.8	11.3		

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

Capacity Data

Condensing Temperature 40°C														
Models with Liquid Injection														
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**
ZF06K4E	1.3	1.6	2.0	2.5	3.0	3.6	4.4	ZF06K4E	1.4	1.4	1.4	1.4	1.5	1.5	1.6
ZF08K4E	1.6	2.0	2.6	3.2	3.9	4.7	5.5	ZF08K4E	1.6	1.6	1.7	1.7	1.8	1.9	2.0
ZF09K4E	1.8	2.2	2.8	3.4	4.2	5.1	6.1	ZF09K4E	1.8	1.8	1.8	1.8	1.9	1.9	2.0
ZF11K4E	2.2	2.8	3.5	4.3	5.2	6.3	7.6	ZF11K4E	2.2	2.1	2.1	2.2	2.3	2.4	2.5
ZF13K4E	2.5	3.2	4.0	5.0	6.1	7.4	8.9	ZF13K4E	2.3	2.3	2.4	2.4	2.5	2.6	2.7
ZF15K4E	3.1	3.9	4.9	6.1	7.5	9.1	10.9	ZF15K4E	3.0	3.1	3.1	3.2	3.4	3.5	3.7
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 Enhanced Vapor Injection															
ZF13KVE EVI	3.2	4.0	5.0	6.2	7.5	9.0	10.7	ZF13KVE EVI	2.5	2.6	2.7	2.8	2.8	2.9	3.0
ZF18KVE EVI	4.5	5.7	7.0	8.4	10.1	12.1	14.2	ZF18KVE EVI	3.1	3.3	3.6	3.8	4.0	4.2	4.3
ZF Summit Models - with Liquid 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
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
ZF41K5E	7.6	9.7	12.1	15.0	18.4	22.5	27.1	ZF41K5E	6.4	6.6	6.9	7.2	7.6	8.0	8.4
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
ZF54K5E	15.2	18.6	22.7	27.4	33.0			ZF54K5E	10.2	10.5	10.9	1.2	11.6		
ZF Summit Models - with Enhanced Vapor Injection															
ZF25K5E EVI	6.2	7.7	9.5	11.4	13.5	15.7	18.1	ZF25K5E EVI	3.9	4.2	4.5	4.8	5.1	5.3	5.5
ZF34K5E EVI	8.1	10.3	12.8	15.6	18.8	22.2	26.2	ZF34K5E EVI	5.6	6.0	6.4	6.8	7.3	7.9	8.5
ZF41K5E EVI	9.9	12.6	15.6	19.0	22.8	27.1	31.9	ZF41K5E EVI	6.8	7.3	7.8	8.4	9.0	9.7	10.4
ZF49K5E EVI	11.9	14.9	18.3	22.2	26.8			ZF49K5E EVI	8.4	8.9	9.4	10.0	10.6		

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

Capacity Data

Condensing Temperature 40°C														
Models with Liquid Injection														
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**
ZF06K4E	1.4	1.8	2.2	2.6	3.1	3.8	4.5	ZF06K4E	1.4	1.4	1.5	1.5	1.6	1.7	1.8
ZF08K4E	1.8	2.2	2.8	3.4	4.0	4.8	5.7	ZF08K4E	1.6	1.7	1.8	1.9	1.9	2.1	2.2
ZF09K4E	1.9	2.4	3.0	3.6	4.4	5.2	6.3	ZF09K4E	1.8	1.8	1.9	1.9	2.0	2.1	2.2
ZF11K4E	2.5	3.0	3.7	4.5	5.4	6.5	7.8	ZF11K4E	2.2	2.2	2.3	2.4	2.5	2.6	2.7
ZF13K4E	2.8	3.5	4.3	5.3	6.4	7.7	9.1	ZF13K4E	2.3	2.4	2.5	2.6	2.7	2.8	3.0
ZF15K4E	3.4	4.3	5.3	6.4	7.8	9.4	11.2	ZF15K4E	3.0	3.2	3.3	3.5	3.6	3.8	4.1
ZF18K4E	4.0	5.1	6.3	7.6	9.2	11.1	13.2	ZF18K4E	3.6	3.7	3.8	3.9	4.0	4.2	4.4
Models with Enhanced Vapor Injection														
ZF13KVE EVI	4.0	4.9	6.0	7.2	8.5	10.0	11.7	ZF13KVE EVI	2.8	2.9	3.0	3.0	3.1	3.2	3.3
ZF18KVE EVI	6.1	7.3	8.7	10.4	12.3	14.4	16.9	ZF18KVE EVI	3.8	4.0	4.1	4.2	4.4	4.5	4.7
ZF Summit Models - with Liquid Injection														
ZF25K5E	5.1	6.4	7.9	9.6	11.7	14.1	16.8	ZF25K5E	3.8	4.1	4.4	4.6	4.9	5.2	5.5
ZF34K5E	6.8	8.5	10.5	12.8	15.5	18.6	22.2	ZF34K5E	5.1	5.4	5.8	6.1	6.5	6.8	7.2
ZF41K5E	8.4	10.5	13.0	15.8	19.2	23.1	27.7	ZF41K5E	6.4	6.8	7.3	7.7	8.2	8.7	9.1
ZF49K5E	10.1	12.7	15.6	19.1	23.1	27.8	33.2	ZF49K5E	7.7	8.1	8.5	9.0	9.6	10.2	10.9
ZF54K5E	11.2	13.9	17.1	20.8	25.2			ZF54K5E	8.7	9.1	9.7	10.2	10.9		
ZF Summit Models - with Enhanced Vapor Injection														
ZF25K5E EVI	7.7	9.3	11.2	13.2	15.3	17.5	19.7	ZF25K5E EVI	4.8	5.1	5.4	5.7	6.0	6.3	5.8
ZF34K5E EVI	10.4	12.5	14.9	17.7	20.8	24.4	28.4	ZF34K5E EVI	6.4	6.8	7.2	7.6	7.9	8.3	6.8
ZF41K5E EVI	12.5	15.1	18.1	21.5	25.5	30.0	35.2	ZF41K5E EVI	7.9	8.3	8.8	9.2	9.7	10.1	8.4
ZF49K5E EVI	14.1	17.1	20.5	24.5	28.9			ZF49K5E EVI	9.1	9.7	10.3	10.8	11.3		

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

For capacity data of ZF28K5E please refer to Select Software.

ZFD & ZBD Copeland Scroll Digital™ Compressor Range for Medium and Low Temperature Refrigeration

Copeland Scroll Digital ZBD and ZFD compressors provide stepless continuous capacity modulation in medium and low temperature refrigeration applications.

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.

Digital Scroll technology is a simple modulation solution that can easily and quickly be implemented into any existing system design as no other components are required.

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.

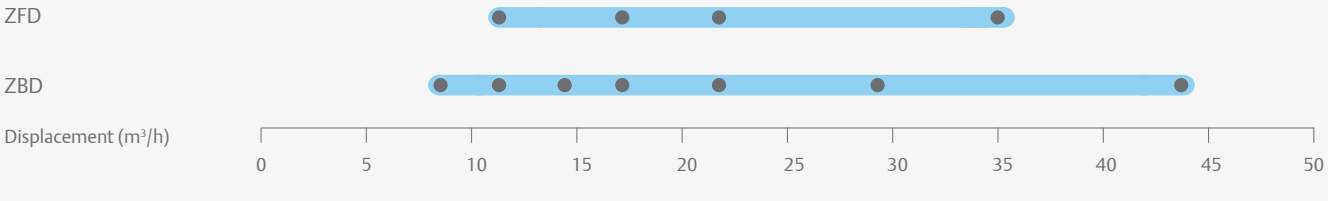
The Digital Scroll range consists of:
- ZBD models dedicated to medium temperature applications
- ZFD models with vapor injection for low temperature applications
- ZOD model designed for use in R744 (CO_2) - see page 66

Copeland Scroll Digital for Low and Medium Temperature Refrigeration With and Without Sound Shell

CoreSense™ Diagnostics is now available as an option for the ZBD Scroll Summit series (ZBD76K5E and ZBD114K5E) as well as for ZFD41K5E.

These compressors are qualified for R407A/F/C, R448A/R449A and R404A for all digital models and R134a, R450A and R513 for ZBD only.

Digital Scroll Compressor Line-Up



Features and Benefits

- Continuous modulation from 10% to 100% ensuring a perfect match of capacity and power to the desired load
- An economical and reliable alternative to variable speed drive
- Precise suction pressure control with associated energy savings
- Food quality is maintained by stable evaporating temperatures in the refrigerated areas
- Longer lasting refrigeration equipment due to fewer compressor cycling
- Quick and easy integration into refrigeration equipment, similar to any other scroll compressor
- Availability of optional sound shell on all models providing up to 10 dBA additional sound attenuation for silent operation
- Availability of Emerson's series of controllers that operate the Digital Scroll compressor
- Possibility of digital and liquid injection control via optional CoreSense technology

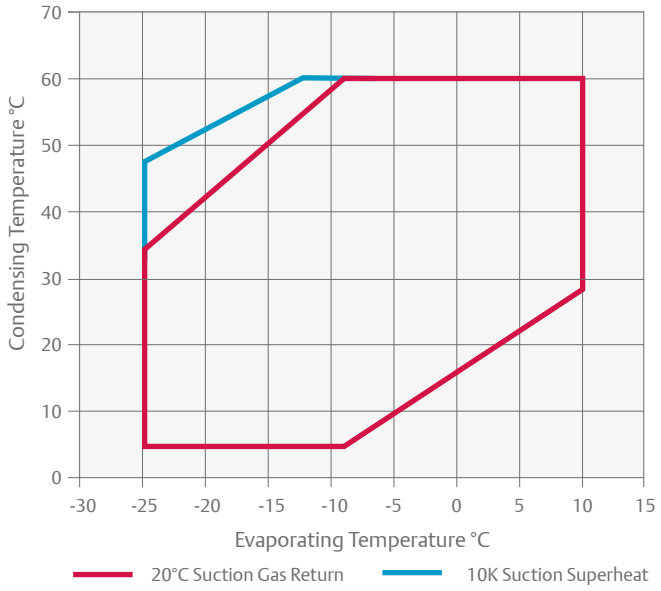
Maximum Allowable Pressure (PS)

- Digital ZBD:
  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)

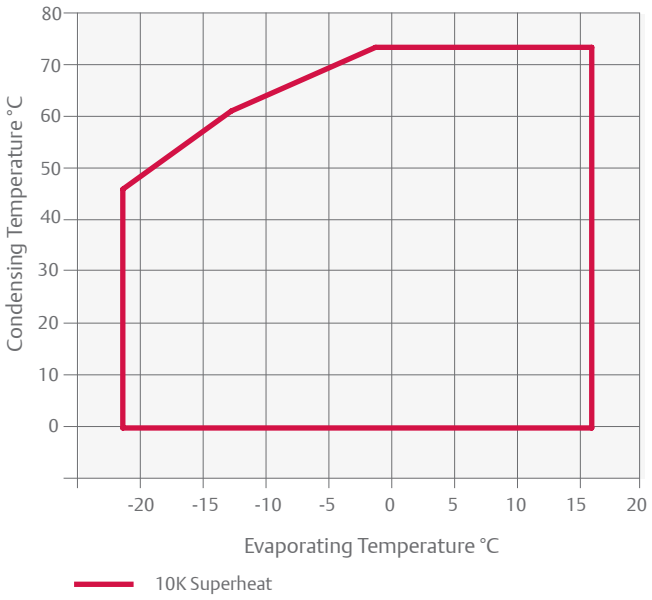
Operating Envelope R448A/R449A

For ZBD Digital Models



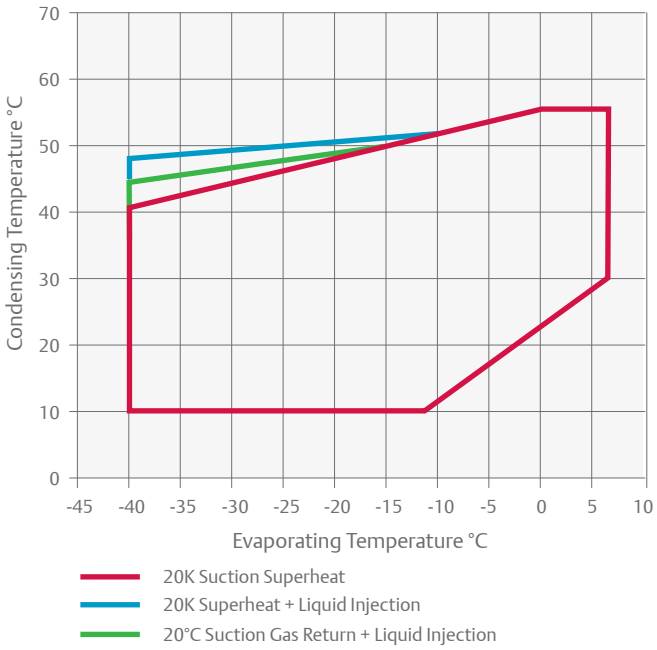
Operating Envelope R134a

For ZBD Digital Models



Operating Envelope R448A/R449A

For ZFD Digital Models



For individual model details please refer to select software.

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														
ZBD21KCE	3.0	8.3	1 1/4	1	1.2	243/243/432	30.2	PFJ	TFD	16.5	6.7	97.0	40.0	62.0
ZBD29KCE	4.0	11.4	1 1/4	1	1.4	245/243/463	32.7		TFD		7.9		48.0	58.0
ZBD38KCE	5.0	14.4	1 1/4	1	1.9	246/250/481	38.1		TFD		11.3		64.0	67.0
ZBD45KCE	6.0	17.1	1 1/4	1	1.9	241/246/481	39.9		TFD		12.3		74.0	61.0
ZBD57KCE	7.5	21.4	1 1/4	1 1/4	1.9	246/257/481	43.1		TFD		15.9		102.0	68.0
ZBD76K5E	10.0	28.8	1 3/4	1 1/4	3.4	299/280/534	61.2		TFD		24.0		118.0	66.0
ZBD114K5E	15.0	43.3	1 3/4	1 1/4	3.4	299/280/552	68.9		TFD		33.0		174.0	71.0
Low Temperature														
ZFD13KVE EVI	4.0	11.7	1 1/4	1	1.9	246/250/481	38.6		TFD		9.0		64.0	65.0
ZFD18KVE EVI	6.0	17.1	1 1/4	1	1.9	300/299/481	43.1		TFD		13.8		74.0	67.0
ZFD25KVE EVI	7.5	21.4	1 1/4	1 1/4	1.9	246/250/481	43.1		TFD		16.0		102.0	70.0
ZFD41K5E	10.0	35.3	1 3/4	1 1/4	3.4	310/280/534	66.2		TFD		20.4		118.0	73.0
ZFD41K5E EVI	13.0	35.3	1 1/4	1 3/4	3.4	310/280/534	66.2		TFD		20.4		118.0	72.0

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

For capacity data of ZFD54K5E please refer to select software.

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															
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
Low Temperature with Enhanced Vapor Injection															
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

Suction Gas Return 20°C / Subcooling 0K
*Suction Superheat 10K, Subcooling 0K
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
Medium Temperature															
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
Low Temperature with Enhanced Vapor Injection															
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			

Suction Gas Return 20°C / Subcooling 0K
*Suction Superheat 10K, 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
Medium temperature															
ZBD21KCE			2.5*	3.3	4.2	5.2	6.4	ZBD21KCE			2.0*	2.0	2.0	2.0	2.0
ZBD38KCE			3.9*	5.7	7.2	8.9	10.9	ZBD38KCE			3.4*	3.4	3.4	3.4	3.4
ZBD45KCE			4.5*	6.6	8.4	10.5	12.8	ZBD45KCE			3.9*	3.9	3.9	3.9	3.9
ZBD57KCE			6.0*	8.7	11.0	13.6	16.5	ZBD57KCE			4.3*	4.5	4.7	4.9	5.1
ZBD76K5E					15.1	18.8	23.0	ZBD76K5E					6.9	6.9	7.0
ZBD114K5E					21.8	27.7	34.2	ZBD114K5E					10.7	10.8	10.9
Low Temperature with Enhanced Vapor Injection															
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

Suction Gas Return 20°C / Subcooling 0K
*Suction Superheat 10K, Subcooling 0K
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
Medium Temperature															
ZBD21KCE			3.0	3.7	4.5	5.5	6.6	ZBD21KCE			1.9	1.9	2.0	2.1	2.1
ZBD29KCE			4.1	5.1	6.2	7.4	8.9	ZBD29KCE			2.5	2.6	2.7	2.8	2.8
ZBD38KCE			5.2	6.3	7.7	9.3	11.1	ZBD38KCE			3.1	3.2	3.4	3.5	3.6
ZBD45KCE			6.1	7.5	9.2	11.2	13.4	ZBD45KCE			3.7	3.8	4.0	4.2	4.4
ZBD57KCE			7.9	9.7	11.9	14.3	17.1	ZBD57KCE			4.7	4.9	5.2	5.4	5.5
ZBD76K5E			10.6	13.3	16.4	20.0	23.9	ZBD76K5E			7.5	7.5	7.6	7.7	7.8
ZBD114K5E			14.2	18.6	23.4	28.7	34.7	ZBD114K5E			11.3	11.3	11.3	11.4	11.4
Low Temperature with Enhanced Vapor Injection															
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

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

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
Medium Temperature															
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

Suction Gas Return 20°C / Subcooling 0K
*Suction Superheat 10K, Subcooling 0K
Preliminary Data

Emerson Coresense™ Diagnostics for Refrigeration Scrolls

The CoreSense Diagnostics module is a breakthrough innovation for troubleshooting refrigeration system faults and is installed in the electrical box of all 8 - 17 hp Copeland Scroll K5 refrigeration compressors. By monitoring and analyzing data from the compressors (via module power, discharge line thermistor and the current transducer), the CoreSense module accurately detects the cause of electrical and system related issues and guides the service technician more quickly and accurately to the root cause of a problem via flashing LED indicators visible on the CoreSense box. Supermarket operators hence benefit from increased system uptime as well as reduced food losses and maintenance costs.

Coresense™ Diagnostics for Refrigeration Scrolls

Technical Specification

- Power supply 110-230V AC
- Front end: multi-color LEDs
- Communication protocol: Modbus®RTU
- Bus to system controller: RS485, 3-wire, (+,GND)
- Discharge temperature sensor
- Current sensor
- EEPROM memory
- Alarm reset button

Benefits

- Facilitate predictive maintenance & advanced diagnostics
- Reduce applied system costs
- Manage on-site compressor data
- Reduce maintenance costs
- Increase system uptime / reduce food loss
- Digital and liquid injection control through CoreSense
- Remote trouble shooting

Functions

- Current sensing based diagnostics
- Discharge temperature protection
- Phase monitor protection
- Liquid injection control
- Scroll Digital control
- Open circuit identification
- System trip protection
- Low voltage protection
- Locked rotor protection
- Alarm and operating history
- Asset information
- LED visual indication of alerts
- Modbus communication

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

ZO Copeland 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.

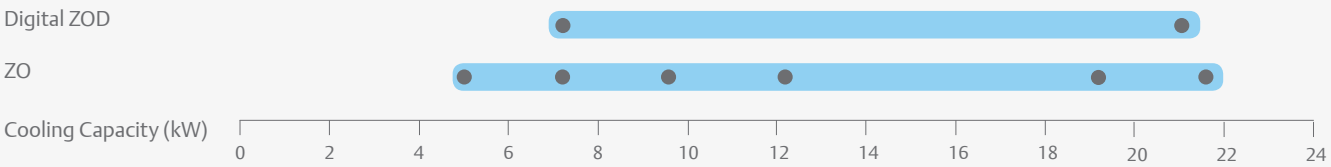
In comparison with HFC refrigerants, the specific properties of R744 require changes in the design of the refrigeration system. The ZO range of Copeland Scroll compressors has been particularly designed to exploit the characteristics of the R744 refrigeration system. Efficiency, reliability and liquid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

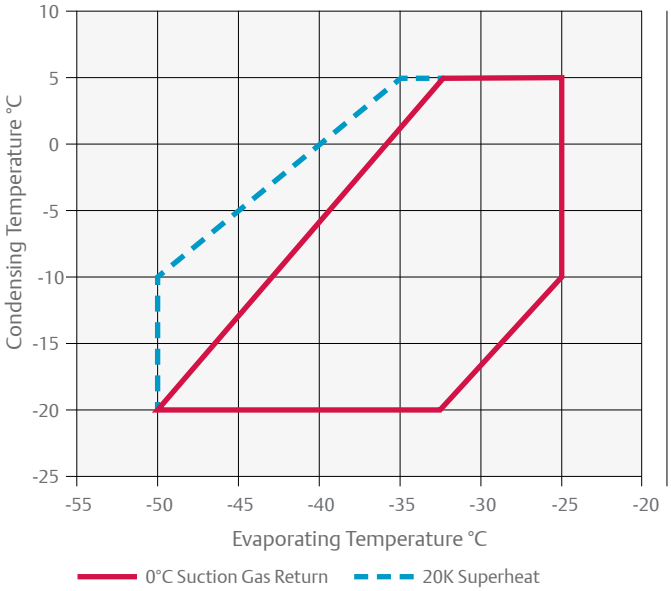
Features and Benefits

- 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 (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**	
ZO21K5E	1.5	2.6	11/4	1	1.0	228/228/388	22.2	TFD	3.6	27	52
ZO34K3E	2	4.1	11/4	1	1.4	242/242/381	30	TFD	5.5	26	54
ZO45K3E	2.5	5.4	11/4	1	1.4	242/242/403	31	TFD	6.2	35	56
ZO58K3E	3.5	6.9	11/4	1	1.4	242/242/417	32.5	TFD	8	48	56
ZO88KCE	5	10.1	11/4	1	1.9	245/249/440	40.3	TFD	11.8	64	60
ZO104KCE	6	11.7	11/4	1	1.9	242/242/461	40	TFD	15	74	61
Digital Models											
ZOD34K3E	2	4.07	11/4	1	1.4	242/242/377	30	TFD	5.5	26	55
ZOD104KCE	6	11.7	11/4	1	1.9	241/246/484	41	TFD	15	75	67

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

10 K Superheat
Preliminary Data

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 Climate Technologies 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					