

DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

OFFICE USE ONLY APPLICATION FOR HCAI SPECIAL SEISMIC **CERTIFICATION PREAPPROVAL (OSP)** APPLICATION #: OSP-0181 **HCAI Special Seismic Certification Preapproval (OSP)** Type: New Renewal **Manufacturer Information** Manufacturer: AAON, Inc. Manufacturer's Technical Representative: James Velde Mailing Address: 203 Gum Springs Road, Longview, TX 75602 Telephone: (903) 247-9263 Email: jvelde@aaon.com **Product Information** Product Name: Air Conditioning Units Product Type: Air Conditioning Units Packaged Product Model Number: CB/CC Packaged Condensing Units General Description: Galvanized steel panel cabinets w/internal & external components. Mounting Description: Rigid, Floor Mounted Seismic enhancements made to the test units and/or modifications required to address Tested Seismic Enhancements: anomalies during the tests shall be incorporated into the production units. **Applicant Information** Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc. Contact Person: Galen Reid Mailing Address: 233 SW Wilson Ave., Suite 101, Bend, OR 97702

Email: greid@structint.com

OSP-0181





Telephone: (541) 604-7225

Title: Director, TRU Compliance

12/08/2022



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION FACILITIES DEVELOPMENT DIVISION

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| California Licensed Structural Engineer Responsible for the Engineering and Test Report(s) |
| Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC. |
| Name: Andrew Coughlin California License Number: S6082 |
| Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025 |
| Felephone: (415) 635-8461 Email: acoughlin@structint.com |
| |
| Certification Method |
| GR-63-Core X ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3 |
| Other (Please Specify): |
| EOR CODE CO. |
| Testing Laboratory |
| Company Name: Clark Dynamics Test Laboratory |
| Contact Person: Robert Francis |
| Mailing Address: 1801 Route 51, Jefferson Hills GA 15025 |
| Telephone: (412) 387-1001 Email: rfrancis@clarktesting.com |
| |
| DATE: 12/08/2022 |
| |







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| Seismic Parameters | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|
| Design Basis of Equipment or Components | Design Basis of Equipment or Components (F _P /W _P) = 1.44 | | | | | | | | |
| SDS (Design spectral response acceleration at short period, g) = 2.00 | | | | | | | | | |
| a _p (Amplification factor) = | 1.0 | | | | | | | | |
| Rp (Response modification factor) = | 2.5 | | | | | | | | |
| Ω_0 (System overstrength factor) = | 2.0 | | | | | | | | |
| Ip (Importance factor) = | 1.5 | | | | | | | | |
| z/h (Height ratio factor) = | 1 | | | | | | | | |
| Natural frequencies (Hz) = | See Attachment | | | | | | | | |
| Overall dimensions and weight = | See Attachment | | | | | | | | |

| HCAI Approval (For Office Use Only) - Approval Expires on 12/08/2028 | | | | | | | | | |
|--|---|--------|-------------------------------|--|--|--|--|--|--|
| Date: | 12/8/2022 OSP-0181 | 18 | | | | | | | |
| Name: | Mohammad Karim | Title: | Supervisor, Health Facilities | | | | | | |
| Special | Seismic Certification Valid Up to: SDS (g) = 2.00 | z/h = | 1 | | | | | | |
| Conditio | on of Approval (if applicable): DATF · 12/08/2022 | | | | | | | | |





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TRU PROJECT NO. 1700667



Manufacturer: AAON

Model Line: CB/CC Packaged Condensing Units

TABLE 1

Certified Product Construction Summary:

20 ga. Carbon Steel Panel Construction

Certified Options Summary:

Interior corrosion protection, single phase (208, 230V) or three phase (460V) system.

Mounting Configuration:

Base mounted - rigid using standard manufacturer provided brackets

Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2022

Seismic Certification Limits:

 $S_{DS} = 2.0 g z/h = 1.0$

I_P= 1.5

| Building Code: CBC 2 | 2022 | Seismic C | ertificatio | on Limits: | S _{DS} = | 2.0 g z/h=0.0 | <i>I</i> _P = 1.5 |
|----------------------|------------------------------|-----------|-------------|---------------------|--------------------------|---------------|------------------------------------|
| Model Line | Model | Dir | nensions | (in) 1 | Weight | | UUT |
| Model Lille | Model | Depth | Width | Height | (lb.) | Notes | 001 |
| | CB-B <mark>-024</mark> | 36.3/ | ha31,0na | 36.7 _{rin} | 237 | | Interp. |
| СВ | CB-B <mark>-036</mark> | 36.3 | 31.0 | 36.7 | 237 | | Interp. |
| СВ | CB-B-048 | 36.3 | 37.0 | 40.5 | 260 | | Interp. |
| | CB-B-060 | 36.3 | 137.0 | /240.52 | 281 | 0 | Interp. |
| | CC-B-002- <mark>1-B-1</mark> | 20.2 | 50.1 | 38.6 | 237 | UUT: 325 lbs. | 9 |
| CC | CC-B-003 | 20.2 | 50.1 | 38.6 | 237 | | Interp. |
| CC | CC-B-004 | 20.2 | 50.1 | 38.6 | 260 | | Interp. |
| | CC-B-005-3-B-1 | 20.2 | 50.1 | 38.3 | 281 | UUT: 330 lbs. | 10 |
| | | YA R | IIIDI | NIG | | | |
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TRU PROJECT NO. 1700667



Manufacturer: AAON Table Description: Compressors

Model Line: CB/CC Packaged Condensing Units

TABLE 2

Building Code: CBC 2022 Seismic Certification Limits: $S_{DS} = 2.0 \text{ g} \quad z/h = 1.0$ $S_{DS} = 2.0 \text{ g} \quad z/h = 0.0$

| uilding Code: CBC 2022 | | | Seisiilic | Certification | on Linits: | $S_{DS} = 2.0 g z/h = 0.0$ | $I_P = 1.5$ | |
|------------------------|----------|-------|-----------|--------------------|------------|--|-------------|-------|
| Model Line | Model | Di | mension | (in) | Weight | DE C Material | Notes | UUT |
| (Manufacturer) | Model | Depth | Width | Height | (lb.) | O Material | Notes | |
| | ZPS20K4E | 9.5 | 9.5 | 16.0 | 67.0 | | | 9 |
| | ZPS30K4E | 9.5 | 9.5 | 16.0 | 68.2 | | | Inter |
| Compressors | ZPD34K5E | 9.6 | 9.6 | 17.7 | 68.2 | ······································ | | Inter |
| (Copeland) | ZPS40K4E | 9.5 | 9.5 | 16.0 | 68.2- | 181 | | Inter |
| | ZPD42K5E | 9.3 | 9.3 | 18.4 | 68.2 | | | Inter |
| | ZPS51K4E | 9.6 | 9.6 | B16.9 _M | 0 h 76.6 m | ad Karim O | | 10 |
| | | | | | 4.0.10 | 0/0000 | | |
| | | | 5 | DAIL | : 12/0 | 8/2022 | | |
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| Manufacturer: Model Line: | AAON CB/CC Packaged Condens | Table Description: Fan Motors - Mounted to Fan Assembly ing Units TABLE 3 | | | | | | | |
|------------------------------|--------------------------------|--|--|----------------------|-----------|-------|--|--|--|
| Building Code: CBC 20 | | Seismic Certificat | ion Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $S_{DS} = 2.0 g$ $z/h = 0.0$ | I _P = 1.5 | | | | | |
| Component Type | Manufacturer | Model | R CODE Description | No | otes | UUT | | | |
| Fan Motor | GE | BY: N | 1/2 HP, 208/230-460V, 17 lbs. OSP-0181 Chammad Karim 12/08/2022 | UUT9: 208/230V, UU | T10: 460V | 9, 10 | | | |
| | | | | | | | | | |

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Manufacturer: AAON Table Description: Fans **TABLE 4** CB/CC Packaged Condensing Units Model Line: $S_{DS} = 2.0 g z/h = 1.0$ Building Code: CBC 2022 **Seismic Certification Limits:** $I_P = 1.5$ $S_{DS} = 2.0 g z/h = 0.0$ Dimension (in) Weight **Model Line** Model Material UUT **Notes** (Manufacturer) (lb.) Diameter Blades Width Carbon Steel T12E07A 8.0 2.1 9 22 3 Fans Carbon Steel 6088190 2.1 22 3 8.0 Interp. (LAU) 2.3 Carbon Steel 3 T5082630 26 8.0 10 BY: Mohammad Karim

TRU PROJECT NO. 1700667



Manufacturer: Table Description: Microchannel Coils AAON **TABLE 5** CB/CC Packaged Condensing Units Model Line: $S_{DS} = 2.0 g z/h = 1.0$ Building Code: CBC 2022 **Seismic Certification Limits:** $I_P = 1.5$ $S_{DS} = 2.0 g z/h = 0.0$ Dimension (in) Weight **Model Line** Model Material UUT **Notes** (Manufacturer) (lb.) Height Depth Width Microchannel **Custom Coils** 33.8 43.0 30 Aluminum 2-5 Ton CC A/C 10 (Delphi) BY: Mohammad Karim

TRU PROJECT NO. 1700667



Table Description: Tube and Fin Coils Manufacturer: AAON **TABLE 6** CB/CC Packaged Condensing Units Model Line: $S_{DS} = 2.0 g z/h = 1.0$ Building Code: CBC 2022 Seismic Certification Limits: $I_P = 1.5$ $S_{DS} = 2.0 g z/h = 0.0$ Dimension (in)¹ Weight **Model Line** Model Material UUT **Notes** (Manufacturer) (lb.) Height Depth Width Tube and Fin Coils Cu tube, Al fin, CS Casing 43.0 34.0 9 **Custom Coils** 3 row (AAON, INC.) BY: Mohammad Karim Notes: 1. Tube Wall Thickness: 0.012"; Fin Thickness: 0.006" Al; Fins per Inch: 22

TRU Compliance, by Structural Integrity Associates, Inc. 844-TRU-0200 | info@trucompliance.com

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Manufacturer: AAON Table Description: Sensors **TABLE 7** Model Line: CB/CC Packaged Condensing Units $S_{DS} = 2.0 g z/h = 1.0$ Building Code: CBC 2022 **Seismic Certification Limits:** $I_P = 1.5$ $S_{DS} = 2.0 g z/h = 0.0$ Dimension (in) Weight **Model Line** Model Material UUT **Notes** (Manufacturer) (lb.) Height Depth Width Sensors P352PN-4C 9, 10 2.4 2.4 5.0 (Johnson Controls) BY: Mohammad Karim

TRU PROJECT NO. 1700667



Manufacturer: AAON Table Description: Expansion Valves

Model Line: CB/CC Packaged Condensing Units

TABLE 8

Building Code: CBC 2022 Seismic Certification Limits: $S_{DS} = 2.0 \text{ g} \quad z/h = 1.0$ $S_{DS} = 2.0 \text{ g} \quad z/h = 0.0$

| | | Scisinic | ceremean | JII EIIIIICS. | $S_{DS} = 2.0 g z/h = 0.0$ | 1p - 1.3 | |
|----------|-------------------------------------|--|--|---|---|--|--|
| Model | Di | mension | (in) | | | Notes | UUT |
| Modet | Depth | Width | Height | (lb.) | Ola | Notes | 001 |
| CBBIZE-2 | 1.5 | 1.9 | 2.9 | 0.9 | | | 9 |
| CBBIZE-3 | 1.5 | 1.9 | 2.9 | 0.9 | | | Inter |
| CBBIZE-4 | 1.5 | 1.9 | 2.9 | 1.2 | | | Inter |
| CBBIZE-5 | 1.5 | 1.9 | 2.9 | OS12-(| 181 | | 10 |
| | | | BY: M | ohamm | ad Karim | | |
| | | | | 20025355 | | | |
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| | Model CBBIZE-2 CBBIZE-3 CBBIZE-4 | Model Dimension CBBIZE-2 1.5 CBBIZE-3 1.5 CBBIZE-4 1.5 | Model Dimension Depth Width CBBIZE-2 1.5 1.9 CBBIZE-3 1.5 1.9 CBBIZE-4 1.5 1.9 | Model Dimension (in) Depth Width Height CBBIZE-2 1.5 1.9 2.9 CBBIZE-3 1.5 1.9 2.9 CBBIZE-4 1.5 1.9 2.9 CBBIZE-5 1.5 1.9 2.9 | Model Dimension (in) Weight (lb.) CBBIZE-2 1.5 1.9 2.9 0.9 CBBIZE-3 1.5 1.9 2.9 0.9 CBBIZE-4 1.5 1.9 2.9 1.2 CBBIZE-5 1.5 1.9 2.9 1.2 | Nodel Dimension (in) Weight (lb.) Material | Model Dimension (in) Weight Material Notes |

UNIT UNDER TEST (UUT) SUMMARY SHEET





| Manufo Model I | acturer: AAON | ad Candansing Units | | | | | | |
|-------------------|---------------------------------------|--|--|----------------|--------------------------|-----------------|-----|----------------|
| UUT | Unit Description (Coils) | ed Condensing Units Report Number (UUT #) | Testing Lab | Year Tested | ISO 17025 Accredited? | S _{DS} | z/h | I _P |
| 9 | CC-B-002-1-B-1 (Tube & Fin Coil) | EL: 9814 (UUT9) | Clark Dynamic Test Laboratory, Inc. | 2011 | No ¹ | 2.0 | 1.0 | 1.5 |
| 10 | CC-B-005-3-B-1 (Microchannel Coil) | EL: 9814 (UUT10) | Clark Dynamic Test Laboratory, Inc. | 2011 | No ¹ | 2.0 | 1.0 | 1.5 |
| | | ED FOR (| ODE COMS | | | | | |
| | | OS | P-0181 | W.C. | | | | |
| | | BY: Moha | mmad Karim | 0 | | | | |
| | | DATE: 1 | 2/08/2022 | 079 | | | | |
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Notes:

1. Clark was not ISO 17025 accredited at the time of testing but has been reviewed by TRU Compliance and found to meet the requirements for ICC-ES AC156 testing. Review form is on file with TRU Compliance.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700667



UUT9

Manufacturer: AAON

Model Line: CB/CC Packaged Condensing Units

Model Number: CC-B-002 (CC-B-002-1-B-1:BG00000) **Serial Number:** 201107-CHCT03423

Product Construction Summary:

Painted Carbon Steel Enclosure

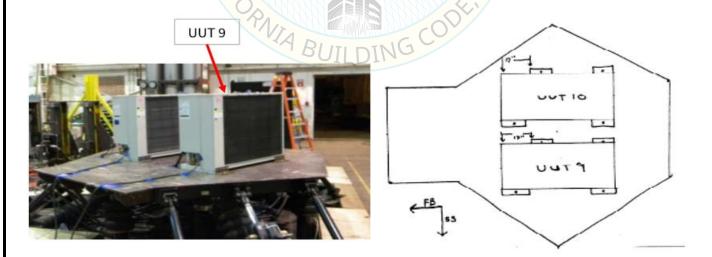
Options/Subcomponent Summary:

Compressor: Copeland (ZPS20K4E); Fan Motors: GE (48); Fans: LAU (T12E07A);

Tube & Fin Coils: AAON (Custom Coils); Sensors: Johnson Controls (P352PN-4C); Expansion Valves: Sporlan (CBBIZE-2)

| | | | UUT Pr | operties | | 7 | | | | | |
|----------|---------|---------------|-------------------|----------------------|---------|----------------|------------------------|------------------------|------------------------|------------------------|--|
| Weight | | Dimension (in |) In Mark March | /~/\/\/ . | | Lowes | t Natural | Frequen | cy (Hz) | | |
| (lb.) | Depth | Width | OSHe | OS Height 81 | | Front-Back | | Side-Side | | Vertical | |
| 325 | 20.2 | 50.1 | 8.6 | 25.1 | | 11.8 | | >33.3 | | | |
| | | UUT Highe | st Passed S | eismic Run | Informa | tion | | | | | |
| Buildi | ng Code | Test Criteria | | S _{DS} (g) | z/h | I _P | A _{FLX-H} (g) | A _{RIG-H} (g) | A _{FLX-V} (g) | A _{RIG-V} (g) | |
| CBC 2022 | | ICC-ES A | ICC-ES AC156 12/0 | | 2 1.0 | 1.5 | 3.20 | 2.40 | 1.33 | 0.53 | |

Test Mounting Details: (Test Report: EL: 9814)(UUT9)



UUT9 was base mounted - rigid using standard manufacturer provided brackets using four (4) 2"x2"x 8"x1/4" carbon steel angles. Each angle used four (4) #14 x 1-1/2" zip screws to attach to the unit and four (4) 1/2"-13 Grade 5 bolts with flat and lock washers.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1700667



UUT 10

Manufacturer: AAON

Model Number:

Model Line: CB/CC Packaged Condensing Units

CC-B-005 (CC-B-005-3-B-1:0DB000X) **Serial Number:** 201107-CHCW03424

Product Construction Summary:

Painted Carbon Steel Enclosure

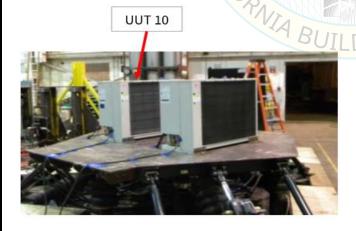
Options/Subcomponent Summary:

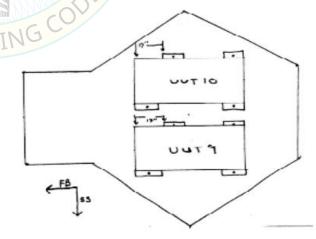
Compressor: Copeland (ZPS51K4E); Fan Motors: GE (48); Fans: LAU (T5082630); Microchannel Coils: Delphi (Custom Coils);

Sensors: Johnson Controls (P352PN-4C); Expansion Valves: Sporlan (CBBIZE-5)

| | | | UUT Pr | operties | | 7 | | | | |
|-------------|---------|-------------------|--------------|---------------------|-------------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| Weight | | Dimension (in | Market | Xv.V.V.Xv.Xv.XXX | Lowest Natural Frequency (Hz) | | | | | |
| (lb.) Depth | | Width | OS Height 81 | | Front-Back | | Side-Side | | Vertical | |
| 330 | 20.2 | 50.1 | 0.1 38.0 | | 15.4 | | 11.2 | | 12.6 | |
| | | UUT Highe | st Passed Se | eismic Run | Informa | tion | | | | |
| Buildi | ng Code | Test Criteria | | S _{DS} (g) | z/h | I _P | A _{FLX-H} (g) | A _{RIG-H} (g) | A _{FLX-V} (g) | A _{RIG-V} (g) |
| CBC 2022 | | ICC-ES AC156 12/0 | | 08/2002 | 2 1.0 | 1.5 | 3.20 | 2.40 | 1.33 | 0.53 |

Test Mounting Details: (Test Report: EL: 9814)(UUT10)





UUT10 was base mounted - rigid using standard manufacturer provided brackets using four (4) 2"x2"x 8"x1/4" carbon steel angles. Each angle used four (4) #14 x 1-1/2" zip screws to attach to the unit and four (4) 1/2"-13 Grade 5 bolts with flat and lock washers.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.