

APPLICATION FOR OSHPD SPECIAL SEISMIC	SMIC OFFICE USE ONLY				
CERTIFICATION PREAPPROVAL (OSP)	APPLICATION #:	OSP - 0381 - 10			
OSHPD Special Seismic Certification Preapproval (OSP)					
Type:   New  Renewal					
Manufacturer Information					
Manufacturer: Vertiv Corporation					
Manufacturer's Technical Representative: Kiel Stephens					
Mailing Address: 1050 Dearborn Drive, Columbus, OH 43085					
CODE	ephens@Vertiv.com				
Product Information	OM				
Product Name: Liebert CRV					
Product Type: Air Conditioning / Air Handling Units - Data Room Air	Conditioners – Comp	outer Room Air Conditioners			
Product Model Number: CR019, CR020, CR035, CR040, and CR032	GIIII CE				
(List all unique product identification numbers and/or part numbers)  General Description: CRV units 300mm and 600mm wide, 19, 20, a	nd 35kW air cooled a	and water/alveol unit 32kW			
and 40kW chilled water unit. Seismic enhancements made to the test anomalies observed during the tests shall be incorporated into the pro-	t units and <mark>mod</mark> ificati				
Mounting Description: Rigid base mount to carbon steel floor stand m	nounted up to 24" in h	eight.			
	\$ ,				
Applicant Information	CODA				
Applicant Company Name: Vertiv Corporation					
Contact Person: Kiel Stephens					
Mailing Address: 1050 Dearborn Drive, Columbus, OH 43085					
Telephone: (614) 841-8168 Email: <u>Kiel.St</u>	ephens@Vertiv.com				
I hereby agree to reimburse the Office of Statewide Health Faccordance with the California Administrative Code, 2016.	Planning and Deve	elopment review fees in			
Signature of Applicant:	Da	ate: <u>4/18/2019</u>			
Title: Principal Engineer Company Name: Vertiv	Corporation				
	1	OCHDD			

"Access to Safe. Quality Healthcare Environments that Meet California's



OSHPD

Page 1 of 3

## OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)
Company Name: Buehler Engineering, Inc.
Name: Scott R. Hooker, S.E. California License Number: S 3937
Mailing Address: 600 Q Street Suite 200, Sacramento, CA 95811
Telephone: (916) 443-0303 Email: shooker@buehlerengineering.com
Supports and Attachments Preapproval
<ul> <li>Supports and attachments are preapproved under OPM-         (Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)</li> <li>Supports and attachments are not preapproved</li> </ul>
Certification Method
Testing in accordance with:
HI HI
Testing Laboratory  BY: Timothy J Piland
Company Name: Clark Dynamic Test Laboratory, Inc. /17/2019
Contact Name: John R. Antenucci
Mailing Address: 1801 Route 51, Jefferson Hills, PA 15025
Telephone: (412) 387-1010 Email: jrantenucci@clarckdynamic.com





"Access to Safe. Quality Healthcare Environments that Meet California's

Page 2 of 3

Page 2 of 28



## OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

Seismic Parameters
Design in accordance with ASCE 7-10 Chapter 13: ⊠ Yes □ No
Design Basis of Equipment or Components ( $F_p/W_p$ ) = 0.6 ( $S_{DS}$ = 0.80); 1.5 ( $S_{DS}$ = 2.00)
$S_{DS}$ (Design spectral response acceleration at short period, g) = 0.80 (w/o seismic kit); 2.00 (w/ seismic kit)
a <sub>P</sub> (In-structure equipment or component amplification factor) =
R <sub>p</sub> (Equipment or component response modification factor) =6.0
Ω0 (System overstrength factor) = 2
I <sub>p</sub> (Importance factor) = 1.5
z/h (Height factor ratio) = 1
Equipment or Component Natural Frequencies (Hz) = See UUT Sheets
Overall dimensions and weight (or range thereof) = See Table 1 & 2
Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15:   Yes  No
Design Basis of Equipment or Components (V/W) =
S <sub>DS</sub> (Design spectral response acceleration at short period, g) =
S <sub>D1</sub> (Design spectral response acceleration at 1 second period, g) =
R (Response modification coefficient) = OSP-0381-10
$\Omega_0$ (System overstrength factor) =
C <sub>d</sub> (Deflection amplification factor) = BY: Timothy J Piland
I <sub>p</sub> (Importance factor) = 1.5
Height to Center of Gravity above base =
Equipment or Component Natural Frequencies (Hz) =
Overall dimensions and weight (or range thereof) =
Tank(s) designed in accordance with ASME BPVC, 2015: ☐ Yes ☒ No
List of Attachments Supporting Special Seismic Certification
☐ Test Report(s) ☐ Drawings ☐ Calculations ☐ Manufacturer's Catalog
☐ Calculations ☐ Maintracturer's Catalog ☐ Other(s) (Please Specify): _Equipment Matrices/Tables, Merger Letter/Document
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022
Signature: Date: September 17, 2019
Print Name: Timothy J. Piland Title: SSE
Special Seismic Certification Valid Up to: S <sub>DS</sub> (g) = See Above z/h = 1
Condition of Approval (if applicable):

"Access to Safe. Ouality Healthcare Environments that Meet California's

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY





OSH-FD-759 (REV 12/16/15)

Page 3 of 3





Table 1a. CRV 300mm - Certified Product List (Rigid Base Mounted)

 $F_{p}/W_{p} = 0.6$  $R_{p} = 6.0$  $\Omega_0 = 2.0$ Seismic Parameters  $S_{DS}(g) = 0.8$ z/h = 1.0 $a_{p} = 2.5$ 

Model Number	Nominal Capacity (kW)	Unit Length (in)	Unit Width (in)	Unit Height (in)	Unit Maximum Operating Weight (lbs)	Heat Rejection Type	Voltage (V)	Tested / Interpolated	Seismic Kit
CR019RA1Y70D0A13P060PA	19	43.3	11.81	78.7	514	Air Cooled	208-230 Three Phase	Interpolated	Without
CR019RA1370D0A13P060PA1734	19	43.3	11.81	78.7	504	Air Cooled	460 Three Phase Wye	UUT-1C	Without
CR019RA1370D0A13P060PA	19	43.3	11.81	78.7	514	Air Cooled	460 Three Phase Wye	Interpolated	Without
CR019RW1Y40D0A73P060PA1734	19	43.3	11.81	78.7	548	Water / Glycol	208-230 Three Phase	UUT-3C	Without
CR019RW1Y40D0A73P060PA	19	43.3	11.81	78.7	555	Water / Glycol	208-230 Three Phase	Interpolated	Without
CR019RW1340D0A73P060PA	19	43.3	11.81	78.7	555	Water / Glycol	460 Three Phase Wye	Interpolated	Without
CR032RC1Y30D0AH3P060PA	32	43.3	11.81	G8.7D	E 491	Chilled Water	208-230 Three Phase	Interpolated	Without
CR032RC1330D0AH3P060PA	32	43.3	11.81	78.7	491 1	Chilled Water	460 Three Phase Wye	Interpolated	Without
CR032RC1P30D0AH3P060PA	32	43.3	11.81	78.7	491	Chilled Water	208-230 Single Phase	Interpolated	Without
CR032RC1K30D0CH35060PA598	32 🛆	43.3	11.81 OSP	<b>78.7</b>	-10 <sup>438</sup>	Chilled Water	120 Single Phase	UUT-5C	Without
CR032RC1K30D0CH35060PA	32	43.3	11.81	78.7	491	Chilled Water	120 Single Phase	Interpolated	Without

- 1. The 9th digit for the above models specifies the 60 Hz. unit voltage. "Y" is for 208-230V three phase, "3" is for 460V wye three phase, "P" is for 208-230V single phase and "K" is for 120V single phase.
- 2. The 10th digit for above CR032 models specifies chilled water piping configuration. A "3" is three way which are listed above and "2" is two way not listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 3. The 10th digit for above CR019RW models specifies customer piping connections. A "4" is top which are listed above and "5" is bottom not listed above.
- 4. The 14th digit in above model numbers specifies the air filter type. An "A" is Merv 8 and a "C" is Merv 1.
- 5. The 15th digit for above CR019RW models specifies water/glycol piping configuration. A "7" is three way which are listed above and "1" is two way not listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 6. The 16th digit in above model numbers specifies inclusion of seismic kit. "3" is for models without seismic kits listed above and "4" for models with seismic kit.
- 7. The 19th digit in above model numbers specifies IntelliSlot Card type. All above models are "6" for one IS-Unity-DP Card and one Sitelink-Ecard.
- 8. Above models include condensate pump option.
- BUILDING 9. See "Model Number Nomenclature" for complete model number nomenclature.
- 10. Unit height includes casters.
- 11. Listed unit maximum operating weights are calculated from actual unit dry weight and fluids operating in the unit.





### Table 1a. CRV 300mm - Certified Product List (Rigid Base Mounted) Cont.

 $\Omega_0 = 2.0$  $S_{DS}(g) = 2.0$  $F_p/W_p = 1.5$  $R_{p} = 6.0$ Seismic Parameters z/h = 1.0 $a_p = 2.5$ 

Model Number	Nominal Capacity (kW)	Unit Length (in)	Unit Width (in)	Unit Height (in)	Unit Maximum Operating Weight (lbs)	Heat Rejection Type	Voltage (V)	Tested / Interpolated	Seismic Kit
CR019RA1Y70D0A14P060PA	19	43.3	11.81	78.7	514	Air Cooled	208-230 Three Phase	Interpolated	With
CR019RA1370D0A14P060PA1734	19	43.3	11.81	78.7	504	Air Cooled	460 Three Phase Wye	UUT-1B	With
CR019RA1370D0A14P060PA	19	43.3	11.81	78.7	514	Air Cooled	460 Three Phase Wye	Interpolated	With
CR019RW1Y40D0A74P060PA1734	19	43.3	11.81	78.7	548	Water / Glycol	208-230 Three Phase	UUT-3B	With
CR019RW1Y40D0A74P060PA	19	43.3	11.81	78.7	555	Water / Glycol	208-230 Three Phase	Interpolated	With
CR019RW1340D0A74P060PA	19	43.3	11.81	78.7	555	Water / Glycol	460 Three Phase Wye	Interpolated	With
CR032RC1Y30D0AH4P060PA	32	43.3	11.81	(78.7 <sub>D</sub>	A91	Chilled Water	208-230 Three Phase	Interpolated	With
CR032RC1330D0AH4P060PA	32	43.3	11.81	78.7	4910/	Chilled Water	460 Three Phase Wye	Interpolated	With
CR032RC1P30D0AH4P060PA	32	43.3	11.81	78.7	491	Chilled Water	208-230 Single Phase	Interpolated	With
CR032RC1K30D0CH45060PA598	32	43.3	11.81	78.7	438	Chilled Water	120 Single	UUT-5B	With
CR032RC1K30D0CH45060PA	32	43.3	11.81	78.7	491	Chilled Water	120 Single Phase	Interpolated	With

- 1. The 9th digit for the above models specifies the 60 Hz. unit voltage. "Y" is for 208-230V three phase, "3" is for 460V wye three phase, "P" is for 208-230V single phase and "K" is for 120V single phase.
- 2. The 10th digit for above CR032 models specifies chilled water piping configuration. A "3" is three way which are listed above and "2" is two way not listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 3. The 10th digit for above CR019RW models specifies customer piping connections. A "4" is top which are listed above and "5" is bottom not listed above.
- 4. The 14th digit in above model numbers specifies the air filter type. An "A" is Merv 8 and a "C" is Merv 1.
- 5. The 15th digit for above CR019RW models specifies water/glycol piping configuration. A "7" is three way which are listed above and "1" is two way not listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 6. The 16th digit in above model numbers specifies inclusion of seismic kit. "3" is for models without seismic kits listed above and "4" for models with seismic kit.
- 7. The 19th digit in above model numbers specifies IntelliSlot Card type. All above models are "6" for one IS-Unity-DP Card and one Sitelink-Ecard.
- 8. Above models include condensate pump option.
- 9. See "Model Number Nomenclature" for complete model number nomenclature. ILDING
- 10. Unit height includes casters.
- 11. Listed unit maximum operating weights are calculated from actual unit dry weight and fluids operating in the unit. Does not include seismic mounting clips (add 3lbs).





#### Table 1a. CRV 300mm - Certified Product List (Floor Stand Mounted)

 $R_{p} = 6.0$  $\Omega_0 = 2.0$  $S_{DS}(g) = 2.0$  $F_p/W_p = 1.5$ Seismic Parameters z/h = 1.0 $a_p = 2.5$ 

Model Number	Nominal Capacity (kW)	Unit Length (in)	Unit Width (in)	Unit Height (in)	Unit Maximum Operating Weight (lbs)	Heat Rejection Type	Voltage (V)	Tested / Interpolated	Seismic Kit
CR019RA1Y70D0A14P060PA	19	43.3	11.81	78.7	514	Air Cooled	208-230 Three Phase	Interpolated	With
CR019RA1370D0A14P060PA1734	19	43.3	11.81	78.7	503	Air Cooled	460 Three Phase Wye	UUT-2 18" Floor Stand	With
CR019RA1370D0A14P060PA	19	43.3	11.81	78.7	503	Air Cooled	460 Three Phase Wye	Interpolated	With
CR019RW1Y40D0A74P060PA1734	19	43.3	11.81	78.7	547	Water / Glycol	208-230 Three Phase	UUT-4 24" Floor Stand	With
CR019RW1Y40D0A74P060PA	19	43.3	11.81	78.7	555	Water / Glycol	208-230 Three Phase	Interpolated	With
CR019RW1340D0A74P060PA	19	43.3	11.81	78.7	555	Water / Glycol	460 Three Phase Wye	Interpolated	With
CR032RC1Y30D0AH4P060PA	32	43.3	11.81	(78.7 <sub>D</sub>	F 491	Chilled Water	208-230 Three Phase	Interpolated	With
CR032RC1330D0AH4P060PA	32	43.3	11.81	78.7	4910/	Chilled Water	460 Three Phase Wye	Interpolated	With
CR032RC1P30D0AH4P060PA	32	43.3	11.81	78.7	491	Chilled Water	208-230 Single Phase	Interpolated	With
CR032RC1K30D0CH45060PA598	32	43.3	11.81	78.7	435	Chilled Water	120 Single	UUT-6 12" Floor Stand	With
CR032RC1K30D0CH45060PA	32	43.3	11.81	78.7	491	Chilled Water	120 Single Phase	Interpolated	With

- 1. The 9th digit for the above models specifies the 60 Hz. unit voltage. "Y" is for 208-230V three phase, "3" is for 460V wye three phase, "P" is for 208-230V single phase and "K" is for 120V single phase.
- 2. The 10th digit for above CR032 models specifies chilled water piping configuration. A "3" is three way which are listed above and "2" is two way not listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 3. The 10th digit for above CR019RW models specifies customer piping connections. A "4" is top which are listed above and "5" is bottom not listed above.
- 4. The 14th digit in above model numbers specifies the air filter type. An "A" is Merv 8 and a "C" is Merv 1.
- 5. The 15th digit for above CR019RW models specifies water/glycol piping configuration. A "7" is three way which are listed above and "1" is two way not listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 6. The 16th digit in above model numbers specifies inclusion of seismic kit. "3" is for models without seismic kits listed above and "4" for models with seismic kit.
- 7. The 19th digit in above model numbers specifies IntelliSlot Card type. All above models are "6" for one IS-Unity-DP Card and one Sitelink-Ecard.
- 8. Above models include condensate pump option.
- 9. See "Model Number Nomenclature" for complete model number nomenclature. ILD INC
- 10. Unit height includes casters. Unit height does not include floor stand.
- 11. Listed unit maximum operating weights are calculated from actual unit dry weight and fluids operating in the unit. Does not include floorstand (70 lbs to 88 lbs).





### Table 1b. CRV 600mm - Certified Product List (Rigid Base Mounted)

Seismic Parameters  $S_{DS}(g) = 0.8$  z/h = 1.0  $F_p/W_p = 0.6$   $a_p = 2.5$   $R_p = 6.0$   $\Omega_0 = 2.0$ 

	Nominal Capacity	Unit Length	Unit Width	Unit Height	Unit Maximum Operating	Heat Rejection	Voltage	Tested /	Seismic
Model Number	(kW)	(in)	(in)	(in)	Weight (lbs)	Type	(V)	Interpolated	Kit
CR020RA1C7SD1813P060PA	20	46.25	22.63	78.75	758	Air Cooled	208	Interpolated	Without
CR020RA1A7SD1813P060PA	20	46.25	22.63	78.75	758	Air Cooled	460	Interpolated	Without
CR020RW1C7SD1873P060PA	20	46.25	22.63	78.75	834	Water / Glycol	208	UUT-7C	Without
CR020RW1A7SD1873P060PA	20	46.25	22.63	78.75	834	Water / Glycol	460	Interpolated	Without
CR035RA1C7SD1813P060PA	35	46.25	22.63	78.75	827	Air Cooled	208	Interpolated	Without
CR035RA1A7SD1813P060PA	35	46.25	22.63	78.75	827	Air Cooled	460	Interpolated	Without
CR035RW1C7SD1973P060PA	35	46.25	22.63	78.75	938	Water / Glycol	208	Interpolated	Without
CR035RW1A7SD1973P060PA	35	46.25	22.63	78.75	938	Water / Glycol	460	UUT-8C	Without
CR040RC1C3SD19H3P060PA	40	46.25	22.63	C 78.75	790	Chilled Water	208	Interpolated	Without
CR040RC1A3SD19H3P060PA	40	46.25	22.63	78.75	7907	Chilled Water	460	Interpolated	Without

#### Notes

- 1. The 9th digit for the above models specifies the 60 Hz. unit voltage. "C" is for 208-230V three phase, "A" is for 460V three phase phase and "K" is for 120V single phase.
- 2. The 10th digit specifies chilled water piping configuration. A "7" is for all 600 mm units and "3" is three way valve which was tested in 300 mm units. above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 3. The 14th digit in above model numbers specifies the air filter type. An "8" specifies Merv 8 and "9" specifies Merv 9, additional tested in 300mm.
- 4. The 15th digit specifies water/glycol piping configuration. A "7" is three way which are listed above, "1" is two way and "H" is default.

  listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 5. The 16th digit in above model numbers specifies inclusion of seismic kit. "3" is for models without seismic kits listed above and "4" for models with seismic kit.
- 6. The 19th digit in above model numbers specifies intelliSlot Card type. All above models are "6" for one IS-Unity-DP Card and one Sitelink-Ecard.
- 7. Above models include humidifier, reheat, condensate pump and 65KA SCCR disconnect options.
- 8. Air cooled units listed above are identical to the Water/Glycol without following parts condenser plate heat exchanger, refrigerant receiver, heat rejection control valve and actuator. No additional structural support is included in the Water/Glycol units compared to Air-Cooled. Center of Gravity of both units are substantially similar.
- 9. See "Model Number Nomenclature" for complete model number nomenclature.
- 10. Unit height includes casters.
- 11. Listed unit maximum operating weights are calculated from actual unit dry weight and fluids operating in the unit.

BUILDING





### Table 1b. CRV 600mm - Certified Product List (Rigid Base Mounted) Cont.

Seismic Parameters  $S_{DS}(g) = 2.0$  z/h = 1.0  $F_p/W_p = 1.5$   $a_p = 2.5$   $R_p = 6.0$   $\Omega_0 = 2.0$ 

	Nominal Capacity	Unit Length	Unit Width	Unit Height	Unit Maximum Operating	Heat Rejection	Voltage	Tested /	Seismic
Model Number	(kW)	(in)	(in)	(in)	Weight (lbs)	Type	(V)	Interpolated	Kit
CR020RA1C7SD1814P060PA	20	46.25	22.63	78.75	758	Air Cooled	208	Interpolated	With
CR020RA1A7SD1814P060PA	20	46.25	22.63	78.75	758	Air Cooled	460	Interpolated	With
CR020RW1C7SD1874P060PA	20	46.25	22.63	78.75	834	Water / Glycol	208	UUT-7B	With
CR020RW1A7SD1874P060PA	20	46.25	22.63	78.75	834	Water / Glycol	460	Interpolated	With
CR035RA1C7SD1814P060PA	35	46.25	22.63	78.75	827	Air Cooled	208	Interpolated	With
CR035RA1A7SD1814P060PA	35	46.25	22.63	78.75	827	Air Cooled	460	Interpolated	With
CR035RW1C7SD1974P060PA	35	46.25	22.63	78.75	938	Water / Glycol	208	Interpolated	With
CR035RW1A7SD1974P060PA	35	46.25	22.63	78.75	938	Water / Glycol	460	UUT-8B	With
CR040RC1C3SD19H4P060PA	40	46.25	22.63	C 78.75	790	Chilled Water	208	Interpolated	With
CR040RC1A3SD19H4P060PA	40	46.25	22.63	78.75	7907	Chilled Water	460	Interpolated	With

- 1. The 9th digit for the above models specifies the 60 Hz. unit voltage. "C" is for 208-230V three phase, "A" is for 460V three phase phase and "K" is for 120V single phase.
- 2. The 10th digit specifies chilled water piping configuration. A "7" is for all 600 mm units and "3" is three way valve which was tested in 300 mm units. above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 3. The 14th digit in above model numbers specifies the air filter type. An "8" specifies Merv 8 and "9" specifies Merv 9, additional tested in 300mm.
- 4. The 15th digit specifies water/glycol piping configuration. A "7" is three way which are listed above, "1" is two way and "H" is default.

  listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 5. The 16th digit in above model numbers specifies inclusion of seismic kit. "3" is for models without seismic kits listed above and "4" for models with seismic kit.
- 6. The 19th digit in above model numbers specifies IntelliSlot Card type. All above models are "6" for one IS-Unity-DP Card and one Sitelink-Ecard.
- 7. Above models include humidifier, reheat, condensate pump and 65KA SCCR disconnect options. 19
- 8. Air cooled units listed above are identical to the Water/Glycol without following parts condenser plate heat exchanger, refrigerant receiver, heat rejection control valve and actuator. No additional structural support is included in the Water/Glycol units compared to Air-Cooled. Center of Gravity of both units are substantially similar.
- 9. See "Model Number Nomenclature" for complete model number nomenclature.
- 10. Unit height includes casters.
- 11. Listed unit maximum operating weights are calculated from actual unit dry weight and fluids operating in the unit. Does not include seismic braces (add 14lbs).







### Table 1b. CRV 600mm - Certified Product List (Floor Stand Mounted)

Seismic Parameters  $S_{DS}(g) = 2.0$  z/h = 1.0  $F_p/W_p = 1.5$   $a_p = 2.5$   $R_p = 6.0$   $\Omega_0 = 2.0$ 

Nominal Capacity (kW)	Unit Length (in)	Unit Width (in)	Unit Height (in)	Unit Maximum Operating Weight (lbs)	Heat Rejection Type	Voltage (V)	Tested /	Seismic Kit
20	46.25	22.63	78.75	758	Air Cooled	208	Interpolated	With
20	46.25	22.63	78.75	758	Air Cooled	460	Interpolated	With
20	46.25	22.63	78.75	834	Water / Glycol	208	UUT-9 12" Floor Stand	With
20	46.25	22.63	78.75	834	Water / Glycol	460	Interpolated	With
35	46.25	22.63	78.75	827	Air Cooled	208	Interpolated	With
35	46.25	22.63	78.75	827	Air Cooled	460	Interpolated	With
35	46.25	22.63	78.75	938	Water / Glycol	208	Interpolated	With
35	46.25	22.63	78.75	938	Water / Glycol	460	UUT-10 24" Floor Stand	With
40	46.25	22.63	78.75	790	Chilled Water	208	Interpolated	With
40	46.25	22.63	78.75	790	Chilled Water	460	Interpolated	With
	20 20 20 35 35 35 35 40	Capacity (kW)         Length (in)           20         46.25           20         46.25           20         46.25           20         46.25           35         46.25           35         46.25           35         46.25           35         46.25           40         46.25	Capacity (kW)         Length (in)         Width (in)           20         46.25         22.63           20         46.25         22.63           20         46.25         22.63           20         46.25         22.63           35         46.25         22.63           35         46.25         22.63           35         46.25         22.63           35         46.25         22.63           46         25         22.63           40         46.25         22.63	Capacity (kW)         Length (in)         Width (in)         Height (in)           20         46.25         22.63         78.75           20         46.25         22.63         78.75           20         46.25         22.63         78.75           20         46.25         22.63         78.75           35         46.25         22.63         78.75           35         46.25         22.63         78.75           35         46.25         22.63         78.75           35         46.25         22.63         78.75           46.25         22.63         78.75	Nominal Capacity (kW)         Unit (in)         Unit (in)         Unit (in)         Unit (in)         Maximum Operating Weight (lbs)           20         46.25         22.63         78.75         758           20         46.25         22.63         78.75         758           20         46.25         22.63         78.75         834           20         46.25         22.63         78.75         834           35         46.25         22.63         78.75         827           35         46.25         22.63         78.75         827           35         46.25         22.63         78.75         938           35         46.25         22.63         78.75         938           40         46.25         22.63         78.75         790	Nominal Capacity (kW)         Unit (in)         Unit (in)         Unit (in)         Maximum Operating (in)         Heat Rejection Type           20         46.25         22.63         78.75         758         Air Cooled           20         46.25         22.63         78.75         758         Air Cooled           20         46.25         22.63         78.75         834         Water / Glycol           20         46.25         22.63         78.75         834         Water / Glycol           35         46.25         22.63         78.75         827         Air Cooled           35         46.25         22.63         78.75         827         Air Cooled           35         46.25         22.63         78.75         938         Water / Glycol           35         46.25         22.63         78.75         938         Water / Glycol           40         46.25         22.63         78.75         790         Chilled Water	Nominal Capacity (kW)         Unit (in)         Unit (in)         Unit (in)         Unit (in)         Maximum Operating (in)         Heat Rejection Type (V)           20         46.25         22.63         78.75         758         Air Cooled 460           20         46.25         22.63         78.75         758         Air Cooled 460           20         46.25         22.63         78.75         834         Water / Glycol         208           20         46.25         22.63         78.75         834         Water / Glycol         460           35         46.25         22.63         78.75         827         Air Cooled 208           35         46.25         22.63         78.75         827         Air Cooled 460           35         46.25         22.63         78.75         827         Air Cooled 460           35         46.25         22.63         78.75         938         Water / Glycol         208           35         46.25         22.63         78.75         938         Water / Glycol         208           40         46.25         22.63         78.75         790         Chilled Water         208	Nominal Capacity   Length (kW)   Capacity (k

- 1. The 9th digit for the above models specifies the 60 Hz. unit voltage. "C" is for 208-230V three phase, "A" is for 460V three phase phase and "K" is for 120V single phase.
- 2. The 10th digit specifies chilled water piping configuration. A "7" is for all 600 mm units and "3" is three way valve which was tested in 300 mm units. above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 3. The 14th digit in above model numbers specifies the air filter type. An "8" specifies Merv 8 and "9" specifies Merv 9, additional tested in 300mm.
- 4. The 15th digit specifies water/glycol piping configuration. A "7" is three way which are listed above, "1" is two way and "H" is default.

  listed above. Both two and three way piping use the same valve. Piping is the same except for two way has no bypass piping connection to bypass of valve.
- 5. The 16th digit in above model numbers specifies inclusion of seismic kit. "3" is for models without seismic kits listed above and "4" for models with seismic kit.
- 6. The 19th digit in above model numbers specifies IntelliSlot Card type. All above models are "6" for one IS-Unity-DP Card and one Sitelink-Ecard.
- 7. Above models include humidifier, reheat, condensate pump and 65KA SCCR disconnect options.
- 8. Air cooled units listed above are identical to the Water/Glycol without following parts condenser plate heat exchanger, refrigerant receiver, heat rejection control valve and actuator. No additional structural support is included in the Water/Glycol units compared to Air-Cooled. Center of Gravity of both units are substantially similar.
- 9. See "Model Number Nomenclature" for complete model number nomenclature.
- 10. Unit height includes casters. Unit height does not include floor stand.
- 11. Listed unit maximum operating weights are calculated from actual unit dry weight and fluids operating in the unit. Does not include seismic braces (add 14lbs).

  Does not include floorstand (84 lbs to 100 lbs).





## Table 2a. CRV 300mm - Certified Sub-Component List

Cooling Fans						
Туре	Unit Voltage	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated
	208-230 Single Phase		315021P2	Aluminum blades. Carbon Steel & Copper Motor	CR032RC1P	Interpolated
EC Fan	All CR019 Models	ЕВМ	315021P2		CR019RA1Y / CR019RW1Y / CR032RC1Y / CR019RA13 / CR019RW13 / CR032RC13	UUT-1,2,3 & 4
	120 Single Phase		315021P3		CR035RC1K	UUT-5 & 6

Cooling Coils						
Туре	Unit Voltage	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated
Cooling Coil 3 Row 30" height	All CR019 Models	Vertiv Corporation	315051G1	C Ocopper Tube/ Alum. Fins	CR019RA1Y / CR019RW1Y / CR019RA13 / CR019RW13	UUT-1,2,3 & 4
Cooling Coil 3 Row 36" height	All CR032 Models	65	316672G1	CAD CAD	CR032RC	UUT-5 & 6

Electrical Panel	Assemblies	Gr.				
Туре	Unit Voltage	Manufacturer	P/N	Material Z	Designed Model Usage	Tested / Interpolated
	208-230 Three Phase	RE	315033G1	0301 10 CH	CR019RA1Y	Interpolated
20	208-230 Three Phase		315033G2	othy J Piland	CR019RW1Y	UUT-3 & 4
	460 Wye Three Phase	Vertiv Corporation	315033G3		CR019RA13	UUT-1 & 2
Electrical Panel	460 Wye Three Phase		315033G4	9 / 1 7 / 2 0 1 9 18 Gauge Painted	CR019RW13	Interpolated
Assemblies	208-230 Three Phase		315033G5	Cold Rolled Steel box	CR032RC1Y	Interpolated
	460 Wye Three Phase		315033G6		CR032RC13	Interpolated
	208-230 Single Phase		315033G7	ILDING CODE	CR032RC1P	Interpolated
	120 Single Phase		315033G8	ILDING	CR032RC1K	UUT-5 & 6

<b>Electrical Panel D</b>	Disconnects					
Туре	Unit Voltage	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated
60A Fused 65KA SCCR	208-230 Three Phase		303397P2		CR019RA1Y / CR019RW1Y	UUT-3 & 4
30A Fused 65KA SCCR	460 Wye Three Phase	Allen Bradley	303397P1		CR019RA13 / CR019RW13 / CR032RC13	UUT-1 & 2
30A Fused 65KA SCCR	208-230 Three Phase	Alleli bradiey	303397P1	Aluminum shaft, plated carbon steel body, copper contacts and plastic body	CR032RC1Y	Interpolated
30A Fused 65KA SCCR	208-230 Single Phase		303397P1		CR032RC1P	Interpolated
Fused 5KA	120 Single Phase	ABB & Mersen	320064P1		CR032RC1K	UUT-5 & 6

Scroll Compresso	Scroll Compressors										
Туре	Unit Voltage	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated					
ZPD72KCE-TF5	208-230 three phase	Canaland	315631P1	Shell is painted	CR019RA1Y & CR019RW1Y	UUT-3 & 4					
ZPD72KCE-TFD	460 Wye Three Phase	Copeland	315631P2	cold rolled carbon steel	CR019RA13 & CR019RW13	UUT-1 & 2					





## Table 2a. CRV 300mm - Certified Sub-Component List Cont.

Condenser : Braz	ed Plate Heat	Exchanger				To ad . d .				
Туре	Unit Voltage	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated				
Condenser Plate 26 plates	All CR019RW Models	SWEP	257382P2	All 316 stainless steel HX with copper Braze	CR019RW	UUT-3 & 4				
Filter										
Туре	Туре	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated				
Air Filter	MERV1	Koch Filter Corp.	155419P4	Metal galvanized steel frame, washable quadrafoam filter, MERV	ALL MODELS	UUT-5 & 6				
7 til 1 litter	MERV8	room mor corp.	315029P1	media metal mesh backing on both sides	ALL MODELS	UUT-1,2,3 & 4				
<b>Condensate Pum</b>	р									
Туре	Unit Voltage	Manufacturer	P/N	Material	Designed Model Usage	Tested / Interpolated				
	120		319860G2	CODE	CR032RC1K	UUT-5 & 6				
1/10 HP	208-230 Single Phase		319860G1	Carbon Steel (motor), Stainless steel shaft, copper (motor windings), plastic	CR032RC1P	Interpolated				
Condensate Pump	208-230 Three Phase	Hartell	319860G1	(pump housing, impeller and piping connections).	CR019RA1Y / CR019RW1Y / CR032RC1Y	UUT-3 & 4				
	460 Wye Three Phase	[2]	319860G3	S1 Composition).	CR019RA13 / CR019RW13 / CR032RC13	UUT-1 & 2				
TEV		A	OSF	9-0381-10						
Туре	Unit Voltage	M <mark>anufa</mark> cturer	P/N	Material Fig. 1	Designed Model Usage	Tested / Interpolated				
Thermal Expansion Valve	All CR019 Models	Emerson Climate Technologies	315077P1	Brass (body), copper (piping) and stainless steel (internals).	CR019RA / CR019RW	UUT-1,2,3 & 4				
<b>Electrical Panel T</b>	ransformer	T I	DATE: 0	9/17/2019						
Туре	Unit Voltage	Manufacturer	P/N	Material Naterial	Designed Model Usage	Tested / Interpolated				
Low Voltage Control Isolation Transformer	All	CAN	180792P1	CODE	All Models	UUT-1,2,3,4,5 & 6				
	120		317839P1	The state of the s	CR032RC1K	UUT-5 & 6				
Electrical Panel	208-230 Single Phase	Emerson (Emermex)	136201P1	Carbon Steel laminations and copper	CR032RC1P	Interpolated				
High Voltage Transformer	208-230 Three Phase	(Linelinex)	136201P1	windings	CR019RA1Y / CR019RW1Y / CR032RC1Y	UUT-3 & 4				
	460 Wye Three Phase		136201P3		CR019RA13/CR019RW1 3 /CR032RC13	UUT-1 & 2				
Miscellaneous										
Sub-component	Unit Voltage	Manufacturan		Matarial	D : /// / ///	Tested /				
	om vonage	Manufacturer	P/N	Material	Designed Model Usage	Interpolated				
Display	All	Vertiv Corporation	<i>P/N</i> 314979G2	iviateriai	All Models					
Display Heat Rejection		Vertiv		Electrical parts and plastic		<i>Interpolated</i> UUT-1,2,3,4,5				
Display	All	Vertiv Corporation	314979G2		All Models	UUT-1,2,3,4,5 & 6				
Display  Heat Rejection  Control Valve	All CR019RW	Vertiv Corporation Siemens	314979G2 257271P1	Electrical parts and plastic  Stainless steel valve. Electrical parts	All Models CR019RW	UUT-1,2,3,4,5 & 6 UUT-3 & 4				
Display  Heat Rejection Control Valve  Actuator 3 Way	All CR019RW All CR032	Vertiv Corporation Siemens Siemens	314979G2 257271P1 257371P1	Electrical parts and plastic  Stainless steel valve. Electrical parts	All Models CR019RW CR019RW	UUT-3 & 4 UUT-3 & 4				





## Table 2b. CRV 600mm - Certified Sub-Component List

<b>Cooling Fans</b>					
Туре	Unit Voltage	Manufacturer	P/N	Material	Tested / Interpolated
EC Fan	208/460	EBM	191881P1		UUT-7 & UUT-8
EC Fall	208	EDIVI	257241P1	Aluminum blades. Carbon Steel & Copper Motor	Interpolated
	460		257240P1		UUT-9 & UUT-10

Cooling Coils				
Туре	Manufacturer	P/N	Material	Tested / Interpolated
Cooling Coil 4 Row		197515G1	0 71 /41	UUT-7 & UUT-8
Cooling Coil 5 Row	Vertiv Corporation	197479G1	Copper Tube/ Alum. Fins	Interpolated
Cooling Coil 6 Row		197542G1	1 1113	UUT-9 & UUT10

<b>Electrical Panel</b>	Electrical Panel Assemblies CODE									
Туре	Unit Voltage	Manufacturer	P/N	Material	Tested / Interpolated					
	208		191986G1		UUT-7 & UUT-8					
	460	Sr. T	191850G3		Interpolated					
Electrical Panel	208	Vertiv Corporation	191986G2	Galvanized G90 Steel panel	Interpolated					
Assemblies	460	Vertiv Corporation	191986G4 g 1 _	Galvarlized G90 Steel pariel	UUT-9 & UUT-10					
	208		191986G5		Interpolated					
	460	14	191986G6	WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Interpolated					
	BY:Timothy J Piland									

<b>Electrical Panel</b>	Disconnec	ets	**************************************		
Туре	Unit Voltage	Manufacturer <sub>DA</sub>	TE: 0 9 17/2	019 Material	Tested / Interpolated
100A Fused 65KA SCCR	208/460	Socomec	303399P3	50	UUT-7 & UUT-8
60A Fused 65KA SCCR	208/460	Allen Bradley	303397P2	Aluminum shaf <mark>t, plated</mark> carbon steel body, copp contacts and plastic body	er UUT-7, UUT-8, UUT-9 & UUT-10
30A Fused 65KA SCCR	208/460	Socomec	303399P1	CODA	UUT-8 & UUT-10

Scroll Compressors								
Туре	Unit Voltage	Manufacturer	P/N	Material	Tested / Interpolated			
ZPD72KCE-TF5	208		257220P1	Chall is a sinted sold called souther stool	UUT-7 & UUT-9			
ZPD72KCE-TFD	460	Copeland	257220P2		Interpolated			
ZPD120KCE-TF5	208	Copeland	257223P1	Shell is painted cold rolled carbon steel	Interpolated			
ZPD120KCE-TFD	460		257223P2		UUT-8 & UUT-10			

Condenser : Brazed Plate Heat Exchanger									
Туре	Manufacturer	P/N	Material	Tested / Interpolated					
Condenser Plate 26 plates	SWEP	257382P2	All 316 stainless steel HX with copper Braze	UUT-7 & UUT-8					
Condenser Plate 42 plates	SVVEP	257383P2	All 310 stailless steel HA with copper Braze	UUT-8 & UUT-10					

Humidifier					
Type Unit		Manufacturer	P/N	Material	Tested /
Туре	Voltage	Itage Wanufacturer	F/N	waterial	Interpolated
Humidifier	208	Nortec	257521P3	Electrical parts, carbon steel sheetmetal and	UUT-7 & UUT-9
Humumer	460	Nortec	257521P4	plastic	UUT-8 & UUT-10





## Table 2b. CRV 600mm - Certified Sub-Component List Cont.

Filter					
Туре	Туре	Manufacturer	P/N	Material	Tested / Interpolated
Air Filter	MERV8	Koch Filter Corp.	196968P1	Beverage board frame, pleated polypropylene	UUT-7 & UUT-9
All Filler	MERV11	Roch Filler Corp.	196968P2	blend MERV media & metal mesh backing	UUT-8 & UUT-10

Reheat Assembly										
Туре	Unit Voltage	Manufacturer	P/N	Material	Tested / Interpolated					
6 kW Reheat	208	Vertiv Corporation	257604G13	Galvanized steel (mounting plates) , nickel plated steel (mounting nuts), stainless steel (electrical	UUT-7 & UUT-9					
Assembly	460	vertiv Corporation	257604G14	connections) and silicone rubber (insulating terminals).	UUT-8 & UUT-10					

Condensate Pun	np		a COD		
Туре	Unit Voltage	Manufacturer	E P/N	Material	Tested / Interpolated
1/3 HP Condensate	208	Hartell	1A19271P1	Carbon Steel (motor), copper (motor windings),	UUT-7 & UUT-9
Pump	460	Hallen	1A19271P2	plastic (pump housing and impeller) and brass (piping connections).	UUT-8 & UUT-10
		\\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	OSD-0381-	10 2	

TEX		N THE	USP USUI	H C	
Туре	Unit Voltage	Manufacturer BY	.Timothy J	Piland Material	Tested / Interpolated
Thermal Expansion	208/460	Sporlan Valve	257260P2	Brass (body), copper (piping) and stainless steel	UUT-7 & UUT-9
Valve	208/460	Sponan valve	257261P1	(internals).	UUT-8 & UUT-10
		DA WWW DA	TE: 09/17/2	019	

Electrical Panel Transformer										
Туре	Type Unit Manufacturer		P/N	Material	Tested / Interpolated					
Electrical Panel	208	- Emerson (Emermex)	136202P1	Carbon Stool leminations and conner windings	UUT-7 & UUT-9					
Transformer	460	Emerson (Emermex)	136202P2	Carbon Steel laminations and copper windings	UUT-8 & UUT-10					

Miscellaneous		POILDI	No.	
Sub-component	Manufacturer	P/N	Material	Tested / Interpolated
Refrigerant Receiver	Westermeyer	300842P1	Carbon Steel Shell attached to unit base frame	UUT-7, UUT-8, UUT-9 & UUT-10
Heat Rejection Control Valve	Siemens	257271P1	Electrical parts and plastic	UUT-7, UUT-8, UUT-9 & UUT-10
Actuator	Siemens	257371P1	Electrical parts and plastic	UUT-7, UUT-8, UUT-9 & UUT-10
Transformer	ACME	1C23973P1	Carbon Steel and Copper	UUT-7, UUT-8, UUT-9 & UUT-10
Communication Card	Vertiv Corporation	191944G3	Plastic, solder, semiconductors	UUT-7, UUT-8, UUT-9 & UUT-10





## **UUT-1B Test Summary**

Testing Lab: Clark Testing Lab
Testing Report: JID 14-1292

Testing Unit Num: 1B

Model Number	Nominal Capacity (kW)	Mounting	Direction		Frequency * (Hz)	Length (in)	Width (in)	Heigh t (in)	Tested Operating Weight (lbs)
CR019RA1371734		Rigid Base	Х	Front - Back	17.8				
CR019RA1371734 (CR019RA1370D0A14P060PA1734)	19	Mounted	Υ	Side - Side	5.3	43	11 7/8	78 3/4	504
(CR019RA1370D0A14F000FA1734)		Mounted	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

model italise in parentin	olo lo lan modol mambol bacca on canoni momentia	iai o							
Attachment Method	Seismic kits (part # 317816G0), consisting	Seismic Para							
with Seismic	of seismic plates & angle brackets were					Horis	ontal	Vor	tical
Modifications	installed on each end of the unit. The plates	Building	Test	Horizontal		Vertical			
	of the kit were attached with four (4)-1/4"Ø	Code	Criteria	S <sub>DS</sub> (g)	z/h	Δ	Δ	A <sub>FLX-V</sub>	Δ
	self tapping screws. The angles of the kit	ODE				A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	TFLX-V	ARIG-V
	attached with six (6)-1/4"Ø self tapping	ODE		2.00	1.0				
	and anchored to the shake table with	CBC 2016	AC 156	2.00	1.0 0.0	3.20g	2.40g	1.68g	0.68g
	1/2" diameter Grade 8 bolts per bracket		(7)	2.50	0.0	_	_	_	





Figure 1B.2: Mounting Details with Modifications

Figure 1B.1: Unit on the shake table

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-1B Summary Tested Sub-Component**

CC: ID Cultillian	TOOLOG CUB CO.			
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P2	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	315051G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR019RA13 460V	315033G3	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	30 Amp 65KA SCCR	303397P1	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body, and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Compressor	Scroll ZPD72KCE-TFD	315631P2	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/10 HP 266VAC	319860G3	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).
Thermal Expansion Valve	6 Ton Expansion Valve	315077P1	Emerson Climate Tech	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	315029P1		Beverage board frame, pleated polypropylene blend MERV 8 media & metal mesh backing
Electrical Panel Transformer	200VA 460-600 Volt X 24 Volt 60 Hz.	136201P3	Emerson (Emermex)	Carbon Steel laminations and copper windings
<b>Electrical Panel Transformer</b>	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## UUT-1C Test Summary

Testing Lab: Clark Testing Lab JID 14-1292 Testing Report: Testing Unit Num: 1C

Model Number	Nominal Capacity (kW)	Mounting	Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR019RA1371734		Rigid Base	Х	Front - Back	17.1				
(CR019RA1370D0A13P060PA1734)	19	Mounted	Υ	Side - Side	4.2	43	11 7/8	78 3/4	504
(CRU19RA1370D0A13P000PA1734)		Mounted	Z	Vertical	>33.3				

Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Carbon steel angles (part # 317816G2)	Seismic Parar	neters							
	were installed on each end of the unit with					Llori-	ontol	Vort	tical	
	(6) 1/4"Ø self tapping screws and	Building	Test	S (m)	-/le	Horizontal		vert	Vertical	
	anchored to the shake table with (4) -1/2"Ø	Code	Code Criteria S <sub>DS</sub> (g) z/h		۸	۸	۸	۸		
	Grade 8 bolts (8 per bracket).	ODE	OD 7		A <sub>FLX-H</sub>	<b>^</b> RIG-H	A <sub>FLX-V</sub>	<b>~</b> RIG-V		
	EOR	CBC 2016	AC 156	0.80	1.0	1.28g	0.96g	0.54g	0.22g	





Figure 1C.2: Mounting Details

Figure 1C.1: Unit on the shake table

The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturing operational limits

## **UUT-1C Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P2	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	315051G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR019RA13 460V	315033G3	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	30 Amp 65KA SCCR	303397P1	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body, and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Compressor	Scroll ZPD72KCE-TFD	315631P2	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/10 HP 266VAC	319860G3		Carbon Steel (motor), copper (motor windings), plastic (pump
Condensate i dilip	1/10/11 2007AC	31900003	i iai teli	housing and impeller) and brass (piping connections).
Thermal Expansion Valve	6 Ton Expansion Valve	315077P1	Emerson Climate Tech.	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	315029P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8 media
All Filler	WERVO FIILEI	313029F1	Roch Filler Corp.	& metal mesh backing
Electrical Panel Transformer	200VA 460-600 Volt	126201D2	Emercen (Emermey)	Carbon Stool laminations and conner windings
Electrical Parier Transformer	X 24 Volt 60 Hz.	136201P3	Emerson (Emermex)	Carbon Steel laminations and copper windings
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## **UUT-2 Test Summary**

 Testing Lab:
 Clark Testing Lab

 Testing Report:
 JID 14-1292

 Testing Unit Num:
 2

Model Number	Nominal Capacity (kW)	Mounting	Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR019RA1371734		Rigid on	X	Front - Back	24.0				
(CR019RA1370D0A14P060PA1734	, 19	18" Floor	Υ	Side - Side	5.0	43	11 7/8	78 3/4	503
(CR019RA1370D0A14P000PA1734	7)	Stand	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Holdown brackets (part # 317816G4) were	Seismic Para	ameters						
with Seismic	installed on the front and back of the unit					Horizontal		Vertical	
Modifications	with (14) 1/4"Ø self tapping screws (each	Building Test S <sub>DS</sub> (g) z/h		попи	Horizoniai		vertical		
	bracket) attaching the unit to the floorstand.	Code	Criteria	S <sub>DS</sub> (9)	2/11	A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	Δ	A <sub>RIG-V</sub>
	The floor stand is anchored to the shake	CODE				<b>∽</b> FLX-H	~RIG-H	TFLX-V	~RIG-V
	table with (2) -1/2" diameter Grade 8 bolts	OODE	0	2.00	1.0				
	per bracket (8 total).	CBC 2016	AC 156	2.00	1.0 0.0	3.20g	2.40g	1.68g	0.68g

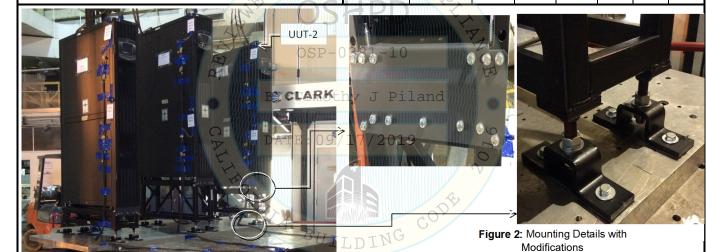


Figure 2: Unit on the shake table

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-2 Summary Tested Sub-Component**

	TOUTOU OUD OUT			
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P2	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	315051G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR019RA13 460V	315033G3	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	30 Amp 65KA SCCR	303397P1	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Compressor	Scroll ZPD72KCE-TFD	315631P2	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/10 HP 266VAC	319860G3	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump
Condensate i dirip	1/10111 200VAC	31900003	Tartell	housing and impeller) and brass (piping connections).
Thermal Expansion Valve	6 Ton Expansion Valve	315077P1	Emerson Climate Tech.	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	315029P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8 media
All I litter	WEITVOTILE	31302911	Room inter corp.	& metal mesh backing
Electrical Panel	200VA 460-600 Volt	136201P3	Cmaraan (Cmarmay)	Carbon Steel Isminations and conner windings
Transformer	X 24 Volt 60 Hz.	130201P3	Emerson (Emermex)	Carbon Steel laminations and copper windings
<b>Electrical Panel Transforme</b>	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## UUT-3B Test Summary

Testing Lab: Clark Testing Lab
Testing Report: JID 14-1292

Testing Unit Num: 3B

	Model Number	Nominal Capacity (kW)	Mounting		excitation Direction	Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Operating Weight
	CR019RW1Y41734 (CR019RW1Y40D0A74P060PA1734)	19	Rigid Base Mounted	Х	Front - Back	17.8		11 7/8	78 3/4	
1				Υ	Side - Side	5.3	43			548
(	CK019KW1140D0A74F000FA1754)		Mounted	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Seismic kits (part # 317816G0), consisting	Seismic Para	meters							
with Seismic	of seismic plates & angle brackets were					Horiza	Horizontal		Vertical	
Modifications	installed on each end of the unit. The plates	s Building Test		S <sub>DS</sub> (g)	z/h	Horizoniai		vertical		
	of the kit were attached with four (4)-1/4"Ø	Code	Criteria	S <sub>DS</sub> (9)	2/11	A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	Δ	Δ	
	self tapping screws. The angles of the kit	ODE				<b>∽</b> FLX-H	~RIG-H	, #FX-A	*RIG-V	
	attached with six (6)-1/4"Ø self tapping	ODE C								
	and anchored to the shake table with four(4)	CBC 2016	AC 156	2.00	1.0	3.20g	2.40g	1.68g	0.68g	
	1/" diameter Crade 9 halts per breeket	TEANAMINE STATE OF THE STATE OF	ベブム			1				





Figure 3B.2: Mounting Details with Modifications

Figure 3B.1: Unit on the shake table

The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained.

After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-3B Summary Tested Sub-Component**

00: 02 00:::::	J rected can con														
Sub-Component	Description	PN	Manufacturer	Material											
Cooling Fan	EC (200-277V 1 phase)	315021P2	EBM	Aluminum blades. Carbon Steel & Copper Motor											
Cooling Coil Assembly	3 Row Tube & Fin Coil	315051G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets											
Electrical Panel Assembly	CR019RW1Y 208-230V	315033G2	Vertiv Corporation	Galvanized G90 Steel panel											
Disconnect	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts											
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic											
Compressor	Scroll ZPD120KCE-TF5	315631P2	Copeland	Shell is painted cold rolled carbon steel											
CP - Heat Exchanger	Condenser PL B80X26 UL	257382P2	Swep	All 316 stainless steel HX with copper Braze											
Condensate Pump (CP)	1/10 HP 208VAC	319860G3	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump											
Condensate Fullip (CF)	1/10111 200VAC	31900003	riarteii	housing and impeller) and brass (piping connections).											
Thermal Expansion Valve	6 Ton Expansion Valve	315077P1	Emerson Climate Tech.	Brass (body), copper (piping) and stainless steel (internals).											
Air Filter	MERV8 Filter	315029P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8											
7 11 1 1101	INET CVOT INCI	01002011	rtoon r iitor oorp.	media & metal mesh backing											
Electrical Panel	200VA 208-230 Volt	136201P3	Emerson (Emermex)	Carbon Steel laminations and copper windings											
Transformer	X 24 Volt 60 Hz.	130201F3	Emerson (Emermex)	Carbon Steer familiations and copper windings											
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings											
Heat rejection control valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic											
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic											
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors											





## UUT-3C Test Summary

Testing Lab: Clark Testing Lab JID 14-1292 Testing Report: Testing Unit Num: 3C

	Model Number	Nominal Capacity (kW)	Mounting	Excitation Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
I	CR019RW1Y41734 (CR019RW1Y40D0A73P060PA1734)	1 10	Rigid Base Mounted	Χ	Front - Back	17.1	43	11 7/8		
ı				Υ	Side - Side	4.2			78 3/4	548
ı	(CR019RW1140D0A73F000FA1734)		Mounted	Z	Vertical	>33.3				

Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Carbon steel angles (part # 317816G2)	Seismic Parai	meters						
	were installed on each end of the unit with					Horize	ontol	Vert	ical
	(6) 1/4"Ø self tapping screws and anchored	Building	Test	S <sub>DS</sub> (g)	z/h	HOHZ	icai		
	to the shake table with (4) -1/2"Ø Grade 8	Code	Criteria	S <sub>DS</sub> (g)	2/11	۸	۸	۸	^
	bolts (8 per bracket).	ODE				A <sub>FLX-H</sub>	~RIG-H	A <sub>FLX-V</sub>	~RIG-V
	FOR	CBC 2016	AC 156	0.80	1.0	1.28g	0 96a	0.54a	U 33a
ĺ		ODO 2010	70 130	0.00	1.0	1.209	0.90g	0.54g	0.229



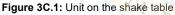




Figure 3C.2: Mounting Details

The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained.

After the test, the UUT was functional and operated within the manufacturer operational limits

## **UUT-3C Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P2	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	315051G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR019RW1Y 208-230V	315033G2	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Compressor	Scroll ZPD120KCE-TF5	315631P2	Copeland	Shell is painted cold rolled carbon steel
CP - Heat Exchanger	Condenser PL B80X26 UL	257382P2	Swep	All 316 stainless steel HX with copper Braze
Condensate Pump (CP)	1/10 HP 208VAC	319860G3	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump
Condensate Fullip (CF)	1/10111 200VAC	31900003	Tartell	housing and impeller) and brass (piping connections).
Thermal Expansion Valve	6 Ton Expansion Valve	315077P1	Emerson Climate Tech	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	315029P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8 media & metal mesh backing
Electrical Panel Transformer	200VA 208-230 Volt	126201D2	Emercen (Emermey)	Carbon Steel Iaminations and conner windings
Electrical Parier Transformer	X 24 Volt 60 Hz.	136201P3	Emerson (Emermex)	Carbon Steel laminations and copper windings
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Heat rejection control valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## UUT-4 Test Summary

Testing Lab: Clark Testing Lab
Testing Report: JID 14-1292

Testing Unit Num:  $\frac{4}{4}$ 

Model Number	Nominal Capacity (kW)	Mounting	Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR019RW1Y41734 (CR019RW1Y40D0A74P060PA1734)	19	Rigid on	X	Front - Back	24.0	43			
		24" Floor	Υ	Side - Side	5.0		11 7/8	78 3/4	547
(CK019KW1140D0A74F000FA1734)		Stand	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Metho
Attachment Metho with Seismic
Modifications

Notes:

Holdown brackets (part # 317816G4) were	Seismic Para	meters						
installed on the front and back of the unit			S <sub>DS</sub> (g)	z/h	Horize	ontal	Vertical	
with (14) 1/4"Ø self tapping screws (each	Building	Test			Tiorizontal		vert	icai
bracket) attaching the unit to the floor stand.	Code	Criteria	S <sub>DS</sub> (9)	2/11	A <sub>FLX-H</sub>	Δ	Δ	Δ
The floor stand is anchored to the shake	ODE				TFLX-H	~RIG-H	~FLX-V	~RIG-V
table with (2) -1/2" diameter Grade 8 bolts	ODE C		2.00	1.0				
per bracket (8 total).	CBC 2016	AC 156	2.50	0.0	3.20g	2.40g	1.68g	0.68g
G,	TWANTAL TANK	170	2.50	0.0				

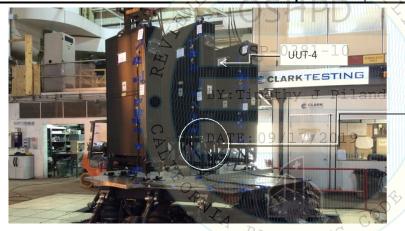




Figure 4.2: Mounting Details with Modifications

Figure 4.1: Unit on the shake table

The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

## **UUT-4 Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P2	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	315051G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR019RW1Y 208-230V	315033G2	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body, and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Compressor	Scroll ZPD120KCE-TF5	315631P2	Copeland	Shell is painted cold rolled carbon steel
CP - Heat Exchanger	Condenser PL B80X26 UL	257382P2	Swep	All 316 stainless steel HX with copper Braze
Condensate Pump (CP)	1/10 HP 208VAC	319860G3	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump
condensate rump (or )	1710111 2000710	01300000	Tarton	housing and impeller) and brass (piping connections).
Thermal Expansion Valve	6 Ton Expansion Valve	315077P1	Emerson Climate Tech.	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	315029P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8
7 til 1 litter	INIER VOT IIICI	0100231 1	rtoon inter oorp.	media & metal mesh backing
Electrical Panel Transformer	200VA 208-230 Volt	136201P3	Emerson (Emermex)	Carbon Steel laminations and copper windings
Electrical Parier Haristoffier	X 24 Volt 60 Hz.	130201F3	Emerson (Emermex)	Carbon Steer laminations and copper windings
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Heat rejection control valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## **UUT-5B Test Summary**

Testing Lab: Clark Testing Lab
Testing Report: JID 14-1292

Testing Unit Num: 5B

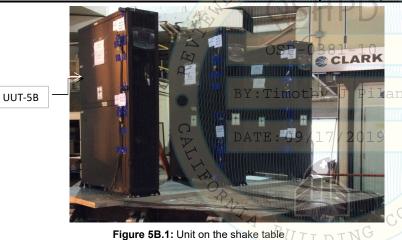
Model Number	Nominal Capacity (kW)	Mounting		citation irection	Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR032RC1K3L598	32	Rigid Base Mounted	Х	Front - Back	17.8		11 7/8		438
(CR032RC1K30D0CH45060PA598)			Υ	Side - Side	5.3	43		78 3/4	
(CR032RC1R30D0C1143000FA398)		Mounted	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight is approximately 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Seismic kits (part # 317816G0), consisting	Seismic Par	ameters						
with Seismic	of seismic plates & angle brackets were					Horiz	ontol	Vort	ical
Modifications	installed on each end of the unit. The plates	Building Test		S <sub>DS</sub> (g)	z/h	Horizontal		Vertical	
	of the kit were attached with four (4)-1/4"Ø	Code	Code Criteria		Z/II	A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	Δ	Δ
	self tapping screws. The angles of the kit	ODE				<b>∽</b> FLX-H	~RIG-H	TFLX-V	~RIG-V
	attached with six (6)-1/4"Ø self tapping	ODE	7	2.00	1.0				0.68g
	and anchored to the shake table with	CBC 2016	AC 156	2.00	1.0	3.20g	2.40g	1.68g	
½" diameter Grade 8 bolts per bracket.			170	2.50	0.0				





**Figure 5B.2:** Mounting Details with Modifications

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained.

After the test, the UUT was functional and operated within the manufacturer operational limits

## **UUT-35 Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P3	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	316672G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR032RC1K 120V	315033G8	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	5KA	300308P2	ABB & Socomec (1)	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Condensate Pump	1/10 HP 120VAC	319860G2	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump
Condensate Fullip	1/1011F 120VAC	319000G2	i iai teii	housing and impeller) and brass (piping connections).
Air Filter	MERV1 Filter	155419P4	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 81media
All I litter	INICIO I I III.	133419F4	Roci i illei Coip.	& metal mesh backing
Electrical Panel Transformer	200VA 120 Volt	317839P1	Emercen (Emermey)	Carbon Steel laminations and copper windings
Electrical Parier Transformer	X 24 Volt 60 Hz.	317039P1	Emerson (Emermex)	Carbon Steer laminations and copper windings
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
3 Way Valve / Actuator	Motorized 3 Way 24VAC	185661P13	Belimo	Stainless steel valve. Electrical parts and plastic actuator
2 Way Valve / Actuator	Motorized 2 Way 24VAC	185660P13	Belimo	Stainless steel valve. Electrical parts and plastic actuator
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors
4 LILIT CD b b -45 DN 2000	0.404 !!		A 1	

<sup>1.</sup> UUT-5B has both PN 320064P1 disconnect sources (ABB and Mersen) installed within the unit disconnect enclosure.





## **UUT-5C Test Summary**

UUT-5C

 Testing Lab:
 Clark Testing Lab

 Testing Report:
 JID 14-1292

 Testing Unit Num:
 5C

Model Number	Nominal Capacity (kW)	Mounting	Mounting Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR032RC1K3L598 (CR032RC1K30D0CH35060PA598)	32	Rigid Base Mounted	Χ	Front - Back	17.1	43	11 7/8		
			Υ	Side - Side	4.2			78 3/4	438
(CR032RC1R30D0C133000FA390)			Z	Vertical	>33.3				

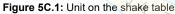
Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight is approximately 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Carbon steel angles (part # 317816G2)	Seismic Para	meters						
	were installed on each end of the unit with					Horizontal		Vertical	
	(6) 1/4"Ø self tapping screws and anchored		S <sub>DS</sub> (g)	z/h	Horizontal		Vertical		
	to the shake table with (4) -½"Ø Grade 8		Criteria	ODS (9)	2/11	A <sub>FLX-H</sub>	Δ	Δ	Δ
	bolts (8 per bracket).	ODE				<b>∼</b> FLX-H	<b>~</b> RIG-H	A <sub>FLX-V</sub>	~RIG-V
	FOR	CBC 2016	AC 156	0.80	1.0	1.28g	0.06a	0.54g	0.224
		CBC 2010	AC 130	0.00	1.0	1.209	0.909	0.549	0.229







**Figure 5C.2:** Mounting Details with Modifications

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained.

After the test, the UUT was functional and operated within the manufacturer operational limits

## **UUT-5C Summary Tested Sub-Component**

		-		
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P3	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	316672G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR032RC1K 120V	315033G8	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	5KA	300308P2	ABB & Socomec (1)	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Condensate Pump	1/10 HP 120VAC	319860G2		Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).
Air Filter	MERV1 Filter	155419P4	IKOCh Eliter Corn	Beverage board frame, pleated polypropylene blend MERV 81media & metal mesh backing
Electrical Panel Transformer	200VA 120 Volt	317839P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Electrical Faller Transferrier	X 24 Volt 60 Hz.	01700011	Emerson (Emermex)	Carbon Clear lanimations and copper windings
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
3 Way Valve / Actuator	Motorized 3 Way 24VAC	185661P13	Belimo	Stainless steel valve. Electrical parts and plastic actuator
2 Way Valve / Actuator	Motorized 2 Way 24VAC	185660P13	Belimo	Stainless steel valve. Electrical parts and plastic actuator
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors

<sup>1.</sup> UUT-5C has both PN 320064P1 disconnect sources (ABB and Mersen) installed within the unit disconnect enclosure.





## **UUT-6 Test Summary**

Testing Lab: Clark Testing Lab
Testing Report: JID 14-1292

Testing Unit Num:  $\overline{6}$ 

Model Number	Nominal Capacity (kW)	Mounting	Direction Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR032RC1K3L598		Rigid on	X	Front - Back	24.0				
(CR032RC1K30D0CH45060PA598)	32	12" Floor	Υ	Side - Side	5.0	43	11 7/8	78 3/4	435
(CR032RC1R30D0C1143000FA390)		Stand	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight is approximately 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method
with Seismic
Modifications

UUT-6

Holdown brackets (part # 317816G4) were	Seismic Parai	neters						
installed on the front and back of the unit					Horiz	ontal	Vert	ical
with (14) 1/4"Ø self tapping screws (each	Building	Test	S <sub>DS</sub> (g)	z/h	ПОПЕ	Ulitai	vert	icai
bracket) attaching the unit to the floorstand	Code	Criteria	S <sub>DS</sub> (9)	2/11	A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	Δ	Δ
The floor stand is anchored to the shake	CODE				~FLX-H	~RIG-H	~FLX-V	~RIG-V
table with (2) -1/2" diameter Grade 8 bolts	ODE	7	2.00	1.0				
per bracket (8 total).	CBC 2016	AC 156	2.00	0.0	3.20g	2.40g	1.68g	0.68g
		170	2.50	0.0				





**Figure 6.2:** Mounting Details with Modifications

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained.

After the test, the UUT was functional and operated within the manufacturer operational limits

## **UUT-6 Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (200-277V 1 phase)	315021P3	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	3 Row Tube & Fin Coil	316672G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR032RC1K 120V	315033G8	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	5KA	300308P2	ABB & Socomec (1)	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Display	ICOM Control CRV300	314979G2	Vertiv Corporation	Electrical parts and plastic
Condensate Pump	1/10 HP 120VAC	319860G2	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump
Condensate Fullip	1/1011F 120VAC	31900002	i iai teii	housing and impeller) and brass (piping connections).
Air Filter	MERV1 Filter	155419P4	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV
All Filler	MERVIFILEI	133419F4	Roch Filler Corp.	81media & metal mesh backing
Flactrical Danel Transformer	200VA 120 Volt	24702004	Emercen (Emermey)	Carbon Steel Isminations and conner windings
Electrical Panel Transformer	X 24 Volt 60 Hz.	317839P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Electrical Panel Transformer	45VA 24Volt X 22 Volt	180792P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
3 Way Valve / Actuator	Motorized 3 Way 24VAC	185661P13	Belimo	Stainless steel valve. Electrical parts and plastic actuator
2 Way Valve / Actuator	Motorized 2 Way 24VAC	185660P13	Belimo	Stainless steel valve. Electrical parts and plastic actuator
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors

<sup>1.</sup> UUT-6 has both PN 320064P1 disconnect sources (ABB and Mersen) installed within the unit disconnect enclosure.





## **UUT-7B Test Summary**

Clark Testing Lab Testing Lab: JID 2672-R Testing Report:

Testing Unit Num:

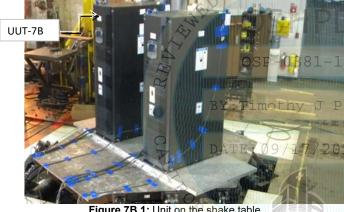
Model Number	Nominal Capacity (kW)	Mounting	Mounting Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR020RW1C7SD1871P (CR020RW1C7SD1874P060PA)	20	Rigid Base Mounted	Χ	Front - Back	10.6	46.25			834
			Υ	Side - Side	7.9		22.63	78.75	
(CR020RW1C73D1874F000FA)			Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Model Number in parenties is fail model number based on eartern nomenciatate									
Attachment Method	Seismic kits (part # 317816G0) was	Seismic Parameters							
with Seismic	attached to unit with eight (8) 1/4"Ø self					Horiz	ontol	Vor	tioal
Modifications	tapping screws on each end of the unit.	Building	Test	S (a)	z/h	Horizontal		Vertical	
	Each bracket was attached to table with	Code	Criteria	S <sub>DS</sub> (g)	2/11	Λ	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
	three (3) 1/2"-13 Grade 5 bolts (6 bolts per	G 0 -				A <sub>FLX-H</sub>			
	unit). Cross brace (PN 313743G1), shown	CBC 2016	AC 1EG	2.00	1.0	2 20 ~	0.40 =	1 60 ~	0.00 =
	below was installed	CBC 2010	AC 156	2.50	0.0	3.20 g	2.40 g	1.00 g	0.00 g



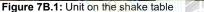




Figure 7B.2: Mounting Details with Modifications

The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-7B Summary Tested Sub-Component**

OOT-7 D Suffilliary	Toolea Gab Go	<u>inponen</u>		
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (208VAC)	191881P1	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	4 Row Tube & Fin Coil	197515G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR020 208V	191986G1	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Disconnect	100 Amp 65KA SCCR	303399P3	Socomec	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Compressor	Scroll ZPD72KCE-TF5	257220P1	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/3 HP Pump condensate 208VAC	1A19271P1	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).
Condensate Plate Heat Exch	B80X26 UL	257382P2	Swep	All stainless steel 316 HX with copper Braze
Humidifier	208V	257521P3	Nortec	Electrical parts, carbon steel sheetmetal and plastic
Reheat Assembly	Heaters 6 KW 208V	257604G13	Vertiv Corporation	Galvanized steel (mtg PLs), nickel plated steel (mtg nuts), stainless steel (electrical connections) & silicone rubber (insulating terminals).
Thermal Expansion Valve	6 Ton Expansion Valve	257261P2	Sporlan Valve	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	196968P1	IKOCH FIITER CORH	Beverage board frame, pleated polypropylene blend MERV 8 media & metal mesh backing
Electrical Panel Transformer	300VA 460-600 Volt	136202P1	Emorgon (Emormoy)	Carbon Steel laminations and copper windings
Electrical Farier Transformer	X 24 Volt 60 Hz.	130202F1	Emerson (Emermex)	Carbon Steer familiations and copper windings
Refigerant Receiver	Receiver 6" X14"	300842P1	Westermeyer	Carbon Steel shell attached to unit base pan
Heat Rejection Control Valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Transformer	1.5KVA 240-480/120-240	1C23973P1	ACME	Carbon Steel and Copper
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## **UUT-7C Test Summary**

 Testing Lab:
 Clark Testing Lab

 Testing Report:
 JID 2672-R

 Testing Unit Num:
 1

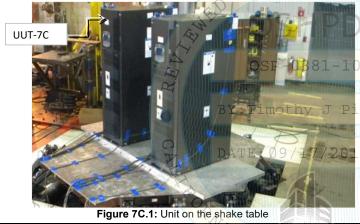
Model Number	Nominal Capacity (kW)	Mounting	Mounting Excitation Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR020RW1C7SD1871P		Rigid Base	Χ	Front - Back	11.0				
(CR020RW1C7SD1873P060PA)	20	Mounted	Υ	Side - Side	4.2	46.25	22.63	78.75	834
(CITOZOITW 1073D1873F000FA)		Modrited	Z	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

meder ramber in parentine									
Attachment Method	Carbon steel angles (part # 317816G0)	Seismic Para	meters						
	were installed on each end of the unit					Horize	ontal	Vert	ical
	eight (8) 1/4"Ø self tapping screws and	Building	Test	S <sub>DS</sub> (g)	z/h	110112	ontai	VC11	icai
	anchored to the shake table with (3)-1/2"	Code	Criteria	ODS (9)	2/11	A <sub>FLX-H</sub>	Δ	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
	diameter Grade 5 bolts per bracket.	0.05				~+LX-H	~RIG-H	T+LX-V	ARIG-V
	ROR	CBC 2016	AC 156	0.80	1.0	1.28g	0.96g	0.54g	0.22g



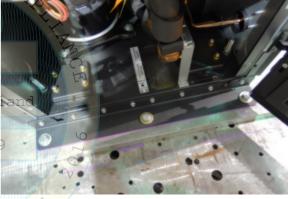


Figure 7C.2: Mounting Details

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

#### UUT-7C Summary Tested Sub-Component

UUI-7C Summary	/ Tested Sub-Co	mponen	[	
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (208VAC)	191881P1	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	4 Row Tube & Fin Coil	197515G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR020 208V	191986G1	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Disconnect	100 Amp 65KA SCCR	303399P3	Socomec	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Compressor	Scroll ZPD72KCE-TF5	257220P1	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/3 HP Pump	1A19271P1	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing
Condensate Fullip	condensate 208VAC	1A 1927 1F 1	narteli	and impeller) and brass (piping connections).
Condensate Plate Heat Exch	B80X26 UL	257382P2	Swep	All stainless steel 316 HX with copper Braze
Humidifier	208V	257521P3	Nortec	Electrical parts, carbon steel sheetmetal and plastic
Reheat Assembly	Heaters 6 KW 208V	257604G13	Vertiv Corporation	Galvanized steel (mtg PLs), nickel plated steel (mtg nuts), stainless
Refleat Assembly	Tieaters o IVV 200V	237004013	Vertiv Corporation	steel (electrical connections) & silicone rubber (insulating terminals).
Thermal Expansion Valve	6 Ton Expansion Valve	257261P2	Sporlan Valve	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	196968P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8 media &
7 til 1 liter	WEITO I IIICI	1303001 1	Room inter oorp.	metal mesh backing
Electrical Panel Transformer	300VA 460-600 Volt	136202P1	Emerson (Emermey)	Carbon Steel laminations and copper windings
Liectrical i ariei i arisiorinei	X 24 Volt 60 Hz.	1302021 1	Lineison (Lineimex)	Carbon Steer lanimations and copper windings
Refigerant Receiver	Receiver 6" X14"	300842P1	Westermeyer	Carbon Steel shell attached to unit base pan
Heat Rejection Control Valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Transformer	1.5KVA 240-480/120-240	1C23973P1	ACME	Carbon Steel and Copper
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## UUT-8B Test Summary

Testing Lab: Clark Testing Lab
Testing Report: JID 2672-R

Testing Unit Num:  $\frac{1}{2}$ 

	Model Number	Nominal Capacity (kW)	Mounting		Excitation Direction	Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
Ī	CR035RW1A7SD1971P		Digid Doop	Χ	Front - Back	10.2				
	(CR035RW1A7SD1974P060PA)	35	Rigid Base Mounted	Υ	Side - Side	6.6	46.25	22.63	78.75	938
L	(CR055RW 1A75D1974F000FA)		Mounted	Ζ	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	ethod Seismic kits (part # 317816G0) was		meters						
with Seismic	attached to unit with eight (8) 1/4"Ø self					Horizontal		Vort	ical
Modifications	tapping screws on each end of the unit.	Building	Test	e (a)	z/h			Vertical	
	Each bracket was attached to table with	Code	Criteria	S <sub>DS</sub> (g)	2/11	Δ	Δ	A <sub>FLX-V</sub>	Δ
	three (3) 1/2"-13 Grade 5 bolts (6 bolts per					A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	<b>∽</b> FLX-V	A <sub>RIG-V</sub>
	unit). Cross brace (PN 313743G1), shown	CBC 2016	AC 156	2.00	1.0	3.20g	2.40a	1 60 a	0.68 g
	below was installed	CBC 2010	AC 136	2.50	0.0	3.20g	2.40g	1.089	0.66 g

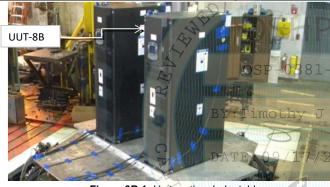




Figure 8B.1: Unit on the shake table

Figure 8B.2: Mounting Details with Modifications

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-8B Summary Tested Sub-Component**

OOT-OB Sulfilliary		in policing	UTTDINO	
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan E	EC (460VAC)	257240P1	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly 6	Row Tube & Fin Coil	197542G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly C	CR035 460V	191986G4	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect (1) 6	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Disconnect (1) 3	30 Amp 65KA SCCR	303399P3	Socomec	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Compressor	Scroll ZPD120KCE-TFD	257223P2	Copeland	Shell is painted cold rolled carbon steel
Condensate Plimn	1/3 HP Pump condensate 460VAC	1A19271P2	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).
Condensate Plate Heat Exch E	380X42 UL	257382P2	Swep	All stainless steel 316 HX with copper Braze
Humidifier 4	160V	257521P2	Nortec	Electrical parts, carbon steel sheetmetal and plastic
Reheat Assembly	Heaters 6 KW 460V	257604G14	Vertiv Corporation	Galvanized steel (mtg PLs), nickel plated steel (mtg nuts), stainless steel (electrical connections) & silicone rubber (insulating terminals).
Thermal Expansion Valve 6	Ton Expansion Valve	257261P1	Sporlan Valve	Brass (body), copper (piping) and stainless steel (internals).
Air Filter N	MERV11 Filter	196968P2	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 11 media & metal mesh backing
Flectrical Panel Transformer	300VA 460-600 Volt X 24 Volt 60 Hz.	136202P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Refigerant Receiver	Receiver 6" X14"	300842P1	Westermeyer	Carbon Steel shell attached to unit base pan
Heat Rejection Control Valve 3	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Transformer (2)	1.5KVA 240-480/120-240	1C23973P1	ACME	Carbon Steel and Copper
				Plastic, solder, semiconductors

(1) UUT-8B includes PN 303397P2 as normally wired and installed. PN 303399P3 was installed behind wired to voltage but not to load.

(2) PN 1C23973P1 will be mounted in same place as designed. The primary side will be wired and the secondary side will not since there is no 230V fan load.





## **UUT-8C Test Summary**

Testing Lab: Clark Testing Lab
Testing Report: JID 2672-R

Testing Unit Num:  $\frac{1}{2}$ 

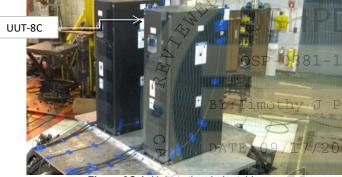
	Model Number	Nominal Capacity (kW)	Mounting		Excitation Direction	Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
Ī	CR035RW1A7SD1971P		Digid Doop	Χ	Front - Back	10.5				
	(CR035RW1A7SD1971P (CR035RW1A7SD1973P060PA)	35	Rigid Base Mounted	Υ	Side - Side	4.0	46.25	22.63	78.75	938
L	(CR055RW 1A75D1975F000FA)		Mounted	Ζ	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Carbon steel angles (part # 317816G0) Seismic Parameters								
	were installed on each end of the unit					Horizontal		Vort	ical
	with eight (8) 1/4"Ø self tapping screws	Building	Test Criteria	S <sub>DS</sub> (g)	z/h	HOHZ	Ulitai	Vertical	
	and anchored to the shake table with	Code		ODS (9)	2/11	Δ	Δ	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
	three (3)-1/2"Ø Grade 5 bolts per bracket.					A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	<b>∽</b> FLX-V	~RIG-V
	OB	CBC 2016	AC 156	0.80	1.0	1.28 g	0 96 a	0 54 a	0 22 a
	TI O I I	ODO 2010	70 100	0.00	1.0	1.20 g	0.50 g	0.5 <del>-</del> 9	0.22 g



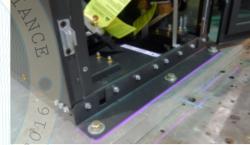


Figure 8C.1: Unit on the shake table

Figure 8C.2: Mounting Details

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-8C Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material
				1 0 0 0
Cooling Fan	EC (460VAC)	257240P1	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	6 Row Tube & Fin Coil	197542G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets
Electrical Panel Assembly	CR035 460V	191986G4	Vertiv Corporation	Galvanized G90 Steel panel
Disconnect (1)	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Disconnect (1)	30 Amp 65KA SCCR	303399P3	Socomec	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Compressor	Scroll ZPD120KCE-TFD	257223P2	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/3 HP Pump condensate 460VAC	1A19271P2	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).
Condensate Plate Heat Exch	B80X42 UL	257382P2	Swep	All stainless steel 316 HX with copper Braze
Humidifier	460V	257521P2	Nortec	Electrical parts, carbon steel sheetmetal and plastic
Reheat Assembly	Heaters 6 KW 460V	257604G14	Vertiv Corporation	Galvanized steel (mtg PLs), nickel plated steel (mtg nuts), stainless steel (electrical connections) & silicone rubber (insulating terminals).
Thermal Expansion Valve	6 Ton Expansion Valve	257261P1	Sporlan Valve	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV11 Filter	196968P2	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 11 media & metal mesh backing
Electrical Panel Transformer	300VA 460-600 Volt X 24 Volt 60 Hz.	136202P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Refigerant Receiver	Receiver 6" X14"	300842P1	Westermeyer	Carbon Steel shell attached to unit base pan
Heat Rejection Control Valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Transformer (2)	1.5KVA 240-480/120-240	1C23973P1	ACME	Carbon Steel and Copper
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors
(1) UUT-8C includes PN 303	397P2 as normally wired a	nd installed. F	PN 303399P3 was insta	alled behind wired to voltage but not to load.

(1) UUT-8C includes PN 303397P2 as normally wired and installed. PN 303399P3 was installed behind wired to voltage but not to load.

(2) PN 1C23973P1 will be mounted in same place as designed. The primary side will be wired and the secondary side will not since there is no 230V fan load.





## **UUT-9 Test Summary**

Testing Lab: Clark Testing Lab
Testing Report: JID 2672-R

Testing Unit Num:  $\overline{3}$ 

	Model Number	Nominal Capacity (kW)	Mounting	Mounting Ex		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
	CR020RW1C7SD1871P		Rigid to 12"	Χ	Front - Back	16.3				
10	CR020RW1C7SD1871P	20	Floor Stand	Y	Side - Side	6.6	46.25	22.63	78.75	834
(	01102011VV 1073D 1874F000FA)		1 1001 Stariu	Z	Vertical	12.0				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method	Holdown brackets (part # 319314G4)	Seismic Parai	meters						
with Seismic	were installed on the front & back of unit					Horizontal		Vert	ical
Modifications	with ten (10)-1/4"Ø self tapping screws	Building	Test	S <sub>DS</sub> (g)	z/h	HOHZ	Jillai	vert	icai
	(each bracket). The floor stand is	Code	Criteria	ODS (9)	2/11	Λ	Λ	A <sub>FLX-V</sub>	Λ
	anchored to the shake table with two (2)	G 0 -				A <sub>FLX-H</sub>	<b>~</b> RIG-H	<b>∽</b> FLX-V	~RIG-V
	½" Grade 5 bolts per bracket (8 total).	CBC 2016	AC 156	2.00	1.0	3.2 a	2.4 a	160 a	0.60 a
	Cross brace (see UUT-7B) was installed.	UNITED TO SERVICE OF THE SERVICE OF	CAC 150	2.50	0.0	3.2 y	2.4 g	1.68 g	0.06 g



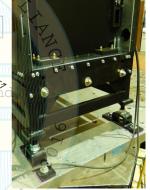


Figure 9.1: Unit on the shake table

Figure 9.2: Mounting Details with Modifications

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-9 Summary Tested Sub-Component**

	Cotca Gab-Coll	ропопс		
Sub-Component	Description	PN	Manufacturer	Material
Cooling Fan	EC (208VAC)	191881P1	EBM	Aluminum blades. Carbon Steel & Copper Motor
Cooling Coil Assembly	4 Row Tube & Fin Coil	197515G1	Vertiv Corporation	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Electrical Panel Assembly	CR020 208V	191986G1	Vertiv Corporation	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Disconnect	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Disconnect	100 Amp 65KA SCCR	303399P3	Socomec	Aluminum shaft, plated carbon steel/plastic body and copper contacts
Compressor	Scroll ZPD72KCE-TF5	257220P1	Copeland	Shell is painted cold rolled carbon steel
Condensate Pump	1/3 HP Pump condensate 208VAC	1A19271P1	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).
Condensate Plate Heat Exch.	B80X26 UL	257382P2	Swep	All stainless steel 316 HX with copper Braze
Humidifier	208V	257521P3	Nortec	Electrical parts, carbon steel sheetmetal and plastic
Reheat Assembly	Heaters 6 KW 208V	257604G13	Vertiv Corporation	Galvanized steel (mtg PLs), nickel plated steel (mtg nuts), stainless steel (electrical connections) & silicone rubber (insulating terminals).
Thermal Expansion Valve	6 Ton Expansion Valve	257261P2	Sporlan Valve	Brass (body), copper (piping) and stainless steel (internals).
Air Filter	MERV8 Filter	196968P1	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 8 media & metal mesh backing
Electrical Panel Transformer	300VA 460-600 Volt X 24 Volt 60 Hz.	136202P1	Emerson (Emermex)	Carbon Steel laminations and copper windings
Refigerant Receiver	Receiver 6" X14"	300842P1	Westermeyer	Carbon Steel shell attached to unit base pan
Heat Rejection Control Valve	3 way globe valve	257271P1	Siemens	Electrical parts and plastic
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic
Transformer	1.5KVA 240-480/120-240	1C23973P1	ACME	Carbon Steel and Copper
Communication Card	1-WEBL card	191944G3	Vertiv Corporation	Plastic, solder, semiconductors





## **UUT-10 Test Summary**

 Testing Lab:
 Clark Testing Lab

 Testing Report:
 JID 2672-R

 Testing Unit Num:
 4

Model Number	Nominal Capacity (kW)	Mounting	Excitation Direction		Frequency * (Hz)	Length (in)	Width (in)	Height (in)	Tested Operating Weight (lbs)
CR035RW1A7SD1971P		Rigid to 24"	Χ	Front - Back	15.0				
(CR035RW1A7SD1971P	35	Floor Stand		Side - Side	5.4	46.25	22.63	78.75	938
			Ζ	Vertical	>33.3				

<sup>\*</sup> Frequencies are for units prior to ICC ES AC-156 testing.

Unit length, width, height and operating weight within 10% of those listed in Table 1.

Model Number in parenthesis is full model number based on current nomenclature

Attachment Method Holdown brackets (part # 319314G4)		Seismic Parameters							
with Seismic	were installed on the front & back of unit			Test criteria S <sub>DS</sub> (g)	z/h	Horizontal		Vertical	
Modifications	with ten (10) 1/4"Ø self tapping screws	Building Code	Test Criteria						
	(each bracket The floor stand is					A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
	anchored to the shake table with two (2)								
	1/2 Grade 5 boltsper bracket (8 total).	CBC 2016	AC 156	2.00	1.0	3.20a	2.40 g	160 a	0.60 a
Cross brace (see UUT-8B) was installed.		111111111111111111111111111111111111111	AC 130	2.50	0.0	3.20g	2.40 g	1.00 g	0.06 g

UUT-10







Figure 10.2: Mounting Details with Modifications

Notes: The UUTs were full of contents (refrigerant & water) during the test.

The structural integrity of the component attachment and force-resisting systems was maintained. After the test, the UUT was functional and operated within the manufacturer operational limits

### **UUT-10 Summary Tested Sub-Component**

Sub-Component	Description	PN	Manufacturer	Material				
Cooling Fan	EC (460VAC)	257240P1	EBM	Aluminum blades. Carbon Steel & Copper Motor				
Cooling Coil Assembly	6 Row Tube & Fin Coil	197542G1	Vertiv Corporation	Aluminum fin, Copper Tube, Galv. Tube sheets				
Electrical Panel Assembly	CR035 460V	191986G4	Vertiv Corporation	Galvanized G90 Steel panel				
Disconnect (1)	60 Amp 65KA SCCR	303397P2	Allen Bradley	Aluminum shaft, plated carbon steel/plastic body and copper contacts				
Disconnect (1)	30 Amp 65KA SCCR	303399P3	Socomec	Aluminum shaft, plated carbon steel/plastic body and copper contacts				
Compressor	Scroll ZPD120KCE-TFD	CE-TFD 257223P2 Copeland		Shell is painted cold rolled carbon steel				
Condensate Pump 1/3 HP Pump condensate 460VAC		1A19271P2	Hartell	Carbon Steel (motor), copper (motor windings), plastic (pump housing and impeller) and brass (piping connections).				
Condensate Plate Heat Exch	B80X42 UL	257382P2	Swep	All stainless steel 316 HX with copper Braze				
Humidifier	460V	257521P2	Nortec	Electrical parts, carbon steel sheetmetal and plastic				
Reheat Assembly	Heaters 6 KW 460V	257604G14	Vertiv Corporation	Galvanized steel (mtg PLs), nickel plated steel (mtg nuts), stainless steel (electrical connections) & silicone rubber (insulating terminals).				
Thermal Expansion Valve	6 Ton Expansion Valve	257261P1	Sporlan Valve	Brass (body), copper (piping) and stainless steel (internals).				
Air Filter	MERV11 Filter	196968P2	Koch Filter Corp.	Beverage board frame, pleated polypropylene blend MERV 11 media & metal mesh backing				
Electrical Panel Transformer	300VA 460-600 Volt X 24 Volt 60 Hz.	136202P1	Emerson (Emermex)	Carbon Steel laminations and copper windings				
Refigerant Receiver	Receiver 6" X14"	300842P1	Westermeyer	Carbon Steel shell attached to unit base pan				
Heat Rejection Control Valve 3 way globe valve		257271P1	Siemens	Electrical parts and plastic				
Actuator	Actuator 24V 0-10V	257371P1	Siemens	Electrical parts and plastic				
Transformer (2)	1.5KVA 240-480/120-240	1C23973P1	ACME	Carbon Steel and Copper				
Communication Card 1-WEBL card 191944G3		191944G3	Vertiv Corporation	Plastic, solder, semiconductors				

(1) UUT-10 includes PN 303397P2 as normally wired and installed. PN 303399P3 was installed behind wired to voltage but not to load.

(2) PN 1C23973P1 will be mounted in same place as designed. The primary side will be wired and the secondary side will not since there is no 230V fan load.