APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0388

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Johnson Controls, Inc.

Manufacturer's Technical Representative: Tyler Williams

Mailing Address: 8575 Largo Lakes Blvd, Largo, FL 33773

Telephone: (727) 560-9400 Email: tyler.j.williams@jci.com

Product Information

Product Name: Air Conditioning Units

Product Type: Fan Coil Units

Product Model Number: FL, FW, FS, FC, FN, FH, Reference attachment

General Description: Fan coil units containing coils, fans, motors, filters, dampers, electric heat and controls.

Mounting Description: Rigid base & wall mounted (FL, FW, FS, FC), Ceiling suspended without spring isolators (FN, FH), .

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Petra Seismic Design

Contact Person: Robert Simmons

Mailing Address: 17832 Mound Road, Suite E, Cypress, TX 77433

Telephone: (281) 656-1439 Email: rsimmons@petraseismicdesign.com

Title: CEO

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: RESPONSE STRUCTURAL ENGINEERS

Name: Todd Kemen California License Number: S5409

Mailing Address: 5441 Fair Oaks Blvd, STE G2, Carmichael, CA 95608

Telephone: (530) 200-4022 Email: toddk@response-eng.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: Kelly Laplace

Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431

Telephone: (775) 358-5085 Email: Kelly@shaketest.com

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.45

S_{DS} (Design spectral response acceleration at short period, g) = 1.93

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 05/06/2030

Date: 5/6/2024

Name: Timothy Piland Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: S_{DS} (g) = 1.93 z/h = 1

Condition of Approval (if applicable):

Special Seismic Certification
Certified Components - Fan Coil Units

Manufacturer: Johnson Controls

Product Family: Fan Coil Units

Certified Product Construction: Top, side and bottom panel construction : exterior is 18 gage galvanized carbon steel (with powder-coated exterior finish in JCI-branded "X" and "I" models); interior insulation is 1/2" foil-face fiberglass with elastomeric closed cell foam.

Mounting Description: Rigid base and wall mounted [1]

Product Family:	JCI Model Number	Enviro-Tec Model Number	Titus Model Number	Krueger Model Number	Superior Rex Model Number	Dimensions (in)			Max. Weight (lb)	UUT
						Length	Width	Height		
Fan Coil Units, FL, FW[2,3]	FLX 02	VLE 02	TVBL 02	KVFC 02	RBVL 02	41	12 1/2	14 1/2	75	UUT5
	FLX 03	VLE 03	TVBL 03	KVFC 03	RBVL 03	46	12 1/2	14 1/2	75 - 180	Interpolated
	FLX 04	VLE 04	TVBL 04	KVFC 04	RBVL 04	54	12 1/2	14 1/2		Interpolated
	FLX 06	VLE 06	TVBL 06	KVFC 06	RBVL 06	68	12 1/2	14 1/2		Interpolated
	FLC 02	VLC 02	TVLC 02	KVFL 02	RBVD 02	36	11 1/4	15 1/2	75 - 180	Interpolated
	FLC 03	VLC 03	TVLC 03	KVFL 03	RBVD 03	41	11 1/4	15 1/2		Interpolated
	FLC 04	VLC 04	TVLC 04	KVFL 04	RBVD 04	49	11 1/4	15 1/2		Interpolated
	FLC 06	VLC 06	TVLC 06	KVFL 06	RBVD 06	63	11 1/4	15 1/2		Interpolated
	FWC 02	VFC 02	TVBC 02	KVFH 02	RBVR 02	36	9 1/4	26	75 - 180	Interpolated
	FWC 03	VFC 03	TVBC 03	KVFH 03	RBVR 03	40	9 1/4	26		Interpolated
	FWC 04	VFC 04	TVBC 04	KVFH 04	RBVR 04	46	9 1/4	26		Interpolated
	FWC 06	VFC 06	TVBC 06	KVFH 06	RBVR 06	56	9 1/4	26		Interpolated
	FWC 08	VFC 08	TVBC 08	KVFH 08	RBVR 08	58	9 1/4	26		Interpolated
	FWC 10	VFC 10	TVBC 10	KVFH 10	RBVR 10	72	9 1/4	26		Interpolated
	FWC 12	VFC 12	TVBC 12	KVFH 12	RBVR 12	80	9 1/4	26		Interpolated
	FWX 02	VFE 02	TVBF 02	KVFF 02	RBVC 02	41	10	25 1/4	75 - 180	Interpolated
	FWX 03	VFE 03	TVBF 03	KVFF 03	RBVC 03	45	10	25 1/4		Interpolated
	FWX 04	VFE 04	TVBF 04	KVFF 04	RBVC 04	51	10	25 1/4		Interpolated
	FWX 06	VFE 06	TVBF 06	KVFF 06	RBVC 06	61	10	25 1/4		Interpolated
	FWX 08	VFE 08	TVBF 08	KVFF 08	RBVC 08	63	10	25 1/4		Interpolated
	FWX 10	VFE 10	TVBF 10	KVFF 10	RBVC 10	77	10	25 1/4		Interpolated
	FWX 12	VFE 12	TVBF 12	KVFF 12	RBVC 12	85	10	25 1/4		Interpolated
	FWI 02	VFS 02	TVBA 02	KVFS 02	RBVS 02	41	10	28 3/4	75 - 180	Interpolated
	FWI 03	VFS 03	TVBA 03	KVFS 03	RBVS 03	45	10	28 3/4		Interpolated
	FWI 04	VFS 04	TVBA 04	KVFS 04	RBVS 04	51	10	28 3/4		Interpolated
	FWI 06	VFS 06	TVBA 06	KVFS 06	RBVS 06	61	10	28 3/4		Interpolated
	FWI 08	VFS 08	TVBA 08	KVFS 08	RBVS 08	63	10	28 3/4		Interpolated
	FWI 10	VFS 10	TVBA 10	KVFS 10	RBVS 10	77	10	28 3/4		Interpolated
	FWI 12	VFS 12	TVBA 02	KVFS 12	RBVS 12	85	10	28 3/4	180	UUT6

Notes:
1. Certified units are attached at the base and rear of the unit
2. FL = Low Profile Vertical Floor Mounted, FW = Standard Vertical Floor Mounted
3. For FL and FW units, "X" designates a standard exposed module, "I" designates an exposed module with a vertical sloped top and "C" designates a concealed module. The X and I modules differ from the C modules in that they feature an additional powder-coated exterior paneling.

Special Seismic Certification

Manufacturer: Johnson Controls

Product Family: Fan Coil Units

Certified Product Construction: Top, side and bottom panel construction: exterior is 18 gage galvanized carbon steel; interior insulation is 1/2" foil-face fiberglass with elastomeric closed cell foam.

Mounting Description: Rigid base and wall mounted [1]

Product Family	JCI Model Number[2]	Enviro-Tec Model Number	Titus Model Number	Krueger Model Number	Superior Rex Model Number	Dimensions (in)			Max. Weight (lb)	UUT
						Length	Width	Height		
Fan Coil Units, FS	FSC 03	VHC 03	TVSR 03	KVPH 03	RAVS 03	18	18	88	190	UUT9
	FSC 04	VHC 04	TVSR 04	KVPH 04	RAVS 04	18	18	88	190 - 260	Interpolated
	FSC 06	VHC 06	TVSR 06	KVPH 06	RAVS 06	20	20	88		Interpolated
	FSC 08	VHC 08	TVSR 08	KVPH 08	RAVS 08	20	20	88		Interpolated
	FSC 10	VHC 10	TVSR 10	KVPH 10	RAVS 10	24	24	88		Interpolated
	FSC 12	VHC 12	TVSR 12	KVPH 12	RAVS 12	24	24	88	260	UUT10
	FSS 03	VHS 03	TVRS 03	KVPS 03	RARS 03	18	18	88	190 - 260	Extrapolated
	FSS 04	VHS 04	TVRS 04	KVPS 04	RARS 04	18	18	88		Extrapolated
	FSS 06	VHS 06	TVRS 06	KVPS 06	RARS 06	20	20	88		Extrapolated
	FSS 08	VHS 08	TVRS 08	KVPS 08	RARS 08	20	20	88		Extrapolated
	FSS 10	VHS 10	TVRS 10	KVPS 10	RARS 10	24	24	88		Extrapolated
	FSS 12	VHS 12	TVRS 12	KVPS 12	RARS 12	24	24	88		Extrapolated
	FSM 03	VHM 03	TVRM 03	KVPP 03	RARM 03	18	18	88	190 - 260	Extrapolated
	FSM 04	VHM 04	TVRM 04	KVPP 04	RARM 04	18	18	88		Extrapolated
	FSM 06	VHM 06	TVRM 06	KVPP 06	RARM 06	20	20	88		Extrapolated
	FSM 08	VHM 08	TVRM 08	KVPP 08	RARM 08	20	20	88		Extrapolated
	FSM 10	VHM 10	TVRM 10	KVPP 10	RARM 10	24	24	88		Extrapolated
	FSM 12	VHM 12	TVRM 12	KVPP 12	RARM 12	24	24	88		Extrapolated

Notes:
1. Certified units are attached at the base and rear of the unit
2. FSS/FSM (slave/master) units are identical in construction to FSC (concealed) units, and vary by a software change.

Special Seismic Certification
Certified Components - Fan Coil Units

Manufacturer: Johnson Controls

Product Family: Fan Coil Units

Certified Product Construction: Top, side and bottom panel construction : exterior is 18 gage galvanized carbon steel; interior insulation is 1/2" scrim-reinforced foil-face fiberglass with elastomeric closed cell foam.

Mounting Description: Rigid base and wall mounted [1]

Product Family	JCI Model Number	Enviro-Tec Model Number	Titus Model Number	Krueger Model Number	Superior Rex Model Number	Dimensions (in)								Max. Weight (lb)	UUT
						Main Cabinet			Supply Plenum[2]			Mixing Box[2]			
						Length	Width	Height	Length	Width	Height	Length	Width		
Fan Coil Units, FCC	FCC 04	CDV 04	TVHC 04	KVGH 04	RAVC 04	22	23	49	22	15	15	22	15	160	UUT33
	FCC 06	CDV 06	TVHC 06	KVGH 06	RAVC 06	22	23	49	22	15	15	22	15	160 - 350	Interpolated
	FCC 08	CDV 08	TVHC 08	KVGH 08	RAVC 08	22	23	49	22	15	15	22	15		Interpolated
	FCC 10	CDV 10	TVHC 10	KVGH 10	RAVC 10	29	36	49	29	18	18	29	18		Interpolated
	FCC 12	CDV 12	TVHC 12	KVGH 12	RAVC 12	29	36	49	29	18	18	29	18		Interpolated
	FCC 16	CDV 16	TVHC 16	KVGH 16	RAVC 16	46	36	49	46	18	18	46	18		Interpolated
	FCC 20	CDV 20	TVHC 20	KVGH 20	RAVC 20	46	36	49	46	18	18	46	18	350	UUT34

Notes:
1. Certified units are attached at the base and rear of the unit
2. Units can be installed with or without supply plenum and mixing box. UUT33 and UUT34 were tested with supply plenum and mixing box.

Special Seismic Certification
Certified Components - Fan Coil Units

Manufacturer: Johnson Controls

Product Family: Fan Coil Units

Certified Product Construction: Top, side and bottom panel construction: exterior is 20 gage galvanized carbon steel; interior insulation is 1/2" foil-face fiberglass with elastomeric closed cell foam.

Mounting Description: Ceiling suspended (without spring isolators)

Product Family	JCI Model Number	Enviro-Tec Model Number	Titus Model Number	Krueger Model Number	Superior Rex Model Number	Dimensions (in) Main Cabinet Length	Width	Height	Max. Weight (lb)	Unit
Fan Coil Units, FN	FNP 06 w/ mix	HPM 06 w/mix	THHPA 06 w/mix	KHGPA 06 w/mix	RAHRA 06 w/mix	47 3/8	37	16 3/4	161	UUT23
	FNP 08 w/ mix	HPM 08 w/mix	THHPA 08 w/mix	KHGPA 08 w/mix	RAHRA 08 w/mix	47 3/8	42	16 3/4	161 - 340	Interpolated
	FNP 10 w/ mix	HPM 10 w/mix	THHPA 10 w/mix	KHGPA 010 w/mix	RAHRA 10 w/mix	47 3/8	46	16 3/4		Interpolated
	FNP 12 w/ mix	HPM 12 w/mix	THHPA 12 w/mix	KHGPA 12 w/mix	RAHRA 12 w/mix	47 3/8	51	16 3/4		Interpolated
	FNP 14 w/ mix	HPM 14 w/mix	THHPA 14 w/mix	KHGPA 14 w/mix	RAHRA 14 w/mix	47 3/8	56	16 3/4		Interpolated
	FNP 16 w/ mix	HPM 16 w/mix	THHPA 16 w/mix	KHGPA 16 w/mix	RAHRA 16 w/mix	47 3/8	61	16 3/4		Interpolated
	FNP 18 w/ mix	HPM 18 w/mix	THHPA 18 w/mix	KHGPA 18 w/mix	RAHRA 18 w/mix	47 3/8	66	16 3/4		Interpolated
	FNP 20 w/ mix	HPM 20 w/mix	THHPA 20 w/mix	KHGPA 20 w/mix	RAHRA 20 w/mix	47 3/8	70	16 3/4	340	UUT26
	FNP 06	HPP 06	THHPA 06	KHGPA 06	RAHRA 06	32 1/2	37	16 3/4	161 - 340	Extrapolated
	FNP 08	HPP 08	THHPA 08	KHGPA 08	RAHRA 08	32 1/2	42	16 3/4		Extrapolated
	FNP 10	HPP 10	THHPA 10	KHGPA 10	RAHRA 10	32 1/2	46	16 3/4		Extrapolated
	FNP 12	HPP 12	THHPA 12	KHGPA 12	RAHRA 12	32 1/2	51	16 3/4		Extrapolated
	FNP 14	HPP 14	THHPA 14	KHGPA 14	RAHRA 14	32 1/2	56	16 3/4		Extrapolated
	FNP 16	HPP 16	THHPA 16	KHGPA 16	RAHRA 16	32 1/2	61	16 3/4		Extrapolated
	FNP 18	HPP 18	THHPA 18	KHGPA 18	RAHRA 18	32 1/2	66	16 3/4		Extrapolated
	FNP 20	HPP 20	THHPA 20	KHGPA 20	RAHRA 20	32 1/2	70	16 3/4		Extrapolated
	FNF 06	HPF 06	THHCA 06	KHGHA 06	RAHOA 06	29 1/8	37	16 3/4	161 - 340	Extrapolated
	FNF 08	HPF 08	THHCA 08	KHGHA 08	RAHOA 08	29 1/8	42	16 3/4		Extrapolated
	FNF 10	HPF 10	THHCA 10	KHGHA 10	RAHOA 10	29 1/8	46	16 3/4		Extrapolated
	FNF 12	HPF 12	THHCA 12	KHGHA 12	RAHOA 12	29 1/8	51	16 3/4		Extrapolated
	FNF 14	HPF 14	THHCA 14	KHGHA 14	RAHOA 14	29 1/8	56	16 3/4		Extrapolated
	FNF 16	HPF 16	THHCA 16	KHGHA 16	RAHOA 16	29 1/8	61	16 3/4		Extrapolated
	FNF 18	HPF 18	THHCA 18	KHGHA 18	RAHOA 18	29 1/8	66	16 3/4		Extrapolated
	FNF 20	HPF 20	THHCA 20	KHGHA 20	RAHOA 20	29 1/8	70	16 3/4		Extrapolated

Notes:
1. FNP units can be installed with or without mixing box. Units were tested with a mixing box. For Enviro-Tec nomenclature HPP / HPM, M designates the presence of a mixing box.
2. FNF stands for a "free return" unit and is identical to the FNP unit, except without the fan enclosure.

Special Seismic Certification
Certified Components - Fan Coil Units

Manufacturer: Johnson Controls

Product Family: Fan Coil Units

Certified Product Construction: Top, side and bottom panel construction: exterior is 20 gage galvanized carbon steel; interior insulation is 1/2" foil-face fiberglass with elastomeric closed cell foam.

Mounting Description: Ceiling suspended (without spring isolators)

Product Family	JCI Model Number	Enviro-Tec Model Number	Titus Model Number	Krueger Model Number	Superior Rex Model Number	Dimensions (in)			Max. Weight (lb)	Unit
						Main Cabinet				
						Length	Width	Height		
Fan Coil Units, FN (Continued)	FNX 06	HPE 06	THHEA 06	KHGEA 06	RAHCA 06	31 7/8	31 1/4	18	152	UUT35
	FNX 08	HPE 08	THHEA 08	KHGEA 08	RAHCA 08	31 7/8	36 1/4	18	152 - 286	Interpolated
	FNX 10	HPE 10	THHEA 10	KHGEA 10	RAHCA 10	31 7/8	40 1/4	18		Interpolated
	FNX 12	HPE 12	THHEA 12	KHGEA 12	RAHCA 12	31 7/8	45 1/4	18		Interpolated
	FNX 14	HPE 14	THHEA 14	KHGEA 14	RAHCA 14	31 7/8	50 1/4	18		Interpolated
	FNX 16	HPE 16	THHEA 16	KHGEA 16	RAHCA 16	31 7/8	55 1/4	18		Interpolated
	FNX 18	HPE 18	THHEA 18	KHGEA 18	RAHCA 18	31 7/8	60 1/4	18		Interpolated
	FNX 20	HPE 20	THHEA 20	KHGEA 20	RAHCA 20	31 7/8	64 1/4	18	286	UUT36
Fan Coil Units, FH	FHP 02	HLP 02	THBPA 02	KHFPA 02	RBHRA 02	25 1/4	25 1/4	10 3/4	24	UUT37
	FHP 03	HLP 03	THBPA 03	KHFPA 03	RBHRA 03	28 1/2	25 1/4	10 3/4	24 - 71	Interpolated
	FHP 04	HLP 04	THBPA 04	KHFPA 04	RBHRA 04	34 3/4	25 1/4	10 3/4		Interpolated
	FHP 06	HLP 06	THBPA 06	KHFPA 06	RBHRA 06	41 1/2	25 1/4	10 3/4		Interpolated
	FHP 08	HLP 08	THBPA 08	KHFPA 08	RBHRA 08	48 1/2	25 1/4	10 3/4		Interpolated
	FHP 09	HLP 09	THBPA 09	KHFPA 09	RBHRA 09	52 4/7	25 1/4	10 3/4		Interpolated
	FHP 10	HLP 10	THBPA 10	KHFPA 10	RBHRA 10	62 1/2	25 1/4	10 3/4		Interpolated
	FHP 12	HLP 12	THBPA 12	KHFPA 12	RBHRA 12	69 1/2	25 1/4	10 3/4	71	UUT38

Special Seismic Certification
Certified Subcomponents

Manufacturer: Johnson Controls, Inc.

Product Line: Fan Coil Units

Certified Subcomponent: Coils

Coils (FW/FL/FS/FCC Units)

Unit Type	Unit Size	Manufacturer	Material	Dimensions (in)		Max Row Qty (Heat)	Max Row Qty (Cool)	Weight (lb)	Unit
				Height	Width				
FL	02	JCI	Aluminum fins, copper tubes, galvanized carbon steel casing	11 3/4	41	2	2	11	UUT 5
	3, 4			11 3/4	41 - 68	2	3	11 - 79	Interpolated
	06			11 3/4	68	2	3	79	Interpolated
FW	02			10.5	16	1	3	36	Interpolated
	3, 4, 6, 8, 10			10.5	16 - 60	1	3	36 - 77	Interpolated
	12			10.5	60	1	3	77	UUT 6
FS	03			32	16.5	2	3	20	UUT9
	04 - 10			32	16.5 - 22.5	2	3	20 - 66	Interpolated
	12			33	22.5	2	3	66	UUT10
FCC	04			15	48	2	4	7	UUT33
	6-18			18	48	2	4	7 - 77	Interpolated
	20			18	48	2	4	77	UUT34

Coils (FN/FH Units)

Unit Type	Unit Size	Manufacturer	Material	Dimensions (in)		Max Row Qty (Heat)	Max Row Qty (Cool)	Weight (lb)	Unit
				Height	Width				
FNP	06	JCI	Aluminum fins, copper tubes, galvanized carbon steel casing	12.5	14	2	6	5	UUT23
	8-18			12.5	14 - 47	2	6	5 - 111	Interpolated
	20			12.5	47	2	6	111	UUT26
FN	06			14	15	2	6	17	UUT35
	8-18			14	22 - 44	2	6	17 - 67	Interpolated
	20			14	48	2	6	71	UUT36
FH	02			8	16	2	6	7	UUT37
	3 - 10			8	19.25 - 52	2	6	7 - 45	Interpolated
	12			8	60	2	6	51	UUT38

Special Seismic Certification
Certified Subcomponents

Manufacturer: Johnson Controls, Inc.

Product Line: Fan Coil Units

Certified Subcomponent: Fans

Fans (FW/FL/FS/FCC Units)

Unit Size	Manufacturer	Type	Drive	Blade Material	Number of Fans	Fan Wheel Diam. (in)	Fan Wheel Width (in)	Motor Frame	Fan + Motor Weight (lb)	Unit
02	Revcor	DWDI, Forward Curve	Direct	Galvanized carbon steel	1	5.75	3.75	42	11	UUT5
03 - 10					124	5.75	3.75 - 7		11 - 28	Interpolated
12					4	5.75	7		28	UUT6
03	Morrison	DWDI, Forward Curve	Direct	Galvanized carbon steel	1	7	6	48	19	UUT9
04 - 10					1	7 - 9	6 - 10		19 - 25	Interpolated
12					1	9	10		25	UUT10
04	Morrison	DWDI, Forward Curve	Direct	Galvanized carbon steel	1	9	6	48	20	UUT33
06-18					12	9 - 10	6 - 8		20 - 43	Interpolated
20					2	9	8		43	UUT34

Fans (FN/FH Units)

Unit Size	Manufacturer	Type	Drive	Blade Material	Number of Fans	Fan Wheel Diam. (in)	Fan Wheel Width (in)	Motor Frame	Fan + Motor Weight (lb)	Unit
06	Morrison	DWDI, Forward Curve	Direct	Galvanized carbon steel	1	9	4	48	20	UUT23, UUT35
08 - 18					1, 2	9	4 - 6		20 - 46	Interpolated
20					2	9	6		46	UUT26, UUT36
2	Beckett	DWDI, Forward Curve	Direct	Galvanized carbon steel	1	5.75	6.5	48	11	UUT37
3 - 10					1, 2, 4	5.75	6.5 - 8		11 - 50	Interpolated
12					4	5.75	8		50	UUT38

Special Seismic Certification
Certified Subcomponents

Manufacturer: Johnson Controls, Inc.

Product Line: Fan Coil Units

Certified Subcomponent: Motors

Fan Motors (FW/FL/FS/FCC Units)

Manufacturer	Drive	Voltage	HP	Material	Unit
Regal Beloit	Direct	115	1/35	Painted carbon steel shell	UUT9
			1/25		UUT5
			1/25 - 1/20		Interpolated
			1/20		UUT6
			1/20 - 1/3		Interpolated
			1/4		UUT10
			1/3		UUT33, UUT34

Fan Motors (FN/FH Units)

Manufacturer	Drive	Voltage	HP	Material	Unit
Regal Beloit	Direct	115	1/20	Painted carbon steel shell	Extrapolated
			1/10		UUT38[1]
			1/10 - 1/4		Interpolated
			1/4		UUT23, UUT37
			1/3		UUT35, UUT36

Notes:
1. Two identical Regal Beloit motors were tested in UUT38. The Extrapolated motor is identical in size and composition to the tested motors.

Special Seismic Certification
Certified Subcomponents

Manufacturer: Johnson Controls, Inc.

Product Line: Fan Coil Units

Certified Subcomponent: Filters

Filters (FW/FL/FS/FCC Units)

Unit Type	Unit Size	Manufacturer	Type	Material	Height (in)	Width (in)	Weight (lb)	Unit
FW/FL	02	AAF	1" pleated	Cotton-based fiber	7.5	21.5	0.2	UUT5
	03 - 10	AAF	1" pleated		7.5 - 9.25	21.5 - 65.25	0.2 - 0.3	Interpolated
	12	AAF	1" pleated		9.25	65.25	0.3	UUT6
FS	03	AAF	1" pleated	Cotton-based fiber	13 .75	24	0.2	UUT9
	04 - 10	AAF	1" pleated		13 .75 - 19.75	24 - 29	0.2	Interpolated
	12	AAF	1" pleated		19.75	29	0.2	UUT10
FCC	04	AAF	1" Throwaway	Cotton-based fiber	13.75	23	0.4	UUT33
	06 - 18	AAF	1" Throwaway		13.75 - 16.75	23 - 45	0.4 - 0.8	Interpolated
	20	AAF	1" Throwaway		16.75	45	0.8	UUT34

Filters (FN/FH Units)

Unit Type	Unit Size	Manufacturer	Type	Material	Height (in)	Width (in)	Weight (lb)	Unit
FN	06	AAF	2" pleated	Cotton-based fiber	16	16	0.3	UUT23, UUT35
	08 - 18	AAF	2" pleated		13.75	16 - 50	0.4 - 0.9	Interpolated
	20	AAF	2" pleated		16	50	1.0	UUT26, UUT36
FH	02	Koch	1" Throwaway	Cotton-based fiber	10.5	16	0.2	UUT37
	03 - 10	Koch	1" Throwaway		10.5	19.25 - 52	0.2 - 0.3	Interpolated
	12	Koch	1" Throwaway		10.5	60	0.3	UUT38

Special Seismic Certification
Certified Subcomponents

Manufacturer: Johnson Controls, Inc.

Product Line: Fan Coil Units

Certified Subcomponent: Dampers

Dampers (FCC)

Unit Size	Manufacturer	Construction	Qty	Height (in)	Width (in)	Weight (lb)	Unit
4	JCI	16 gauge, galvanized carbon steel	1	9	15	5.5	UUT33
6-18			1	9	20	7.4	Interpolated
20			1	9	36	13.3	UUT34

Dampers (FN)

Unit Size	Manufacturer	Construction	Qty	Height (in)	Width (in)	Weight (lb)	Unit
6	JCI	16 gauge, galvanized carbon steel	2	10	12.625	10	UUT23
8-18			2	10	12.625 to 40.625	10 to 15	Interpolated
20			2	10	40.625	15	UUT26

Special Seismic Certification
Certified Subcomponents

Manufacturer: Johnson Controls, Inc.

Product Line: Fan Coil Units

Certified Subcomponent: Controls

Controls				
Model Number	Manufacturer	Description	Material	Unit
MS-VMA1620-0	Johnson Controls	Metasys controller	Plastic cover	UUT23, UUT26
66-001-1000	Johnson Controls	Fanspeed control assembly	Plastic and fiberglass	UUT23
66-003-1000	Johnson Controls	Fanspeed control assembly	Plastic and fiberglass	UUT26
66-006-1000	Johnson Controls	Fanspeed control assembly	Plastic and fiberglass	UUT5-6, UUT9-10
PC-07-0103	Johnson Controls	Pipe sensor	Stainless steel	UUT9-10
PC-01-4000	Johnson Controls	Control board	Fiberglass	UUT33-34
84-52007-10	Johnson Controls	Fan coil unit relay board	Fiberglass	UUT33
84-52007-17	Johnson Controls	Fan coil unit relay board	Fiberglass	UUT34, UUT26
B63-001-2068	Johnson Controls	Fan coil unit relay board	Fiberglass	UUT33-34, UUT26
PC-01-0026	Johnson Controls	Thermostat controller	Plastic cover	UUT9-10
T602DFH-4	Johnson Controls	Thermostat controller	Plastic cover	UUT6
T701DFN-1	Johnson Controls	Thermostat controller	Plastic cover	UUT10
PC-00-0249	Erie	Actuator, PopTop, 24V	Stainless steel cover	UUT23-26
PC-00-0250	Erie	Actuator, PopTop, 120V	Stainless steel cover	UUT5
PC-00-0737	Erie	Actuator, PopTop, 120V - CW,44 In	Stainless steel cover	UUT9-10
PC-00-0738	Erie	Actuator, PopTop, 120V - HW,44 In	Stainless steel cover	UUT9-10
PC-00-0775	Erie	Actuator, PopTop, 120V - CW,86 In	Stainless steel cover	UUT6
PC-00-0776	Erie	Actuator, PopTop, 120V - HW,86 In	Stainless steel cover	UUT6
PC-03-0001	Cleveland Controls	Airflow switch	Stainless steel housing	UUT23, UUT26
PE-10-9300	Hartland	Transformer	130deg C class B insulation	UUT23, UUT26
PC-01-0134	Johnson Controls	Fan coil unit relay board	Fiberglass	UUT35-38

Special Seismic Certification
Tested Components - Fan Coil Units

Manufacturer: Johnson Controls

Product Family: Fan Coil Units

Tested Product Construction: Galvanized carbon steel cabinet

Tested Mounting Description: FLX, FWI, FSC and FCC are rigid base and wall mounted (certified units are attached at the base and rear of the unit); FNP, FNE and FHP units are ceiling suspended (without spring isolators)

JCI Model	Enviro-Tec Model	Titus Model Number	Krueger Model Number	Superior Rex Model Number	Dimensions (in)									Weight (lb)	Mounting	Sds (g), z/h=1	Unit
					Main Cabinet*			Supply Plenum			Mixing Box						
					Length	Width	Height	Length	Width	Height	Length	Width	Height				
FLX 02	VLE 02	TVBL 02	KVFC 02	RBVL 02	41	12 1/2	14 1/2	N/A	N/A	N/A	N/A	N/A	N/A	75	Rigid base and wall mounted	2.5	UUT5
FWI 12	VFS 12	TVBA 12	KVFS 12	RBVS 12	85	10	28 3/4	N/A	N/A	N/A	N/A	N/A	N/A	180		2.5	UUT6
FSC 03	VHC 03	TVSR 03	TVSR 03	TVSR 03	18	18	88	N/A	N/A	N/A	N/A	N/A	N/A	190		2.5	UUT9
FSC 12	VHC 12	TVSR 12	TVSR 12	TVSR 12	24	24	88	N/A	N/A	N/A	N/A	N/A	N/A	260		2.5	UUT10
FCC 04	CDV 04	TVHC 04	KVGH 04	RAVC 04	22	23	49	22	15	15	22	15	15	160		2.5	UUT33
FCC 20	CDV 20	TVHC 20	KVGH 20	RAVC 20	46	36	49	46	18	18	46	18	18	350		2.5	UUT34
FNP 06	HPP 06	THHPA 06	KHGPA 06	RAHRA 06	47 3/8	37	16 3/4	N/A	N/A	N/A	N/A	N/A	N/A	161	Ceiling suspended	2.5	UUT23
FNP 20	HPP 20	THHPA 20	KHGPA 20	RAHRA 20	47 3/8	70	16 3/4	N/A	N/A	N/A	N/A	N/A	N/A	340		1.93	UUT26
FNE 06	HPE 06	THHEA 06	KHGEA 06	RAHCA 06	31 7/8	31 1/4	18	N/A	N/A	N/A	N/A	N/A	N/A	152		1.93	UUT35
FNE 20	HPE 20	THHEA 20	KHGEA 20	RAHCA 20	31 7/8	64 1/4	18	N/A	N/A	N/A	N/A	N/A	N/A	286		1.93	UUT36
FHP 02	HLP 02	THBPA 02	KHFPA 02	RBHRA 02	25 1/4	25 1/4	10 3/4	N/A	N/A	N/A	N/A	N/A	N/A	24		1.93	UUT37
FHP 12	HLP 12	THBPA 12	KHFPA 12	RBHRA 12	69 1/2	25 1/4	10 3/4	N/A	N/A	N/A	N/A	N/A	N/A	71		1.93	UUT38

*Main cabinet dimensions for FNP 06 and FNP 20 include mixing box, which is integral to the tested unit.

UUT5 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FLX 02

Options: 2 row heating and 2 row cooling coils, direct drive fan, 115V 1/25HP motor, 1" pleated filter, fanspeed control assembly, actuator

Cabinet Construction Summary

Construction: 18 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
75	Main Cabinet	41	12 1/2	14 1/2	N/A	N/A	N/A

Seismic Test Parameters

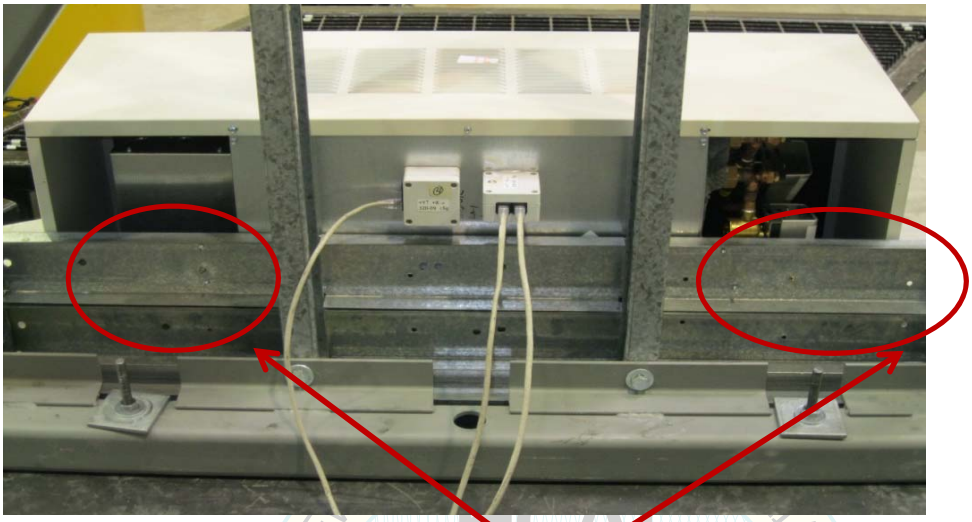
Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

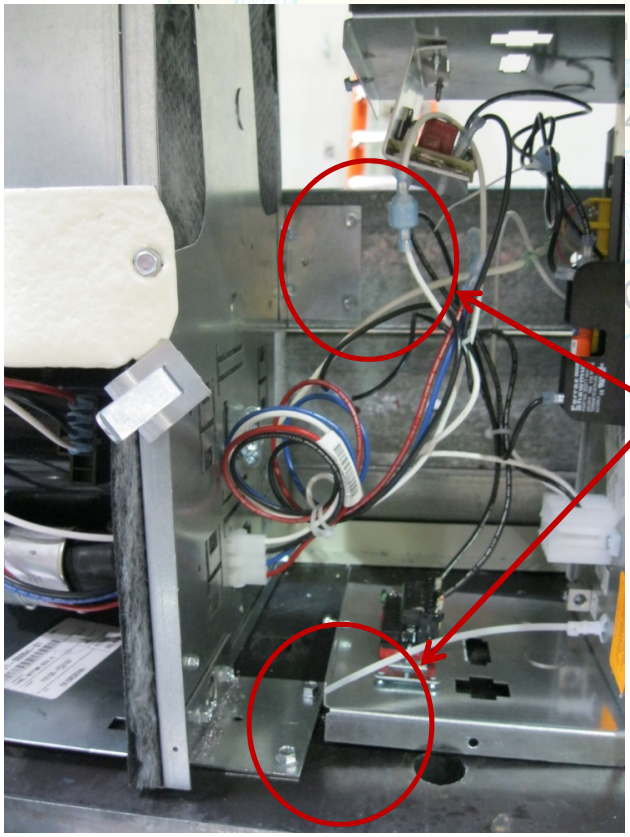
See test report number 90300-1009

The unit was mounted at the bottom and back using four manufacturer-provided angle clips (one on each front bottom corner and two at the back of the unit at approximately 7 inches high). Each clip was held in place using four #12, 3/4-inch long sheet metal screws; two screws were attached through the unit, and two through the DCL-provided steel fixture.

UUT5 Unit Under Test Summary Sheet (Cont.)



Mounting locations at back of unit (rear view of unit)



Mounting locations at back and base of unit (interior view of unit)

UUT6 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FWI 12

Options: 1 row heating and 3 row cooling coils, direct drive fan, 115V 1/20HP motor, 1" pleated filter, fanspeed control assembly, thermostat controller, actuator

Cabinet Construction Summary

Panel Construction: 18 Gauge Galvanized Steel (exterior), closed cell foam insulation (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
180	Main Cabinet	85	10	28 3/4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 90300-1009

The unit was mounted at the base using four #14 sheet metal screws through the flange at the unit's base. The unit was mounted at the back using the two manufacturer-provided brackets integral to the unit and one 1/2-inch diameter Grade 5 bolt per bracket to attach the unit to the DCL shake table interface frame. The manufacturer-provided brackets at the back of the unit were located at approximately 12 inches from the unit's base.

UUT6 Unit Under Test Summary Sheet (Cont.)

Mounting locations at base of unit (interior view of unit)

UUT9 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FSC 03

Options: 2 row heating and 3 row cooling coils, direct drive fan, 120V 1/35HP motor, 1" pleated filter, fanspeed control assembly, pipe sensor, thermostat controller, actuators

Cabinet Construction Summary

Panel Construction: 18 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
190	Main Cabinet	18	18	88	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

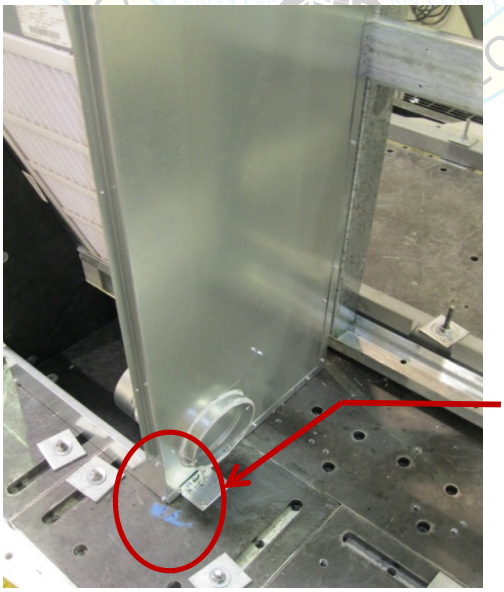
Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 90300-1009

The unit was mounted at the bottom and back using four manufacturer-provided angle clips (two on each front-bottom corner, and one on each side at approximately 58.5 inches high. Each clip was held in place using four #12, 3/4-inch long sheet metal screws; two screws were attached through the unit, and two through the DCL-provided steel fixture.

UUT9 Unit Under Test Summary Sheet (Cont.)

Mounting location at back of unit



Mounting location at base of unit

UUT10 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FSC 12

Options: 2 row heating and 3 row cooling coils, direct drive fan, 120V 1/4HP motor, 1" pleated filter, fanspeed control assembly, pipe sensor, thermostat controller, actuators

Cabinet Construction Summary

Panel Construction: 18 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
260	Main Cabinet	24	24	88	N/A	N/A	N/A

Seismic Test Parameters

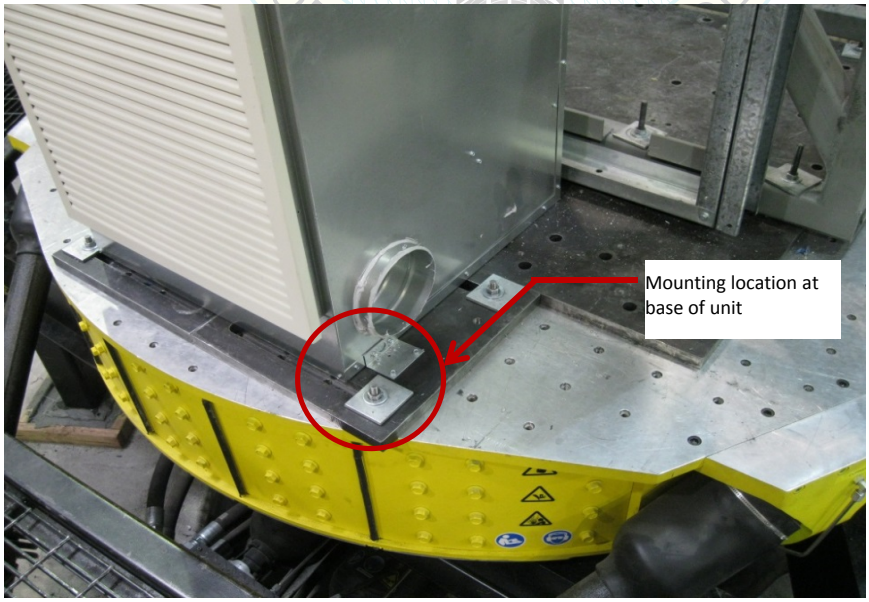
Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 90300-1009

The unit was mounted at the bottom and back using four manufacturer-provided angle clips (two on each front-bottom corner, and one on each side at approximately 58.5 inches high. Each clip was held in place using four #12, 3/4-inch long sheet metal screws; two screws were attached through the unit, and two through the DCL-provided steel fixture.

UUT10 Unit Under Test Summary Sheet (Cont.)



UUT23 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FNP 06

Options: 2 row heating and 6 row cooling coils, direct drive fan, 115V 1/4HP motor, 2" pleated filter, dampers, Metasys controller, fanspeed control assembly, actuator, airflow switch and transformer

Cabinet Construction Summary

Panel Construction: 20 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
161	Main Cabinet*	47 3/8	37	16 3/4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

*Main cabinet dimensions include mixing box, which is integral to the tested unit.

See test report number 90300-1009

The unit was ceiling-suspended using (4) 90 deg. brackets on the side and 4 flat brackets on the top of each of the four corners. Each bracket attached to unit using four #12 3/4" SMS. Each flat bracket overlaps the 90 deg. bracket, and a 1/2" threaded rod is attached through each and up into the fixture frame. Each threaded rod is stiffened using a length of unistrut and three B-line 1/2-inch clips, placed two inches from the top and bottom of the unistrut, and one at the approximate middle of the unistrut. Lateral bracing accomplished using 14 gage 45 degree brackets provided by JCI, 3/16" cable with 4 saddle clamps per cable (2 saddle clamps at each connection).

UUT26 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FNP 20

Options: 2 row heating and 6 row cooling coils, direct drive fan, 115V 1/4HP motor, 2" pleated filter, dampers, Metasys controller, fanspeed control assembly, fan coil unit relay board, actuator, airflow switch and transformer

Cabinet Construction Summary

Panel Construction: 20 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
340	Main Cabinet*	47 3/8	70	16 3/4	N/A	N/A	N/A

1

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	1.93	1	1.5	3.09	2.32	1.29	0.51

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

*Main cabinet dimensions include mixing box, which is integral to the tested unit.

See test report number 90300-1009

Unit was ceiling-suspended using (4) 90 deg. brackets on the side and 4 flat brackets on the top of each of the four corners. Each bracket attached to unit using four #12 3/4" SMS. Each flat bracket overlaps the 90 deg. bracket, and a 1/2" threaded rod is attached through each and up into the fixture frame. Each threaded rod is stiffened using a length of unistrut and three B-line 1/2-inch clips, placed two inches from the top and bottom of the unistrut, and one at the approximate middle of the unistrut. Lateral bracing accomplished using 14 gage 45 degree brackets provided by JCI, 3/16" cable with 4 saddle clamps per cable (2 saddle clamps at each connection).

UUT33 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FCC 04

Options: 2 row heating and 4 row cooling coils, direct drive fan, 115V 1/3HP motor, 1" throwaway filter, dampers, control board, fan coil unit relay board

Cabinet Construction Summary

Panel Construction: 18 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
160	Main Cabinet	22	23	49	N/A	N/A	N/A
	Supply Plenum	22	15	15			
	Mixing Box	22	15	15			

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

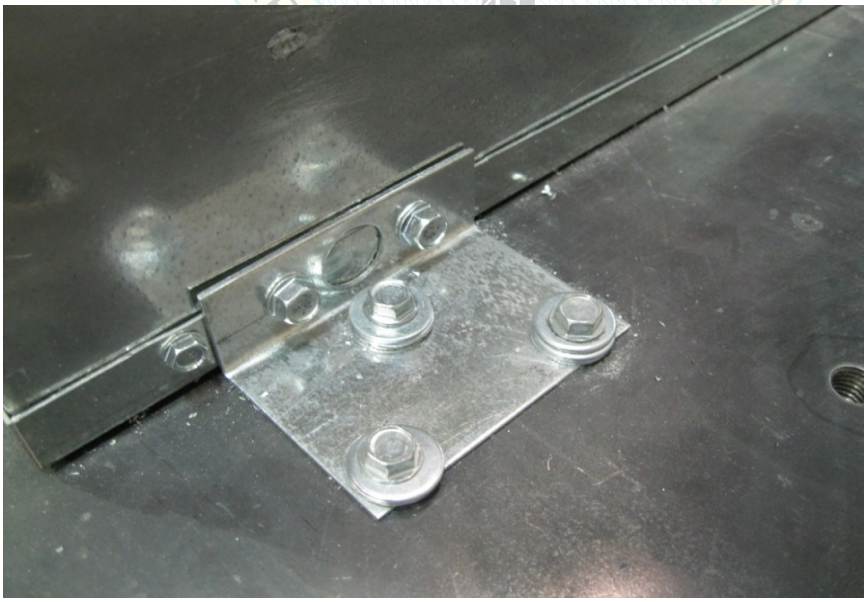
Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 13001-1302

The unit was mounted at the bottom and back using four manufacturer-provided angle clips (one on each bottom-front corner, and one on each side at approximately 55 inches high. Each clip was held in place using five #12, 3/4-inch long sheet metal screws; two screws were attached through the unit, and three through the DCL-provided steel fixture.

UUT33 Unit Under Test Summary Sheet (Cont.)

Mounting bracket at back of unit



Mounting bracket at base of unit

UUT34 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FCC 20

Options: 2 row heating and 4 row cooling coils, direct drive fan, 115V 1/3HP motor, 1" throwaway filter, dampers, control board, fan coil unit relay board

Cabinet Construction Summary

Panel Construction: 18 gage galvanized Steel (exterior), 1/2" fiberglass insulation

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
350	Main Cabinet	46.0	36.0	49.0	N/A	N/A	N/A
	Supply Plenum	46.0	18.0	18.0			
	Mixing Box	46.0	18.0	18.0			

Seismic Test Parameters

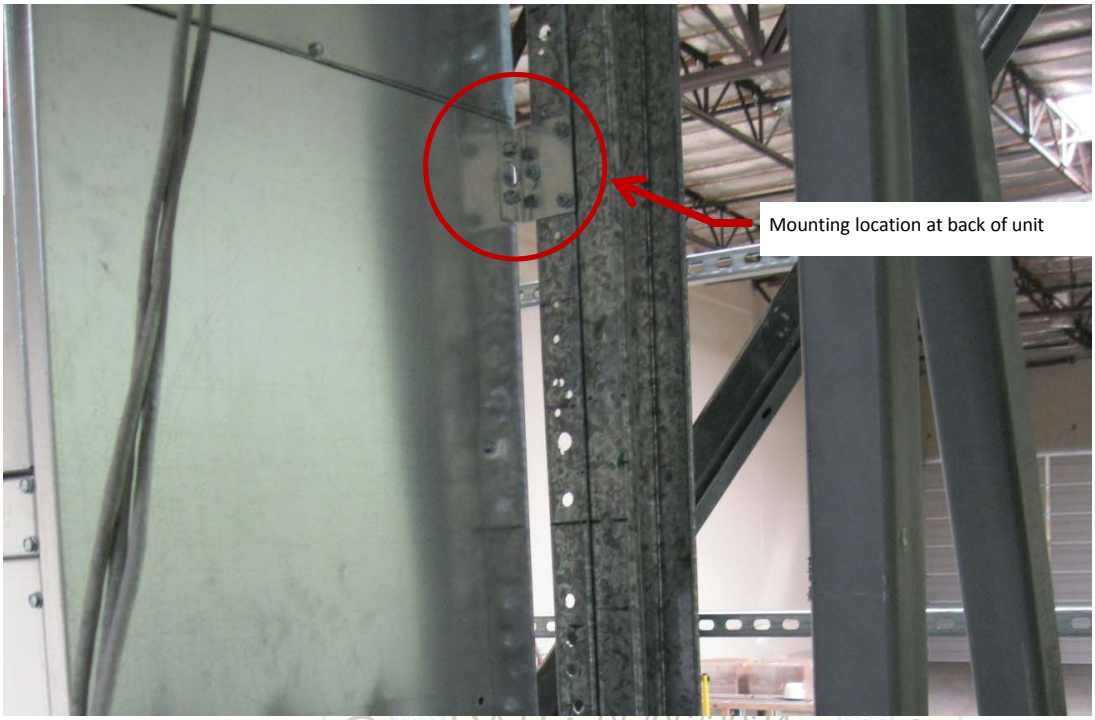
Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1	1.5	4.00	3.00	1.67	0.67

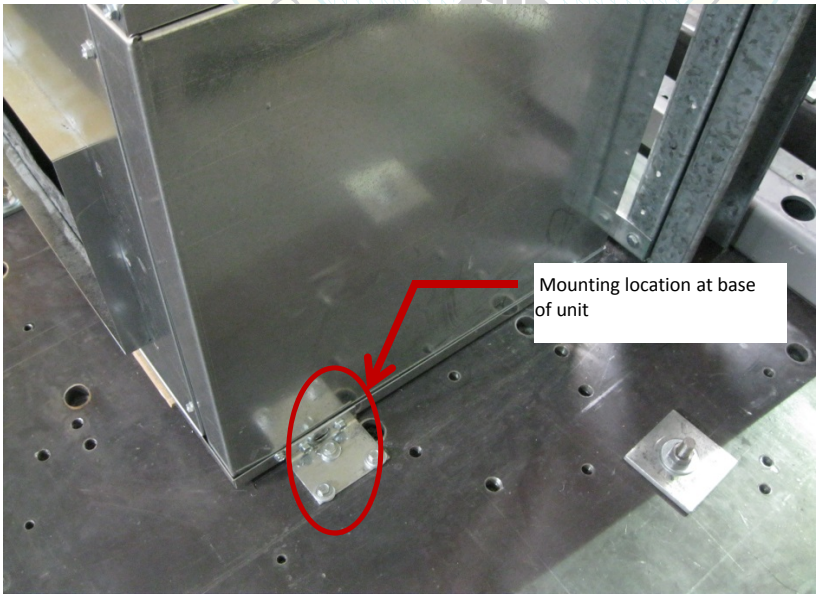
Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 13001-1302

The unit was mounted at the bottom and back using four manufacturer-provided angle clips (two on each front-bottom corner, and one on each side at approximately 58.5 inches high. Each clip was held in place using five #12, 3/4-inch long sheet metal screws; two screws were attached through the unit, and three through the DCL-provided steel fixture.

UUT34 Unit Under Test Summary Sheet (Cont.)





UUT35 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FNE 06

Options: 2 row heating and 6 row cooling coils, direct drive fan, 115V 1/3HP motor, 2" pleated filter, fan coil unit relay board

Cabinet Construction Summary

Panel Construction: 20 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
152	Main Cabinet	31 7/8	31 1/4	18	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	1.93	1	1.5	3.09	2.32	1.29	0.51

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 03091-1601

The unit was ceiling-suspended using the mounting brackets integral to the unit. A 1/2" diameter threaded rod was attached through each bracket and up into the fixture frame, with the unit hanging at approximately 15 1/4 inches below the fixture frame. The rod spacing was 16.5 inches in the short direction of the unit, and a maximum of 22 inches in the long direction. Each threaded rod was stiffened using a length of P1000 channel and three B-line 1/2-inch clips, placed at the top, bottom, and approximate center of the channel. Lateral bracing consisted of (8) lengths of 3/16" wire rope and (16) 10 gage 2"x5.5" galvanized carbon steel brackets provided by JCI, bent in the middle at a 45 degree angle. The brackets were placed at each end of the wire rope, and secured with (2) saddle clamps per rope.

UUT36 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FNE 20

Options: 2 row heating and 6 row cooling coils, direct drive fan, 115V 1/3HP motor, 2" pleated filter, fan coil unit relay board

Cabinet Construction Summary

Panel Construction: 20 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
286	Main Cabinet	31 7/8	64 1/4	18	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	1.93	1	1.5	3.09	2.32	1.29	0.51

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 03091-1601

The unit was ceiling-suspended using the mounting brackets integral to the unit. A 1/2" diameter threaded rod was attached through each bracket and up into the fixture frame, with the unit hanging at approximately 15 1/4 inches below the fixture frame. The rod spacing was 16.5 inches in the short direction of the unit, and a maximum of 55 inches in the long direction. Each threaded rod was stiffened using a length of P1000 channel and three B-line 1/2-inch clips, placed at the top, bottom, and approximate center of the channel. Lateral bracing consisted of (8) lengths of 3/16" wire rope and (16) 10 gage 2"x5.5" galvanized carbon steel brackets provided by JCI, bent in the middle at a 45 degree angle. The brackets were placed at each end of the wire rope, and secured with (2) saddle clamps per rope.

UUT37 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FHP 02

Options: 2 row heating and 6 row cooling coils, direct drive fan, 115V 1/4HP motor, 1" throwaway filter, fan coil unit relay board

Cabinet Construction Summary

Panel Construction: 20 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
24	Main Cabinet	25 1/4	25 1/4	10 3/4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	1.93	1	1.5	3.09	2.32	1.29	0.51

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 03091-1601

The unit was ceiling-suspended using the mounting brackets integral to the unit. A 1/2" diameter threaded rod was attached through each bracket and up into the fixture frame, with the unit hanging at approximately 15 1/4 inches below the fixture frame. The rod spacing was 12.5 inches in one direction of the unit, and 17.5 inches in the other. Each threaded rod was stiffened using a length of P1000 channel and three B-line 1/2-inch clips, placed at the top, bottom, and approximate center of the channel. Lateral bracing consisted of (8) lengths of 3/16" wire rope and (16) 10 gage 2"x5.5" galvanized carbon steel brackets provided by JCI, bent in the middle at a 45 degree angle. The brackets were placed at each end of the wire rope, and secured with (2) saddle clamps per rope.

UUT38 Unit Under Test Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: FHP 12

Options: 2 row heating and 6 row cooling coils, direct drive fan, 115V 1/10HP motor, 1" throwaway filter, fan coil unit relay board

Cabinet Construction Summary

Panel Construction: 20 Gauge Galvanized Steel (exterior), Fiberglass (interior)

UUT Properties

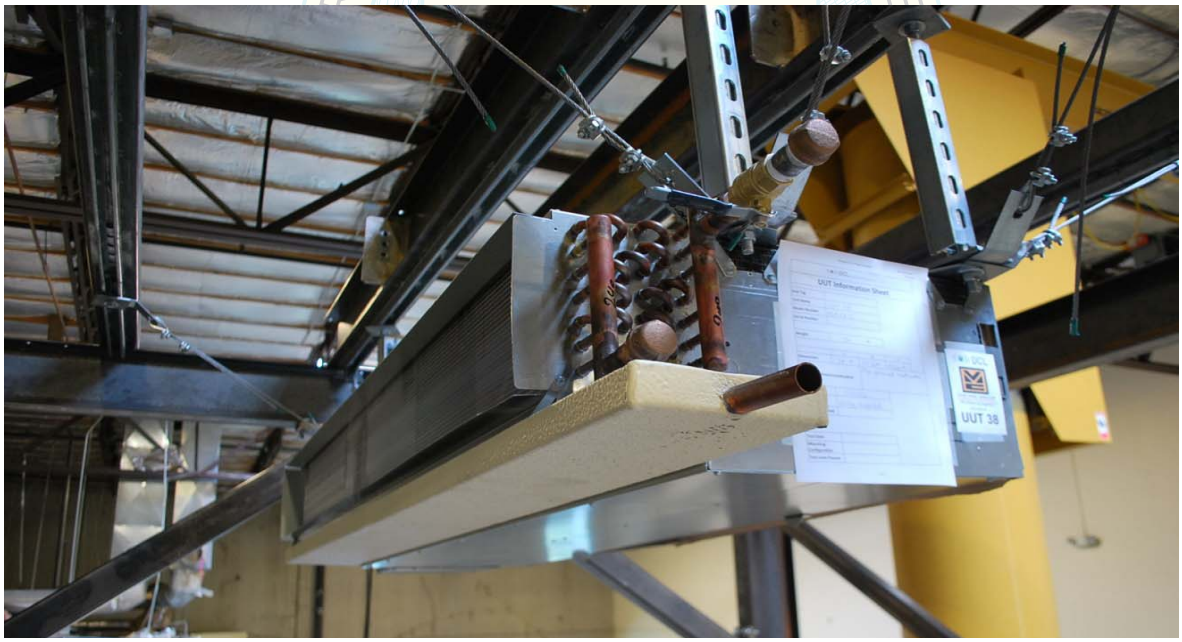
Weight (lb)		Dimensions (in)			Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
71	Main Cabinet	69 1/4	25 1/4	10 3/4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	1.93	1	1.5	3.09	2.32	1.29	0.51

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

See test report number 03091-1601

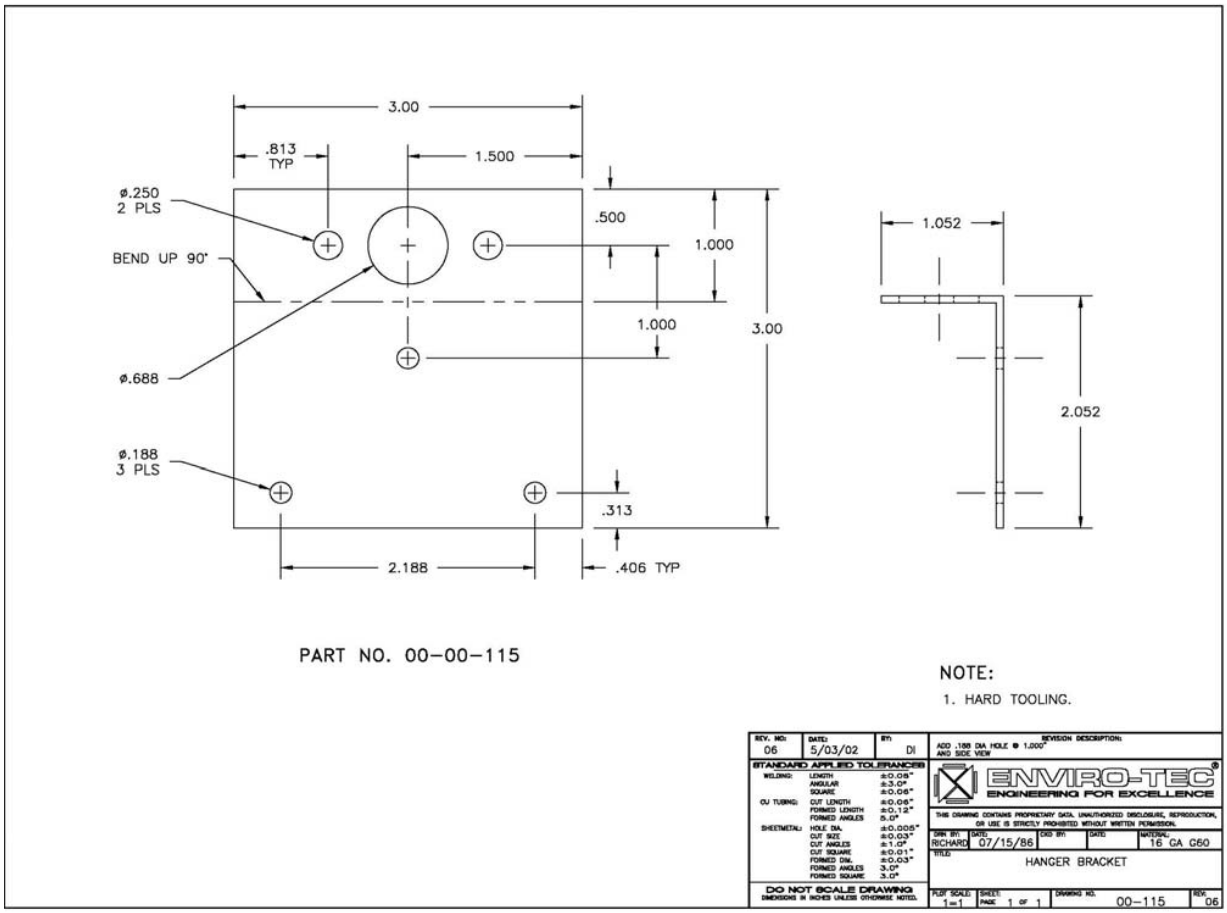


The unit was ceiling-suspended using the mounting brackets integral to the unit. A 1/2" diameter threaded rod was attached through each bracket and up into the fixture frame, with the unit hanging at approximately 15 1/4 inches below the fixture frame. The rod spacing was 12.5 inches in one direction of the unit, and 61.5 inches in the other. Each threaded rod was stiffened using a length of P1000 channel and three B-line 1/2-inch clips, placed at the top, bottom, and approximate center of the channel. Lateral bracing consisted of (8) lengths of 3/16" wire rope and (16) 10 gage 2"x5.5" galvanized carbon steel brackets provided by JCI, bent in the middle at a 45 degree angle. The brackets were placed at each end of the wire rope, and secured with (2) saddle clamps per rope.

Angle Clip Detail
UUT5, UUT9-10, UUT33-34

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

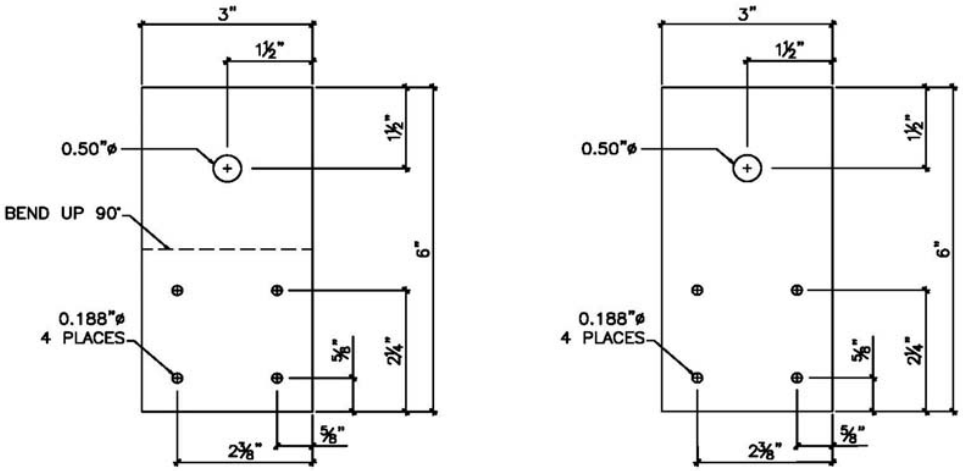


Note: Angle clips used for mounting UUT5, UUT9-10 and UUT33-34. Clip material is 16 gage G60 galvanized steel. Each clip was held in place using four #12, 3/4-inch long sheet metal screws; two screws were attached through the unit, and two through the DCL-provided steel fixture.

Mounting Bracket Details
UUT23, UUT26

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line



Note: Bracket material is 16 gage G60 galvanized steel.

Photograph showing typical mounting for UUT23, UUT26.

For UUT23 and UUT26, the unit was ceiling-mounted using (4) angle brackets on the side and 4 flat brackets on the top of each of the four corners. Each bracket was attached to unit using four #14 3/4" SMS as shown in the above photograph.