

Copeland Scroll™

ZBW/ZFW Variable Speed Integrated Solutions

For Refrigeration Applications





Copeland Scroll™ ZBW/ZFW variable speed integrated solutions

Emerson variable speed integrated solutions were developed for our partners with specific requirements for variable speed capacity modulated medium temperature and low temperature applications, such as convenient stores, supermarkets, process chilling and cold rooms.

The solution offering includes variable speed compressors, drives & controllers, as well as system components like EXVs, economizers, pressure transducers & temperature sensors tailored to the customer requirements.

With long term engineering and manufacturing experience in scroll compressors, combined with innovative variable speed technology, Emerson provides a total integrated solution with value in matched and tuned drives, CoreSense™ diagnostics and vapor injection technology for a variety of Cold Chain applications.



ZBW/ZFW variable speed compressor & drive



CoreSense™ controller



System components (Optional)

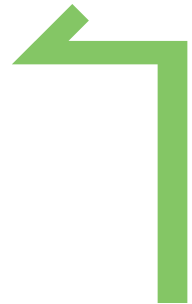


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Features and benefits

Variable speed advantage



Modulated capacity
high efficiency at part load



Low noise
operation








Accurate temperature
control for food safety



Wide input range
minimizes grid impact

Emerson integrated solutions to meet customer needs

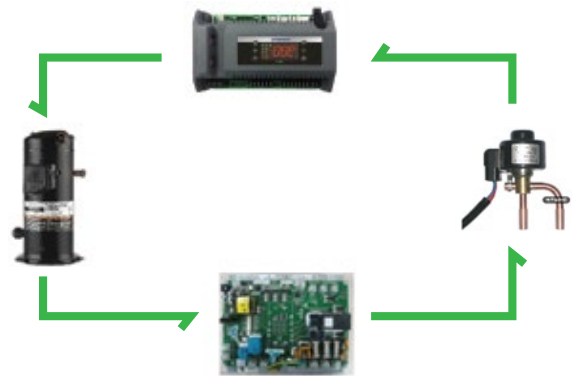
Customer pain points	Emerson solution
Need to coordinate with various compressor and electronics suppliers for system development	 <p>One-stop shop Capability to supply all core components in variable speed systems including compressors, drives, controllers, temperature sensors, valves etc.</p>
Lack of adequate technical support	 <p>Dedicated integrated solutions team Expert Emerson engineering team provides specialized support for all refrigeration requirements</p>
Long lead times for variable speed system development	 <p>Qualified solution with high reliability Fully integrated control logic, system protection and optimized parameters</p>
Poor performance in low evaporating conditions	 <p>Refrigeration variable speed scroll ZBW for medium temperature applications ZFW for low temperature applications</p>
Low efficiency at high pressure ratio conditions	 <p>Vapor injection technology Significantly improving efficiency, providing best in class lifecycle cost</p>

Emerson integrated solutions team

Emerson is fully committed to developing innovative solutions for the HVACR industry and to help customers achieve their cold chain objectives. Emerson responds quickly to the market changes and listens attentively to the voice of customers. With Emerson, you can consider your cold chain challenges solved.

Our service offerings:

- Provides customers with full technical support services
- Coordinates with internal resources and Emerson laboratories to fully validate solutions
- Delivers safe and reliable product solutions for the market
- Continues to expand system simulations and system lab capabilities



Value for customers



Market-leading
system performance



Trusted Emerson brand
with decades of cold chain
solutions



Helping customers
respond quickly to
market demands



Higher unit reliability



On-site monitoring
continuously tracks
real-time performance



Emerson variable speed integrated solutions features



Drive

- Optimized for Copeland Scroll™ compressors with customized parameter settings
- Plug and play compressor compatibility
- Built-in compressor protection further enhances reliability



ZBW/ZFW Variable speed compressor

- Wide operating envelope
- Robust design for refrigeration
- Enhanced vapor injection
- Highly efficient scroll & BPM motor



CoreSense™ controller

- Compressor envelope control
- Premium control algorithm for annual base energy savings
- Monitors operating conditions
- Compressor / power-supply / system protection
- System self-diagnostics for prolonged system operation
- Communication & intelligent store solution
- Premium user interface with LED

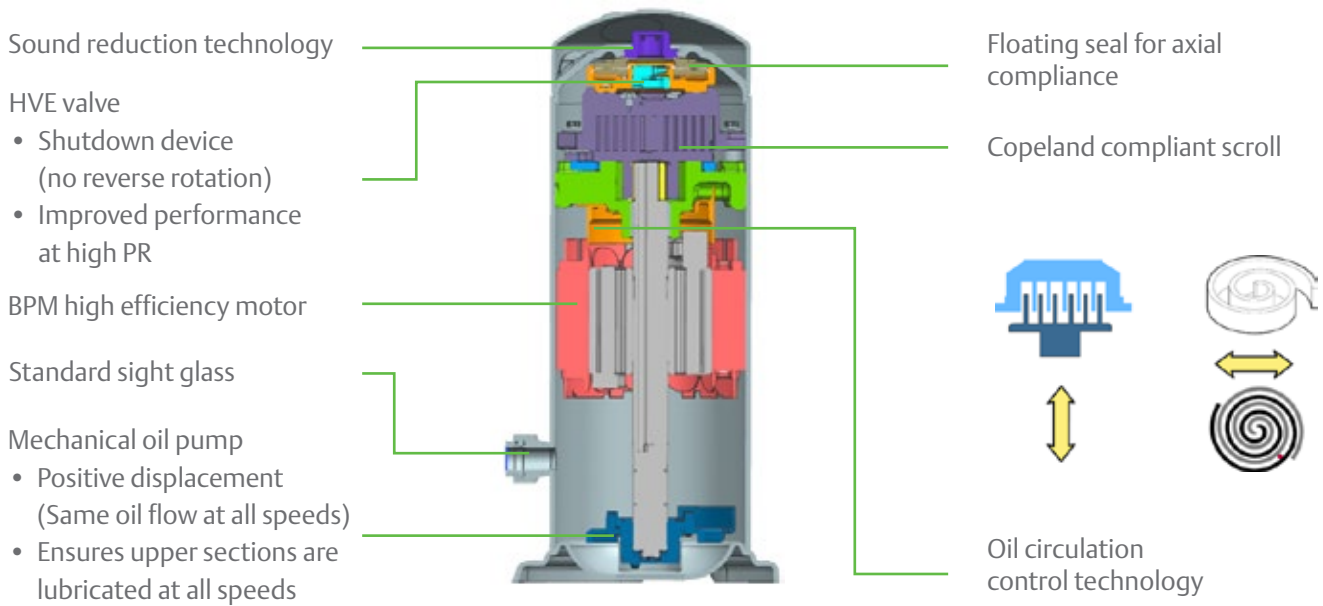


System components

- Accurate pressure and temperature control
- Qualified for high reliability
- Optimized selection per customized needs



ZBW/ZFW variable speed compressor key design features



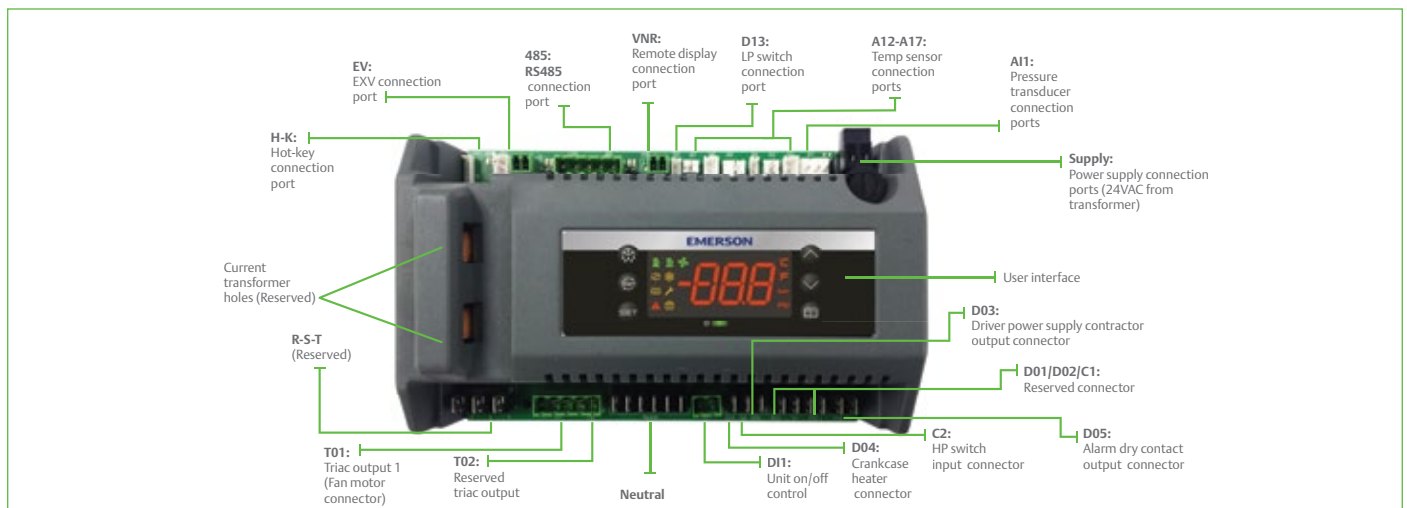
Drive

- Optimum combination of compressor and drive, delivering maximum efficiency
- Best in class built-in protection & control for reliable operation

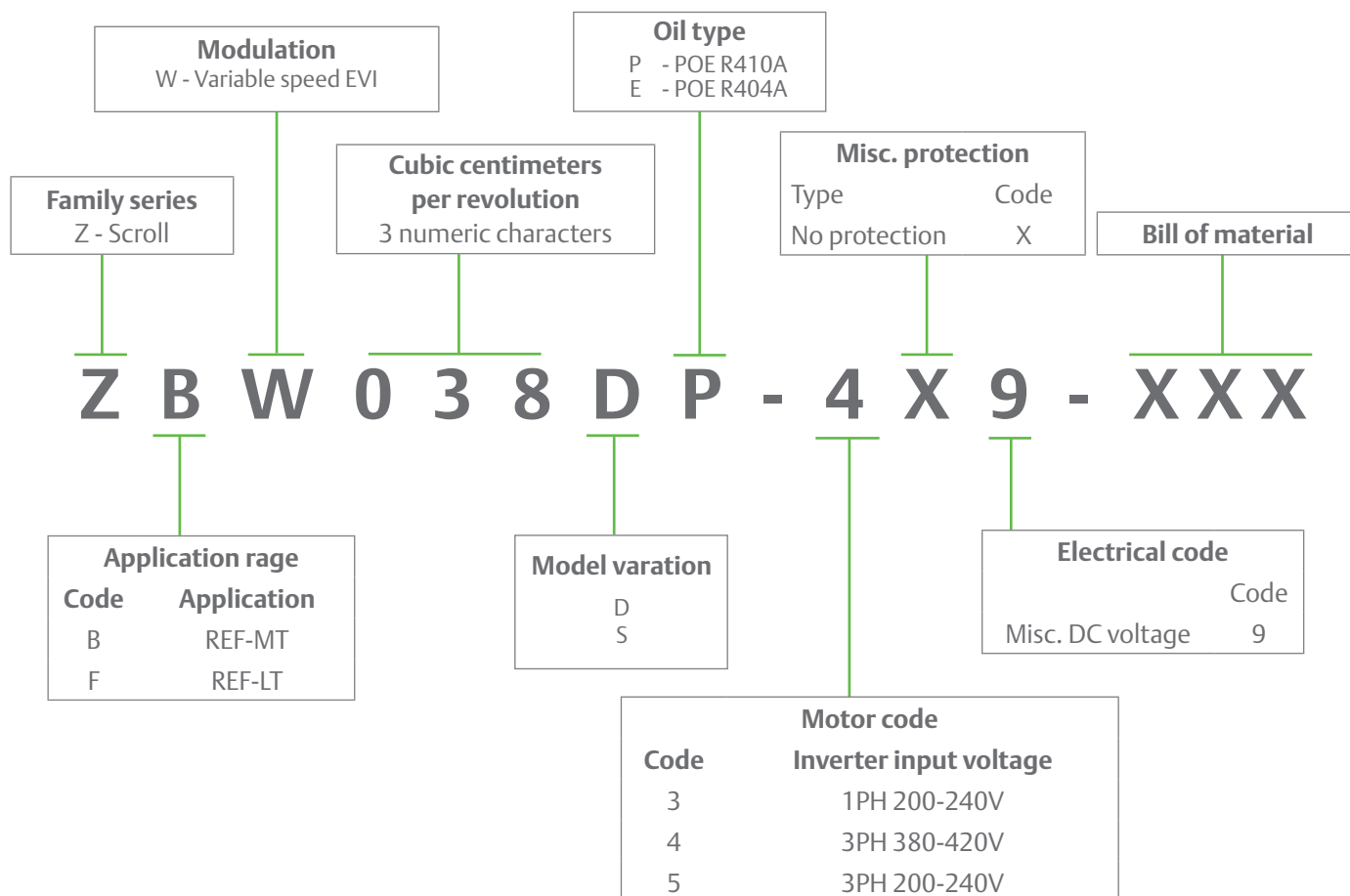


EV2 Drive	EVD Drive
<ul style="list-style-type: none"> • Global platform • Fully compliant with UL 60730, IEC 60335-1 & IEC 60335-2-34 • Voltage range <ul style="list-style-type: none"> - 3X9 Rated AC power supply: 200-240V 1PH - 4X9 Rated AC power supply: 380-460V 3PH 	<ul style="list-style-type: none"> • Specifically design for Asia market • Meets system EN60335 standard without component UL/VDE • Voltage range <ul style="list-style-type: none"> - 3X9 Rated AC power supply: 180-240V 1PH - 4X9 Rated AC power supply: 380-400V 3PH

CoreSense™ Controller



Nomenclature

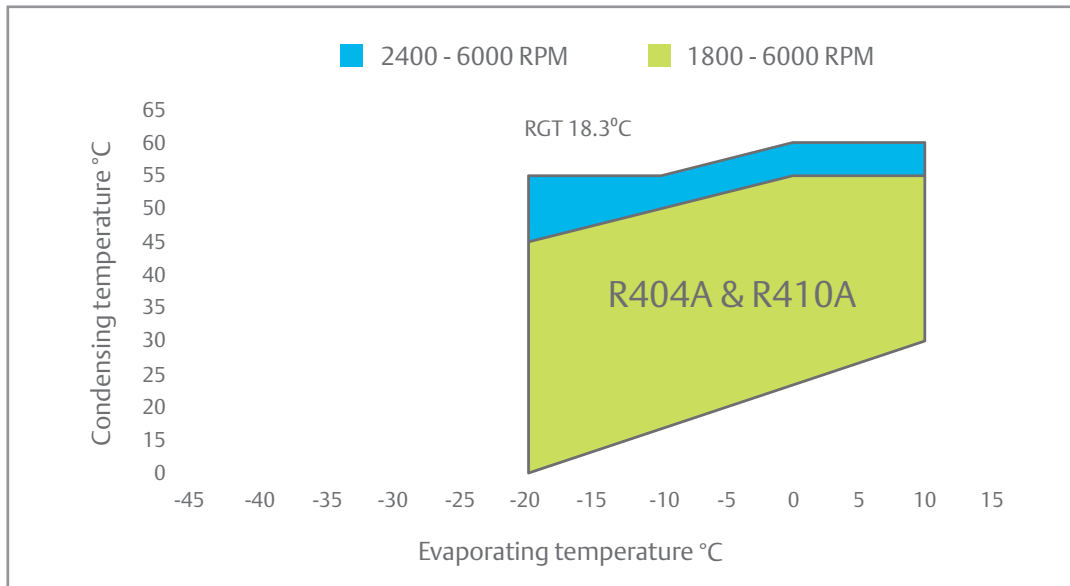


Bill of material

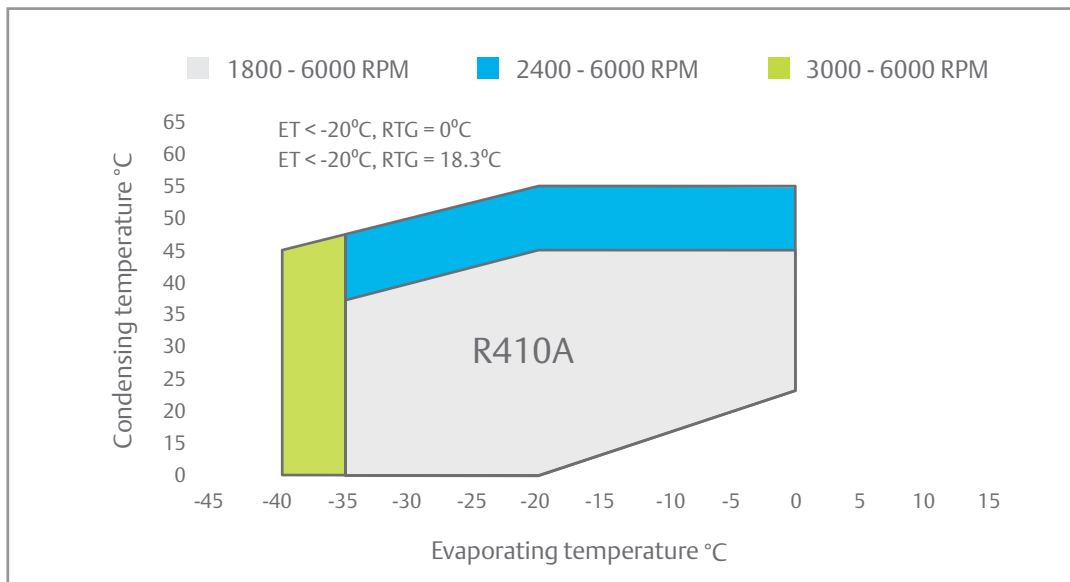
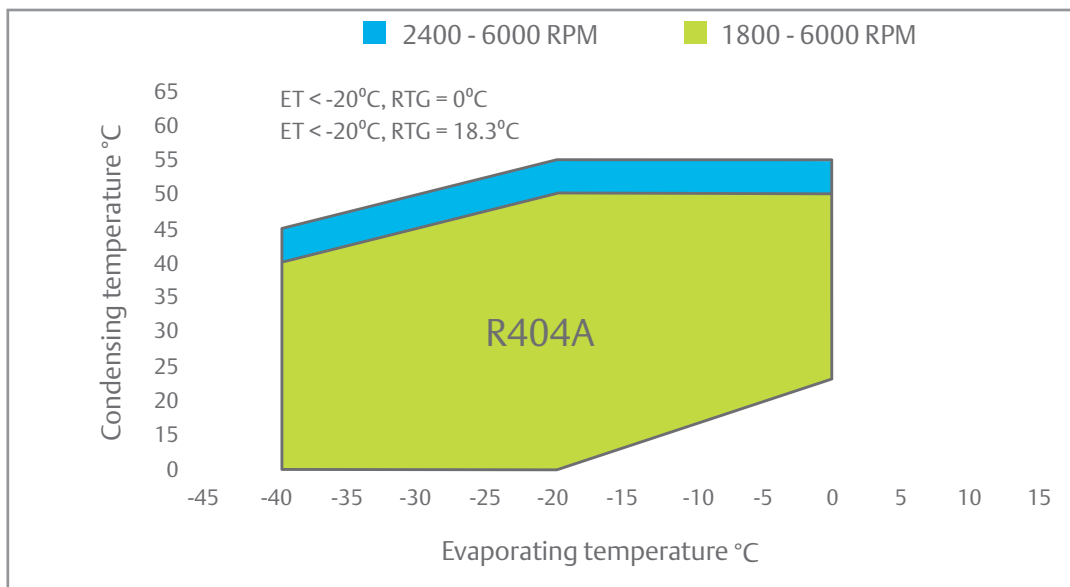
Compressor model	Motor code	BOM code	Stub tube connection	Oil sight glass
Medium temperature with vapor injection				
ZBW030DP	4X9	573	v	v
	3X9			
ZBW030DE	4X9	573	v	v
ZBW038DP	4X9	573	v	v
ZBW038DE	4X9	573	v	v
ZBW050SP	4X9	558	v	v
ZBW050SE	4X9	558	v	v
Low temperature with vapor injection				
ZFW030DE	4X9	573	v	v
ZFW038DE	4X9	573	v	v
ZFW050SP	4X9	558	v	v
ZFW050SE	4X9	558	v	v

Operating envelopes

Medium temperature



Low temperature



Performance data

ZBW Medium temperature
Capacity and power (kW) at 380 V-3PH
ZBW030DE-4X9

R404A

Condensing Temperature °C		Evaporating temperature °C						
		-20	-15	-10	-5	0	5	10
Q (kW)	60							
	55					3.3	3.8	4.3
	50			2.5	2.9	3.4	3.9	4.5
	45	1.9	2.2	2.6	3.0	3.5	4.1	4.7
	40	1.9	2.3	2.7	3.2	3.7	4.3	4.9
	35	2.0	2.4	2.8	3.3	3.8	4.4	5.1
	30	2.1	2.4	2.9	3.4	3.9	4.6	5.3
	25	2.1	2.5	3.0	3.5	4.1		
	20	2.2	2.6	3.0	3.6			
	15	2.2	2.6					
10	2.2							
P (kW)	60							
	55					1.3	1.3	1.3
	50			1.2	1.2	1.2	1.2	1.2
	45	1.0	1.0	1.1	1.1	1.1	1.1	1.1
	40	0.9	0.9	1.0	1.0	1.0	1.0	1.0
	35	0.8	0.8	0.8	0.9	0.9	0.9	0.9
	30	0.7	0.7	0.8	0.8	0.8	0.8	0.8
	25	0.6	0.6	0.7	0.7	0.7		
	20	0.6	0.6	0.6	0.6			
	15	0.5	0.5					
10	0.5							
Q (kW)	60					7.9	9.1	10.4
	55	4.4	5.2	6.1	7.1	8.2	9.4	10.8
	50	4.5	5.4	6.3	7.3	8.5	9.8	11.3
	45	4.7	5.5	6.5	7.6	8.8	10.2	11.8
	40	4.8	5.7	6.7	7.9	9.2	10.6	12.3
	35	5.0	5.9	7.0	8.2	9.5	11.1	12.8
	30	5.2	6.1	7.2	8.4	9.9	11.5	13.3
	25	5.3	6.3	7.4	8.7	10.2		
	20	5.4	6.4	7.6	8.9			
	15	5.5	6.5					
10	5.5							
P (kW)	60					3.3	3.3	3.4
	55	2.9	2.9	3.0	3.0	3.1	3.1	3.2
	50	2.6	2.7	2.7	2.8	2.9	2.9	2.9
	45	2.4	2.5	2.5	2.6	2.6	2.7	2.7
	40	2.2	2.2	2.3	2.3	2.4	2.4	2.4
	35	1.9	2.0	2.0	2.1	2.1	2.2	2.2
	30	1.7	1.7	1.8	1.8	1.9	1.9	2.0
	25	1.5	1.5	1.6	1.6	1.7		
	20	1.3	1.4	1.4	1.4			
	15	1.2	1.2					
10	1.1							
Q (kW)	60					10.7	12.2	14.0
	55	6.0	7.1	8.2	9.6	11.0	12.7	14.6
	50	6.1	7.2	8.5	9.9	11.5	13.2	15.2
	45	6.3	7.5	8.8	10.3	11.9	13.8	15.9
	40	6.5	7.7	9.1	10.6	12.4	14.4	16.6
	35	6.7	8.0	9.4	11.0	12.9	14.9	17.3
	30	7.0	8.2	9.7	11.4	13.3	15.5	17.9
	25	7.1	8.5	10.0	11.7	13.7		
	20	7.3	8.7	10.3	12.1			
	15	7.4	8.8					
10	7.5							
P (kW)	60					4.3	4.3	4.4
	55	3.7	3.8	3.9	4.0	4.0	4.1	4.1
	50	3.5	3.5	3.6	3.7	3.7	3.8	3.9
	45	3.2	3.2	3.3	3.4	3.4	3.5	3.5
	40	2.8	2.9	3.0	3.0	3.1	3.2	3.2
	35	2.5	2.6	2.6	2.7	2.8	2.8	2.9
	30	2.2	2.3	2.3	2.4	2.5	2.5	2.6
	25	2.0	2.0	2.1	2.1	2.2		
	20	1.7	1.8	1.8	1.9			
	15	1.5	1.6					
10	1.4							

Note:
1. Return gas temperature 18.3°C
2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C							
		-20	-15	-10	-5	0	5	10	
Q (kW)	30 Hz	60							
		55					4.2	4.8	5.6
		50			3.2	3.8	4.4	5.0	5.8
		45	2.4	2.9	3.3	3.9	4.5	5.3	6.1
		40	2.5	2.9	3.5	4.1	4.7	5.5	6.3
		35	2.6	3.0	3.6	4.2	4.9	5.7	6.6
		30	2.6	3.1	3.7	4.3	5.1	5.9	6.8
		25	2.7	3.2	3.8	4.5	5.2		
		20	2.8	3.3	3.9	4.6			
		15	2.8	3.4					
10	2.9								
P (kW)	30 Hz	60							
		55					1.7	1.7	1.7
		50			1.5	1.5	1.5	1.6	1.6
		45	1.3	1.3	1.4	1.4	1.4	1.4	1.5
		40	1.2	1.2	1.2	1.2	1.3	1.3	1.3
		35	1.0	1.1	1.1	1.1	1.1	1.2	1.2
		30	0.9	0.9	1.0	1.0	1.0	1.0	1.1
		25	0.8	0.8	0.8	0.9	0.9		
		20	0.7	0.7	0.8	0.8			
		15	0.6	0.7					
10	0.6								
Q (kW)	75 Hz	60					10.1	11.6	13.3
		55	5.7	6.7	7.8	9.1	10.5	12.1	13.9
		50	5.8	6.9	8.1	9.4	10.9	12.6	14.5
		45	6.0	7.1	8.4	9.8	11.4	13.1	15.2
		40	6.2	7.4	8.7	10.1	11.8	13.7	15.8
		35	6.4	7.6	9.0	10.5	12.2	14.2	16.4
		30	6.6	7.9	9.3	10.9	12.7	14.7	17.1
		25	6.8	8.1	9.5	11.2	13.1		
		20	7.0	8.3	9.8	11.5			
		15	7.1	8.4					
10	7.1								
P (kW)	75 Hz	60					4.2	4.3	4.3
		55	3.7	3.7	3.8	3.9	3.9	4.0	4.1
		50	3.4	3.5	3.5	3.6	3.7	3.7	3.8
		45	3.1	3.2	3.2	3.3	3.4	3.4	3.5
		40	2.8	2.8	2.9	3.0	3.0	3.1	3.1
		35	2.5	2.5	2.6	2.7	2.7	2.8	2.8
		30	2.2	2.2	2.3	2.4	2.4	2.5	2.5
		25	1.9	2.0	2.0	2.1	2.1		
		20	1.7	1.7	1.8	1.8			
		15	1.5	1.6					
10	1.4								
Q (kW)	100 Hz	60					13.7	15.7	18.0
		55	7.7	9.1	10.6	12.3	14.2	16.3	18.8
		50	7.9	9.3	10.9	12.7	14.7	17.0	19.6
		45	8.1	9.6	11.3	13.2	15.3	17.7	20.5
		40	8.4	9.9	11.7	13.7	15.9	18.5	21.3
		35	8.7	10.3	12.1	14.2	16.5	19.2	22.2
		30	8.9	10.6	12.5	14.7	17.1	19.9	23.0
		25	9.2	10.9	12.9	15.1	17.7		
		20	9.4	11.2	13.2	15.5			
		15	9.5	11.3					
10	9.6								
P (kW)	100 Hz	60					5.5	5.6	5.6
		55	4.8	4.9	5.0	5.1	5.2	5.2	5.3
		50	4.4	4.5	4.6	4.7	4.8	4.9	4.9
		45	4.0	4.1	4.2	4.3	4.4	4.5	4.5
		40	3.6	3.7	3.8	3.9	4.0	4.0	4.1
		35	3.2	3.3	3.4	3.5	3.6	3.6	3.7
		30	2.9	2.9	3.0	3.1	3.2	3.2	3.3
		25	2.5	2.6	2.6	2.7	2.8		
		20	2.2	2.3	2.3	2.4			
		15	2.0	2.0					
10	1.8								

Note:
 1. Return gas temperature 18.3°C
 2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C							
		-20	-15	-10	-5	0	5	10	
Q (kW)	60	30 Hz							
	55						5.6	6.4	7.2
	50				4.3	4.9	5.7	6.5	7.4
	45		3.2	3.7	4.3	5.0	5.8	6.6	7.5
	40		3.2	3.8	4.4	5.2	5.9	6.8	7.7
	35		3.3	3.9	4.5	5.3	6.0	6.9	7.8
	30		3.4	4.0	4.6	5.3	6.1	7.0	7.9
	25		3.4	4.0	4.6	5.4	6.1		
	20		3.5	4.0	4.7	5.4			
	15		3.5	4.1					
10	3.5								
P (kW)	60	30 Hz							
	55						2.1	2.1	2.1
	50				1.8	1.8	1.9	1.9	1.9
	45		1.6	1.6	1.6	1.6	1.7	1.7	1.7
	40		1.4	1.4	1.4	1.5	1.5	1.5	1.5
	35		1.2	1.3	1.3	1.3	1.3	1.4	1.4
	30		1.1	1.1	1.1	1.1	1.2	1.2	1.2
	25		1.0	1.0	1.0	1.1	1.1		
	20		0.9	0.9	0.9	0.9			
	15		0.8	0.9					
10	0.7								
Q (kW)	60	75 Hz					12.9	14.7	16.7
	55		7.2	8.5	10.0	11.7	13.5	15.4	17.5
	50		7.6	8.9	10.4	12.1	14.0	16.1	18.3
	45		7.8	9.1	10.7	12.5	14.5	16.7	19.0
	40		7.9	9.3	11.0	12.9	15.0	17.3	19.8
	35		8.1	9.6	11.3	13.3	15.6	18.0	20.7
	30		8.3	9.9	11.7	13.8	16.2	18.8	21.7
	25		8.6	10.3	12.2	14.5	17.0		
	20		9.1	10.9	12.9	15.3			
	15		9.8	11.6					
10	10.7								
P (kW)	60	75 Hz					5.6	5.7	5.7
	55		4.5	4.7	4.8	5.0	5.1	5.2	5.2
	50		4.1	4.3	4.4	4.5	4.6	4.7	4.7
	45		3.8	3.9	4.0	4.1	4.2	4.2	4.3
	40		3.4	3.6	3.7	3.7	3.8	3.8	3.9
	35		3.1	3.2	3.3	3.4	3.4	3.5	3.5
	30		2.8	3.0	3.1	3.1	3.1	3.2	3.3
	25		2.6	2.7	2.8	2.9	2.9		
	20		2.5	2.6	2.7	2.7			
	15		2.4	2.5					
10	2.3								
Q (kW)	60	100 Hz					16.8	19.2	21.8
	55		9.7	11.4	13.4	15.4	17.7	20.3	23.1
	50		10.0	11.9	13.9	16.1	18.5	21.2	24.2
	45		10.3	12.2	14.3	16.6	19.2	22.1	25.3
	40		10.6	12.5	14.7	17.1	19.8	22.9	26.4
	35		10.9	12.8	15.1	17.6	20.5	23.8	27.5
	30		11.2	13.2	15.5	18.2	21.2	24.7	28.6
	25		11.6	13.7	16.1	18.8	22.0		
	20		12.2	14.3	16.8	19.7			
	15		13.0	15.1					
10	14.0								
P (kW)	60	100 Hz					7.7	7.9	8.0
	55		6.0	6.2	6.5	6.8	7.0	7.2	7.3
	50		5.6	5.7	6.0	6.2	6.5	6.6	6.7
	45		5.1	5.3	5.5	5.7	5.9	6.1	6.2
	40		4.7	4.9	5.1	5.3	5.5	5.7	5.7
	35		4.4	4.5	4.8	4.9	5.1	5.2	5.3
	30		4.0	4.2	4.4	4.5	4.7	4.8	4.9
	25		3.7	3.9	4.1	4.2	4.3		
	20		3.3	3.5	3.7	3.8			
	15		3.0	3.4					
10	2.8								

Note:
 1. Return gas temperature 18.3°C
 2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C						
		-20	-15	-10	-5	0	5	10
Q (kW)	60							
	55					4.2	4.9	5.7
	50			3.3	3.8	4.4	5.1	5.9
	45	2.2	2.8	3.4	3.9	4.5	5.3	6.2
	40	2.2	2.9	3.4	4.0	4.6	5.4	6.5
	35	2.3	2.9	3.5	4.1	4.8	5.6	6.7
	30	2.3	2.9	3.5	4.2	4.9	5.8	7.0
	25	2.4	3.0	3.6	4.3	5.1		
	20	2.4	3.1	3.7	4.4			
	15	2.5	3.2					
10	2.7							
P (kW)	60							
	55					2.0	2.0	2.0
	50			1.7	1.7	1.8	1.8	1.8
	45	1.5	1.5	1.5	1.6	1.6	1.6	1.6
	40	1.4	1.4	1.4	1.4	1.5	1.5	1.5
	35	1.2	1.2	1.3	1.3	1.3	1.4	1.4
	30	1.1	1.1	1.2	1.2	1.2	1.3	1.3
	25	1.0	1.0	1.1	1.1	1.2		
	20	0.9	0.9	1.0	1.0			
	15	0.8	0.8					
10	0.7							
Q (kW)	60					11.1	12.8	14.7
	55	5.8	7.0	8.4	9.9	11.5	13.3	15.2
	50	6.0	7.2	8.6	10.1	11.8	13.6	15.7
	45	6.2	7.4	8.8	10.4	12.1	14.0	16.0
	40	6.3	7.6	9.0	10.6	12.3	14.2	16.4
	35	6.4	7.7	9.1	10.7	12.5	14.5	16.6
	30	6.5	7.8	9.2	10.8	12.6	14.6	16.9
	25	6.5	7.8	9.3	10.9	12.7		
	20	6.5	7.8	9.3	10.9			
	15	6.5	7.8					
10	6.4							
P (kW)	60					4.7	4.8	4.8
	55	4.1	4.1	4.1	4.2	4.2	4.3	4.3
	50	3.6	3.6	3.7	3.7	3.8	3.8	3.9
	45	3.2	3.3	3.3	3.4	3.4	3.5	3.5
	40	2.9	3.0	3.0	3.1	3.1	3.2	3.2
	35	2.6	2.7	2.7	2.8	2.9	2.9	2.9
	30	2.4	2.4	2.5	2.6	2.6	2.7	2.7
	25	2.2	2.2	2.3	2.3	2.4		
	20	1.9	2.0	2.0	2.1			
	15	1.7	1.7					
10	1.4							
Q (kW)	60					14.3	16.5	19.0
	55	7.8	9.2	10.9	12.7	14.8	17.2	19.8
	50	8.0	9.5	11.2	13.2	15.4	17.8	20.6
	45	8.2	9.8	11.6	13.6	15.9	18.5	21.4
	40	8.4	10.0	11.9	14.0	16.5	19.2	22.2
	35	8.5	10.3	12.2	14.5	17.0	19.9	23.1
	30	8.7	10.5	12.6	15.0	17.7	20.7	24.0
	25	8.9	10.8	13.0	15.5	18.3		
	20	9.2	11.1	13.4	16.1			
	15	9.4	11.5					
10	9.7							
P (kW)	60					6.4	6.5	6.6
	55	5.5	5.5	5.6	5.6	5.7	5.8	5.8
	50	4.9	4.9	5.0	5.1	5.1	5.2	5.2
	45	4.4	4.4	4.5	4.6	4.6	4.7	4.7
	40	4.0	4.0	4.1	4.1	4.2	4.3	4.3
	35	3.6	3.6	3.7	3.8	3.9	3.9	4.0
	30	3.2	3.3	3.4	3.5	3.5	3.6	3.6
	25	2.9	3.0	3.1	3.2	3.3		
	20	2.6	2.7	2.8	2.9			
	15	2.3	2.3					
10	1.9							

Note:
1. Return gas temperature 18.3°C
2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C						
		-20	-15	-10	-5	0	5	10
Q (kW)	60							
	55					4.2	4.9	5.7
	50			3.3	3.8	4.4	5.1	5.9
	45	2.2	2.8	3.4	3.9	4.5	5.3	6.2
	40	2.2	2.9	3.4	4.0	4.6	5.4	6.5
	35	2.3	2.9	3.5	4.1	4.8	5.6	6.7
	30	2.3	2.9	3.5	4.2	4.9	5.8	7.0
	25	2.4	3.0	3.6	4.3	5.1		
	20	2.4	3.1	3.7	4.4			
	15	2.5	3.2					
10	2.7							
P (kW)	60							
	55					2.0	2.0	2.0
	50			1.7	1.7	1.8	1.8	1.8
	45	1.5	1.5	1.5	1.6	1.6	1.6	1.6
	40	1.4	1.4	1.4	1.4	1.5	1.5	1.5
	35	1.2	1.2	1.3	1.3	1.3	1.4	1.4
	30	1.1	1.1	1.2	1.2	1.2	1.3	1.3
	25	1.0	1.0	1.1	1.1	1.2		
	20	0.9	0.9	1.0	1.0			
	15	0.8	0.8					
10	0.7							
Q (kW)	60					11.1	12.8	14.7
	55	5.8	7.0	8.4	9.9	11.5	13.3	15.2
	50	6.0	7.2	8.6	10.1	11.8	13.6	15.7
	45	6.2	7.4	8.8	10.4	12.1	14.0	16.0
	40	6.3	7.6	9.0	10.6	12.3	14.2	16.4
	35	6.4	7.7	9.1	10.7	12.5	14.5	16.6
	30	6.5	7.8	9.2	10.8	12.6	14.6	16.9
	25	6.5	7.8	9.3	10.9	12.7		
	20	6.5	7.8	9.3	10.9			
	15	6.5	7.8					
10	6.4							
P (kW)	60					4.7	4.8	4.8
	55	4.1	4.1	4.1	4.2	4.2	4.3	4.3
	50	3.6	3.6	3.7	3.7	3.8	3.8	3.9
	45	3.2	3.3	3.3	3.4	3.4	3.5	3.5
	40	2.9	3.0	3.0	3.1	3.1	3.2	3.2
	35	2.6	2.7	2.7	2.8	2.9	2.9	2.9
	30	2.4	2.4	2.5	2.6	2.6	2.7	2.7
	25	2.2	2.2	2.3	2.3	2.4		
	20	1.9	2.0	2.0	2.1			
	15	1.7	1.7					
10	1.4							
Q (kW)	60					14.3	16.5	19.0
	55	7.8	9.2	10.9	12.7	14.8	17.2	19.8
	50	8.0	9.5	11.2	13.2	15.4	17.8	20.6
	45	8.2	9.8	11.6	13.6	15.9	18.5	21.4
	40	8.4	10.0	11.9	14.0	16.5	19.2	22.2
	35	8.5	10.3	12.2	14.5	17.0	19.9	23.1
	30	8.7	10.5	12.6	15.0	17.7	20.7	24.0
	25	8.9	10.8	13.0	15.5	18.3		
	20	9.2	11.1	13.4	16.1			
	15	9.4	11.5					
10	9.7							
P (kW)	60					6.4	6.5	6.6
	55	5.5	5.5	5.6	5.6	5.7	5.8	5.8
	50	4.9	4.9	5.0	5.1	5.1	5.2	5.2
	45	4.4	4.4	4.5	4.6	4.6	4.7	4.7
	40	4.0	4.0	4.1	4.1	4.2	4.3	4.3
	35	3.6	3.6	3.7	3.8	3.9	3.9	4.0
	30	3.2	3.3	3.4	3.5	3.5	3.6	3.6
	25	2.9	3.0	3.1	3.2	3.3		
	20	2.6	2.7	2.8	2.9			
	15	2.3	2.3					
10	1.9							

Note:
1. Return gas temperature 18.3°C
2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C						
		-20	-15	-10	-5	0	5	10
Q (kW)	60							
	55					5.6	6.5	7.6
	50			4.4	5.1	5.9	6.8	8.0
	45	2.9	3.8	4.5	5.2	6.0	7.0	8.3
	40	3.0	3.8	4.6	5.3	6.2	7.3	8.7
	35	3.1	3.9	4.7	5.4	6.4	7.5	9.0
	30	3.1	4.0	4.7	5.6	6.6	7.8	9.4
	25	3.2	4.0	4.8	5.7	6.8		
	20	3.3	4.1	4.9	5.9			
	15	3.4	4.2					
10	3.6							
P (kW)	60							
	55					2.2	2.2	2.3
	50			1.9	2.0	2.0	2.0	2.0
	45	1.7	1.7	1.7	1.8	1.8	1.8	1.8
	40	1.5	1.6	1.6	1.6	1.6	1.7	1.7
	35	1.4	1.4	1.4	1.5	1.5	1.5	1.5
	30	1.3	1.3	1.3	1.3	1.4	1.4	1.4
	25	1.1	1.2	1.2	1.2	1.3		
	20	1.0	1.0	1.1	1.1			
	15	0.9	0.9					
10	0.7							
Q (kW)	60					14.6	16.8	19.4
	55	8.0	9.5	11.1	12.9	15.0	17.4	20.1
	50	8.1	9.6	11.3	13.2	15.4	17.9	20.9
	45	8.1	9.7	11.5	13.5	15.8	18.5	21.6
	40	8.3	9.9	11.8	13.9	16.3	19.1	22.3
	35	8.4	10.1	12.0	14.2	16.7	19.6	23.0
	30	8.6	10.3	12.2	14.5	17.1	20.1	23.6
	25	8.7	10.5	12.5	14.8	17.4		
	20	8.9	10.6	12.7	15.0			
	15	9.0	10.8					
10	9.1							
P (kW)	60					6.1	6.2	6.2
	55	5.2	5.2	5.3	5.3	5.4	5.5	5.5
	50	4.6	4.7	4.7	4.8	4.9	4.9	5.0
	45	4.2	4.2	4.2	4.3	4.4	4.5	4.5
	40	3.8	3.8	3.8	3.9	4.0	4.1	4.1
	35	3.4	3.4	3.5	3.6	3.7	3.7	3.7
	30	3.1	3.1	3.2	3.3	3.4	3.4	3.4
	25	2.8	2.8	2.9	3.0	3.1		
	20	2.5	2.5	2.6	2.7			
	15	2.1	2.2					
10	1.8							
Q (kW)	60					18.7	21.7	24.9
	55	10.3	12.1	14.2	16.7	19.4	22.5	25.8
	50	10.5	12.5	14.7	17.3	20.1	23.2	26.7
	45	10.8	12.8	15.2	17.8	20.7	23.9	27.5
	40	11.1	13.2	15.6	18.3	21.3	24.6	28.2
	35	11.3	13.5	16.0	18.8	21.9	25.3	28.9
	30	11.6	13.8	16.4	19.3	22.4	25.9	29.6
	25	11.8	14.2	16.8	19.8	23.0		
	20	12.1	14.5	17.3	20.3			
	15	12.5	14.9					
10	12.8							
P (kW)	60					8.2	8.3	8.3
	55	7.0	7.0	7.1	7.2	7.3	7.4	7.4
	50	6.2	6.2	6.3	6.4	6.5	6.6	6.7
	45	5.6	5.6	5.7	5.8	5.9	6.0	6.0
	40	5.0	5.1	5.2	5.3	5.4	5.4	5.5
	35	4.6	4.6	4.7	4.8	4.9	5.0	5.0
	30	4.1	4.2	4.3	4.4	4.5	4.5	4.5
	25	3.7	3.8	3.9	4.0	4.1		
	20	3.3	3.4	3.5	3.5			
	15	2.8	2.9					
10	2.3							

Note:
 1. Return gas temperature 18.3°C
 2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C							
		-20	-15	-10	-5	0	5	10	
Q (kW)	60	30 Hz							
	55						6.7	7.7	8.9
	50				5.2	6.1	7.0	8.1	9.4
	45		3.9	4.6	5.4	6.3	7.2	8.4	9.7
	40		4.0	4.7	5.5	6.4	7.4	8.7	10.1
	35		4.1	4.8	5.6	6.5	7.6	8.9	10.5
	30		4.1	4.9	5.7	6.7	7.8	9.2	10.9
	25		4.2	5.0	5.8	6.9	8.1		
	20		4.3	5.1	6.0	7.1			
	15		4.5	5.3					
10	4.7								
P (kW)	60	30 Hz							
	55						2.8	2.8	2.9
	50				2.5	2.5	2.6	2.6	2.7
	45		2.1	2.2	2.2	2.2	2.3	2.4	2.5
	40		1.8	1.9	1.9	2.0	2.0	2.0	2.2
	35		1.6	1.7	1.7	1.7	1.8	1.8	1.9
	30		1.4	1.5	1.5	1.5	1.6	1.6	1.7
	25		1.2	1.3	1.3	1.3	1.4		
	20		1.1	1.1	1.2	1.2			
	15		1.0	1.0					
10	0.9								
Q (kW)	60	75 Hz					17.4	20.1	22.9
	55		9.4	11.2	13.3	15.6	18.1	20.8	23.8
	50		9.7	11.6	13.7	16.1	18.7	21.5	24.5
	45		10.0	11.9	14.1	16.6	19.3	22.2	25.2
	40		10.3	12.2	14.5	17.0	19.8	22.7	25.9
	35		10.5	12.5	14.9	17.4	20.2	23.3	26.5
	30		10.7	12.8	15.2	17.8	20.7	23.7	27.0
	25		10.8	13.0	15.4	18.1	21.0		
	20		11.0	13.2	15.6	18.4			
	15		11.1	13.3					
10	11.2								
P (kW)	60	75 Hz					7.2	7.3	7.4
	55		6.1	6.2	6.3	6.4	6.5	6.6	6.6
	50		5.5	5.6	5.7	5.8	5.9	6.0	6.0
	45		5.0	5.1	5.2	5.3	5.4	5.4	5.4
	40		4.5	4.6	4.7	4.8	4.8	4.9	5.0
	35		4.1	4.2	4.3	4.3	4.4	4.4	4.5
	30		3.6	3.8	3.9	3.9	4.0	4.1	4.2
	25		3.2	3.4	3.5	3.5	3.6		
	20		2.8	3.0	3.1	3.2			
	15		2.4	2.6					
10	2.0								
Q (kW)	60	100 Hz					22.3	25.6	29.3
	55		12.2	14.7	17.4	20.2	23.3	26.8	30.7
	50		12.9	15.4	18.0	20.9	24.2	27.8	32.0
	45		13.3	15.8	18.5	21.5	24.9	28.8	33.3
	40		13.5	16.0	18.8	22.0	25.6	29.8	34.6
	35		13.5	16.1	19.0	22.4	26.3	30.9	36.1
	30		13.5	16.1	19.3	22.9	27.2	32.1	37.8
	25		13.4	16.3	19.6	23.6	28.2		
	20		13.4	16.5	20.1	24.4			
	15		13.5	16.9					
10	13.8								
P (kW)	60	100 Hz					9.9	10.2	10.4
	55		8.0	8.3	8.5	8.8	9.1	9.3	9.4
	50		7.4	7.6	7.8	8.1	8.3	8.4	8.5
	45		6.8	6.9	7.1	7.3	7.5	7.6	7.7
	40		6.1	6.2	6.4	6.6	6.8	7.0	7.0
	35		5.4	5.5	5.7	5.9	6.2	6.4	6.5
	30		4.7	4.7	5.0	5.3	5.6	5.9	6.1
	25		4.1	4.1	4.4	4.8	5.2		
	20		3.5	3.5	3.8	4.3			
	15		2.9	2.6					
10	2.3								

Note:
 1. Return gas temperature 18.3°C
 2. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C									
		-40	-35	-30	-25	-20	-15	-10	-5	0	
Q (kW)	60	30 Hz									
	55										
	50					1.4	1.7	2.1	2.5	2.9	3.4
	45			1.0	1.2	1.5	1.8	2.2	2.6	3.0	3.5
	40		0.8	1.0	1.3	1.5	1.8	2.3	2.7	3.2	3.7
	35		0.8	1.0	1.3	1.6	1.9	2.4	2.8	3.3	3.8
	30		0.9	1.1	1.3	1.6	2.0	2.4	2.9	3.4	3.9
	25		0.9	1.1	1.4	1.7	2.0	2.5	3.0	3.5	4.1
	20		1.0	1.2	1.4	1.7	2.1	2.6	3.0	3.6	4.2
	15		1.0	1.2	1.5	1.7	2.1	2.6	3.1		
10	1.0	1.2	1.5	1.8	2.1						
P (kW)	60	30 Hz									
	55										
	50					1.1	1.2	1.1	1.2	1.2	1.2
	45			0.9	1.0	1.0	1.1	1.0	1.1	1.1	1.1
	40		0.8	0.8	0.9	0.9	1.0	0.9	1.0	1.0	1.0
	35		0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.9
	30		0.6	0.7	0.7	0.8	0.8	0.7	0.8	0.8	0.8
	25		0.6	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7
	20		0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	15		0.5	0.5	0.6	0.6	0.6	0.5	0.5		
10	0.4	0.5	0.5	0.5	0.6						
Q (kW)	60	75 Hz									
	55					3.5	4.2	5.2	6.1	7.1	8.2
	50			2.3	2.9	3.6	4.3	5.4	6.3	7.3	8.5
	45		1.8	2.4	3.0	3.7	4.4	5.5	6.5	7.6	8.8
	40		1.9	2.5	3.1	3.8	4.6	5.7	6.7	7.9	9.2
	35		2.0	2.6	3.2	3.9	4.7	5.9	7.0	8.2	9.5
	30		2.2	2.7	3.4	4.1	4.9	6.1	7.2	8.4	9.9
	25		2.3	2.8	3.5	4.2	5.0	6.3	7.4	8.7	10.2
	20		2.4	2.9	3.6	4.3	5.1	6.4	7.6	8.9	10.5
	15		2.5	3.0	3.6	4.4	5.2	6.5	7.7		
10	2.5	3.0	3.7	4.4	5.2						
P (kW)	60	75 Hz									
	55					3.0	3.1	2.9	3.0	3.0	3.1
	50			2.5	2.6	2.7	2.8	2.7	2.7	2.8	2.9
	45		2.1	2.2	2.4	2.5	2.5	2.5	2.5	2.6	2.6
	40		1.9	2.0	2.1	2.2	2.3	2.2	2.3	2.3	2.4
	35		1.7	1.8	1.9	2.0	2.0	2.0	2.0	2.1	2.1
	30		1.5	1.6	1.7	1.8	1.8	1.7	1.8	1.8	1.9
	25		1.3	1.5	1.6	1.6	1.7	1.5	1.6	1.6	1.7
	20		1.2	1.3	1.4	1.5	1.5	1.4	1.4	1.4	1.5
	15		1.1	1.2	1.3	1.4	1.4	1.2	1.3		
10	1.0	1.2	1.2	1.3	1.3						
Q (kW)	60	100 Hz									
	55					4.7	5.7	7.1	8.2	9.6	11.0
	50			3.1	3.9	4.8	5.8	7.2	8.5	9.9	11.5
	45		2.4	3.2	4.1	5.0	6.0	7.5	8.8	10.3	11.9
	40		2.6	3.4	4.2	5.2	6.2	7.7	9.1	10.6	12.4
	35		2.7	3.5	4.4	5.3	6.4	8.0	9.4	11.0	12.9
	30		2.9	3.7	4.5	5.5	6.6	8.2	9.7	11.4	13.3
	25		3.1	3.8	4.7	5.7	6.8	8.5	10.0	11.7	13.7
	20		3.2	4.0	4.8	5.8	6.9	8.7	10.3	12.1	14.1
	15		3.3	4.1	4.9	5.9	7.0	8.8	10.4		
10	3.4	4.1	4.9	5.9	7.1						
P (kW)	60	100 Hz									
	55					3.9	4.0	3.8	3.9	4.0	4.0
	50			3.3	3.4	3.6	3.6	3.5	3.6	3.7	3.7
	45		2.8	2.9	3.1	3.2	3.3	3.2	3.3	3.4	3.4
	40		2.5	2.6	2.8	2.9	3.0	2.9	3.0	3.0	3.1
	35		2.2	2.4	2.5	2.6	2.7	2.6	2.6	2.7	2.8
	30		2.0	2.1	2.3	2.4	2.4	2.3	2.3	2.4	2.5
	25		1.8	1.9	2.0	2.1	2.2	2.0	2.1	2.1	2.2
	20		1.6	1.7	1.9	1.9	2.0	1.8	1.8	1.9	1.9
	15		1.5	1.6	1.7	1.8	1.9	1.6	1.6		
10	1.4	1.5	1.6	1.7	1.8						

Note:
 1. Return gas temperature 0°C at evaporating temperature below -20°C
 2. Return gas temperature 18.3°C at evaporating temperature above -20°C
 3. Power data does not include power of drive

Condensing Temperature °C		Evaporating temperature °C									
		-40	-35	-30	-25	-20	-15	-10	-5	0	
Q (kW)	60	30 Hz									
	55										
	50					1.9	2.2	2.8	3.2	3.8	4.4
	45			1.2	1.6	1.9	2.3	2.9	3.3	3.9	4.5
	40		1.0	1.3	1.6	2.0	2.4	2.9	3.5	4.1	4.7
	35		1.0	1.3	1.7	2.0	2.4	3.0	3.6	4.2	4.9
	30		1.1	1.4	1.7	2.1	2.5	3.1	3.7	4.3	5.1
	25		1.2	1.5	1.8	2.2	2.6	3.2	3.8	4.5	5.2
	20		1.2	1.5	1.8	2.2	2.6	3.3	3.9	4.6	5.4
	15		1.3	1.6	1.9	2.3	2.7	3.4	4.0		
10	1.3	1.6	1.9	2.3	2.7						
P (kW)	60	30 Hz									
	55										
	50					1.4	1.5	1.5	1.5	1.5	1.5
	45			1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
	40		1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3
	35		0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1
	30		0.8	0.9	0.9	0.9	1.0	0.9	1.0	1.0	1.0
	25		0.7	0.8	0.8	0.9	0.9	0.8	0.8	0.9	0.9
	20		0.6	0.7	0.7	0.8	0.8	0.7	0.8	0.8	0.8
	15		0.6	0.6	0.7	0.7	0.7	0.7	0.7		
10	0.5	0.6	0.6	0.7	0.7						
Q (kW)	60	75 Hz									
	55					4.5	5.4	6.7	7.8	9.1	10.5
	50			3.0	3.8	4.6	5.5	6.9	8.1	9.4	10.9
	45		2.3	3.1	3.9	4.8	5.7	7.1	8.4	9.8	11.4
	40		2.4	3.2	4.0	4.9	5.9	7.4	8.7	10.1	11.8
	35		2.6	3.4	4.2	5.1	6.1	7.6	9.0	10.5	12.2
	30		2.8	3.5	4.3	5.3	6.3	7.9	9.3	10.9	12.7
	25		2.9	3.7	4.5	5.4	6.5	8.1	9.5	11.2	13.1
	20		3.1	3.8	4.6	5.5	6.6	8.3	9.8	11.5	13.4
	15		3.2	3.9	4.7	5.6	6.7	8.4	9.9		
10	3.2	3.9	4.7	5.7	6.8						
P (kW)	60	75 Hz									
	55					3.7	3.8	3.7	3.8	3.9	3.9
	50			3.1	3.3	3.4	3.5	3.5	3.5	3.6	3.7
	45		2.6	2.8	3.0	3.1	3.1	3.2	3.2	3.3	3.4
	40		2.4	2.5	2.7	2.8	2.8	2.8	2.9	3.0	3.0
	35		2.1	2.3	2.4	2.5	2.6	2.5	2.6	2.7	2.7
	30		1.9	2.0	2.2	2.2	2.3	2.2	2.3	2.4	2.4
	25		1.7	1.8	1.9	2.0	2.1	2.0	2.0	2.1	2.1
	20		1.5	1.7	1.8	1.9	1.9	1.7	1.8	1.8	1.9
	15		1.4	1.5	1.6	1.7	1.8	1.6	1.6		
10	1.3	1.4	1.5	1.6	1.7						
Q (kW)	60	100 Hz									
	55					6.1	7.3	9.1	10.6	12.3	14.2
	50			4.0	5.1	6.2	7.5	9.3	10.9	12.7	14.7
	45		3.1	4.2	5.3	6.4	7.7	9.6	11.3	13.2	15.3
	40		3.3	4.3	5.4	6.6	8.0	9.9	11.7	13.7	15.9
	35		3.5	4.5	5.7	6.9	8.2	10.3	12.1	14.2	16.5
	30		3.7	4.8	5.9	7.1	8.5	10.6	12.5	14.7	17.1
	25		4.0	5.0	6.1	7.3	8.7	10.9	12.9	15.1	17.7
	20		4.2	5.1	6.2	7.5	8.9	11.2	13.2	15.5	18.1
	15		4.3	5.2	6.3	7.6	9.1	11.3	13.4		
10	4.4	5.3	6.4	7.6	9.1						
P (kW)	60	100 Hz									
	55					4.9	5.0	4.9	5.0	5.1	5.2
	50			4.1	4.3	4.4	4.6	4.5	4.6	4.7	4.8
	45		3.4	3.7	3.9	4.0	4.1	4.1	4.2	4.3	4.4
	40		3.1	3.3	3.5	3.6	3.7	3.7	3.8	3.9	4.0
	35		2.8	3.0	3.1	3.3	3.3	3.3	3.4	3.5	3.6
	30		2.5	2.7	2.8	2.9	3.0	2.9	3.0	3.1	3.2
	25		2.2	2.4	2.6	2.7	2.7	2.6	2.6	2.7	2.8
	20		2.0	2.2	2.3	2.4	2.5	2.3	2.3	2.4	2.5
	15		1.8	2.0	2.1	2.3	2.3	2.0	2.1		
10	1.7	1.9	2.0	2.1	2.2						

Note:
 1. Return gas temperature 0°C at evaporating temperature below -20°C
 2. Return gas temperature 18.3°C at evaporating temperature above -20°C
 3. Power data does not include power of drive

Condensing Temperature °C		ET °C									
		-40	-35	-30	-25	-20	-15	-10	-5	0	
Q (kW)	60	30 Hz									
	55										
	50						2.9	3.7	4.3	4.9	5.7
	45				2.0	2.8	3.0	3.7	4.3	5.0	5.8
	40		1.4	1.4	2.1	2.8	3.1	3.8	4.4	5.2	5.9
	35		1.4	1.4	2.1	2.9	3.1	3.9	4.5	5.3	6.0
	30		1.4	1.5	2.2	3.0	3.2	4.0	4.6	5.3	6.1
	25		1.4	1.5	2.2	3.0	3.2	4.0	4.6	5.4	6.1
	20		1.4	1.5	2.2	3.0	3.3	4.0	4.7	5.4	
	15		1.4	1.5	2.2	3.0	3.3	4.1			
	10		1.4	1.5	2.3	3.1	3.3				
P (kW)	60	30 Hz									
	55										
	50						1.8	1.8	1.8	1.8	1.8
	45				1.5	1.5	1.6	1.6	1.6	1.6	1.6
	40		1.3	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.4
	35		1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.2
	30		1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1
	25		0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0	0.9
	20		0.8	0.9	0.8	0.8	0.9	0.9	0.8	0.8	
	15		0.8	0.8	0.8	0.7	0.8	0.7			
	10		0.7	0.8	0.8	0.7	0.8				
Q (kW)	60	75 Hz									
	55						6.9	8.5	10.0	11.7	13.5
	50				5.4	6.3	7.2	8.9	10.4	12.1	14.0
	45		3.6	4.3	5.5	6.3	7.4	9.1	10.7	12.5	14.5
	40		3.7	4.2	5.6	6.4	7.7	9.3	11.0	12.9	15.0
	35		3.8	4.1	5.7	6.5	7.8	9.6	11.3	13.3	15.6
	30		3.9	4.2	5.8	6.6	8.0	9.9	11.7	13.8	16.2
	25		4.1	4.3	5.9	6.8	8.2	10.3	12.2	14.5	17.0
	20		4.2	4.5	6.0	7.0	8.5	10.9	12.9	15.3	
	15		4.3	4.8	6.1	7.2	8.7	11.6			
	10		4.4	5.2	6.2	7.6	9.0				
P (kW)	60	75 Hz									
	55						4.7	4.7	4.8	5.0	5.1
	50				3.9	4.2	4.3	4.3	4.4	4.5	4.6
	45		3.3	3.3	3.5	3.8	3.9	3.9	4.0	4.1	4.2
	40		3.0	3.0	3.2	3.5	3.6	3.6	3.7	3.7	3.8
	35		2.7	2.7	2.9	3.2	3.3	3.2	3.3	3.4	3.4
	30		2.5	2.4	2.7	2.9	3.0	3.0	3.1	3.1	3.1
	25		2.3	2.2	2.4	2.7	2.7	2.7	2.8	2.9	2.9
	20		2.1	2.0	2.2	2.5	2.5	2.6	2.7	2.7	
	15		1.8	1.8	2.0	2.2	2.3	2.5			
	10		1.6	1.6	1.8	2.0	2.0				
Q (kW)	60	100 Hz									
	55						8.9	11.4	13.4	15.4	17.7
	50				6.6	8.0	9.3	11.9	13.9	16.1	18.5
	45		4.2	5.4	6.8	8.3	9.7	12.2	14.3	16.6	19.2
	40		4.3	5.5	7.0	8.5	10.0	12.5	14.7	17.1	19.8
	35		4.4	5.7	7.2	8.8	10.4	12.8	15.1	17.6	20.5
	30		4.6	5.8	7.4	9.0	10.7	13.2	15.5	18.2	21.2
	25		4.7	6.0	7.5	9.3	11.0	13.7	16.1	18.8	22.0
	20		4.8	6.1	7.7	9.4	11.2	14.3	16.8	19.7	
	15		5.0	6.2	7.8	9.6	11.3	15.1			
	10		5.1	6.3	7.9	9.6	11.4				
P (kW)	60	100 Hz									
	55						6.4	6.2	6.5	6.8	7.0
	50				5.3	5.6	5.9	5.7	6.0	6.2	6.5
	45		4.4	4.6	4.9	5.2	5.4	5.3	5.5	5.7	5.9
	40		4.0	4.3	4.5	4.8	5.0	5.0	5.1	5.3	5.5
	35		3.7	3.9	4.2	4.4	4.7	4.7	4.8	4.9	5.1
	30		3.4	3.6	3.9	4.1	4.4	4.4	4.4	4.5	4.7
	25		3.1	3.3	3.6	3.8	4.0	4.1	4.1	4.2	4.3
	20		2.8	3.1	3.3	3.5	3.7	3.8	3.7	3.8	
	15		2.5	2.8	3.0	3.2	3.4	3.4			
	10		2.2	2.4	2.7	2.8	3.0				

Note:
 1. Return gas temperature 0°C at evaporating temperature below -20°C
 2. Return gas temperature 18.3°C at evaporating temperature above -20°C
 3. Power data does not include power of drive

ZFW Low temperature
Capacity and power (kW) at 380 V-3PH
ZFW050SP-4X9

R410A

Condensing Temperature °C		ET °C									
		-40	-35	-30	-25	-20	-15	-10	-5	0	
Q (kW)	60	30 Hz									
	55										
	50										
	45						3.9	4.6	5.4	6.3	7.2
	40				2.7	3.5	4.0	4.7	5.5	6.4	7.4
	35			2.0	2.7	3.6	4.0	4.8	5.6	6.5	7.6
	30			2.0	2.8	3.7	4.1	4.9	5.7	6.7	7.8
	25			2.0	2.8	3.7	4.2	5.0	5.8	6.9	8.1
	20			2.1	2.9	3.8	4.3	5.1	6.0	7.1	
	15			2.1	2.9	3.8	4.3	5.3			
	10			2.1	3.0	3.9	4.4				
P (kW)	60	30 Hz									
	55										
	50										
	45						2.1	2.2	2.2	2.2	2.2
	40				1.7	1.8	1.9	1.9	1.9	2.0	2.0
	35			1.5	1.6	1.7	1.7	1.8	1.7	1.7	1.6
	30			1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.7
	25			1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.6
	20			1.2	1.2	1.2	1.3	1.3	1.4	1.4	
	15			1.1	1.1	1.2	1.2	1.3			
	10			1.0	1.1	1.1	1.1				
Q (kW)	60	75 Hz									
	55						9.3	11.2	13.3	15.6	18.1
	50				6.9	8.4	9.6	11.6	13.7	16.1	18.7
	45		4.7	5.6	7.0	8.6	9.8	11.9	14.1	16.6	19.3
	40		4.7	5.6	7.1	8.7	10.1	12.2	14.5	17.0	19.8
	35		4.8	5.7	7.1	8.8	10.3	12.5	14.9	17.4	20.2
	30		4.9	5.7	7.2	9.0	10.6	12.8	15.2	17.8	20.7
	25		4.9	5.7	7.2	9.1	10.8	13.0	15.4	18.1	21.0
	20		5.0	5.7	7.3	9.2	11.1	13.2	15.6	18.4	
	15		5.0	5.8	7.3	9.3	11.3	13.3			
	10		5.0	5.8	7.4	9.4	11.5				
P (kW)	60	75 Hz									
	55						6.0	6.2	6.3	6.4	6.5
	50				5.4	5.5	5.5	5.6	5.7	5.8	5.9
	45		4.6	4.8	4.9	5.0	5.0	5.1	5.2	5.3	5.4
	40		4.2	4.4	4.4	4.5	4.5	4.6	4.7	4.8	4.8
	35		3.7	3.9	4.0	4.1	4.1	4.2	4.3	4.3	4.4
	30		3.4	3.5	3.6	3.7	3.7	3.8	3.9	3.9	3.9
	25		3.0	3.2	3.3	3.3	3.4	3.4	3.5	3.5	3.4
	20		2.7	2.9	2.9	3.0	3.0	3.0	3.1	3.0	
	15		2.5	2.6	2.7	2.7	2.7	2.6			
	10		2.3	2.4	2.4	2.4	2.4				
Q (kW)	60	100 Hz									
	55						12.3	14.7	17.4	20.2	23.3
	50				8.9	10.7	12.7	15.4	18.0	20.9	24.2
	45		6.0	7.4	9.1	11.0	13.0	15.8	18.5	21.5	24.9
	40		6.1	7.5	9.2	11.2	13.4	16.0	18.8	22.0	25.6
	35		6.2	7.6	9.4	11.4	13.7	16.1	19.0	22.4	26.3
	30		6.3	7.7	9.5	11.7	14.0	16.1	19.3	22.9	27.2
	25		6.4	7.9	9.7	11.9	14.3	16.3	19.6	23.6	28.2
	20		6.5	8.0	9.9	12.2	14.7	16.5	20.1	24.4	
	15		6.7	8.2	10.2	12.6	15.2	16.9			
	10		6.9	8.5	10.6	13.0	15.7				
P (kW)	60	100 Hz									
	55						8.2	8.3	8.5	8.8	9.1
	50				6.9	7.0	7.5	7.6	7.8	8.1	8.3
	45		5.8	6.3	6.3	6.4	6.8	6.9	7.1	7.3	7.5
	40		5.3	5.7	5.8	5.8	6.3	6.2	6.4	6.6	6.8
	35		4.8	5.2	5.3	5.3	5.7	5.5	5.7	5.9	6.2
	30		4.4	4.8	4.8	4.8	5.3	4.7	5.0	5.3	5.6
	25		4.0	4.4	4.4	4.4	4.8	4.0	4.4	4.8	5.2
	20		3.6	4.0	4.0	4.0	4.4	3.3	3.8	4.3	
	15		3.2	3.6	3.6	3.7	4.1	2.6			
	10		2.8	3.3	3.3	3.3	3.8				

Note:
1. Return gas temperature 0°C at evaporating temperature below -20°C
2. Return gas temperature 18.3°C at evaporating temperature above -20°C
3. Power data does not include power of drive

Technical data

Medium temperature

Medium temperature									
Refrigerant			R404A			R410A			
Model name			ZBW030DE	ZBW038DE	ZBW050SE	ZBW030DP		ZBW038DP	ZBW050SP
Displacement	@75 Hz	cc/rev	29.5	38.4	47.7	29.5		38.4	47.7
Motor type			BPM Motor	BPM Motor	BPM Motor	BPM Motor	BPM Motor	BPM Motor	BPM Motor
Motor code			4X9	4X9	4X9	3X9	4X9	4X9	4X9
Voltage			380V/3PH	380V/3PH	380V/3PH	220V/1PH	380V/3PH	380V/3PH	380V/3PH
Winding resistance at 25 °C		Ohm	0.521 ±7%	0.521 ±7%	0.309 ±7%	0.521 ±7%	0.521 ±7%	0.521 ±7%	0.521 ±7%
Oil type			POE	POE	POE	POE	POE	POE	POE
Oil charge	Initial	cm3	1,700	1,700	1,597	1,700	1,700	1,700	1,597
	Refill		1,500	1,500	1,479	1,500	1,500	1,500	1,479
Sound power	@75 Hz	dB(A)	75	75	75	75	75	75	75
Connection size	Suction	Inch	3/4	3/4	7/8	3/4	3/4	3/4	7/8
	Discharge		1/2	1/2	1/2	1/2	1/2	1/2	1/2
	Vapor injection		3/8	3/8	3/8	3/8	3/8	3/8	3/8
Outline dimension	Length	mm	195	195	239	195	195	195	239
	Width		225	225	229	225	225	225	229
	Height		425	425	349	425	425	425	349
Weight (net)		kg	22.0	22.0	26.5	22.0	22.0	22.0	26.5
Mounting size (3-foot)		mm	3× φ 11.2	3× φ 11.2	4× φ 19	3× φ 11.2	3× φ 11.2	3× φ 11.2	4× φ 19
Mounting kit (for 3 feet)			527-0239-00	527-0239-00	527-0267-00	527-0239-00	527-0239-00	527-0239-00	527-0267-00
T-box ip grade			IP21	IP21	IP21	IP21	IP21	IP21	IP21

Low temperature

Low temperature								
Refrigerant			R404A			R410A		
Model name			ZFW030DE	ZFW038DE	ZFW050SE	ZFW050SP		
Displacement	@75 Hz	cc/rev	29.5	38.4	47.7	47.7		
Motor type			BPM Motor	BPM Motor	BPM Motor	BPM Motor		
Motor code			4X9	4X9	4X9	4X9		
Voltage			380V/3PH	380V/3PH	380V/3PH	380V/3PH		
Winding resistance at 25 °C		Ohm	0.521 ±7%	0.521 ±7%	0.309 ±7%	0.309 ±7%		
Oil type			POE	POE	POE	POE		
Oil charge	Initial	cm3	1,700	1,700	1,597	1,597		
	Refill		1,500	1,500	1,479	1,479		
Sound power	@75 Hz	dB(A)	75	75	75	75		
Connection size	Suction	Inch	3/4	3/4	7/8	7/8		
	Discharge		1/2	1/2	1/2	1/2		
	Vapor injection		3/8	3/8	3/8	3/8		
Outline dimension	Length	mm	195	195	239	239		
	Width		225	225	229	229		
	Height		425	425	349	349		
Weight (net)		kg	22.0	22.0	26.5	26.5		
Mounting size (3-foot)		mm	3× φ 11.2	3× φ 11.2	4× φ 19	4× φ 19		
Mounting kit (for 3 feet)			527-0239-00	527-0239-00	527-0267-00	527-0267-00		
T-box ip grade			IP21	IP21	IP21	IP21		

Bundled solutions list

The variable speed integrated solution is intended to provide a turnkey solution for condensing unit builders. The bundle includes a variable speed compressor, a matched drive and a CoreSense™ controller for condensing unit. The CoreSense controller provides the compressor envelope control, vapor injection control, condensing fan speed control and protection functions for the compressor and unit.



Medium temperature, R404A

ZBW030DE-4X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZBW030DE-4X9-573	1	ZBW030DE-4X9-573	1
Drive board	EV2055M-K8-291	1	EVD1080B-D1-111	1
Capacitor board	143-0020-03	1	143-0066-00	1
Filter board	143-0028-01	1	143-0065-00	1
Choke	037-0043-01	3	037-0068-00	1
Controller	543-0220-01	1	543-0220-01	1

ZBW038DE-4X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZBW038DE-4X9-573	1	ZBW038DE-4X9-573	1
Drive board	EV2080M-K8-291	1	EVD1080B-D1-111	1
Capacitor board	143-0020-02	1	143-0066-00	1
Filter board	143-0028-01	1	143-0065-00	1
Choke	037-0043-01	3	037-0068-00	1
Controller	543-0220-01	1	543-0220-01	1

ZBW050SE-4X9-558				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	Provided upon request		ZBW050SE-4X9-558	1
Drive board			EVD1110B-D1-111	1
Capacitor board			143-0066-00	1
Filter board			143-0065-00	1
Choke			037-0068-00	1
Controller			543-0220-01	1

Medium temperature, R410A

ZBW030DP-3X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZBW030DP-3X9-573	1	Provided upon request	
Drive board	EV2055M-C8-291	1		
Capacitor board	Not Needed	1		
Filter board	143-0021-00	1		
Choke	037-0035-00	1		
Controller	543-0220-01	1		

ZBW030DP-4X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZBW030DP-4X9-573	1	ZBW030DP-4X9-573	1
Drive board	EV2080M-K8-291	1	EVD1080B-D1-111	1
Capacitor board	143-0020-02	1	143-0066-00	1
Filter board	143-0028-01	1	143-0065-00	1
Choke	037-0043-01	3	037-0068-00	1
Controller	543-0220-01	1	543-0220-01	1

ZBW038DP-4X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZBW038DP-4X9-573	1	ZBW030DP-4X9-573	1
Drive board	EV2080M-K8-291	1	EVD1080B-D1-111	1
Capacitor board	143-0020-02	1	143-0066-00	1
Filter board	143-0028-01	1	143-0065-00	1
Choke	037-0043-01	3	037-0068-00	1
Controller	543-0220-01	1	543-0220-01	1

ZBW050SP-4X9-558				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	Provided upon request		ZBW050SP-4X9-558	1
Drive board			EVD1110B-D1-111	1
Capacitor board			143-0066-00	1
Filter board			143-0065-00	1
Choke			037-0068-00	1
Controller			543-0220-01	1

Low temperature, R404A

ZFW030DE-4X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZFW030DE-4X9-573	1	ZFW030DE-4X9-573	1
Drive board	EV2055M-K8-291	1	EVD1080B-D1-111	1
Capacitor board	143-0020-03	1	143-0066-00	1
Filter board	143-0028-01	1	143-0065-00	1
Choke	037-0043-01	3	037-0068-00	1
Controller	543-0220-01	1	543-0220-01	1

ZFW038DE-4X9-573				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	ZFW038DE-4X9-573	1	ZFW038DE-4X9-573	1
Drive board	EV2080M-K8-291	1	EVD1080B-D1-111	1
Capacitor board	143-0020-02	1	143-0066-00	1
Filter board	143-0028-01	1	143-0065-00	1
Choke	037-0043-01	3	037-0068-00	1
Controller	543-0220-01	1	543-0220-01	1

ZFW050SE-4X9-558				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	Provided upon request		ZFW050SE-4X9-558	1
Drive board			EVD1110B-D1-111	1
Capacitor board			143-0066-00	1
Filter board			143-0065-00	1
Choke			037-0068-00	1
Controller			543-0220-01	1

Low temperature, R410A

ZFW050SP-4X9-558				
Drive option	EV Drive		EVD Drive	
Name	P/N	Number	P/N	Number
Compressor	Provided upon request		ZFW050SP-4X9-558	1
Drive board			EVD1110B-D1-111	1
Capacitor board			143-0066-00	1
Filter board			143-0065-00	1
Choke			037-0068-00	1
Controller			543-0220-01	1

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