APPLICATION FOR PREAPPROVAL

SPECIAL SEISMIC CERTIFICATION OF EQUIPMENT AND COMPONENTS

For Office Use Only

APPLICATION NO.

OSP – 0153-10

Check whether application is: NEW [X] RENEWAL [ ]

1.0

Carrier Corporation - Commercial Unitary Systems
Manufacturer

Mike Froehlich
Manufacturer's Technical Representative

7310 West Morris Street, PO Box 70, Indianapolis, IN 46206-0070
Mailing Address

(315) 432-6703
Telephone

Mike.Froehlich@carrier.utc.com
E-mail Address

2.0

CARRIER WeatherMaster and WeatherMaker Roof Top Units: 48 and 50 series
Product Name

Packaged Rooftop Air Conditioning Units
Product Type

Models: 48TC (3-25 Cooling Tons), 50TC (3-25 Cooling Tons), 50TCQ (3-20 Cooling Tons)
Product model No (List all unique product identification numbers and/or serial numbers)

General Description: Small and Medium Constant Volume Rooftop Units with Refrigerant R-410A. The certification is only valid for installation on rigid base mounted sheet metal curbs with components listed in attachments. The certification is valid only for enclosure type "single wall carbon steel with fiberglass insulation backing".

3.0

Carrier Corporation – Commercial Unitary Systems
Applicant Company Name

Mike Froehlich
Contact Person

6304 Thompson Road Building TR-4, Door 25, East Syracuse, NY 13057
Mailing Address

(315) 432-6703
Telephone

Mike.Froehlich@carrier.utc.com
E-mail Address

I hereby agree to reimburse the Office of Statewide Health Planning and Development for the actual costs incurred by the department for review.

Michael J. Froehlich
Signature of Applicant

3/16/11
Date

Staff Engineer, Mechanical

Carrier Corporation

Registered Design Professional Preparing the Report

4.0

Buehler and Buehler Structural Engineers, Inc
Company Name

Ali Sumer	72785 / Civil
Contact Name	*California License Number*

600 Q St. Suite 200, Sacramento, CA 95811
Mailing Address

(916) 443-0303	asumer@bbse.com
Telephone	*E-mail Address*

California Licensed Structural Engineer Review and Acceptance of the Report

5.0

Buehler and Buehler Structural Engineers, Inc
Company Name

Scott R. Hooker	3937 / Structural
Contact Name	*California License Number*

600 Q St. Suite 200, Sacramento, CA 95811
Mailing Address

(916) 443-0303	shooker@bbse.com
Telephone	*E-mail Address*

Anchorage Pre-Approval

6.0

☐ *Anchorage is pre-approved under OPA-*
(Separate application for anchorage pre-approval is required)

☒ Anchorage is not Pre-approved

Certification Method

70. ☐ *Testing in accordance with:* ☒ *ICC-ES AC-156* ☐ *Other (Please Specify):*

☐ *Analysis*
☐ *Experience data*
☐ *Combination of Testing, Analysis, and/or Experience Data (Please Specify):*

Testing Laboratory (if applicable)

8.0

University at Buffalo, SEESL	Mark Pitman
Company Name	*Contact Name*

Department of Civil, Structural, and Environmental Engineering, University at Buffalo, State University of New York, Buffalo, NY 14260-4300
Mailing Address

(716) 645-5400	mpitman@eng.buffalo.edu
Telephone	E-mail:

Approval Parameters

9.0

Design in accordance with ASCE 7-05 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 1.5g

S_{DS} (Spectral response acceleration at short period) =2.00g

a_p (In-structure equipment or component amplification factor) =2.5

R_p (Equipment or component response modification factor) =6

I_p (Importance factor) = 1.5

z/h (Height factor ratio)=1.0

Equipment or Component fundamental period(s) =See Table 1.

Building period limits (if any) =N/A

Overall dimensions and weight (or range thereof) =See attached tables.

Equipment or Components @ grade designed in accordance with ASCE 7-05 Chapter 15: ☐ Yes ☒ No

Design Basis of Equipment or Components (V/W) =

S_{DS} (Spectral response acceleration at short period) =

S_1 (Spectral response acceleration at 1 second period) =

R (Response modification coefficient)=1.0

Ω_0 (System overstrength factor) =1.0

C_d (Deflection amplification factor) =1.0

I_p (Importance factor) =1.5

Height to Center of Gravity above base =

Equipment or Component fundamental period(s) = Sec

Overall dimensions and weight (or range thereof) =

Tank(s) designed in accordance with ASME BPVC, 2007: ☐ Yes ☒ No

10.0 *List of attachments supporting the special seismic certification of equipment or components:*

☒ *Test Report*	☐ *Drawings*	☒ *Manufacturer's Catalog*
☐ *Calculations*	☐ *Others (Please Specify):*	

11.0 *OSHPD Approval (For Office Use Only)*

3/16/2011	**December 31, 2016**
Signature & Date	*Approval Expiration Date*
Chris Tokas, SHFR	S_{DS} (g) = **2.0** z/h = **1.0**
Name & Title	*Special Seismic Certification Valid Up to*

Condition of Approval (if any):

Carrier Corporation Rooftop Unit Model #'s: 50TC, 50TCQ, and 48TC Shake Table Testing

Buehler & Buehler
structural engineers

Figure 1. UUT 1 on the shake table

Figure 2. UUT 2 on the shake table

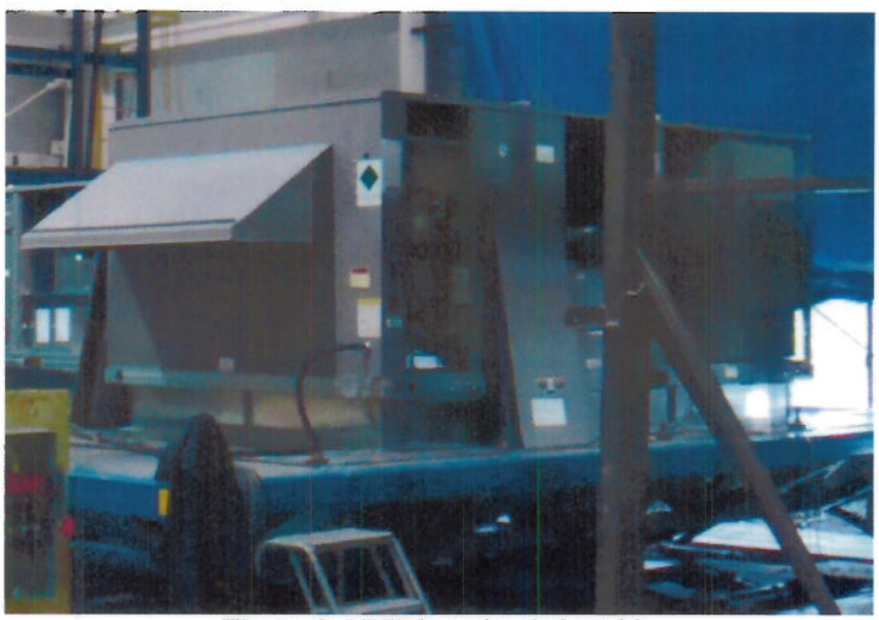

Figure 3. UUT 3 on the shake table

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OSHPD Preapproval
Carrier 48TC, 50TC, 50TCQ Product Line

Table 1. Shake Table Tested Units Summary**

Model Number	Tonnage	UUT Mark	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)	Notes
50TC-A04H3A6-0F2C0	3	UUT-1	Base - Sheet metal curb - Hard Mount	X	10.8	74 3/8	46 3/4	33 3/8	573	tested with sheet metal curbs only
				Y	8.4					
				Z	12.6					
50TCQD12H3A6-0F2C0	10	UUT-2	Base - Sheet metal curb - Hard Mount	X	7.6	59 1/2	88 1/8	49 3/8	1,049	tested with sheet metal curbs only
				Y	6.3					
				Z	8.9					
48TCFD28H3G6-0F2C0	25	UUT-3	Base - Sheet metal curb - Hard Mount	X	7.5	141 1/2	86 5/8	57 3/8	2,278	tested with sheet metal curbs only
				Y	7.3					
				Z	12.3					

* Frequencies are for units tested prior to AC156.

** Tested at Univ. at Buffalo Report No: UB CSEE/SEESL-2010-17

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Table 1a. Tested Equipment Major-Component List

Compressor

Model Number	UUT	Nominal Tons	Model Number(s)	Manufacturer	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	ZP31K5E-TFD-130	Copeland	Tested
50TCQD12H3A6-0F2C0	2	10	ZP54K5E-TFD-130 ZP51K5E-TFD-130	Copeland	Tested
48TCFD28H3G6-0F2C0	3	25	ZP137K5E-TFD-130 ZP137K5E-TFD-130	Copeland	Tested

Heat Cell (50 Series Electric, 48 Series Gas Heat)

Model Number	UUT	Nominal Tons	Model Number	Manufacturer	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	CRHEATER_009A	Carrier	Tested
50TCQD12H3A6-0F2C0	2	10	CRHEATER_015A + 013A	Carrier	Tested
48TCFD28H3G6-0F2C0	3	25	50HE400800	Carrier	Tested

Condenser

Model Number	UUT	Nominal Tons	Model Number	Manufacturer*	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	48TM400050	Carrier	Tested
50TCQD12H3A6-0F2C0	2	10	48TM400207	Carrier	Tested
48TCFD28H3G6-0F2C0	3	25	50HE400867	Delphi	Tested

* Round Tube Plate Fin Coils by Carrier and Novation (Microchannel) by Delphi

Evaporator

Model Number	UUT	Nominal Tons	Model Number	Manufacturer	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	48TM400003	Carrier	Tested
50TCQD12H3A6-0F2C0	2	10	48TM401916	Carrier	Tested
48TCFD28H3G6-0F2C0	3	25	50HE400117	Carrier	Tested

Refrigerant Expansion Device

Model Number	UUT	Nominal Tons	Model Number	Manufacturer	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	99CC404834	Carrier - Acutrol*	Tested
50TCQD12H3A6-0F2C0	2	10	99CC405504	Carrier - Acutrol*	Tested
48TCFD28H3G6-0F2C0	3	25	99CC404854	Carrier - Acutrol*	Tested

*Acutrol is a Carrier Registered Trademark

Control Box

Model Number	UUT	Nominal Tons	Model Number	Manufacturer	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	48TMCSRSP-1600	Whitepath	Tested
50TCQD12H3A6-0F2C0	2	10	48TMCSRMH-2610	Whitepath	Tested
48TCFD28H3G6-0F2C0	3	25	50HECMRAY--600	Whitepath	Tested

Condenser Fan Motor (s)

Model Number	UUT	Nominal Tons	Model Number	Manufacturer*	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	5KCP39HGS239S	Regal Beloit	Tested
50TCQD12H3A6-0F2C0	2	10	5KCP39MFY968S	Regal Beloit	Tested
48TCFD28H3G6-0F2C0	3	25	5KCP39KFV110S	Regal Beloit	Tested

Evaporator Fan Motor

Model Number	UUT	Nominal Tons	Model Number	Manufacturer*	Interpolated / Included With Test
50TC-A04H3A6-0F2C0	1	3	5K49MN4500Z	Regal Beloit	Tested
50TCQD12H3A6-0F2C0	2	10	5K49QN4536	Regal Beloit	Tested
48TCFD28H3G6-0F2C0	3	25	850115J3	AO Smith	Tested

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48TC Model Nomenclature

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
4	8	T	C	D	A	0	4	A	1	A	5	–	0	A	0	A	0

Unit Type
48 = Cooling/Gas Heat RTU with Puron refrigerant

Tier / Model
TC = WeatherMaker Series

Heat Size
D = Low heat
E = Medium heat
F = High heat
L = Low NO_x, low heat
M = Low NO_x, medium heat
N = Low NO_x, high heat
S = Stainless steel, low heat
R = Stainless steel, medium heat
T = Stainless steel, high heat

Refrig. System Options
A = Standard 1–stage cooling
B = 1–stage cooling models with Humidi–MiZer
D = Standard 2–stage cooling models
E = 2–stage cooling with Humidi–MiZer

Cooling Tons
04 = 3 Ton
05 = 4 Ton
06 = 5 Ton
07 = 6 Ton
08 = 7.5 Ton
09 = 8.5 Ton
12 = 10 Ton
14 = 12.5 Ton
16 = 15 Ton
17 = 15 Ton
20 = 17.5 Ton
24 = 20 Ton
28 = 25 Ton

Sensor Options
A = None
B = RA smoke detector
C = SA smoke detector
D = RA & SA smoke detector
E = CO_2 sensor
F = RA smoke detector & CO_2
G = SA smoke detector & CO_2
H = RA & SA smoke detector & CO_2

Indoor Fan Options
1 = Standard Static Option, Vertical
2 = Medium Static Option, Vertical
3 = High Static Option, Vertical
B =Medium Static High Efficiency Motor/Vertical Supply, Return Air Flow
C =High Static, High Efficiency Motor/Vertical Supply, Return Air Flow

5 = Standard Static Option, Horizontal
6 = Medium Static Option, Horizontal
7 = High Static Option, Horizontal
F = Medium Static High Efficiency Motor/Horizontal Supply, Return Air Flow
G = High Static, High Efficiency Motor/Horizontal Supply, Return Air Flow

Models w/Round Tube Plate Fin (RTPF) condenser coils (Outdoor – Indoor – Hail Guard)
A = Al/Cu – Al/Cu
B = Precoat Al/Cu – Al/Cu
C = E coat Al/Cu – Al/Cu
D = E coat Al/Cu – E coat Al/Cu
E = Cu/Cu – Al/Cu
F = Cu/Cu – Cu/Cu
M = Al/Cu – Al/Cu – Louvered Hail Guards
N = Precoat Al/Cu – Al/Cu – Louvered Hail Guards
P = E coat Al/Cu – Al/Cu – Louvered Hail Guards
Q = E coat Al/Cu – E coat Al/Cu – Louvered Hail Guards
R = Cu/Cu – Al/Cu – Louvered Hail Guards
S = Cu/Cu – Cu/Cu – Louvered Hail Guards
Models w/All aluminum, Novation condenser coils (Outdoor – Indoor – Hail Guard)
G = Al/Al – Al/Cu
H = Al/Al – Cu/Cu
J = Al/Al – E–coat Al/Cu
K = E–coat Al/Al – Al/Cu
L = E–coat Al/Al – E–coat Al/Cu
T = Al/Al – Al/Cu – Louvered Hail Guards
U = Al/Al – Cu/Cu – Louvered Hail Guards
V = Al/Al – E–coat Al/Cu – Louvered Hail Guards
W = E–coat Al/Al – Al/Cu – Louvered Hail Guards
X = E–coat Al/Al – E–coat Al/Cu – Louvered Hail Guards

Voltage
1 = 575/3/60
3 = 208–230/1/60
5 = 208–230/3/60
6 = 460/3/60

Design Rev
Factory assigned

Base Unit Controls
0 = Electromechanical
1 = PremierLink DDC controller
2 = RTU Open multi protocol controller

Intake / Exhaust Options
A = None
B = Temp Economizer w/ Barometric Relief
D = Temperature Economizer w/PE
F = Enthalpy Economizer w/ Baro Relief
H = Enthalpy Economizer w/PE
K = 2–Position Damper
P = Manual Outdoor Air Damper

Service Options
0 = None
1 = Un–powered convenience outlet
2 = Powered convenience outlet

Electrical Options
A = None
C = Non–fused disc
D = Thru the base
F = Non–fused & thru the base

Brand / Packaging
0 = Standard
1 = LTL

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50TC Model Option List - Cooling Unit with Option Field Installed Electric Heat

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
5	0	T	C	–	A	0	6	A	1	A	5	A	0	A	0	A	0

Unit Type
50 = Cooling/Elec Heat RTU with Puron refrigerant

Tier / Model
TC = WeatherMaker Series

Heat Size
– = No heat

Refrig. System Options
A = Standard 1–stage cooling
B = 1–stage cooling models with Humidi–MiZer
D = Standard 2–stage cooling models
E = 2–stage cooling with Humidi–MiZer

Cooling Tons

04 = 3 Ton	14 = 12.5 Ton
05 = 4 Ton	16 = 15 Ton
06 = 5 Ton	17 = 15 Ton
07 = 6 Ton	20 – 17.5 Ton
08 = 7.5 Ton	24 = 20 Ton
09 = 8.5 Ton	28 = 25 Ton
12 = 10 Ton	

Sensor Options
A = None
B = RA smoke detector
C = SA smoke detector
D = RA & SA smoke detector
E = CO_2 sensor
F = RA smoke detector & CO_2
G = SA smoke detector & CO_2
H = RA & SA smoke detector & CO_2

Indoor Fan Options
1 = Standard Static Option, Vertical
2 = Medium Static Option, Vertical
3 = High Static Option, Vertical
B =Medium Static High Efficiency Motor/Vertical Supply, Return Air Flow
C =High Static, High Efficiency Motor/Vertical Supply, Return Air Flow

5 = Standard Static Option, Horizontal
6 = Medium Static Option, Horizontal
7 = High Static Option, Horizontal
F = Medium Static High Efficiency Motor/Horizontal Supply, Return Air Flow
G = High Static, High Efficiency Motor/Horizontal Supply, Return Air Flow

Models w/Round Tube Plate Fin (RTPF) condenser coils (Outdoor – Indoor – Hail Guard)
A = Al/Cu – Al/Cu
B = Precoat Al/Cu – Al/Cu
C = E coat Al/Cu – Al/Cu
D = E coat Al/Cu – E coat Al/Cu
E = Cu/Cu – Al/Cu
F = Cu/Cu – Cu/Cu
M = Al/Cu –Al/Cu – Louvered Hail Guards
N = Precoat Al/Cu – Al/Cu – Louvered Hail Guards
P = E coat Al/Cu – Al/Cu – Louvered Hail Guards
Q = E coat Al/Cu – E coat Al/Cu – Louvered Hail Guards
R = Cu/Cu – Al/Cu – Louvered Hail Guards
S = Cu/Cu – Cu/Cu – Louvered Hail Guards

Models w/All aluminum, Novation condenser coils (Outdoor – Indoor – Hail Guard)
G = Al/Al – Al/Cu
H = Al/Al – Cu/Cu
J = Al/Al – E–coat Al/Cu
K = E–coat Al/Al – Al/Cu
L = E–coat Al/Al – E–coat Al/Cu
T = Al/Al – Al/Cu – Louvered Hail Guards
U = Al/Al – Cu/Cu – Louvered Hail Guards
V = Al/Al – E–coat Al/Cu – Louvered Hail Guards
W = E–coat Al/Al – Al/Cu – Louvered Hail Guards
X = E–coat Al/Al – E–coat Al/Cu – Louvered Hail Guards

Voltage
1 = 575/3/60
3 = 208–230/1/60
5 = 208–230/3/60
6 = 460/3/60

Design Rev
Factory assigned

Base Unit Controls
0 = Electromechanical
1 = PremierLink DDC controller
2 = RTU Open multi protocol controller

Intake / Exhaust Options
A = None
B = Temp Economizer w/ Barometric Relief
D = Temperature Economizer w/PE
F = Enthalpy Economizer w/ Baro Relief
H = Enthalpy Economizer w/PE
K = 2–Position Damper
P = Manual Outdoor Air Damper

Service Options
0 = None
1 = Un–powered convenience outlet
2 = Powered convenience outlet

Electrical Options
A = None
C = Non–fused disc
D = Thru the base
F = Non–fused & thru the base

Brand / Packaging
0 = Standard
1 = LTL

50TCQ Model Option List - HEATPUMP with optional field installed electric heat

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
5	0	T	C	Q	A	0	6	A	2	A	5	A	0	A	0	A	0

Unit Type
50 = Cooling/Elec Heat RTU

Model
TC = WeatherMaker Series

Heat Size
Q = Heat Pump

Refrig. System Options
A = 1–stage cooling compressor models
D = 2–stg. cooling compressor models

Cooling Tons
04 = 3 Ton
05 = 4 Ton
06 = 5 Ton
07 = 6 Ton
08 = 7.5 Ton
09 = 8.5 Ton
12 = 10 Ton
14 = 12.5 Ton
17 = 15 Ton
24 = 20 Ton

Sensor Options
A = None
B = RA smoke detector
C = SA smoke detector
D = RA & SA smoke detector
E = CO_2 sensor
F = RA smoke detector & CO_2
G = SA smoke detector & CO_2
H = RA & SA smoke detector & CO_2

Indoor Fan Options
1 = Standard Static Option, Vertical
2 = Medium Static Option, Vertical
3 = High Static Option, Vertical
B =Medium Static High Efficiency Motor/Vertical Supply, Return Air Flow
C =High Static, High Efficiency Motor/Vertical Supply, Return Air Flow

5 = Standard Static Option, Horizontal
6 = Medium Static Option, Horizontal
7 = High Static Option, Horizontal
F = Medium Static High Efficiency Motor/Horizontal Supply, Return Air Flow
G = High Static, High Efficiency Motor/Horizontal Supply, Return Air Flow

Models w/Round Tube Plate Fin (RTPF) condenser coils (Outdoor – Indoor – Hail Guard)
A = Al/Cu – Al/Cu
B = Precoat Al/Cu – Al/Cu
C = E coat Al/Cu – Al/Cu
D = E coat Al/Cu – E coat Al/Cu
E = Cu/Cu – Al/Cu
F = Cu/Cu – Cu/Cu
M = Al/Cu – Al/Cu – Louvered Hail Guards
N = Precoat Al/Cu – Al/Cu – Louvered Hail Guards
P = E coat Al/Cu – Al/Cu – Louvered Hail Guards
Q = E coat Al/Cu – E coat Al/Cu – Louvered Hail Guards
R = Cu/Cu – Al/Cu – Louvered Hail Guards
S = Cu/Cu – Cu/Cu – Louvered Hail Guards

Models w/All aluminum, Novation condenser coils (Outdoor – Indoor – Hail Guard)
G = Al/Al – Al/Cu
H = Al/Al – Cu/Cu
J = Al/Al – E–coat Al/Cu
K = E–coat Al/Al – Al/Cu
L = E–coat Al/Al – E–coat Al/Cu
T = Al/Al – Al/Cu – Louvered Hail Guards
U = Al/Al – Cu/Cu – Louvered Hail Guards
V = Al/Al – E–coat Al/Cu – Louvered Hail Guards
W = E–coat Al/Al – Al/Cu – Louvered Hail Guards
X = E–coat Al/Al – E–coat Al/Cu – Louvered Hail Guards

Voltage
1 = 575/3/60
3 = 208–230/1/60
5 = 208–230/3/60
6 = 460/3/60

Design Rev
Factory assigned

Base Unit Controls
0 = Electromechanical
1 = PremierLink DDC controller
2 = RTU Open multi protocol controller

Intake / Exhaust Options
A = None
B = Temp Economizer w/ Barometric Relief
D = Temperature Economizer w/PE
F = Enthalpy Economizer w/ Baro Relief
H = Enthalpy Economizer w/PE
K = 2–Position Damper
P = Manual Outdoor Air Damper

Service Options
0 = None
1 = Un–powered convenience outlet
2 = Powered convenience outlet

Electrical Options
A = None
C = Non–fused disc
D = Thru the base
F = Non–fused & thru the base

Brand / Packaging
0 = Standard
1 = LTL

Special Seismic Certification
OSHPD Preapproval
Carrier 48TC, 50TC, 50TCQ Product Line

Table 2. Approved Unit List

Model Number	Nominal Tons	Tested/ Interpolated	Length (in)	Width (in)	Height (in)	Operating Weight (lbs)
50TC**04	3	Tested	74.375	46.75	33.375	570
50TC**05	4	Interpolated	74.375	46.75	33.375	582
50TC**06	5	Interpolated	74.375	46.75	33.375	614
50TC**07	6	Interpolated	74.375	46.75	41.375	700
50TC**08	7.5	Interpolated	88.125	59.5	41.25	850
50TC**09	8.5	Interpolated	88.125	59.5	49.375	955
50TC**12	10	Interpolated	88.125	59.5	49.375	965
50TC**14	12.5	Interpolated	88.125	59.5	49.375	1,140
50TC**16	15	Interpolated	115.875	63.375	57.375	1,400
50TC**17	15	Interpolated	127.875	86.625	49.375	1,917
50TC**20	17.5	Interpolated	127.875	86.625	49.375	1,932
50TC**24	20	Interpolated	141.5	86.625	49.375	2,112
50TC**28	25	Interpolated	141.5	86.625	57.375	2,150
50TCQ*04	3	Interpolated	74.375	46.75	41.375	580
50TCQ*05	4	Interpolated	74.375	46.75	41.375	602
50TCQ*06	5	Interpolated	74.375	46.75	41.375	621
50TCQ*07	6	Interpolated	74.375	46.75	41.375	712
50TCQ*08	7.5	Interpolated	88.125	59.5	49.375	865
50TCQ*09	8.5	Interpolated	88.125	59.5	49.375	962
50TCQ*12	10	Tested	88.125	59.5	49.375	975
50TCQ*14	12.5	Interpolated	115.875	63.375	57.375	1,152
50TCQ*17	15	Interpolated	127.875	86.625	49.375	1,410
50TCQ*24	20	Interpolated	141.5	86.625	49.375	1,935
48TC**04	3	Interpolated	74.375	46.75	33.375	573
48TC**05	4	Interpolated	74.375	46.75	33.375	627
48TC**06	5	Interpolated	74.375	46.75	33.375	659
48TC**07	6	Interpolated	74.375	46.75	41.375	742
48TC**08	7.5	Interpolated	88.125	59.5	41.25	935
48TC**09	8.5	Interpolated	88.125	59.5	49.375	1,030
48TC**12	74.375	Interpolated	88.125	59.5	49.375	1,040
48TC**14	12.5	Interpolated	88.125	59.5	49.375	1,277
48TC**16	15	Interpolated	115.875	63.375	57.375	1,500
48TC**17	15	Interpolated	127.875	86.625	49.375	1,931
48TC**20	17.5	Interpolated	127.875	86.625	49.375	1,946
48TC**24	20	Interpolated	141.5	86.625	49.375	2,126
48TC**28	25	Tested	141.5	86.625	57.375	2,278

Special Seismic Certification
OSHPD Preapproval
Carrier 48TC, 50TC, 50TCQ Product Line

Table 3a. 48TC Major-Component List

Compressor

Model Number	Nominal Tons	Smallest	Largest	Manufacturer	Interpolated / Included With Test
48TC**04	3	ZP31K5E	na	Copeland	Interpolated
48TC**05	4	ZP42K5E	na	Copeland	Interpolated
48TC**06	5	ZP54K5E	na	Copeland	Interpolated
48TC**07	6	ZP61KCE	na	Copeland	Interpolated
48TC**08	7.5	ZP83KCE	na	Copeland	Interpolated
48TC**09	8.5	ZP90KCE	na	Copeland	Interpolated
48TC**12	10	ZP103KCE	na	Copeland	Interpolated
48TC**14	12.5	ZP61KCE	ZP61KCE	Copeland	Interpolated
48TC**16	15	ZP83KCE	ZP76KCE	Copeland	Interpolated
48TC**17	15	ZP90KCE	ZP103KCE	Copeland	Interpolated
48TC**20	17.5	ZP90KCE	ZP103KCE	Copeland	Interpolated
48TC**24	20	ZP137KCE	ZP90KCE	Copeland	Interpolated
48TC**28	25	ZP137KCE	ZP137KCE	Copeland	Tested

Heat Cell

Model Number	Nominal Tons	Smallest (MBTUH Input)	Largest (MBTUH Input)	Manufacturer	Interpolated / Included With Test
48TC**04	3	72	115	Carrier	Interpolated
48TC**05	4	72	150	Carrier	Interpolated
48TC**06	5	72	150	Carrier	Interpolated
48TC**07	6	72	150	Carrier	Interpolated
48TC**08	7.5	125	224	Carrier	Interpolated
48TC**09	8.5	125	224	Carrier	Interpolated
48TC**12	10	180	250	Carrier	Interpolated
48TC**14	12.5	180	250	Carrier	Interpolated
48TC**16	15	180	350	Carrier	Interpolated
48TC**17	15	220	400	Carrier	Interpolated
48TC**20	17.5	220	400	Carrier	Interpolated
48TC**24	20	220	400	Carrier	Interpolated
48TC**28	25	220	400	Carrier	Tested

Condenser

Model Number	Nominal Tons	Face Area (Sq Ft)	Rows	Manufacturer*	Interpolated / Included With Test
48TC**04	3	14.6	1	Carrier	Interpolated
48TC**05	4	16.5	2	Carrier	Interpolated
48TC**06	5	16.5	2	Carrier	Interpolated
48TC**07	6	21.3	2	Carrier	Interpolated
48TC**08	7.5	20.5	2	Carrier	Interpolated
48TC**09	8.5	21.4	2	Carrier	Interpolated
48TC**12	10	25.1	2	Carrier	Interpolated
48TC**14	12.5	25.1	3	Carrier	Interpolated
48TC**16	15	46.2	2	Carrier	Interpolated
48TC**17	15	42.8	2	Carrier or Delphi	Interpolated
48TC**20	17.5	42.8	2	Carrier or Delphi	Interpolated
48TC**24	20	42.5	2	Carrier or Delphi	Interpolated
48TC**28	25	54.2	2	Carrier or Delphi	Tested

* Round Tube Plate Fin Coils by Carrier and Novation (Microchannel) by Delphi

Table 3a. 48TC Major-Component List (Cont'd)

Evaporator

Model Number	Nominal Tons	Face Area (Sq Ft)	Rows	Manufacturer	Interpolated / Included With Test
48TC**04	3	5.5	2	Carrier	Interpolated
48TC**05	4	5.5	2	Carrier	Interpolated
48TC**06	5	5.5	4	Carrier	Interpolated
48TC**07	6	7.3	4	Carrier	Interpolated
48TC**08	7.5	8.9	3	Carrier	Interpolated
48TC**09	8.5	11.1	3	Carrier	Interpolated
48TC**12	10	11.1	4	Carrier	Interpolated
48TC**14	12.5	11.1	4	Carrier	Interpolated
48TC**16	15	17.5	3	Carrier	Interpolated
48TC**17	15	19.6	4	Carrier	Interpolated
48TC**20	17.5	19.6	4	Carrier	Interpolated
48TC**24	20	22.0	4	Carrier	Interpolated
48TC**28	25	23.1	4	Carrier	Tested

Refrigerant Expansion Device

Model Number	Nominal Tons	Indoor	Outdoor	Manufacturer	Interpolated / Included With Test
48TC**04	3	Acutrol*	na	Carrier	Interpolated
48TC**05	4	Acutrol*	na	Carrier	Interpolated
48TC**06	5	Acutrol*	na	Carrier	Interpolated
48TC**07	6	Acutrol*	na	Carrier	Interpolated
48TC**08	7.5	Acutrol*	na	Carrier	Interpolated
48TC**09	8.5	Acutrol*	na	Carrier	Interpolated
48TC**12	10	Acutrol*	na	Carrier	Interpolated
48TC**14	12.5	Acutrol*	na	Carrier	Interpolated
48TC**16	15	Acutrol*	na	Carrier	Interpolated
48TC**17	15	Acutrol*	na	Carrier	Interpolated
48TC**20	17.5	Acutrol*	na	Carrier	Interpolated
48TC**24	20	Acutrol*	na	Carrier	Interpolated
48TC**28	25	Acutrol*	na	Carrier	Tested

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Control Box

Model Number	Nominal Tons	Electro-Mechanical	PremierLink /RTU-Open	Manufacturer	Interpolated / Included With Test
48TC**04	3	X	X	Whitepath	Interpolated
48TC**05	4	X	X	Whitepath	Interpolated
48TC**06	5	X	X	Whitepath	Interpolated
48TC**07	6	X	X	Whitepath	Interpolated
48TC**08	7.5	X	X	Whitepath	Interpolated
48TC**09	8.5	X	X	Whitepath	Interpolated
48TC**12	10	X	X	Whitepath	Interpolated
48TC**14	12.5	X	X	Whitepath	Interpolated
48TC**16	15	X	X	Whitepath	Interpolated
48TC**17	15	X	X	Whitepath	Interpolated
48TC**20	17.5	X	X	Whitepath	Interpolated
48TC**24	20	X	X	Whitepath	Interpolated
48TC**28	25	X	X	Whitepath	Tested

Table 3a. 48TC Major-Component List (Cont'd)

Condenser Fan Motor (s)

Model Number	Nominal Tons	HP	#	Manufacturer*	Interpolated / Included With Test
48TC**04	3	1/4	1	Regal Beloit	Interpolated
48TC**05	4	1/4	1	Regal Beloit	Interpolated
48TC**06	5	1/4	1	Regal Beloit	Interpolated
48TC**07	6	1/4	1	Regal Beloit	Interpolated
48TC**08	7.5	1/4	2	Regal Beloit	Interpolated
48TC**09	8.5	1/4	2	Regal Beloit	Interpolated
48TC**12	10	1/4	2	Regal Beloit	Interpolated
48TC**14	12.5	1.0	1	Regal Beloit	Interpolated
48TC**16	15	1/4	3	Regal Beloit	Interpolated
48TC**17	15	1/4	3	Regal Beloit	Interpolated
48TC**20	17.5	1/4	3	Regal Beloit	Interpolated
48TC**24	20	1/4	4	Regal Beloit	Interpolated
48TC**28	25	1/4	4	Regal Beloit	Tested

Evaporator Fan Motor

Model Number	Nominal Tons	Smallest HP	Largest HP	Manufacturer*	Interpolated / Included With Test
48TC**04	3	1.2	2.4	Regal Beloit	Interpolated
48TC**05	4	1.2	2.4	Regal Beloit	Interpolated
48TC**06	5	1.2	2.9	Regal Beloit	Interpolated
48TC**07	6	2.4	3.7	Regal Beloit	Interpolated
48TC**08	7.5	1.7	4.7	Regal Beloit	Interpolated
48TC**09	8.5	1.7	3.7	Regal Beloit	Interpolated
48TC**12	10	2.4	4.7	Regal Beloit	Interpolated
48TC**14	12.5	2.9	4.7	Regal Beloit	Interpolated
48TC**16	15	2.9	6.1	Regal Beloit/AO Smith	Interpolated
48TC**17	15	2.2	4.9	Regal Beloit	Interpolated
48TC**20	17.5	3.3	6.5	Regal Beloit/AO Smith	Interpolated
48TC**24	20	4.9	8.7	Regal Beloit/AO Smith	Interpolated
48TC**28	25	4.9	8.7	AO Smith	Tested

Special Seismic Certification
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Carrier 48TC, 50TC, 50TCQ Product Line

Table 3b. 50TC Major-Component List

Compressor

Model Number	Nominal Tons	System 1	System 2	Manufacturer	Interpolated / Included With Test
50TC**04	3	ZP31K5E	na	Copeland	Tested
50TC**05	4	ZP42K5E	na	Copeland	Interpolated
50TC**06	5	ZP54K5E	na	Copeland	Interpolated
50TC**07	6	ZP61KCE	na	Copeland	Interpolated
50TC**08	7.5	ZP83KCE	na	Copeland	Interpolated
50TC**09	8.5	ZP90KCE	na	Copeland	Interpolated
50TC**12	10	ZP103KCE	na	Copeland	Interpolated
50TC**14	12.5	ZP61KCE	ZP61KCE	Copeland	Interpolated
50TC**16	15	ZP83KCE	ZP76KCE	Copeland	Interpolated
50TC**17	15	ZP90KCE	ZP103KCE	Copeland	Interpolated
50TC**20	17.5	ZP90KCE	ZP103KCE	Copeland	Interpolated
50TC**24	20	ZP137KCE	ZP90KCE	Copeland	Interpolated
50TC**28	25	ZP137KCE	ZP137KCE	Copeland	Interpolated

Electric Heater

Model Number	Nominal Tons	Smallest (KW)	Largest (KW)	Manufacturer	Interpolated / Included With Test
50TC**04	3	4.4	16	Carrier	Tested
50TC**05	4	4.4	23	Carrier	Interpolated
50TC**06	5	6	26.5	Carrier	Interpolated
50TC**07	6	6	26.5	Carrier	Interpolated
50TC**08	7.5	10.4	42.4	Carrier	Interpolated
50TC**09	8.5	10.4	42.4	Carrier	Interpolated
50TC**12	10	10.4	50	Carrier	Interpolated
50TC**14	12.5	16.5	50	Carrier	Interpolated
50TC**16	15	16.5	50	Carrier	Interpolated
50TC**17	15	25	75	Carrier	Interpolated
50TC**20	17.5	25	75	Carrier	Interpolated
50TC**24	20	25	75	Carrier	Interpolated
50TC**28	25	25	75	Carrier	Interpolated

Condenser

Model Number	Nominal Tons	Face Area (Sq Ft)	Rows	Manufacturer*	Interpolated / Included With Test
50TC**04	3	14.6	1	Carrier	Tested
50TC**05	4	16.5	2	Carrier	Interpolated
50TC**06	5	16.5	2	Carrier	Interpolated
50TC**07	6	21.3	2	Carrier	Interpolated
50TC**08	7.5	20.5	2	Carrier	Interpolated
50TC**09	8.5	21.4	2	Carrier	Interpolated
50TC**12	10	25.1	2	Carrier	Interpolated
50TC**14	12.5	25.1	3	Carrier	Interpolated
50TC**16	15	46.2	2	Carrier	Interpolated
50TC**17	15	42.8	2	Carrier or Delphi	Interpolated
50TC**20	17.5	42.8	2	Carrier or Delphi	Interpolated
50TC**24	20	42.5	2	Carrier or Delphi	Interpolated
50TC**28	25	54.2	2	Carrier or Delphi	Interpolated

* Round Tube Plate Fin Coils by Carrier and Novation (Microchannel) by Delphi

Table 3b. 50TC Major-Component List (Cont'd)

Evaporator

Model Number	Nominal Tons	Face Area (Sq Ft)	Rows	Manufacturer	Interpolated / Included With Test
50TC**04	3	5.5	2	Carrier	Tested
50TC**05	4	5.5	2	Carrier	Interpolated
50TC**06	5	5.5	4	Carrier	Interpolated
50TC**07	6	7.3	4	Carrier	Interpolated
50TC**08	7.5	8.9	3	Carrier	Interpolated
50TC**09	8.5	11.1	3	Carrier	Interpolated
50TC**12	10	11.1	4	Carrier	Interpolated
50TC**14	12.5	11.1	4	Carrier	Interpolated
50TC**16	15	17.5	3	Carrier	Interpolated
50TC**17	15	19.6	4	Carrier	Interpolated
50TC**20	17.5	19.6	4	Carrier	Interpolated
50TC**24	20	22.0	4	Carrier	Interpolated
50TC**28	25	23.1	4	Carrier	Interpolated

Refrigerant Expansion Device

Model Number	Nominal Tons	Indoor	Outdoor	Manufacturer	Interpolated / Included With Test
50TC**04	3	Acutrol*	na	Carrier	Tested
50TC**05	4	Acutrol*	na	Carrier	Interpolated
50TC**06	5	Acutrol*	na	Carrier	Interpolated
50TC**07	6	Acutrol*	na	Carrier	Interpolated
50TC**08	7.5	Acutrol*	na	Carrier	Interpolated
50TC**09	8.5	Acutrol*	na	Carrier	Interpolated
50TC**12	10	Acutrol*	na	Carrier	Interpolated
50TC**14	12.5	Acutrol*	na	Carrier	Interpolated
50TC**16	15	Acutrol*	na	Carrier	Interpolated
50TC**17	15	Acutrol*	na	Carrier	Interpolated
50TC**20	17.5	Acutrol*	na	Carrier	Interpolated
50TC**24	20	Acutrol*	na	Carrier	Interpolated
50TC**28	25	Acutrol*	na	Carrier	Interpolated

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Control Box

Model Number	Nominal Tons	Electro-Mechanical	PremierLink /RTU-Open	Manufacturer	Interpolated / Included With Test
50TC**04	3	X	X	Whitepath	Tested
50TC**05	4	X	X	Whitepath	Interpolated
50TC**06	5	X	X	Whitepath	Interpolated
50TC**07	6	X	X	Whitepath	Interpolated
50TC**08	7.5	X	X	Whitepath	Interpolated
50TC**09	8.5	X	X	Whitepath	Interpolated
50TC**12	10	X	X	Whitepath	Interpolated
50TC**14	12.5	X	X	Whitepath	Interpolated
50TC**16	15	X	X	Whitepath	Interpolated
50TC**17	15	X	X	Whitepath	Interpolated
50TC**20	17.5	X	X	Whitepath	Interpolated
50TC**24	20	X	X	Whitepath	Interpolated
50TC**28	25	X	X	Whitepath	Interpolated

Table 3b. 50TC Major-Component List (Cont'd)

Condenser Fan Motor (s)

Model Number	Nominal Tons	HP	#	Manufacturer*	Interpolated / Included With Test
50TC**04	3	1/4	1	Regal Beloit	Tested
50TC**05	4	1/4	1	Regal Beloit	Interpolated
50TC**06	5	1/4	1	Regal Beloit	Interpolated
50TC**07	6	1/4	1	Regal Beloit	Interpolated
50TC**08	7.5	1/4	2	Regal Beloit	Interpolated
50TC**09	8.5	1/4	2	Regal Beloit	Interpolated
50TC**12	10	1/4	2	Regal Beloit	Interpolated
50TC**14	12.5	1.0	1	Regal Beloit	Interpolated
50TC**16	15	1/4	3	Regal Beloit	Interpolated
50TC**17	15	1/4	3	Regal Beloit	Interpolated
50TC**20	17.5	1/4	3	Regal Beloit	Interpolated
50TC**24	20	1/4	4	Regal Beloit	Interpolated
50TC**28	25	1/4	4	Regal Beloit	Interpolated

Evaporator Fan Motor

Model Number	Nominal Tons	Smallest HP	Largest HP	Manufacturer*	Interpolated / Included With Test
50TC**04	3	1.2	2.4	Regal Beloit	Tested
50TC**05	4	1.2	2.4	Regal Beloit	Interpolated
50TC**06	5	1.2	2.9	Regal Beloit	Interpolated
50TC**07	6	2.4	3.7	Regal Beloit	Interpolated
50TC**08	7.5	1.7	4.7	Regal Beloit	Interpolated
50TC**09	8.5	1.7	3.7	Regal Beloit	Interpolated
50TC**12	10	2.4	4.7	Regal Beloit	Interpolated
50TC**14	12.5	2.9	4.7	Regal Beloit	Interpolated
50TC**16	15	2.9	6.1	Regal Beloit/AO Smith	Interpolated
50TC**17	15	2.2	4.9	Regal Beloit	Interpolated
50TC**20	17.5	3.3	6.5	Regal Beloit/AO Smith	Interpolated
50TC**24	20	4.9	8.7	Regal Beloit/AO Smith	Interpolated
50TC**28	25	4.9	8.7	Regal Beloit/AO Smith	Interpolated

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Table 3c. 50TCQ Major-Component List

Compressor

Model Number	Nominal Tons	System 1	System 2	Manufacturer	Interpolated / Included With Test
50TCQ*04	3	ZP34K5E	na	Copeland	Interpolated
50TCQ*05	4	ZP42K5E	na	Copeland	Interpolated
50TCQ*06	5	ZP54K5E	na	Copeland	Interpolated
50TCQ*07	6	ZP61KCE	na	Copeland	*Interpolated
50TCQ*08	7.5	ZP39K5E	ZP39K5E	Copeland	*Interpolated
50TCQ*09	8.5	ZP44K5E	ZP42K5E	Copeland	*Interpolated
50TCQ*12	10	ZP51K5E	ZP54K5E	Copeland	Tested
50TCQ*14	12.5	ZP67KCE	ZP67KCE	Copeland	*Interpolated
50TCQ*17	15	ZP83KCE	ZP83KCE	Copeland	*Interpolated
50TCQ*24	20	ZP103KCE	ZP120KCE	Copeland	*Interpolated

* Interpolated from other size compressors tested on the non Heat Pump units.

Electric Heater

Model Number	Nominal Tons	Smallest (KW)	Largest (KW)	Manufacturer	Interpolated / Included With Test
50TCQ*04	3	4.4	16	Carrier	Interpolated
50TCQ*05	4	4.4	23	Carrier	Interpolated
50TCQ*06	5	6	26.5	Carrier	Interpolated
50TCQ*07	6	6	26.5	Carrier	Interpolated
50TCQ*08	7.5	10.4	42.4	Carrier	Interpolated
50TCQ*09	8.5	10.4	42.4	Carrier	Interpolated
50TCQ*12	10	10.4	49.5	Carrier	Tested
50TCQ*14	12.5	16.5	49.5	Carrier	Interpolated
50TCQ*17	15.0	25.0	75.0	Carrier	Interpolated
50TCQ*24	20.0	25.0	75.0	Carrier	Interpolated

*KW

Condenser

Model Number	Nominal Tons	Face Area (Sq Ft)	Rows	Manufacturer*	Interpolated / Included With Test
50TCQ*04	3	14.6	1	Carrier	Interpolated
50TCQ*05	4	12.7	2	Carrier	Interpolated
50TCQ*06	5	15	2	Carrier	Interpolated
50TCQ*07	6	21.3	2	Carrier	Interpolated
50TCQ*08	7.5	25.1	2	Carrier	Interpolated
50TCQ*09	8.5	25.1	2	Carrier	Interpolated
50TCQ*12	10	25.1	3	Carrier	Tested
50TCQ*14	12.5	36.1	2	Carrier	Interpolated
50TCQ*17	15	42.8	2	Carrier	Interpolated
50TCQ*24	20	42.8	2	Carrier	Interpolated

* Round Tube Plate Fin Coils

BUEHLER & BUEHLER structural engineers

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Carrier 48TC, 50TC, 50TCQ Product Line

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Table 3c. 50TCQ Major-Component List (Cont'd)

Evaporator

Model Number	Nominal Tons	Face Area (Sq Ft)	Rows	Manufacturer	Interpolated / Included With Test
50TCQ*04	3	5.5	3	Carrier	Interpolated
50TCQ*05	4	5.5	3	Carrier	Interpolated
50TCQ*06	5	7.3	4	Carrier	Interpolated
50TCQ*07	6	7.3	4	Carrier	Interpolated
50TCQ*08	7.5	11.1	3	Carrier	Interpolated
50TCQ*09	8.5	11.1	4	Carrier	Interpolated
50TCQ*12	10	11.1	4	Carrier	Tested
50TCQ*14	12.5	17.5	3	Carrier	Interpolated
50TCQ*17	15	19.6	3	Carrier	Interpolated
50TCQ*24	20	22.0	4	Carrier	Interpolated

Control Box

Model Number	Nominal Tons	Electro-mechanical	PremierLink /RTU-Open	Manufacturer	Interpolated / Included With Test
50TCQ*04	3	X	X	Carrier/Whitepath	Interpolated
50TCQ*05	4	X	X	Carrier/Whitepath	Interpolated
50TCQ*06	5	X	X	Carrier/Whitepath	Interpolated
50TCQ*07	6	X	X	Carrier/Whitepath	Interpolated
50TCQ*08	7.5	X	X	Carrier/Whitepath	Interpolated
50TCQ*09	8.5	X	X	Carrier/Whitepath	Interpolated
50TCQ*12	10	X	X	Carrier/Whitepath	Tested
50TCQ*14	12.5	X	X	Carrier/Whitepath	Interpolated
50TCQ*17	15	X	X	Carrier/Whitepath	Interpolated
50TCQ*24	20	X	X	Carrier/Whitepath	Interpolated

Condenser Fan Motor (s)

Model Number	Nominal Tons	HP	#	Manufacturer*	Interpolated / Included With Test
50TCQ*04	3	1/4	1	Regal Beloit	Interpolated
50TCQ*05	4	1/4	1	Regal Beloit	Interpolated
50TCQ*06	5	1/4	1	Regal Beloit	Interpolated
50TCQ*07	6	1/4	1	Regal Beloit	Interpolated
50TCQ*08	7.5	1/4	2	Regal Beloit	Interpolated
50TCQ*09	8.5	1/4	2	Regal Beloit	Interpolated
50TCQ*12	10	1.0	1	Regal Beloit	Tested
50TCQ*14	12.5	1/4	3	Regal Beloit	Interpolated
50TCQ*17	15	1/4	3	Regal Beloit	Interpolated
50TCQ*24	20	1/4	4	Regal Beloit	Interpolated

Evaporator Fan Motor

Model Number	Nominal Tons	Smallest HP	Largest HP	Manufacturer*	Interpolated / Included With Test
50TCQ*04	3	1	2	Regal Beloit	Interpolated
50TCQ*05	4	1	2	Regal Beloit	Interpolated
50TCQ*06	5	1	2.9	Regal Beloit	Interpolated
50TCQ*07	6	1.5	2.9	Regal Beloit	Interpolated
50TCQ*08	7.5	1.2	2.9	Regal Beloit	Interpolated
50TCQ*09	8.5	1.2	2.9	Regal Beloit	Interpolated
50TCQ*12	10	2.4	4.7	Regal Beloit	Tested
50TCQ*14	12.5	2.9	6.1	Regal Beloit/AO Smith	Interpolated
50TCQ*17	15	2.2	4.9	Regal Beloit	Interpolated
50TCQ*24	20	3.3	6.5	Regal Beloit/AO Smith	Interpolated