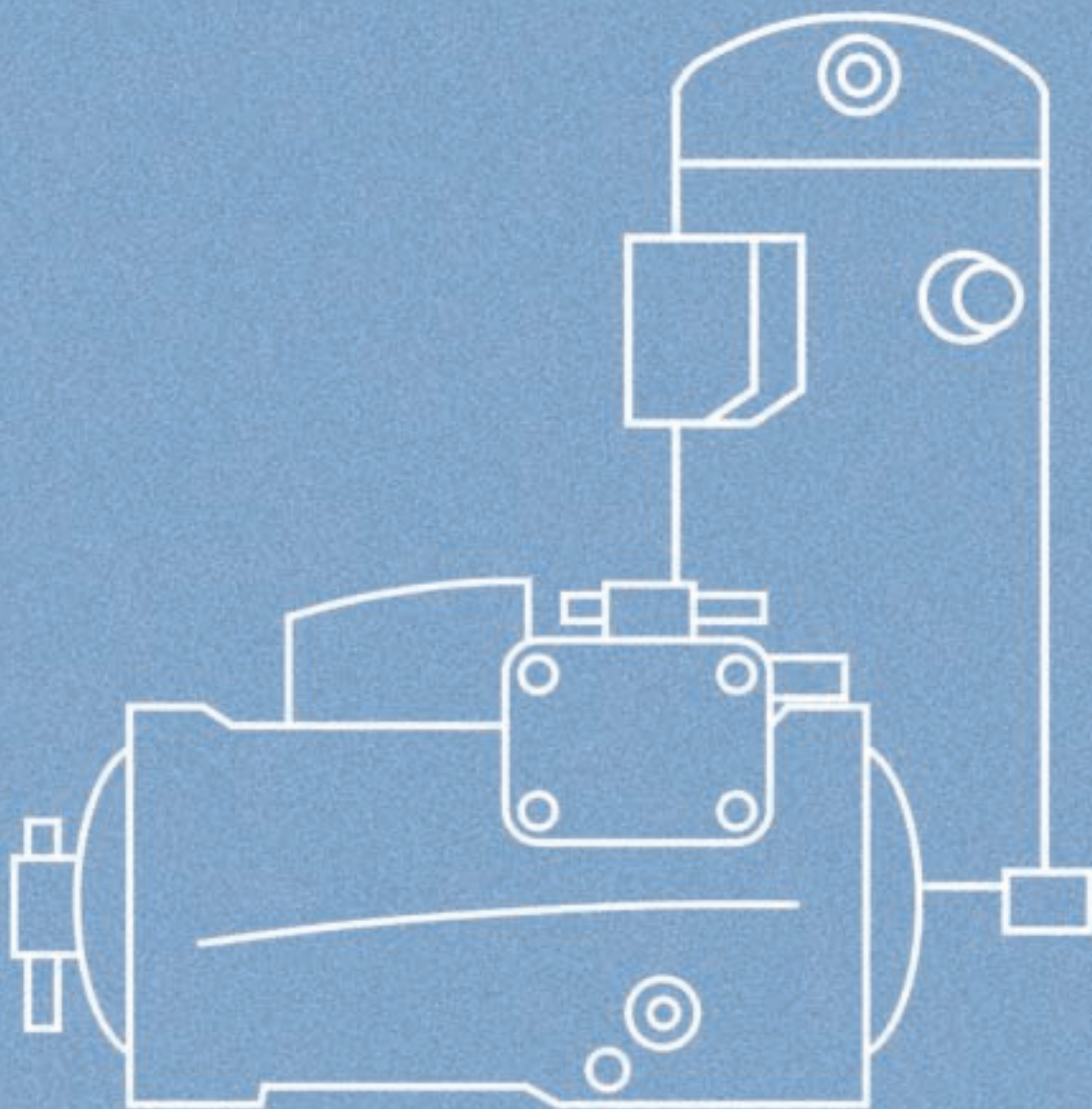


Refrigeration Applications



Refrigeration Applications

Emerson Climate Technologies 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 condensing units, Emerson Climate Technologies 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 Climate Technologies' 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 Climate Technologies' 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 Climate Technologies' 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.

ZB Copeland Scroll™ Compressor Range for Medium Temperature Refrigeration

using R407A/F/C, R448A/R449A, R404A, R134a, R450A and R513A

Emerson Climate Technologies offers ZB compressors with a wide displacement range 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 condensing 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.

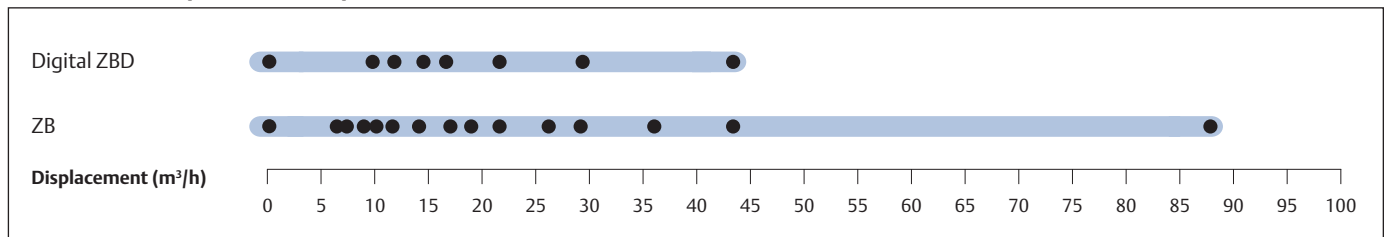
The ZB range also features ZB220 (30hp), the largest refrigeration scroll available on the market. These compressors are qualified for R407A/F/C, R448A, R449A, R404A, R134a, R450A and R513A. CoreSense™ Diagnostics is now available as an option for the ZB Scroll Summit series (ZB66K5E, ZB76K5E, ZB95K5E 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 54 in the catalogue.

ZB and ZBD Compressor Line-up



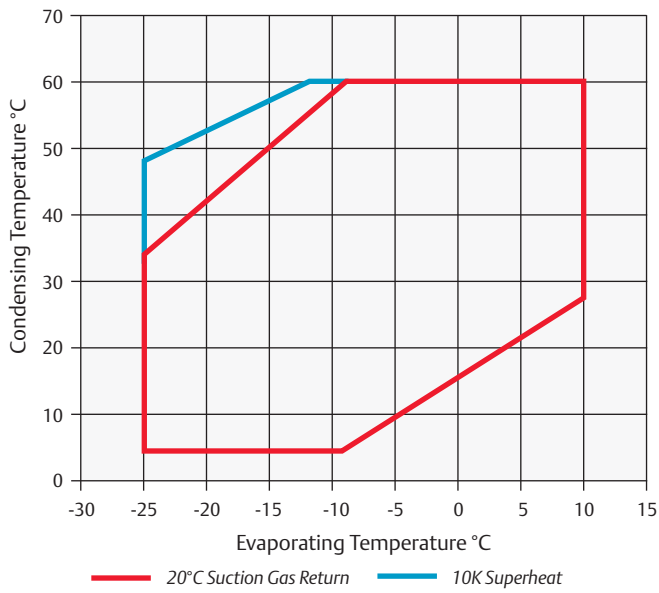
Features and Benefits

- 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

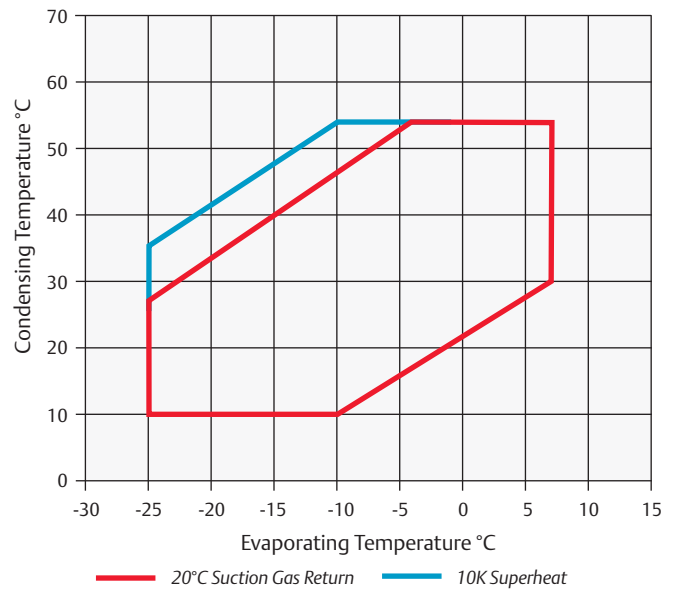
Maximum Allowable Pressure (PS)

- 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)

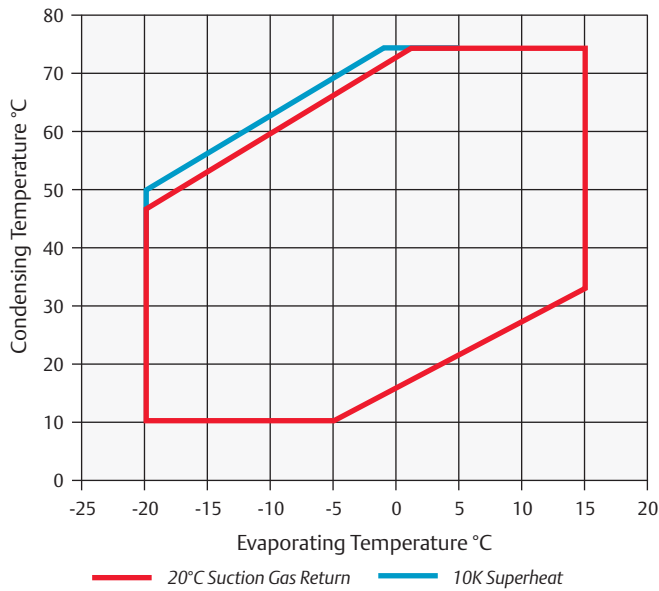
Operating Envelope R448A/R449A



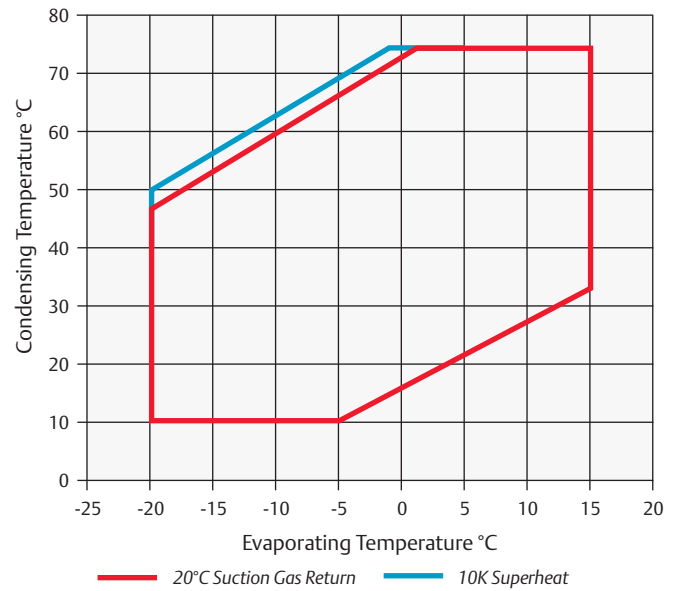
Operating Envelope R407A



Operating Envelope R450A



Operating Envelope R513A



For individual model details please refer to Select software.

Technical Overview

Models	Nominal hp	Displacement (m ³ /h)	Rotolock Suction (inch)	Rotolock 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 @1m - dB(A)***
								1 Ph*	3 Ph**	1 Ph*	3 Ph**	1 Ph*	3 Ph**	
ZB15KCE	2.0	5.9	1 ¼	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 ¼	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 ¼	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 ¼	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 ¼	1	1.5	246/246/423	28.6		TFD		10.0		50.0	58.0
ZB38KCE	5.0	14.4	1 ¼	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 ¼	1	1.9	251/246/438	43.0	PFJ		35.7		150.0		62.0
ZB45KCE	6.0	17.1	1 ¼	1	1.9	242/242/438	39.5		TFD		13.1		74.0	61.0
ZB48KCE	6.5	18.8	1 ¼	1 ¼	1.8	246/250/442	39.0		TFD		14.0		101.0	62.0
ZB57KCE		21.4	1 ¼	1 ¼	1.9	246/256/442	39.5		TFD		15.9		102.0	68.0
ZB220KCE	30.0	87.5	2 ¾	1 ¾	6.3	448/392/715	176.0		TWM		69.0		310.0	78.0
ZB Summit Models														
ZB66K5E	10.0	25.7	1 ¾	1 ¼	3.4	280/280/534	59.9		TFD		17.5		111.0	66.0
ZB76K5E	12.0	28.8	1 ¾	1 ¼	3.4	280/280/534	61.2		TFD		20.4		118.0	67.0
ZB95K5E	13.0	36.4	1 ¾	1 ¼	3.4	280/280/552	64.9		TFD		28.2		140.0	69.0
ZB114K5E	15.0	43.4	1 ¾	1 ¼	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

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

Capacity Data

Condensing Temperature 40°C															
R450A	Cooling Capacity (kW)							R450A	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				1.0*	1.5	1.9	2.4	ZB15KCE				0.9*	0.8	0.8	0.8
ZB19KCE				1.2*	1.7	2.2	2.7	ZB19KCE				1.0*	1.0	1.0	1.0
ZB21KCE				1.6*	2.2	2.8	3.6	ZB21KCE				1.2*	1.2	1.1	1.1
ZB26KCE				1.9*	2.6	3.3	4.1	ZB26KCE				1.4*	1.4	1.4	1.3
ZB29KCE				2.1*	2.9	3.7	4.6	ZB29KCE				1.5*	1.5	1.5	1.5
ZB38KCE				2.7*	3.8	4.8	6.0	ZB38KCE				2.0*	2.0	1.9	1.9
ZB42KCE**				3.1*	4.3	5.4	6.8	ZB42KCE**				2.2*	2.2	2.2	2.1
ZB45KCE				3.2*	4.4	5.6	7.1	ZB45KCE				2.3*	2.3	2.2	2.2
ZB48KCE				3.6*	5.0	6.3	7.9	ZB48KCE				2.6*	2.6	2.5	2.5
ZB57KCE				4.0*	5.5	7.0	8.7	ZB57KCE				2.6*	2.7	2.8	2.9
ZB220KCE					23.6	29.8	36.7	ZB220KCE					11.6	12.1	12.4
ZB Summit Models															
ZB66K5E				5.1	6.5	8.3	10.3	ZB66K5E				3.3	3.4	3.4	3.5
ZB76K5E				5.9	7.6	9.6	12.0	ZB76K5E				3.8	3.9	4.0	4.2
ZB95K5E				7.2	9.5	12.1	14.9	ZB95K5E				4.9	5.0	5.1	5.2
ZB114K5E				8.3	11.1	14.1	17.7	ZB114K5E				5.9	6.0	6.2	6.3

Suction Gas Return 20°C / Subcooling 0K

*Suction Superheat 10K, Subcooling 0K

** Single Phase only

Preliminary data

Condensing Temperature 40°C															
R513A	Cooling Capacity (kW)							R513A	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				1.2*	1.7*	2.1*	2.8	ZB15KCE				1.0*	1.0*	1.0*	0.9
ZB19KCE				1.6*	2.0*	2.6*	3.3	ZB19KCE				1.1*	1.1*	1.1*	1.1
ZB21KCE				2.0*	2.6*	3.3*	4.3	ZB21KCE				1.4*	1.4*	1.4*	1.4
ZB26KCE				2.3*	2.9*	3.7*	4.9	ZB26KCE				1.6*	1.6*	1.6*	1.6
ZB29KCE				2.6*	3.3*	4.2*	5.5	ZB29KCE				1.8*	1.8*	1.8*	1.8
ZB38KCE				3.3*	4.3*	5.5*	7.2	ZB38KCE				2.3*	2.3*	2.3*	2.3
ZB42KCE**				3.7*	4.8*	6.2*	8.1	ZB42KCE**				2.6*	2.6*	2.6*	2.5
ZB45KCE				3.9*	5.0*	6.4*	8.4	ZB45KCE				2.6*	2.6*	2.6*	2.6
ZB48KCE				4.3*	5.6*	7.2*	9.4	ZB48KCE				3.0*	3.0*	3.0*	3.0
ZB57KCE				4.9*	6.4*	8.1*	10.5	ZB57KCE				3.0*	3.2*	3.3*	3.4
ZB220KCE					29.4	36.8	45.3	ZB220KCE					13.4	13.7	13.9
ZB Summit Models															
ZB66K5E				6.3	7.9	9.9	12.2	ZB66K5E				3.8	3.9	4.0	4.0
ZB76K5E				7.2	9.2	11.6	14.3	ZB76K5E				4.4	4.6	4.7	4.7
ZB95K5E				8.8	11.4	14.3	17.7	ZB95K5E				5.7	5.8	5.9	6.0
ZB114K5E				10.3	13.3	16.9	21.0	ZB114K5E				6.9	7.1	7.2	7.2

Suction Gas Return 20°C / Subcooling 0K

*Suction Superheat 10K, Subcooling 0K

** Single Phase only

Preliminary data



ZS*KA Copeland Scroll™ Compressor Range for Medium Temperature Refrigeration 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 4m³/h to 5 m³/h. As with the other existing scrolls, ZS*KA scrolls also feature a scroll compliance mechanism which makes them particularly robust and reliable under severe conditions including liquid slugging.

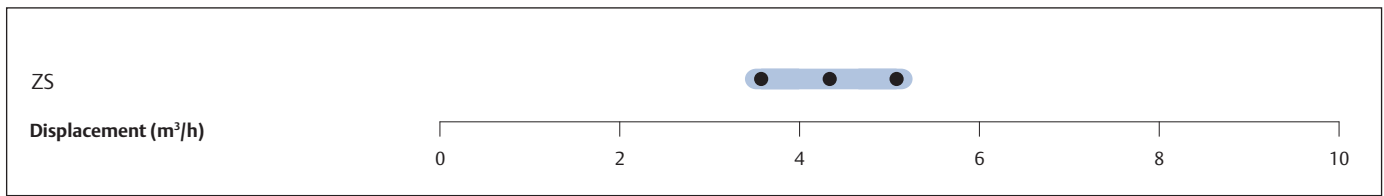
The ZS*KA models are intended for medium temperature refrigeration type systems and are ideally suited for applications such as walk-ins, reach-ins, cold rooms, display cases, and milk tank units. These models are multi-refrigerant capable and feature low sound and low vibration particularly important 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 1.8 hp 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



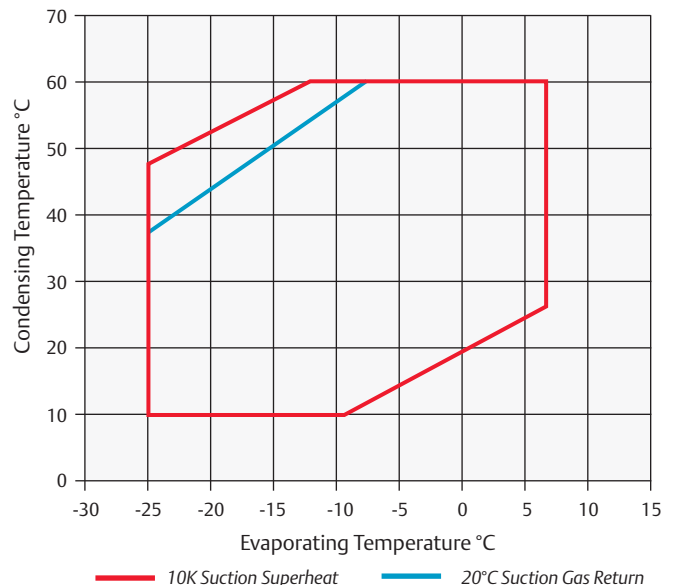
Features and Benefits

- 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 an additional 10 dBA 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, R134a, R450A and R513A refrigerants

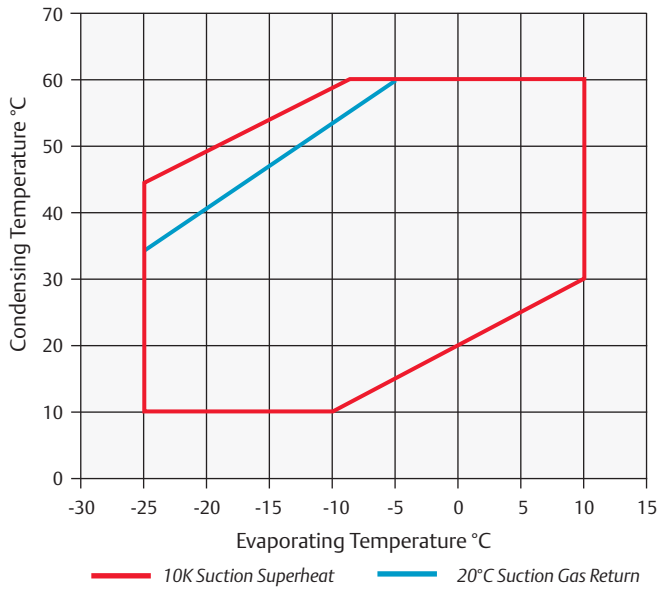
Maximum Allowable Pressure (PS)

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

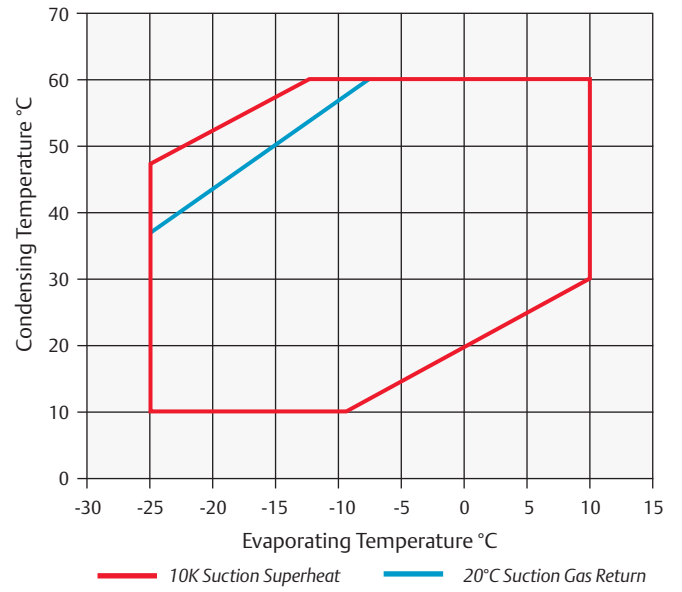
Operating Envelope R407A



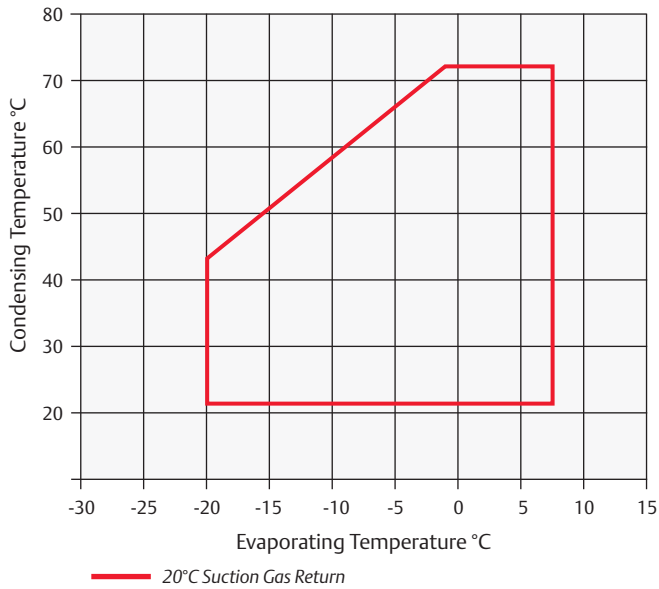
Operating Envelope R407F



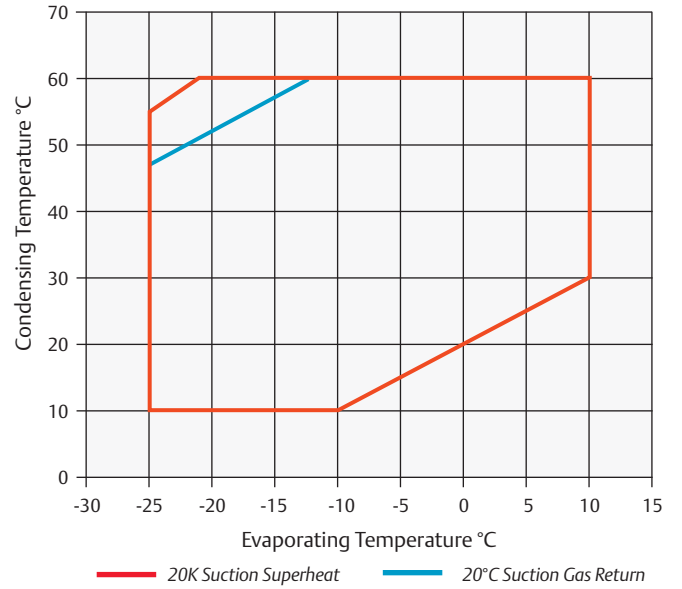
Operating Envelope R448A/R449A



Operating Envelope R134a



Operating Envelope R404A



Technical Overview

R404A	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**	
ZS09KAE	1.3	3.7	¾	½	0.7	246/246/387	22.2	PFJ	TFD	7.2	3.0	45.0	27.0	59.0
ZS11KAE	1.5	4.4	¾	½	0.7	246/246/387	22.4	PFJ	TFD	8.7	3.3	45.0	27.0	59.0
ZS13KAE	1.8	5.0	¾	½	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
ZS09KAE			1.1*	1.5	1.8	2.2	2.6	ZS09KAE			0.8*	0.8	0.8	0.8	0.9
ZS11KAE			1.3*	1.7	2.1	2.6	3.1	ZS11KAE			0.9*	1.0	1.0	1.0	1.1
ZS13KAE			1.5*	2.0	2.4	2.9	3.6	ZS13KAE			1.1*	1.1	1.1	1.2	1.2

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

* Conditions: Suction Superheat 10K, Subcooling 0K

Condensing Temperature 40°C															
R407F	Cooling Capacity (kW)							R407F	Power Input (kW)						
	Evaporating Temperature (°C)								Evaporating Temperature (°C)						
Model	-35	-30	-25	-20	-15	-10	-5	Model	-35	-30	-25	-20	-15	-10	-5
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

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
ZS09KAE			1.0*	1.4	1.7	2.1	2.5	ZS09KAE			0.8*	0.8	0.9	0.9	0.9
ZS11KAE			1.2*	1.7	2.1	2.5	3.0	ZS11KAE			0.9*	1.0	1.0	1.0	1.0
ZS13KAE			1.4*	1.9	2.4	2.9	3.5	ZS13KAE			1.1*	1.1	1.1	1.2	1.2

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

* Conditions: Suction Superheat 10K, Subcooling 0K

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
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
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

ZF Copeland Scroll™ Compressor Range for Low Temperature Refrigeration

using R407A/F, R448A/R449A and R404A

Emerson Climate Technologies 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.

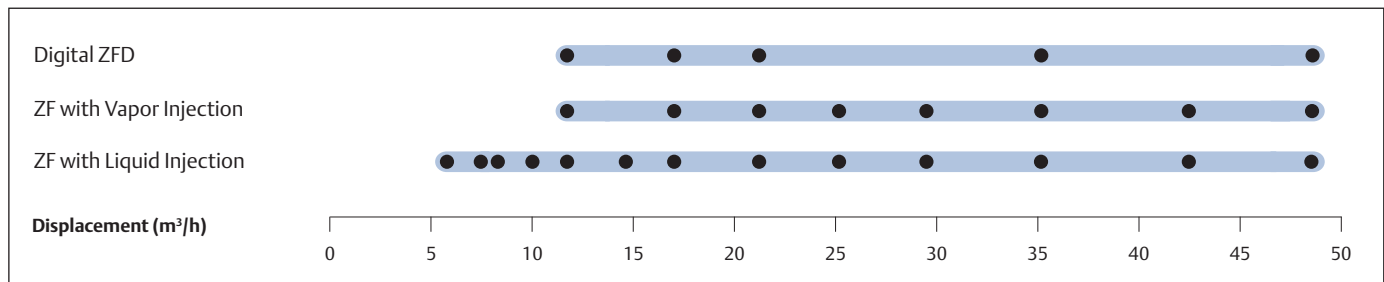
These compressors are qualified for R407A/F, R448A/R449A, R404A and R134a for certain models. For more details on Digital Scroll models please refer to page 54 in the catalogue.

CoreSense™ Diagnostics is now available as an option for the ZF Scroll Summit series (ZF34K5E-ZF54K5E) as well as for Summit Digital ZFD41K5E and ZFD54K5E.



ZF Compressor for Low Temperature Refrigeration with and without Sound Shell

ZF and ZFD Compressor Line-up



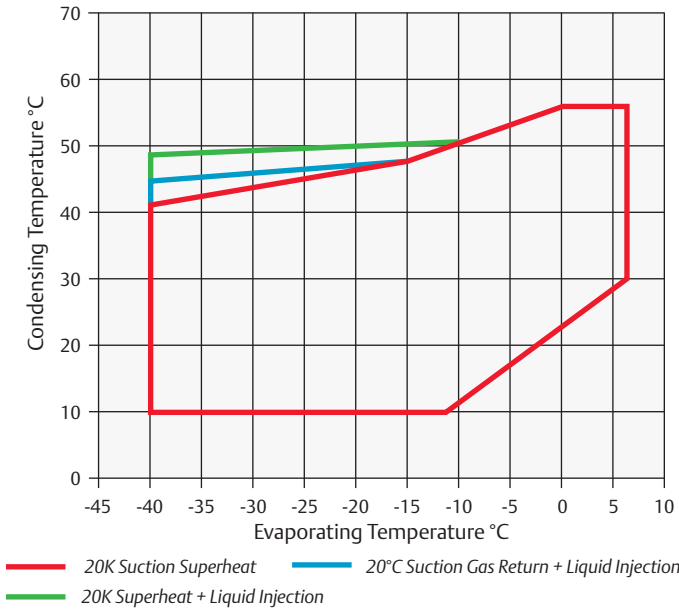
Features and Benefits

- 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 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

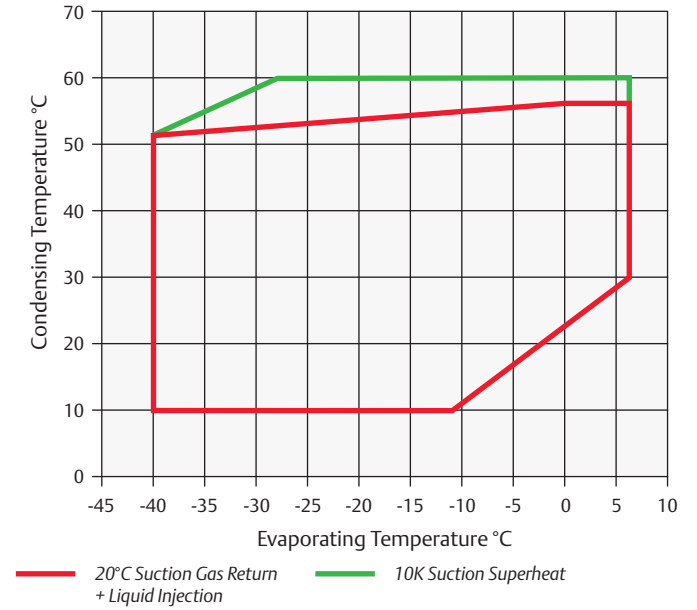
Maximum Allowable Pressure (PS)

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

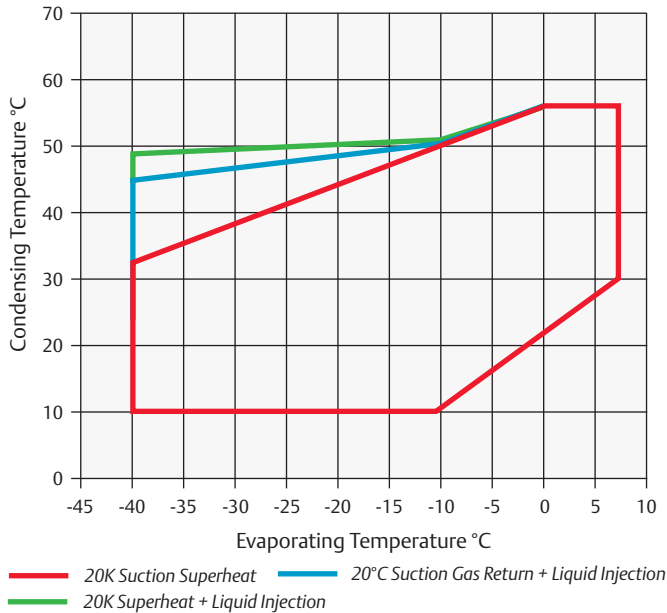
Operating Envelope R407A - For Vapor Injection



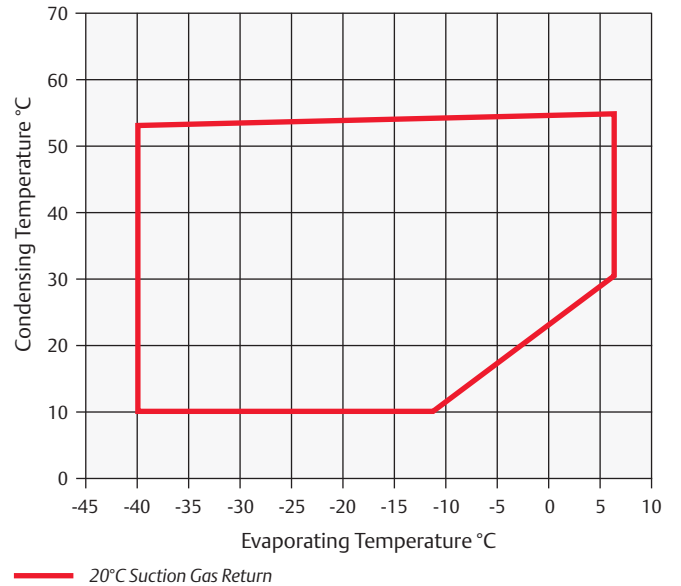
For Liquid Injection



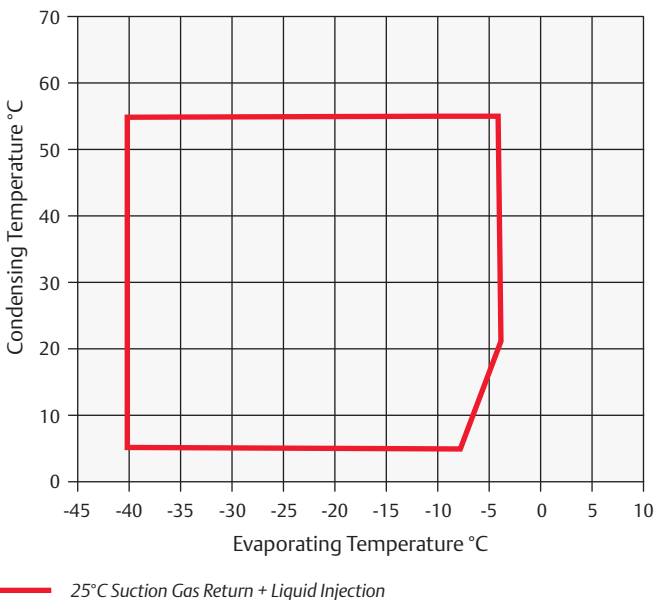
Operating Envelope R407F - For Vapor Injection



For Liquid Injection



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)	Rotolock Suction (inch)	Rotolock 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 ¼	1	1.3	243/245/369	25.4	TFD	5.0	26.0	57.0
ZF08K4E	2.5	7.3	1 ¼	1	1.5	243/245/391	27.2	TFD	6.0	32.0	59.0
ZF09K4E	2.8	8.0	1 ¼	1	1.5	243/244/391	27.0	TFD	6.0	40.0	62.0
ZF11K4E	3.5	9.9	1 ¼	1	1.5	243/244/405	28.0	TFD	7.1	46.0	63.0
ZF13K4E	4.0	11.8	1 ¼	1	1.9	246/251/442	38.0	TFD	8.0	51.5	65.0
ZF15K4E	5.0	14.5	1 ¼	1	1.9	246/251/442	39.0	TFD	10.0	64.0	65.0
ZF18K4E	6.0	17.1	1 ¼	1	1.9	246/251/442	41.0	TFD	12.5	74.0	67.0
ZF24K4E	7.5	20.9	1 ¾	1 ¼	4.1	368/316/525	100.0	TWD	16.1	99.0	72.0
ZF33K4E	10.5	28.8	1 ¾	1 ¼	4.1	368/319/532	93.0	TWD	22.3	127.0	72.0
ZF40K4E	12.5	35.6	1 ¾	1 ¼	4.1	368/324/532	103.0	TWD	25.1	167.0	72.0
ZF48K4E	15.0	42.8	2 ¼	1 ¾	4.1	324/294/579	112.0	TWD	28.7	198.0	72.0
ZF Summit Models with Liquid Injection											
ZF25K5E	7.5	21.4	1 ¼	1 ¼	1.9	246/257/452	39.5	TFD	16.0	102.0	70.0
ZF34K5E	9.0	29.1	1 ¾	1 ¼	3.4	280/280/534	63.1	TFD	25.0	100.0	68.0
ZF41K5E	10.0	35.3	1 ¾	1 ¼	3.4	280/280/534	63.1	TFD	29.0	118.0	69.0
ZF49K5E	13.0	42.4	1 ¾	1 ¼	3.4	280/280/552	66.2	TFD	30.0	139.0	72.0
Models with Enhanced Vapor Injection											
ZF13KVE EVI	4.0	11.7	1 ¼	1	1.9	246/251/442	38.0	TFD	9.0	64.0	63.0
ZF18KVE EVI	6.0	17.1	1 ¼	1	1.9	246/251/442	39.5	TFD	13.7	74.0	67.0
ZF24KVE EVI	7.5	20.9	1 ¾	1 ¼	4.1	316/368/525	100.2	TWD	16.0	99.0	70.0
ZF33KVE EVI	10.5	28.8	1 ¾	1 ¼	4.1	368/319/525	93.0	TWD	21.4	127.0	72.0
ZF40KVE EVI	12.5	35.6	1 ¾	1 ¼	4.1	316/368/532	96.2	TWD	27.0	167.0	72.0
ZF48KVE EVI	15.0	42.8	2 ¼	1 ¾	4.1	324/294/579	112.0	TWD	30.6	198.0	72.0

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

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

For technical and capacity data of ZF28K5E and ZF54K5E please refer to Select software.

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
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
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	12.7	15.8	19.4	23.5	28.1			ZF49K5E EVI	8.4	8.7	9.0	9.3	9.5		

Suction Gas Return 20°C / Subcooling OK

Preliminary 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
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 OK

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
ZF24K4E	5.2	6.4	7.9	9.6	11.6	13.8	16.4	ZF24K4E	4.5	4.7	5.0	5.2	5.4	5.6	5.8
ZF33K4E	7.1	8.8	10.9	13.3	16.1	19.3	23.0	ZF33K4E	5.8	6.2	6.5	6.9	7.2	7.5	7.8
ZF40K4E	8.8	11.0	13.5	16.4	19.8	23.7	28.2	ZF40K4E	7.4	7.8	8.2	8.6	9.0	9.4	9.8
ZF48K4E	10.6	13.2	16.3	20.0	24.1	28.9	34.4	ZF48K4E	9.7	10.2	10.6	11.1	11.6	12.1	12.7
Models with Enhanced Vapor Injection															
ZF13KVE EVI	4.0	4.9	6.0	7.2	8.5	10.0	11.7	ZF13KVE EVI	2.9	3.0	3.1	3.2	3.3	3.4	3.5
ZF18KVE EVI	6.1	7.3	8.7	10.4	12.3	14.4	16.9	ZF18KVE EVI	4.0	4.3	4.5	4.6	4.8	5.0	5.1
ZF24KVE EVI	7.2	8.8	10.7	12.7	14.9	17.4	20.3	ZF24KVE EVI	5.1	5.4	5.6	5.8	6.0	6.2	6.5
ZF19KVE EVI	7.7	9.4	11.3	13.4				ZF19KVE EVI	5.2	5.4	5.7	5.9			
ZF33KVE EVI	9.8	11.9	14.4	17.2	20.4	24.0	28.0	ZF33KVE EVI	6.9	7.2	7.4	7.7	8.0	8.3	8.5
ZF40KVE EVI	11.9	15.2	18.7	22.4	26.4	30.8	35.6	ZF40KVE EVI	8.0	8.8	9.4	9.9	10.3	10.6	10.8
ZF48KVE EVI	14.9	18.2	21.7	25.6	29.8	34.6	39.7	ZF48KVE EVI	9.8	10.4	11.0	11.6	12.2	12.8	13.5
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
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	6.6
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	8.7
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	10.6
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 and ZF54K5E please refer to Select software.

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

Copeland Scroll Digital ZBD and ZFD compressors provide step-less 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 condensing 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 (CO₂) - see page 60

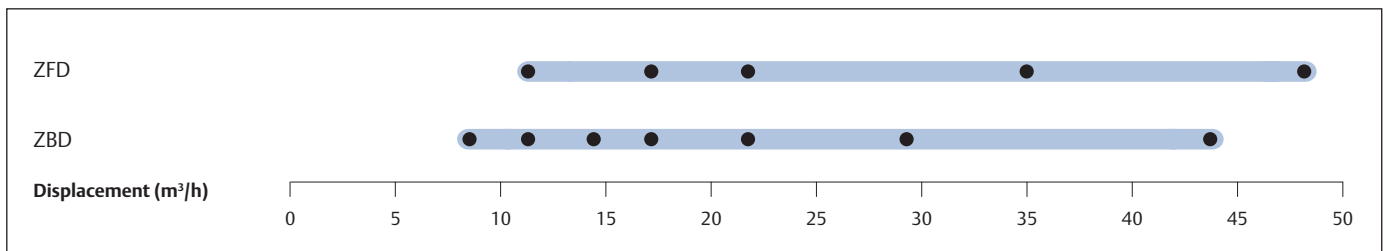


Copeland Scroll Digital for Low and Medium Temperature Refrigeration with and without Sound Shell

CoreSense™ Diagnostics is now available as an option for the ZBD Scroll Summit series (ZBD76K5E and ZBD114K5E) as well as for ZFD41K5E and ZFD54K5E Summit Digital.

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



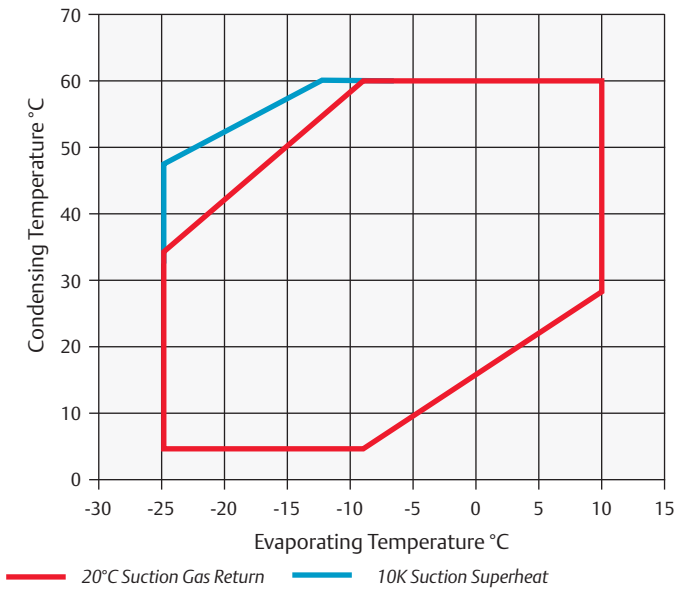
Features and Benefits

- 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 an additional 10dBA sound attenuation for silent operation
- Availability of Emerson's series of controllers that operate the Digital Scroll compressor

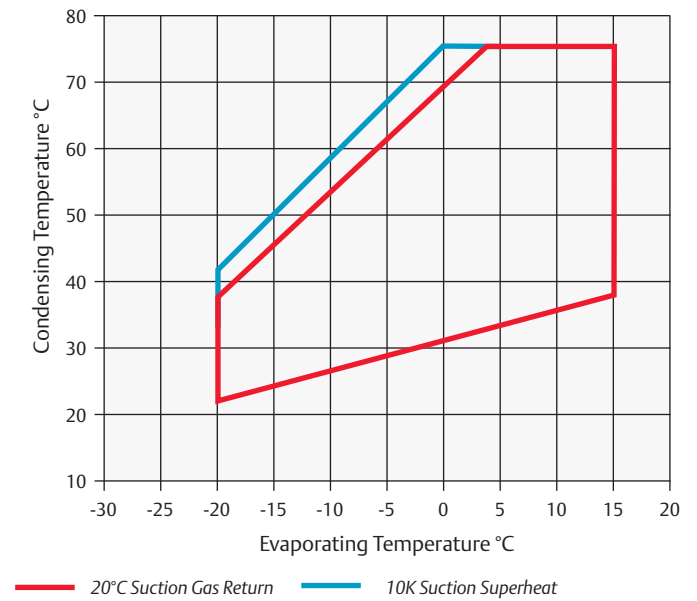
Maximum Allowable Pressure (PS)

- Digital ZBD:
Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)
- Digital ZFD:
Low Side PS 19 bar(g) / High Side PS 28 bar(g)

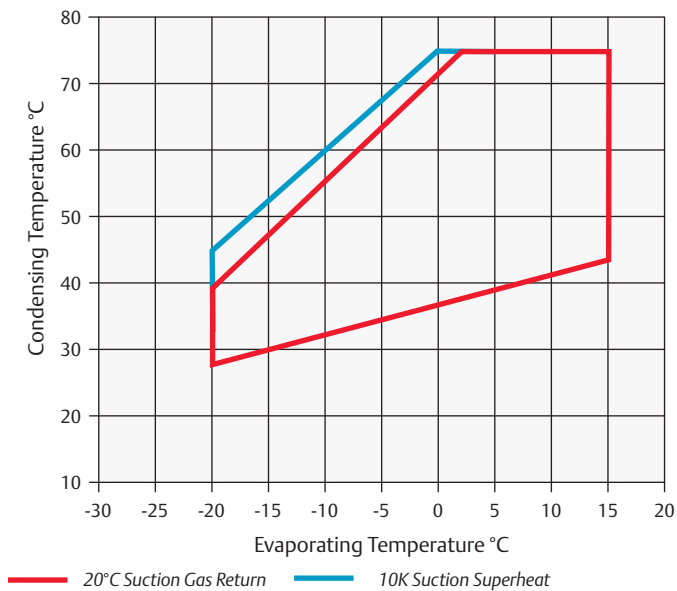
Operating Envelope R448A/R449A - For ZBD Digital Models



Operating Envelope R513A - For ZBD Digital Models

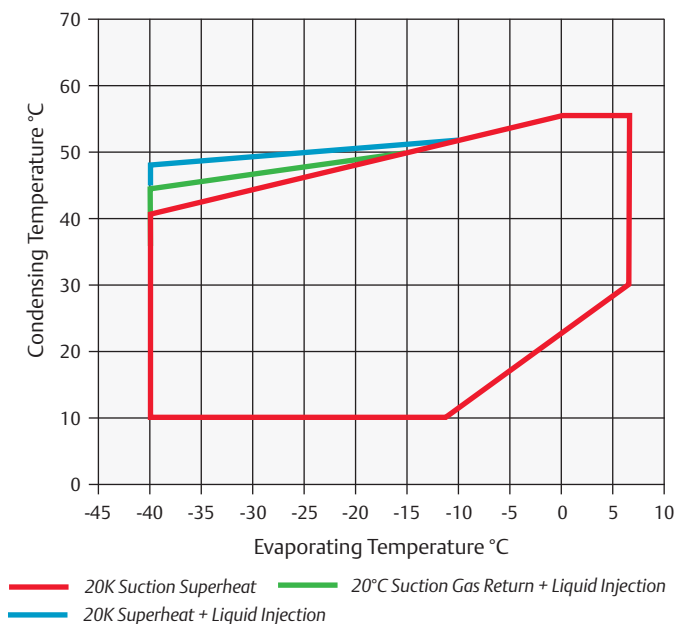


Operating Envelope R450A - For ZBD Digital Models



For individual model details please refer to Select software.

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)	Rotolock Suction (inch)	Rotolock 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 ¼	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 ¼	1	1.4	245/243/463	32.7		TFD		7.9		48.0	58.0
ZBD38KCE	5.0	14.4	1 ¼	1	1.9	246/250/481	38.1		TFD		11.3		64.0	67.0
ZBD45KCE	6.0	17.1	1 ¼	1	1.9	241/246/481	39.9		TFD		12.3		74.0	61.0
ZBD57KCE		21.4	1 ¼	1 ¼	1.9	246/257/481	43.1		TFD		15.9		102.0	68.0
ZBD76K5E	10	28.8	1.75	1.25	3.37	299/280/534	61.2	TFD	24	118	66			
ZBD114K5E	15	43.3	1.75	1.25	3.37	299/280/552	68.9	TFD	33.3	174	71			
Low Temperature														
ZFD13KVE EVI	4.0	11.7	1 ¼	1	1.9	246/250/481	38.6		TFD		9.0		64.0	65.0
ZFD18KVE EVI	6.0	17.1	1 ¼	1	1.9	300/299/481	43.1		TFD		13.8		74.0	67.0
ZFD25KVE EVI	7.5	21.4	1 ¼	1 ¼	1.9	246/250/481	43.1		TFD		16.0		102.0	70.0
ZFD41K5E	10	35.3	1 ¼	1 ¼	3.4	363/312/534	66.2		TFD		20.4		118	73.0

* 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			
ZFD54K5E	on request							ZFD54K5E	on request						

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 KVE	23.5	29.8	37.2	45.9				ZFD41K5E KVE	6.4	6.6	6.8	7.1			
ZFD54K5E	on request							ZFD54K5E	on request						

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	on request							ZBD76K5E	on request						
ZBD114K5E	on request							ZBD114K5E	on request						
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

Suction Gas Return 20°C / Subcooling 0K

*Suction Superheat 10K, Subcooling 0K

Preliminary data

For capacity data of ZFD41K5E and ZFD54K5E please refer to Select software.

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
ZFD54K5E EVI	on request							ZFD54K5E EVI	on request						

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	on request							ZBD76K5E	on request						
ZBD114K5E	on request							ZBD114K5E	on request						

Suction Gas Return 20°C / Subcooling 0K

*Suction Superheat 10K, Subcooling 0K

Preliminary data

Condensing Temperature 40°C															
R450A	Cooling Capacity (kW)							R450A	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				1.6*	2.3	2.9	3.6	ZBD21KCE				1.0*	1.1	1.1	1.1
ZBD38KCE				2.7*	3.8	4.8	5.9	ZBD38KCE				1.7*	1.8	1.8	1.9
ZBD45KCE				3.2*	4.5	5.7	7.2	ZBD45KCE				2.0*	2.1	2.2	2.3
ZBD57KCE				4.0*	5.5	7.0	8.7	ZBD57KCE				2.6*	2.7	2.8	2.9
ZBD76K5E	on request							ZBD76K5E	on request						
ZBD114K5E	on request							ZBD114K5E	on request						

Suction Gas Return 20°C / Subcooling 0K

*Suction Superheat 10K, Subcooling 0K

Preliminary data

Condensing Temperature 40°C															
R513A	Cooling Capacity (kW)							R513A	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				1.9*	2.6*	3.3*	4.2	ZBD21KCE				1.2*	1.2*	1.3*	1.3
ZBD38KCE				3.3*	4.3*	5.4*	7.0	ZBD38KCE				2.0*	2.1*	2.2*	2.2
ZBD45KCE				4.0*	5.5	6.9	8.5	ZBD45KCE				2.4*	2.5	2.6	2.7
ZBD57KCE				5.0*	6.4*	8.1*	10.6	ZBD57KCE				3.0*	3.2*	3.3*	3.4
ZBD76K5E	on request							ZBD76K5E	on request						
ZBD114K5E	on request							ZBD114K5E	on request						

Suction Gas Return 20°C / Subcooling 0K

*Suction Superheat 10K, Subcooling 0K

Preliminary data