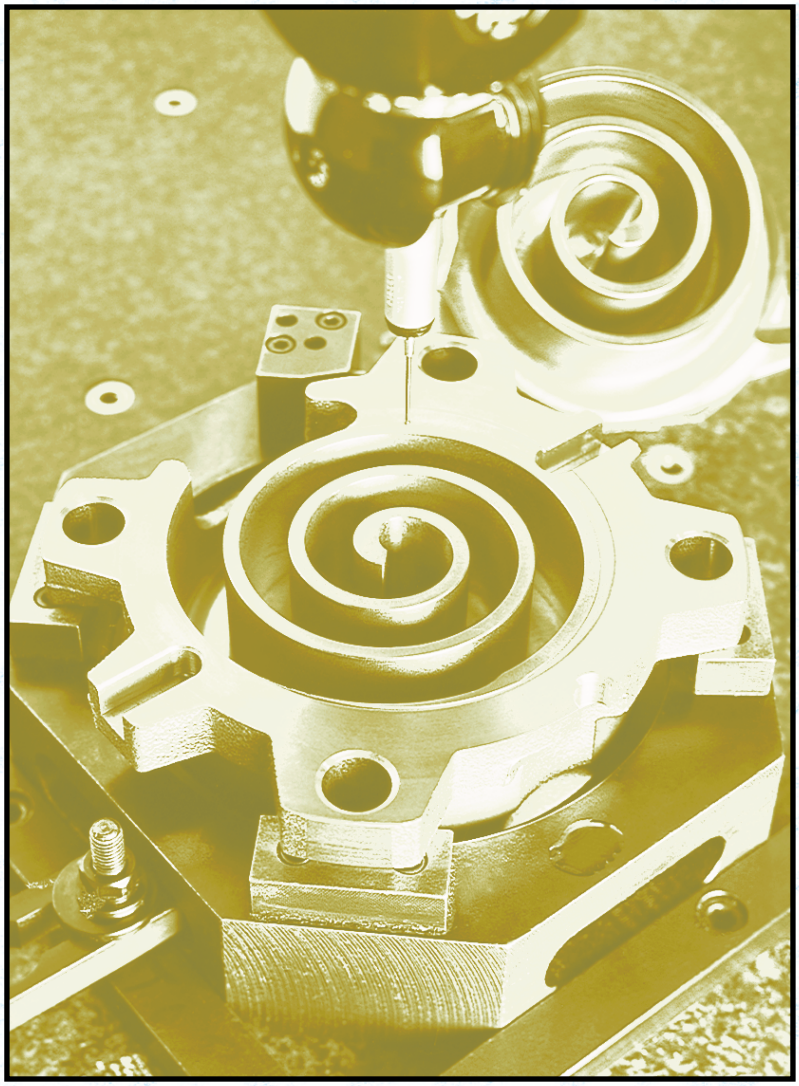
THE COMMERCIAL SOLUTION

SUMMIT™

SPECTER™



Contents

Commercial Copeland Scroll Story

Copeland believes in surpassing customer needs and expectations. After developing the dependable low sound QR series, Copeland's research and development teams set about designing Copeland Scroll product lines for the commercial air conditioning market. With the addition of Summit™ and Specter,™ Copeland now has increased its capability to meet a wide range of needs in commercial air conditioning around the world.

Copeland created Summit to deliver the best value and reliability for buildings such as shopping centers, warehouses and free-standing retail outlets. Summit is specifically designed for high-volume, 7 to 24 horsepower commercial applications. On the other hand, Specter's robust design addresses the needs of the 20 to 100 horsepower and above commercial market. Specter provides the additional features and durability for these more demanding applications. Together, Summit and Specter deliver powerful solutions for high and low volume commercial air conditioning needs.

Since they are patented with Copeland's award winning Scroll technology, Summit and Specter serve customers with superior quietness, efficiency and reliability. The Scroll provides Copeland's new commercial product lines with greater durability. Thanks to radial and axial compliance, Copeland Scroll technology also furnishes Summit and Specter with protection against damage from liquid refrigerant and debris. In addition, the performance of Summit and Specter will get better over time because the Copeland Scroll "wears in," not out. The Scroll helps Copeland meet today's market needs for quieter systems by enabling Summit and Specter to operate at low sound levels despite their large operating capacities.

Due to its proprietary manufacturing technologies and belief in constant product improvement and technological advancement, Copeland has become the leader in the scroll compressor market. With millions of scrolls installed and numerous global manufacturing facilities dedicated to this technology, Copeland has established the highest scroll production volume of any compressor manufacturer in the world. And now, with the production of Summit and Specter, the commercial market can enjoy the inherent advantages provided by the Copeland Scroll.

Summit™ Copeland Scroll

Compared to other commercial compressors in the market, Summit Copeland Scroll has higher reliability and efficiency as well as lower sound.

DESCRIPTION

Summit, Copeland's addition to its Scroll Compressor line, now enables the world's largest producer of integral horsepower compressors to meet the challenges of today's light commercial A/C applications by delivering superior reliability, durability, efficiency and sound reduction. In addition to superior performance, Summit answers the needs that the high volume, 7 to 24 horsepower commercial market has for competitive cost and compact size.

Summit compressors deliver all the superior benefits of Copeland Scroll technology.

- Quiet operation.
- Unmatched reliability with 70% fewer moving parts than comparably sized reciprocating compressors.
- Greater capability at handling liquid and debris in the system.
- High efficiency performance.

These features, in addition to Copeland's advanced engineering capability, enable Summit to provide years of dependable performance even under the most rugged operating conditions.

Summit's voltage flexibility makes it capable of satisfying light commercial air conditioning needs around the world. The Summit product line consists of five displacements, seven, eight, nine, ten and twelve horsepower options, for a total of 20 models. Each model is designed for use with R-22 or R-407C.

Copeland engineers designed Summit Scroll with the needs of all their customers around the world in mind. With its advanced scroll design, superior dependability, and exceptional compressor value, Summit shows Copeland's commitment to the needs of the global commercial air conditioning market.

FEATURES

- Compliant Scroll
  - – High Efficiency
  - – Better Liquid Handling
  - – Better Debris Handling
  - – Self-compensating for wear ("Wears-in" vs. "Wears-out")
  - – 70% fewer moving parts
  - – Low sound levels
- Handles 16 Pound/7.3 Kg System Refrigerant Charge without a Crankcase Heater
- Compact, Lightweight Shell with 9 Inch/22.9 Cm Diameter (Rolled/Welded)
- Internal Line Break Motor Protection
- Suction Gas Motor Cooling
- Suction Screen
- Disc Type Check Valve
- Centrifugal Oil Pump with Filter and Magnet
- Rotalock or Braze Fittings
- High Pressure Tap on Rotalock Version
- DU (PTFE) Journal Bearings
- Flexible Voltage Options
- Arrangement of Fittings and Terminal Box Convenient for Service and Installation
- Wide Model Selection
- Low Shutdown Noise
- R407C and R22 Applications
- Tandem Availability

50 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE — **220-3-50 (TF5) 380-3-50 (TFD) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY BTU HOUR	CAPACITY KCAL HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS MOTOR WATTS
ZR84KC-TF5/D	A	70000	17600	20500	6130	20.5/11.9	11.4	2.9	3.3
	B	69400	17500	20300	6140	20.5/11.9	11.3	2.9	3.3
	C	81400	20500	23900	4440	17.0/9.8	18.3	4.6	5.4
ZR94KC-TF5/D	A	80400	20300	23600	6870	21.4/12.4	11.7	3.0	3.4
	B	79800	20100	23400	6880	21.4/12.4	11.6	2.9	3.4
	C	94100	23700	27600	4910	16.8/9.7	19.2	4.8	5.6
ZR108KC-TF5/D	A	91700	23100	26900	7810	25.3/13.7	11.7	3.0	3.4
	B	91000	22900	26700	7830	25.3/13.7	11.6	2.9	3.4
	C	107000	27000	31400	5730	20.8/11.0	18.7	4.7	5.5
ZR125KC-TF5/D	A	105400	26600	30900	9110	27.5/15.9	11.6	2.9	3.4
	B	104600	26400	30600	9130	27.5/15.9	11.5	2.9	3.4
	C	122200	30800	35800	6630	21.6/12.5	18.4	4.6	5.4
ZR144KC-TF5/D	A	119800	30200	35100	10180	34.7/20.1	11.8	3.0	3.4
	B	118800	29900	34800	10200	34.7/20.1	11.6	2.9	3.4
	C	140700	35500	41200	7500	27.3/15.8	18.8	4.7	5.5

* Ampere values shown are at 220 volts/380 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 9A to 11A.
See full operating range on page 14A.
Production compressors to meet above nominal performance values within ±5%.

50 HERTZ PERFORMANCE NOMINALS R407C

THREE PHASE — **220-3-50 (TF5) 380-3-50 (TFD) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY BTU HOUR	CAPACITY KCAL HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS MOTOR WATTS
ZR84KCE-TF5/D	A	70900	17900	20800	6450	21.2/12.3	11.0	2.8	3.2
	B	70300	17700	20600	6460	21.2/12.3	10.9	2.7	3.2
	C	83600	21100	24500	4790	17.8/10.3	17.5	4.4	5.1
ZR94KCE-TF5/D	A	79900	20100	23400	7190	22.5/13.0	11.1	2.8	3.3
	B	79300	20000	23200	7200	22.5/13.0	11.0	2.8	3.2
	C	97400	24500	28500	5110	17.6/10.2	19.1	4.8	5.6
ZR108KCE-TF5/D	A	89400	22500	26200	7960	24.9/14.4	11.2	2.8	3.3
	B	88700	22400	26000	7980	24.9/14.4	11.1	2.8	3.3
	C	109000	27500	31900	5700	19.3/11.2	19.1	4.8	5.6
ZR125KCE-TF5/D	A	105700	26600	31000	9480	30.2/17.5	11.1	2.8	3.3
	B	104900	26400	30700	9500	30.2/17.5	11.0	2.8	3.2
	C	129400	32600	37900	6790	23.9/13.8	19.1	4.8	5.6
ZR144KCE-TF5/D	A	120900	30500	35400	10680	31.6/18.3	11.3	2.9	3.3
	B	119900	30200	35100	10700	31.6/18.3	11.2	2.8	3.3
	C	149300	37600	43700	7730	24.4/14.1	19.3	4.9	5.7

* Ampere values shown are at 220 volts/380 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 9A to 11A.
See full operating range on page 14A.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE — **TEST VOLTAGE**: 230-3-60 (TF5), 380-3-60 (TF7), 460-3-60 (TFD), 575-3-60 (TFE)

MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZR84KC-TF5/7/D/E	A	84700	21300	24800	7430	22.8/13.8/11.4/9.1	11.4	2.9	3.3
	B	84000	21200	24600	7440	22.8/13.8/11.4/9.1	11.3	2.8	3.3
	C	98500	24800	28900	5470	18.6/11.3/9.3/7.4	18.0	4.5	5.3
ZR94KC-TF5/7/D/E	A	96400	24300	28200	8230	25.2/15.1/12.6/10.1	11.7	3.0	3.4
	B	95600	24100	28000	8250	25.2/15.1/12.6/10.1	11.6	2.9	3.4
	C	112500	28400	33000	5980	20.0/12.0/10.0/8.0	18.8	4.7	5.5
ZR108KC-TF5/7/D/E	A	109600	27600	32100	9350	28.1/17.1/14.1/11.3	11.7	3.0	3.4
	B	108700	27400	31800	9370	28.1/17.1/14.1/11.3	11.6	2.9	3.4
	C	126900	32000	37200	6980	22.8/13.8/11.4/9.1	18.2	4.6	5.3
ZR125KC-TF5/7/D/E	A	127400	32100	37300	10980	32.5/17.7/16.3/12.8	11.6	2.9	3.4
	B	126400	31900	37000	11000	32.5/17.7/16.3/12.8	11.5	2.9	3.4
	C	148000	37300	43400	8140	26.0/14.0/13.0/10.0	18.2	4.6	5.3
ZR144KC-TF5/7/D/E	A	145700	36700	42700	12400	38.4/23.0/19.2/15.4	11.8	3.0	3.4
	B	144500	36400	42300	12420	38.4/23.0/19.2/15.4	11.6	2.9	3.4
	C	171000	43100	50100	9140	31.0/18.6/15.5/12.4	18.7	4.7	5.5

* Ampere values shown are at 230 volts/380 volts/460 volts/575volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 11B to 13B.
See full operating range on page 14A.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R407C

THREE PHASE					230-3-60 (TF5) 380-3-60 (TF7) 460-3-60 (TFD) 575-3-60 (TFE) TEST VOLTAGE				
MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZR84KCE-TF5/7/D/E	A	86500	21800	25300	7630	24.0/14.4/12.0/9.6	11.3	2.9	3.3
	B	85800	21600	25100	7650	24.0/14.4/12.0/9.6	11.2	2.8	3.3
	C	104700	26400	30700	5440	19.2/11.5/9.6/7.7	19.2	4.9	5.6
ZR94KCE-TF5/7/D/E	A	96400	24300	28200	8670	26.6/16.0/13.3/10.6	11.1	2.8	3.3
	B	95600	24100	28000	8690	26.6/16.0/13.3/10.6	11.0	2.8	3.2
	C	117400	29600	34400	6160	20.6/12.4/10.3/8.2	19.1	4.8	5.6
ZR108KCE-TF5/7/D/E	A	108800	27400	31900	9680	29.8/17.9/14.9/11.9	11.2	2.8	3.3
	B	107900	27200	31600	9700	29.8/17.9/14.9/11.9	11.1	2.8	3.3
	C	133100	33500	39000	6950	23.4/14.0/11.7/9.4	19.2	4.8	5.6
ZR125KCE-TF5/7/D/E	A	127500	32100	37400	11490	34.6/20.8/17.3/13.8	11.1	2.8	3.3
	B	126500	31900	37100	11510	34.6/20.8/17.3/13.8	11.0	2.8	3.2
	C	155800	39300	45600	8200	27.4/16.4/13.7/11.0	19.0	4.8	5.6
ZR144KCE-TF5/7/D/E	A	146200	36800	42800	12940	38.0/22.8/19.0/15.2	11.3	2.8	3.3
	B	145000	36500	42500	12970	38.0/22.8/19.0/15.2	11.2	2.8	3.3
	C	179300	45200	52500	9300	29.4/17.6/14.7/11.8	19.3	4.9	5.6

* Ampere values shown are at 230 volts/380 volts/460 volts/575volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 11B to 13B.
See full operating range on page 14A.
Production compressors to meet above nominal performance values within ±5%.

MECHANICAL SPECIFICATIONS

MODEL	NOMINAL HP KW	IN^3 CM^3 CUBIC INCHES PER REVOLUTION CUBIC CENTIMETERS PER REVOLUTION	CFH M^3/HR CUBIC FEET PER HOUR CUBIC METERS PER HOUR		COMPRESSOR NET WEIGHT WITH OIL POUNDS KILOGRAMS
			50 HERTZ 2900 RPM	60 HERTZ 3500 RPM	THREE PHASE
ZR84KC/KCE	7.0 5.25	6.930 113.6	697.8 19.8	842.2 23.8	126.0 57.2
ZR94KC/KCE	8.0 6.00	7.757 127.1	781.1 22.1	942.7 26.7	126.0 57.2
ZR108KC/KCE	9.0 6.75	9.010 147.6	907.3 25.7	1095.0 31.0	138.0 62.6
ZR125KC/KCE	10.0 7.50	10.106 165.6	1017.6 28.8	1228.2 34.8	138.0 62.6
ZR144KC/KCE	12.0 9.00	11.650 190.9	1173.1 33.2	1415.8 40.1	138.0 62.6

ELECTRICAL SPECIFICATIONS

VOLTAGE CODE	TF5		TF7		TFD		TFE	
NOMINAL VOLTAGE-PHASE-HERTZ	200/220-3-50 200/230-3-60		380-3-60		380/420-3-50 460-3-60		575-3-60	
VOLTAGE RANGE 50 HERTZ 60 HERTZ	180-242 180-253		– 342-418		342-462 414-506		– 518-633	
MODEL	TF5		TF7		TFD		TFE	
	RATED LOAD AMPS RLA	LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA	LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA	LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA	LOCKED ROTOR AMPS LRA
ZR84KC/KCE	28.6	196	15.7	135	14.2	100	9.7	90
ZR94KC/KCE	32.1	203	16.7	123	16.4	95	12.0	80
ZR108KC/KCE	33.6	231	18.6	140	17.3	114	13.5	80
ZR125KC/KCE	42.0	239	23.5	145	19.2	125	13.8	80
ZR144KC/KCE	47.1	273	24.4	145	22.1	125	15.8	100

ZR COMMERCIAL SCROLL COMPRESSOR BILLS OF MATERIAL FOR THE INTERNATIONAL MARKET

"STANDARD" BILLS OF MATERIAL

The bill of material includes features as shown by the X.

MODEL	BILL OF MATERIAL NUMBER	STUB TUBE CONNECTIONS	ROTALOCK CONNECTIONS	GROUNDING TAB SCREW AND WASHER	MOUNTING PARTS	TANDEM-READY
ZR84KC/KCE **ZR94KC/KCE** **ZR108KC/KCE** **ZR125KC/KCE** **ZR144KC/KCE**	452	X				X
	501	X			X	
	522	X		X	X	
	523		X	X	X	

NOTES:
1. These bills are consistent with Quest models ZR54 to ZR81.
2. All fusites include T-blocks with screws inserted.
3. Accessory parts need to be ordered separately.
4. 452 BOM not available for ZR144KCE.

BILL OF MATERIAL PROVISIONS

Please refer to the bills of material shown on the previous page to view our standard offers of compressor selections.

In addition to the marked features, each compressor will include the following:

- Terminal box and cover complete with wiring diagram.
- Four Foot Mounting Pattern.
  7-1/2 x 7-1/2 inches
  (190.5 x 190.5 mm)
- Mounting Kit (527-0116-00).
- Internal Line Break Protector.
- Terminal Connector Block with Screws.
- Grounding tab located in the terminal box.
- 3GS oil for R22 or MMMAPOE (Polyol Ester Oil w/additives) for R407C.
  - Initial oil charge

ZR84KC/KCE	85 ounces	(2.51 liters)
ZR94KC/KCE	85 ounces	(2.51 liters)
ZR108KC/KCE	110 ounces	(3.25 liters)
ZR125KC/KCE	110 ounces	(3.25 liters)
ZR144KC/KCE	110 ounces	(3.25 liters)

  - Refill oil charge.

ZR84KC/KCE	81 ounces	(2.40 liters)
ZR94KC/KCE	81 ounces	(2.40 liters)
ZR108KC/KCE	106 ounces	(3.13 liters)
ZR125KC/KCE	106 ounces	(3.13 liters)
ZR144KC/KCE	106 ounces	(3.13 liters)

See outline drawings on pages 7B and 8A for stub tube and rotalock connection sizes.

ACCESSORY INFORMATION

Crankcase Heater - 120 volts	018-0047-00
Crankcase Heater - 240 volts	018-0047-01
Crankcase Heater - 480 volts	018-0047-02
Crankcase Heater - 575 volts	018-0047-03
Discharge Line Thermostat Kit (non-conduit)	998-0071-03
Three Phase Voltage Monitor	085-0160-00

ROTALOCK SERVICE VALVES

For your ZR rotalock connection compressor, please order the valves separately by choosing them from the tables below.

Valve Style

Table A illustrates the style for each valve listed in Tables B and C. The drawings in this table will show gauge port quantity and location. The gauge ports are 1/4 inch flare fittings and include brass caps.

Valve Kits

The kits listed in Table B below, include rotalock suction and discharge service valves and seals for all the Summit models. Use of these with your ZR rotalock connection compressors will simplify your order and inventory process.

Special Valves

Special valves and seals should be selected from Table C below to fit the rotalock connections supplied on the ZR compressor. A suggestion is to select valves having the same line sizes as the connections supplied on compressors with stub tubes. Be sure to match rotalock connection sizes.

TABLE A

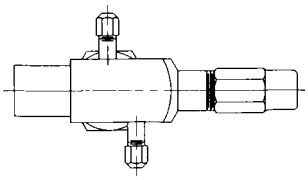
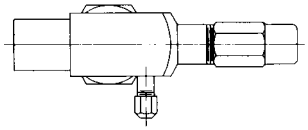
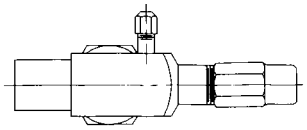
STYLE 1	STYLE 2	STYLE 3
		

TABLE B

KIT PART NUMBER	SUCTION VALVE			DISCHARGE VALVE			ROTALOCK CONNECTION SIZE IN INCHES AND SEAL PART NUMBER	
	SIZE IN INCHES	TYPE AND VALVE PART NUMBER	STYLE	SIZE IN INCHES	TYPE AND VALVE PART NUMBER	STYLE	SUCTION	DISCHARGE
998-5100-24	1 1/8	Solder 510-0330-04	3	3/4	Solder 510-0080-04	2	1 3/4-12 020-0028-03	1 1/4-12 020-0028-02
998-5100-25	1 3/8	Solder 510-0330-03	3	3/4	Solder 510-0080-04	2		
998-5100-27	1 3/8	Solder 510-0330-03	3	7/8	Solder 510-0080-07	2		

TABLE C

ROTALOCK CONNECTION SIZE IN INCHES	VALVE KIT* PART NUMBER	VALVE PART NUMBER	SIZE IN INCHES	TYPE	STYLE	SEAL PART NUMBER (ONE PER VALVE REQUIRED)
1 1/4-12 Discharge	998-0510-93	510-0105-05	5/8	Solder	3	020-0028-02
	998-0510-38	510-0080-04	3/4	Solder	2	
	998-0510-39	510-0080-07	7/8	Solder	2	
	998-0510-94	510-0105-04	7/8	Solder	3	
	998-0510-90	510-0133-11	7/8	Solder	1	
	998-0510-47	510-0080-06	1 1/8	Solder	2	
	998-0510-99	510-0133-12	1 1/8	Solder	1	
1 3/4-12 Suction	998-0510-37	510-0330-05	7/8	Solder	3	020-0028-03
	998-0510-02	510-0330-04	1 1/8	Solder	3	
	998-0510-46	510-0330-03	1 3/8	Solder	3	

*NOTE: Valve kit includes the valve and its corresponding seal.

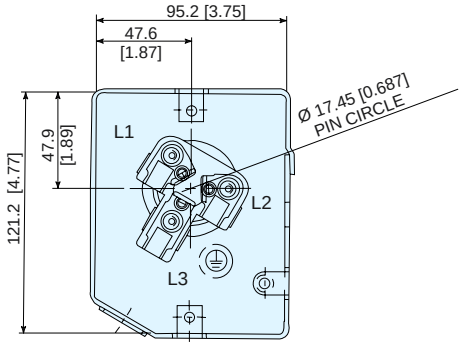
NOTES:

1. NOMINAL DIMENSIONS ARE SHOWN. ALL TOLERANCES ARE ± 1.50 [0.060] UNLESS OTHERWISE SPECIFIED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS VARY FROM THE MOUNTING HOLES BY ± 3.0 [0.12].
3. STUB TUBE AND ROTALOCK FITTINGS ARE SHOWN. BILLS OF MATERIAL PAGE 6A SHOWS B/M NUMBERS FOR EACH TYPE OF FITTING.
4. OIL EQUALIZATION FITTING INCLUDED ON TANDEM-READY BILLS OF MATERIAL ONLY.
5. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

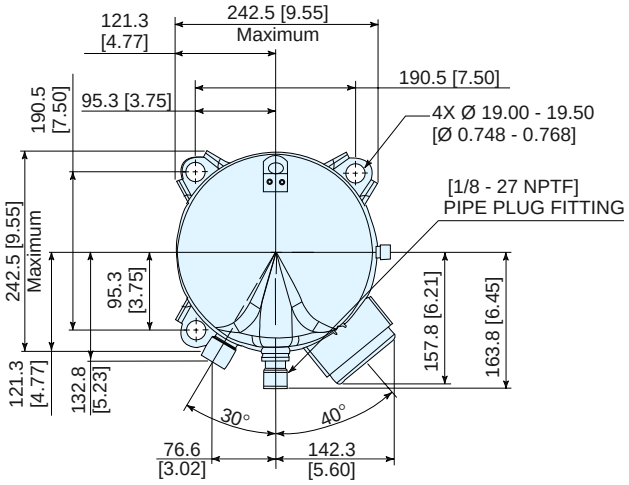
THIRD ANGLE PROJECTION

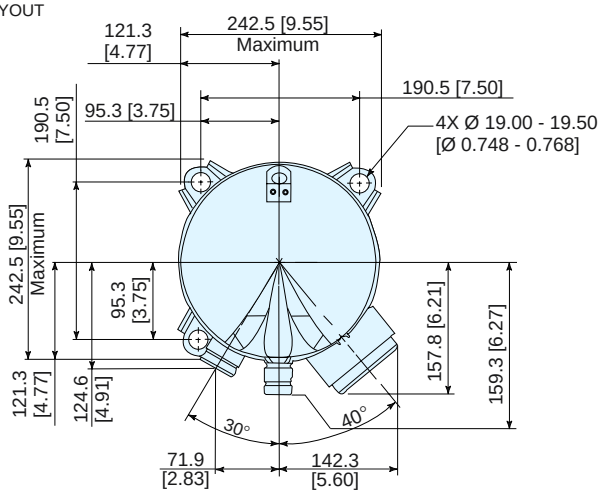
DIMENSIONAL INFORMATION

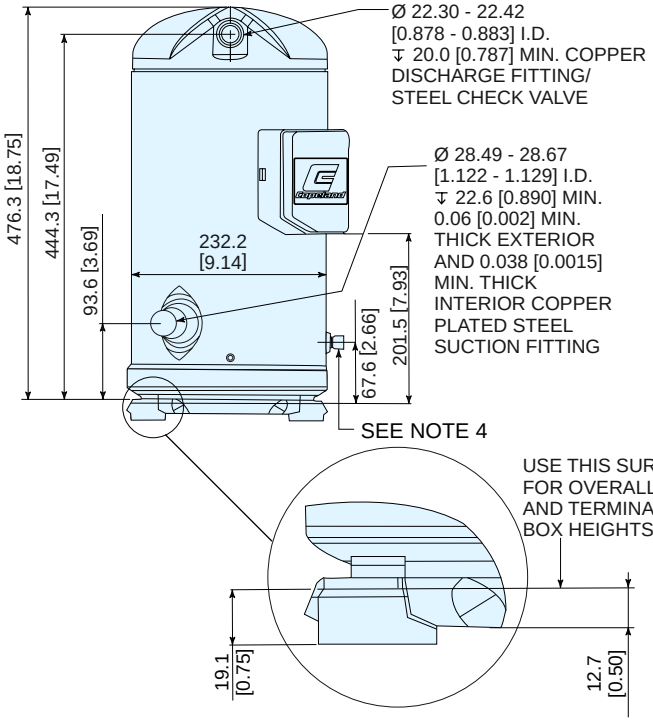
MODEL NUMBER	INTERNAL FREE VOLUME CM³ [IN.³] EXCLUDING OIL CHARGE
ZR84	10471 [639]
ZR94	10471 [639]

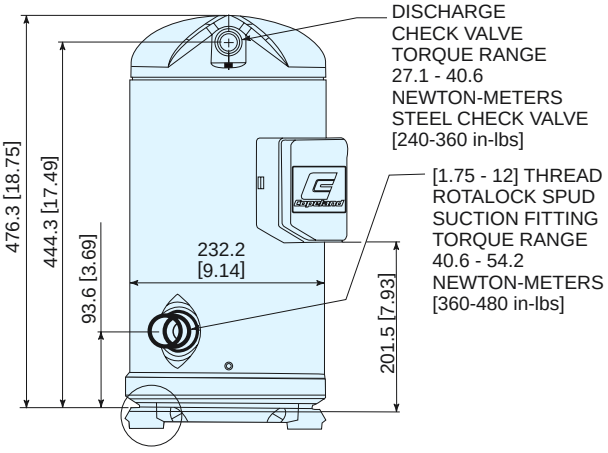


STANDARD TERMINAL BOX LAYOUT









Available Optional Fittings

FOR THE INTERNATIONAL MARKET

ZR84 and ZR94
HEAT PUMP AND AIR CONDITIONING MODELS

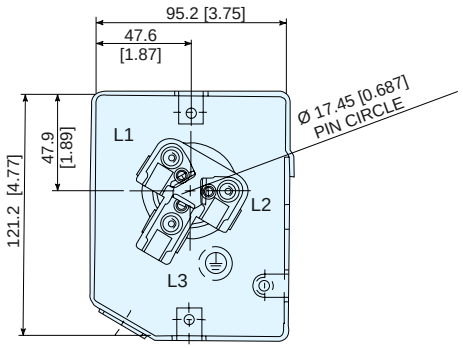
NOTES:

1. NOMINAL DIMENSIONS ARE SHOWN. ALL TOLERANCES ARE ± 1.50 [0.060] UNLESS OTHERWISE SPECIFIED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS VARY FROM THE MOUNTING HOLES BY ± 3.0 [0.12].
3. STUB TUBE AND ROTALOCK FITTINGS ARE SHOWN. BILLS OF MATERIAL PAGE 6A SHOWS B/M NUMBERS FOR EACH TYPE OF FITTING.
4. OIL EQUALIZATION FITTING INCLUDED ON TANDEM-READY BILLS OF MATERIAL ONLY.
5. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

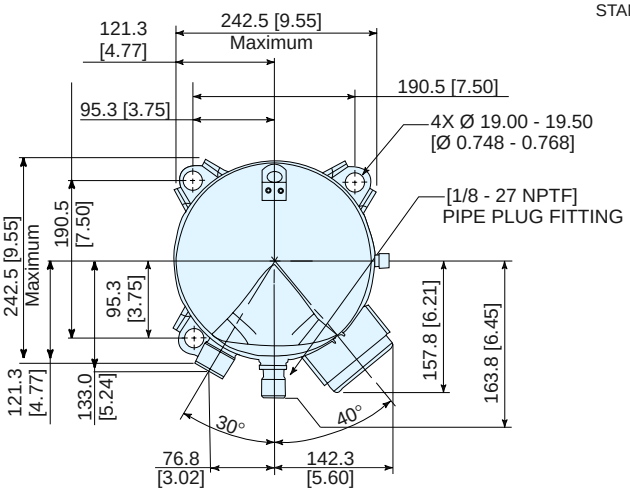
THIRD ANGLE PROJECTION

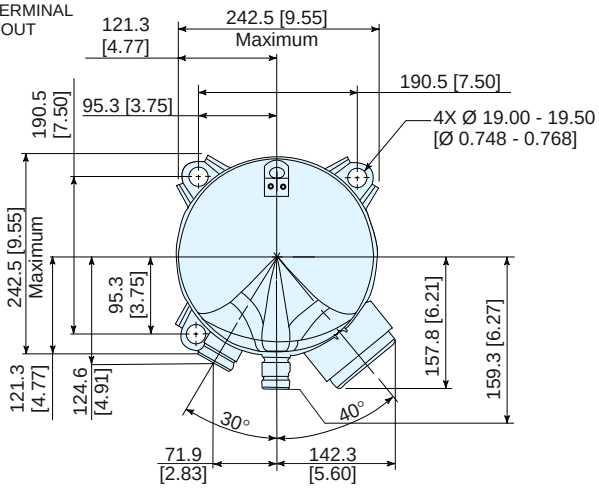
DIMENSIONAL INFORMATION

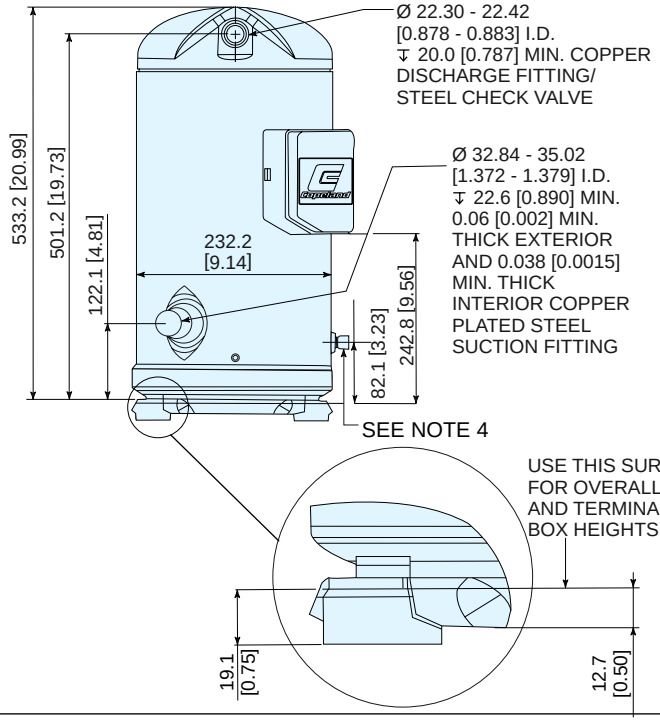
MODEL NUMBER	INTERNAL FREE VOLUME CM³ [IN.³] EXCLUDING OIL CHARGE
ZR108	13257 [809]
ZR125	13257 [809]
ZR144	13257 [809]

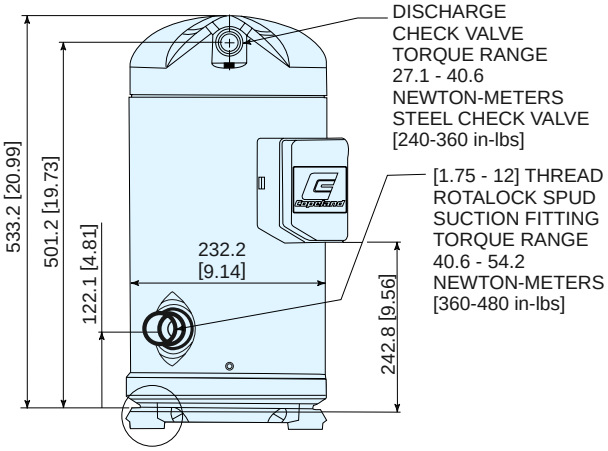


STANDARD TERMINAL BOX LAYOUT









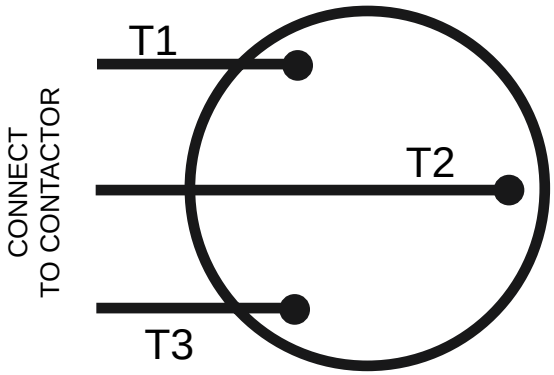
Available Optional Fittings

FOR THE INTERNATIONAL MARKET

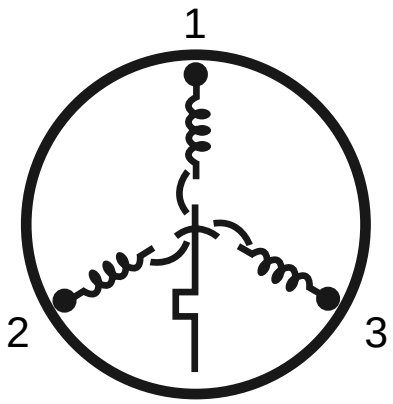
ZR108 TO ZR144
HEAT PUMP AND AIR CONDITIONING MODELS

COMPRESSOR WIRING DIAGRAMS

THREE PHASE MOTOR



EXTERNAL MOTOR
WIRING DIAGRAM



INTERNAL MOTOR
WIRING DIAGRAM

ZR84 TO ZR144

USE COPPER CONDUCTORS ONLY.

USE THIS EQUIPMENT ON A GROUNDED SYSTEM ONLY.

USE MINIMUM 75° C WIRE FOR AMPACITY DETERMINATION.

INTERNAL MOTOR PROTECTION – ALLOW TIME FOR RESET.

PRIMARY SINGLE PHASE FAILURE PROTECTION IS PROVIDED.

CRANKCASE HEATER, WHEN APPLIED, MUST BE CONNECTED ONLY TO ITS RATED VOLTAGE.

OVERCURRENT PROTECTION DEVICE RATING AND TYPE MUST BE IN ACCORDANCE WITH REGULATORY AGENCY END PRODUCT APPROVALS – SEE SYSTEM NAMEPLATE.

TO CORRECT IMPROPER MOTOR ROTATION, SWITCH ANY TWO SUPPLY LINES.

50 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)
200/220-3-50 (TF5) 380/420-3-50 (TFD) Rated Voltage		220-3-50 (TF5) 380-3-50 (TFD) Test Voltage

ZR84KC-TF5/TFD R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	20800	29300	38600	48900	60600	74000	81400	89300	97800
120 (48.9)			31700	42400	54000	66800	73700	81100	89000
140 (60.0)					45100	57900	64700	71800	79200

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5240	7380	9730	12300	15300	18600	20500	22500	24600
120 (48.9)			7990	10700	13600	16800	18600	20400	22400
140 (60.0)					11400	14600	16300	18100	20000

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6090	8580	11300	14300	17800	21700	23900	26200	28700
120 (48.9)			9290	12400	15800	19600	21600	23800	26100
140 (60.0)					13200	17000	19000	21000	23200

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4370	4360	4360	4370	4380	4420	4440	4470	4510
120 (48.9)			5570	5520	5490	5490	5490	5510	5530
140 (60.0)					7000	6930	6900	6890	6880

ZR94KC-TF5/TFD R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	24700	34200	44700	56600	70100	85600	94100	103200	112900
120 (48.9)			38000	49500	62400	77000	85000	93600	102700
140 (60.0)					52600	66400	74000	82000	90600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6220	8620	11300	14300	17700	21600	23700	26000	28500
120 (48.9)			9580	12500	15700	19400	21400	23600	25900
140 (60.0)					13300	16700	18600	20700	22800

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7240	10000	13100	16600	20500	25100	27600	30200	33100
120 (48.9)			11100	14500	18300	22600	24900	27400	30100
140 (60.0)					15400	19500	21700	24000	26500

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4710	4750	4770	4780	4800	4860	4910	4970	5060
120 (48.9)			6110	6090	6080	6100	6120	6160	6210
140 (60.0)					7800	7770	7760	7760	7780

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)
200/220-3-50 (TF5) 380/420-3-50 (TFD) Rated Voltage		220-3-50 (TF5) 380-3-50 (TFD) Test Voltage

ZR108KC-TF5/TFD R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	30300	39900	51300	64400	79700	97300	107000	117300	128300
120 (48.9)			45000	57300	71400	87700	96700	106200	116400
140 (60.0)					61800	76800	85000	93800	103200

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7640	10100	12900	16200	20100	24500	27000	29600	32300
120 (48.9)			11300	14400	18000	22100	24400	26800	29300
140 (60.0)					15600	19400	21400	23600	26000

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8880	11700	15000	18900	23400	28500	31400	34400	37600
120 (48.9)			13200	16800	20900	25700	28300	31100	34100
140 (60.0)					18100	22500	24900	27500	30200

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5270	5370	5450	5500	5570	5670	5730	5810	5900
120 (48.9)			6860	6890	6930	6980	7020	7070	7130
140 (60.0)					8800	8790	8790	8800	8830

ZR125KC-TF5/TFD R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	36700	46900	59500	74500	91900	111500	122200	133500	145300
120 (48.9)			52900	66500	82500	100800	110800	121300	132400
140 (60.0)					71500	88400	97700	107500	117900

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9250	11800	15000	18800	23200	28100	30800	33600	36600
120 (48.9)			13300	16800	20800	25400	27900	30600	33400
140 (60.0)					18000	22300	24600	27100	29700

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10800	13700	17400	21800	26900	32700	35800	39100	42600
120 (48.9)			15500	19500	24200	29500	32500	35500	38800
140 (60.0)					20900	25900	28600	31500	34500

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6100	6240	6330	6410	6480	6570	6630	6700	6790
120 (48.9)			7950	8020	8080	8130	8170	8220	8270
140 (60.0)					10210	10230	10250	10270	10290

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R22/407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200/220-3-50 (TF5) 380/420-3-50 (TFD) Rated Voltage	220-3-50 (TF5) 380-3-50 (TFD) Test Voltage

ZR144KC-TF5/TFD R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	42100	53900	68700	86200	106200	128600	140700	153200	166300
120 (48.9)			59700	75500	94200	115300	126800	138800	151400
140 (60.0)					80100	99500	110200	121400	133300

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10600	13600	17300	21700	26800	32400	35500	38600	41900
120 (48.9)			15000	19000	23700	29100	32000	35000	38200
140 (60.0)					20200	25100	27800	30600	33600

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	12300	15800	20100	25300	31100	37700	41200	44900	48700
120 (48.9)			17500	22100	27600	33800	37200	40700	44400
140 (60.0)					23500	29200	32300	35600	39100

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6800	7010	7120	7190	7270	7400	7500	7630	7800
120 (48.9)			8900	8990	9040	9110	9160	9240	9340
140 (60.0)					11350	11380	11400	11430	11480

ZR84KCE-TF5/TFD R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	21300	30100	39700	50400	62500	76100	83600	91500	100000
120 (48.9)			29600	42400	55100	67800	74200	80700	87400
140 (60.0)					43700	59000	66100	73000	79600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5400	7600	10000	12700	15800	19200	21100	23100	25200
120 (48.9)			7500	10700	13900	17100	18700	20300	22000
140 (60.0)					11000	14900	16700	18400	20100

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6240	8820	11600	14800	18300	22300	24500	26800	29300
120 (48.9)			8670	12400	16100	19900	21700	23600	25600
140 (60.0)					12800	17300	19400	21400	23300

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4450	4450	4450	4490	4570	4700	4790	4910	5040
120 (48.9)			5950	5730	5670	5780	5900	6070	6290
140 (60.0)					7360	7120	7110	7180	7330

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)
200/220-3-50 (TF5) 380/420-3-50 (TFD) Rated Voltage		220-3-50 (TF5) 380-3-50 (TFD) Test Voltage

ZR94KCE-TF5/TFD R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	24500	33900	44600	57000	71400	88100	97400	107400	118200
120 (48.9)			36900	48400	61800	77200	85800	95100	105000
140 (60.0)					50200	64300	72100	80500	89600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6170	8540	11200	14400	18000	22200	24500	27100	29800
120 (48.9)			9300	12200	15600	19500	21600	24000	26500
140 (60.0)					12700	16200	18200	20300	22600

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7180	9930	13100	16700	20900	25800	28500	31500	34600
120 (48.9)			10810	14200	18100	22600	25100	27900	30800
140 (60.0)					14700	18800	21100	23600	26300

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4930	4980	5000	5010	5030	5070	5110	5160	5220
120 (48.9)			6340	6360	6360	6380	6390	6420	6460
140 (60.0)					8120	8130	8130	8140	8160

ZR108KCE-TF5/TFD R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	29800	39600	50800	63900	79500	98300	109000	120800	133600
120 (48.9)			43700	55600	69600	86100	95500	105800	116900
140 (60.0)					58900	73500	81800	90800	100600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7510	9980	12800	16100	20000	24800	27500	30400	33700
120 (48.9)			11000	14000	17500	21700	24100	26700	29500
140 (60.0)					14800	18500	20600	22900	25400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8730	11600	14900	18700	23300	28800	31900	35400	39100
120 (48.9)			12800	16300	20400	25200	28000	31000	34300
140 (60.0)					17300	21500	24000	26600	29500

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5340	5430	5480	5510	5550	5640	5700	5790	5900
120 (48.9)			6970	7000	7020	7060	7090	7140	7210
140 (60.0)					9010	9010	9010	9020	9040

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)
200/220-3-50 (TF5) 380/420-3-50 (TFD) Rated Voltage		220-3-50 (TF5) 380-3-50 (TFD) Test Voltage

ZR125KCE-TF5/TFD R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	34100	46100	59600	75200	93900	116400	129400	143600	159100
120 (48.9)			51100	65500	82100	101800	113100	125400	138900
140 (60.0)					69100	86500	96400	107100	118700

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8590	11600	15000	19000	23700	29300	32600	36200	40100
120 (48.9)			12900	16500	20700	25700	28500	31600	35000
140 (60.0)					17400	21800	24300	27000	29900

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9990	13500	17500	22000	27500	34100	37900	42100	46600
120 (48.9)			15000	19200	24100	29800	33100	36700	40700
140 (60.0)					20200	25300	28200	31400	34800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6380	6460	6520	6580	6650	6740	6790	6860	6940
120 (48.9)			8280	8340	8380	8430	8460	8500	8540
140 (60.0)					10660	10690	10710	10720	10730

ZR144KCE-TF5/TFD R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	43900	53900	68400	87100	109500	135300	149300	164000	179300
120 (48.9)			60000	75700	94700	116600	128500	141000	153900
140 (60.0)						100300	111000	122300	133900

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	11100	13600	17200	21900	27600	34100	37600	41300	45200
120 (48.9)			15100	19100	23900	29400	32400	35500	38800
140 (60.0)						25300	28000	30800	33700

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	12900	15800	20000	25500	32100	39600	43700	48100	52500
120 (48.9)			17600	22200	27700	34200	37700	41300	45100
140 (60.0)						29400	32500	35800	39200

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7240	7210	7280	7400	7550	7680	7730	7760	7770
120 (48.9)			9310	9350	9430	9480	9500	9490	9470
140 (60.0)						12100	12100	12090	12060

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200/230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE)	Rated Voltage	230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE)	Test Voltage

ZR84KC-TF5/TF7/TFD/TFE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	26300	35900	46700	59000	73200	89500	98500	108000	119000
120 (48.9)			39500	51600	65300	80700	89200	98200	108000
140 (60.0)					55300	70200	78300	86900	96000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6630	9050	11800	14900	18500	22600	24800	27300	29900
120 (48.9)			9950	13000	16500	20300	22500	24800	27200
140 (60.0)					13900	17700	19700	21900	24200

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7710	10500	13700	17300	21500	26200	28900	31700	34900
120 (48.9)			11600	15100	19100	23600	26100	28800	31600
140 (60.0)					16200	20600	22900	25500	28100

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5150	5180	5220	5270	5340	5420	5470	5520	5570
120 (48.9)			6570	6590	6620	6660	6680	6700	6730
140 (60.0)					8350	8330	8320	8310	8300

ZR94KC-TF5/TF7/TFD/TFE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	30100	41100	53400	67600	83700	102300	112500	123400	135100
120 (48.9)			45900	59300	74600	92100	101700	112000	123000
140 (60.0)					63700	79900	88900	98500	108700

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7590	10400	13500	17000	21100	25800	28400	31100	34000
120 (48.9)			11600	14900	18800	23200	25600	28200	31000
140 (60.0)					16100	20100	22400	24800	27400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8820	12000	15600	19800	24500	30000	33000	36200	39600
120 (48.9)			13400	17400	21900	27000	29800	32800	36000
140 (60.0)					18700	23400	26000	28900	31800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5710	5740	5760	5790	5840	5920	5980	6050	6140
120 (48.9)			7300	7300	7320	7350	7370	7410	7460
140 (60.0)					9240	9240	9250	9260	9280

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)
200/230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE) Rated Voltage		230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE) Test Voltage

ZR108KC-TF5/TF7/TFD/TFE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	37300	48600	61800	77200	95000	115600	126900	139100	152100
120 (48.9)			54700	69100	85600	104500	115000	126200	138200
140 (60.0)					75100	92500	102000	112300	123200

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9400	12200	15600	19500	23900	29100	32000	35100	38300
120 (48.9)			13800	17400	21600	26300	29000	31800	34800
140 (60.0)					18900	23300	25700	28300	31000

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10900	14200	18100	22600	27800	33900	37200	40800	44600
120 (48.9)			16000	20200	25100	30600	33700	37000	40500
140 (60.0)					22000	27100	29900	32900	36100

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6270	6420	6550	6660	6770	6900	6980	7060	7160
120 (48.9)			8110	8220	8310	8410	8470	8530	8600
140 (60.0)					10300	10370	10410	10450	10490

ZR125KC-TF5/TF7/TFD/TFE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	44300	57200	72600	90700	111500	135100	148000	161700	176200
120 (48.9)			64000	80800	100100	122000	133900	146500	159800
140 (60.0)					87300	107600	118600	130200	142400

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	11200	14400	18300	22900	28100	34000	37300	40700	44400
120 (48.9)			16100	20400	25200	30700	33700	36900	40300
140 (60.0)					22000	27100	29900	32800	35900

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	13000	16800	21300	26600	32700	39600	43400	47400	51600
120 (48.9)			18800	23700	29300	35700	39200	42900	46800
140 (60.0)					25600	31500	34700	38100	41700

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7350	7520	7650	7760	7880	8040	8140	8250	8390
120 (48.9)			9570	9660	9740	9840	9910	10000	10100
140 (60.0)					12140	12190	12230	12280	12350

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R22/R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200/230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE) Rated Voltage	230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE) Test Voltage

ZR144KC-TF5/TF7/TFD/TFE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	53400	64000	81500	104100	130000	157300	171000	184300	197100
120 (48.9)			71400	90400	113800	140000	153500	167000	180300
140 (60.0)					97000	121500	134700	148100	161700

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	13500	16100	20500	26200	32800	39600	43100	46400	49700
120 (48.9)			18000	22800	28700	35300	38700	42100	45400
140 (60.0)					24400	30600	33900	37300	40700

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	15600	18800	23900	30500	38100	46100	50100	54000	57800
120 (48.9)			20900	26500	33300	41000	45000	48900	52800
140 (60.0)					28400	35600	39500	43400	47400

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8050	8300	8480	8630	8790	9000	9140	9300	9490
120 (48.9)			10620	10780	10910	11060	11160	11270	11410
140 (60.0)					13680	13800	13870	13950	14040

ZR84KCE-TF5/TF7/TFD/TFE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	26800	36600	47800	60900	76300	94400	104700	115800	127800
120 (48.9)			40700	52700	66700	83100	92400	102500	133300
140 (60.0)					56000	70700	78900	87900	97600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6750	9220	12000	15300	19200	23800	26400	29200	32200
120 (48.9)			10300	13300	16800	20900	23300	25800	33600
140 (60.0)					14100	17800	19900	22200	24600

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7850	10700	14000	17800	22400	27700	30700	33900	37400
120 (48.9)			11900	15400	19500	24300	27100	30000	39100
140 (60.0)					16400	20700	23100	25800	28600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5180	5250	5290	5320	5350	5400	5440	5480	5530
120 (48.9)			6730	6750	6770	6790	6820	6850	6880
140 (60.0)					8580	8590	8600	8610	8630

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200/230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE)	Rated Voltage	230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE)	Test Voltage

ZR94KCE-TF5/TF7/TFD/TFE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	29600	40600	53400	68400	85800	106100	117400	129600	142600
120 (48.9)			44500	58200	74300	93000	103400	114700	126800
140 (60.0)					61000	77800	87200	97400	108400

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7460	10200	13500	17200	21600	26700	29600	32700	35900
120 (48.9)			11200	14700	18700	23400	26100	28900	32000
140 (60.0)					15400	19600	22000	24500	27300

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8670	11900	15600	20000	25100	31100	34400	38000	41800
120 (48.9)			13000	17100	21800	27200	30300	33600	37200
140 (60.0)					17900	22800	25500	28500	31800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5900	5950	5980	6010	6050	6110	6160	6210	6280
120 (48.9)			7590	7630	7660	7700	7720	7740	7780
140 (60.0)					9730	9780	9810	9830	9850

ZR108KCE-TF5/TF7/TFD/TFE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	34500	46900	60900	77100	96500	119800	133100	147700	163700
120 (48.9)			51600	66800	84200	104600	116200	128900	142700
140 (60.0)					71300	89400	99600	110500	122400

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8690	11800	15300	19400	24300	30200	33500	37200	41300
120 (48.9)			13000	16800	21200	26400	29300	32500	36000
140 (60.0)					18000	22500	25100	27800	30800

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10100	13700	17800	22600	28300	35100	39000	43300	48000
120 (48.9)			15100	19600	24700	30600	34000	37800	41800
140 (60.0)					20900	26200	29200	32400	35900

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6250	6440	6540	6600	6690	6840	6950	7110	7300
120 (48.9)			8370	8450	8500	8580	8650	8740	8870
140 (60.0)					10810	10850	10870	10920	10990

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200/230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE) Rated Voltage	230-3-60 (TF5) 460-3-60 (TFD) 380-3-60 (TF7) 575-3-60 (TFE) Test Voltage

ZR125KCE-TF5/TF7/TFD/TFE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	39900	54500	70800	89900	112700	140100	155800	173100	192000
120 (48.9)			60600	78200	98600	122600	136300	151200	167500
140 (60.0)					83100	104400	116400	129400	143500

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10100	13700	17800	22700	28400	35300	39300	43600	48400
120 (48.9)			15300	19700	24800	30900	34300	38100	42200
140 (60.0)					20900	26300	29300	32600	36200

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	11700	16000	20700	26300	33000	41000	45600	50700	56300
120 (48.9)			17800	22900	28900	35900	39900	44300	49100
140 (60.0)					24300	30600	34100	37900	42000

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7280	7540	7700	7810	7920	8090	8200	8350	8540
120 (48.9)			9830	9950	10050	10170	10250	10360	10500
140 (60.0)					12820	12900	12960	13030	13120

ZR144KCE-TF5/TF7/TFD/TFE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	54800	66300	83300	105400	132000	162600	179300	196800	215100
120 (48.9)			74400	92400	114700	140800	155200	170200	186000
140 (60.0)						121900	134800	148400	162600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	13800	16700	21000	26600	33300	41000	45200	49600	54200
120 (48.9)			18700	23300	28900	35500	39100	42900	46900
140 (60.0)						30700	34000	37400	41000

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	16100	19400	24400	30900	38700	47600	52500	57700	63000
120 (48.9)			21800	27100	33600	41300	45500	49900	54500
140 (60.0)						35700	39500	43500	47600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8260	8350	8500	8700	8930	9180	9300	9430	9550
120 (48.9)			11020	11130	11270	11410	11480	11550	11610
140 (60.0)						14630	14690	14750	14800

Production compressors to meet above nominal performance values within ± 5%.

50 60 HERTZ — APPROVED COMPRESSOR OPERATING RANGE — R22 R407C

AN OKAY INDICATES AN APPROVED POINT FOR COMPRESSOR OPERATION

A #### INDICATES A NON-APPROVED POINT FOR COMPRESSOR OPERATION

CONDENSING TEMPERATURE		EVAPORATING TEMPERATURE °F/°C								
°F	°C	–10 –23.3	0 –17.8	10 –12.2	20 –6.7	30 –1.1	40 4.4	45 7.2	50 10.0	55 12.8
80	26.7	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
90	32.2	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
100	37.8	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
110	43.3	####	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
120	48.9	####	####	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
130	54.4	####	####	####	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
140	60.0	####	####	####	####	OKAY*	OKAY	OKAY	OKAY	OKAY
150	65.6	####	####	####	####	####	OKAY*	OKAY	OKAY	OKAY

Approved range is based on 20°F (11.1°C) of superheat.

*This point not approved for ZR144KCE-TF5/7/D/E R407C 50/60 hertz.

SUMMIT APPLICATION NOTES

The Copeland Scroll Compressor, the most efficient and durable compressor ever developed for residential air conditioning and heat pump applications, can now also be used in the commercial sector. The 7 to 12 horsepower Scrolls used in the commercial market are a higher range of capacities based on the earlier 4 to 6¾ horsepower ZR*KC "QUEST" scrolls. There are several operating characteristics and design features that are different from the smaller residential air conditioning models. These are fully detailed in the Application Bulletin **AE-1303**.

- To attain higher motor efficiency and optimum cooling the suction inlet is placed low on the shell to guide the return gas through the motor.
- Because the suction tube is located on the lower portion of the shell, care must be taken to keep the compressor upright during installation and removal, otherwise oil could spill out of this connection.
- The Summit Scroll compressors do not have internal pressure relief valves. To ensure safe operation, a high pressure control set no higher than 425 psig (30 kg/cm²) must be used in all applications.
- A low pressure control is required for loss of charge protection. A cut out setting no lower than 25 psig (2 kg/cm²) for air conditioning and 7 psig (0.5 kg/cm²) for heat pumps is recommended.
- A discharge line thermostat is required for all air to air heat pump applications and must be located within 6" of the discharge fitting.
- A low mass, disc-type check valve in the discharge tube of the compressor prevents the compressor from running backwards for more than a second.
- The minimum sump temperature to saturated suction temperature differential (△T) should be greater than 20°F (11.1°C); maximum sump temperature is 200°F (93.3°C).
- No crankcase heater is required for this compressor when the system charge is below 16 lbs. (7.3 Kg), but is recommended for applications which experience an increased amount of liquid refrigerant floodback.
- The Summit compressor requires a suction accumulator in some applications. See Application Bulletin **AE-1303** for application and sizing details.
- For Scroll compressors, Copeland recommends that the capacity rating on reversing valves be no more than two times the nominal capacity of the compressor with which it will be used in order to ensure proper operation for the reversing valve under all operating conditions.
- The compressor has the approval to operate as a heat pump within the R22 and R407C operating range.
- Complete 50 and 60 Hertz R22 and R407C performance curves are available in the units as follows for all models:
  - Capacity BTUH
  - Power Input Watts
  - Current Amps
  - Efficiency BTUH/Watt
- Copeland has compiled a book of compressor Application Bulletins. Please see the following bulletins, from the book, for more ZR compressor application information as entitled below:

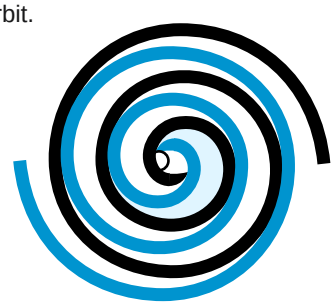
Mounting Parts ..... AE 4-1111
Application Guidelines ..... AE 4-1303
Nameplate Amperage Rating ..... AE 9-1154
Nameplate Voltage ..... AE 9-1228
Maximum Continuous Current Rating ..... AE 9-1250

HOW A SCROLL WORKS

Compression in the scroll is created by the interaction of an orbiting spiral and a stationary spiral. Gas enters the outer openings as one of the spirals orbit.

The open passages are sealed off as gas is drawn into the spiral.

As the spiral continues to orbit, the gas is compressed into two increasingly smaller pockets.



By the time the gas arrives at the center port, discharge pressure has been reached.

Actually, during operation, all six gas passages are in various stages of compression at all times, resulting in nearly continuous suction and discharge.

The scroll is a simple compression concept first patented in 1905. A scroll is an involute spiral which, when matched with a mating scroll form as shown above, generates a series of crescent-shaped gas pockets between the two members. During compression, one scroll remains stationary (fixed scroll) while the other form (orbiting scroll) is allowed to orbit (but not rotate) around the first form. As this motion occurs, the pockets between the two forms are slowly pushed to the center of the two scrolls while simultaneously being reduced in volume. When the pocket reaches the center of the scroll form, the gas, which is now at a high pressure, is discharged out of a port located at the center. During compression, several pockets are being compressed simultaneouly, resulting in a very smooth process. Both the suction process (outer portion of the scroll members) and the discharge process (inner portion) are continuous.

MULTIPACK PACKAGING AND SHIPPING INFORMATION

Compressors are placed on a heavy-duty skid, overpacked with a protective shroud, and banded.

MODEL	NUMBER OF COMPRESSORS PER MULTIPACK	MULTIPACK WEIGHT POUNDS KILOGRAMS	MULTIPACK DIMENSIONS LENGTH x WIDTH x HEIGHT INCHES CENTIMETERS	MULTIPACK CUBE CUBIC FEET CUBIC METERS	NUMBER OF MULTIPACKS PER 20 FOOT STEEL CONTAINER	NUMBER OF COMPRESSORS PER 20 FOOT STEEL CONTAINER	TOTAL WEIGHT INSIDE 20 FOOT STEEL CONTAINER POUNDS KILOGRAMS
ZR84	6	785 356.8	34 x 30 x 27 86.4 x 76.2 x 68.6	15.9 0.45	48	288	37700 17100
ZR94	6	785 356.8	34 x 30 x 27 86.4 x 76.2 x 68.6	15.9 0.45	48	288	37700 17100
ZR108	6	845 384.1	34 x 30 x 27 86.4 x 76.2 x 68.6	15.9 0.45	45	270	38000 17300
ZR125	6	857 389.5	34 x 30 x 27 86.4 x 76.2 x 68.6	15.9 0.45	45	270	38600 17500
ZR144	6	857 389.5	34 x 30 x 27 86.4 x 76.2 x 68.6	15.9 0.45	45	270	38400 17500
ZR84	12	1603 728.6	46 x 44.5 x 27 116.8 x 113 x 68.6	32.0 0.91	24	288	38500 17500
ZR94	12	1603 728.6	46 x 44.5 x 27 116.8 x 113 x 68.6	32.0 0.91	24	288	38500 17500
ZR108	12	1723 783.2	46 x 44.5 x 27 116.8 x 113 x 68.6	32.0 0.91	22	264	37900 17200
ZR125	12	1747 794.1	46 x 44.5 x 27 116.8 x 113 x 68.6	32.0 0.91	22	264	38400 17500
ZR144	12	1747 794.1	46 x 44.5 x 27 116.8 x 113 x 68.6	32.0 0.91	22	264	38400 17500

MULTIPLE SINGLE PACK PACKAGING AND SHIPPING INFORMATION

Weight (pounds/kilograms) of a pallet of 6 single pack cartons placed on a wooden skid, overpacked with a protective shroud, and banded. Multipack dimensions (cube) are 46 x 46 x 32 inches (39.2 FT^3), 116.88 x 116.8 x 81.3 centimeters (1.12 m^3).

MODEL	POUNDS	KILOGRAMS
ZR84	886	403
ZR94	886	403
ZR108	946	430
ZR125	958	435
ZR144	958	435

SINGLE PACK PACKAGING AND SHIPPING INFORMATION

For your domestic shipments of 1 single pack, the box dimensions are 19 x 16.5 x 27.5 inches (5.0 FT^3), 48.3 x 41.9 x 69.9 centimeters (0.14 m^3), and the weights (pounds/kilograms) are shown below.

MODEL	WITHOUT PALLET	WITH PALLET
ZR84	136/61.8	157/71.4
ZR94	136/61.8	157/71.4
ZR108	146/66.4	167/75.9
ZR125	148/67.3	169/76.8
ZR144	148/67.3	169/76.8

MODEL NUMBER NOMENCLATURE

Application Range

Code	Description
R	High and medium temperature

Compressor Motor Type

Motor Type	Code
Three phase	T

Product Variations

Three digit bill of material number that indicates compressor configuration and accessories included.

Optional

Oil	Code
MMMAPOE	E

Z R X X X K C X — T F X — X X X

Compressor Family Series

Letter “Z” established for this family of compressors.

Capacity Multiplier

K	1,000

Compressor Motor Protection

Type	Code
Internal inherent protection – One protector, use with contactor.	F

Capacity

Compressor nominal 60 Hertz capacity at ARI rating condition to two or three significant digits.

84
94
108
125
144

Model Series Variations

Indicates different model types within any one family series.

Electrical Codes

50 HZ	60 HZ	Code
200/220-3	200/230-3	5
–	380-3	7
380/420-3	460-3	D
–	575-3	E

SUMMIT TANDEM COMPRESSORS

50 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE — **220-3-50 (TF5) 380-3-50 (TFD) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY BTU HOUR	CAPACITY KCAL HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS MOTOR WATTS
ZRT168KC-TF5/D	A	140100	35300	41000	12190	39.2/22.7	11.5	2.9	3.4
	B	139000	35000	40700	12210	39.2/22.7	11.4	2.9	3.3
	C	163300	41200	47800	8920	31.4/18.2	18.3	4.6	5.4
ZRT188KC-TF5/D	A	158900	40000	46600	13800	49.6/28.7	11.5	2.9	3.4
	B	157600	39700	46200	13830	49.6/28.7	11.4	2.9	3.3
	C	185500	46700	54400	9870	42.1/24.4	18.8	4.7	5.5
ZRT216KC-TF5/D	A	180600	45500	52900	15610	56.3/32.6	11.6	2.9	3.4
	B	179200	45200	52500	15640	56.3/32.6	11.5	2.9	3.4
	C	208600	52600	61100	11600	48.9/28.3	18.0	4.5	5.3
ZRT250KC-TF5/D	A	210000	52900	61500	18160	70.7/40.9	11.6	2.9	3.4
	B	208300	52500	61000	18200	70.7/40.9	11.4	2.9	3.4
	C	239200	60300	70100	13460	62.5/36.2	17.8	4.5	5.2
ZRT288KC-TF5/D	A	235500	59300	69000	20370	61.8/35.8	11.6	2.9	3.4
	B	233600	58900	68400	20410	61.8/35.8	11.4	2.9	3.4
	C	277300	69900	81200	15050	48.7/28.2	18.4	4.6	5.4

*Ampere values shown are at 220 volts/380 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See full operating range on page 19B.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE — **TEST VOLTAGE: 230-3-60 (TF5), 380-3-60 (TF7), 460-3-60 (TFD), 575-3-60 (TFE)**

MODEL	RATING CONDITION	CAPACITY BTU/HOUR	CAPACITY KCAL/HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH/MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH/MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS/MOTOR WATTS
ZRT168KC-TF5/7/D/E	A	169200	42600	49600	14780	46.4/27.8/23.2/18.6	11.4	2.9	3.4
	B	167900	42300	49200	14810	46.4/27.8/23.2/18.6	11.3	2.9	3.3
	C	198500	50000	58200	11010	38.0/22.8/19.0/15.2	18.0	4.5	5.3
ZRT188KC-TF5/7/D/E	A	188200	47400	55100	16400	51.2/30.7/25.6/20.5	11.5	2.9	3.4
	B	186700	47000	54700	16430	51.2/30.7/25.6/20.5	11.4	2.9	3.3
	C	220900	55700	64700	12010	41.2/24.7/20.6/16.5	18.4	4.6	5.4
ZRT216KC-TF5/7/D/E	A	217600	54800	63800	18750	57.6/34.6/28.8/23.0	11.6	2.9	3.4
	B	215900	54400	63300	18790	57.6/34.6/28.8/23.0	11.5	2.9	3.4
	C	251400	63400	73700	13990	46.4/27.8/23.2/18.6	18.0	4.5	5.3
ZRT250KC-TF5/7/D/E	A	250100	63000	73300	21680	65.3/39.2/32.7/26.1	11.5	2.9	3.4
	B	248100	62500	72700	21720	65.3/39.2/32.7/26.1	11.4	2.9	3.3
	C	289200	72900	84700	15920	51.7/31.0/25.9/20.7	18.2	4.6	5.3
ZRT288KC-TF5/7/D/E	A	285300	71900	83600	24780	72.0/43.2/36.0/28.8	11.5	2.9	3.4
	B	283000	71300	82900	24830	72.0/43.2/36.0/28.8	11.4	2.9	3.3
	C	334100	84200	97900	18220	56.8/34.1/28.4/22.7	18.3	4.6	5.4

* Ampere values shown are at 230/380/460/575 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See full operating range on page 19B.

Production compressors to meet above nominal performance values within ±5%.

MECHANICAL SPECIFICATIONS

MODEL	NOMINAL HP KW	IN^3 CM^3 CUBIC INCHES PER REVOLUTION CUBIC CENTIMETERS PER REVOLUTION	CFH M^3/HR CUBIC FEET PER HOUR CUBIC METERS PER HOUR		COMPRESSOR NET WEIGHT WITH OIL POUNDS KILOGRAMS
			50 HERTZ 2900 RPM	60 HERTZ 3500 RPM	THREE PHASE
ZRT168KC	14.0 10.4	13.860 227.1	1395.6 39.5	1684.4 47.7	278 126
ZRT188KC	15.7 11.7	15.514 254.2	1562.2 44.2	1885.4 53.4	278 126
ZRT216KC	18.0 13.4	18.020 295.3	1814.6 51.4	2190.0 62.0	302 137
ZRT250KC	20.8 15.5	20.212 331.2	2035.2 57.6	2456.4 69.5	302 137
ZRT288KC	24.0 17.9	23.300 381.8	2346.2 66.4	2831.6 80.2	302 137

ELECTRICAL SPECIFICATIONS

***Note: Electrical specifications are the same as those for individual component compressors comprising the tandem. (Found on page 5B)**

TANDEM MODEL	COMPONENT COMPRESSOR
ZRT168KC	ZR84KC + ZR84KC
ZRT188KC	ZR94KC + ZR94KC
ZRT216KC	ZR108KC + ZR108KC
ZRT250KC	ZR125KC + ZRT125KC
ZRT288KC	ZR144KC + ZR144KC

"STANDARD" TANDEM BILL OF MATERIAL

MODEL	BILL OF MATERIAL NUMBER	DESCRIPTION
ZRT168KC, ZRT188KC ZRT216KC, ZRT250KC ZRT288KC	250	Discharge Out, Suction Up, Rail Mounting Kit, Terminal Box Covers, Oil and Terminal Blocks with Screws.

BILL OF MATERIAL PROVISIONS

Please refer to the bills of material shown on the previous page to view our standard offers of compressor selections.

In addition to the marked features, each tandem will include the following:

- Stub tube compressor suction and discharge fittings and tandem tubing.
- Stub tube oil equalization fitting and tandem tubing.
- Stub tube connections for suction and discharge to the system.
- Terminal box and cover complete with wiring diagram.
- Grounding tab located in the terminal box.
- Four Foot Mounting to rails using mounting grommets and bolts.
  7-1/2 x 7-1/2 inches
  (190.5 x 190.5 mm)
- Rail Mounting Kit.
- Internal Line Break Protector.
- Terminal Connector Block with Screws.
- 3GS oil for use with R22.
  - Initial oil charge

ZRT168KC	170 ounces	(5.03 liters)
ZRT188KC	170 ounces	(5.03 liters)
ZRT216KC	220 ounces	(6.51 liters)
ZRT250KC	220 ounces	(6.51 liters)
ZRT288KC	220 ounces	(6.51 liters)

  - Refill oil charge.

ZRT168KC	162 ounces	(4.79 liters)
ZRT188KC	162 ounces	(4.79 liters)
ZRT216KC	212 ounces	(6.27 liters)
ZRT250KC	212 ounces	(6.27 liters)
ZRT288KC	212 ounces	(6.27 liters)

See outline drawings on pages 18B and 19A for stub tube and rotalock connection sizes.

ACCESSORY INFORMATION

Crankcase Heater - 120 volts	018-0047-00
Crankcase Heater - 240 volts	018-0047-01
Crankcase Heater - 480 volts	018-0047-02
Crankcase Heater - 575 volts	018-0047-03
Discharge Line Thermostat Kit (non-conduit)	998-0071-03
3 Phase Voltage Monitor	085-0160-00

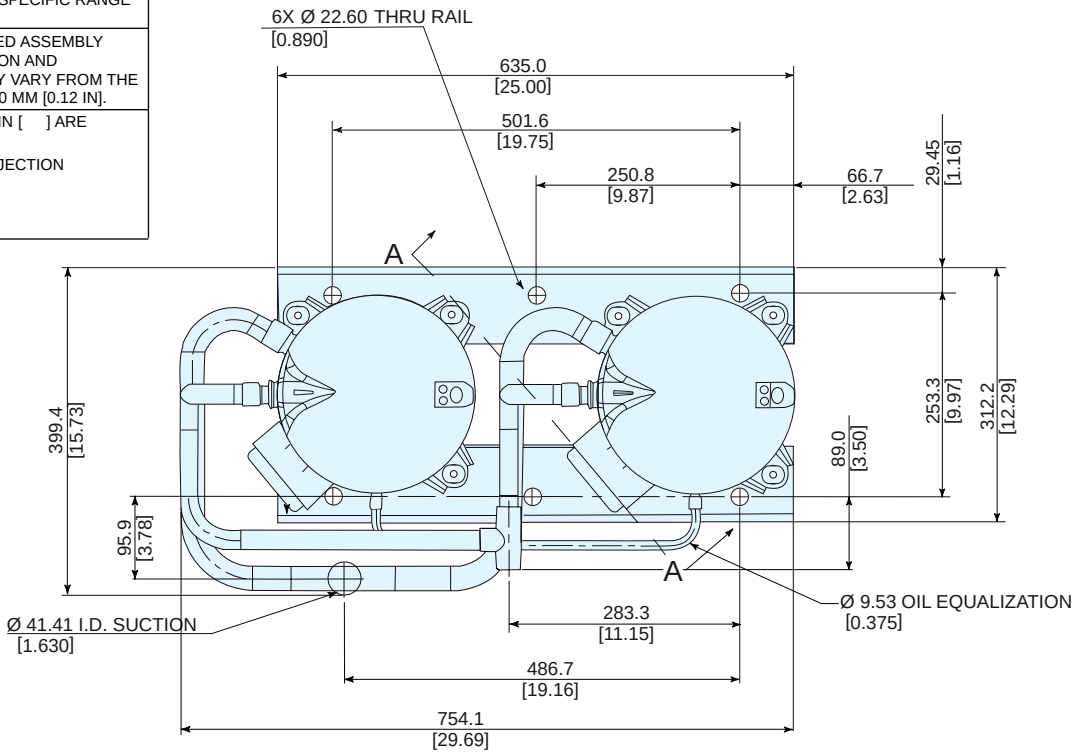
NOTES:

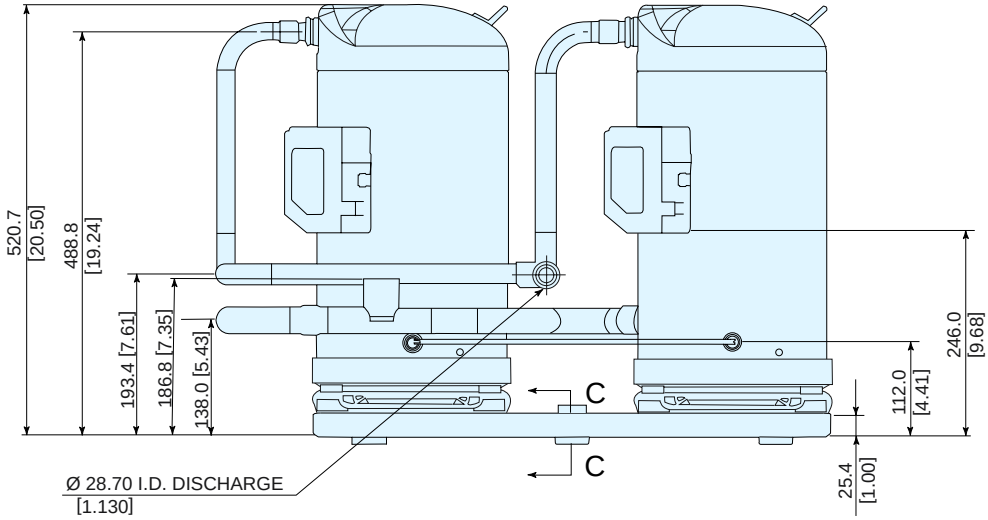
1. NOMINAL DIMENSIONS ARE SHOWN. MAXIMUM OVERALL TOLERANCE RANGE IS ± 1.5 MM [4.75 IN]. CONTACT COPELAND INTERNATIONAL IF MORE SPECIFIC RANGE IS REQUIRED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 3.0 MM [0.12 IN].
4. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

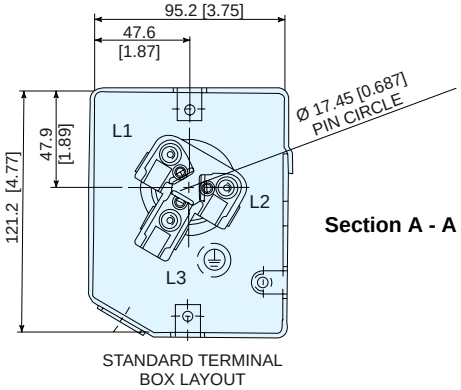
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

MODEL NUMBER
ZRT168KC-TF5/TF7/TFD/TFE
ZRT188KC-TF5/TF7/TFD/TFE

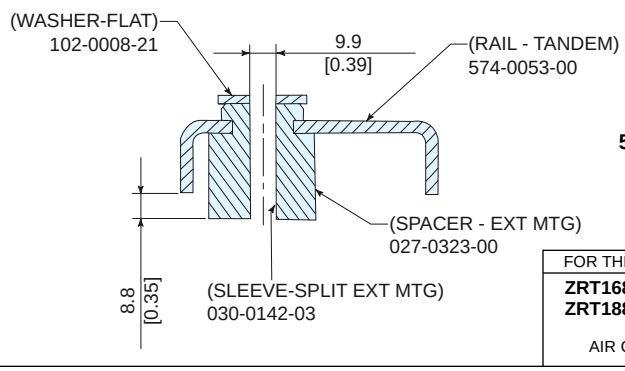






Section A - A

STANDARD TERMINAL BOX LAYOUT



Section C - C
527-0177-00 (shown)
Rail Mounting Kit

FOR THE INTERNATIONAL MARKET

ZRT168KC-TF5, TF7, TFD, TFE
ZRT188KC-TF5, TF7, TFD, TFE
HEAT PUMP AND
AIR CONDITIONING MODELS

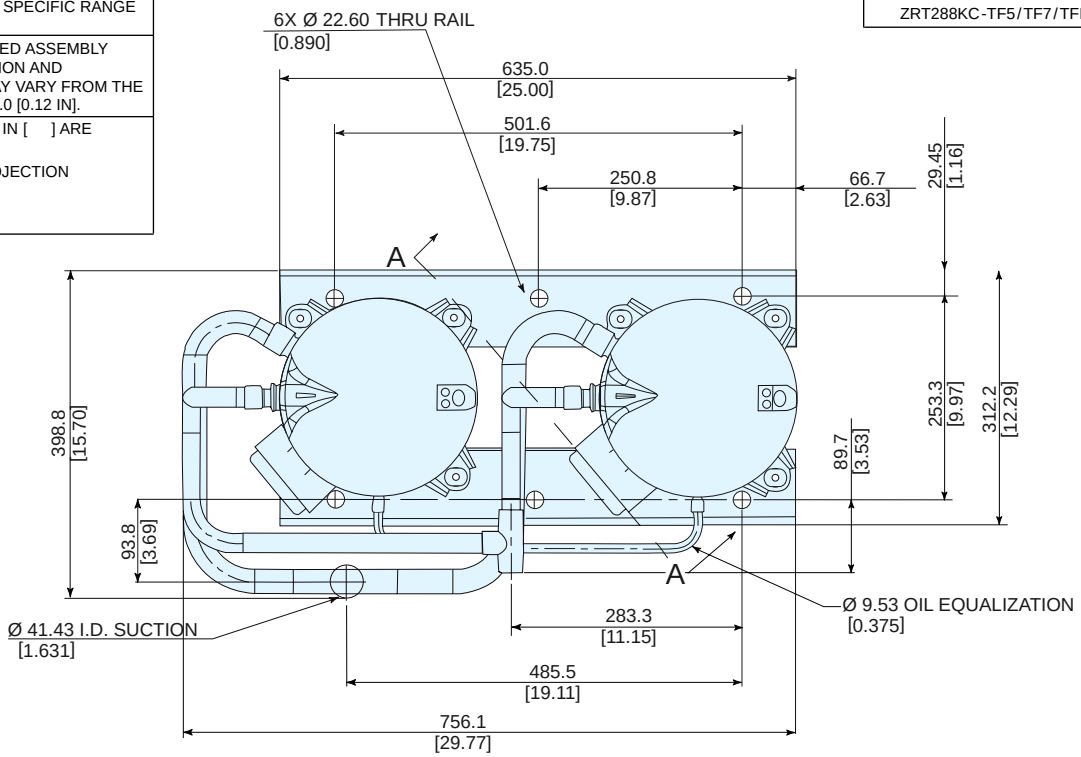
NOTES:

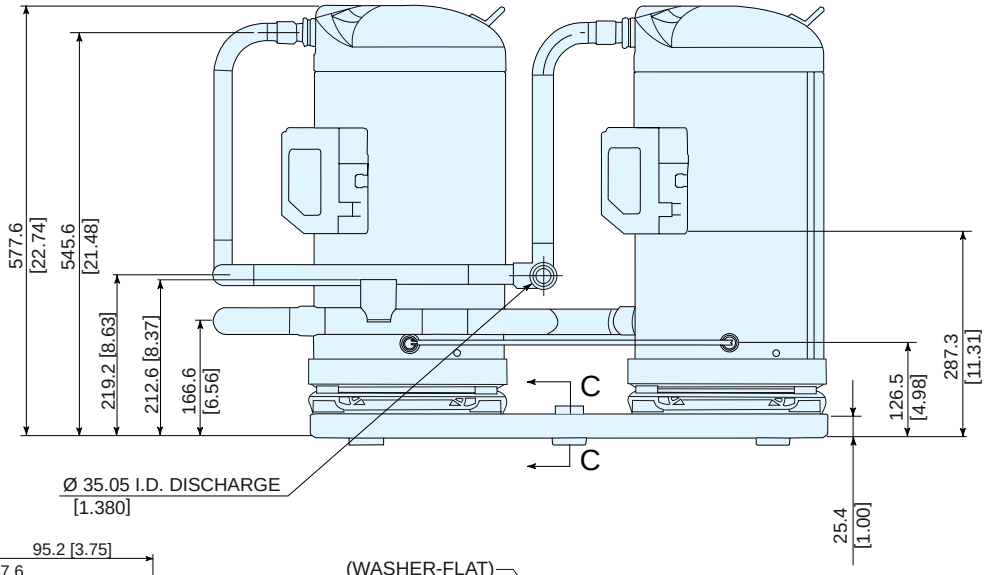
1. NOMINAL DIMENSIONS ARE SHOWN. MAXIMUM OVERALL TOLERANCE RANGE IS ± 1.5 MM [4.75 IN]. CONTACT COPELAND INTERNATIONAL IF MORE SPECIFIC RANGE IS REQUIRED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 3.0 [0.12 IN].
4. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

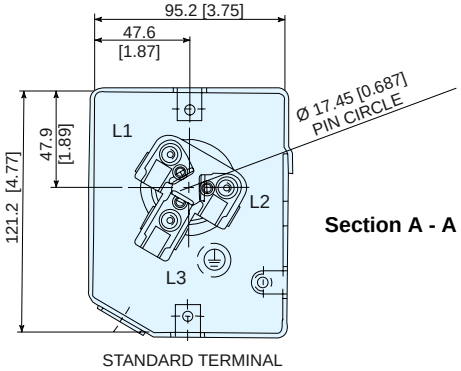
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

MODEL NUMBER
ZRT216KC-TF5/TF7/TFD/TFE
ZRT250KC-TF5/TF7/TFD/TFE
ZRT288KC-TF5/TF7/TFD/TFE

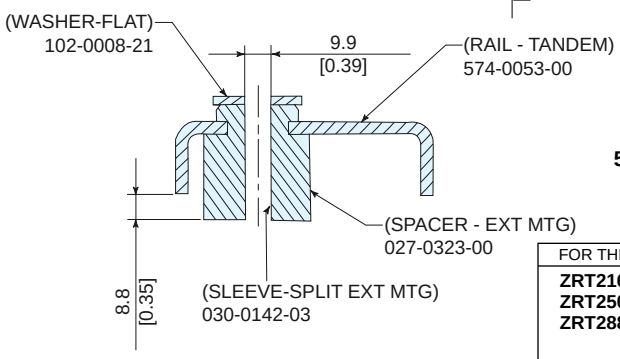






STANDARD TERMINAL BOX LAYOUT

Section A - A



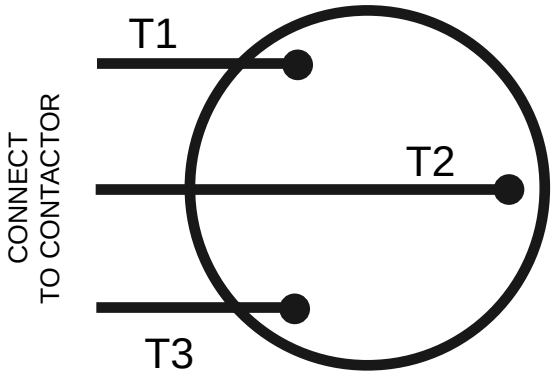
Section C - C
527-0177-00 (shown)
Rail Mounting Kit

FOR THE INTERNATIONAL MARKET

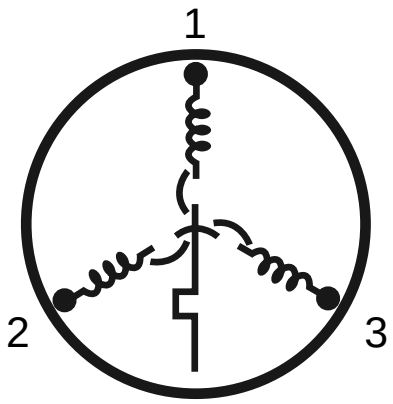
ZRT216KC-TF5, TF7, TFD, TFE
ZRT250KC-TF5, TF7, TFD, TFE
ZRT288KC-TF5, TF7, TFD, TFE
HEAT PUMP AND
AIR CONDITIONING MODELS

COMPRESSOR WIRING DIAGRAMS

THREE PHASE MOTOR



EXTERNAL MOTOR
WIRING DIAGRAM



INTERNAL MOTOR
WIRING DIAGRAM

ZR168KC TO ZR288KC

USE COPPER CONDUCTORS ONLY.

USE THIS EQUIPMENT ON A GROUNDED SYSTEM ONLY.

USE MINIMUM 75° C WIRE FOR AMPACITY DETERMINATION.

INTERNAL MOTOR PROTECTION – ALLOW TIME FOR RESET.

PRIMARY SINGLE PHASE FAILURE PROTECTION IS PROVIDED.

CRANKCASE HEATER, WHEN APPLIED, MUST BE CONNECTED ONLY TO ITS RATED VOLTAGE.

OVERCURRENT PROTECTION DEVICE RATING AND TYPE MUST BE IN ACCORDANCE WITH REGULATORY AGENCY END PRODUCT APPROVALS – SEE SYSTEM NAMEPLATE.

TO CORRECT IMPROPER MOTOR ROTATION, SWITCH ANY TWO SUPPLY LINES.

50 60 HERTZ — APPROVED COMPRESSOR OPERATING RANGE — R22

AN OKAY INDICATES AN APPROVED POINT FOR COMPRESSOR OPERATION

AN ** INDICATES A NON-APPROVED POINT FOR COMPRESSOR OPERATION**

CONDENSING TEMPERATURE		EVAPORATING TEMPERATURE °F/°C								
°F	°C	–10 –23.3	0 –17.8	10 –12.2	20 –6.7	30 –1.1	40 4.4	45 7.2	50 10.0	55 12.8
80	26.7	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
90	32.2	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
100	37.8	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
110	43.3	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
120	48.9	****	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
130	54.4	****	****	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
140	60.0	****	****	****	****	OKAY	OKAY	OKAY	OKAY	OKAY
150	65.6	****	****	****	****	****	OKAY	OKAY	OKAY	OKAY

Approved range is based on 20°F (11.1°C) of superheat.

SUMMIT TANDEM APPLICATION NOTES

Use of the Summit Compressor in a tandem configuration follows the guidelines of the single compressor found in Application Bulletin **AE-1303** and on page 14A with the following exceptions:

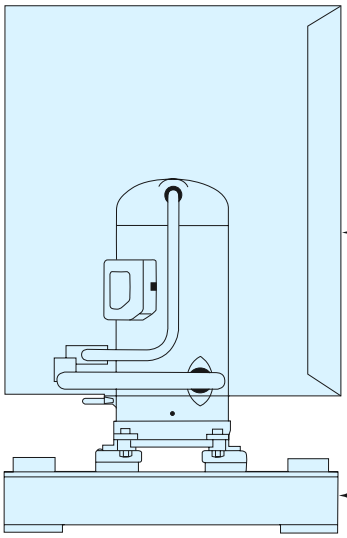
- The tandem compressors are rigidly mounted with steel spacers on rails. These mounts are installed at the factory and should not be loosened. Re-torque to 125 inch pounds (14.1 Nm) if it becomes necessary to tighten these mounts. Holes in the mounting rails may be used to Mount isolation grommets under the entire tandem.
- Both compressors must be at the same level to prevent oil from migrating to the lowest compressor through the oil equalization line.
- Refrigerant charge limit for all Summit tandem models is 20 lbs. for the entire tandem (20% more than for a single compressor). A tandem with a circuit charge over 20 lbs. must use crankcase heaters on both compressors.
- Pumpdown may be used instead of, or in conjunction with, a crankcase heater when the compressor is located so that cold air blowing over the compressor makes the crankcase heater ineffective. A separate external check valve must be added to the common discharge close to the manifold if pumpdown is used.
- The individual compressors that make up the tandem are wired independently using the electrical values of the single compressors. It is recommended that compressors be wired to change lead/lag position. This will ensure equal run time for both compressors, thereby increasing reliability.
- It is recommended that the entire Summit tandem be replaced should one compressor fail. Individual scrolls configured for tandem may not be available in the field. When a tandem is exchanged in the field it is possible that a major portion of the oil may still be in the system. While this may not affect the reliability of the replacement compressor, the extra oil will add to rotor drag and increase power usage. To remove this excess oil an access valve may be added to the lower portion of the suction manifold. The compressor should then be run for 10 minutes, shut down and the access valve opened until no oil flows. This should be repeated twice to make sure the proper oil level has been achieved.

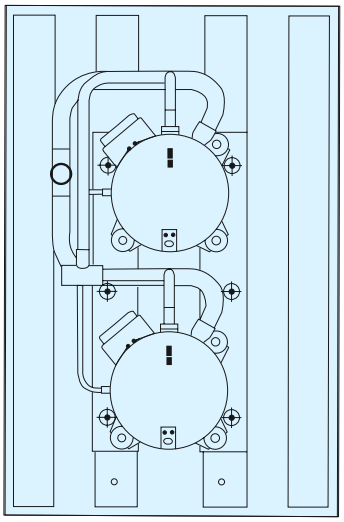
SINGLE PACK TANDEM PACKAGING AND SHIPPING INFORMATION

For shipments of 1 single pack tandem compressors, the dimensions for the box and the skid together are 40.0 x 26.9 x 33.6 inches (20.9 ft³), 101.6 x 68.3 x 85.3 centimeters (0.59m³), and the weights (in lbs. and kgs.) are shown in the table below.

MODEL NUMBER	WEIGHT (POUNDS)	WEIGHT (KILOGRAMS)
ZRT168KC	336	152
ZRT188KC	336	152
ZRT216KC	360	163
ZRT250KC	360	163
ZRT288KC	360	163

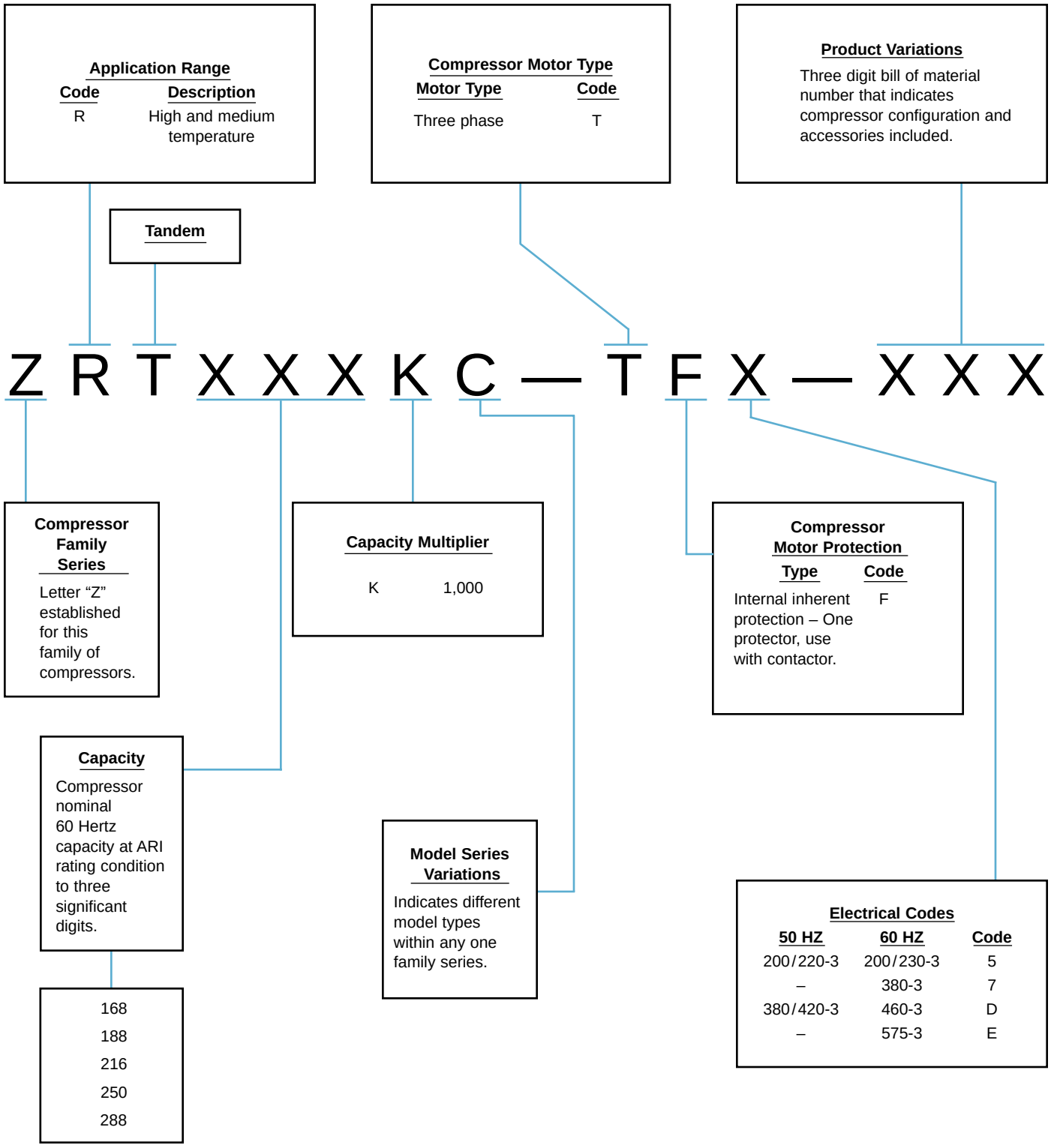
Tandem Packaging





590-0174-00
COMPRESSOR ORIENTATION

MODEL NUMBER NOMENCLATURE



COMPRESSOR SPECIFICATIONS

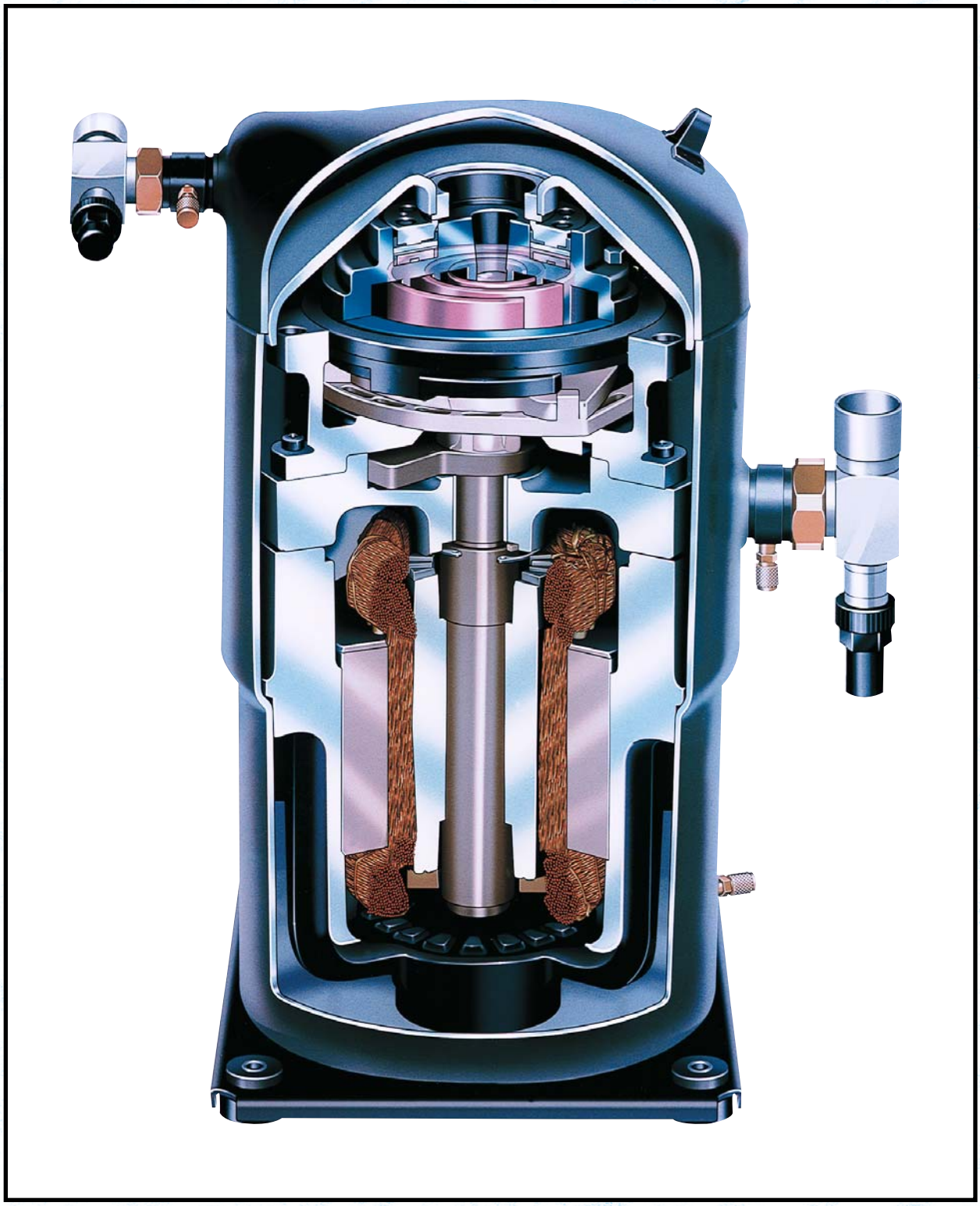
The compressor shall be a Copeland Scroll type, with DU (PTFE) journal bearings, internal line break motor protection and both rotalock or braze fittings. The compressor shall be able to handle a 16 pound (7.3 Kg) refrigerant charge limit without a crankcase heater. The compressor shall be capable of operating on R22 within the evaporating range of –10°F to 55°F (–23.3°C to 12.8°C) at condensing temperatures up to 150°F (65.6°C). The compressor shall operate at an ARI point efficiency range of 10.8 to 11.6 BTUH/WATT. Efficiencies above 11.6 BTUH/WATT are also acceptable. The compressor shall be of the Copeland ZR type or approved equal.

UNITS CONVERSION CHART

BTUH × 0.252 = KCALH
BTUH × 0.293 = WATTS
(°F – 32) × $^{5}/_{9}$ = °C
POUNDS × 0.454 = KILOGRAMS
INCHES × 25.4 = MILLIMETERS
CUBIC INCHES × 16.386 = CUBIC CENTIMETERS
FLUID OUNCES × 0.02957 = LITERS
CUBIC FEET × 0.02831 = CUBIC METERS
HORSEPOWER × 0.746 = KILOWATTS

Specter™ Copeland Scroll

With its inherent compliant capabilities, unique features, and applied cost savings, Specter has expanded the limits of scroll technology to meet the challenges of the most demanding commercial air-conditioning applications for today and tomorrow.



DESCRIPTION

Copeland continues to deliver comprehensive compressor solutions for the commercial air conditioning market with the Specter Copeland Scroll. Its highly engineered robust design enables Specter to meet the most demanding commercial applications around the world. Specter delivers in the 20 to 100 horsepower and above packaged rooftop and chiller markets. It is also designed for specialized applications, such as computer rooms, transportation cooling and mushroom coolers.

Besides demonstrating superior reliability, Specter also possesses the most efficient operating characteristics of any hermetic compressor in its class.

- High efficiency performance (11.1 to 11.5 EER).
- Low sound levels.
- Specter is available in 7.5, 9, 10, 13, and 15 horsepower models, five electrical configurations, and tandem offerings.
- A total of 25 models are available now in the Specter family, including compressors that use alternate refrigerants such as R-407C and R-134a. They combine to make up our extensive line of tandem offerings.
- Unique patented features that are not found in other scroll compressors. See Product Features on this page for a listing of Specter's unique features.

Even with all its unique benefits and features, Specter is economical due to significant savings in system design, service, and applied cost.

FEATURES

- Copeland Scroll
  - – High Efficiency
  - – Better Liquid Handling
  - – Better Debris Handling
  - – Self-compensating for wear ("Wears-in" vs. "Wears-out")
  - – 70% fewer moving parts
  - – Low sound levels
- 17 Pound/7.7 Kg Refrigerant Charge Limit
- Sight Glass and Oil Level Adjustment Port
- Unique, Quick Responding Temperature Protection
- Three Oil Filtration Devices and Rotary Dirt Trap
- Integral Cast Iron Frame and Cast Iron Scrolls
- DU (PTFE) Journal Bearings
- Rotalock or Stub Tube Fittings
- High & Low Pressure Taps (Shrader Valves) on Rotalock Version
- Low Shutdown Noise
- Available with POE for R-407C and R-134a
- Heavy commercial capability with small size, fewer moving parts and rugged design.
- Wide Model Selection to Meet Diverse Market Needs
- Flexible Voltage Options
- Tandem Models Available

50 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE — **200-3-50 (TWC) 220-3-50 (TWR) 380-3-50 (TWD) 500-3-50 (TWE) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY BTU HOUR	CAPACITY KCAL HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS MOTOR WATTS
ZR90K3-TWC/R/D/E	A	74100	18700	21700	6610	25.0/22.7/13.1/10.0	11.2	2.8	3.3
	B	73500	18500	21500	6620	25.0/22.7/13.1/10.0	11.1	2.8	3.2
	C	86000	21700	25200	4740	21.0/19.1/11.1/8.4	18.1	4.6	5.3
ZR11M3-TWC/R/D/E	A	90300	22800	26500	7920	28.6/26.0/15.1/11.4	11.4	2.9	3.3
	B	89600	22600	26300	7940	28.6/26.0/15.1/11.4	11.3	2.8	3.3
	C	106000	26700	31100	5590	23.2/21.1/12.2/9.3	19.0	4.8	5.6
ZR12M3-TWC/R/D/E	A	104700	26400	30700	9090	33.0/30.0/17.4/13.2	11.5	2.9	3.4
	B	103900	26200	30400	9110	33.0/30.0/17.4/13.2	11.4	2.9	3.3
	C	122700	30900	36000	6420	26.8/24.4/14.1/10.7	19.1	4.8	5.6
ZR16M3-TWC/R/D/E	A	128700	32400	37700	11180	38.2/34.7/20.1/15.3	11.5	2.9	3.4
	B	127700	32200	37400	11200	38.2/34.7/20.1/15.3	11.4	2.9	3.3
	C	150000	37800	44000	8100	30.4/27.6/16.0/12.2	18.5	4.7	5.4
ZR19M3-TWC/R/D/E	A	158000	39800	46300	13550	47.4/43.1/25.0/19.0	11.7	2.9	3.4
	B	156700	39500	45900	13580	47.4/43.1/25.0/19.0	11.5	2.9	3.4
	C	182700	46000	53500	9560	37.2/33.8/19.6/14.9	19.1	4.8	5.6

* Ampere values shown are at 200 volts/220 volts/380 volts/500 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 30A to 31A.
See full operating range on page 39A.
Production compressors to meet above nominal performance values within ±5%.

50 HERTZ PERFORMANCE NOMINALS R407C

THREE PHASE — **200-3-50 (TWC) 220-3-50 (TWR) 380-3-50 (TWD) 500-3-50 (TWE) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY BTU HOUR	CAPACITY KCAL HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS MOTOR WATTS
ZR90K3E-TWC/R/D/E	A	73900	18600	21700	6970	25.8/23.5/13.6/10.3	10.6	2.7	3.1
	B	73300	18500	21500	6980	25.8/23.5/13.6/10.3	10.5	2.7	3.1
	C	90900	22900	26600	4840	20.8/18.9/10.9/8.3	18.8	4.7	5.5
ZR11M3E-TWC/R/D/E	A	91600	23100	26800	8570	30.4/27.6/16.0/12.2	10.7	2.7	3.1
	B	90900	22900	26600	8590	30.4/27.6/16.0/12.2	10.6	2.7	3.1
	C	112000	28200	32800	5900	24.0/21.8/12.6/9.6	19.0	4.8	5.6
ZR12M3E-TWC/R/D/E	A	106100	26700	31100	9850	34.8/31.6/18.3/13.9	10.8	2.7	3.2
	B	105300	26500	30900	9870	34.8/31.6/18.3/13.9	10.7	2.7	3.1
	C	130000	32800	38100	6780	27.4/24.9/14.4/11.0	19.2	4.8	5.6
ZR16M3E-TWC/R/D/E	A	130600	32900	38300	12150	41.4/37.6/21.8/16.6	10.7	2.7	3.2
	B	129600	32700	38000	12170	41.4/37.6/21.8/16.6	10.6	2.7	3.1
	C	161000	40600	47200	8590	31.4/28.5/16.5/12.6	18.7	4.7	5.5
ZR19M3E-TWC/R/D/E	A	161400	40700	47300	14870	49.0/44.5/25.8/19.6	10.9	2.7	3.2
	B	160100	40300	46900	14900	49.0/44.5/25.8/19.6	10.7	2.7	3.1
	C	196900	49600	57700	10350	37.2/33.8/19.6/15.7	19.0	4.8	5.6

* Ampere values shown are at 200 volts/220 volts/380 volts/500 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 31B to 32B.
See full operating range on page 39A.
Production compressors to meet above nominal performance values within ±5%.

50 HERTZ PERFORMANCE NOMINALS R134a

THREE PHASE — **200-3-50 (TWC) 220-3-50 (TWR) 380-3-50 (TWD) 500-3-50 (TWE) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY BTU HOUR	CAPACITY KCAL HOUR	CAPACITY WATTS	MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING BTUH MOTOR WATTS	ENERGY EFFICIENCY RATING KCALH MOTOR WATTS	ENERGY EFFICIENCY RATING WATTS MOTOR WATTS
ZR90K3E-TWC/R/D/E	A	49900	12600	14600	4610	20.2/18.4/10.7/8.1	10.8	2.7	3.2
	B	49500	12500	14500	4620	20.2/18.4/10.7/8.1	10.7	2.7	3.1
	C	58800	14800	17200	3260	17.4/15.8/9.1/7.0	18.0	4.5	5.3
ZR11M3E-TWC/R/D/E	A	61400	15500	18000	5610	22.8/20.7/12.0/9.1	10.9	2.8	3.2
	B	60900	15300	17800	5620	22.8/20.7/12.0/9.1	10.8	2.7	3.2
	C	72700	18300	21300	3970	19.6/17.8/10.3/7.8	18.3	4.6	5.4
ZR12M3E-TWC/R/D/E	A	71100	17900	20800	6440	26.2/23.8/13.8/10.5	11.0	2.8	3.2
	B	70500	17800	20700	6450	26.2/23.8/13.8/10.5	10.9	2.8	3.2
	C	84300	21200	24700	4560	22.6/20.5/11.9/9.0	18.5	4.6	5.4
ZR16M3E-TWC/R/D/E	A	87300	22000	25600	7900	32.2/29.3/17.0/12.9	11.1	2.8	3.2
	B	86600	21800	25400	7920	32.2/29.3/17.0/12.9	10.9	2.8	3.2
	C	104000	26200	30500	5680	27.8/25.3/14.6/11.1	18.3	4.6	5.4
ZR19M3E-TWC/R/D/E	A	104100	26200	30500	9980	35.8/32.5/18.8/14.3	10.4	2.6	3.1
	B	103300	26000	30300	10000	35.8/32.5/18.8/14.3	10.3	2.6	3.0
	C	123700	31200	36200	7270	29.6/26.9/15.6/11.8	17.0	4.3	5.0

* Ampere values shown are at 200 volts/220 volts/380 volts/500 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 33A to 34A.
See full operating range on page 39A.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE

230-3-60 (TWC)
380-3-60 (TW7)
460-3-60 (TWD)
575-3-60 (TWE)
TEST VOLTAGE

MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZR90K3-TWC/7/D/E	A	89500	22600	26200	7970	25.0/15.1/12.5/10.0	11.2	2.8	3.3
	B	88800	22400	26000	7990	25.0/15.1/12.5/10.0	11.1	2.8	3.3
	C	103900	26200	30400	5690	21.0/12.7/10.5/8.4	18.3	4.6	5.3
ZR11M3-TWC/7/D/E	A	109200	27500	32000	9580	28.6/17.3/14.3/11.4	11.4	2.9	3.3
	B	108300	27300	31700	9600	28.6/17.3/14.3/11.4	11.3	2.8	3.3
	C	127900	32200	37500	6760	23.2/14.0/11.6/9.3	18.9	4.8	5.5
ZR12M3-TWC/7/D/E	A	126500	31900	37100	10980	33.0/20.0/16.5/13.2	11.5	2.9	3.4
	B	125500	31600	36800	11000	33.0/20.0/16.5/13.2	11.4	2.9	3.3
	C	148200	37300	43400	7750	26.8/16.2/13.4/10.7	19.1	4.8	5.6
ZR16M3-TWC/7/D/E	A	155500	39200	45600	13510	38.2/23.1/19.1/15.3	11.5	2.9	3.4
	B	154300	38900	45200	13540	38.2/23.1/19.1/15.3	11.4	2.9	3.3
	C	181400	45700	53200	9940	29.8/18.0/14.9/11.9	18.2	4.6	5.4
ZR19M3-TWC/7/D/E	A	191800	48300	56200	16490	48.2/29.2/24.1/19.3	11.6	2.9	3.4
	B	190300	48000	55800	16520	48.2/29.2/24.1/19.3	11.5	2.9	3.4
	C	222200	56000	65100	11780	37.0/22.4/18.5/14.8	18.9	4.8	5.5

* Ampere values shown are at 230 volts/380 volts/460 volts/575 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 34B to 35B.
See full operating range on page 39A.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R407C

THREE PHASE

230-3-60 (TWC)
380-3-60 (TW7)
460-3-60 (TWD)
575-3-60 (TWE)
TEST VOLTAGE

MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZR90K3E-TWC/7/D/E	A	89300	22500	26200	8430	25.8/15.6/12.9/10.3	10.6	2.7	3.1
	B	88600	22300	26000	8450	25.8/15.6/12.9/10.3	10.5	2.6	3.1
	C	110000	27700	32200	5860	20.8/12.6/10.4/8.3	18.8	4.7	5.5
ZR11M3E-TWC/7/D/E	A	110700	27900	32400	10370	30.4/18.4/15.2/12.2	10.7	2.7	3.1
	B	109800	27700	32200	10390	30.4/18.4/15.2/12.2	10.6	2.7	3.1
	C	135500	34100	39700	7140	24.0/14.5/12.0/9.6	19.0	4.8	5.6
ZR12M3E-TWC/7/D/E	A	128200	32300	37600	11890	34.8/21.1/17.4/13.9	10.8	2.7	3.2
	B	127200	32100	37300	11910	34.8/21.1/17.4/13.9	10.7	2.7	3.1
	C	156900	39500	46000	8180	27.4/16.6/13.7/11.0	19.2	4.8	5.6
ZR16M3E-TWC/7/D/E	A	158000	39800	46300	14670	41.4/25.0/20.7/16.6	10.8	2.7	3.2
	B	156700	39500	45900	14700	41.4/25.0/20.7/16.6	10.7	2.7	3.1
	C	194500	49000	57000	10370	31.4/19.0/15.7/12.6	18.8	4.7	5.5
ZR19M3E-TWC/7/D/E	A	196600	49500	57600	18190	49.0/29.6/24.5/19.6	10.8	2.7	3.2
	B	195000	49100	57100	18230	49.0/29.6/24.5/19.6	10.7	2.7	3.1
	C	239800	60400	70300	12670	37.2/22.5/18.6/14.9	18.9	4.8	5.5

* Ampere values shown are at 230 volts/380 volts/460 volts/575 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 36A to 37A.
See full operating range on page 39A.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R134a

THREE PHASE

230-3-60 (TWC)
380-3-60 (TW7)
460-3-60 (TWD)
575-3-60 (TWE)
TEST VOLTAGE

MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZR90K3E-TWC/7/D/E	A	60300	15200	17700	5580	20.2/12.2/10.1/8.1	10.8	2.7	3.2
	B	59800	15100	17500	5590	20.2/12.2/10.1/8.1	10.7	2.7	3.1
	C	71200	17900	20900	3940	17.4/10.5/8.7/7.0	18.1	4.5	5.3
ZR11M3E-TWC/7/D/E	A	74200	18700	21700	6780	22.8/13.8/11.4/9.1	10.9	2.8	3.2
	B	73600	18500	21600	6790	22.8/13.8/11.4/9.1	10.8	2.7	3.2
	C	87900	22200	25800	4800	19.6/11.9/9.8/7.8	18.3	4.6	5.4
ZR12M3E-TWC/7/D/E	A	85900	21600	25200	7770	26.2/15.9/13.1/10.5	11.1	2.8	3.2
	B	85200	21500	25000	7790	26.2/15.9/13.1/10.5	10.9	2.8	3.2
	C	101800	25700	29800	5510	22.6/13.7/11.3/9.0	18.5	4.7	5.4
ZR16M3E-TWC/7/D/E	A	105400	26600	30900	9560	32.2/19.5/16.1/12.9	11.0	2.8	3.2
	B	104600	26400	30600	9580	32.2/19.5/16.1/12.9	10.9	2.8	3.2
	C	125100	31500	36700	6870	27.8/16.8/13.9/11.1	18.2	4.6	5.3
ZR19M3E-TWC/7/D/E	A	126800	32000	37200	12220	35.8/21.7/17.9/14.3	10.4	2.6	3.0
	B	125800	31700	36900	12240	35.8/21.7/17.9/14.3	10.3	2.6	3.0
	C	150600	38000	44100	8890	29.6/17.9/14.8/9.4	16.9	4.3	5.0

* Ampere values shown are at 230 volts/380 volts/460 volts/575 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See expanded performance data on pages 37B to 38B.
See full operating range on page 39A.
Production compressors to meet above nominal performance values within ±5%.

MECHANICAL SPECIFICATIONS

MODEL	NOMINAL HP KW	IN^3 CM^3 CUBIC INCHES PER REVOLUTION CUBIC CENTIMETERS PER REVOLUTION	CFH M^3/HR CUBIC FEET PER HOUR CUBIC METERS PER HOUR		COMPRESSOR NET WEIGHT POUNDS KILOGRAMS
			50 HERTZ 2900 RPM	60 HERTZ 3500 RPM	
ZR90K3/K3E	7.5 5.6	7.319 119.9	737.0 20.86	889.5 25.18	205 93.0
ZR11M3/M3E	9 6.7	8.790 144.0	885.1 25.06	1068.2 30.24	205 93.0
ZR12M3/M3E	10 7.5	10.10 165.5	1016.5 28.78	1226.8 34.73	205 93.0
ZR16M3/M3E	13 9.7	12.47 204.3	1255.6 35.55	1515.3 42.90	227 103.0
ZR19M3/M3E	15 11.2	14.76 241.9	1486.2 42.07	1793.8 50.78	247 112.0

ELECTRICAL SPECIFICATIONS

VOLTAGE CODE	TWR	TWC	TW7	TWD	TWE
NOMINAL VOLTAGE-PHASE-HERTZ	220/240-3-50	200-3-50 208/230-3-60	380-3-60	380/420-3-50 460-3-60	500-3-50 575-3-60
VOLTAGE RANGE 50 HERTZ 60 HERTZ	198-264	180-220 187-253	342-418	342-462 414-506	450-550 518-633

MODEL	TWR				TWC				TW7				TWD				TWE			
	RATED LOAD AMPS RLA			LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA			LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA			LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA			LOCKED ROTOR AMPS LRA	RATED LOAD AMPS RLA			LOCKED ROTOR AMPS LRA
REFRIGERANT	R22	R407C	R134a	ALL	R22	R407C	R134a	ALL	R22	R407C	R134a	ALL	R22	R407C	R134a	ALL	R22	R407C	R134a	ALL
ZR90K3/K3E	23.6	26.0	26.0	174	27.2	30.2	30.2	189	17.1	17.1	17.1	112	14.3	14.6	14.6	99	10.4	11.8	11.8	74
ZR11M3/M3E	30.5	30.5	30.5	221	34.3	34.3	34.3	232	21.3	21.3	21.3	144	17.5	17.5	17.5	125	13.2	13.2	13.2	100
ZR12M3/M3E	35.0	35.0	35.0	235	38.6	37.5	37.5	278	26.1	26.1	26.1	151	18.9	18.9	18.9	127	15.7	15.7	15.7	100
ZR16M3/M3E	44.2	44.2	44.2	293	47.1	50.4	50.4	350	28.7	28.7	28.7	195	25	28	28	167	19.9	19.9	19.9	125
ZR19M3/M3E	52.2	52.5	52.5	345	55.2	56.7	56.7	425	37.5	38.3	38.3	239	27.2	33.1	33.1	198	24.3	24.3	24.3	148

ZR COMMERCIAL SCROLL COMPRESSOR BILLS OF MATERIAL FOR THE INTERNATIONAL MARKET

"STANDARD" BILLS OF MATERIAL

The bill of material includes features as shown by the X.

MODEL	BILL OF MATERIAL NUMBER	STUB TUBE CONNECTIONS	ROTALOCK CONNECTIONS	SOLID STATE MOTOR PROTECTOR MODULE	TANDEM FITTINGS
ZR90K THROUGH ZR19M	522	X		115/230V	
	540		X	24V	X
	551		X	115/230V	
	561		X	24V	
	568	X		24V	
	570		X	115/230V	X

BILL OF MATERIAL PROVISIONS

Please refer to the bills of material shown on the previous page to view our standard offers of compressor selections.

In addition to the marked features, each compressor will include the following:

- Unique Features – Cast iron inner frame, special bearings, sight glass, oil adjustment port, temperature probe, as well as additional refrigerant and oil filtration capacity.
- Terminal box and cover complete with wiring diagram.
- Four Foot Mounting Pattern.
  8.65 x 8.65 inches
  (219.7 x 219.7 mm)
- Mounting Kit.
- Grounding Tab, Screw, and Washer.
- Grounding tab located in the terminal box.
- Terminal Connector Block with Screws.
- 3GS Oil.
  - Initial oil charge
    For all Specter models
    140 ounces (4.14 liters)
  - Refill oil charge.
    For all Specter models
    137 ounces (4.05 liters)

See outline drawing on pages 28B and 29A for stub tube and rotalock connection sizes.

ACCESSORY INFORMATION

Crankcase Heater - 120 volts	018-0036-01
Crankcase Heater - 240 volts	018-0036-00
Crankcase Heater - 480 volts	018-0036-02
Crankcase Heater - 575 volts	018-0036-03
Mounting Kit	527-0159-00

ROTALOCK SERVICE VALVES

For your ZR rotalock connection compressor, please order the valves separately by choosing them from the tables below.

Valve Style

Table A illustrates the style for each valve listed in Tables B and C. The drawings in this table will show gage port quantity and location. The gage ports are 1/4 inch flare fittings and include brass caps. Note that parts are available in both Europe and U.S. American part numbers are listed in brackets.

Valve Kits

The kits listed in Table B below, include rotalock suction and discharge service valves for the ZR models shown. Use of these with your ZR rotalock connection compressors will simplify your order and inventory process. Refer to Table C for your selection of seal parts.

Special Valves

If the kits are not ordered, special valves and seals should be selected from Table C below to fit the rotalock connections supplied on the ZR compressor. A suggestion is to select valves having the same line sizes as the connections supplied on compressors with stub tubes. Be sure to match rotalock connection sizes.

TABLE A

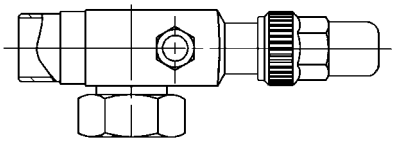
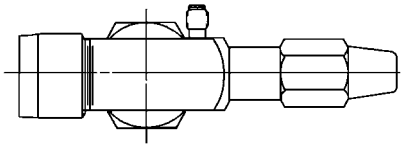
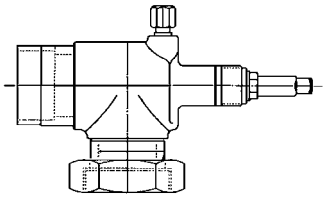
STYLE 1	STYLE 2	STYLE 3
		

TABLE B

COMPRESSOR MODEL	KIT PART NUMBER EUROPE [U.S.]	SUCTION VALVE*			DISCHARGE VALVE*			ROTALOCK CONNECTION SIZE IN INCHES and SEAL PART NUMBER	
		SIZE IN INCHES	VALVE PART NUMBER EUROPE [U.S.]	STYLE	SIZE IN INCHES	VALVE PART NUMBER EUROPE [U.S.]	STYLE	SUCTION	DISCHARGE
ZR90	6309534 **[998-5100-24]**	1 1/8	2837131 **[510-0330-04]**	2	3/4	8032978 **[510-0080-04]**	1	1 3/4-12 2050772 **[020-0028-03]**	1 1/4-12 2495939 **[020-0028-02]**
ZR11	8502282 **[998-5100-16]**	1 3/8	2837120 **[510-0330-03]**	2	3/4	8032978 **[510-0080-04]**	1		
ZR12-ZR16	6309545 **[998-5100-27]**	1 3/8	2837120 **[510-0330-03]**	2	7/8	2837164 **[510-0080-07]**	1		
ZR19	8511928 **[998-5100-39]**	1 5/8	8517357 **[510-0402-00]**	3	1 1/8	2731459 **[510-0330-04]**	2	2 1/4-12 8506819 **[020-0941-00]**	1 3/4-12 2050772 **[020-0028-03]**

*All valves are solder type.

TABLE C

VALVE	ROTALOCK CONNECTION SIZE IN INCHES	VALVE PART NUMBER EUROPE [U.S.]	SIZE IN INCHES	TYPE	STYLE	GASKET PART NUMBER EUROPE [U.S.] (ONE PER VALVE REQUIRED)
Discharge	1 1/4-12	8032978 **[510-0080-04]**	3/4	Solder	1	2495939 **[020-0028-02]**
	1 1/4-12	2837164 **[510-0080-07]**	7/8	Solder	1	2495939 **[020-0028-02]**
	1 3/4-12	2387131 **[510-0330-04]**	1 1/8	Solder	2	2050772 **[020-0028-03]**
Suction	1 3/4-12	2837131 **[510-0330-04]**	1 1/8	Solder	2	2050772 **[020-0028-03]**
	1 3/4-12	2837120 **[510-0330-03]**	1 3/8	Solder	2	2050772 **[020-0028-03]**
	2 1/4-12	8517357 **[510-0402-00]**	1 5/8	Solder	3	8506819 **[020-0941-00]**

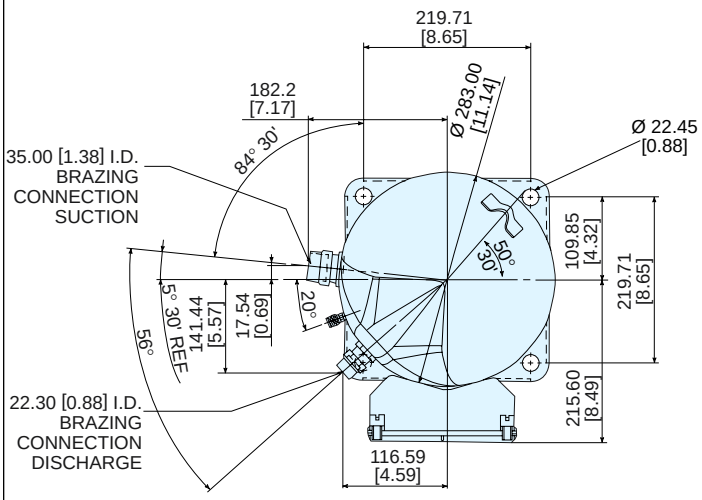
NOTES:

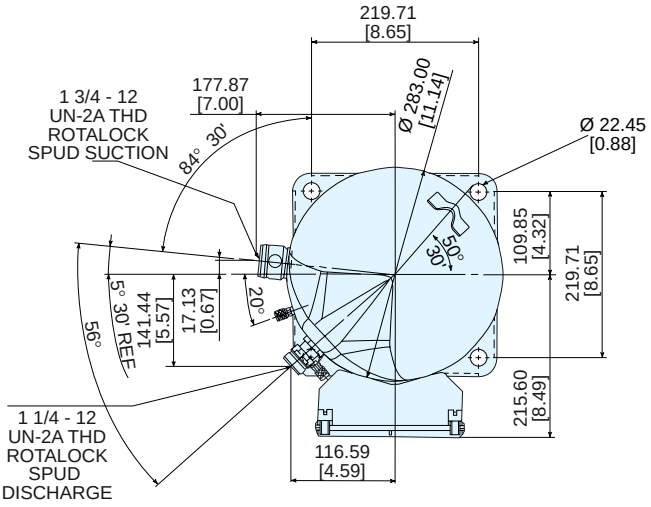
1. NOMINAL DIMENSIONS ARE SHOWN. ALL TOLERANCES ARE ± 1.50 [0.060] UNLESS OTHERWISE SPECIFIED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS VARY FROM THE MOUNTING HOLES BY ± 3.0 [0.12].
3. STUB TUBE AND ROTALOCK FITTINGS ARE SHOWN. BILLS OF MATERIAL PAGE 27A SHOWS B/M NUMBERS FOR EACH TYPE OF FITTING.
4. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

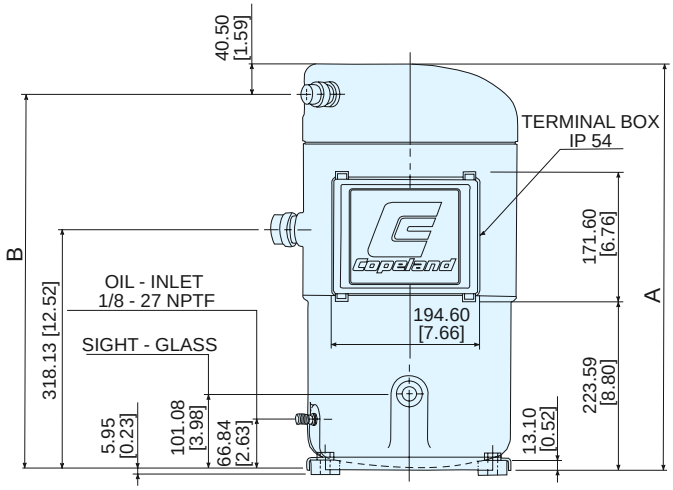
THIRD ANGLE PROJECTION

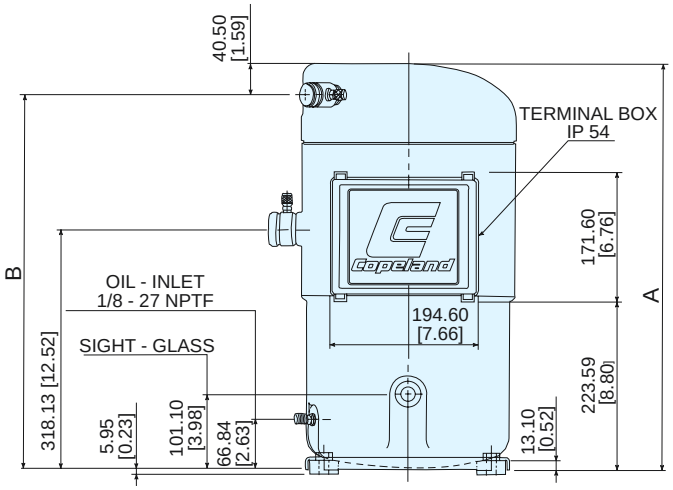
DIMENSIONAL INFORMATION

MODEL NUMBER	A	B	INTERNAL FREE VOLUME CM³ [IN.³] EXCLUDING OIL CHARGE
ZR90K	537.8 [21.2]	497.3 [19.6]	16999 [1037.4]
ZR11M	537.8 [21.2]	497.3 [19.6]	16999 [1037.4]
ZR12M	537.8 [21.2]	497.3 [19.6]	16999 [1037.4]
ZR16M	545.5 [21.5]	505.0 [19.9]	17349 [1058.8]









Available Optional Fittings

FOR THE INTERNATIONAL MARKET

ZR90K to ZR16M
HEAT PUMP AND
AIR CONDITIONING MODELS

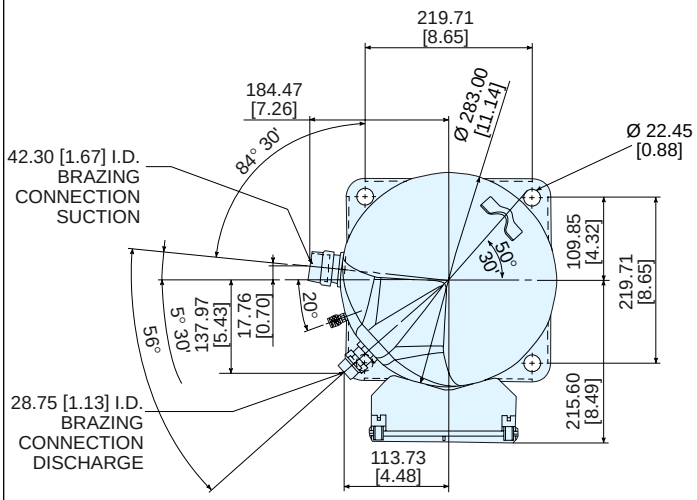
NOTES:

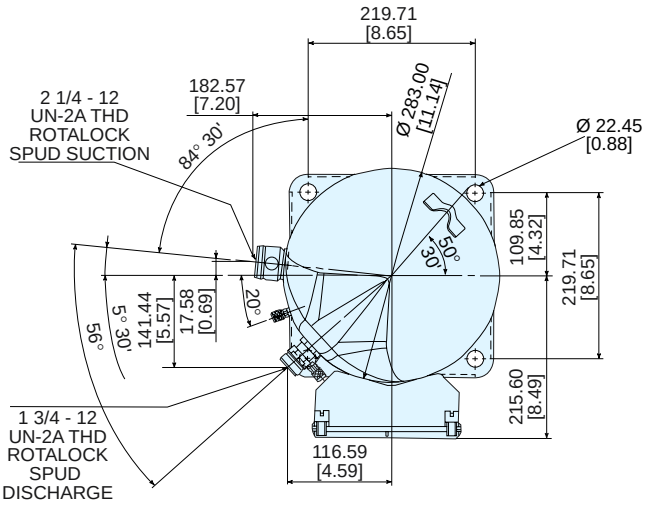
1. NOMINAL DIMENSIONS ARE SHOWN. ALL TOLERANCES ARE ± 1.50 [0.060] UNLESS OTHERWISE SPECIFIED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS VARY FROM THE MOUNTING HOLES BY ± 3.0 [0.12].
3. STUB TUBE AND ROTALOCK FITTINGS ARE SHOWN. BILLS OF MATERIAL PAGE 27A SHOWS B/M NUMBERS FOR EACH TYPE OF FITTING.
4. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

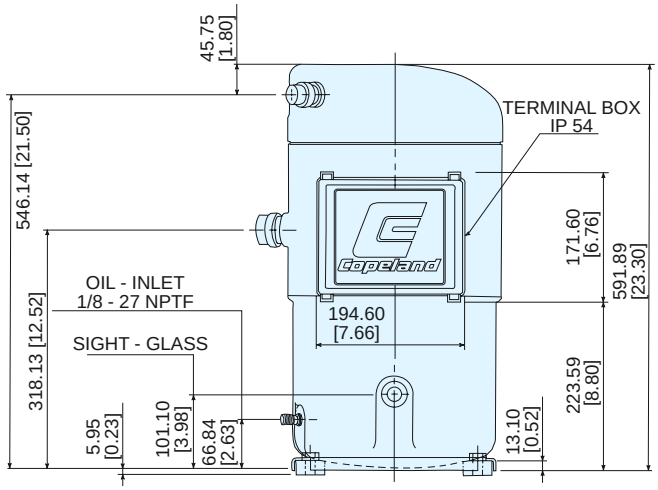
THIRD ANGLE PROJECTION

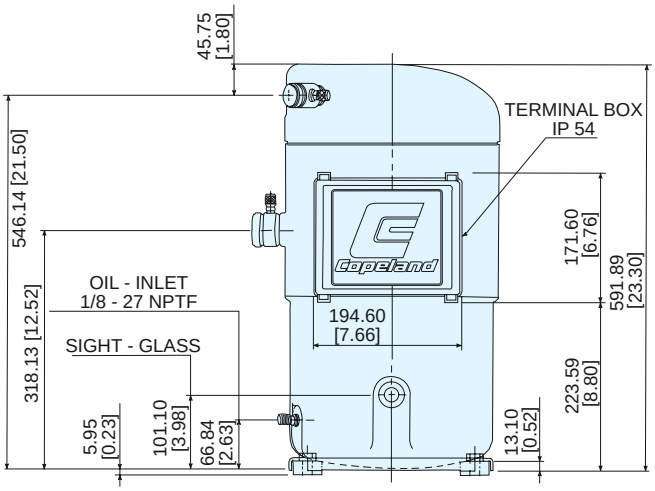
DIMENSIONAL INFORMATION

MODEL NUMBER	INTERNAL FREE VOLUME CM³ [IN.³] EXCLUDING OIL CHARGE
ZR19M	18349 [1119.8]









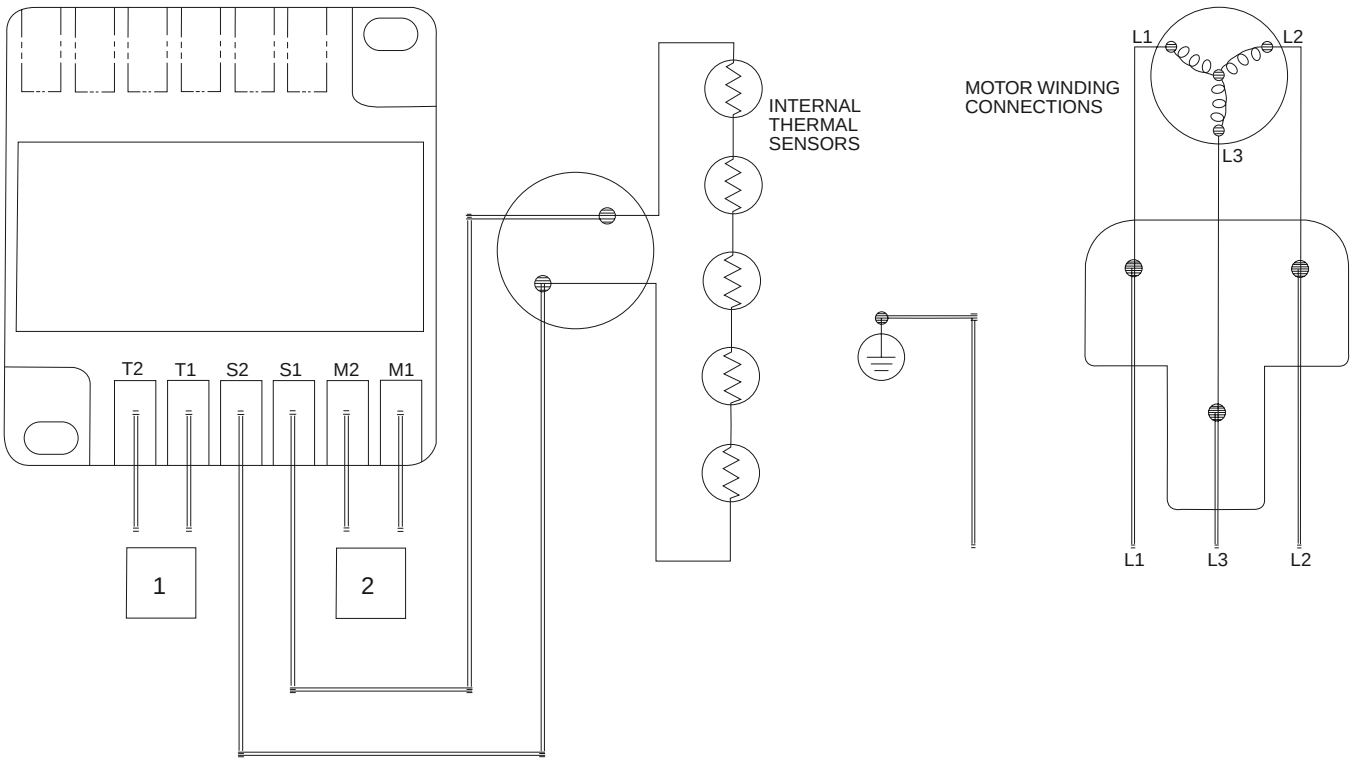
Available Optional Fittings

FOR THE INTERNATIONAL MARKET

ZR19M
HEAT PUMP AND
AIR CONDITIONING MODELS

COMPRESSOR WIRING DIAGRAMS

THREE PHASE MOTOR



WHEN CHECKING SOLID STATE MODULE:

DO NOT SHORT ACROSS S1 AND S2 SENSOR TERMINALS.

MODULE HAS 30 MINUTES TIME DELAY BEFORE RESET IN EVENT OF PROTECTOR TRIP.

SYMBOLS

—〰—	**THERMAL SENSORS**
1	**PROTECTOR MODULE VOLTAGE**
2	**TO CONTROL CIRCUIT**

ZR90K TO ZR19M

USE COPPER CONDUCTORS ONLY

USE MINIMUM 75°C WIRE FOR AMPACITY DETERMINATION.

USE THIS EQUIPMENT ON A GROUNDED SYSTEM ONLY.

PRIMARY SINGLE PHASE FAILURE PROTECTION IS PROVIDED.

PROTECTOR MODULE AND OPTIONAL CRANKCASE HEATER MUST BE CONNECTED ONLY TO THEIR RATED VOLTAGE.

OVERCURRENT PROTECTION DEVICE RATING AND TYPE MUST BE IN ACCORDANCE WITH REGULATORY AGENCY END PRODUCT APPROVALS – SEE SYSTEM NAMEPLATE.

50 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR90K3-TWC/TWR/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	22100	31200	40800	51500	63600	77900	86000	94800	104000
120 (48.9)			36700	46400	57400	70400	77700	85800	94500
140 (60.0)					50400	62100	68800	76100	84000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5570	7870	10300	13000	16000	19600	21700	23900	26300
120 (48.9)			9240	11700	14500	17700	19600	21600	23800
140 (60.0)					12700	15600	17300	19200	21200

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6480	9150	12000	15100	18600	22800	25200	27800	30600
120 (48.9)			10700	13600	16800	20600	22800	25100	27700
140 (60.0)					14800	18200	20100	22300	24600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4550	4660	4720	4740	4730	4730	4740	4750	4770
120 (48.9)			5910	5930	5920	5910	5910	5910	5920
140 (60.0)					7430	7420	7420	7410	7420

ZR11M3-TWC/TWR/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	28800	39100	50600	63600	78700	96100	106000	116000	128000
120 (48.9)			44500	56700	70500	86400	95200	105000	115000
140 (60.0)					61700	76000	83900	92400	102000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7270	9860	12700	16000	19800	24200	26700	29200	32300
120 (48.9)			11200	14300	17800	21800	24000	26500	29000
140 (60.0)					15500	19100	21100	23300	25700

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8450	11500	14800	18600	23100	28200	31000	34100	37400
120 (48.9)			13000	16600	20700	25300	27900	30700	33700
140 (60.0)					18100	22300	24600	27100	29800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5470	5570	5630	5620	5630	5600	5590	5590	5600
120 (48.9)			7020	7070	7090	7080	7060	7050	7040
140 (60.0)					8870	8900	8900	8900	8890

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR12M3-TWC/TWR/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	33400	45300	58600	73800	91200	111000	123000	135000	148000
120 (48.9)			51600	65700	81700	100000	110000	121000	133000
140 (60.0)					71500	88000	97200	107000	118000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8420	11400	14800	18600	23000	28100	30900	34000	37300
120 (48.9)			13000	16500	20600	25200	27800	30600	33600
140 (60.0)					18000	22200	24500	27000	29700

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9800	13300	17200	21600	26700	32600	35900	39500	43300
120 (48.9)			15100	19200	23900	29300	32300	35600	39000
140 (60.0)					20900	25800	28500	31400	34500

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6280	6400	6450	6460	6450	6430	6420	6420	6430
120 (48.9)			8060	8120	8140	8130	8110	8100	8090
140 (60.0)					10200	10200	10200	10200	10200

ZR16M3-TWC/TWR/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	40200	55400	71900	90500	112000	136000	150000	165000	181000
120 (48.9)			62500	80500	101000	123000	136000	149000	163000
140 (60.0)					86600	108000	119000	132000	145000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10100	14000	18100	22800	28200	34400	37800	41600	45600
120 (48.9)			15700	20300	25300	31000	34200	37600	41200
140 (60.0)					21800	27200	30100	33100	36400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	11800	16200	21100	26500	32700	40000	44000	48400	53100
120 (48.9)			18300	23600	29400	36100	39700	43700	47900
140 (60.0)					25400	31600	34900	38500	42400

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7680	7860	7950	8000	8030	8070	8100	8150	8210
120 (48.9)			9860	9970	10000	10000	10000	10000	10000
140 (60.0)					12500	12600	12600	12600	12500

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR19M3-TWC/TWR/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	52300	69200	88500	110700	136400	166100	182700	200500	219600
120 (48.9)			77600	99000	123200	150600	165800	181900	199200
140 (60.0)					108300	133300	146900	161400	176700

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	13200	17400	22300	27900	34400	41900	46000	50500	55300
120 (48.9)			19600	24900	31000	38000	41800	45800	50200
140 (60.0)					27300	33600	37000	40700	44500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	15300	20300	25900	32400	40000	48700	53500	58700	64300
120 (48.9)			22700	29000	36100	44100	48600	53300	58400
140 (60.0)					31700	39100	43000	47300	51800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9210	9390	9480	9510	9510	9530	9560	9600	9660
120 (48.9)			11890	12010	12060	12070	12060	12070	12080
140 (60.0)					15220	15280	15290	15280	15270

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR90K3E-TWC/TWR/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	23300	31800	41400	52700	65900	81900	90900	101000	112000
120 (48.9)			35200	45200	57000	71100	79100	87900	97600
140 (60.0)					48300	60600	67600	75300	83800

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5860	8010	10400	13300	16600	20600	22900	25400	28200
120 (48.9)			8870	11400	14400	17900	19900	22200	24600
140 (60.0)					12200	15300	17000	19000	21100

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6810	9320	12100	15400	19300	24000	26600	29600	32700
120 (48.9)			10300	13200	16700	20800	23200	25800	28600
140 (60.0)					14200	17800	19800	22100	24600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4640	4760	4830	4860	4860	4850	4840	4830	4830
120 (48.9)			6060	6150	6190	6190	6190	6170	6160
140 (60.0)					7760	7840	7860	7870	7870

ZR11M3E-TWC/TWR/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	29500	39300	50900	64700	81300	101000	112000	124000	137000
120 (48.9)			43700	55800	70300	87900	97800	109000	121000
140 (60.0)					60200	75400	84200	93800	104000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7440	9900	12800	16300	20500	25400	28200	31300	34600
120 (48.9)			11000	14100	17700	22100	24700	27400	30400
140 (60.0)					15200	19000	21200	23600	26300

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8650	11500	14900	19000	23800	29600	32800	36400	40200
120 (48.9)			12800	16300	20600	25700	28700	31900	35300
140 (60.0)					17600	22100	24700	27500	30600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5880	5970	6000	6000	5970	5930	5900	5880	5850
120 (48.9)			7560	7630	7640	7620	7590	7560	7530
140 (60.0)					9640	9690	9690	9680	9670

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR12M3E-TWC/TWR/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	34200	45500	58900	75000	94200	117000	130000	144000	159000
120 (48.9)			50700	64600	81500	102000	113000	126000	140000
140 (60.0)					69800	87400	97600	109000	121000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8620	11500	14900	18900	23700	29500	32700	36300	40100
120 (48.9)			12800	16300	20500	25700	28600	31800	35200
140 (60.0)					17600	22000	24600	27400	30500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10000	13300	17300	22000	27600	34300	38100	42200	46600
120 (48.9)			14800	18900	23900	29800	33200	36900	40900
140 (60.0)					20500	25600	28600	31800	35400

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6750	6850	6900	6890	6860	6810	6780	6750	6720
120 (48.9)			8680	8760	8770	8750	8720	8690	8650
140 (60.0)					11100	11100	11100	11100	11100

ZR16M3E-TWC/TWR/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	40400	56300	73600	93400	117000	145000	161000	179000	198000
120 (48.9)			62000	79900	101000	126000	140000	156000	173000
140 (60.0)					84800	107000	120000	133000	149000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10200	14200	18500	23500	29400	36500	40600	45000	49900
120 (48.9)			15600	20100	25400	31700	35300	39200	43600
140 (60.0)					21400	26900	30100	33600	37500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	11800	16500	21600	27400	34200	42400	47200	52300	58000
120 (48.9)			18200	23400	29500	36800	41000	45600	50700
140 (60.0)					24900	31300	35000	39100	43600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7850	8080	8230	8330	8410	8520	8590	8670	8770
120 (48.9)			10300	10500	10700	10800	10800	10900	10900
140 (60.0)					13300	13500	13600	13700	13800

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR19M3E-TWC/TWR/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	51900	69100	89500	114000	143000	177400	196900	217800	240500
120 (48.9)			76300	98400	124600	155500	172900	191700	212100
140 (60.0)					105100	131600	146600	162900	180600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	13100	17400	22600	28700	36000	44700	49600	54900	60600
120 (48.9)			19200	24800	31400	39200	43600	48300	53400
140 (60.0)					26500	33200	36900	41100	45500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	15200	20200	26200	33400	41900	52000	57700	63800	70500
120 (48.9)			22400	28800	36500	45600	50700	56200	62100
140 (60.0)					30800	38600	43000	47700	52900

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10070	10440	10600	10600	10510	10400	10350	10320	10320
120 (48.9)			13160	13320	13320	13240	13190	13140	13100
140 (60.0)					16730	16810	16810	16800	16780

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R134a

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE) Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE) Test Voltage

ZR90K3E-TWC/TWR/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	14500	19900	26100	33600	42400	52900	58800	65300	72200
120 (48.9)			23000	29700	37800	47300	52700	58500	64900
140 (60.0)					32900	41300	46200	51400	57100

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	3650	5010	6590	8460	10700	13300	14800	16400	18200
120 (48.9)			5790	7490	9520	11900	13300	14800	16400
140 (60.0)					8280	10400	11600	13000	14400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4250	5830	7660	9840	12400	15500	17200	19100	21200
120 (48.9)			6740	8710	11100	13900	15400	17200	19000
140 (60.0)					9630	12100	13500	15100	16700

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	3120	3190	3230	3250	3250	3260	3260	3260	3270
120 (48.9)			4040	4080	4110	4110	4110	4110	4110
140 (60.0)					5100	5150	5170	5190	5200

ZR11M3E-TWC/TWR/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	18900	24400	31700	40900	52000	65300	72700	80800	89400
120 (48.9)			28200	36300	46200	58200	65000	72400	80300
140 (60.0)					40200	50600	56600	63200	70300

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4760	6150	7990	10300	13100	16500	18300	20400	22500
120 (48.9)			7120	9140	11600	14700	16400	18200	20200
140 (60.0)					10100	12800	14300	15900	17700

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5540	7150	9290	12000	15200	19100	21300	23700	26200
120 (48.9)			8280	10600	13500	17000	19000	21200	23500
140 (60.0)					11800	14800	16600	18500	20600

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	3610	3710	3800	3860	3920	3960	3970	3990	3990
120 (48.9)			4750	4850	4930	4990	5010	5030	5040
140 (60.0)					6120	6230	6280	6320	6350

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R134a

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR12M3E-TWC/TWR/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	21900	28300	36800	47400	60300	75700	84300	93600	104000
120 (48.9)			32700	42000	53500	67400	75300	83900	93000
140 (60.0)					46600	58700	65600	73200	81500

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5520	7130	9260	11900	15200	19100	21200	23600	26100
120 (48.9)			8250	10600	13500	17000	19000	21100	23400
140 (60.0)					11700	14800	16500	18500	20500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6420	8290	10800	13900	17700	22200	24700	27400	30400
120 (48.9)			9590	12300	15700	19800	22100	24600	27300
140 (60.0)					13600	17200	19200	21500	23900

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4150	4260	4360	4440	4500	4550	4560	4580	4590
120 (48.9)			5460	5570	5660	5730	5750	5770	5780
140 (60.0)					7030	7160	7210	7250	7290

ZR16M3E-TWC/TWR/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	26900	34800	45100	58200	74000	92900	104000	115000	127000
120 (48.9)			40200	51600	65700	82800	92500	103000	114000
140 (60.0)					57200	72000	80600	89900	100000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6780	8770	11400	14700	18700	23400	26100	29000	32100
120 (48.9)			10100	13000	16600	20900	23300	25900	28800
140 (60.0)					14400	18200	20300	22700	25200

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7880	10200	13200	17000	21700	27200	30300	33700	37300
120 (48.9)			11800	15100	19300	24300	27100	30200	33500
140 (60.0)					16800	21100	23600	26300	29300

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5230	5310	5380	5440	5520	5620	5680	5760	5850
120 (48.9)			6790	6890	6970	7050	7090	7140	7190
140 (60.0)					8690	8800	8850	8890	8930

Production compressors to meet above nominal performance values within ± 5%.

50 HERTZ PERFORMANCE DATA R134a

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

200-3-50 (TWC) 380/420-3-50 (TWD) 220/240-3-50 (TWR) 500-3-50 (TWE)	Rated Voltage	200-3-50 (TWC) 380-3-50 (TWD) 220-3-50 (TWR) 500-3-50 (TWE)	Test Voltage

ZR19M3E-TWC/TWR/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C – 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	27000	39000	52900	69200	88400	111000	123700	137400	152200
120 (48.9)			46300	61100	78500	98800	110300	122600	136000
140 (60.0)					67700	85900	96100	107100	119100

CAPACITY (KCAL/HOUR)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	6800	9830	13300	17400	22300	28000	31200	34600	38400
120 (48.9)			11700	15400	19800	24900	27800	30900	34300
140 (60.0)					17100	21600	24200	27000	30000

CAPACITY (WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	7910	11400	15500	20300	25900	32500	36200	40300	44600
120 (48.9)			13600	17900	23000	28900	32300	35900	39800
140 (60.0)					19800	25200	28200	31400	34900

POWER (MOTOR WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	6670	6920	7090	7200	7250	7270	7270	7270	7280
120 (48.9)			8700	8840	8920	8980	9000	9010	9030
140 (60.0)					11020	11100	11140	11170	11200

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Test Voltage

ZR90K3-TWC/TW7/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	26700	37700	49300	62200	76900	94200	103900	114600	126200
120 (48.9)			44200	56000	69400	85000	93900	103600	114200
140 (60.0)					60800	75000	83000	91900	101500

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6730	9500	12400	15700	19400	23700	26200	28900	31800
120 (48.9)			11100	14100	17500	21400	23700	26100	28800
140 (60.0)					15300	18900	20900	23200	25600

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7820	11000	14400	18200	22500	27600	30400	33600	37000
120 (48.9)			13000	16400	20300	24900	27500	30400	33500
140 (60.0)					17800	22000	24300	26900	29700

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5470	5600	5670	5690	5690	5690	5690	5710	5730
120 (48.9)			7130	7150	7140	7130	7120	7130	7140
140 (60.0)					8990	8970	8960	8960	8970

ZR11M3-TWC/TW7/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	34900	47300	61100	76900	95100	116000	128000	141000	154000
120 (48.9)			53800	68500	85200	104000	115000	127000	139000
140 (60.0)					74500	91800	101000	112000	123000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8790	11900	15400	19400	24000	29300	32200	35500	38800
120 (48.9)			13500	17200	21500	26300	29000	31900	35000
140 (60.0)					18800	23100	25500	28100	30900

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10200	13900	17900	22500	27900	34000	37500	41300	45100
120 (48.9)			15800	20100	25000	30600	33700	37100	40700
140 (60.0)					21800	26900	29700	32700	35900

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6610	6740	6790	6810	6790	6770	6760	6760	6770
120 (48.9)			8480	8560	8570	8560	8540	8530	8520
140 (60.0)					10730	10760	10770	10760	10750

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)
208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Rated Voltage		230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Test Voltage

ZR12M3-TWC/TW7/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C – 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	40400	54800	70800	89100	110000	135000	148000	163000	179000
120 (48.9)			62300	79300	98700	121000	133000	147000	161000
140 (60.0)					86300	106000	118000	129000	142000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	10200	13800	17800	22500	27800	33900	37300	41000	45000
120 (48.9)			15700	20000	24900	30500	33600	36900	40600
140 (60.0)					21800	26800	29700	32600	35800

CAPACITY (WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	11800	16000	20700	26100	32300	39400	43400	47700	52300
120 (48.9)			18300	23200	28900	35400	39100	43000	47200
140 (60.0)					25300	31200	34600	37900	41700

POWER (MOTOR WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	7580	7720	7790	7800	7780	7760	7750	7750	7760
120 (48.9)			9730	9810	9830	9810	9790	9770	9760
140 (60.0)					12300	12340	12340	12330	12320

ZR16M3-TWC/TW7/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C – 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	48600	66900	86900	109000	135000	165000	181000	199000	219000
120 (48.9)			75500	97300	121000	149000	164000	180000	198000
140 (60.0)					105000	130000	144000	159000	175000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	12200	16900	21900	27600	34000	41500	45700	50300	55200
120 (48.9)			19000	24500	30500	37500	41300	45400	49900
140 (60.0)					26400	32800	36300	40100	44200

CAPACITY (WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	14200	19600	25500	32000	39500	48200	53100	58400	64200
120 (48.9)			22100	28500	35500	43600	48100	52800	58000
140 (60.0)					30700	38200	42300	46700	51400

POWER (MOTOR WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	9450	9660	9770	9830	9860	9910	9940	10000	10070
120 (48.9)			11980	12110	12160	12160	12160	12150	12150
140 (60.0)					15080	15130	15130	15110	15090

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R22

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Test Voltage

ZR19M3-TWC/TW7/TWD/TWE R22

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	69700	86700	108500	135000	166400	202400	222200	243200	265300
120 (48.9)			97400	121100	149700	183000	201500	221200	242000
140 (60.0)					132000	161800	178500	196500	215600

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	17600	21800	27300	34000	41900	51000	56000	61300	66900
120 (48.9)			24500	30500	37700	46100	50800	55700	61000
140 (60.0)					33300	40800	45000	49500	54300

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	20400	25400	31800	39600	48800	59300	65100	71300	77700
120 (48.9)			28500	35500	43900	53600	59000	64800	70900
140 (60.0)					38700	47400	52300	57600	63200

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	11050	11350	11520	11590	11640	11710	11780	11870	12000
120 (48.9)			14330	14540	14640	14700	14730	14780	14840
140 (60.0)					18270	18440	18500	18560	18610

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Test Voltage

ZR90K3E-TWC/TW7/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	28100	38500	50100	63700	79800	99000	110000	122000	135200
120 (48.9)			42600	54700	68900	86000	95700	106300	118000
140 (60.0)					58400	73300	81800	91100	101300

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7080	9700	12600	16100	20100	24900	27700	30700	34100
120 (48.9)			10700	13800	17400	21700	24100	26800	29700
140 (60.0)					14700	18500	20600	23000	25500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8230	11300	14700	18700	23400	29000	32200	35700	39600
120 (48.9)			12500	16000	20200	25200	28000	31100	34600
140 (60.0)					17100	21500	24000	26700	29700

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5610	5760	5840	5880	5880	5870	5860	5850	5840
120 (48.9)			7330	7440	7490	7490	7480	7470	7450
140 (60.0)					9390	9480	9510	9520	9520

ZR11M3E-TWC/TW7/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	35700	47500	61500	78200	98200	122000	135500	150100	166000
120 (48.9)			52800	67400	85000	106200	118200	131400	145700
140 (60.0)					72800	91100	101700	113400	126100

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9000	12000	15500	19700	24700	30700	34100	37800	41800
120 (48.9)			13300	17000	21400	26800	29800	33100	36700
140 (60.0)					18300	23000	25600	28600	31800

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10500	13900	18000	22900	28800	35700	39700	44000	48600
120 (48.9)			15500	19700	24900	31100	34600	38500	42700
140 (60.0)					21300	26700	29800	33200	36900

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7110	7220	7260	7260	7230	7170	7140	7110	7080
120 (48.9)			9140	9220	9240	9210	9180	9150	9110
140 (60.0)					11660	11720	11720	11710	11690

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Test Voltage

ZR12M3E-TWC/TW7/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	41300	55000	71200	90600	113800	141300	156900	173900	192200
120 (48.9)			61200	78100	98500	123000	137000	152200	168800
140 (60.0)					84300	105600	117900	131300	146100

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	10400	13900	17900	22800	28700	35600	39500	43800	48400
120 (48.9)			15400	19700	24800	31000	34500	38400	42500
140 (60.0)					21200	26600	29700	33100	36800

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	12100	16100	20900	26500	33300	41400	46000	51000	56300
120 (48.9)			17900	22900	28900	36000	40100	44600	49500
140 (60.0)					24700	30900	34500	38500	42800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8150	8270	8320	8320	8280	8220	8180	8150	8110
120 (48.9)			10480	10570	10590	10560	10520	10480	10440
140 (60.0)					13370	13430	13430	13420	13400

ZR16M3E-TWC/TW7/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	48900	68100	89000	112900	141100	175000	194500	215900	239400
120 (48.9)			75000	96600	121800	151900	169200	188200	209100
140 (60.0)					102600	129200	144500	161300	179800

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	12300	17200	22400	28500	35600	44100	49000	54400	60300
120 (48.9)			18900	24300	30700	38300	42600	47400	52700
140 (60.0)					25900	32600	36400	40600	45300

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	14300	20000	26100	33100	41300	51300	57000	63300	70100
120 (48.9)			22000	28300	35700	44500	49600	55100	61300
140 (60.0)					30100	37900	42300	47300	52700

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9490	9760	9940	10060	10160	10290	10370	10470	10600
120 (48.9)			12460	12720	12890	13020	13070	13130	13200
140 (60.0)					16040	16340	16460	16560	16650

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R407C

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Test Voltage

ZR19M3E-TWC/TW7/TWD/TWE R407C

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	63300	84200	109100	138900	174300	216200	239800	265400	293000
120 (48.9)			93000	119900	151800	189400	210600	233500	258300
140 (60.0)					128000	160300	178600	198500	220000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	16000	21200	27500	35000	43900	54500	60400	66900	73800
120 (48.9)			23400	30200	38300	47700	53100	58800	65100
140 (60.0)					32300	40400	45000	50000	55400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	18500	24700	32000	40700	51100	63300	70300	77800	85800
120 (48.9)			27200	35100	44500	55500	61700	68400	75700
140 (60.0)					37500	47000	52300	58200	64500

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	12320	12770	12960	12960	12860	12720	12670	12630	12630
120 (48.9)			16100	16290	16300	16200	16140	16070	16030
140 (60.0)					20470	20560	20560	20550	20530

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R134a

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE) Test Voltage

ZR90K3E-TWC/TW7/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C – 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	17500	24000	31600	40600	51300	64000	71200	78900	87400
120 (48.9)			27800	36000	45700	57200	63700	70800	78500
140 (60.0)					39800	50000	55900	62200	69100

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4410	6050	7960	10200	12900	16100	17900	19900	22000
120 (48.9)			7010	9070	11500	14400	16100	17800	19800
140 (60.0)					10000	12600	14100	15700	17400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5130	7030	9260	11900	15000	18800	20900	23100	25600
120 (48.9)			8150	10500	13400	16800	18700	20700	23000
140 (60.0)					11700	14700	16400	18200	20200

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	3780	3860	3900	3930	3940	3940	3940	3950	3960
120 (48.9)			4890	4940	4970	4980	4980	4980	4980
140 (60.0)					6170	6240	6260	6280	6290

ZR11M3E-TWC/TW7/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C – 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	22800	29500	38300	49400	62900	78900	87900	97600	108100
120 (48.9)			34100	43800	55800	70300	78600	87500	97000
140 (60.0)					48600	61200	68500	76400	85000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5750	7430	9650	12400	15900	19900	22200	24600	27200
120 (48.9)			8590	11000	14100	17700	19800	22100	24400
140 (60.0)					12200	15400	17300	19300	21400

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6680	8640	11200	14500	18400	23100	25800	28600	31700
120 (48.9)			9990	12800	16300	20600	23000	25600	28400
140 (60.0)					14200	17900	20100	22400	24900

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	4370	4490	4590	4670	4740	4790	4800	4820	4830
120 (48.9)			5750	5870	5960	6030	6060	6080	6090
140 (60.0)					7410	7540	7590	7640	7670

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R134a

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Test Voltage

ZR12M3E-TWC/TW7/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	26400	34200	44400	57200	72800	91400	101800	113100	125200
120 (48.9)			39600	50800	64700	81500	91000	101300	112400
140 (60.0)					56300	70900	79300	88500	98400

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6650	8620	11200	14400	18300	23000	25700	28500	31600
120 (48.9)			9980	12800	16300	20500	22900	25500	28300
140 (60.0)					14200	17900	20000	22300	24800

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	7740	10000	13000	16800	21300	26800	29800	33100	36700
120 (48.9)			11600	14900	19000	23900	26700	29700	32900
140 (60.0)					16500	20800	23200	25900	28800

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	5010	5140	5260	5360	5430	5490	5510	5520	5540
120 (48.9)			6590	6730	6840	6920	6940	6970	6980
140 (60.0)					8490	8640	8700	8760	8800

ZR16M3E-TWC/TW7/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C								
	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	32500	42000	54500	70300	89500	112300	125100	138900	153700
120 (48.9)			48600	62300	79400	100000	111700	124400	138000
140 (60.0)					69100	87100	97400	108600	120900

CAPACITY (KCAL/HOUR)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	8190	10600	13700	17700	22600	28300	31500	35000	38700
120 (48.9)			12200	15700	20000	25200	28100	31300	34800
140 (60.0)					17400	21900	24500	27400	30500

CAPACITY (WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	9520	12300	16000	20600	26200	32900	36700	40700	45000
120 (48.9)			14200	18300	23300	29300	32700	36400	40400
140 (60.0)					20200	25500	28500	31800	35400

POWER (MOTOR WATTS)

°F/°C	– 10 – 23.3	0 – 17.8	10 – 12.2	20 – 6.7	30 – 1.1	40 4.4	45 7.2	50 10.0	55 12.8
100 (37.8)	6320	6420	6500	6580	6670	6790	6870	6960	7070
120 (48.9)			8210	8330	8430	8530	8580	8630	8690
140 (60.0)					10510	10640	10700	10750	10800

Production compressors to meet above nominal performance values within ± 5%.

60 HERTZ PERFORMANCE DATA R134a

20° F (11.1° C) Superheat	15° F (8.3° C) Subcooling	95° F (35° C) Ambient (Air Over)

208/230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Rated Voltage	230-3-60 (TWC) 460-3-60 (TWD) 380-3-60 (TW7) 575-3-60 (TWE)	Test Voltage

ZR19M3E-TWC/TW7/TWD/TWE R134a

CAPACITY (BTU/HOUR)

CONDENSING TEMPERATURE °F/°C	EVAPORATING TEMPERATURE °F/°C – 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	32900	47500	64400	84300	107700	135200	150600	167300	185300
120 (48.9)			56400	74500	95600	120400	134300	149400	165600
140 (60.0)					82400	104600	117000	130500	145000

CAPACITY (KCAL/HOUR)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	8290	12000	16200	21200	27100	34100	38000	42200	46700
120 (48.9)			14200	18800	24100	30300	33800	37600	41700
140 (60.0)					20800	26400	29500	32900	36500

CAPACITY (WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	9640	13900	18900	24700	31600	39600	44100	49000	54300
120 (48.9)			16500	21800	28000	35300	39300	43800	48500
140 (60.0)					24100	30600	34300	38200	42500

POWER (MOTOR WATTS)

°F/°C	– 10 / – 23.3	0 / – 17.8	10 / – 12.2	20 / – 6.7	30 / – 1.1	40 / 4.4	45 / 7.2	50 / 10.0	55 / 12.8
100 (37.8)	8150	8470	8680	8800	8860	8890	8890	8900	8900
120 (48.9)			10640	10810	10910	10980	11000	11020	11050
140 (60.0)					13480	13580	13620	13660	13700

Production compressors to meet above nominal performance values within ± 5%.

50 60 HERTZ — APPROVED COMPRESSOR OPERATING RANGE — R22 R407C R134a

AN OKAY INDICATES AN APPROVED POINT FOR COMPRESSOR OPERATION

AN ** INDICATES A NON-APPROVED POINT FOR COMPRESSOR OPERATION**

CONDENSING TEMPERATURE		EVAPORATING TEMPERATURE °F/°C								
°F	°C	–10 –23.3	0 –17.8	10 –12.2	20 –6.7	30 –1.1	40 4.4	45 7.2	50 10.0	55 12.8
80	26.7	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
90	32.2	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
100	37.8	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
110	43.3	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
120	48.9	****	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
130	54.4	****	****	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
140	60.0	****	****	****	****	OKAY	OKAY	OKAY	OKAY	OKAY
150	65.6	****	****	****	****	****	OKAY	OKAY	OKAY	OKAY

Approved range is based on 20 °F (11.1°C) of superheat.

UNITS CONVERSION CHART

BTUH × 0.252 = KCALH
BTUH × 0.293 = WATTS
(°F – 32) × 5/9 = °C
POUNDS × 0.454 = KILOGRAMS
INCHES × 25.4 = MILLIMETERS
CUBIC INCHES × 16.386 = CUBIC CENTIMETERS
FLUID OUNCES × 0.02957 = LITERS
CUBIC FEET × 0.02831 = CUBIC METERS
HORSEPOWER × 0.746 = KILOWATTS

SPECTER APPLICATION NOTES

Due to the Specter Scroll's large operating capacity and unique features, it has some different characteristics than Summit and other Scroll compressors. Please refer to Application Bulletin **AE 4-1316** for more details.

- Due to the inherent ability of the Copeland Scroll to handle liquid refrigerant in flooded conditions, no crankcase heater or accumulator is required when the system charge does not exceed 17 pounds (7.7 Kg).
- Since Scroll compressors have very high volumetric efficiencies, their displacements are lower than comparable capacity reciprocating compressors. As a result, Copeland recommends that the capacity rating on reversing valves be no more than 2 times the nominal capacity of the compressor with which it will be used in order to ensure proper operation of the reversing valve under all operating conditions.
- For the Specter Scroll, the discharge gas temperature protection is incorporated in the motor protection.
- The electronic motor protection used in all Specter Scroll models is identified by a "W" as the center letter in the motor code. This system utilizes the temperature dependent resistance of thermistors (also called PTC-resistances) to read the winding temperature.
- A low ambient cut-out is not required to limit heat pump operation.
- There is no internal pressure relief valve in the Specter Scroll compressors. To ensure safe operation, a high pressure control set no higher than 425 psig for R22, 455 psig for R407C, and 290 psig for R134a must be used in all applications.
- A low pressure control is strongly recommended for protection against charge loss. Cut out settings no lower than the following are recommended:
  - R22 — 25 psig for air conditioning
  - — 7 psig for heat pumps
  - R407C — 20 psig for air conditioning
  - — 4 psig for heat pumps
  - R134a — 6 psig for air conditioning
  - — 4 psig for heat pumps
- Since the Scroll compressor is such an excellent gas expander, the compressor may run backwards for a very brief period at shutoff as the internal pressures equalize. A floating valve in the upper scroll of the compressor prevents the compressor from running backwards for more than a second or two.
- The compressor has the approval to operate as a heat pump with the R22, R407C, and R134a operating range.
- Complete 50 and 60 Hertz performance curves for R22, R407C, and R134a are available in the units as follows for all models:
  - Capacity BTUH
  - Power Input Watts
  - Current Amps
  - Efficiency BTUH/Watt
- Copeland has compiled a book of compressor Application Bulletins. Please see the following bulletins, from the book, for more ZR compressor application information as entitled below:

Mounting Parts	AE 4-1111
Application Guidelines	AE 4-1316
Nameplate Amperage Rating	AE 9-1154
Nameplate Voltage	AE 9-1228
Maximum Continuous Current Rating	AE 9-1250

MULTIPACK PACKAGING AND SHIPPING INFORMATION

Compressors are placed on a heavy-duty skid, overpacked with a protective shroud, and banded.

MODEL	NUMBER OF COMPRESSORS PER MULTIPACK	MULTIPACK WEIGHT POUNDS KILOGRAMS	MULTIPACK DIMENSIONS LENGTH x WIDTH x HEIGHT INCHES CENTIMETERS	MULTIPACK CUBE CUBIC FEET CUBIC METERS	NUMBER OF MULTIPACKS PER 20 FOOT STEEL CONTAINER	NUMBER OF COMPRESSORS PER 20 FOOT STEEL CONTAINER*	TOTAL WEIGHT INSIDE 20 FOOT STEEL CONTAINER POUNDS KILOGRAMS
ZR90K	6	1256 570	30.9 x 45.3 x 28.5 78.5 x 115 x 72.5	23.1 0.65	31	186	38900 17700
ZR11M	6	1256 570	30.9 x 45.3 x 28.5 78.5 x 115 x 72.5	23.1 0.65	31	186	38900 17700
ZR12M	6	1269 576	30.9 x 45.3 x 28.5 78.5 x 115 x 72.5	23.1 0.65	30	180	38100 17300
ZR16M	6	1348 612	30.9 x 45.3 x 29.1 78.5 x 115 x 74.0	23.6 0.67	28	168	37700 17100
ZR19M	6	1467 666	30.9 x 45.3 x 29.1 78.5 x 115 x 74.0	23.6 0.67	26	156	38100 17300

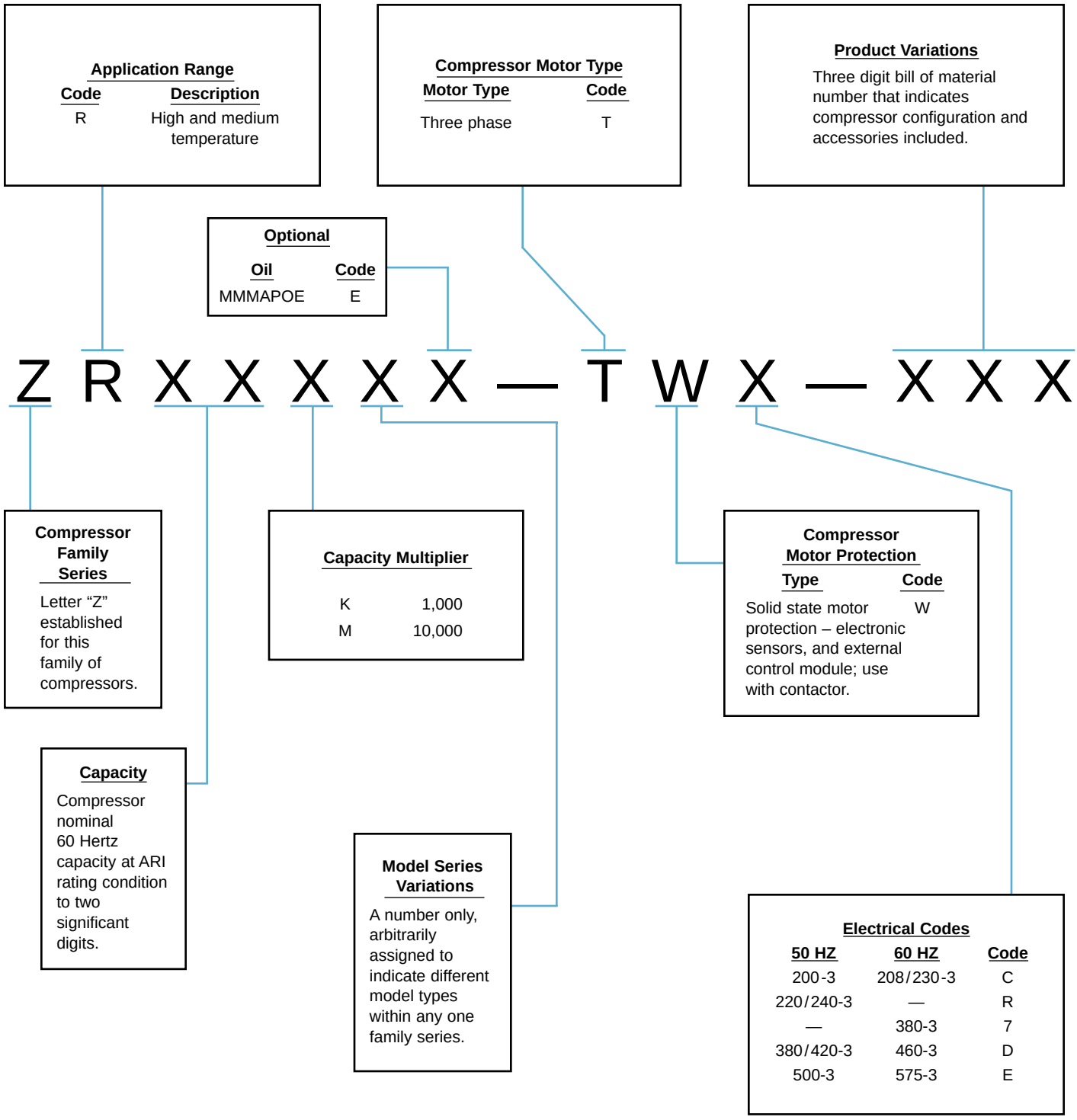
*Minimum quantities are shown. Quantities can be increased through special arrangements if certain equipment and services are available.

SINGLE PACK PACKAGING AND SHIPPING INFORMATION

For your shipments of 1 single pack, the box dimensions (cube) are 16.9 x 15.6 x 27.2 inches (4.1 FT^3), 43 x 39.5 x 69 centimeters (0.12 m^3), and the weights (pounds/kilograms) are shown below.

MODEL	POUNDS	KILOGRAMS
ZR90K	212	96
ZR11M	212	96
ZR12M	214	97
ZR16M	227	103
ZR19M	258	117

MODEL NUMBER NOMENCLATURE



SPECTER TANDEM COMPRESSORS

50 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE — **200-3-50 (TWC) 220-3-50 (TWR) 380-3-50 (TWD) 500-3-50 (TWE) TEST VOLTAGE**

MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZZ18M3-TWC/R/D/E	A	148200	37300	43400	13200	50.0/45.5/26.3/20.0	11.2	2.8	3.3
	B	147000	37000	43100	13230	50.0/45.5/26.3/20.0	11.1	2.8	3.3
	C	172000	43300	50400	9440	42.0/38.2/22.1/16.8	18.2	4.6	5.3
ZZ21M3-TWC/R/D/E	A	178700	45000	52400	15710	58.0/52.7/30.5/23.2	11.4	2.9	3.3
	B	177300	44700	51900	15740	58.0/52.7/30.5/23.2	11.3	2.8	3.3
	C	208800	52600	61200	11150	47.8/43.5/25.2/19.1	18.7	4.7	5.5
ZZ22M3-TWC/R/D/E	A	180700	45500	52900	15840	57.4/52.2/30.2/23.0	11.4	2.9	3.3
	B	179300	45200	52500	15870	57.4/52.2/30.2/23.0	11.3	2.8	3.3
	C	211300	53200	61900	11170	46.4/42.2/24.4/18.6	18.9	4.8	5.5
ZZ24M3-TWC/R/D/E	A	209300	52700	61300	18200	65.8/59.8/34.6/26.3	11.5	2.9	3.4
	B	207600	52300	60800	18240	65.8/59.8/34.6/26.3	11.4	2.9	3.3
	C	245200	61800	71800	12840	53.4/48.5/28.1/21.4	19.1	4.8	5.6
ZZ28M3-TWC/R/D/E	A	233600	58900	68400	20280	71.0/64.5/37.4/28.4	11.5	2.9	3.4
	B	231700	58400	67900	20320	71.0/64.5/37.4/28.4	11.4	2.9	3.3
	C	272800	68700	79900	14540	57.2/52.0/30.1/22.9	18.8	4.7	5.5
ZZ32M3-TWC/R/D/E	A	257200	64800	75400	22420	76.6/69.6/40.3/30.6	11.5	2.9	3.4
	B	255200	64300	74800	22460	76.6/69.6/40.3/30.6	11.4	2.9	3.3
	C	300200	75700	88000	16200	61.0/55.4/32.1/24.4	18.5	4.7	5.4
ZZ35M3-TWC/R/D/E	A	286700	72200	84000	24770	86.8/78.9/45.7/34.7	11.6	2.9	3.4
	B	284400	71700	83300	24820	86.8/78.9/45.7/34.7	11.5	2.9	3.4
	C	333100	83900	97600	17640	68.4/62.2/36.0/27.4	18.9	4.8	5.5
ZZ38M3-TWC/R/D/E	A	315800	79600	92500	27090	94.6/86.0/49.8/37.8	11.7	2.9	3.4
	B	313300	79000	91800	27140	94.6/86.0/49.8/37.8	11.5	2.9	3.4
	C	365100	92000	107000	19130	74.6/67.8/39.3/29.8	19.1	4.8	5.6

* Ampere values shown are at 200 volts/220 volts/380 volts/500 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See full operating range on page 47B.
Production compressors to meet above nominal performance values within ±5%.

60 HERTZ PERFORMANCE NOMINALS R22

THREE PHASE

230-3-60 (TWC)
380-3-60 (TW7)
460-3-60 (TWD)
575-3-60 (TWE)
TEST VOLTAGE

MODEL	RATING CONDITION	CAPACITY			MOTOR WATTS	AMPERES*	ENERGY EFFICIENCY RATING		
		BTU HOUR	KCAL HOUR	WATTS			BTUH MOTOR WATTS	KCALH MOTOR WATTS	WATTS MOTOR WATTS
ZZ18M3-TWC/7/D/E	A	179100	45100	52500	15930	50.0/30.3/25.0/20.0	11.2	2.8	3.3
	B	177700	44800	52100	15960	50.0/30.3/25.0/20.0	11.1	2.8	3.3
	C	207700	52300	60900	11390	42.0/25.4/21.0/16.8	18.2	4.6	5.3
ZZ21M3-TWC/7/D/E	A	216000	54400	63300	18960	57.8/35.0/28.9/23.1	11.4	2.9	3.3
	B	214300	54000	62800	19000	57.8/35.0/28.9/23.1	11.3	2.8	3.3
	C	251700	63400	73700	13480	47.6/28.8/23.8/19.0	18.7	4.7	5.5
ZZ22M3-TWC/7/D/E	A	218400	55000	64000	19140	57.0/34.5/28.5/22.8	11.4	2.9	3.3
	B	216700	54600	63500	19180	57.0/34.5/28.5/22.8	11.3	2.8	3.3
	C	255500	64400	74900	13520	46.2/28.0/23.1/18.5	18.9	4.8	5.5
ZZ24M3-TWC/7/D/E	A	253000	63800	74100	21990	65.4/39.6/32.7/26.2	11.5	2.9	3.4
	B	251000	63300	73500	22030	65.4/39.6/32.7/26.2	11.4	2.9	3.3
	C	296700	74800	86900	15510	53.0/32.1/26.5/21.2	19.1	4.8	5.6
ZZ28M3-TWC/7/D/E	A	282300	71100	82700	24500	70.8/42.9/35.4/28.3	11.5	2.9	3.4
	B	280100	70600	82100	24550	70.8/42.9/35.4/28.3	11.4	2.9	3.3
	C	329800	83100	96600	17700	56.4/34.2/28.2/22.6	18.6	4.7	5.5
ZZ32M3-TWC/7/D/E	A	311600	78500	91300	27080	76.2/46.1/38.1/30.5	11.5	2.9	3.4
	B	309100	77900	90600	27130	76.2/46.1/38.1/30.5	11.4	2.9	3.3
	C	362500	91400	106200	19920	60.0/36.3/30.0/24.0	18.2	4.6	5.3
ZZ35M3-TWC/7/D/E	A	347400	87500	101800	30030	86.2/52.2/43.1/34.5	11.6	2.9	3.4
	B	344600	86800	101000	30090	86.2/52.2/43.1/34.5	11.5	2.9	3.4
	C	403100	101600	118100	21730	66.8/40.4/33.4/26.7	18.6	4.7	5.4
ZZ38M3-TWC/7/D/E	A	382800	96500	112200	32990	96.4/58.4/48.2/38.6	11.6	2.9	3.4
	B	379800	95700	111300	33060	96.4/58.4/48.2/38.6	11.5	2.9	3.4
	C	444900	112100	130400	23560	73.8/44.7/36.9/29.5	18.9	4.8	5.5

*Ampere values shown are at 230 volts/380 volts/460 volts/575 volts.

RATING CONDITION	RATING STANDARD	EVAPORATING TEMPERATURE °F/°C	CONDENSING TEMPERATURE °F/°C	AMBIENT TEMPERATURE °F/°C	LIQUID TEMPERATURE °F/°C	RETURN GAS TEMPERATURE °F/°C
A	ASRE/T	45 7.2	130 54.4	95 35.0	115 46.1	95 35.0
B	ARI	45 7.2	130 54.4	95 35.0	115 46.1	65 18.3
C	CHEER ★	45 7.2	100 37.8	95 35.0	85 29.4	65 18.3

See full operating range on page 47B.
Production compressors to meet above nominal performance values within ±5%.

MECHANICAL SPECIFICATIONS

MODEL	NOMINAL HP KW	IN^3 CM^3 CUBIC INCHES PER REVOLUTION CUBIC CENTIMETERS PER REVOLUTION	CFH M^3/HR CUBIC FEET PER HOUR CUBIC METERS PER HOUR		COMPRESSOR NET WEIGHT WITH OIL POUNDS KILOGRAMS
			50 HERTZ 2900 RPM	60 HERTZ 3500 RPM	
ZZ18M3	15.0 11.2	14.64 239.9	1474.0 41.73	1779.0 50.36	478 217
ZZ21M3	17.5 13.1	17.42 285.4	1753.5 49.64	2116.3 59.91	490 222
ZZ22M3	18.3 13.7	17.58 288.1	1770.2 50.11	2136.4 60.48	490 222
ZZ24M3	20.0 14.9	20.19 330.8	2033.0 57.55	2453.6 69.46	496 225
ZZ28M3	23.3 17.4	22.57 369.8	2272.1 64.32	2742.1 77.63	510 231
ZZ32M3	26.7 19.9	24.94 408.7	2511.2 71.09	3030.6 85.80	510 231
ZZ35M3	29.2 21.8	27.23 446.2	2741.8 77.62	3309.1 93.68	545 247
ZZ38M3	31.7 23.6	29.52 483.7	2972.4 84.15	3587.6 101.6	565 256

ELECTRICAL SPECIFICATIONS

***Note: Electrical specifications are the same as those for individual component compressors comprising the tandem. (Found on page 26B)**

TANDEM MODEL	COMPONENT COMPRESSOR
ZZ18M3	ZR90K3 + ZR90K3
ZZ21M3	ZR90K3 + ZR12M3
ZZ22M3	ZR11M3 + ZR11M3
ZZ24M3	ZR12M3 + ZR12M3
ZZ28M3	ZR12M3 + ZR16M3
ZZ32M3	ZR16M3 + ZR16M3
ZZ35M3	ZR16M3 + ZR19M3
ZZ38M3	ZR19M3 + ZR19M3

"STANDARD" INTERNATIONAL TANDEM BILLS OF MATERIAL

MODEL	BILL OF MATERIAL NUMBER	TANDEM SUCTION FITTING POINTING UP	ROTALOCK VALVE	ROTALOCK ADAPTER	SOLID STATE MOTOR PROTECTOR MODULE
ZZ18TO ZZ38	840	X	X		24 V
	841	X		X	24 V
	870	X	X		115/230 V
	871	X		X	115/230 V

The bill of material includes features as shown by the X.

BILL OF MATERIAL PROVISIONS

Please refer to the bills of material shown on the previous page to view our standard offers of compressor selections.

In addition to the marked features, each compressor will include the following:

- Unique Features – Cast iron inner frame, special bearings, a sight glass, oil adjustment port, temperature probe, as well as additional refrigerant and oil filtration capacity.
- Rotalock compressor suction and discharge fittings and tubing.
- Rotalock oil equalization fittings and tubing.
- Rotalock gas equalization fitting and tubing.
- Stub tube connections for discharge and suction to the system.
- Terminal box and cover complete with wiring diagram.
- Four Foot Mounting to rails using mounting grommets and bolts.
  8.65 x 8.65 inches
  (219.7 x 219.7 mm)
- Rail Mounting Kit.
- Grounding Tab, Screw, and Washer.
- Grounding tab located in the terminal box.
- Terminal Connector Block with Screws.
- 3GS oil.
  - Initial oil charge
    For all Specter models
    280 ounces (8.28 liters)
  - Refill oil charge.
    For all Specter models
    274 ounces (8.10 liters)

See outline drawings on pages 43B to 47A for stub tube connection sizes.

ACCESSORY INFORMATION

Crankcase Heater - 120 volts	018-0036-01
Crankcase Heater - 240 volts	018-0036-00
Crankcase Heater - 480 volts	018-0036-02
Crankcase Heater - 575 volts	018-0036-03

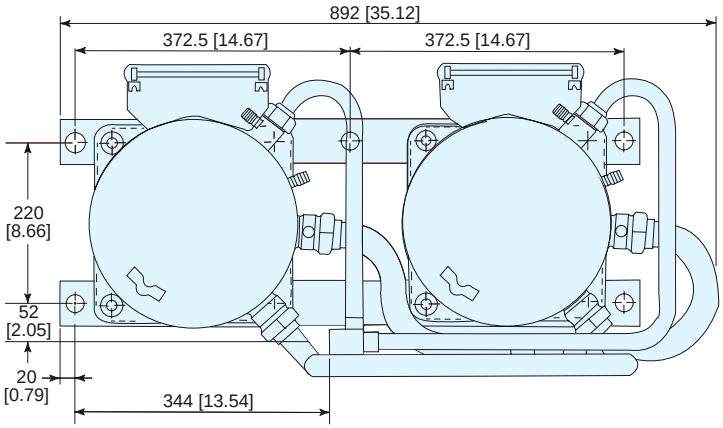
NOTES:

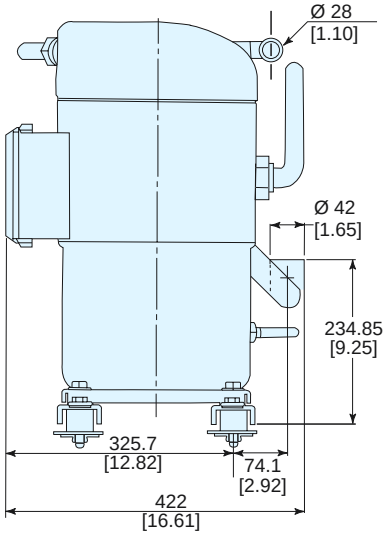
1. NOMINAL DIMENSIONS ARE SHOWN. MAXIMUM OVERALL TOLERANCE RANGE IS ± 1.5 MM [4,75 IN]. CONTACT COPELAND INTERNATIONAL IF A MORE SPECIFIC RANGE IS REQUIRED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 4.6 MM [0.18 IN].
3. THE TANDEM WITHOUT SERVICE VALVES IS SHOWN. BILL OF MATERIAL PAGE 42B SHOWS B/M NUMBERS FOR TANDEMS WITH AND WITHOUT SERVICE VALVES.
4. FOR UNEVEN TANDEM, COMPRESSOR 'A' MUST BE THE LEAST CAPACITY UNIT AND COMPRESSOR 'B' MUST BE THE LARGER CAPACITY UNIT.
5. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

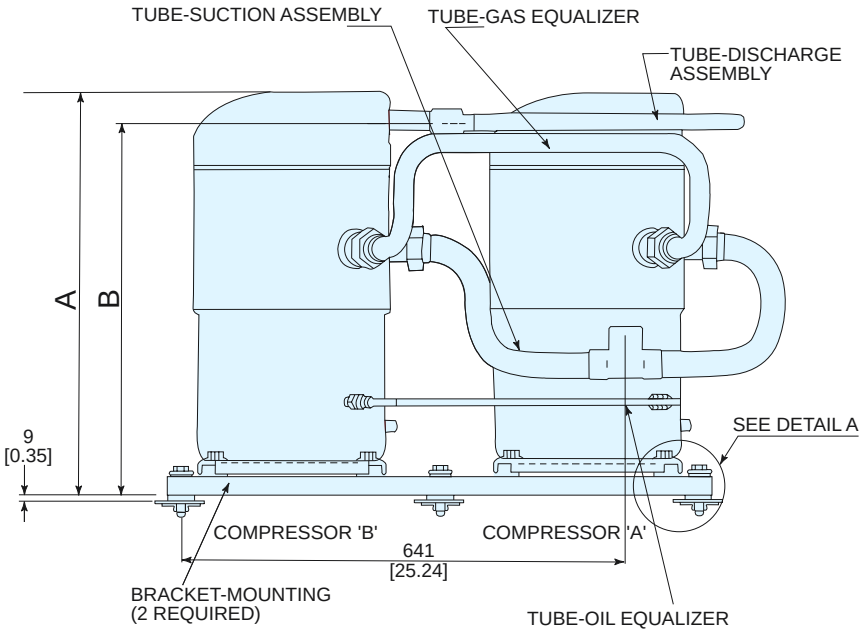
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

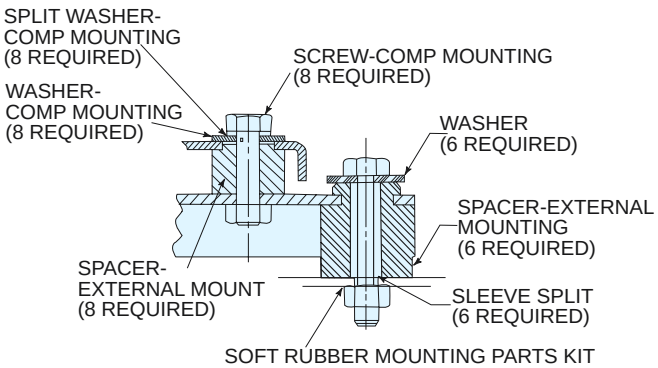
MODEL NUMBER	A	B
ZZ18, ZZ21, ZZ22, ZZ24	569 [22.4]	529 [20.8]
ZZ32	577 [22.7]	536 [21.1]







DETAIL A
SOLID COMPRESSOR MOUNTING PART KIT



FOR THE INTERNATIONAL MARKET
ZZ18 - ZZ21 - ZZ22 - ZZ24 - ZZ32
HEAT PUMP AND AIR CONDITIONING MODELS

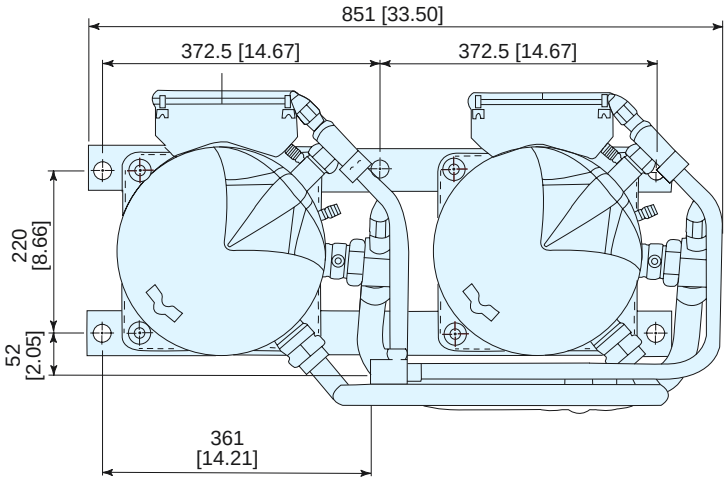
NOTES:

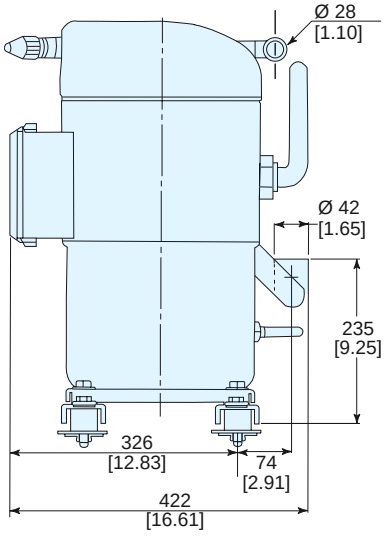
1. NOMINAL DIMENSIONS ARE SHOWN. MAXIMUM OVERALL TOLERANCE RANGE IS ± 1.5 MM [4,75 IN]. CONTACT COPELAND INTERNATIONAL IF A MORE SPECIFIC RANGE IS REQUIRED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 4.6 MM [0.18 IN].
3. THE TANDEM WITH SERVICE VALVES IS SHOWN. BILL OF MATERIAL PAGE 42B SHOWS B/M NUMBERS FOR TANDEMS WITH AND WITHOUT SERVICE VALVES.
4. FOR UNEVEN TANDEM, COMPRESSOR 'A' MUST BE THE LEAST CAPACITY UNIT AND COMPRESSOR 'B' MUST BE THE LARGER CAPACITY UNIT.
5. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

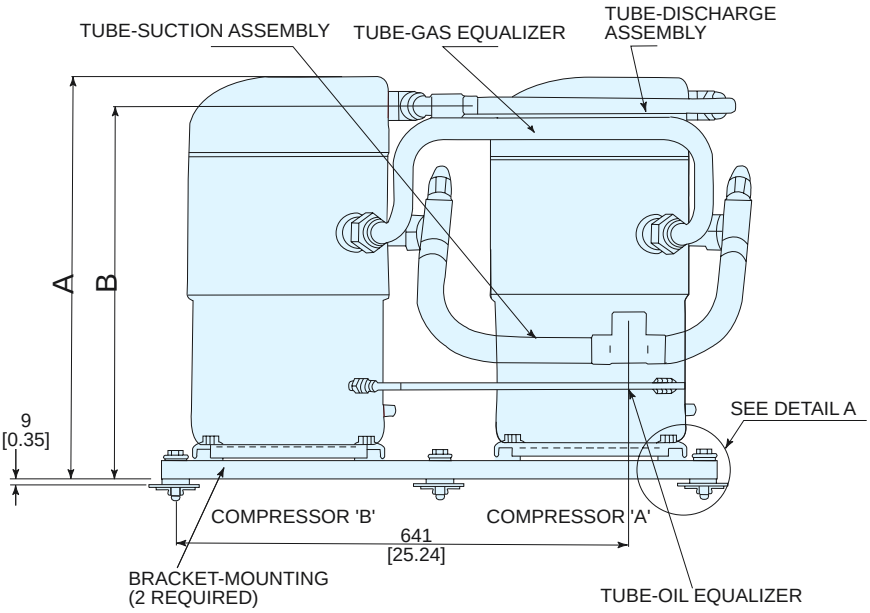
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

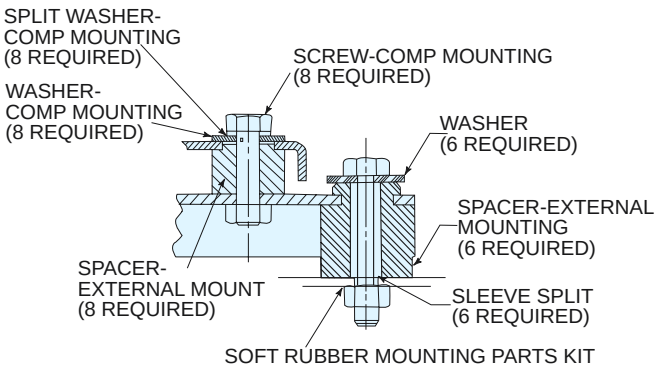
MODEL NUMBER	A	B
ZZ18, ZZ21, ZZ22, ZZ24	569 [22.4]	529 [20.8]
ZZ32	577 [22.7]	536 [21.1]







DETAIL A
SOLID COMPRESSOR MOUNTING PART KIT



FOR THE INTERNATIONAL MARKET
ZZ18 - ZZ21 - ZZ22 - ZZ24 - ZZ32
HEAT PUMP AND AIR CONDITIONING MODELS

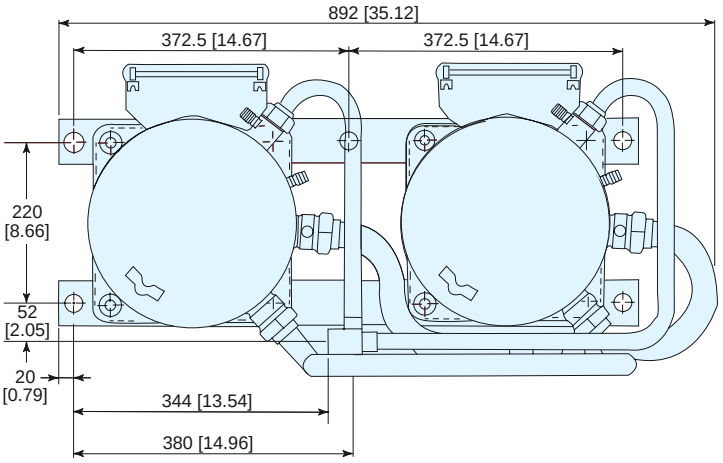
NOTES:

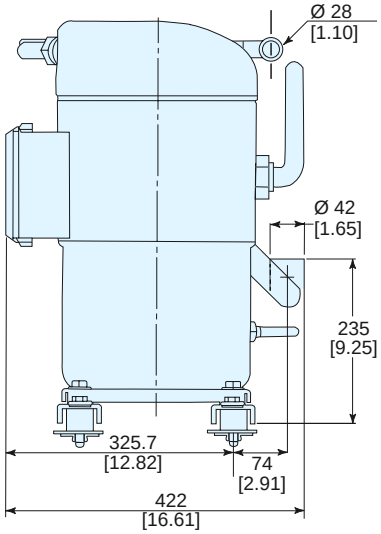
1. NOMINAL DIMENSIONS ARE SHOWN. MAXIMUM OVERALL TOLERANCE RANGE IS ± 1.5 MM [4,75 IN]. CONTACT COPELAND INTERNATIONAL IF A MORE SPECIFIC RANGE IS REQUIRED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 4.6 MM [0.18 IN].
3. THE TANDEM WITHOUT SERVICE VALVES IS SHOWN. BILL OF MATERIAL PAGE 42B SHOWS B/M NUMBERS FOR TANDEMS WITH AND WITHOUT SERVICE VALVES.
4. FOR UNEVEN TANDEM, COMPRESSOR 'A' MUST BE THE LEAST CAPACITY UNIT AND COMPRESSOR 'B' MUST BE THE LARGER CAPACITY UNIT.
5. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

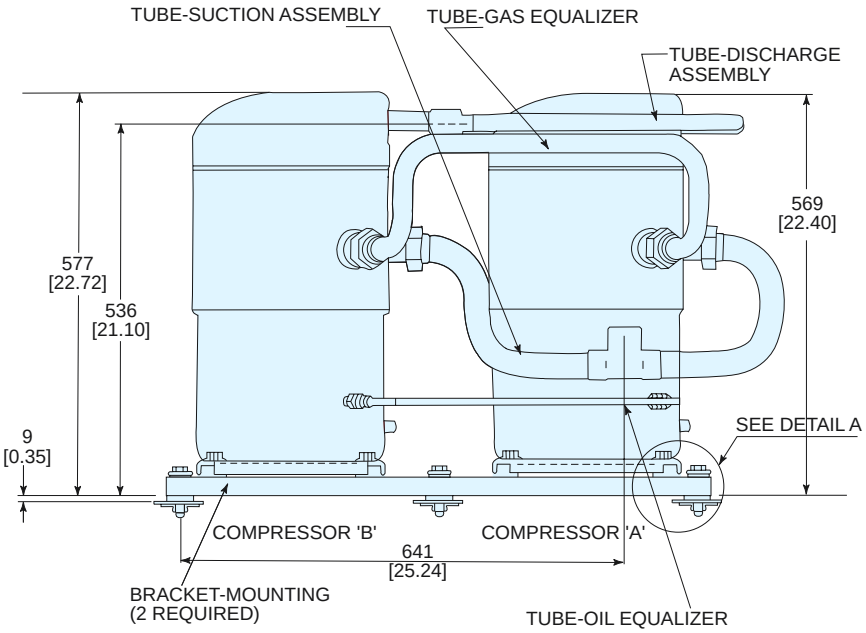
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

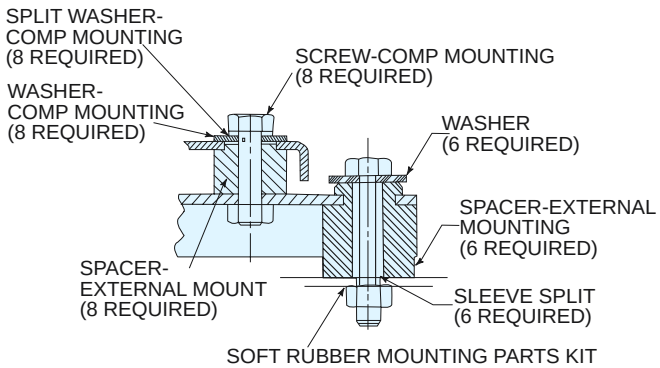
MODEL NUMBER
ZZ28







DETAIL A
SOLID COMPRESSOR MOUNTING PART KIT



FOR THE INTERNATIONAL MARKET
ZZ28
HEAT PUMP AND
AIR CONDITIONING MODELS

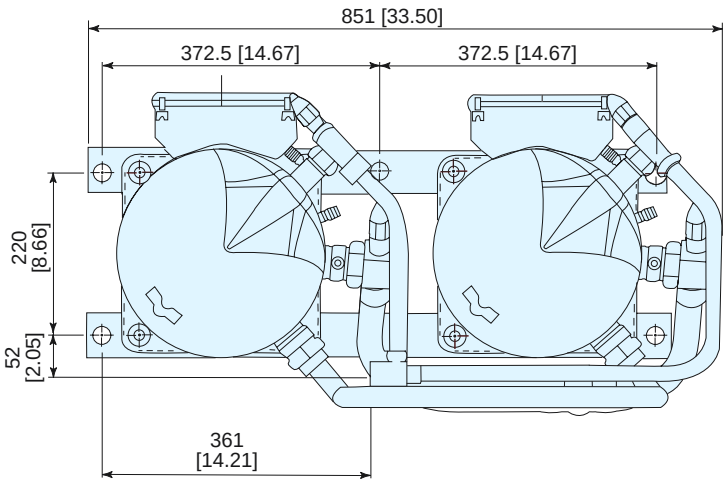
NOTES:

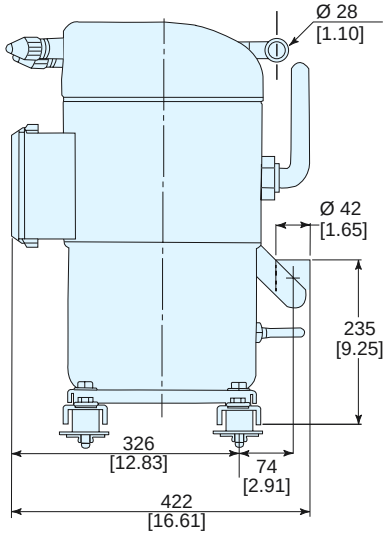
1. NOMINAL DIMENSIONS ARE SHOWN. MAXIMUM OVERALL TOLERANCE RANGE IS ± 1.5 MM [4,75 IN]. CONTACT COPELAND INTERNATIONAL IF A MORE SPECIFIC RANGE IS REQUIRED.
2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 4.6 MM [0.18 IN].
3. THE TANDEM WITH SERVICE VALVES IS SHOWN. BILL OF MATERIAL PAGE 42B SHOWS B/M NUMBERS FOR TANDEMS WITH AND WITHOUT SERVICE VALVES.
4. FOR UNEVEN TANDEM, COMPRESSOR 'A' MUST BE THE LEAST CAPACITY UNIT AND COMPRESSOR 'B' MUST BE THE LARGER CAPACITY UNIT.
5. LINEAR MEASUREMENTS IN [ ] ARE INCH CONVERSIONS.

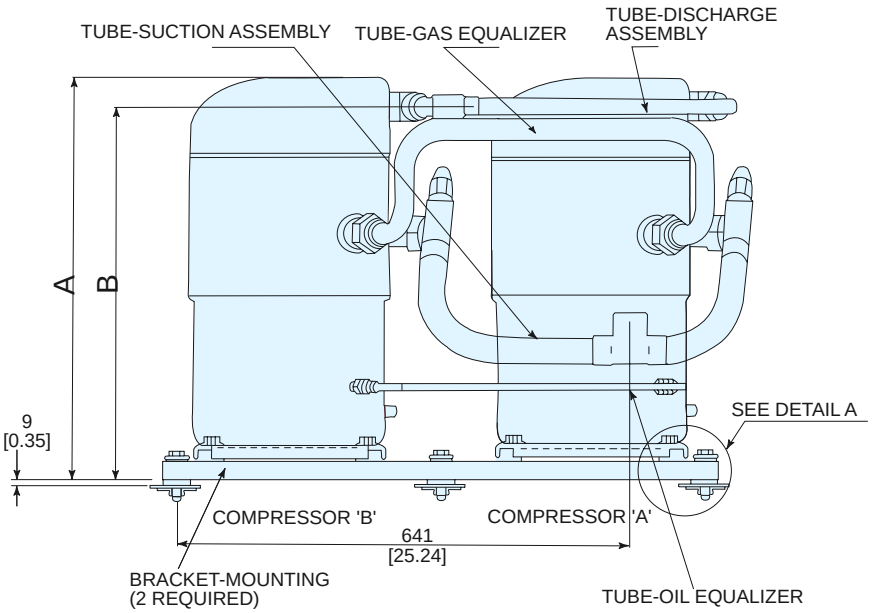
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

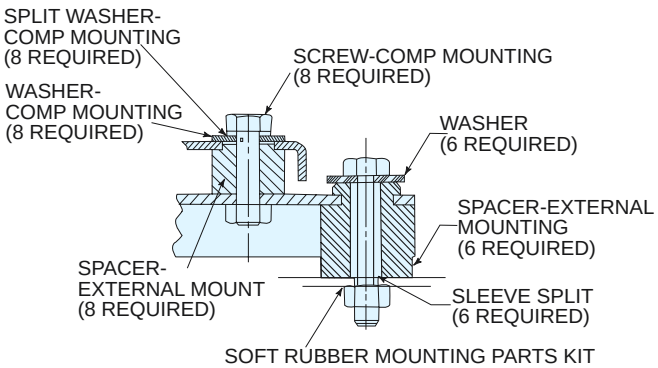
MODEL NUMBER
ZZ28







DETAIL A
SOLID COMPRESSOR MOUNTING PART KIT



FOR THE INTERNATIONAL MARKET
ZZ28
HEAT PUMP AND AIR CONDITIONING MODELS

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2. DUE TO THE ACCUMULATED ASSEMBLY TOLERANCES, THE SUCTION AND DISCHARGE FITTINGS MAY VARY FROM THE MOUNTING HOLES BY ± 4.6 MM [0.18 IN].
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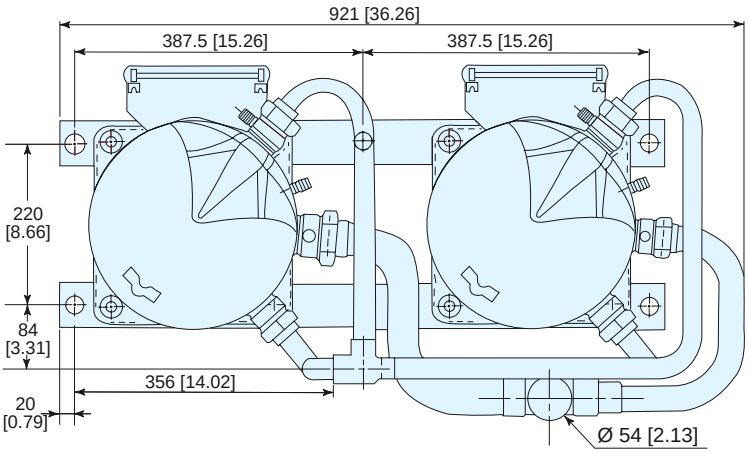
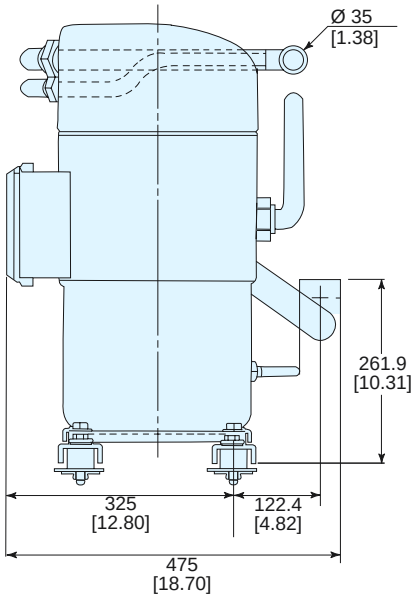
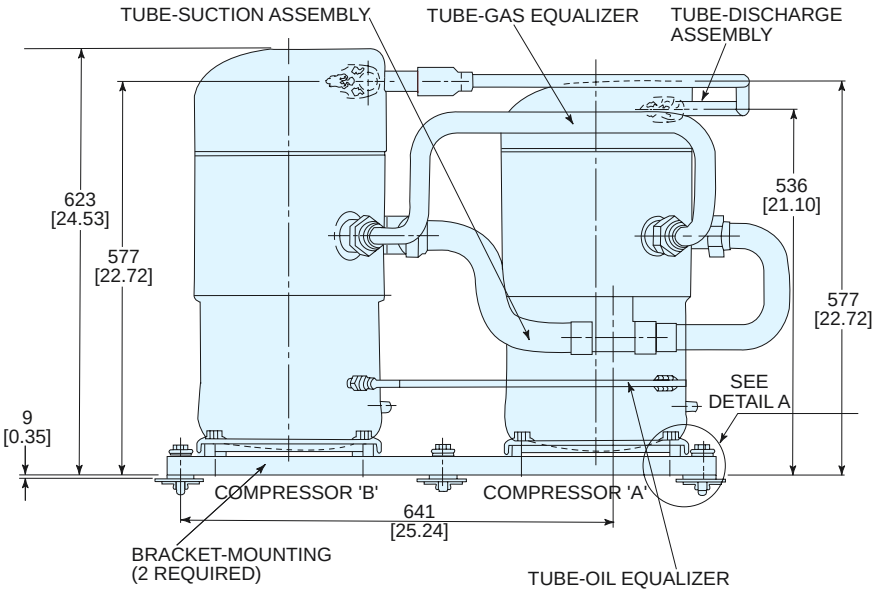
THIRD ANGLE PROJECTION

DIMENSIONAL INFORMATION

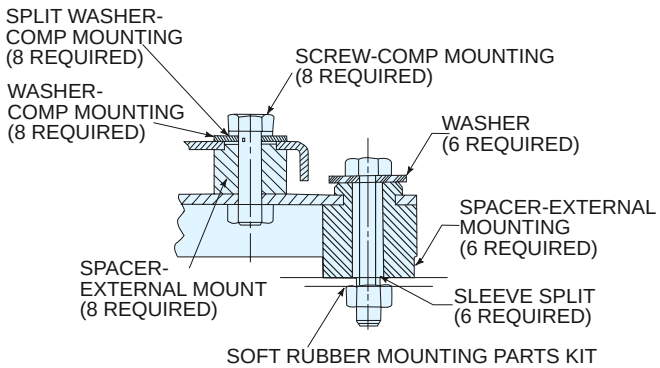
MODEL NUMBER
ZZ35







DETAIL A
SOLID COMPRESSOR MOUNTING PART KIT



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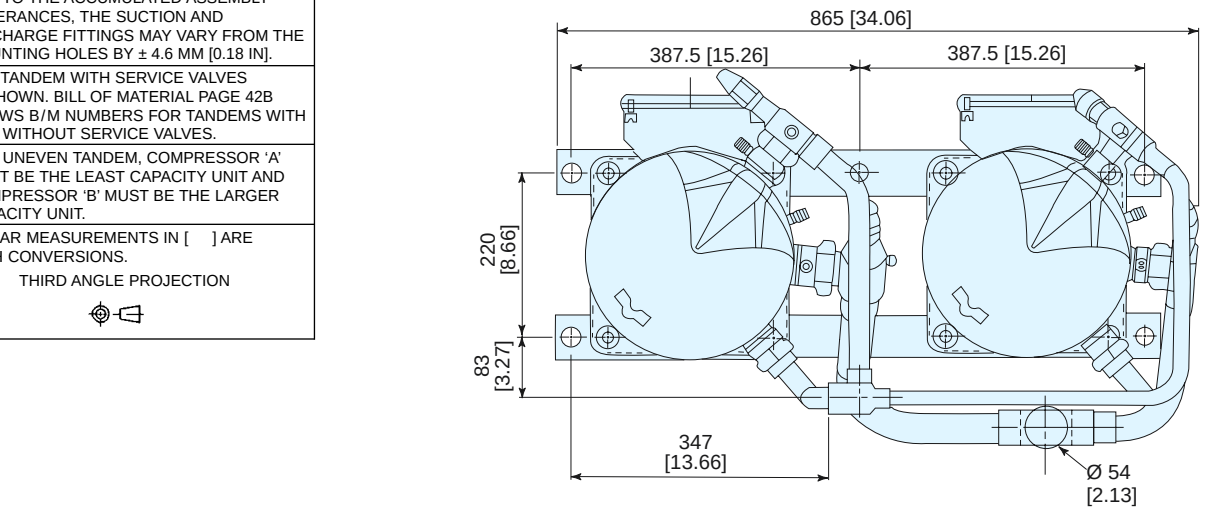

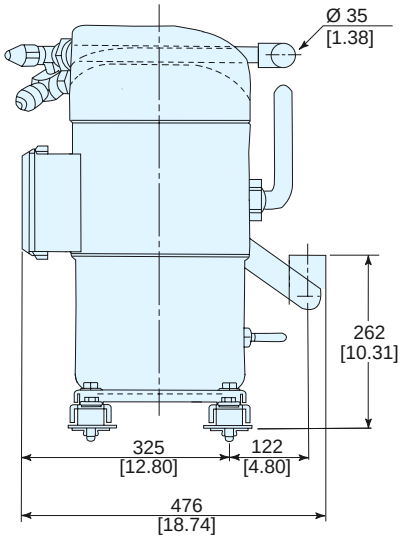

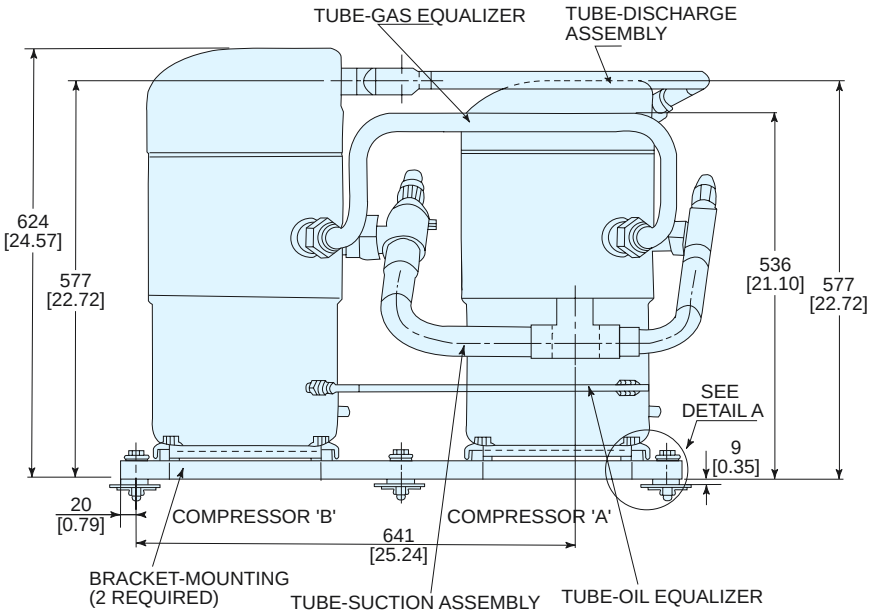

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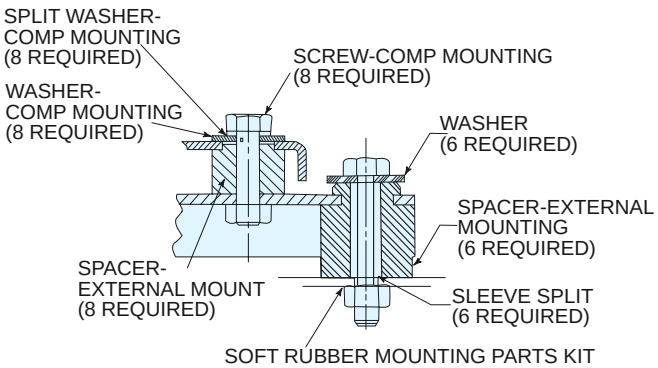

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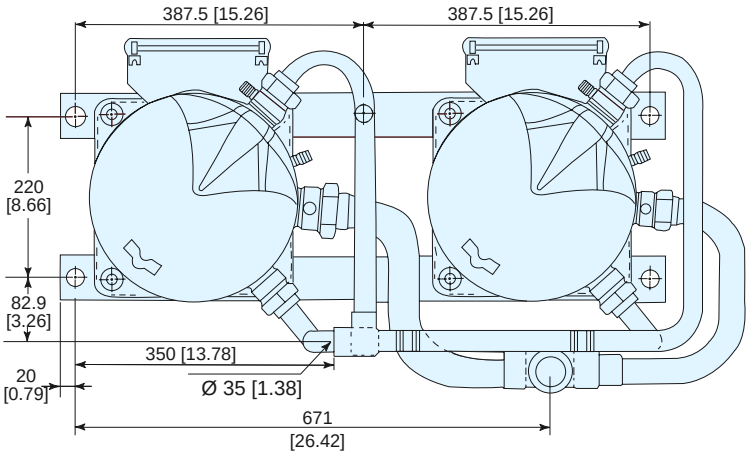

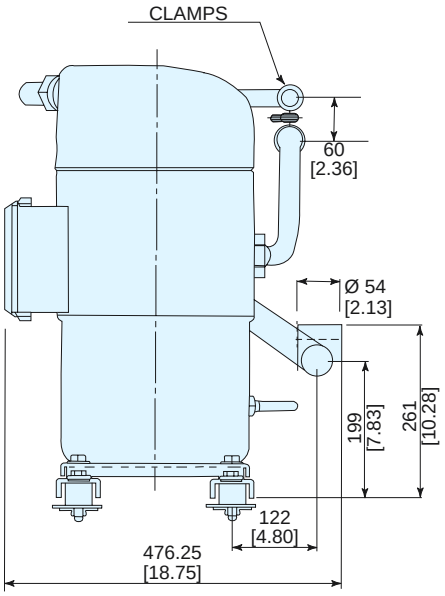

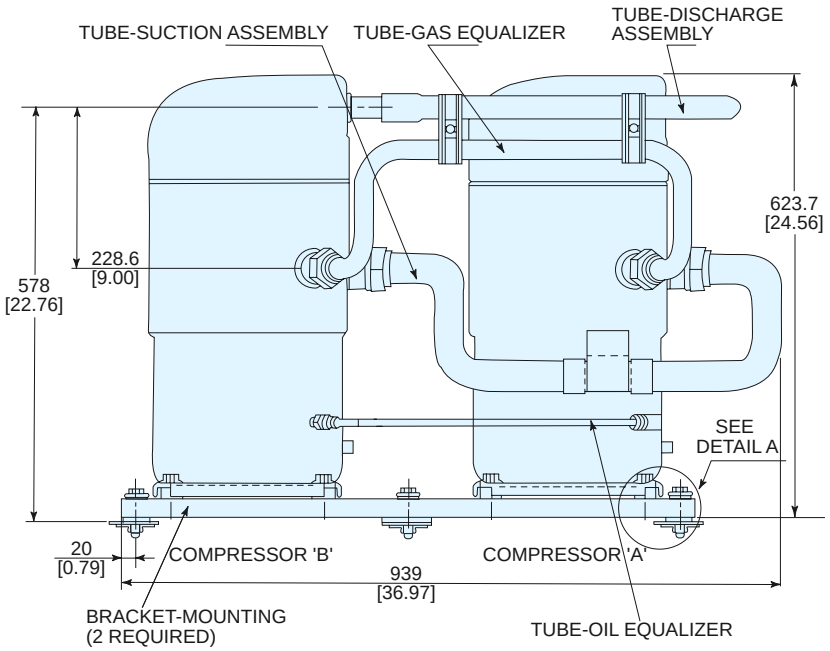

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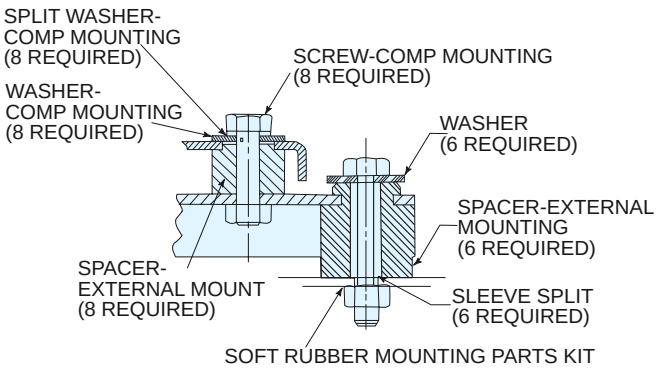

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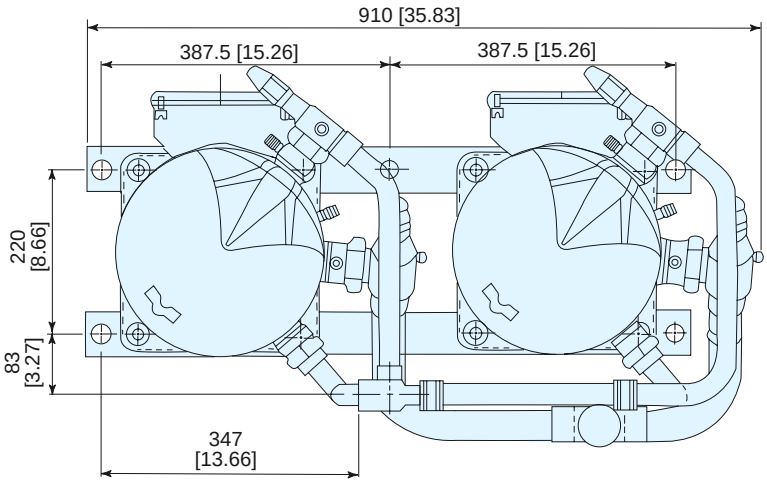

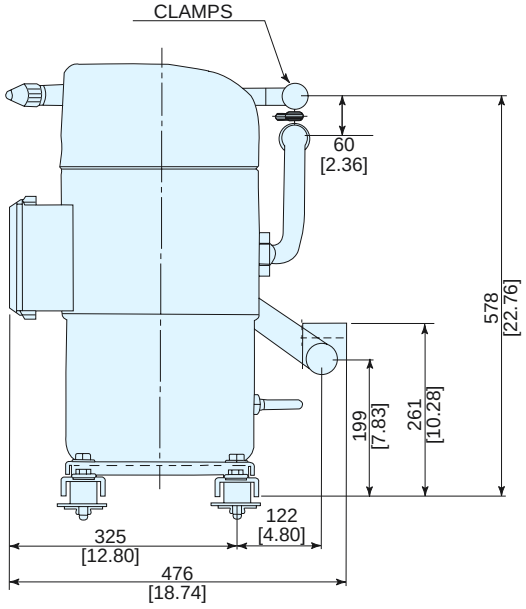

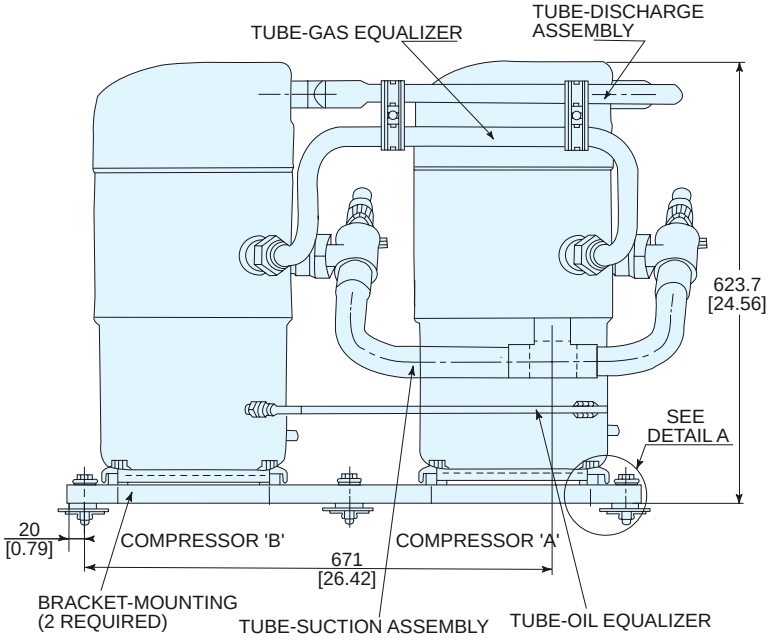

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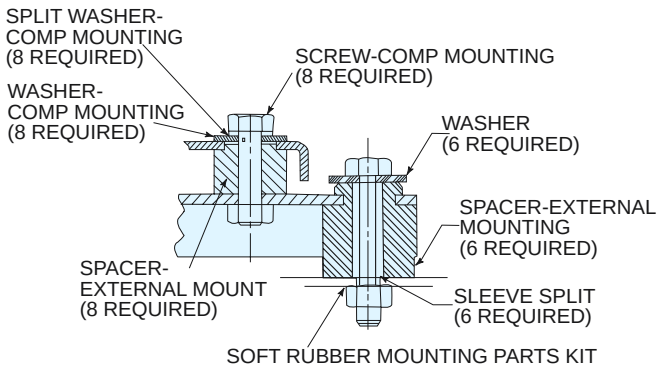
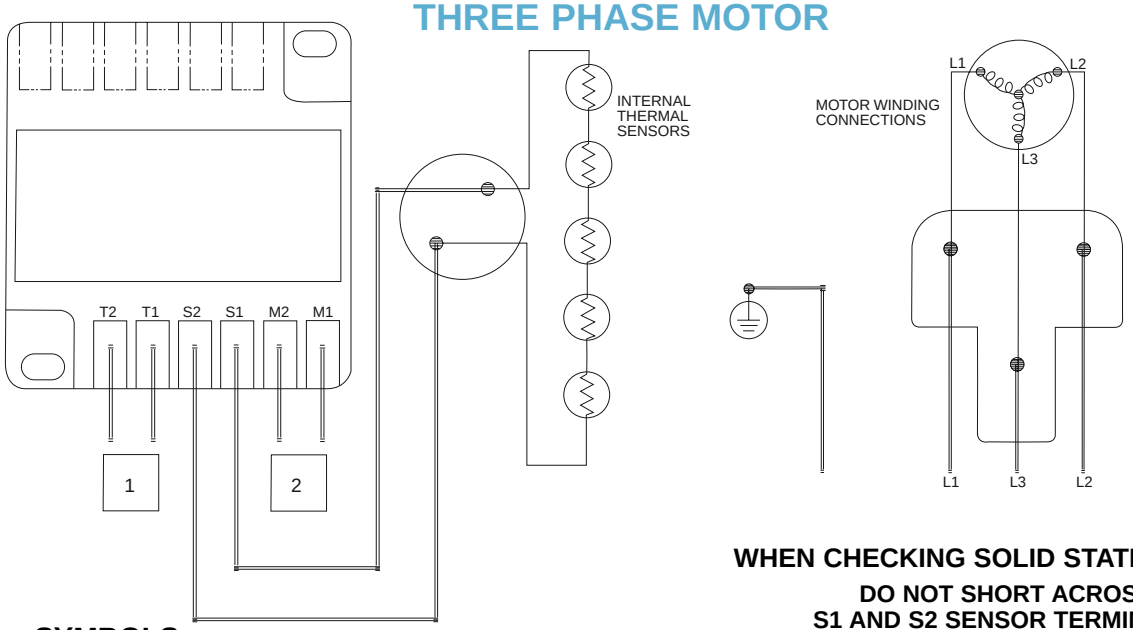


FOR THE INTERNATIONAL MARKET

ZZ38
HEAT PUMP AND
AIR CONDITIONING MODELS

COMPRESSOR WIRING DIAGRAMS

THREE PHASE MOTOR



WHEN CHECKING SOLID STATE MODULE:

DO NOT SHORT ACROSS S1 AND S2 SENSOR TERMINALS.

MODULE HAS 30 MINUTES TIME DELAY BEFORE RESET IN EVENT OF PROTECTOR TRIP.

SYMBOLS

THERMAL SENSORS

1 **PROTECTOR MODULE VOLTAGE**

2 **TO CONTROL CIRCUIT**

ZZ18 TO ZZ38

USE COPPER CONDUCTORS ONLY

USE MINIMUM 75°C WIRE FOR AMPACITY DETERMINATION.

USE THIS EQUIPMENT ON A GROUNDED SYSTEM ONLY.

PRIMARY SINGLE PHASE FAILURE PROTECTION IS PROVIDED.

PROTECTOR MODULE AND OPTIONAL CRANKCASE HEATER MUST BE CONNECTED ONLY TO THEIR RATED VOLTAGE.

OVERCURRENT PROTECTION DEVICE RATING AND TYPE MUST BE IN ACCORDANCE WITH REGULATORY AGENCY END PRODUCT APPROVALS – SEE SYSTEM NAMEPLATE.

50 60 HERTZ — APPROVED COMPRESSOR OPERATING RANGE — R22

AN OKAY INDICATES AN APPROVED POINT FOR COMPRESSOR OPERATION

AN ** INDICATES A NON-APPROVED POINT FOR COMPRESSOR OPERATION**

CONDENSING TEMPERATURE		EVAPORATING TEMPERATURE °F/°C								
°F	°C	–10 –23.3	0 –17.8	10 –12.2	20 –6.7	30 –1.1	40 4.4	45 7.2	50 10.0	55 12.8
80	26.7	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
90	32.2	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
100	37.8	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
110	43.3	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
120	48.9	****	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
130	54.4	****	****	****	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
140	60.0	****	****	****	****	OKAY	OKAY	OKAY	OKAY	OKAY
150	65.6	****	****	****	****	****	OKAY	OKAY	OKAY	OKAY

Approved range is based on 20°F (11.1°C) of superheat.

SPECTER TANDEM APPLICATION NOTES

Use of the Specter Compressor in a tandem configuration follows the guidelines of the single compressor found in Application Bulletin **AE4-1316** and on page 39B with the following exceptions:

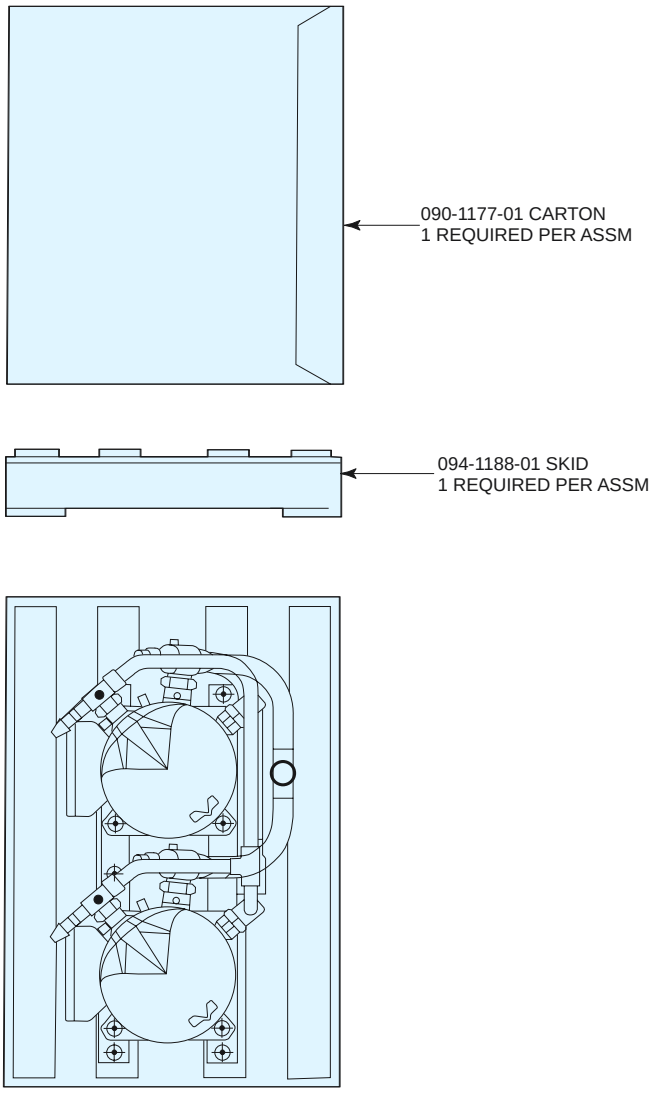
- The 7.5 to 15 HP models are designed so that the compressors may be piped together for parallel tandem operation offering two steps of modulation. Either one or both compressors can run, depending upon the capacity requirement. A discharge and suction manifold provide a single point discharge and suction line connection. An oil equalization tube is installed between the compressors to ensure that oil is distributed equally.
- The compressors are mounted directly on two steel rails. This rigid mounting keeps the interconnecting tubing stresses to a minimum. The tandem assembly should be mounted on rubber isolating grommets to the unit basepan.
- Both compressors must be at the same level to prevent oil from migrating to the lowest compressor through the oil equalization line.
- Refrigerant charge limit for all Specter tandem models is 20.4 lbs. (9.25 kg) for the entire tandem (20% more than for a single compressor). A tandem with a circuit charge over 20.4 lbs. (9.25 kg) must use crankcase heaters on both compressors.
- The individual compressors that make up the tandem are wired independently using the electrical values of the single compressors. It is recommended that compressors be wired to change lead/lag position. This will ensure equal run time for both compressors, thereby increasing reliability.
- Only the defective compressor should be replaced in case of a failure.
- In the case of a motor burn, the majority of contaminated oil will be removed with the burned compressor. The rest of the oil is cleaned through use of suction and liquid line filter driers. A 100% activated alumina suction filter drier is recommended but must be removed after 72 hours.
- Application Engineering Bulletin 24-1105 describes clean-up procedures while AE Bulletin 11-1297 has liquid line filter recommendations.

SINGLE PACK TANDEM PACKAGING AND SHIPPING INFORMATION

For shipments of 1 single pack tandem compressors, the dimensions for the box and the skid together are 40.0 x 26.9 x 33.6 inches (20.9 ft³), 101.6 x 68.3 x 85.3 centimeters (0.59m³), and the weights (in lbs. and kgs.) are shown in the table below

MODEL NUMBER	WEIGHT (POUNDS)	WEIGHT (KILOGRAMS)
ZZ18	536	243
ZZ21	548	249
ZZ22	548	249
ZZ24	554	251
ZZ28	568	258
ZZ32	568	258
ZZ35	603	274
ZZ38	623	283

TANDEM PACKAGING



590-1199-02
COMPRESSOR ORIENTATION

MODEL NUMBER NOMENCLATURE

Application Range

Code	Description
Z	High and medium temperature Tandem Application

Compressor Motor Type

Motor Type	Code
Three phase	T

Product Variations

Three digit bill of material number that indicates compressor configuration and accessories included.

Z Z X X X X — T W X — X X X

Compressor Family Series

Letter "Z" established for this family of compressors.

Capacity

Tandem Compressor nominal 60 Hertz capacity at ARI rating condition to two significant digits.

Capacity Multiplier

M	10,000

Model Series Variations

A number only, arbitrarily assigned to indicate different model types within any one family series.

Compressor Motor Protection

Type	Code
Solid state motor protection – electronic sensors, and external control module; use with contactor.	W

Electrical Codes

50 HZ	60 HZ	Code
200-3	208/230-3	C
220/240-3	—	R
—	380-3	7
380/420-3	460-3	D
500-3	575-3	E

COMPRESSOR SPECIFICATIONS

The compressor shall be a Compliant Scroll type, with DU (PTFE) journal bearings, both rotalock or braze fittings, high and low pressure taps on the rotalock version, sight glass and oil adjustment port, and unique, quick responding temperature protection. The compressor shall be able to handle a 17 pound (7.7 Kg) refrigerant charge. The compressor shall be capable of operating on R22, R407C and R134a within the evaporating range of –10°F to 55°F (–23.3°C to 12.8°C) at condensing temperatures up to 150°F (65.6°C). With R22 refrigerant, the compressor shall operate at an ARI point efficiency range of 11.1 to 11.5 BTUH/WATT. Efficiencies above 11.5 BTUH/WATT are also acceptable. The compressor shall be of the Copeland ZR type or approved equal.

UNITS CONVERSION CHART

BTUH × 0.252 = KCALH
BTUH × 0.293 = WATTS
(°F – 32) × $^{5}/_{9}$ = °C
POUNDS × 0.454 = KILOGRAMS
INCHES × 25.4 = MILLIMETERS
CUBIC INCHES × 16.386 = CUBIC CENTIMETERS
FLUID OUNCES × 0.02957 = LITERS
CUBIC FEET × 0.02831 = CUBIC METERS
HORSEPOWER × 0.746 = KILOWATTS

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SHELBY, NORTH CAROLINA U.S.A.
RUSHVILLE, INDIANA U.S.A.
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AVA, MISSOURI U.S.A.
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REYNOSA, MEXICO
SHENYANG, CHINA
SUZHOU, CHINA
RAYONG, THAILAND
KARAD, INDIA
ATIT, INDIA
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DUBAI, UAE
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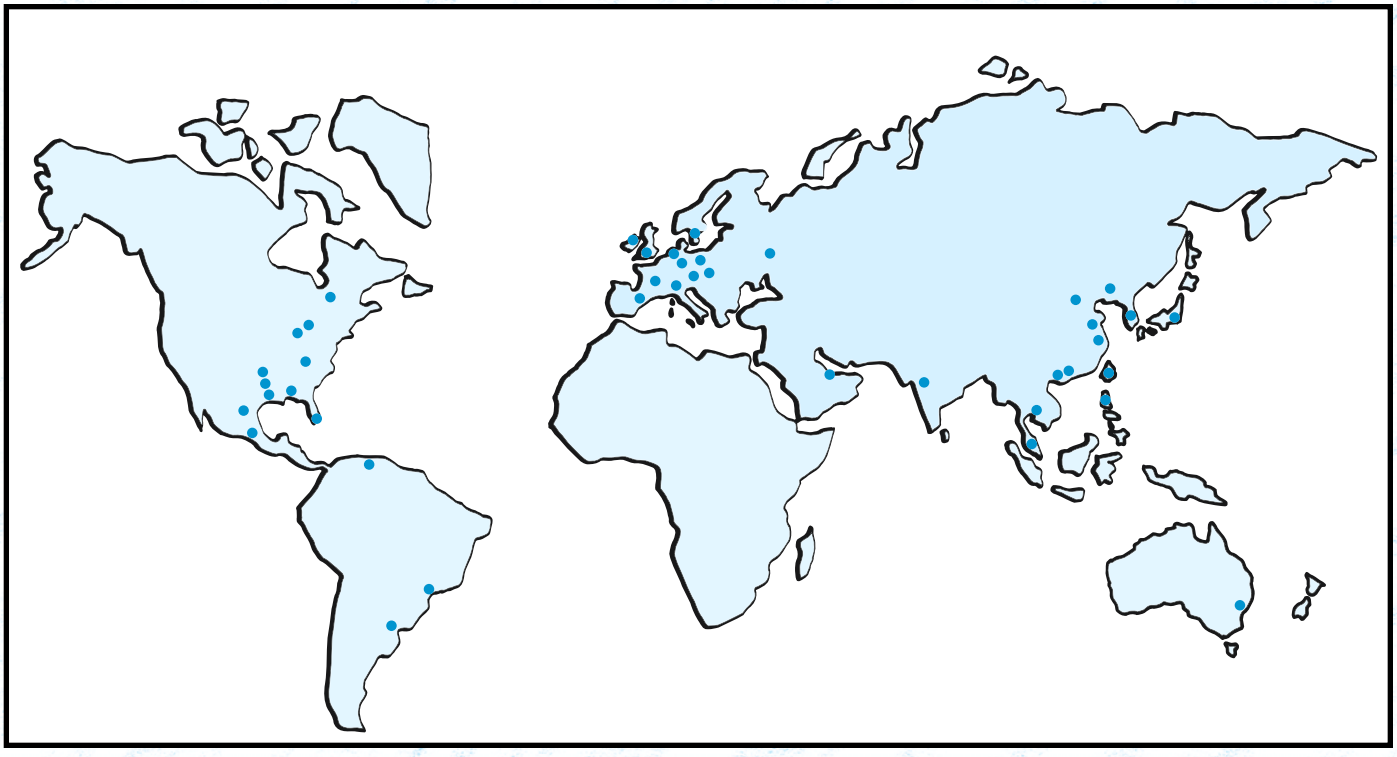

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