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

Emerson offers ZB compressors with a wide displacement range from 5.9 m^3/h to 87.5 m^3/h. It includes ZBD digital compressors models that offer continuous capacity modulation technology.

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

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

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



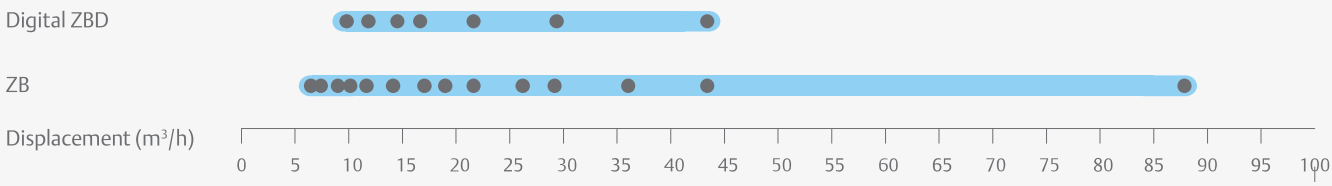
ZB compressor for medium temperature refrigeration with and without sound shell

ZBD Digital Scroll Compressors

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

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

ZB and ZBD Compressor Line-up



Features and Benefits

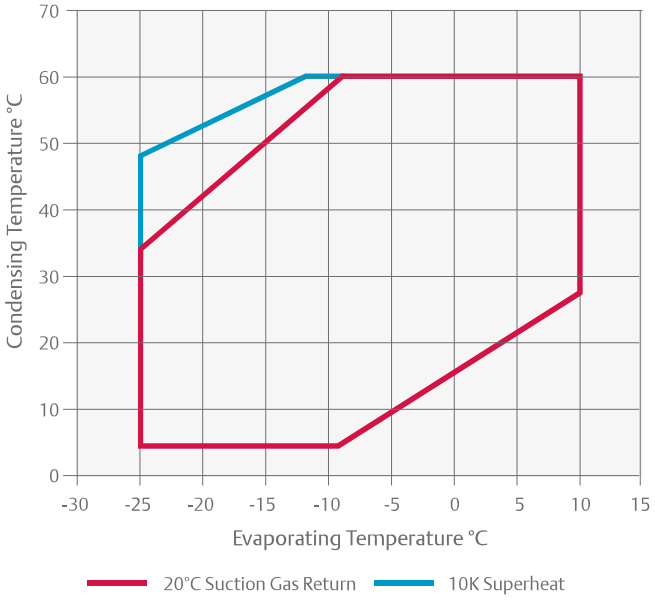
- Copeland scroll axial and radial compliance for superior reliability and efficiency
- Wide operating envelope with 10°C condensing limit and fast pull-down capabilities
- High seasonal efficiencies as scrolls are designed at the condition where equipment runs most of the time
- Light weight and compactness,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

Maximum Allowable Pressure (PS)

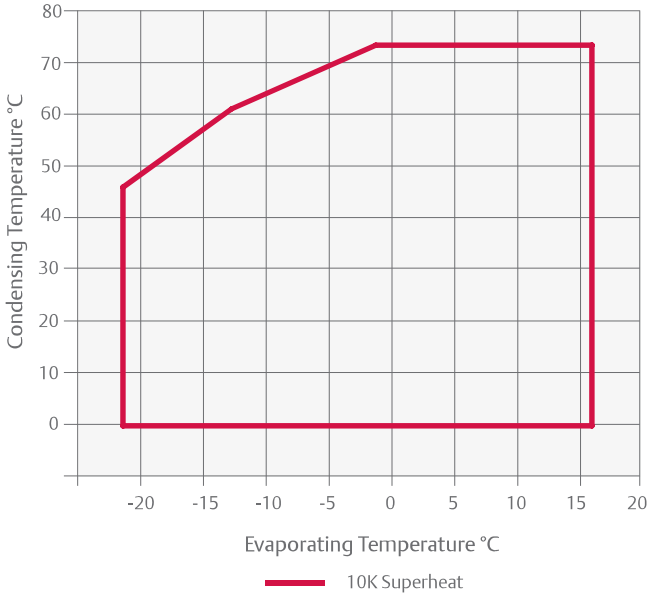
- ZB15 to ZB45:
  Low Side PS 21 bar(g) / High Side PS 32 bar(g)
- ZB50 to ZB220:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar(g)
- Digital ZBD:
  Low Side PS 21 bar(g) / High Side PS 28.8 bar(g)
- Summit ZBD:
  Low Side PS 22.6 bar(g) / High Side PS 32 bar (g)

Operating Envelope

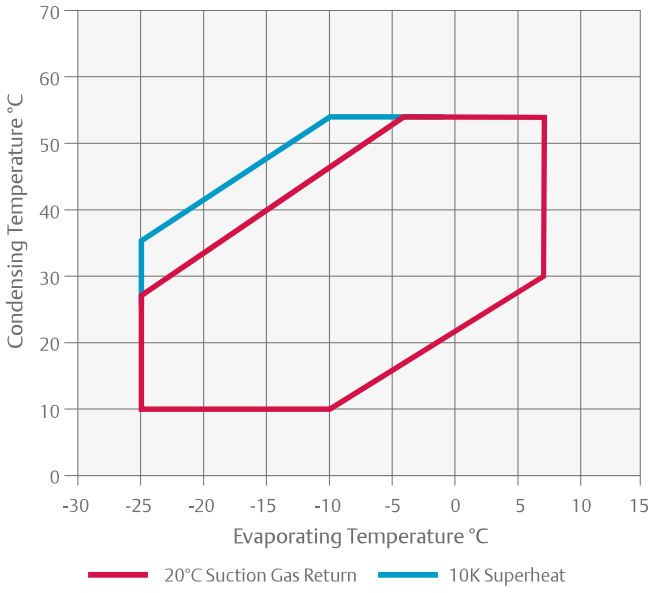
ZB - R448A/R449A



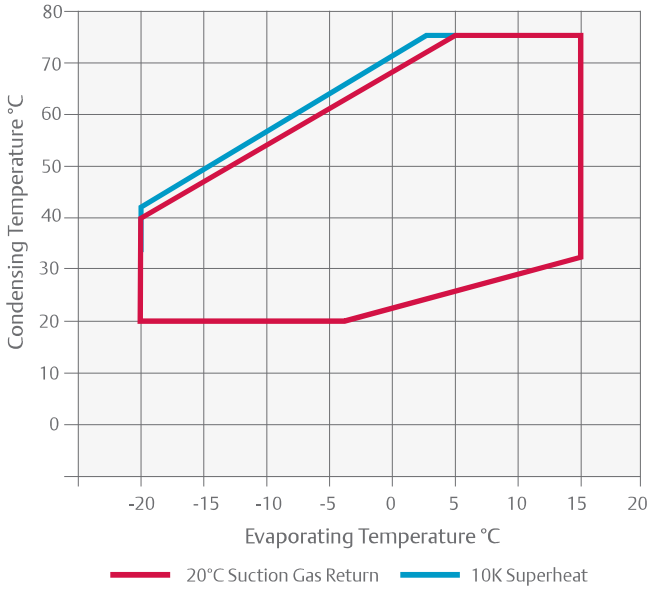
ZBD - R134a



ZB - R407A



ZB - R134a



Technical Overview

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

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

Capacity Data

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

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

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

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

Capacity Data

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

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

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

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